Case No: HC11C04556

IN THE HIGH COURT OF JUSTICE
CHANCERY DIVISION
PATENTS COURT

Royal Courts of Justice, Rolls Building
Fetter Lane, London, EC4A 1NL

Date: 26 March 2014

Before :

THE HON MR JUSTICE ARNOLD

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Between :

(1) STARSIGHT TELECAST INC	**Claimants**
(2) UNITED VIDEO PROPERTIES INC	
- AND -	
(1) VIRGIN MEDIA LIMITED	**Defendants**
(2) VIRGIN MEDIA PAYMENTS LIMITED	
(3) TIVO INC	

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Daniel Alexander QC, **James Abrahams** and **Isabel Jamal** (instructed by **Powell Gilbert LLP**) for the **Claimants**
James Mellor QC and **James Whyte** (instructed by **Marks & Clerk Solicitors LLP**) for the **Defendants**

Hearing dates: 26, 28 February, 3-6, 10-11 March 2014
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Approved Judgment

I direct that pursuant to CPR PD 39A para 6.1 no official shorthand note shall be taken of this Judgment and that copies of this version as handed down may be treated as authentic.

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THE HON MR JUSTICE ARNOLD

MR JUSTICE ARNOLD :

Contents

Topic   *Paragraphs*

Introduction

1.   The Claimants are members of the Rovi group of companies and therefore I will follow the parties' practice of referring to them collectively as "Rovi". The First and Second Defendants are members of the Virgin Media group. The Third Defendant provides hardware and software for one type of set-top box ("STB") supplied by Virgin Media to their customers, and therefore I will follow the parties' practice of referring to all three Defendants collectively as "Virgin". This is the third in a sequence of actions between the same parties concerning television electronic programme guides ("EPGs") to come before this Court.

2.   In this action, Rovi claim that Virgin have infringed two patents belonging to Rovi ("the Patents"):

    i)   European Patent (UK) No. 1 763 234 entitled "Improved electronic television program schedule guide system and method" ("234"). The priority date is 20 May 1994.

    ii)   European Patent (UK) No. 0 821 856 entitled "Merging multi-source information in a television system" ("1856"). The priority date is 17 April 1995.

3.   There are two classes of allegedly infringing device:

      i)   the TiVo STB; and

      ii)   the VHD and V+HD STBs, which are identical in respect of the functionality in issue, and accordingly I will refer to both as "VHD".

4.   The TiVo STB is alleged to infringe both 234 and 1856, while the VHD STBs are only alleged to infringe 234. Virgin deny infringement and counterclaim for revocation of the Patents on multiple grounds. There is no challenge to either of the priority dates, however.

The course of the trial

5.   The trial did not go according to plan. When the trial started on 26 February 2014, it was planned that, following oral opening submissions, I would hear Virgin's witness Mark Jackman cross-examined in relation to Virgin's Product and Process Description for 234 for about an hour, then I would hear the evidence of the expert witnesses in relation to 234 for about a day each, then I would hear the evidence of the expert witnesses in relation to 1856 for about a day each, and then the parties would prepare and deliver closing submissions. On this basis, it was envisaged that the trial would finish on 7 March 2014. In the event, Mr Jackman was cross-examined for over half a day. At the conclusion of his evidence, counsel for Rovi requested that Virgin provide certain further information. It was subsequently agreed that the court would not sit on 27 February 2014. When the trial was resumed on 28 February 2014, I heard the evidence of the expert witnesses in relation to 1856, followed by the evidence of the expert witnesses in relation to 234. This enabled the factual position in relation to infringement of 234 to be clarified as described below before those experts gave evidence. The trial finished on 11 March 2014. In my view it is clear that Virgin were mainly responsible for this state of affairs, although Rovi contributed to it. In order to explain why, I must first set out the law in relation to the preparation of product and process descriptions in patent cases.

Product and process descriptions: the law

6.   CPR rule 63.9 provides that Part 31 is modified to the extent set out in Practice Direction 63. Practice Direction 63 paragraph 6.1 provides, so far as relevant, as follows:

> "Standard disclosure does not require the disclosure of documents that relate to –
>
> (1)   the infringement of a patent by a product or process where –
>
>   (a)   not less than 21 days before the date for service of a list of documents the defendant notifies the claimant and any other party of the defendant's intention to serve–
>
>   (i)   full particulars of the product or process alleged to infringe; and

> > (ii)   any necessary drawings or other illustrations; and
>
> > (b)   on or before the date for service the defendant serves on the claimant and any other party the documents referred to in paragraph 6.1(1)(a);
>
> …"

7.   As Pumfrey J observed in relation to a predecessor of this rule in *Consafe Engineering (UK) Ltd v Emtunga UK Ltd* [1999] RPC 154 at [23] (emphasis added):

> "A product description is normally prepared by the defendant to the allegation of infringement so as to take advantage of the provisions of RSC Ord. 104 rule 11 and avoid giving discovery. The purpose of this provision is to avoid, if possible, obliging the defendant to give extensive discovery much of which, experience has shown, is rarely if ever referred to. If this object is to be achieved, it is essential that parties and their advisers appreciate that the rule requires 'full particulars of the product or process alleged to infringe' to be given. *In this context, 'full particulars' means particulars sufficient to enable all issues of infringement to be resolved. The description must be complete in all relevant areas.* A description of the product either in general terms or including tendentious assertions is not acceptable."

8.   In *Taylor v Ishida (Europe) Ltd* [2000] FSR 224 Pumfrey J said at 225 (emphasis added):

> "The criticism to which I subjected the product description, in my judgment, is severe. I wish to repeat that the function of a product description is in all respects equivalent to that of disclosure. *The duties of all parties, both the professionals and of the parties themselves, in relation to a product description, are the same as they would be in relation to disclosure.*
>
> In my view, it is quite plain that those duties were not complied with in the present case. At all times, in my judgment, the defendants acted so that they retained the right to reveal what they considered to be sufficient for the purposes of the plaintiff and the Court."

As a result, he made an order for indemnity costs against the defendant on the issue of infringement.

9.   It should be appreciated by practitioners that every word Pumfrey J said in those two judgments continues to apply with full force to PD63 para. 6(1). I would add two points. The first is that it is sometimes said (and I have sometimes been guilty myself of saying) that a product or process description only needs to contain information at the same level of generality as the claims of the patent in suit. This is not correct. It

would be more accurate to say that it must contain information of *at least* the level of specificity of the claims. It is often the case that the product or process description needs to contain rather more detailed information than the claims. This is because, even if the claims are expressed in general terms, the issues on infringement often involve understanding precisely how the allegedly infringing product or process is constructed or functions.

10.   The second is that the defendant's lawyers sometimes complain that they do not understand how the claimant is putting its case on infringement, and therefore they do not know exactly what details of the product or process need to be described. Sometimes the claimant's lawyers respond to such a complaint that it is not possible to provide a detailed statement of case on infringement until the defendant has properly described its product or process. Assuming that the claimant's claim for infringement is not speculative (in which case it should be struck out for that reason), it should be recognised that, as is stated in paragraph 10.3 of the Patents Court guide, both parties have a responsibility. The claimant has the primary responsibility to articulate its infringement case as clearly as it can. The defendant has the primary responsibility to provide full particulars of its product or process. Both parties have a duty to cooperate with the other. Sometimes this may require a degree of iteration. But, in general, I do not accept that it is legitimate for a defendant to seek to use a lack of clarity of the claimant's case on infringement as an excuse for not providing proper particulars of its product or process. If the defendant is genuinely unsure about what particulars it needs to provide, it should apply to the court for directions.

Rovi's Statement of Case

11.   On 11 July 2012 Iain Purvis QC sitting as Deputy High Court Judge made an order by consent, paragraph 2(a) of which required Rovi to serve a statement of case on infringement "identifying precisely those aspects of the Virgin Media Service, VM TiVo set-top box and/or Virgin Media network that are alleged to infringe [1856], including identification of all aspects that are alleged to constitute 'sources', 'source devices' and 'transmission schemes' for the purposes of those claims alleged to be infringed". On 1 October 2012 Rovi duly served its Statement of Case on Infringement of 1856.

12.   Virgin did not apply for, and thus did not obtain, a similar order in relation to 234, and therefore Rovi did not serve a statement of case in relation to 234. Counsel for Virgin informed me that Virgin repeatedly complained in correspondence that Rovi had not done so voluntarily.

Virgin's Product and Process Descriptions

13.   On 18 and 25 October 2013 respectively Virgin served separate Product and Process Descriptions in relation to 234 and 1856 ("the PPDs"). (I note in passing that the 1856 PPD was designated "Confidential", but it is not clear that it contains any confidential information and no application was made at trial for an order under CPR rule 31.22 in respect of it.) I should make it clear that Mr Jackman did not draft the PPDs or sign the statements of truth which they bore, although he gave evidence that he had checked the 234 PPD for technical accuracy. It is manifest that the PPDs did not adequately describe the functionality of the TiVo and VHD STBs. As a result, there

was correspondence between the parties, and Virgin were obliged to provide further information as described below.

14.   In relation to 1856, Virgin served a substantial Addendum to the PPD on 31 January 2014. (This time in versions designated "Confidential" and "Non-Confidential", the only difference being in part of one figure.) In my view this information should have been included in the PPD. On 14 February 2014 Virgin served a witness statement of a witness who confirmed the completeness and accuracy of the Addendum. That was not the end of the matter, however. Rovi asked for a further clarification, which resulted in the service by Virgin of a short Second Addendum on 20 February 2014. At that point, Rovi were content and did not require the individuals who had verified the PPD and the Addenda to attend for cross-examination.

15.   In relation to 234, the position was considerably worse. The PPD was not only inadequate, but also wrong in at least one respect. Furthermore, elucidating the full and correct position was much more troublesome. On 23 October 2013 Rovi served a request under CPR Part 18. Virgin served its reply (which was not verified by a statement of truth, contrary to rule 18.1(3) and Part 22) on 30 October 2013. Regrettably, this turned out to contain at least four errors.

16.   After further correspondence, Virgin served a short Addendum to the PPD on 6 January 2014. Rovi were not content with this, and applied for an order for disclosure of the database schema for the VHD and TiVo STBs. On 9 January 2014 I made an order for disclosure of the database schema so far as relevant to Rovi's infringement case and ordered Virgin to pay the costs of the application. On 20 January 2014 Virgin served two additional PPDs, one of which (verified by Chuang Liu) set out extracts from the TiVo database schema and a description of how the fields were used to generate the EPG, and the other of which (verified by Mr Jackman) explained that the VHD STBs did not store data in a relational database, but set out equivalent extracts from the relevant software and a description of how the data was used to generate the EPG. In my view this information should have been included in the PPD. Indeed, I would go further. I think a considerable amount of time, effort and money could have been saved if Virgin had simply disclosed the TiVo schema and the VHD application layer software, or at least the relevant parts of it, on terms as to confidentiality at the outset.

17.   Rovi were still not content, and raised further questions by letter dated 27 January 2014 to which Virgin replied by letter dated 3 February 2014 *inter alia* correcting in one respect the schema PPD relating to the VHD STBs. On 14 February 2014 Virgin served a witness statement from Mr Jackman confirming the completeness and accuracy of (i) the PPD, (ii) the Addendum, (iii) the VHD schema PPD as corrected by the letter dated 3 February 2014 and (iv) the letter dated 3 February 2014. He did not verify the response dated 30 October 2013 in this statement.

18.   On 19 February 2014 Virgin served a further witness statement from Mr Jackman correcting three errors in the response dated 30 October 2013 and otherwise confirming its accuracy. Rovi asked further questions by letter dated 19 February 2014 which were answered in a witness statement served by Virgin on 20 February 2014. Rovi raised still further questions by letter dated 20 February 2014 which led to Virgin serving a Second Addendum to the PPD verified by Mr Jackman on 25 February 2014 (the day before trial).

19.   During the course of his cross-examination Mr Jackman acknowledged the error in the PPD referred to above and that there was a further error in the response dated 30 October 2013. It also became clear that the Addenda (particularly the Second Addendum) were incomplete in certain respects. As mentioned above, this led to counsel for Rovi requesting further information. On 28 February 2014 Virgin served a substantial Third Addendum to the PPD and on 3 March 2014 Virgin served a further witness statement from Mr Jackman correcting an answer he had given in cross-examination.

20.   After that, the cross-examination of the experts was able to proceed without incident. In his closing submissions counsel for Rovi suggested that there was still uncertainty as to how the VHD STBs work in one respect, but I do not accept that.

21.   It is only fair to Virgin to note that most of the further information sought by Rovi from 20 February 2014 onwards related to an infringement case which Rovi did not ultimately pursue. Thus I accept that Rovi contributed to the debacle on day 1 of the trial; but I think it is clear that this was mainly the responsibility of Virgin for not having provided proper PPDs at the outset or at least well before trial. To the extent that Virgin's difficulty was caused by uncertainty as to what particulars to provide, this was substantially self-inflicted in that they failed to apply for an order requiring Rovi to serve a statement of case on infringement, or otherwise to seek directions from the court.

The law

22.   The legal principles which must be applied in this case may be identified as follows.

The skilled team

23.   A patent specification is addressed to those likely to have a practical interest in the subject matter of the invention, and such persons are those with practical knowledge and experience of the kind of work in which the invention is intended to be used. The addressee comes to a reading of the specification with the common general knowledge of persons skilled in the relevant art, and he (or she) reads it knowing that its purpose is to describe and demarcate an invention. He is unimaginative and has no inventive capacity. In some cases the patent may be addressed to a team of persons having different skills.

Common general knowledge

24.   I reviewed the law as to common general knowledge in *KCI Licensing Inc v Smith & Nephew plc* [2010] EWHC 1487 (Pat), [2010] FSR 31 at [105]-[115]. That statement of the law was approved by the Court of Appeal [2010] EWCA Civ 1260, [2011] FSR 8 at [6].

Construction

25.   The general principles applicable to the construction of patent claims were summarised by Jacob LJ giving the judgment of the Court of Appeal in *Virgin Atlantic Airways Ltd v Premium Aircraft Interiors UK Ltd* [2009] EWCA Civ 1062, [2010] RPC 8 at [5]. He went on at [6]-[22] to hold that the skilled reader is to be

taken to know (i) the purpose of including reference numerals in patent claims, (ii) the purpose of dividing claims into pre-characterising and characterising portions and (iii) the practice of filing divisional applications, and to bring that knowledge to bear when he considers the scope of the claim. In relation to reference numerals, he said at [17]:

> "… we do not think that numerals should influence the construction of the claim at all – they do not illustrate whether the inventor intended a wide or narrow meaning. The patentee is told by [rule 29(7) of the Implementing Regulations to the EPC] that if he puts numerals into his claim they will not be used to limit it. If the court subsequently pays attention to the numbers to limit the claim that is simply not fair. And patentees would wisely refrain from inserting numbers in case they were used against them. That is not to say that numbers are pointless. They help a real reader orient himself at the stage when he is trying to get the general notion of what the patent is about. He can see where in the specific embodiment a particular claim element is, but no more. Once one comes to construe the claim, it must be construed as if the numbers were not part of it. To give an analogy, the numbers help you get the map the right way up, they do not help you to read it to find out exactly where you are."

Added matter

26.   A patent is invalid if "the matter disclosed in the specification of the patent extends beyond that disclosed in the application for the patent, as filed" (section 72(1)(d) of the Patents Act 1977 derived from Article 123(2) of the European Patent Convention). The law with regard to added matter was comprehensively reviewed by Kitchin LJ in *Nokia Corp v IPCom GmbH* [2012] EWCA Civ 567, [2013] RPC 5, at [46]-[60], in which he considered a number of earlier decisions both of the English courts and of the Boards of Appeal of the European Patent Office. With regard to "intermediate generalisation", I would add to those citations the following summary by the Board of Appeal in T 219/09 *Zaltron/Stick with shock absorber* (unreported, 27 September 2010) at [3.1]:

> "Article 123(2) EPC stipulates that a European patent (application) may not be amended in such a way that it contains subject-matter extending beyond the content of the application as filed. According to established case law it will, for example, normally not be allowable to base an amended claim on the extraction of isolated features from a set of features originally disclosed only in combination, e.g. a specific embodiment in the description, see for example decisions T 1067/97, T 714/00 or T 25/03 cited in the Case Law of the Boards of Appeal, 6th edition, 2010, III.A.2. Such an amendment results in an intermediate generalization, in that it further limits the claimed subject-matter, but is nevertheless directed at in an undisclosed combination of features broader than that of its originally disclosed context, see for example T 1408/04 and T 461/05. It is justified only in the absence of any clearly recognizable

functional or structural relationship among the features of the
specific combination, see T 1067/97, and if the extracted
feature is thus not inextricably linked with those features, see T
714/00."

See also *Case Law of the Boards of Appeal of the European Patent Office* (7th ed,
2013) at 373-378.

Excluded subject matter

27.   A patent will be invalid if the invention is not a patentable invention (section 72(1)(a)
        of the Act. It will not be patentable if the grant of a patent for the invention is
        excluded by section 1(2) of the Act (section 1(1)(d)). Section 1(2) provides that "(c)
        … a program for a computer; (d) the presentation of information" are not inventions
        for the purposes of the Act, but "only to the extent that a patent … relates to that thing
        as such". These provisions derive from Article 52 EPC.

28.   The computer program exclusion has been considered by the Court of Appeal in a
        series of decisions. The leading case remains *Aerotel Ltd v Telco Holdings Ltd* [2006]
        EWCA Civ 1371, [2007] RPC 7, in which it was held at [40] that the court should
        adopt the following structured approach:

        "(1)   properly construe the claim;

        (2)   identify the actual contribution;

        (3)   ask whether it falls solely within the excluded subject matter;

        (4)   check whether the actual or alleged contribution is actually
                 technical in nature."

29.   The decision in *Aerotel* must, however, be read in the light of the subsequent
        decisions of the Court of Appeal in *Symbian Ltd v Comptroller-General of Patents*
        [2008] EWCA Civ 1066, [2009] RPC 1 and *HTC Europe Co Ltd v Apple Inc* [2013]
        EWCA Civ 451, [2013] RPC 30, in particular at [33]-[51] (Kitchin LJ) and [140]-
        [151] (Lewison LJ). I note that the judgments in the latter case do not touch on the
        issue raised by Floyd J (as he then was) in the judgment at first instance [2012]
        EWHC 1789 (Pat) at [15], which is whether the appropriate "baseline" for judging
        technical contribution was any cited prior art or only common general knowledge.
        Floyd J held that it was the former. I have to say that I have doubts about that, but I
        cannot say that I am convinced that he was wrong. Nevertheless, for reasons that will
        appear, I will assume that the correct baseline is common general knowledge.

30.   The presentation of information exclusion was considered by Mann J in *Gemstar-
        TVGuide International Inc v Virgin Media Ltd* [2009] EWHC 3068 (Pat), [2010] RPC
        10, in particular at [53]-[60] (the issue did not arise on the appeal [2011] EWCA Civ
        302, [2011] RPC 25).

Novelty

31.   An invention will not be patentable if it is not novel (section 1(1)(a) of the Act). As
        was explained by the House of Lords in *Synthon BV v SmithKline Beecham plc* [2005]

UKHL 59, [2006] RPC 10, in order for an item of prior art to deprive a patent claim of novelty, two requirements must be satisfied. First, the prior art must disclose subject matter which, if performed, would necessarily infringe that claim. Secondly, the prior art must disclose that subject matter sufficiently to enable the skilled addressee to perform it.

Obviousness

32.   An invention will not be patentable if it does not involve any inventive step (section 1(1)(b) of the Act), that is to say, if the invention claimed was obvious to a person skilled in the art having regard to the state of the art at the priority date (section 3). The structured approach to the assessment of allegations of obviousness first articulated by the Court of Appeal in *Windsurfing International Inc v Tabur Marine (Great Britain) Ltd* [1985] RPC 59 was re-stated by Jacob LJ in *Pozzoli v BDMO SA* [2007] EWCA Civ 588, [2007] FSR 37 at [23] as follows:

"(1)(a) Identify the notional 'person skilled in the art';

(b)   Identify the relevant common general knowledge of that person;

(2)   Identify the inventive concept of the claim in question or if that cannot readily be done, construe it;

(3)   Identify what, if any, differences exist between the matter cited as forming part of the 'state of the art' and the inventive concept of the claim or the claim as construed;

(4)   Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?"

33.   In both *H. Lundbeck A/S v Generics (UK) Ltd* [2008] EWCA Civ 311, [2008] RPC 19 at [24] and *Conor Medsystems Inc v Angiotech Pharmaceuticals Inc* [2008] UKHL 49, [2008] RPC 28 at [42] Lord Hoffmann approved without qualification the following statement of principle by Kitchin J (as he then was) at first instance in the former case:

> "The question of obviousness must be considered on the facts of each case. The court must consider the weight to be attached to any particular factor in the light of all the relevant circumstances. These may include such matters as the motive to find a solution to the problem the patent addresses, the number and extent of the possible avenues of research, the effort involved in pursuing them and the expectation of success."

34.   In assessing whether a claimed invention is obvious, it is always important, although difficult, to avoid hindsight. The fact that, after the event, it is easy to see how the invention could be arrived at by starting from an item of prior art and taking a series of apparently simple steps does not necessarily show that it was obvious at the time:

British Westinghouse Electric & Manufacturing Co Ltd v Braulik (1910) 27 RPC 209 at 230 (Fletcher Moulton LJ), *Non-Drip Measure Co Ltd v Strangers Ltd* (1943) 60 RPC 135 at 142 (Lord Russell) and *Technograph Printed Circuits Ltd v Mills & Rockley (Electronics) Ltd* [1972] RPC 346 at 362 (Lord Diplock).

35.   The question "why was it not done before?" may be a powerful consideration when considering obviousness, particularly when all the components of a combination have been long and widely known: *Technip France SA's Patent* [2004] RPC 46 at [122] (Jacob LJ) and *Schlumberger Holdings Ltd v Electromagnetic Geoservices AS* [2010] EWCA Civ 819, [2010] RPC 33 at [77] (Jacob LJ).

Extension of protection

36.   A patent will be invalid if the protection conferred by the patent has been extended by an amendment which should not have been allowed (section 72(1)(e)). By contrast with an application, the protection conferred by a granted patent may not be extended by an amendment (section 76(3)(b)). This derives from Article 123(3) EPC.

Technical background

37.   Although the technology involved in this case is not particularly complex, it is another case in which I think it would have saved time, effort and money if the parties had agreed a primer setting out the technical background before preparing their experts' reports. This is particularly so given that much of the technical background is relevant to both Patents, and given that the gap between the priority dates of the Patents is only 11 months. As it is, I have had to assemble the following account from a number of sources, particularly the first reports of Mr Turner and Mr Adams. I have also borrowed from Mann J's judgment in *Gemstar* at [2]-[3].

Terrestrial, cable and satellite television

38.   In the early days of television, television channels were broadcast over-the-air (OTA) in analogue format. Each channel was broadcast on its own frequency by modulating it on a radio frequency (RF) carrier wave to be received by a television antenna. This is now frequently referred to as "terrestrial" broadcasting.

39.   A television set connected to an antenna was required to tune to the correct frequency to display that channel. Early television sets had a simple dial which altered the frequency the television's tuner would tune to. A user would turn the dial to tune to a particular frequency and hence channel. Later television sets stored the frequencies on which particular channels were broadcast so that the viewer could simply press a button which would immediately tune the television to a particular frequency and hence channel.

40.   In the 1940s, geographical areas which were unable to receive terrestrial television broadcasts (for example, because of mountainous terrain) began to set up cable television networks, consisting of a receiving station and a network of cables linking the receiving station to television sets. In its simplest incarnation, the receiving station (or "cable headend") would simply transmit the RF signal down the cable to the television sets of subscribers to the cable service. Initially, users would connect the incoming cable directly to their televisions, which would tune to frequencies received

over the cable. Later, as the number of channels available became greater, it became necessary to use a set-top converter (STC) as an intermediary between the television and the cable signal. These systems were also known as "community antenna television" or CATV systems.

41.   In the 1960s and 1970s, geosynchronous satellites began to be used to transmit television to the cable headends rather than ground-based terrestrial transmission techniques. Satellites offered the advantage of being able to transmit to an unlimited number of headends within the footprint covered by the transmission from the satellite. The satellite transmission would be received at the headend by a large satellite dish. The first frequency band used for this purpose was the C-band, which was in the 4 Ghz range and was typically received by dishes 2.5 to 3.5 meters in diameter.

42.   Although satellites were initially intended to be used to distribute signals only to headends of cable systems, a parallel industry grew up to supply users with their own satellite dish, with which it was possible to receive the television signals direct from the satellite and hence provide users with channels not necessarily available on their local cable system.

43.   In the late 1980s, direct-to-home (DTH) satellite, also known as Direct Broadcast Satellite (DBS), services appeared. These utilised the Ku-band frequency band, which was a higher frequency (12 Ghz range), higher power system which enabled transmissions to be received by smaller satellite dishes. To begin with, these systems typically had dishes 1 to 2 metres in diameter. One of the first systems to be launched in the USA was PrimeStar, which formed by a consortium of cable companies in 1991. Later systems had dishes about 0.7 metre in diameter.

Digital television services

44.   In addition to broadcasts using an analogue signal, it was known by May 1994 that television could be broadcast using a digital signal, and digital cable and satellite services were under development. For example, DirecTV launched a digital DTH satellite service in the USA in June 1994. Since then, digital terrestrial television services have also been introduced.

Television signal standards

45.   In order to sell television sets throughout the USA that would work anywhere across the country, a national standard needed to be established so that television manufacturers could ensure that their television receivers would work with the television signals being broadcast, regardless of the location. The National Television Standards Committee therefore created the NTSC standard, with which all television signal transmissions in the USA must comply. Later, many European countries adopted the alternative (and technically more advanced) Phase Alternating Line (PAL) standard. The French adopted their own standard called SECAM (*Séquentiel Couleur à Mémoire*). Within each country, save for some rare exceptions in specialised systems, terrestrial, cable and satellite systems all use the same standard (either NTSC, PAL or SECAM) for television transmission.

46.   Digital cable and terrestrial broadcasting uses digital standards such as MPEG-2 for the encoding of audio and video, but preserves the frequency map of the analogue television standard in the relevant country. This means that digitally encoded television is modulated onto the same frequencies as stipulated by the analogue standard.

Vertical Blanking Interval

47.   The Vertical Blanking Interval (VBI) is the interval between the television display reaching the bottom of the screen and re-commencing at the top of the screen. In 1994/1995 it was common to use the VBI to transmit non-video data such as teletext and closed captions (subtitles). It was also used to transmit programme information. Cable companies who re-transmitted OTA channels would sometimes strip such data from the VBI, however.

Cable STCs

48.   To enable a greater number of channels, cable networks began using a larger range of frequencies which were inaccessible to or incompatible with standard television sets. This was due to the fact that cable systems could use RF frequencies not available for use over-the-air (such as those restricted for use by air traffic and emergency services). In addition, cable systems use different (from terrestrial broadcast) centre frequencies for higher frequency channels.

49.   From the late 1960s, to enable their subscribers to access these frequencies, cable operators started to provide STCs to their subscribers. These STCs would connect to the antenna input on the television set and transmit to the television over a single frequency (commonly channel 3 in the USA) so that there was no longer any need to change channel on the television. Instead, the user would change the channel by changing the channel on the STC. STCs were the first devices to offer features such as remote control and channel number display.

50.   As the number of channels increased and pay-per-view (PPV) channels appeared, cable operators introduced conditional access (CA) technology to control access to services, using scrambled signals which were descrambled in the STC.

Satellite IRDs

51.   An integrated receiver/decoder (IRD) performed the equivalent function in satellite television systems of the STC in cable television systems: it converted the signal received from the satellite dish into the signal required by the television. Like the STC, it allowed satellite operators to control access to their services by descrambling the signal and allowing only authorised subscribers to access them. STCs and IRDs have subsequently come to be referred to generically as STBs.

52.   By the late 1980s, many channels were available from numerous different satellites. To receive as many channels as possible, advanced systems would allow users either to switch between satellites, where their system would physically move a single dish to point at the new satellite, or to switch between multiple feedhorns as explained below.

STBs generally

53.   In 1994/1995 the basic components of an STB were (i) a tuner and associated components for receiving and processing the television signal, (ii) a microprocessor with volatile and non-volatile memory, (iii) an on-screen display (OSD) module for displaying text and graphics and (iv) an infra-red (IR) receiver for receiving control signals from a hand-held remote controller. The microprocessor was typically an 8-bit or 16-bit processor, and thus had a degree of processing power comparable to a personal computer of the mid-1980s. The STB could also include an IR transmitter for controlling a video cassette recorder (VCR). STBs would output audiovisual signals to televisions either by modulating the signals onto RF transmitted over a coaxial cable which the television would be able to tune to using its internal tuner or by means of a dedicated video connection such as composite, S-Video or SCART.

CA systems

54.   CA technology permits broadcasters to make money from television by selling subscriptions to viewers by ensuring that the consumer can only access programmes provided they have paid the required fees. By 1994, CA technology was used by most cable and satellite television companies in the UK and the USA. For obvious reasons, it was particularly important for satellite services. Before the advent of more powerful STBs and, to a lesser extent, the arrival of digital transmission, CA systems sometimes played a central role in managing the delivery of the metadata accompanying television programmes, including EPG data, to the STB.

55.   At the heart of any CA system is the ability to encrypt (often referred to as "scramble" for analogue services) the TV service at the transmission site and then decrypt ("descramble") it at the viewer's home, in their STB. To accomplish this securely, the STB incorporates, or has plugged into it, secure hardware (for instance a smart-card similar to a bank chip and PIN card).

56.   The headend or broadcast site sends two classes of messages to these individually addressable secure elements in the STBs. There are subscriber-related messages, which grant or deny entitlements to view (Entitlement Management Messages or EMMs), and service- or programme-related messages, which provide information on each service or programme including which entitlements are needed for the STB to be allowed to decrypt and display the service or programme (Entitlement Checking/ Control Messages or ECMs). Since EMMs are needed by every STB, these are normally either broadcast in-band alongside every television service, or for cable, out-of-band on a separate data channel. ECMs relate only to a particular TV service, so each ECM is only broadcast on the channel carrying the service to which it relates.

57.   One of the first satellite services to which access was controlled by a CA system in this way was the satellite-delivered HBO service in the USA, which used the VideoCipher system developed by General Instrument ("GI") in the early-mid 1980s. GI then introduced the VideoCipher II system to provide a lower cost alternative to the original STBs, which were expensive. This broadened the appeal of the service, resulting in approximately 1 million receivers in use in around 1990.

58.   The significant change introduced by VideoCipher II, compared to other systems of its time, was that some of the programme data was in a form where it could be

interpreted and processed by the STB so as to provide control within the STB of how the system interacted with the viewer, rather than being purely passive in merely displaying information to the viewer.

59. In around 1988 GI developed Eurocypher, broadly based on VideoCipher but with modifications to match European broadcasting requirements. This was used by British Satellite Broadcasting Ltd ("BSB") in the UK in 1990.

Satellite transponders, feedhorns and LNBs

60. A satellite transponder is the item of communications equipment on a satellite that receives the satellite uplink from Earth and transmits it back to Earth as the downlink. Each satellite may have multiple transponders. Satellite transponders transmit signals in a variety of ways to avoid interference between signals. Signals are polarised (either linear polarisation, i.e. horizontally or vertically, or circular polarisation, i.e. left-handed or right-handed) and broadcast in different frequency ranges (e.g. C-band or Ku-band as mentioned above and described in more detail below).

61. A satellite dish is designed to reflect and focus the signal to a point. A feedhorn is positioned at this focal point to receive the signal. The signal from the feedhorn is passed first to a polariser and then to a low-noise block converter (LNB), which converts the frequency of the signal received from the satellite to a lower RF frequency band known as "L-band". This enables the signal to be carried to the IRD using a standard coaxial cable.

62. Because the C- and Ku-bands occupy different frequency ranges they require different LNBs with different specifications (or different channels of a dual band LNB). Furthermore, because the Ku-band signal is inverted relative to the C-band signal (the local oscillator signal is higher than the received frequency for C-band, but lower for Ku-band), the manner in which the channels map into frequencies is inverted. Thus, even after conversion to L-band, the signals for C-band satellite channels are materially different to those for Ku-band satellite channels.

Carrier signals

63. Television signals transmitted by terrestrial broadcast, cable and satellite are modulated onto RF carrier signals. In the case of terrestrial broadcasts, the carrier signals in 1994/1995 were Ultra High Frequency (UHF) signals in Europe and either UHF or Very High Frequency (VHF) signals in the USA. The UHF or VHF signals would be received by the antenna and transmitted to the tuner in the television, which would be used to select a particular television channel by tuning to the appropriate frequency and then shifting it to an intermediate frequency for processing and conversion into a format suitable for display on the television screen.

Modulation techniques

64. Analogue television signals are transmitted using various modulation techniques. For example, NTSC signals are transmitted OTA and over cable systems using amplitude modulation – vestigial side-band (AM-VSB). The amplitude of the carrier wave is modulated by the television signal and the resulting modulation products (side-bands)

are filtered. In the case of satellite transmission, frequency modulation (FM) is used. The frequency of the carrier wave is modulated by the television.

65.   Digital broadcasting uses advanced modulation techniques that employ a combination of phase and amplitude modulation, for example, quadrature amplitude modulation (QAM) to maximise the data throughput per RF channel. The RF channel bandwidth of QAM channels is typically the same as the bandwidth of modulated analogue TV channels (for example, 6 MHz in the USA). Since digital television also employs video and audio compression techniques to reduce the bit-rate of the television signal, it has become common practice to employ time-division-multiplexing (TDM) to carry multiple TV channels within a QAM channel. Digital television therefore allows the operator to broadcast many more TV channels within a given frequency band.

Combining delivery of television by terrestrial broadcast, cable and satellite

66.   Even after the development of cable and satellite television, terrestrial broadcasts continued to be used to broadcast television signals. In countries or regions with high population densities and geography that allowed for the effective transmission of RF signals over the air (such as the UK), it was for a long time the main method of broadcasting television signals as there was no practical imperative for broadcasters to adopt alternative methods.

67.   In the USA, "local" television stations are commonly broadcast OTA. These were commonly re-transmitted over cable systems as well for consumers who could not receive the OTA signal. Not all local (broadcast OTA) channels were available on cable systems in 1994 or 1995, however. Thus some users would need to receive local terrestrial broadcasts as well as their cable service. I shall return to this point below.

68.   As regards satellite, since a single satellite would be broadcasting to an entire continent, it was impractical in the USA in 1994 and 1995 to transmit the thousands of local stations to the relevant locality from that one satellite. Again, therefore, to access local channels users would need to receive local terrestrial broadcasts as well as their satellite services.

69.   At that time televisions typically only had one RF input, although some models had more. To allow for reception of terrestrial broadcasts as well as cable/satellite broadcasts, STBs would often include a bypass function, which allowed the television to tune to a terrestrial broadcast channel by bypassing the cable/satellite circuitry entirely.

Programme guides

70.   *Paper guides.* Every broadcaster wants the consumer to know what programmes are being or are to be broadcast. Until the advent of EPGs, this information was disseminated principally in paper form, either in newspapers or in magazines such as *Radio Times* (in the UK) and *TV Guide* (in the USA). By May 1994 there were publications available which specialised in collating listings information for terrestrial, cable and satellite channels, such as the UK publication *TV & Satellite Week.*

71.   The listing information took various forms. It could be lists of programmes (with supporting information about those programmes) listed by broadcasting channel, and by time within each channel, in the form of an elaborate chronological list. It could be a listing by start times, with each program starting at a given time appearing by that start time, and then by channel within the start time. Or it could be by way of a grid, with start times on one axis and the channel on the other, with each cell representing the particular programme being broadcast in the cell (and bearing the name of that programme). In that last form, the cells would be of irregular length, because not all TV shows are of the same duration. The left and right hand borders of the cell represent the start and finish times when read against the time axis.

72.   Each of those methods of listing has its benefits, and a choice between them will depend on the preferences of the information providers and/or the subscribers to the lists. Sometimes one sees both formats in one publication. Written listings also contain some notes about the programmes in question, sometimes by the actual listing, and sometimes separately on the page.

73.   *EPGs*. As the number of channels available has increased, the size of the listings has increased, making their compilation, and choice from them, more difficult. One answer to this problem is to provide an EPG to the subscriber of the TV service so that the listings can be viewed on the television screen. It is important to distinguish between two different types of EPG: passive and interactive.

74.   *Passive EPGs*. From the 1970s, given the increased number of channels available on cable, cable operators often dedicated a particular channel (sometimes referred to a "barker channel") to a scrolling television guide. This was generated at the headend and transmitted as a television picture. It typically had time running from left to right across the screen, covering the next hour or two, and the channels arranged vertically. The scrolling guides were often interspersed with short promotional videos. Prevue Guide, launched in the USA in 1988 and re-named Prevue Channel in 1993, was an independent channel which had a scrolling guide on part of the screen and promotional videos on the other part. The user was not able to interact with or control such scrolling guides in any way.

75.   Passive EPGs were also distributed in other ways, such as by teletext using the VBI for terrestrial channels. These methods would allow the user to control the display of the listings information by skipping from page to page, but no more.

76.   *Interactive EPGs*. By the late 1980s and early 1990s, it was clear that a more pro-active way of notifying viewers of current and forthcoming programmes could be of value, both in terms of viewer satisfaction and in terms of increasing revenue for pay TV operators. This led to a move towards downloaded EPGs, with text and data that could be interpreted by an STB or television. In these systems, listings information is delivered to a user's television or STB, and then rendered on-screen by software on the TV/STB.

77.   The normal way to deliver EPG data to STBs in the late 1980s was to broadcast it, either alongside the television service (for example, using the VBI) or on a dedicated channel (for example, an out-of-band data channel on cable systems or using a separate transponder for satellite systems). The data was normally loaded into "carousels" that would be continuously broadcast, cycling round to the beginning of

the data as frequently as the available bandwidth permitted. This meant that, although not all the data might apply to any individual STB and EPG, the data being broadcast covered all services and all programmes that could possibly be received, in order to ensure that every STB receiving that broadcast could populate its EPG. The data would typically be stored in a database in the STB. As it became easier to deliver data alongside programmes, more and more information began to be provided.

78.   By 1990 CA systems such as VideoCipher in the USA and Eurocypher in the UK had enabled the broadcast channel to include data (programme titles and some other information such as ratings for use in parental control) and the introduction of simple interactive EPGs that offered "now and next" functionality. When a viewer changed channel, they would be shown not just the name of the new channel, but also the name of the current programme and its rating. By pressing an appropriate button on the remote control, this information could be called up at any time. By pressing another button, the information would be presented for the following programme due to be broadcast on that channel. The data (programme start time, rating, and, if it was PPV, price) was used by the STB as the basis of interaction with the viewer, for example for parental control and PPV programme purchase.

79.   The next stage was the development of fully interactive EPGs. These enabled a user not merely to navigate around a schedule guide on screen, including selecting genres such as "sports", "movies" and so on, but also to select a programme from the guide by moving a cursor or highlight using arrow keys on the remote control and then pressing a button, which caused the STB automatically to tune to the selected program. The key to this development was the ability to transmit enough data to the EPG, which became easier in the early-mid 1990s with advent of digital broadcasting, and in particular the development of the MPEG-2 standard.

80.   The first fully interactive EPG appears to have been SuperGuide, which was launched in 1986. As explained below, SuperGuide used EPG data transmitted by satellite. In 1991 Cable Television Laboratories (CableLabs), an industry body established and funded by US cable companies, shortlisted six companies (out of 27 who had expressed interest) to develop an interactive EPG. CableLabs chose InSight (later StarSight, and now part of Rovi), which already had a system under development. At that stage, InSight's system used the VBI in the signals of the US Public Broadcasting System (PBS) member stations to transmit the EPG data. By 1994 fully interactive EPGs were being developed by StarSight, TV Guide on Screen ("TVGOS") and Prevue Channel, among others, and STBs designed to function with interactive EPGs were being developed by GI (the Jerrold DigiCable CFT-2900), Scientific Atlanta (the 8600X), Zenith (the HT-2000) and Pioneer, among others. By May 1994 a number of different systems were undergoing trials. By April 1995 at least four interactive EPGs were commercially available.

Parental controls

81.   *The need for parental controls.* For almost as long as there have been television systems, there have been concerns in society about how to protect children from exposure to inappropriate material, whether due to the inclusion of sexual content, violence or bad language. The technology used for this has generally been referred to as "parental control".

82.   In the early days of television, it was not possible to provide any sort of automatic mechanism to restrict access to programmes, and so other methods were used to try and limit exposure. Most countries implemented "watersheds", after which content more suitable for adults is allowed to be broadcast. The UK's 9pm watershed is (and was in 1994) a well-known example of this.

83.   In this respect the UK and some European countries are more highly regulated than some other parts of the world. In the UK, broadcasters other than the BBC were regulated by the Independent Broadcasting Authority (IBA) between 1972 and 1991, after which the Independent Television Commission (ITC) took on the role. Content issues were also covered by the Broadcasting Standards Council. (More recently, these powers have been brought together within the remit of OFCOM.)

84.   An approach taken by some broadcasters was to highlight on-screen the presence of potentially objectionable content, so that it could more readily be avoided by those who would not wish to see such content. This was a technique that was used by Channel 4 in the UK for a while during the 1980s where a red triangle was continuously displayed in the top left corner of the screen for late night material rated unsuitable for viewers below 18 years of age. These flags also made it easier for parents to see if their children were watching unsuitable material, since a quick look by the parent would enable them to see whether the triangle was present. (C4's approach proved counter-effective, however, with younger viewers sometimes seeking out red triangle programming.)

85.   *Channel locks*. In the case of terrestrial broadcasting, the small number of channels available up to and including the 1980s meant that it was impractical to imagine a whole channel which might broadcast nothing other than potentially objectionable content, so no need presented itself to consider providing any form of channel lock. The much larger number of channels that could be provided on cable or by satellite resulted in the appearance of dedicated "adult" channels (such as the Playboy Channel launched in the USA in 1982). In response to this, many early cable and satellite STBs adopted a very simple approach to parental control, namely making it possible to lock out access to a complete channel, so that content on that channel could only be viewed after a PIN code was entered.

86.   Typically, the way in which this worked was as follows:

   i)   to lock a channel, the user tuned to that channel, then called up a menu;

   ii)   the user then called up the parental control option and was prompted to enter a PIN to lock the channel;

   iii)   having tuned away from the channel and tuned back to it, the user would be prompted to enter the PIN before the channel could be viewed;

   iv)   entering the PIN would allow the locked channel to be viewed, but if the viewer tuned away and tuned back, the channel would be locked and the PIN would have to be re-entered;

   v)   to unlock the parental controls on that channel, the user would have to call up the menu once again and unlock the channel.

87.   This kind of lock was entirely local to and carried out on the STB. It involved the STB maintaining a list in memory, so that an attempt to view a channel would cause a check of the list to verify whether or not the channel was locked before either displaying the channel (if it was not locked) or showing the screen requesting the PIN (if the channel was locked).

88.   Channel locks of this kind were well known by 1994. They were a limited solution in that they did not cater for a general entertainment channel where there could be family programming part of the time and other, more adult programming part of the time

89.   *Ratings systems*. The cinema industry had introduced a ratings system after the outcry that accompanied some movies of the 1920s and 1930s. This was established in the UK by the British Board of Film Censors (later the British Board of Film Classification) ("the BBFC") early in the 20th Century, with the Motion Picture Association of America ("the MPAA") providing ratings from the late 1960s. By the 1980s it was clear that this pre-existing ratings system could be used as the basis for television parental control for movies.

90.   It was more difficult to use this system for other types of programmes, because of the need to assign a rating. Nevertheless, regulators such as the IBA were willing to permit notionally post-watershed material to be transmitted, for example by satellite broadcasters in 1990, at pre-watershed times provided parental rating information was provided for the programme and could be used to securely and automatically restrict access to the programme. This was initially introduced through the use of CA technology.

91.   *CA and parental control*. VideoCipher II provided the ability for the broadcaster to rate each programme individually (using MPAA ratings), and the STB would then lock out or permit viewing according to whether the programme's rating exceeded a threshold value that had previously been entered into the STB. In order to view a programme that had been locked out, it was necessary to enter a parental control PIN which was stored securely within the CA system in the STB.

92.   Whilst VideoCipher had enabled the display of basic information for the current and next programmes, as discussed above, this was expanded somewhat for Eurocypher, although the display was still limited to a maximum of 35 characters. The parental control rating scheme was expanded to support not just MPAA or BBFC ratings, but also broadcaster-provided "L" (language), "V" (violence) and "S" (sexual situations) flags. The CA system within the STB controlled user interaction in terms of flagging blocked content and then unlocking it on entry of a PIN which was securely stored within the CA system in the STB. Since it was designed for potential pan-European use, and also to allow for changes in national rating schemes, Eurocypher used a downloadable table within the STB CA system to map from numeric values sent in the over-air messages accompanying each programme to the national ratings (such as those of the BBFC) which were displayed on screen.

93.   Typically, the way in which systems such as Eurocypher worked was as follows:

    i)   The viewer tunes to a different service, or a new programme starts on the service to which they are already tuned. The programme-related data contained

in an accompanying ECM indicates whether the programme is unrated or rated. If the programme is unrated, it is displayed immediately.

ii)   If the programme is rated, the STB CA system checks whether the rating is above or below the threshold setting previously entered on the STB (during an earlier set-up phase).

iii)   If the programme's rating is below the threshold, the programme is displayed immediately.

iv)   If the programme's rating is above the threshold, then the video would be blanked out and the viewer would be presented with a pop-up window on screen saying that the programme exceeded the parental rating threshold and asking the viewer to enter their PIN (either a default value preset in the STB or a different value entered by the user during an earlier set-up stage) if they wished to see the programme.

v)   Once the viewer correctly enters their PIN, the programme is unlocked and is displayed.

94.   *The move from CA-managed to STB-managed parental control.* As STBs became more capable from 1990 onwards and more information appeared in the metadata, there was a tendency to move the parental control functionality from within the CA system and into the general STB software.

95.   *V-chip.* The so-called "V-chip" was a hardware-based solution to parental control which relied on rating signals inserted into the VBI throughout the duration of a programme so that the V-chip in the receiving device could instruct the television or STB to block the display of the programme if the parental control had been activated. This was widely discussed from 1993 onwards and mandated by the US Telecommunications Act 1996.

DOCSIS

96.   DOCSIS stands for Data Over Cable Service Interface Specification. It is a standardised way of establishing data communications over cable systems between a cable modem in the home and a cable modem termination system in a cable headend which receives data from, and transmits data to, the internet. In this way data is transmitted between internet servers and whatever is attached to the cable modem. In April 1995 DOCSIS was under development by CableLabs for data transmission. It had not been proposed for use in the transmission of television programming at that time, but it has subsequently been adopted for that purpose.

Internet protocol television

97.   Internet protocol television (IPTV) is a method of delivering television or video content over the internet using the internet protocol (IP) which has been developed since 1995. There are two main types of IPTV. Closed circuit IPTV uses dedicated bandwidth on the provider's network. It requires the subscriber to have a STB to receive the service, the signal for which is encrypted. From the user's perspective, such closed circuit IPTV services are quite similar to traditional cable broadcasts. In

addition to linear television broadcasts, however, closed circuit IPTV services typically include catch-up facilities and other forms of video-on-demand (VOD). In "over the top" or OTT IPTV, the signal is delivered via a standard broadband connection and can be viewed (with appropriate software applications) on any device with such a connection, including PCs, tablet computers and smartphones. This case is only concerned with closed circuit IPTV. A variety of higher level protocols (i.e. higher than IP) are employed in IPTV systems.

234

98. 234 is a divisional of European Patent Application No. 1 443 756 filed on 27 February 2004, which was in turn a divisional of European Patent Application No. 1 028 590 filed on 14 March 2000, which in turn was a divisional of European Patent Application No. 0 775 417 based on International Patent Application No. WO 95/32583.

99. 234 was granted on 17 February 2010. It was opposed by Virgin. At a hearing before the Opposition Division of the European Patent Office on 1 October 2012, the Opposition Division held that the patent as granted contained added subject matter contrary to Article 76(1) EPC (which applies the added matter test of Article 123(2) to divisional applications). Rovi then filed a sequence of three auxiliary requests. The first two were also found by the Opposition Division to contain added matter, but the third was held to comply with the requirements of Articles 76(1), 84 and 123(2). The Opposition Division also held that the claim which was the subject of the third auxiliary request was inventive over prior art documents D1-D31. The hearing was adjourned at 20:45 leaving the status and relevance of prior art document D32 (the Uniden 4800 Installation Guide) unaddressed.

100. Following the hearing Virgin filed further evidence and an additional item of prior art D33. At a further hearing before the Opposition Division on 9 April 2013 the Opposition Division held that the claim which was the subject of the third auxiliary request was inventive over D32 and D33, and accordingly decided to maintain 234 in amended form on the basis of the third auxiliary request. Rovi withdrew their first and second auxiliary requests, but not their main request (maintenance of 234 as granted). The Opposition Division issued its written decision on 7 October 2013.

101. Both sides have appealed against the Opposition Division's decision. Rovi's main request on appeal is that 234 be upheld as granted. It also has an auxiliary request for the Patent to be maintained in an amended form whereby claim 1 corresponds to the combination of claims 1, 2 and 4 as granted. Virgin seek an order that the Patent be revoked. Since the parties were only required to file their grounds of appeal on 27 February 2014, the appeal will not be heard by the Technical Board of Appeal until sometime in the second half of this year even if it is expedited to the maximum possible extent. In the meantime, the filing of the appeals has had the effect of suspending the Opposition Division's decision.

102. As a first result of the processes described above, it will not be until after 234 has expired on 20 May 2014 that it will be decided by the Board of Appeal whether 234 is to be upheld at all and, if so, in what form. As a second result, this Court has had to consider the Patent both in the form in which was granted, in the first amended form

and in the form in which it was upheld by the Opposition Division. This state of affairs does no credit to the European patent system.

103.   I would add that, if there is an appeal against this judgment, consideration should be given to asking the Board of Appeal to expedite the appeal and ensuring that the domestic appeal is not heard until after the Board of Appeal's decision and reasons are available.

The specification

104.   Because 234 is a divisional of a divisional of a divisional of the original application, much of the specification is not relevant to the claimed invention. The relevant parts of the specification are as follows.

105.   The specification begins under the heading "Background of the invention" by saying at [0001]:

> "This invention relates to an electronic program schedule system, which provides a user with schedule information for broadcast or cablecast program viewed by the user on a television receiver. More particularly, it relates to an improved electronic program guide that provides the user with a more powerful and convenient operating environment, while, at the same time, increasing the efficiency of navigation by the user through the guide."

106.   The specification then refers to certain prior EPG systems at [0002]-[0004], stating at the end of [0002] that "such prior systems are generally discussed in 'Stay Tuned for Smart TV' published in the November 1990 issue of Popular Science". (I interpolate that this article discusses the interactive EPGs then being developed by InSight and SuperGuide.) The specification identifies various disadvantages with the prior systems at [0005]-[0017]. In particular, the specification states at [0009]:

> "The prior electronic program guides also fail to provide the user with a simple and efficient method of controlling access to individual channels and individual programs. The amount of adult situations involving sex and violence has steadily increased during the last 40 years. The issue of how this affects children or other viewers has gained national attention. Providing a parent with the ability to lock-out a channel is a well known and widespread feature of certain television receivers and cable converter boxes. Despite this availability, the feature is seldom used by parents. The main impediments to its effective use are the cumbersome ways in which it is generally implemented, as well as the requirement that entire channels be blocked in order to block access to any objectional [sic] programming. A channel-oriented parental lock is unfair to other programmers on the blocked channel -- who, for example, offer adult-oriented programming in the evening and youth-oriented programming the following morning and inconvenient for viewers who want access to such programs.

> Thus, there is a particular need for a system which provides password control to individual programs and channels using a flexible and uncomplicated on-screen user interface."

107. The specification goes on to identify the objects of the invention at [0018]-[0030]. In particular, the specification states at [0026]:

> "It is still a further object of the present invention to provide password control for access to individual programs, as well as channels, using a protected interactive flexible and uncomplicated on-screen interface."

108. The specification states at [0031] that the objects of the invention are met by an electronic programme schedule system which is described in general terms and without reference to parental controls or restricting access to information.

109. The specification then describes preferred embodiments of the invention by reference to Figs. 1-42. It is clear from [0082] that the specification contemplates that the system can display "additional programming information, generally comprising a textual description of program content and/or other information related to the program, such as the names of cast members and the like". The only part of the description which is relevant to the claimed invention is at [0091]-[0115]. This describes two methods for parental control, which respectively involve the Key Lock Access screen shown in Fig. 30 and the Lockout screen shown in Fig. 39, both of which I reproduce below.
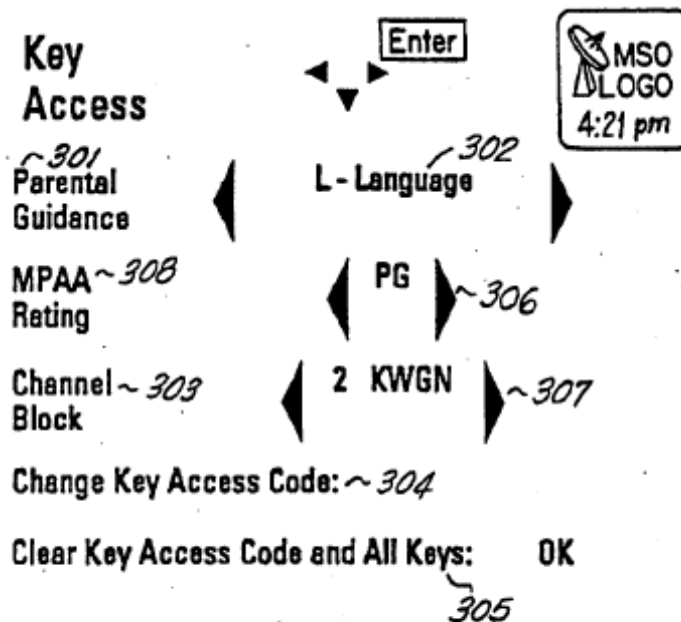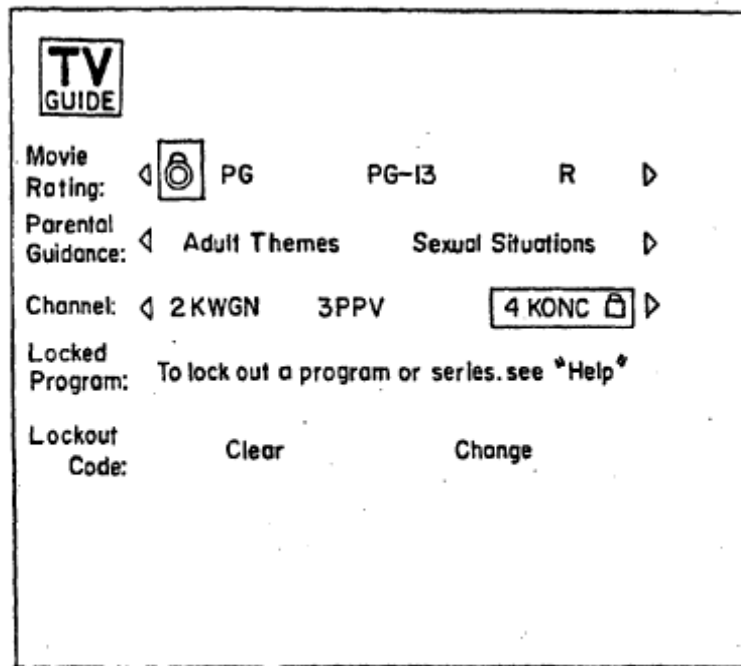

FIG.30

FIG. 39

110. The use of the Key Lock Access screen shown in Fig. 30 is described at [0091]-[0099]. This is said at [0092] to allow the user to "control access to individual channels and programs or events by entering requiring the user to enter an access code 'key', consisting of a user-specified four digit code in the specific embodiment discussed herein, before ordering these pre-selected channels, programs or events". The user navigates around the screen by means of cursor keys on a remote controller and selects options by pressing an Enter key on the remote control. The screen enables the user to select three categories of access control.

111. The first category is "Parental Guidance" 301, the use of which is described at [0093]. Once the user has selected this category, the user can select one of five letter ratings, namely L for language (as shown at 302 in Fig. 30), N for nudity, V for violence, AS for adult situations and PD for parental discretion. If L is chosen, that indicates that "a key lock access has been selected for programs rated with an 'L' rating for violent or explicit language". The system indicates this by displaying a key lock icon below the L category display (not shown in Fig. 30). The user can deactivate the key lock access in the same manner. The user can also set a key lock access "for any of the other program content identifiers appearing in the Parental Guidance category". To enter or change the key lock access code, the user selects "Change Key Access Code" 304, and to clear the key lock access code, the user selects "Clear Key Access Code and All Keys" 305, as described at [0094].

112. The implementation of this category of access control is described at [0095] as follows:

> "The schedule information database record for each program contains a field that corresponds to the program content identifiers in the Parental Guidance category. During operation,

the microcontroller checks this field in response to a user command to tune to or order a program, or to display its corresponding schedule information before carrying out the tuning, ordering or displaying function. If the parental guide identifier in the program schedule information database record matches any one of the activated parental guidance identifiers shown in Fig. 30, the user will be prompted to enter the four digit key lock access code before the system takes any further action. If the entered code matches the key lock access code previously entered and stored by the user as described above, the system will carry out the user request to tune to the program, to order it, or to display its corresponding schedule information. If the code is not recognized by the system, no further action will be taken and the user's request will be denied."

113. The second category is "MPAA Rating" 308. The rating may be G for general audience, PG for parental guidance (as shown at 306 in Fig. 30), PG-13, R or X. The use and implementation of this category is described in essentially the same manner as the Parental Guidance category at [0096]-[0097]. As the specification states in [0097]:

"… as with the Parental Guidance category, once a key lock access is set, the system will prompt the user to enter the four digit key lock access code any time a request is made to tune to, order or display schedule information for a particular program having a rating code which matches a rating code for which key lock access has been activated."

114. The third category is "Channel Block" 303. As the name implies, this enables the user to control access to channels (such as KWGN shown at 307 in Fig. 30). The use and implementation of this category is described in a similar manner as before at [0098]-[0099], but with one difference: if the correct key lock access code is not entered, "the microcontroller 16 will not allow audio or video program signals to [be displayed], but it will allow schedule information to appear for the channel".

115. The use of the Lockout screen shown in Fig. 39 is described at [0100]-[0115]. As the specification explains in [0100], "[i]n addition to limiting access to programs based on the Parental Guidance, MPAA and channel criteria, access may be limited on the basis of program title". In this case the user must enter a lockout code in order to access the Lockout screen. The lockout code is set when the system is installed using the screens shown in Figs. 40-40E as described at [0101]-[0102]. Once the user has accessed the Lockout screen, he can clear or change the lockout code as described at [0103]-[0104]. To set a lock in the Movie Rating, Parental Guidance or Channel categories, the user selects the desired rating, guidance or channel and then presses a lockout key on the remote controller. A padlock can then be displayed on the Lockout screen (as can be seen by PG and KONC in Fig. 39).

116. The specification describes a number of ways of setting locks for particular programs at [0107]-[0110]. Some of these involve the use of a lockout key on the remote controller rather than the Lockout screen shown in Fig. 39. Alternatively the user can

scroll through a list of programs shown in the Locked Program window on the Lockout screen.

117.   The implementation of this method of access control is described as follows:

"[0110] Several methods can be used to block programs at their time of airing. For example, in the case of the Movie Rating, Parental Guidance and Channel categories, the schedule information database record for each program is provided with a field that corresponds to the rating, program content identifier or channel appearing, respectively, in the Movie Rating 251, Parental Guidance 256 and Channel 253 category of the Lockout screen 250 shown in Fig. 39.

[0111] During operation, the microcontroller checks the appropriate field in the database record in response to a user command to tune to or order a program before carrying out the tuning or ordering function. Additionally, the lockout code also may be used to restrict access to program schedule information. In this instance, the microcontroller also would check the appropriate field in the schedule information database record before displaying schedule information for a program.

[0112] If the movie rating, parental guidance or channel identifier in the program schedule information database record matches anyone of the locked-out entries indicated in the Lockout screen 250, a Lockout Verify screen 300 is displayed in overlaying relationship with the video signal then being displayed on the television receiver, as shown in Fig. 41. The user will be prompted to enter the previously set lockout code before the system takes any further action. As an added security measure, asterisks will be displayed as the user enters the lockout code. If the entered code matches the lockout code previously entered and stored by the user as described above, the system will carry out the user request to tune to or order the program, or to display its corresponding schedule information. If the code is not recognized by the system, no further action will be taken and the user's request will be denied. In this case, the Lockout Verify screen 300 will remain displayed on the television receiver waiting for a correct code to be entered. If no action is taken by the user, the Lockout Verify screen 300 will be removed after a predetermined time-out period, such as one or two minutes.

[0113] Similarly, in the case of lockout by title, the microcontroller also could check the title field in the schedule information database record and compare it with the list of program titles for which the user previously set a lock. If, as described above, the microcontroller does not maintain a list of the actual titles of programs locked by title, a suitable identifier can be set in a field in the database record to indicate that a program has been

locked by title when the user first sets the lock, and, thereafter, the microcontroller could check that field in response to a user request to tune to or order a program, or display schedule information."

118. I reproduce Fig. 41 referred to in [0112] below:
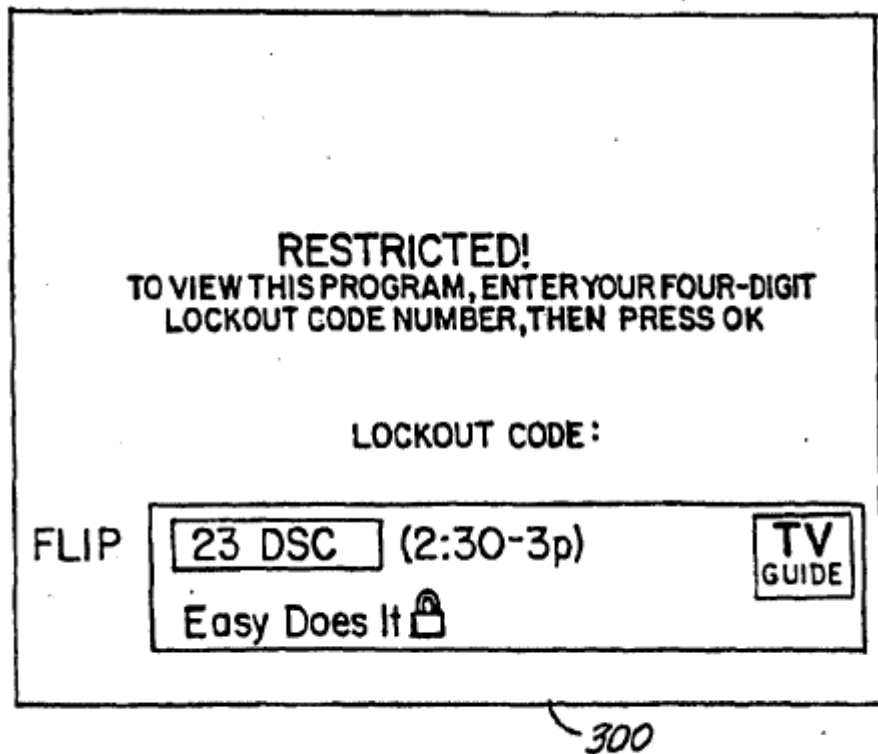
FIG.41

The claims

119. Rovi have made two applications to amend the claims of 234. One is an unconditional application simply to change the dependencies of granted claims 4 and 14. The effect of this amendment is to provide Rovi with a first fall back position in this country corresponding to Rovi's auxiliary request before the Board of Appeal referred to in paragraph 99 above. Virgin do not oppose this amendment, but contend that it does not cure the invalidity of the Patent as granted. The other is a conditional application to amend the claims in accordance with the decision of the Opposition Division. The effect of this amendment is to provide Rovi with a second fall back position. Virgin oppose this amendment on the ground that it results in added matter and contend that it does not cure the invalidity of the Patent as granted in any event. Like the parties, I shall refer to the two sets of claims as proposed to be amended as the "granted claims" and the "EPO claims" respectively.

Granted claims

120. Broken down into integers, omitting reference numerals and showing the amendments to claims 4 and 14, the claims in issue are as follows:

"1.[A]   A method for using an electronic program guide to restrict access to program schedule information displayed on a television, the method comprising:

[B]   receiving and storing in memory television program schedule information;

[C]   providing a user with the ability to set parental control options; and

[D]   restricting the ability to view program schedule information on the television based on the parental control options,

[E]   wherein restricted program schedule information is capable of being viewed when a code is received from the user.

2.[A]   A method according to claim 1, wherein restricting the ability to view program schedule information based on the parental control options comprises

[B]   restricting the ability to view program schedule information based on at least one record field in a schedule information database.

4.[A]   A method according to claim 1 or 2, further comprising

[B]   restricting the ability to access television programming based on the parental control options.

11.[A]   A system for using an electronic program guide to restrict access to program schedule information displayed on a television, the system comprising

[B]   a receiver,

[C]   a data processor,

[D]   a user control apparatus,

[E]   and a display generator,

the data processor configured to:

[F]   receive and store in memory television program schedule information;

[G]   provide a user with the ability to set parental control options; and

[H]   restrict the ability to view program schedule information on the television based on the parental control options

[I]   by directing the display generator not to display restricted program schedule information,

[J]   wherein restricted program schedule information is capable of being viewed when a code is received from the user control apparatus.

12.[A] A system according to claim 11,

[B]   wherein the data processor is further configured to restrict the ability to view program schedule information based on at least one record field in a schedule information database.

14.[A] A system according to claim 11 or 12,

[B]   wherein the data processor is further configured to restrict the ability to access television programming based on the parental control options.”

EPO claims

121. Broken down integers and omitting reference numerals, the claims in issue are as follows

“1.[A] A method for using an electronic program guide to restrict access to program schedule information displayed on a television, the method comprising:

[B]   receiving and storing in memory television program schedule information in a database,

[C]   including a record for each program containing a field corresponding to a rating, program content identifier or channel;

[D]   providing a user with the ability to set parental control options based on the rating, program content identifier or channel;

[E]   receiving a user command to display stored television program schedule information; and

[F]   restricting the ability to view program schedule information for a program on the television based on the parental control options by checking the appropriate field in the record for the program for a match,

[G]   wherein restricted program schedule information is displayed when a code is received from the user in response to a prompt displayed on the television,

[H]   which prompt is displayed in response to the user command
        when it requests display of restricted program schedule
        information.

2.[A]   A method according to claim 1, further comprising

[B]   restricting the ability to access television programming based
        on the parental control options.

5.[A]   A system for using an electronic program guide to restrict
        access to program schedule information displayed on a
        television, the system comprising

[B]   a receiver,

[C]   a data processor,

[D]   a user control apparatus,

[E]   and a display generator,

the data processor configured to:

[F]   receive and store in memory television program schedule
        information in a database,

[G]   including a record for each program containing a field
        corresponding to a rating, program content identifier or
        channel;

[H]   provide a user with the ability to set parental control options
        based on the rating, program content identifier or channel;

[I]   receive a user command to display stored television program
        schedule information; and

[J]   restrict the ability to view program schedule information for a
        program on the television based on the parental control options
        by checking the appropriate field in the record for the program
        for a match and

[K]   directing the display generator not to display restricted
        program schedule information,

[L]   wherein restricted program schedule information is displayed
        when a code is received from the user control apparatus in
        response to a prompt displayed on the television,

[M]   which prompt is displayed in response to the user command
        when it requests display of restricted program schedule
        information.

6.[A] A system according to claim 5,

[B] wherein the data processor is further configured to restrict the ability to access television programming based on the parental control options."

The witnesses

122. Rovi's expert witness was Peter Vogel. Mr Vogel's background can fairly be described as unusual. He describes himself as having "discovered electricity while in nappies, and started tinkering with circuitry at the age of 4". He spent his youth building everything from radio transmitters to computers. In 1971 he obtained his first patent at the age of 16. In 1973 he began studying for a degree in Computer Science at Sydney University, but dropped out. From 1974 to 1988 he was Research and Development Director of Fairlight Instruments Pty Ltd, which he had co-founded and which made the world's first sampling synthesisers.

123. In 1987 Mr Vogel filed the first in a series of patent applications in the field of parental control of television viewing, having become interested in the subject as a result of the impending birth of his first child. From 1988 to 2000 he was Managing Director of Right Hemisphere Pty Ltd, which he had founded. Right Hemisphere's main focus was on attempting to bring a parental control system to market. In addition, it developed various technologies in the field of information technology and electronic entertainment for a number of clients. During this period Mr Vogel also spent four years building an unusual limestone house for himself and his family.

124. In 1989 Mr Vogel filed his first patent application for a parental control system based on an EPG. In June 1994 he sold the resulting family of patents to TVGOS (which subsequently become part of Rovi). Mr Vogel demonstrated a prototype of his system on an inventors' programme on Australian television in July 1994. Access to the parental control system, which enabled the parent to block programmes with certain ratings, was by PIN code.

125. From 2000 to 2006 Mr Vogel worked for Videozap Pty Ltd, later renamed ZapTV and then IceTV, which he also founded. This object of this venture was to supply a subscription and advertising supported service which allowed subscribers better to manage their OTA television viewing though an STB which provided an EPG with parental controls. In 2006 Mr Vogel co-founded Vogel Ross Pty Ltd, a technology consultancy. In 2009 he founded Peter Vogel Instruments which makes electronic keyboard instruments.

126. Mr Vogel was a very careful witness, but despite that I did not find his evidence of much assistance. In part, this was for reasons which were not his fault. Because of his unusual background and because of his position in May 1994 as essentially a lone inventor in Australia, I do not consider that he can be considered to be representative of a member of the skilled team to whom 234 is addressed. Furthermore, whether for that reason or due to his instructions, it became clear during his evidence that he had a very strange conception of the skilled team, which appeared both to include people who had no interest in EPGs and to exclude most of the teams actually working on interactive EPGs at the time. This inevitably coloured his whole approach to the common general knowledge, the Patent and the prior art. Still further, his approach to

the question of common general knowledge was a very narrow one, which involved an unduly stringent application of the requirement of a good basis for further action. In addition to these matters, however, I was troubled by various aspects of his evidence. I will give three examples. First, it emerged during cross-examination that he had abandoned an important point regarding the inventive concept of 234 made in his first report in his second report, but without making that clear. Secondly, even after abandoning that point, he maintained an interpretation of the inventive concept which he accepted was not described in the specification or claims and the implementation of which he had difficulty explaining. Thirdly, he maintained that the disclosure of Bestler (as to which, see below) was "largely aspirational".

127.   Virgin's expert witness was Graham Turner. He was awarded a Bachelor of Science degree in Electrical and Electronic Engineering by the University of Nottingham in 1969, and a Master of Technology degree in Electronic Engineering by Brunel University in 1979. From 1969 to 1977 he worked in the field of consumer and professional audio engineering. From 1977 to 1983 he worked for the Ministry of Defence, initially as researcher into electro-optical systems and then as Senior Lecturer in electronics and other subjects. From 1983 to 1985 he worked for Mars Electronics as a software development engineer on automatic test equipment. He was named as an inventor on two patent applications during this period. From 1985 to the end of 1988 he was a Senior Lecturer in electronics and other subjects at Cranfield Institute of Technology.

128.   From January 1989 to January 1991 Mr Turner was Technical Manager, Conditional Access for BSB, which merged with Sky Television in November 1990 to form British Sky Broadcasting Ltd. BSB launched its DTH satellite service in April 1990. BTB's STB offered features such as "now and next" programme information and individual parental control based on BBFC film classification combined with content flags to highlight the presence of violence, sex or potentially offensive language (i.e. limited interactive EPG functionality). Mr Turner and his team oversaw the development of this feature by the developers and worked with BSB's programme acquisition team on the parental control mechanism.

129.   From March 1991 to 2006 Mr Turner worked as Joint Managing Director for Farncombe Technology Ltd, a consultancy specialising in conditional access and digital television systems which he co-founded with two colleagues. One of Farncombe's first projects was the development of a CA system for FilmNet in Norway. In 1993 Farncombe was commissioned by the European Commission to prepare a report on *Subscriber Management Systems, Condition Access and Encryption* for the Commission's Digital Video Broadcasting (DVB) project. From 1994 onwards Mr Turner sat on a number of DVB committees. At the beginning of 1995 he helped Australis Media launch the world's first fully DVB-compliant pay TV service. Following this project, he undertook consultancy for a variety of broadcasters and cable operators.

130.   From 2007 to 2011 Mr Turner was Vice President of Nagravision SA in Switzerland. Since then he has worked as a consultant through his own company.

131.   Mr Turner was an excellent expert witness, being very knowledgeable, clear in his explanations and balanced in his approach. Counsel for Rovi submitted that he was not appropriately experienced, but I do not accept this. I have no hesitation in

preferring his evidence to that of Mr Vogel on technical matters where they differ. More importantly, counsel for Rovi submitted that Mr Turner's evidence with regard to the prior art was influenced by hindsight, since he had been shown 234 before being asked to consider the prior art. This is particularly important with regard to Bestler, since, as discussed below, there is an important issue as to what Bestler discloses. I agree that it would have been better if Mr Turner had been asked to form a view as to the disclosure of Bestler before reading the Patent, and I have therefore approached Mr Turner's evidence on this topic with a degree of caution.

132.   In addition, Virgin relied on factual evidence from Peter Hallenbeck, who was formerly Chief Technology Officer of SuperGuide Corporation, about the Uniden 4800 (as to which, see below). Mr Hallenbeck was not required by Rovi to attend for cross-examination, and accordingly his evidence stands unchallenged.

The skilled team

133.   It is common ground that 234 is addressed to a team of engineers which is interested in developing an EPG and which has knowledge and experience of both the hardware and software aspects of STBs and EPGs.

Common general knowledge

134.   There is little, if any dispute, that the matters I have set out in paragraphs 38-64, 66-79 and 81-95 above formed part of the skilled team's common general knowledge. In any event, that is my finding.

135.   At the beginning of the trial, there appeared to be a significant issue between the parties as to the extent to which interactive EPGs were common general knowledge by May 1994. By the end of the trial, however, there was no real dispute on this point. Counsel for Rovi accepted that both the concept of an interactive EPG and the fact that a number of interactive EPGs had been developed and were undergoing trials would have been common general knowledge, but not the detailed functionality of any particular interactive EPG. He also accepted that the skilled team would have had the requisite knowledge and skill to implement an interactive EPG. For his part, counsel for Virgin did not suggest that the detailed functionality of any particular interactive EPG was common general knowledge.

136.   There remains, however, a significant and important dispute between the parties as to whether the skilled team would have perceived that there was any concern over the display of program titles or programme information in EPGs. It is common ground that the skilled team would have been well aware that, in the years prior to May 1994, there had been intense concern, particularly but not exclusively in the USA, about children being exposed to inappropriate content, particularly but not exclusively violent content, on television. Rovi contend that such concerns were all directed to the content itself, and not to either programme titles or programme information. Virgin contend that the skilled team would have appreciated that, particularly in the context of channels showing both mainstream and adult content, the display of programme titles, and particularly programme information, was potentially of concern.

137.   In support of Rovi's position, counsel for Rovi relied strongly on two matters in particular. First, Mr Vogel carried out extensive research into the question for his

second report, and found nothing which suggested that either programme titles or programme information were considered to be of concern. Secondly, neither side has located a single contemporaneous document which indicates the existence of such a concern, although it appears that Virgin had also carried out a search. These are powerful points, but for the reasons I shall explain I do not find them conclusive.

138. In support of Virgin's position, counsel for Virgin relied mainly on two pieces of evidence. First, he pointed to some extracts from *TV & Satellite Week* from 1994 which are in evidence. The pages in question show programme listings for The Adult Channel below, and in the same column as, programme listings for the Bravo channel. As the guide makes clear, Bravo and The Adult Channel were broadcast on the same satellite channel at different times of the day i.e. from a functional perspective they were part of the same channel. Some of the titles for programmes on The Adult Channel are entirely innocuous (e.g. "Cat and Mouse"), some might be regarded by some as mildly offensive (e.g. "Euroslut – French Tart") and some would be regarded by many people as not being suitable for children's eyes (e.g. "Blow Job Bonnie"). Counsel for Rovi submitted that the fact that such titles appeared in a mainstream publication sold in newsagents for 60p confirmed that they were of no concern. Counsel for Virgin submitted that there was a considerable difference between such titles appearing buried in the small print of a paper guide and appearing on screen as part of an EPG.

139. Furthermore, the listings for Bravo include the title and brief information for each programme, whereas the listings for The Adult Channel only include titles and not programme information. Counsel for Rovi pointed out that the listings for some other minority interest channels such as TV Asia and MTV are also less extensive than for the mainstream channels, but even in these cases some of the programme titles are accompanied by (very) brief information. Counsel for Virgin submitted that the designer of an EPG which included programme information as well as programme titles and which carried adult content would be forced to think about whether it was acceptable to display programme information about the adult content.

140. Secondly, counsel for Virgin relied on the evidence of Mr Turner as supporting the submissions I have recorded in the preceding two paragraphs. Mr Turner recalled that, while he was working at BSB in 1989-1990, there was debate during the discussions over the implementation of the parental control system as to whether some programme titles might be objectionable and should be blocked together with the programme itself. BSB decided that it was not necessary to do this, because BSB was an IBA licensee which was not intending to broadcast material that was likely to have an objectionable title. Counsel for Rovi submitted that this evidence confirmed that programme titles were of no concern. As Mr Turner explained, however, BSB was (a) limited to 35 characters and (b) operating in a tightly regulated environment. This was not true of all broadcasters. He gave two examples to illustrate this. The first was that, to begin with, Sky operated outside IBA control (although it later submitted voluntarily to IBA regulation). Secondly, he explained that when he worked for FilmNet in Norway there was considerable concern about adult material emanating from neighbouring Sweden. Furthermore, Mr Turner pointed out that, by 1994, the industry was planning for the delivery of multichannel digital services and more extensive programme information could be contained in downloaded EPGs. He said

that, if this could include adult material, he would expect the skilled team to consider whether to restrict access to this material.

141.   Unlike Mr Vogel, Mr Turner was someone who was working in the industry at the relevant time and actually had to consider this issue. There is no reason to think that his experience was atypical. I found his evidence convincing. I agree with counsel for Virgin that it supports, and is supported by, the inferences he sought to draw from *TV & Satellite Week*.

142.   Finally, Rovi contend that the conventional approach in 1994 was to display everything in the EPG which was stored in the memory of the STB. Mr Turner explained, however, that there was a trade-off, particularly in light of the limited screen resolution of the time, so that the system might put up the title only, and allow the user to call up more detailed information. This approach can be seen in the pre-priority interactive EPGs of which there is evidence.

Construction

143.   There are a number of issues of construction of the claims. Like the parties, I shall consider the issues mainly by reference to the method claims. Before turning to the detail of these issues, however, it is convenient first to consider two general points.

Inventive concept

144.   Rovi's formulation of the core inventive concept of 234 underwent something of a sea change during the course of the trial. In Rovi's opening skeleton argument, it was expressed most succinctly as follows: "[the invention] removes blocked programmes from the EPG <u>altogether</u>, so that they do not even appear in the programme listings, with the consequence that programmes cannot be selected from the EPG" (emphasis in the original). As Mr Vogel conceded during cross-examination, however, this idea is nowhere described in the specification or claims. As Mr Turner pointed out, the specification does not expressly state that restricting access to programme schedule information includes restricting access to the programme title, and it is unclear whether it goes that far (Fig. 41 suggests that it only envisages restricting access to information other than the title). Even if it does, there has to be some indication that the programme has been locked (e.g. a padlock symbol in the appropriate space in the grid) and an opportunity for the user to unlock it by entering the PIN code. No doubt as a result, in Rovi's written closing submissions, the inventive concept was expressed as follows: "restricting the ability to view programme schedule information based on parental control options and (of claim 4) additionally restricting access to the programme content". Although the reformulated version is closer to Virgin's formulation, there remains an important difference between them. Virgin contend that the core inventive concept is simply restricting the ability to view programme content and/or programme schedule information based on parental control options. The difference is that Virgin contend that there is no suggestion in 234 of using the restriction on viewing programme schedule information *as a means for* preventing access to the programme content. I agree with Virgin on this point.

The proper approach to construction

145.   Counsel for Rovi submitted that, at the priority date of 234, the idea of restricting programme schedule information would have struck the skilled team as a brand new, innovative idea, and therefore they would see 234 as a patent for this concept. Accordingly, they would understand that the purpose of the claims was to claim this concept and that the patentee was not concerned with implementation details. I do not accept this submission, which as counsel for Virgin submitted amounts to saying that the language of the claims should be disregarded. Neither the specification nor the claims (even as granted, let alone the EPO claims) suggest that the patentee intended to claim such a broad concept.

Granted claims

146.   *Program schedule information.* Integers A, D and E of claim 1 all refer to "program schedule information". Virgin do not dispute that "program schedule information" should be construed as including the programme title, and so the claim covers restricting access to programme titles.

147.   *Restricted program schedule information is capable of being viewed when.* Integer E of claim 1 requires that "restricted program information is capable of being viewed when a code is received from the user". There are two closely-related issues with respect to this integer.

148.   First, Virgin contend that what must be capable of being viewed is "restricted program schedule information", not information which at that point is unrestricted. Rovi dispute this. The crux of the issue can be expressed in this way: is integer E satisfied by a method in which entering the code turns off the parental control options (which has the consequence that any viewer can see any previously restricted information) or does it require a method in which entering the code enables the viewer to see particular restricted information without turning off the parental control options (which has the consequence that only the current viewer can see only the restricted information in question)? I agree with Rovi that as a pure matter of language it is possible to interpret this integer as meaning "the information is restricted, but you can turn off the restriction to view the information". Construing it purposively in the context of the preceding integers of the claim and of the specification as a whole, however, I consider that the skilled team would understand it to require a method in which entering the code enables the viewer to see particular restricted information without turning off the parental control options altogether.

149.   Secondly, Rovi contend that this integer extends to a method in which entering the code merely allows the viewer first to access the parental control options screen so as then to turn the parental control options off and then to access the previously restricted information. Virgin dispute this. What this issue adds to the first is that entering the code does not (without more) enable the viewer to view the restricted information. As a pure matter of language, one might read this integer either way: the word "capable" favours Rovi's interpretation, while the words "is" and "when" favour Virgin's. Counsel for Rovi submitted that the purpose of this integer was simply to impose the barrier of a code between the user and the information. I am prepared to accept that the skilled team would not think that it mattered if an additional step was required (for example, pushing a special button on the remote after entering the code).

As I have said, however, construing this integer purposively in the context of the preceding integers of the claim and of the specification as a whole, I consider that the skilled team would not understand it to be satisfied by a method in which entering the code turns off the parental control options. This is all the more so if entering the code does not even turn off the parental control options, but merely allows the viewer to take the further steps of turning off the parental control options and then accessing the information.

150. *Claim 4*. Claim 4 requires that the method "further compris[es] restricting the ability to access television programming based on the parental control options." Virgin contend that this merely requires that the method must restrict the ability both to view program schedule information and to access television programming based on the parental control options. Rovi contend that this requires that the method must restrict the ability to access television programming *as a consequence* of restricting the ability to view program schedule information. In my judgment Virgin's construction is clearly the correct one. Claim 4 simply does not say anything about restricting the ability to access television programming being a consequence of restricting the ability to view program schedule information. Nor does the specification disclose such an inventive concept, as discussed above.

151. *Claim 11*. As counsel for Virgin submitted, although claim 11 is a product claim, parts of it have the character of a method claim. Integers B-E are the pure product parts of the claim. The data processor must be configured to carry out (i.e. suitable for carrying out) the steps of integers F-J. Virgin contend that these steps must be performed in order as follows: integers F and G are the set-up phase, and can be reversed, but after that the sequence must be H then I then J. Rovi contend that these steps can be performed in any order. I agree with Virgin that, reading the claim purposively and in the context of the specification of whole, it is implicit that the steps must be performed in sequence. The skilled team would understand that otherwise the method would not work. I also agree with Virgin that integer I describes how the restriction of H is done, namely by directing the display generator.

EPO claims

152. *A record for each program containing a field*. Integer C of claim 1 requires "a record for each program containing a field corresponding to a rating, program content identifier or channel" while integer F requires "restricting the ability to view program schedule information for a program … by checking the appropriate field in the record for the program for a match". Virgin contend that this requires that the record contains a field which is specific to the programme. Rovi contend that it is sufficient that it contains a field which is specific to the channel, and hence to every programme identified elsewhere in the database as being on that channel. In support of Rovi's construction, counsel for Rovi argued that the skilled team would appreciate that the structure of the database in which the information was stored did not matter, that the specification made it clear at [0009] that part of the purpose of the invention was to provide a simple method of channel blocking and accordingly that the patentee could not have intended to limit the claim to records containing fields specific to the programme. I do not accept this argument. Although it is quite true that part of the purpose of the invention is to provide a parental control system which includes the ability to lock channels, it would be clear to the skilled team from [0009], [0026] and the description of both embodiments that the main purpose of the invention was to

enable locking at the individual programme level. Thus the skilled team would not think that the patentee intended to claim a system which only permitted channel locking by reference to the channel and not by reference to the programme, which would entail precisely the kind of undesirable consequence identified in [0009]. Furthermore, the language used in the claim confirms this understanding: the claim language is clearly expressed at the programme level and not at the channel level. Indeed, the language of integer C itself distinguishes between the record for the programme which contains the field and the channel which may be specified in the field.

153. *User command.* Integer E requires receiving "a user command to display stored television program schedule information". Integer H requires that the prompt is displayed "in response to the user command when it requests display of restricted program schedule information". Virgin contend that the user command in integer H is the same user command as in integer E. Rovi command that it may be a different user command. In my judgment Virgin's construction is the correct one. Counsel for Rovi relied on the fact that integer does not say "said user command"; but it does say "the user command", which amounts to the same thing since it presupposes an antecedent and there is only one possible antecedent. Furthermore, this conclusion is supported by the fact that the claim specifies a sequence of steps as discussed below. Counsel for Rovi also argued that the two user commands were doing different things, because integer H refers to "restricted" program schedule information while integer E does not. This is not correct. Between integers E and H, integer F has established whether or not viewing programme schedule information is restricted by checking the appropriate field in the record. If the information is restricted, then the prompt for a code is displayed at H.

154. *Is displayed when.* Integer G requires that "restricted program schedule information is displayed when a code is received from the user in response to a prompt". Virgin contend that this means that display must be a direct causal consequence of the entry of the code, and hence of the user command to display the program schedule information. Rovi dispute this. I agree with Virgin. As counsel for Virgin pointed out, this integer does not use the language "capable of being viewed" of granted claim 1, and so the conclusion that it requires display of the information in response to entry of the code is all the stronger. Furthermore, this conclusion is supported by the single user command point discussed above and the sequence of steps considered below.

155. *The sequence of steps.* Virgin accept that the set-up steps (B, C and D) can be performed in any order, but contend that after that the steps must be performed in the following order: E then F then H then G. Rovi contend that the steps may be performed in any order. Again, I agree with Virgin that, reading the claim purposively and in the context of the specification of whole, it is implicit that the steps must be performed in sequence. The skilled team would understand that otherwise the method would not work.

156. *Claim 2.* This raises the same issue as granted claim 4.

157. *Claim 5.* As counsel for Virgin submitted, this is again a hybrid product/method claim. The same dispute arises as to the sequence of steps. Again, I agree with Virgin on this point.

Added matter

158.   The application as filed is International Patent Application No. WO 95/32583. The relevant part of the description in the application is identical to the relevant part of the description in the specification of 234. Accordingly, it is convenient to use the paragraph numbering of the granted Patent to refer to the relevant passages in the application. It is common ground that the added matter objections apply in the same way to the product claims as the method clams, and therefore it is only necessary to consider the method claims.

159.   Before turning to the substantive issues on added matter, it is convenient to address three linked preliminary points. The first is that Rovi contend that the granted claims were based on [0111], whereas the EPO claims are based on [0095]. Virgin dispute this, and contend that both sets of claims must be based on the description of the Lockout screen embodiment, and in particular [0110]-[0112]. This is because both sets of claims include within their scope the restriction of programme schedule information for programs on a particular channel basis (see granted claims 7 and 17 and EPO claims 1 and 5), whereas the description of the Key Lock Access embodiment explicitly excludes this at [0099]. I agree with this.

160.   The second is that Virgin also contend that the claims cannot be based on [0111] alone, because that paragraph cannot be divorced from the preceding and succeeding paragraphs. Again, I agree with this. As counsel for Virgin pointed out, the mere fact that part of the description of the Lockout screen embodiment is divided into three paragraphs, whereas the corresponding part of the description of the Key Lock Access screen embodiment is contained in the single paragraph [0095], would not cause the skilled reader to read them in a different way. The skilled team would understand that both passages describe a single indivisible process. Furthermore, [0111] makes no sense on its own.

161.   The third is that Rovi contend that the second and third sentences of [0111] disclose a distinct feature independently of the remainder of the method i.e. the method may be used to restrict access to programme schedule information independently of whether it may be used to restrict access to programmes. Virgin dispute this. Again, I agree with Virgin. It is true that the third sentence begins "Additionally", which might indicate an independent feature, but both the second and third sentence contain the word "also". Read in context, the skilled team would understand from this that the method enables access to the programme schedule information to be restricted as well as access to the programmes themselves. It is also true that both [0112] and [0113] say that, if the user enters the lockout code, the system will tune to or order the programme "or" display its schedule information. There is no suggestion, however, that a user who is locked out of the programme schedule information relating to a particular programme can nevertheless access the programme itself.

162.   *Granted claim 1.* The Opposition Division held that granted claim 1 was invalid on the ground of added matter for reasons it expressed as follows:

        "8.1   As confirmed by the Opposition Division and not contradicted by Proprietor, Opponents 1 and 3 establish that the claimed subject-matter is based on paragraphs [0110]-[0112] of the description in conjunction with paragraphs [0031], [0092] of

the description and figures 30 and 39 as in the granted patent as published. No basis for the claims of the main request can be found in the claims (or any combination of claims) of the earliest application as originally filed. From the established sources it is clear that:

1.   The programme schedule information is controlled on a 'per programme' basis (paragraph [0111], last sentence);

2.   The parental control options are a rating, programme content identifier or channel (paragraph [0110], second sentence);

3.   The receiving of a code involves the display of a prompt displayed on the television triggered by the imminent display of restricted programme schedule information (paragraph [0112]);

4.   The claimed restriction is in fact a binary type restriction, i.e. the programme information is either shown or it is not shown;

5.   The method is implemented using a database structured in records and fields that is consulted for deciding whether or not a programme information should be restricted.

Since these features are not in claim 1, Opponents 1 and 3 submit that the subject-matter of claim 1 contravenes the requirements of Article 76(1) EPC.

8.2   Proprietor's position on these points is that there is no need for a literal basis in the original filing as long as the claimed subject-matter can directly and unambiguously be derived from the earliest application as filed. More specifically, Proprietor submits that the allegedly missing features are either implied by the claim text or that there is basis for the terms used in the claims in the earliest application as filed:

1.   The term *programme schedule information* is used in the description, for instance in paragraph [0111];

2.   The term *parental control options* is derivable from the disclosure of paragraph [0110]. The mechanism described is not limited to the use of ratings;

3.   The *receiving of a code from the user* is described in paragraph [0112]. The sequence of actions to be taken is defined in the claims;

4.   The binary type decision to show or to hide the programme information is implied by the word *restrict* in the present wording of claim 1;

5.   The use of a database is implied by the present wording of claim 1.

8.3   The Opposition Division finds that the features identified above are not implicit from the claim text as would be required to recreate the context in which they are presented in the description:

1.   The features *ability to view programme schedule information* and *restricted programme schedule information is capable of being viewed* of claim 1 cannot be interpreted to imply restrictions that are applied on a 'per programme' basis;

2.   Parental control options as claimed could refer to option useful for controlling access. In this context ratings, programme content identifiers and channels are to be considered mere, even if obvious, examples of parental control options. The claim language *parental control options* is therefore a generalisation of the original disclosure;

3.   The imminent display of restricted programme schedule information triggering the display of a prompt and the entering of a (correct) password or code in response to the prompt triggering the display of the restricted programme schedule information are not defined in or inferable from the feature *a code is received from the user*;

4.   The term *restricting* in itself does not imply a choice between visible or invisible. The expression *capable of being viewed* may be interpreted to go in this direction. However, it may also be interpreted in other ways, for instance as an attribute of the information itself;

5.   The claim text has no reference to the use of a database, merely a reference to *parental control options* (as set by the user)."

163.   Counsel for Rovi argued somewhat faintly that the Opposition Division was wrong. Counsel for Virgin supported the Opposition Division's decision. I agree with the Opposition Division's conclusion, but can express my reasoning rather more shortly. Granted claim 1 is directed to a method of restricting access to program schedule information based on parental control options *per se*, whether or not information is restricted for individual programmes or only for entire channels, whether or not it involves checking a record in a database and whether or not access to programmes is

restricted. No such invention is disclosed in the application as filed. Accordingly, granted claim 1 presents the skilled team with new information about the invention which is not directly and unambiguously apparent from the original disclosure. It is a blatant intermediate generalisation.

164. *Combination of granted claims 1, 2 and 4*. Counsel for Rovi argued with rather more enthusiasm that, even if the Opposition Division was right about claim 1, claim 4 as dependent on claim 2 as dependent on claim 1 was not bad for added matter. Counsel for Virgin argued to the contrary. Since this combination cures two of the most obvious defects with granted claim 1, it is necessary to consider it in a little more depth.

165. The method disclosed in the application at [0110]-[0112] has the following features:

   i)   There is a schedule information database ([0110]).

   ii)   Restrictions are based on a rating, program content identifier or channel ([0110]).

   iii)   The record for each programme in the schedule information database has a field that corresponds to the rating, programme content identifier or channel ([0110]).

   iv)   In respect of each request to display a programme or its schedule information, the following steps take place in the following order:

      a)   There is a user request to display the programme or its schedule information ([0111-2]).

      b)   In response to that request, there is a check of the appropriate programme field ([0111]).

      c)   If the checked field matches one of the options set by the user as being locked out, a Lockout Verify screen (e.g. a prompt to enter a code) is displayed ([0112]).

      d)   If the lockout code is entered correctly, the user request to display the programme or schedule information is carried out ([0112]). If the lockout code is not entered correctly, the user request to display the programme or schedule information is denied and no further action is taken ([0112]).

166. Counsel for Virgin submitted that each of these features is presented as an inextricable part of the disclosure, but most of these features are absent from the combination of claims 1, 2 and 4. Thus:

   i)   The combined claim envisages that the ability to access programmes and schedule information can be based on "parental control options". This is not an expression which is defined or even used in the application and is not limited to ratings, content identifiers or channels.

ii)   The combined claim merely requires a record field in a schedule information database, but does not specify that it must be a field in a record for each programme.

iii)   More generally, the application discloses control of the display of programme information for each programme, whereas the combined claim extends to control of the display of programme information for entire channels.

iv)   The application requires a precise sequence of steps, whereas the combined claim does not. (I would interpolate that this point is not so applicable to combined claims 11, 12 and 14 as I have construed claim 11.)

167.   Furthermore, he submitted that removal of those features did not satisfy the EPO's *Houdaille* test:

i)   Are the features explained as essential in the disclosure? Answer yes. [0111] explains how the method works "During operation". This is the only disclosure that describes the way that the embodiment operates.

ii)   Are the features, as such, indispensable for the function of the invention in the light of the technical problem the invention serves to solve? Answer yes. The technical problem is restricting the access to information, and the invention is only described in terms of this embodiment. The features of the embodiment are essential to this method.

iii) Does the removal require any real modification of other features to compensate for the change? Answer: the discarding of many of the features of the embodiment renders this question almost meaningless. There has been no attempt to compensate for the change, but rather to substitute an entirely different invention, with features that are not disclosed.

168.   Counsel for Rovi argued that the combined claim simply expressed the invention disclosed in the application at an appropriate level of generality and disclosed no new information about that invention.

169.   In my judgment the combined claim does present the skilled team with new information about the invention which is not directly and unambiguously apparent from the application for the reasons given by counsel for Virgin. In summary, the invention presented in the application is a detailed and specific method. The combined claim generalises the invention in a way that omits important parts of the method disclosed and thereby tells the skilled team for the first time that those parts are inessential. Accordingly, it is an intermediate generalisation. I would add that, if the claims are to be construed as Rovi contend, then the problem is even worse.

170.   *EPO claim 1*. The Opposition Division held that this claim complied with Article 123(2) EPC. Virgin's added matter case on EPO claim 1 is largely a squeeze on construction: Virgin say that, if the claim is construed as contended for by Rovi, then it is bad for added matter. I agree with this. Since I have not accepted Rovi's construction, I do not propose to give my reasons for this at any length. It suffices to say that, on Rovi's construction, the claim presents the skilled team with new information about the invention which is not directly and unambiguously apparent

from the original disclosure, for example that the steps may be performed in any order. On the construction I have accepted, however, I do not consider that claim 1 is invalid on this ground.

Obviousness

171.   Virgin contend that the claims are obvious in the light of:

i)   A paper by Caitlin Bester (Manager Control Systems Design, Zenith Cable Products Division of Zenith Electronics Corp) entitled "Flexible Data Structures and Interface Rituals for Rapid Development of OSD Applications" published in *NCTA Technical Papers* in 1993 at 223-236 ("Bestler"). The NCTA is the (US) National Cable Television Association.

ii)   A public presentation and demonstration by Bruce Davis of TVGOS to the US House of Representatives Committee on Energy and Commerce Subcommittee on Telecommunications and Finance on 25 June 1993 ("the Davis Presentation").

iii)   The Uniden 4800. Originally Virgin pleaded reliance upon a Uniden Preliminary Reference Manual and Installation Guide as publications, but in the light of Mr Hallenbeck's evidence, and Rovi's acceptance thereof, Virgin put their case on the basis of prior use of the Uniden 4800. Rovi do not deny that the prior use would have been both public and enabling.

Bestler

172.   Bestler is conveniently and accurately summarised in the abstract as follows:

> "On Screen Display (OSD) used in CATV subscriber set-top decoders can be used for many different interactive viewer information services such as Schedule Guides and Sports Scores. Allowing for the required flexibility and functionality of Interactive Information Services, an OSD decoder system must use flexible redefinable data structures and interfacing rituals. This mandates downloadable behavior and data, not just downloadable screen images.
>
> Decades of Information Systems (IS) software development on mainframe and personal computers have shown that mere reprogramability is not enough. IS applications must evolve almost constantly. Staying responsive to user needs while avoiding development bottlenecks requires that IS systems be built from standard parts customized by parameterization and/or non-procedural specifications rather than custom hand-crafted code. Examples would include Relational Databases and Application Generators.
>
> These IS productivity techniques can be applied directly in headend computers, and scaled to fit within the OSD decoder. Zenith's HT-2000 decoder system applies both techniques to

rapidly develop and then deploy Interactive OSD Information applications."

173.   As this suggests, much of the paper discusses the design of the HT-2000 and the thinking behind that design. The paper also ranges more widely, however, and includes suggestions which were not implemented in the HT-2000.

174.   In the first section of the paper, headed "Supporting OSD interactive information applications", Bestler states (at 223):

> "While an OSD set-top decoder can certainly be made more user friendly, the real potential is in entirely new features such as Schedule Guides. These new Interactive Information Services can be standalone, or integrated with video programming.
>
> An interactive OSD information application allows the viewer to obtain specific information when they want it. Selection and timing is under viewer control. The requested data is presented on screen, possibly on top of specific video programming.
>
> When designing Zenith's HT-2000 decoder and its headend computer, the OSD Information Gateway, several requirements were identified. Each is discussed in one of the following sections: The Need For Flexibility, Downloaded Data, not Images and Integrated Control."

175.   The section headed "The need for flexibility" begins with a consideration of the requirements for a Schedule Guide application which says that it is almost impossible to predict what information will be required and how it should be presented. Having explained the difficulty of identifying what information should be presented, Bestler goes on (at 224):

> "A well defined user interface combines User Rituals with User Myths. The user rituals are patterns of input required to do certain things. Pressing backspace to erase the previously typed character is a common computer user ritual.
>
> A user myth is an explanation, in user terms, of what each input key or sequence does. Clicking the left mouse button in a certain screen region is 'pushing a toggle button'.
>
> Consistent user rituals and myths make an interface easy to work with and understand. An interface that requires raw memorization of arbitrary input and output sequences is very difficult to learn and user unfriendly.
>
> Predicting in advance what rituals viewers will find difficult. and which they will find frustrating is even more difficult than knowing what information services they want."

176.   This section concludes (at 225):

> "The nature of the information displayed, the format it is displayed in, and the interactions the viewer goes through to access them will all need to change during the lifetime of any OSD decoder.
>
> To meet these needs we must be able to actually redefine the behavior of the decoder from the headend without modifying the decoder."

177.   The section headed "Downloaded data, not images" begins (at 225, emphasis in the original):

> "How the OSD decoder receives and **uses** its information is critical to allowing flexible creation, and evolution, of these and other user-friendly features.
>
> A Schedule Guide, for example, could be viewed as nothing more than many pages of schedule information. Rather than waiting for the information to scroll by, the viewer can now Page Up and Page Down on their own.
>
> Doing so would sell the potential of an OSD decoder short. Separating data reception and storage from display allows flexible implementation of many desirable features."

178.   Bestler proceeds to give four examples of this. The first example is "Tiering" (at 225):

> "Services such as Sports arc likely to be tiered. Only subscribers to these services would be able to display this data.
>
> Even within a given application, there could be levels of service offered by tiering. A 'basic' Schedule Guide might only provide detailed movie descriptions for tonight's PPV offerings. A 'premium' Schedule Guide tier would provide complete descriptions of all movies.
>
> Since decoder RAM space will always be limited, it would be desirable to have the decoder only store data for which it was authorized. For a given RAM capacity the decoder would be limited in what tiers it could be authorized for, not in what tiers were available to it."

179.   The second example is "Conditional display of data/user filtering" (at 225):

> "Unwanted information is clutter. It gets in the way of valuable information. The information displayed should adapt to individual viewer preferences. Insisting that every household receive detailed movie descriptions for an Adults Only service would probably not be desirable.

You may view a Schedule Guide as a value added service or as a promotional device. In either case information about channels a viewer will never want to watch is undesirable.

If the Schedule Guide is viewed as a premium service, an annoying one will not be worth as much. If the Schedule Guide is a promotional feature, you want the viewer to concentrate on promotions for things they are likely to buy."

180.   The fourth example is "Redundant display for convenience" (at 225-226):

"Sometimes an application displays information it normally edits on another screen for the viewer's reference.

The fact that a channel is locked out via Parental Control should be displayed not only on the Parental Control screens, but on the Schedule Guide display as well."

181.   In the section headed "Integrated Control", Bestler says that "Schedule Guide data should interact, not just be a passive display. The viewer should be able to do things with it". She goes on to give various examples of things that the viewer should be able to do after having selected a programme, and then states (at 226, emphasis in the original):

"Parental Control and Favorite Channel maps could reference channels by name. Parental Control could be extended to lock-out or exempt specific **programs**, rather than whole channels."

182.   In the next section, headed "Don't re-invent the wheel", Bestler explains how the lessons which have been learned in developing software should be applied to developing Interactive OSD Information Services. In this section, she briefly describes the use of Relational Database Management Systems (RDBMS) to manage data, saying (at 227-228):

"A RDBMS organizes data into Tables. Tables are said to have Rows and Columns.

Each Row is a record, or one instance of data. A 'Programs' table would have one row for 'The Empire Strikes Back'.

Each Column represents one thing that is known about each instance. It is an attribute of each record. Columns for the 'Programs' table could include 'Title' or 'MPAA Rating'.

…

An OSD decoder can benefit greatly from similarly standardized data structures. Headend computers supplying data to the OSD decoder, such as the HT-2000 system's OSD Information Gateway, can use an RDBMS to store the original data and to map its translation into the downloaded data."

183.   In the next section, headed "Scaling the wheel to fit", Bestler explains how Zenith has scaled the tools she has described in the previous section to fit the modest processing power of the HT-2000 decoder. In this section she identifies the tasks which the processor must perform, one of which is (at 229):

> "Manage a small amount of self-edited data. This data would include favourite channels and a user PIN for IPPV [Impulse Pay Per View] purchases and Parental Control."

184.   Under the sub-heading "Downloading safely", Bestler explains (at 229):

> "A downloadable OSD decoder's behavior is controlled by the data packets sent to it from the headend. The 'code' it is executing is updated over the cable downstream, rather than by distributing new ROMs.
>
> On the HT-2000 project the downloaded behavior is called the 'Dialog'. Once a Dialog has been written it would remain in use indefinitely. This might be a few days, a few weeks, or a few years.
>
> The other data downloaded is the Dynamic Data. This data changes on a daily basis, or possibly more frequently. Schedule Guides, actual weather information and sports scores are all Dynamic Data."

185.   It is common ground that Bestler expressly discloses the following:

i)   parental control using channel locks of the conventional kind;

ii)   the idea of extending parental control to locking out specific programmes;

iii)   the use of a PIN for parental control;

iv)   storing television programme schedule information in a headend RDBMS with a programme table which includes the MPAA rating as one of the attributes; and

v)   downloading data from the headend to the STB and storing it in standardised data structures which correspond to those in the RDBMS.

186.   As Mr Vogel accepted, the skilled team would appreciate that Bestler's suggestion of locking out specific programmes could be implemented using MPAA ratings stored in the appropriate place in the database entry for the programme in question and entry of a PIN.

187.   Nevertheless, there is a substantial dispute between the parties as to the disclosure of Bestler. Remarkably, this turns on the proper understanding of the word "receive" in the third sentence of the passage quoted in paragraph 177 above. Virgin, supported by Mr Turner, contend that this refers to receipt by the viewers; whereas Rovi, supported by Mr Vogel, contend that it refers to receipt by the STB. Both Mr Vogel and Mr Turner addressed this issue in their reports and both were cross-examined on it. To the

extent that it is a matter for expert evidence, I have no hesitation in preferring Mr Turner's evidence on this question even approaching it with a degree of caution as explained above; but it is essentially a question of the construction of the document. Ms Bestler cannot have intended her words to be subject to detailed semantic analysis and that is not how the skilled team would read them. There is no reason to think that, just because she used the word "receive" in the third sentence, as opposed to the word "displayed" in the second sentence, she was intending to draw a fundamental distinction between the two, as opposed to varying her language to avoid monotony. This is particularly so given the context of the two sentences as indicated by the main heading ("Downloaded data, not images") and the sub-heading ("Conditional display of data/user filtering"). Both sides prayed in aid other aspects of the context, but in my view these do not significantly affect the interpretation of this passage. I conclude that the skilled team would understand Bestler to suggest that the system should enable the conditional display/user filtering of detailed movie descriptions for adult channels i.e. that users should be able to control whether such descriptions were displayed or not.

188.   On this basis, Virgin contend that (i) the skilled team would appreciate that viewing detailed movie descriptions for adult channels was a parental control issue, (ii) the skilled team would note what Bester had said about consistency of the user interface and (iii) it would obvious to the skilled team that the techniques which Bestler suggests using for channel and programme locking could also be used for restricting access to programme information such as movie descriptions for adult channels. All of these points were supported by Mr Turner's evidence.

189.   Apart from the dispute over the disclosure of Bestler, Rovi relied upon three main arguments as to why this would not have been obvious. The first is that restricting programme information was counter-intuitive since the designer of an EPG would want to display as much information as possible. I do not accept that this would have been the approach of the skilled team for the reason given in paragraph 140 above. In addition, Bestler herself provides a clear explanation as to why this is not the correct approach.

190.   The second argument is that the skilled team would not have had any motive to restrict access to programme information. So far as the skilled team's perception based on their common general knowledge is concerned, I have already considered and rejected this contention in paragraph 134-139 above. In addition, however, Bestler herself supplies a clear reason for doing this, namely enabling viewers to avoid unwanted exposure to detailed descriptions of adult programmes. Mr Vogel suggested that the obvious way to do this was not to include such descriptions in the database, but this would deny the information to those who wanted it.

191.   The third argument was to ask why, if this was obvious, it had not been done before. I am not impressed with this argument. It is true that, as counsel for Rovi pointed out, the development of interactive EPGs was a field in which there was considerable activity in the early 1990s. Bestler was only published around a year before the priority date, however, and there is no evidence that it was widely read. Furthermore, it is clear from Mr Turner's evidence that it was only in about 1993/94 that it was becoming possible to download sufficient quantities of EPG data to an STB to enable this to be done. As counsel for Virgin pointed out in his closing submissions, simply

obtaining and disseminating the programme schedule information, something which 234 takes for granted, required a substantial investment in infrastructure.

192.   In my judgment it follows that all the granted claims are obvious over Bestler. The same is true of the EPO claims. It is not necessary to consider them integer by integer. For the avoidance of doubt, however, I should make it clear that in reaching this conclusion I am assuming that the claims are to be construed as I have construed them. If they are to be construed as Rovi contend, then the conclusion follows even more clearly.

The Davis Demonstration

193.   This was a demonstration was given by Mr Davis (one of the named inventors of 234) to a Congressional sub-committee which was considering what legislative action might be taken to help protect young people from inappropriate television content. One of the proposals under discussion was the V-chip. Mr Davis' presentation, however, related to a software solution, which was an EPG that allowed for the setting of parental controls. There is in evidence a DVD and an agreed transcript of the presentation.

194.   The following aspects of the TVGOS EPG are shown:

i)   There is a parental lock feature.

ii)   The parental lock feature locks individual programmes rather than whole channels. As demonstrated, the lock feature was based on the MPAA rating.

iii)   The system provides the user with the ability to set parental control options based on the MPAA rating, and could easily be extended to provide for blocking based on all kinds of ratings.

iv)   The ratings information is stored in a field in a database. Given that the feature operated at the programme level, one can infer that this was a programme-specific field.

v)   Although in the system as demonstrated the use of MPAA ratings meant that the lock feature only applied to films, the parental lock feature was not limited to films, but could be applied to every single programme, requiring only that ratings information for each programme be supplied.

vi)   Upon attempting to order a film with a rating for which an access code had been set, an access code prompt is displayed, requiring entry of the correct access code before the ordering function is carried out.

vii)   The access code lock was not limited to ordering a restricted programme, but extended to viewing it as well.

195.   It is not possible to ascertain from the Davis Demonstration whether the EPG restricted access to programme schedule information as opposed to the programmes themselves. Accordingly, Virgin accept that this was not disclosed. Thus it is common ground that the key difference between the Davis Demonstration and the claims of

234 (both the granted claims and the EPO claims) is that the Davis Demonstration did not disclose restricting access to programme schedule information.

196. Virgin contend that this would have been an obvious step to take, since the skilled team would have had the motivation to take it and it was a technically straightforward step to take. This is supported by Mr Turner's evidence. I have already considered Rovi's main arguments to the contrary. I accept that the case based on the Davis Demonstration is not as strong as the case based on Bestler as I have interpreted it, but nevertheless I conclude that this was an obvious step to take.

Uniden 4800

197. The Uniden UST-4800 ("the Uniden 4800") was a satellite IRD which contained an interactive EPG ("SuperGuide") that included parental control. SuperGuide was originally marketed by SuperGuide Corp as a standalone unit in 1986. By 1990 SuperGuide Corp had developed an improved version of SuperGuide, referred to as "SuperGuide 2", which was incorporated into the Uniden 4800. The Uniden 4800 was exhibited by Mr Hallenbeck at a satellite industry show in Nashville in July 1990, and it was launched shortly afterwards. Mr Hallenbeck described in his statements the functionality of the Uniden 4800, including SuperGuide 2, in considerable detail. It used EPG data broadcast via a dedicated satellite channel which was stored in a database in the Uniden 4800. The data included attributes of programmes such as MPAA rating and warnings of potentially objectionable content, e.g. adult, violence, nudity.

198. SuperGuide 2 had a "Parental Lock" feature, which allowed users to lock specific channels. This feature did not restrict access to information about programmes showing on that channel, but did prevent access to the channel itself. A locked channel was identified by a padlock symbol next to any programme listing for that channel. In response to an attempt by a user to view the channel by any means, a password prompt would be displayed, and correct entry of the password allowed the channel to be viewed.

199. By the time Mr Hallenbeck left SuperGuide Corp in October 1991, the Uniden 4800 had been sold to, and used by, over 2000 end users. Mr Hallenbeck retained and continued to use a Uniden 4800 at his home for some time after that.

200. I can deal with Virgin's case on the Uniden 4800 shortly. Unlike Bestler and the Davis Demonstration, the Uniden 4800 does not disclose locking programmes as opposed to channels. Accordingly, it is little different to the common general knowledge approach. I am not persuaded that it was an obvious step to go from channel locks to restricting access to programme information on a per programme basis. Accordingly, I conclude that EPO claim 1 is not obvious over the Uniden 4800. On other hand, I consider that it would have been an obvious step from the Uniden 4800 to restrict the display of programme information for locked channels as a whole. Accordingly, I conclude that the granted claims are obvious over the Uniden 4800.

Excluded subject matter

201. Having regard to my previous conclusions, I shall deal with this briefly. The Opposition Division did not consider whether the granted claims were invalid on this

ground, and held that EPO claim 1 was not invalid on this ground. Counsel for Virgin concentrated on the exclusion of presentation of information. If I am right that the granted and EPO claims are obvious over Bestler and the Davis Demonstration, then it follows that there is no contribution to consider. That is why I shall assume that the baseline is common general knowledge.

202.   If granted claim 1 is not invalid on the ground of added matter, in my view it can only be because the contribution lies simply in the idea of providing the user with the ability to restrict the display of programme schedule information i.e. to determine whether certain information is presented or not. At that level of generality, I consider that the contribution falls within the presentation of information. There is no technical contribution.

203.   If granted claim 1 is invalid on the ground of added matter, but the combination of claims 1, 2 and 4 is not, the position is little different. Again, the contribution lies simply in the idea of providing the user with the ability to restrict the display of programme schedule information i.e. to determine whether certain information is presented or not. Using records in a schedule information database was common general knowledge, as was restricting access to television programmes based on parental control options. Again, there is no technical contribution.

204.   If EPO claim 1 is construed as I have construed it, then I consider the position is different. In this case, the contribution lies in the specific methodology by which the programme schedule information is restricted and displayed. In my judgment, that is a technical contribution, whether one views it from the perspective of the exclusion of presentation of information or of the exclusion of computer programs.

205.   The position in relation to the product claims is the same.

Infringement

206.   Both the TiVo and VHD STBs are equipped with interactive EPGs operated by the user via a remote control. Both EPGs can display programme listings in different formats, but it is not necessary to differentiate between these and I will refer to them simply as "the TV Guide". Both have a similar function that is said to infringe 234, called respectively "Hide Adult Channels" and "Hide Adult Listings". The VHD STBs also have an additional function which is said to infringe, conveniently referred to as the "Alternative Adult Listings Display" (also referred to as "the Second Display Method"). The way in which these functions work is now described accurately and in detail in Virgin's PPD, Part 18 response, schema PPD and Addenda as corrected. Fortunately, it is not necessary for the purposes of this judgment to describe these matters at the same level of detail, particularly having regard to the way in which I have construed the claims. I shall therefore outline this as briefly as I can.

Hide Adult Channels and Hide Adult Listings

207.   The way in which the Hide Adult Channels and Hide Adult Listings functions work from the user's perspective may be summarised as follows. The user may request to access a menu called the "Parental Controls" menu in the case of the TiVo, and the "Locked Channels" menu in the case of the VHD. Before being allowed access to that menu, the user must correctly enter a PIN. The menu then allows the user, if he or

she so chooses, to make various selections of options, which include an option to hide listings of adult channels whenever the TV Guide is requested in the future. When this is activated, the system will simply omit the adult channels from the TV Guide, so that the user will not see them listed, nor be given any indication that they are missing. By the same process, the user can choose to restore the hidden adult channels to the TV Guide.

208.   The way in which this functionality is implemented may be briefly summarised as follows. Both the TiVo and VHD STBs store programme listings information transmitted to them in a database. There is a flag ("the adult flag") in a field in the database which indicates if a channel is an adult channel. In the case of the TiVo STB, this is a single bit in a 64 bit field called [channelBits] in a table called UclChannel. In the case of the VHD STBs, this is a field called [category] in a Javascript array called sChannels Array, which is regarded as indicating an adult channel if the value of the [category] field is 12.

209.   If Hide Adult Channels/Listings has been activated, when the system constructs the TV Guide for viewing, it will check the adult flag for each channel and will not display that channel if the adult flag is set. In the case of the TiVo STB, this involves a software component called NPK which obtains channel data from UclChannel. This will not add a channel to the TV Guide if Hide Adult Channels is on and the relevant bit indicates that the channel is an adult channel.

210.   In the case of the VHD STBs, the position is more complicated because there are two different layers in the software, called the Seachange layer and the Virgin Media applications layer. Channel information is stored in the Virgin Media applications layer, while programme information is stored in the Seachange layer. The Virgin Media applications layer maintains a list of channels to be displayed in the TV Guide ("the Channel List"). If Hide Adult Listings has been activated, the system checks the [category] field in the sChannels array, and if this is 12 the channel is not added to the Channel List.   When programme information is required to populate the TV Guide, the Virgin Media applications layer makes an API (Application Programming Interface) call to the Seachange layer in form of a search command for programmes on the channels identified for display in the Channel List. The results of the search are returned in the form of a Javascript object called TV Program Object. This occurs channel by channel. If Hide Adult Listings has been activated, an adult channel will not appear in the Channel List and therefore no TV Program Object will be returned.

211.   In neither case is any check is made for this purpose of any records in the database for individual programmes. Indeed, none of the fields for a record for a programme contain any indication as to whether the programme is an adult programme. It is nevertheless the case, as one would expect, that the database stores information which indicates which channel each programme is on.

Alternative Adult Listings Display

212.   The way in which the Alternative Adult Listing Display feature works from the user's perspective may be summarised as follows. From the EPG menu, the user can select the option "Adult". If the option to "Hide Adult Listings" has not been activated, listings for the adult channels are displayed. If the option has been activated, however,

the user is prompted to enter a PIN. If the PIN is entered correctly, listings for the adult channels are displayed.

Granted claims

213. *Hide Adult Channels and Hide Adult Listings*. As I have construed granted claims 1 and 11, these claims are not infringed. The alleged infringing method involves entry of the PIN to turn off Hide Adult Channels/Listings. But entry of the PIN does not in itself change anything: it merely allows the user access to the relevant menu, and then (if he or she so wishes) to restore the adult channels to the TV Guide and then (if he or she so wishes) to view programme information for the adult channels. Furthermore, if the user does choose to restore the adult channels, then there is no longer any restricted programme information.

214. There is a further reason why the VHD STBs do not infringe claim 11. The restriction on display is not achieved by directing the display generator to do or not do anything. It is achieved by re-building the Channel List upon Hide Adult Listings being activated.

215. *Alternative Adult Listing Display*. Virgin do not dispute that, even on their construction of claim 1, this claim is infringed. Virgin dispute infringement of claim 2 on the ground that this method does not check a record in a schedule information database in order to restrict the viewing of program schedule information. Virgin say that, when the user selects Adult, the software simply checks the state of a variable. The variable records whether or not the Hide Adult Listings function is activated i.e. whether the parental control option is on or off. If it is on, a PIN is requested. In my judgment, however, this is sufficient to satisfy this claim.

EPO claims

216. *Hide Adult Channels and Hide Adult Listings*. As I have construed claims 1 and 5, these are not infringed. The main reasons for this are as follows:

    i) Both the TiVo and VHD STBs control access to channels on a channel-by-channel basis using an adult flag for a channel. They do not control access (whether to programmes or channels) on a programme-by-programme basis using a flag for a programme. It is not sufficient that every programme is associated with a channel. In the case of the TiVo STB, moreover, there is not even a one-to-one relationship between programme and channel, since the programme information is only stored once, no matter how many channels it is shown on. It follows that the same programme information may be associated both with an adult channel (with its adult flag) and a non-adult channel (with no adult flag).

    ii) Rovi's case is that the user command of claim 1 integer E is a command to display the TV Guide, but the user command of integer H is the command to access the Parental Controls menu. These are not the same command. Furthermore, the command to access the Parental Controls menu corresponds to integer D. It does not enable the steps of integers E-H to be performed.

iii)   Rovi's case involves the steps of the method being performed in a different sequence to that specified in claim 1. In the case of the TiVo STB, this is H then G then an additional, unspecified step (turning off Hide Adult Channels) then E then F. In the case of the VHD STBs, this is H then G then an additional, unspecified step (selecting Show Adult Listings) then F then E.

217.   *Alternative Adult Listing Display*. This does not infringe either. In this case, as I understand it, Rovi relies on a single user command, which is the selection of Adult. But there is no check as required by integer F when this command is received. Not only is there no check of a record for a programme, there is not even a check of a record for a channel. If and in so far as there is any check at all, it is on a per channel basis and does not occur in the sequence specified in the claim.

1856

218.   The application for 1856 was International Patent Application No. WO 96/33572.

219.   Following an opposition by a third party, 1856 was upheld in amended form by the Opposition Division for reasons given in a decision dated 23 April 2004. There was no appeal against that decision.

The specification

220.   The specification begins by referring to certain prior EPG systems and identifying various disadvantages with them. In particular, the specification states:

"[0002] DE 42 40 187 A1 describes a system for displaying program information that is received over one or more video-text channels of a single information source, i.e. an antenna. 'Digital On-Screen Display A New Technology for the Consumer Interface' by Brugliera V., published on 11 June 1993 in Cable Sessions, page 583,6 describes a television guide. This enables a subscriber to tune to different channels through the guide by moving a highlight to a box in the guide that contains the relevant information and pressing a button. This, however, is only used with a single source input.

[0003] US 4,488,179 describes a television viewing centre system. This includes a signal switcher that interconnects signal sources including two tuners and equipment such as a recording device, a local camera and a television game. There is, however, no disclosure of a method or apparatus for co-ordinating the supply of program guide information from a plurality of different sources, such as for example, a cable box, a satellite dish and a tv antenna.

[0004] [M]any different transmission schemes are available for providing the information required for a television schedule guide. For example, a Direct Broadcast Satellite System (DBS) can provide television programs and television program schedule information via a satellite dish in conjunction with a

set-top receiver. DBS systems are commercially available from, for example, Hughes and Primestar. In addition, conventional satellite dishes, coax cable, telephone lines, fiber optic cable, antenna, etc. are used to distribute television program and/or program schedule information."

221.   The specification goes on at [0005]-[0008] to say that some DBS receivers are capable of switching automatically between the DBS input and a local cable or antenna input such that, when the user selects a local channel, the IRD automatically bypasses the DBS signal. By contrast, if the user is receiving both cable and terrestrial services and he has two input ports on his television, he can attach one to each port; but if he does not have two input ports, he must manually switch from one to the other. Manual switching is unacceptable to many consumers, however, and manually switching between channels becomes more complicated as the number of channel sources is increased.

222.   The specification then summarises the invention in the following terms:

"[0009] Consequently, the present invention is directed to coordinating input signals and program information, and more particularly to (1) coordinating television schedule guide information received from multiple sources, (2) automatically switching to a desired signal source, and (3) tuning to a desired television program. Thus, the present invention provides a tuning scheme which coordinates television schedule guide information. This information can be received from numerous sources. These sources can include an incoming cable line (e.g., on a coax cable), satellite broadcasts, a dedicated telephone line (e.g., twisted pair), and any other medium capable of transmitting a signal.

[0010] The present invention provides a method and an apparatus in accordance with claims 1 and 12 respectively for individually delivering television signals from a plurality of sources of different kinds such as, for example, cable, a satellite dish and a tv antenna, to an input of a television appliance. After receiving channel guide information data, these data are mixed and sorted into a desired order. Finally, a display of this channel guide in formation is generated and then shown on a television screen in the desired order."

223.   The specification describes a number of specific embodiments of the invention at [0013]-[0038] by reference to Figs. 1A-1D (referred to in the text as 1a-1d) and 2-4, which are briefly described at [0012]. This section of the specification begins:

"[0013] The present invention provides a tuning scheme which coordinates television programs and television schedule guide information. This television schedule guide information can be received from numerous sources. As stated above, these sources include an incoming cable line (e.g., on a coax cable), satellite broadcasts, a dedicated telephone line (e.g., twisted

pair), and any other medium capable of transmitting a signal. In the preferred embodiment, television channel broadcasts are received from at least two separate sources such as (1) cable and a satellite dish, or (2) two different satellites, or (3) local cable and DBS sources. The schedule information is provided with a source identifier which identifies that schedule information as being from a particular source. The schedule information is sorted and displayed in an organized fashion to the user.

[0014] When a user selects a show or channel located on one of the displayed channels within a displayed guide, the system reads the source identifier associated with that show or channel. In the preferred embodiment, the system then carries out an automatic switching/tuning process that switches the input to the television (either RF or video) to a source device. Source devices include DBS, cable box, television tuner, etc. The system then tunes to the required channel for the desired show. Additionally, the source identifier can be utilized to switch between various devices automatically when unattended VCR programming is desired. Furthermore, when program information is received from multiple satellite sources and a desired channel is selected, the present invention can, in one embodiment, automatically move the customer's satellite dish such that the customer receives the desired program from the associated source. The present invention then tunes to the correct channel.

[0015] In creating a merged television guide, a channel map is created which identifies the channels available on the multiple sources, and identifies their source. For example, in the case of DBS/local channel implementations, a channel map is created with both local cable and DBS channels merged. The local channels and the DBS channels are tagged with a source identifier. When the user/consumer selects a non-DBS channel from the guide, the integrated receiver decoder unit (IRD box) for the satellite switches the IRD to couple the local cable to the receiver. The system then tunes the television tuner or other tuning device to the required channel. If a DBS channel is later selected, the system switches the IRD to couple the satellite receiver/decoder to the receiver. The system then tunes the DBS tuner to the selected DBS channel. In the case of, for example, cable and antenna inputs, the system switches to the correct video input and then tunes the television tuner to the required channel for receiving the selected source. Thus, automatic access to multi-source television schedule guide information is provided."

224. The specification goes on at [0017]-[0024] to describe four different hardware arrangements for implementing the invention with varying degrees of integration of

the components shown in Figs. 1A-1D. Since it is a little easier to understand than Fig 1A, I shall refer to the description of Fig 1B, which I reproduce below:
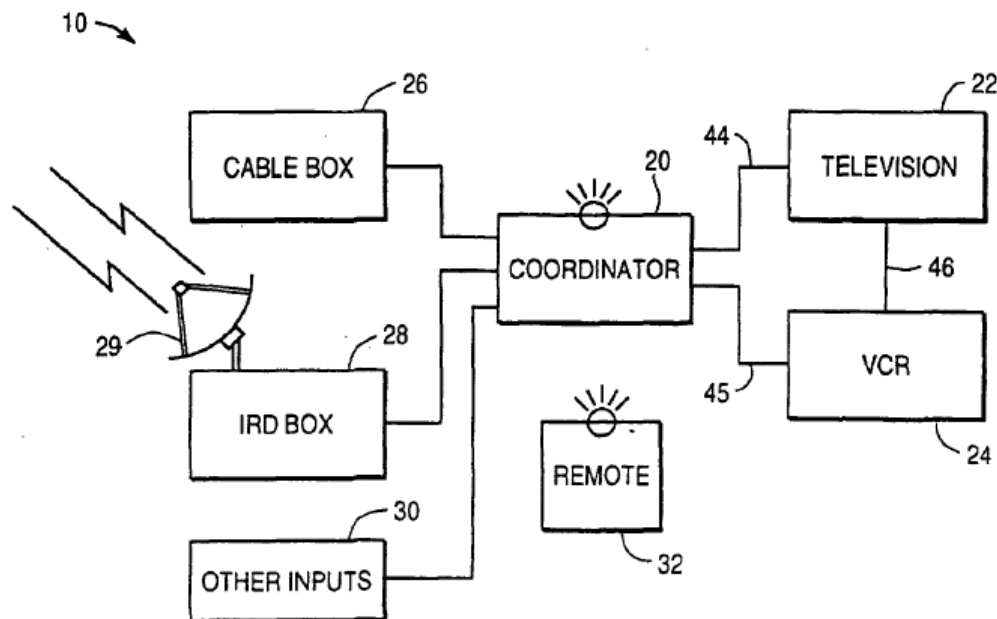

FIG. 1B

225.   The specification describes this arrangement in [0022] as follows:

> "Fig. 1b is a block diagram of a multi-source television program and television schedule guide system with the multiple sources connected directly to the coordinator. In this embodiment, coordinator 20 switches between the multiple sources 26, 28 and 30 and then outputs the information from the desired source to television 22 or to another destination device. This arrangement allows for a single input to television 22. Coordinator 20 inputs program guide information along with television programs to television 22 via line 44 or through VCR 24 via lines 45 and 46."

226.   It is important to note three points from the preceding description of the Fig. 1A embodiment which, although not expressly mentioned in this paragraph, are equally applicable to it. First, the specification states in [0017]:

> "Other inputs 30 can include multiple satellite sources. When multiple satellite sources are present, coordinator 20 switches between the available satellite sources by automatically moving the user's satellite dish or switching between satellite dishes. In order to automatically move the satellite dish, a memory within IRD box 28 tracks the position of the DBS satellite dish in relation to satellite sources which are available via the DBS satellite dish. The IRD box 28 then automatically positions the DBS satellite dish such that the desired satellite source is received by the IRD box 28."

227.   Secondly, the specification states in [0018] that the remote has an IR emitter 40 which communicates with an IR receiver 39 on the coordinator. (These can be seen in Fig. 1B, although not identified by reference numerals.) The specification also says that the IR emitter "can be replaced by, for example, a bus interface or an RF transmitter".

228.   Third, the specification explains:

"[0022] IRD box 28 receives television programs along with other information via, in one embodiment, satellite dish 29. IRD box 28 then provides program schedule information to the system. The schedule information is added to the transmitted signal by the DBS service provider or a company under contract. Examples of DBS service providers include Direct TV and USSB. This program schedule information (or guide) may also include a channel map that contains the channel information which is available on a particular source. Information associated with the DBS guide is saved in the IRD box receiver's RAM 42 or downloaded. Similarly, program guide information can be received through cable box 26, other inputs 30, antenna 34, and/or through any other transmission medium (e.g., dedicated twisted pair telephone line). Each of these sources may also be provided with television schedule data within the signal transmitted by the service provider.

[0021] Coordinator 20 finds and sorts the program guide information available in system 10. In order to receive the required television guide information, coordinator 20 is connected to the source(s) of this information. For example, if the channel map information is provided by a dedicated twisted pair telephone line, then that telephone line is input 43 to coordinator 20 [not shown in Fig. 1B]. Guide information can be provided from any commercially available medium and can apply to all or several of the available sources. In the preferred embodiment, television guide information is provided via the vertical blanking interval on an available television channel….."

229.   In the arrangement shown in Fig. 1C the coordinator is located within the IRD box, and the specification states at [0023] that "no IR emitter is needed". Similarly, in the arrangement shown in Fig. 1D the coordinator and the television tuner are located within the IRD box, and the specification states at [0024] that "no emitter is needed".

230.   The specification describes how the EPG shown in Fig. 2 operates at [0028]-[0032]. I reproduce Fig. 2 below:
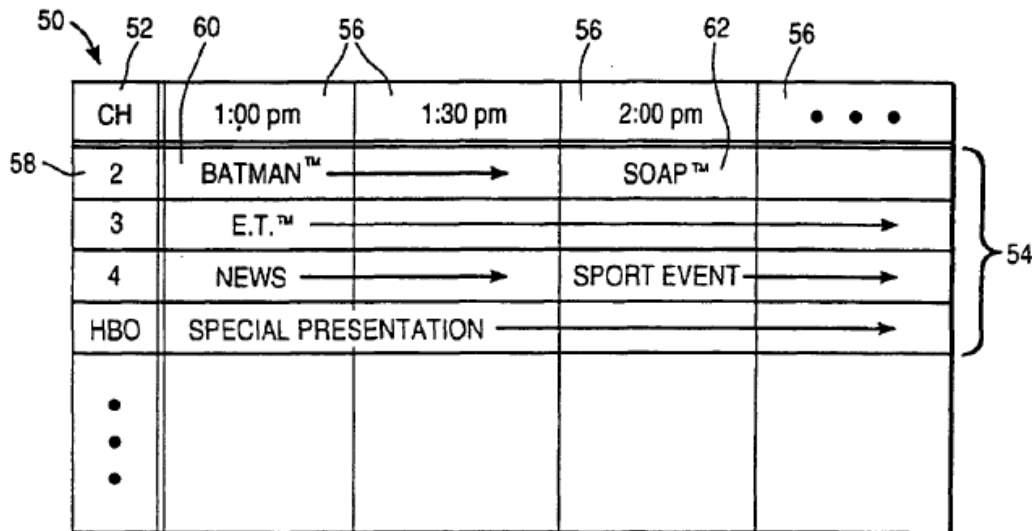
FIG. 2

231.   As the specification explains at [0031]:

"In order to track which channels are available from which sources, a source identifier is located on each channel. Each of the source identifiers may be included in the channel guide information, or the source identifiers may be added by the system based on the origin of the channel guide information. Therefore, if these data are not already provided, coordinator 20 attaches the appropriate identifiers to the received channel guide information. For example, if **BATMAN** 60 is received through IRD box 28, than **BATMAN** 60 will have a source identifier for identifying the IRD box 28 located on its channel 58. In the preferred embodiment, the source identifier is not displayed to the user. If desired, the user can program coordinator 20 to display which source the channel is associated with. For example, channels which come from cable box 26 can be colored red in grid guide 50 and channels available from IRD box 28 can be the color green; thus, if desired, the user can easily identify which source is associated with each channel."

232.   The process for automatic tuning is illustrated in a flowchart at Fig. 3 which is described at [0033]-[0034]. I reproduce Fig. 3 below:
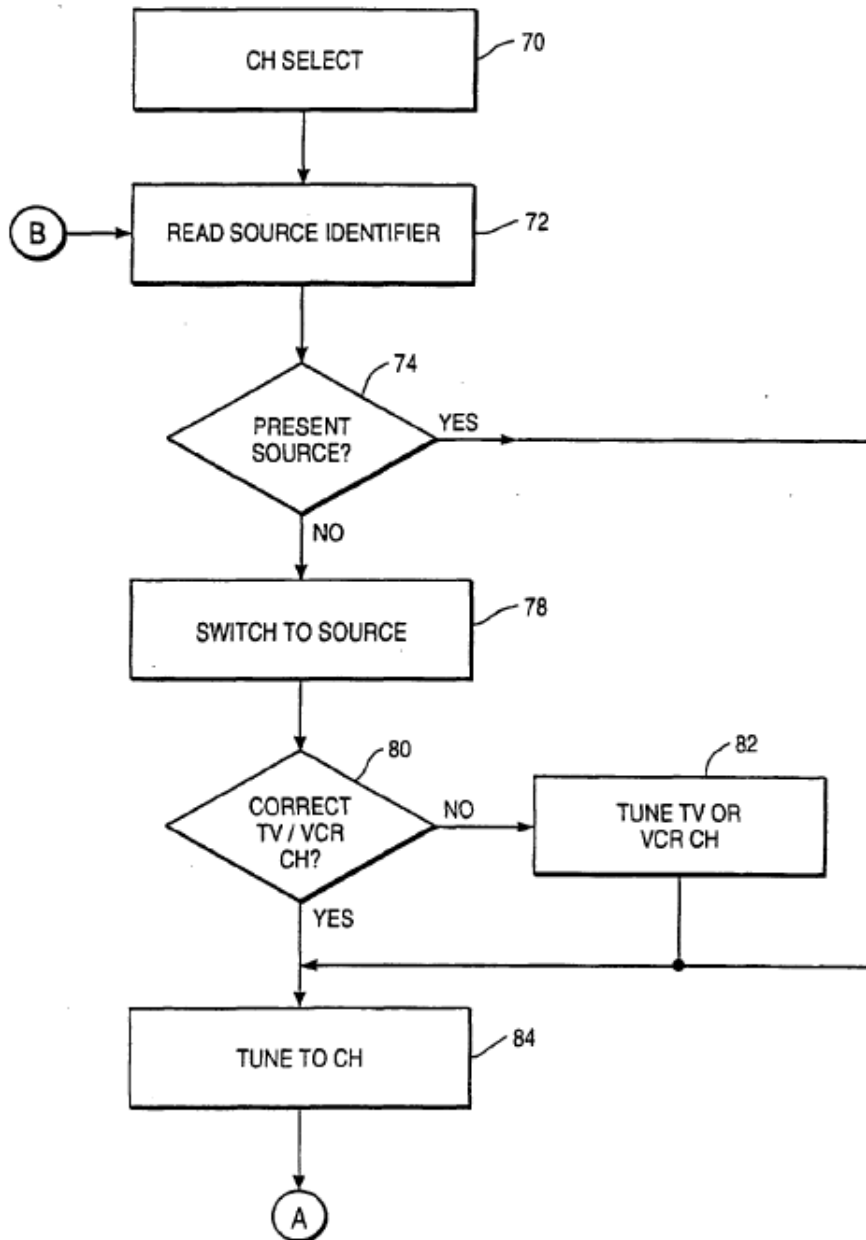
FIG. 3

The claims

233.   Broken down into integers and omitting reference numerals, the claims in issue are as
        follows:

        "1.[A] A method for individually delivering television signals from a
                plurality of sources

        [B]   using source devices for different transmission schemes such
                as, for example, cable, a satellite dish and a TV antenna,

        [C]   to an input of a television appliance,

the method comprising the steps of:

[D]   storing channel guide information data in a memory,

[E]   the data representing television program information telecast from said sources and

[F]   source identifiers that represent the source device for each television program;

[G]   displaying a listing of the television program information in a guide format;

[H]   receiving from a user a program selection from the displayed program listing;

[I]   reading from the memory the channel guide information data that corresponds to the program selection, including the source identifier; and

[J]   coupling automatically to the input of the appliance a television signal from the source device that corresponds to the read source identifier, which television signal carries the selected program.

4.[A]   A method as claimed in any of the preceding claims, additionally comprising

[B]   the step of downloading the channel guide information data from at least one of the sources.

5.[A]   A method as claimed in claim 4, comprising the steps of

[B]   downloading the channel guide information data from a plurality of sources and

[C]   merging that data to provide a consolidated listing of the television programs from all the sources for display in the step of displaying.

12.[A] A multi-source switching system for a television appliance, comprising:

[B]   a microprocessor for switching between multiple source devices for different transmission schemes of different kinds such as, for example, cable, satellite dish and a TV antenna in said multi-source switching system;

[C]   a memory coupled to said microprocessor, for storing channel guide information data in said memory,

[D]   the data representing television program information telecast from said sources and

[E]   source identifiers that represent the source device for each television program,

[F]   the said television program information being displayed in a guide format;

[G]   a remote control for controlling said microprocessor for selecting a program from the displayed television program information;

[H]   means for reading from the memory the channel guide information data that corresponds to the program selection, including the source identifier; and

[I]   an emitter coupled to said microprocessor, for transmitting a signal,

[J]   said signal being operable to cause automatic coupling to the input of the appliance of a television signal from the source device that corresponds to the source identifier of the selected program, which television signal carries the selected program."

The witnesses

234.   Rovi's expert witness was Joel Hassell. From 1979 until about August or September 1995, Mr Hassell worked for a number of companies in various software-related roles, beginning as a junior programmer supporting software for numerical control equipment and rising to Vice President and General Manager of School Systems at McGraw-Hill. During this period he obtained a degree in Legal Studies and a Juris Doctor degree.

235.   In about August or September 1995, Mr Hassell joined TVGOS as a Senior Engineer, working on a pre-existing project to develop an interactive EPG for General Instrument's DCT1000 STB. Thus Mr Hassell had had no experience in the EPG industry as at the priority date of 1856. He did, however, have a personal interest in EPGs, having acquired a television with a StarSight EPG for use at home in late 1994 or early 1995. By the time he left TVGOS in 1999, he was Vice President of Interactive Product Development.

236.   From 1999 to 2001 Mr Hassell was Chief Executive Officer of Intellocity Inc, which was active in the design and development of digital and interactive television platforms, content and applications. Intellocity was taken over by ACTV Inc, which employed Mr Hassell from 2001 to 2003. ACTV was in turn taken over by OpenTV, which employed him from 2003 to 2007. In 2008 Mr Hassell formed DigiForge Inc, a digital television development company of which he was the Chief Technical Officer. After Mr Hassell joined his current employer, he retained a 45% stake in DigiForge until it was acquired by Rovi in 2011. Since 2010, Mr Hassell has been employed by

Canoe Ventures LLC, an advertising technology company of which he is currently the Chief Executive Officer.

237. Mr Hassell is named as an inventor on 36 European Patents and 41 US Patents which related to projects undertaken at TVGOS and Intellocity. Many of these patents are now owned by Rovi. Mr Hassell gave evidence that he was unaware of the fact that Rovi was suing Virgin for infringement of one of these patents.

238. Mr Hassell was a good witness, but through no fault of his own he was not entirely representative of an addressee of 1856. First, he did not begin working in the relevant field until four or five months after the priority date. Secondly, he relied heavily on his recollections of his experience at TVGOS, which was focussed on producing the software for EPGs, and thus did not include hardware experience. Thirdly, he was quite narrowly focussed on the cable industry at the time.

239. Virgin's expert witness was Michael Adams. He obtained a BSc in Electrical and Electronic Engineering from the University of Bristol in 1979. From 1979 to 1988 he worked on networked systems at Kent Process Control and an early ISDN (Integrated Services Digital Network) system at Digital Equipment Corporation. From May 1988 to July 1993 he worked for Bell Northern Research in Canada where he worked on developing software for a CATV system and for Frame Relay and ATM (Asynchronous Transfer Mode) products.

240. From August 1993 to November 2003 he worked for Time Warner in a series of roles. Initially, he joined the team that launched the Time Warner Full Service Network, which was the first system to offer VOD services, for a trial beginning in January 1994. The Full Service Network included an interactive EPG. From January 1995 to 2000 he was a Principal Network Architect and part of a team developing Time Warner's Digital Cable System, which again included an interactive EPG. He is a named inventor on eight patents in the area of digital video and related systems dating from his period at Time Warner.

241. Since 2003 Mr Adams has worked for Terayon Communication Systems and Tandberg Television on video and broadband services and has acted as an independent consultant through his own firm. In 2012 he joined M3C LLC which develops new products for the cable industry. He is the author of *OpenCable Architecture* published in 1999 and co-author of the second edition of *Modern Cable Television Technology* published in 2003.

242. Mr Adams was also a good witness. Although he was also from a cable background, he appeared to have had a greater knowledge of satellite television at the time than Mr Hassell. As with Mr Turner, Counsel for Rovi submitted that Mr Adams' evidence with regard to the prior art was influenced by hindsight, since he had been shown 1856 before being asked to consider the prior art. This is particularly important with regard to Young, since as discussed below there is an important issue as to what Young discloses. Again, I agree that it would have been better if Mr Adams had been asked to form a view as to the disclosure of Young before reading the Patent, and I have therefore approached Mr Adams' evidence on this topic with a degree of caution.

243.   Again, Virgin also relied on the unchallenged factual evidence given by Mr Hallenbeck with regard to the Uniden 4800.

The skilled team

244.   It is common ground that 1856 is addressed to a team of engineers with experience of both the hardware and software used in STBs, knowledge of EPGs and knowledge of the various types of television networks which were available in April 1995 (i.e. terrestrial, cable and satellite).

Common general knowledge

245.   There is little, if any, dispute that all the matters I have set out in paragraphs 38-64 and 66-78 above were common general knowledge. In any event, that is my finding. In addition, as is common ground, the skilled team would be aware at least in general terms of QAM and its use for digital television.

246.   It is necessary, however, to say a little more about re-transmission of OTA channels by cable. It is common ground that it was commonplace in 1995 for cable operators to carry both cable-specific and re-transmitted OTA channels. Where an OTA channel was available by cable, the viewer would use that source rather than the OTA antenna, both for simplicity and because cable signals were usually better than OTA signals even in the absence of geographical obstructions. It was very rare for cable subscription packages to consist only of re-transmitted OTA channels. There was some debate as to the extent to which OTA channels were not re-transmitted. The evidence on this topic focussed exclusively on the situation in the USA, no doubt because that was the largest and most-developed cable market in 1995. The conclusion which I draw from the evidence is that, although the bulk of local OTA channels were carried by cable providers, some local OTA channels were not, particularly in the larger cities. The channels which were not re-transmitted were the less popular ones; but, as Mr Adams pointed out, that does not make any difference to the person who wants to receive a particular a channel.

247.   Counsel for Rovi submitted that the evidence showed that in 1995 the industry was partitioned between OTA, cable and satellite. I do not accept this. Cable operators re-transmitted OTA channels, distributed their services to cable headends by satellite and were getting involved in DTH satellite broadcasting. Furthermore, cable operators participated in a project for EPG standardisation which was predicated upon the availability of television via OTA, cable and satellite. At the level of STBs, these were not multifunctional devices, but both cable STCs and satellite IRDs included bypass switches for OTA signals. Thus the skilled team would have been well aware of these different kinds of television service, even if their background was in OTA, cable or satellite. Furthermore, the skilled team would have been aware that, at least in some circumstances, users might need, or at least want, to access more than one kind of service and to be able to switch between them.

248.   The position with regard to knowledge of interactive EPGs was essentially the same as I have set out in paragraph 135 above. There was no EPG available in April 1995 which was comprehensive in the sense of enabling the user to switch between OTA, cable and satellite channels.

Construction

249.   There are a considerable number of issues of construction. To some extent, these are inter-related. As with 234, it is convenient to consider the issues primarily by reference to the method claims.

Sources, source devices and transmission schemes

250.   Both claim 1 and claim 12 refer to "sources", "source devices" and "transmission schemes". It is very difficult to understand precisely what the Patent means by "sources" and "source devices", and whether these are intended to be the same or different. Although I have stripped out the reference numerals from the claims in paragraph 233 above, it is noticeable that both claims refer in different places to numerals 26, 28, 30 as being both "sources" and "source devices". In the description the terms "sources" and "source devices" appear to be used almost interchangeably. Certainly, if they are intended to mean different things, the distinction is not consistently maintained. For example, the specification refers in [0012] to the embodiments shown in Figs. 1A and 1B as having "multiple sources", while the embodiment shown in Fig. 1C is said to have "DBS and cable as "source devices". Similarly, the specification states in [0013] that in the preferred embodiment "television channel broadcasts are received from at least two separate sources such as (1) cable and a satellite dish, or (2) two different satellites, or (3) local cable and DBS sources", while in [0014] it says that "Source devices include DBS, cable box, television tuner, etc." Similarly, the specification refers in [0022] to "multiple sources 26, 28 and 30", while in [0023] it says that "DBS (via IRD box 28) and cable (via cable box 26) are source devices". In addition, claim 1 refers to "a plurality of sources using source devices" whereas claim 12 refers to "multiple source devices" and "said sources" in integer D of claim 12 has no antecedent. By contrast, the term "transmission schemes" causes less difficulty, since it is only mentioned in [0004] and in the claims.

251.   Rovi contend that the skilled team would understand these terms as follows:

   i)   "Source" denotes the *kind* of television received by the system e.g OTA, cable or satellite. Thus "a plurality of different sources" means more than one kind of television.

   ii)   A "source device" denotes a device which processes signals of a particular kind by taking an input and converting it into signals which can be transmitted to the television or television monitor. Thus a source device may be a cable STC, a satellite IRD or a television tuner.

   iii)   "Transmission scheme" denotes the *kind* of signal used to transmit television programmes and television programme schedule information i.e. OTA, cable or satellite.

252.   Virgin contend that the skilled team would understand these terms as follows:

   i)   The "source" is the local origin of the television or data signal which is received by the system.

ii)   A "source device" is the local equipment which the user needs to process the received television or data signal.

iii)   A "transmission scheme" is how you send the television or data signal.

253.   In my judgment, the skilled team would understand the term "sources" in the sense in which it is used in the specification at [0003], [0009], [0010] and [0013]:

i)   "a plurality of sources, such as for example, a cable box, a satellite dish and a tv antenna" ([0003]) which is almost the same as "a plurality of sources of different kinds such as, for example, cable, a satellite dish and a tv antenna" ([0010]); and

ii)   "sources can include an incoming cable line (e.g., on a coax cable), satellite broadcasts, a dedicated telephone line (e.g., twisted pair), and any other medium capable of transmitting a signal" ([0009]) and [0013]).

254.   Thus "sources" indicates the immediate sources of the television (or other data) signals received by the system.

255.   While the skilled team would presume at first blush that "source devices" was intended to mean something different, I consider that the skilled team would be driven to the conclusion that "source devices" meant essentially the same thing: the source device is the device that constitutes the source.

256.   As for "transmission scheme", I consider that the skilled team would understand this to refer to the method by which the signal is transmitted to and received by the system. Thus the skilled team would understand that the sources and source devices are differentiated for the purposes of the claims by the fact that they work with different transmission schemes i.e. different methods of transmission of the signal.

257.   Having resolved these general points, I can turn to a more specific issue, which is whether television signals received from two different satellites involve different "sources", "source devices" and "transmission schemes". Virgin contend that they do, but Rovi dispute this. In my judgment it is clear from [0013] ("two separate sources such … two different satellites"), [0014] ("multiple satellite sources") and [0017] ("multiple satellite sources") that the specification proceeds on the basis that the signals received from different satellites are from different sources/source devices. Equally, it is clear from [0004] that the specification proceeds on the basis that "conventional satellite dishes" (which the skilled team would understand to mean dishes primarily intended for reception at cable headends e.g. C-band systems) and "DBS systems" (e.g. Ku-band systems) employ different transmission schemes and hence are different sources/source devices. This would make technical sense to the skilled team given the differences between C-band and Ku-band transmissions discussed in paragraphs 41, 43 and 62 above.

Individually delivering

258.   Integer A of claim 1 refers to "individually delivering television signals from a plurality of sources". At one stage, Rovi appeared to be contending that this required the sources to provide tuned signals simultaneously. In his closing submissions,

however, counsel for Rovi accepted that it was sufficient that the signals were appropriately delivered having regard to their source and that this included delivery of one signal at a time.

Telecast

259. Integer E of claim 1 and integer D of claim 12 require "data representing television program information telecast from said sources". The word "telecast" does not appear in the description, only in the claims. Virgin contend that "telecast" bears its dictionary meaning, which Mr Adams said corresponded to his understanding of the word, namely "to broadcast by television". Virgin accept that the skilled team would understand that, in context, the television broadcast may be a terrestrial, cable or satellite broadcast. Rovi contend that "telecast" would be understood as meaning "electronically transmitted from a remote location", and hence as extending to data downloaded on request by the system via the internet.

260. In support of Rovi's construction, counsel for Rovi argued that the purpose of this integer was simply to ensure that television programme information is received from the sources and that there was nothing in the specification to suggest to the skilled team that the patentee intended to restrict the means of delivering television programme information data to television broadcasts. He therefore submitted that the skilled team would understand that the word "telecast" was being used figuratively rather than in a strict sense. I think that this argument also receives some support from the passages at [0009] and [0013] which make it clear that television schedule guide information can be received from numerous sources including e.g. a dedicated telephone line.

261. In my judgment, however, the difficulty with this argument is that the skilled team would note that the patentee had chosen to use the very specific term "telecast", and not a more general expression such as "transmitted", although other parts of the claims are expressed in general terms. I accept that the skilled team would not consider that the patentee could have intended by use of the word "telecast" to limit the claim to any particular method of television broadcasting, and thus would understand it as embracing broadcasting via telephone lines. I am unable to accept that the skilled team would have understood the word as embracing any form of electronic transmission. In particular, while skilled team would have been familiar with the concept of downloading data on request via the internet in April 1995, I do not think they would have regarded such a two-way method of transmission as constituting a form of television broadcasting.

262. I acknowledge that it might be said that there is an inconsistency between the way I have construed "sources" on the one hand and "telecast" on the other hand. As I have construed "sources" and "telecast", it would be more accurate to say that television programme information is telecast *to* said sources, rather than *from*. Given the infelicity with which the claim is drafted, however, I do not consider that this compels a different construction of either "sources" or "telecast".

Source identifiers

263. Integer F requires "source identifiers that represent the source device for each television program". This gives rise to two issues. First, Virgin contend that the

source identifiers must be distinct from the "television program information" in integer E, and hence the source identifier cannot be constituted by part of the television programme information itself (such as the time a programme is on). Rovi contend that the skilled team would understand that it is sufficient if the source can be identified even if only from some aspect of the television programme information. I agree with Virgin. While I would accept that the skilled team would not understand the claim to require that the source identifiers be completely separate from the television programme information (and thus the source identifiers may be embedded in the television programme information), I consider that the skilled team would understand from the structure and wording of the claim and the teaching of the specification that they must be distinct.

264.   Secondly, Virgin contend that the source identifier must identify the source device i.e. it must map each programme to a source device. Virgin say that it is not enough for this purpose for there to be something which contingently and transiently enables the system to determine which source device to use according to e.g. the time of the day. Rovi contend that the skilled team would understand that it is sufficient for the source to be identified at the moment when it needs to be identified, that is to say, when the user wishes to tune to programme in question. Again, I agree with Virgin. No doubt the skilled team would understand that the source identifier only needs to be available at the time that it is used. Nevertheless, I consider that they would understand from the structure and wording of the claim and the teaching of the specification that it does uniquely identify a source device.

Sequence of steps

265.   Again, Virgin contend that claim 1 requires the steps to be performed in the sequence specified, whereas Rovi contend that that they may be performed in any order. In my judgment the skilled team would understand from the claim and the teaching of the specification that the steps must be performed in the sequence specified. In particular, the skilled team would not consider that the claim covered a method in which the system fetched the source identifier after the programme selection had been made.

266.   Claim 12 is another hybrid product/method claim. Virgin contend that integers C-H must be performed in sequence, whereas Rovi contend that they may be performed in any order. Again, I agree with Virgin that it is implicit that the steps must be performed in sequence.

Emitter

267.   Integer I of claim 12 requires "an emitter … for transmitting a signal". Rovi contend that this means any component which electronically transmits a signal. In support of this construction, Rovi rely on the fact that [0018] says that the IR emitter can be replaced by a bus interface or RF transmitter. Furthermore, Rovi contend that the skilled team would understand that the purpose of this integer is simply to transmit the signal and that it did not matter how it was transmitted. Virgin contend that "emitter" means a component which emits electromagnetic radiation (whether IR, RF or some other form of radiation) in order to transmit a signal. In support of this construction, Virgin rely on the fact that in the arrangements of Figs. 1C and 1D, where the signals are transmitted by wire, the specification states at [0023] and [0024] that no emitter is needed. Furthermore, Virgin contend that the skilled team would understand from the

choice of the word "emitter", rather than a more general expression, that the patentee intended to confine the invention to transmission by radiation.

268. In my view these arguments are quite finely balanced, but in this instance I prefer Rovi's construction. Emitter is not a very specific term, so it can be read as including transmission by wire without much strain. The indications in the specification are contradictory and inconclusive. Accordingly, I consider that the skilled team would be guided by the technical purpose of this integer and would conclude that the patentee could not have intended to exclude transmission by wire.

Added matter

269. The application as filed is International Patent Application No. WO 96/33572. The description of 1856 is nearly identical to that of the application: the B2 specification differs in material respects only by insertion of [0002] and [0003] describing the prior art, and a re-wording of [0010] to reflect the different claims. It is therefore convenient to use the numbered paragraphs of the B2 specification when referring to the description of the application.

270. To some extent, Virgin's added matter case amounts to a squeeze on construction of the claims. The construction I have placed on "sources", "sources devices", "transmission schemes" and "source identifiers" does not appear to me to give rise to any added matter objection. The only points which appear to me to be to require separate comment are dealt with below.

Telecast

271. Virgin rely on the fact that the word "telecast" did not appear in the application as filed. In the passage that became [0010], the application said that "The channel guide information is received from multiple television signal sources". As I have construed "telecast", however, I do not consider that the skilled team would learn anything new about the invention from the use of that word.

Coupling automatically

272. Integer J of claim 1 requires "coupling automatically to the input of the appliance a television signal from the source device … which … carries the selected program". Virgin rely on the fact that the application as filed did not use the expression "coupling automatically" and contends that this discloses something different to what is disclosed in [0015]. Virgin say that what is disclosed in [0015] is a process of switching the STB to couple it to the correct input and then tuning to the correct channel, whereas the claim discloses switching/coupling to the correct channel alone i.e. without tuning. In my judgment, however, the skilled team would not learn anything new about the invention from integer J of the claim. What matters for the purposes of the invention is that the STB automatically switches to the correct input. The claim may cover switching without tuning, but it does not disclose it.

Extension of protection

273. Virgin's argument under this heading arises out of the differences between the claims as granted (B1 specification) and the claims as amended before the Opposition

Division (B2 specification). It is essentially a squeeze on construction. In my judgment there is no extension of protection as I have construed the claims.

Novelty

274.   Virgin contend that all the claims lack novelty over the Uniden 4800. I have introduced the Uniden 4800 in paragraphs 197-199 above, but for this purpose it is necessary to say a little more about it. The Uniden 4800 allowed the user to have inputs from one or two satellite dishes, which could be directed towards multiple satellites. It could receive a signal from one dish on the C-band, and from the other on the Ku-band. Alternatively, a single dish could be used but with different LNBs for the C-band and Ku-band signals. The Uniden 4800 was indifferent to whether the satellite was conventional or DBS. It only needed to know the satellite position, band and polarity. The Uniden 4800's SuperGuide EPG showed programmes and channels from multiple satellite transponders (whether C-band or Ku-band). The programme information database was downloaded to and stored by the STB. This included, for each channel, sufficient information about each satellite transponder source to allow the device to switch to the correct satellite source and tune to the correct channel. There were separate transponder-to-frequency tables for C-band channels and Ku-band channels. There were versions of the Uniden 4800 that also included an IR emitter for controlling a VCR.

275.   The main issue regarding the Uniden 4800 is whether it delivered television signals from a plurality of sources using source devices for different transmission schemes as required by integers A and B of claims 1 and 12. As I have construed those terms, these requirements were satisfied by the Uniden 4800. The simplest way to look at this is by considering use of the Uniden 4800 to receive signals from a conventional satellite and a DBS satellite using separate dishes. In that event, there would be two sources and source devices (the conventional satellite dish and the DBS satellite dish) and two different transmission schemes (conventional and DBS). More specifically, the Uniden 4800 could receive both C-band and Ku-band signals. Whether this was done using two dishes or one dish with two LNBs, I consider that there would be two source and source devices and two different transmission schemes.

276.   Accordingly, I conclude that claims 1, 4, 5 and 12 lack novelty over the Uniden 4800.

Obviousness

277.   Virgin contend that 1856 is obvious over two items of prior art:

i)   the Uniden 4800; and

ii)   International Patent Application No. WO 92/04801 entitled "User interface for television schedule system" published on 19 March 1992 (Young).

Uniden 4800

278.   I have concluded that the claims are anticipated by the Uniden 4800. I do not understand Virgin to contend that, if the claims are novel because "different transmission schemes" excludes different satellite transmission schemes, it would

have been obvious to modify the Uniden 4800 to add a cable or OTA source and to switch between them.

Young

279. The invention disclosed in Young is summarised in the abstract as follows:

> "Screen (10) for a user interface of a television schedule system and process consists of an array (24) of irregular cells (26), which vary in length, corresponding to different television program lengths of one half hour to one-and-one half hours or more. Because of the widely varying length of the cells (26), if a conventional cursor used to select a cell location were to simply step from one cell to another, the result would be abrupt changes ín the screen (10). By restricting cursor movements to the regular cells, abrupt screen changes will be avoided. A conventional offset shadow (34) which is a black bar underlines the entire cell and wraps around the right edge of the cell. To tag the underlying position which defines where the cursor (32) is and thus, where it will move next portions (36) of the black bar outside the current underlying position are segmented, while the current position is painted solid."

280. Virgin do not rely upon the disclosure of Young concerning the cursor operation, but rather on what Young discloses in two passages towards the end of the specification.

281. The first passage (at page 23 line 1 to page 24 line 16) describes a Channel Customisation screen shown in Figure 20, which I reproduce below:

FIG.—20

It is common ground that this screen shows (among other things) the mapping between OTA channel numbers and their respective cable channel numbers e.g. KICU OTA channel 36 is on cable channel 3.

282. Young states (at page 23 lines 2-9) that the Channel Customisation screen 116:

"allows the user to customise channels to match viewing
interest, providing a compact listing as well as eliminating
undesired channels during up down scanning. During schedule
update, a list of all cable channels available at the subscriber's
cable (or broadcast stations for over-the-air subscribers) is also
delivered to the VCR. This unabridged set of channels may be
customised using screen 116."

283.   It goes on to explain how the user can select 12 favourite channels which are listed in
the MY column 120 on the screen shown in Fig. 20. It then states (page 24 lines 6-
11):

"The order of listing in the MY favourite channel column 120
is as follows:

All favourite broadcast stations will be listed first in numerical
order. Next, all cable services will be listed in alphabetical
order."

284.   The second passage (at page 24 line 34 to page 28 line 16) describes two "television
schedule systems/tape controllers" 180 and 182 in which the user interface is used.
Schedule system/controller 180 is shown in Fig. 22A which I reproduce below:

FIG.–22A   180

The figure contains a small typographical error and a small omission, both of which
are obvious from reading the specification. The box below line 216 should be labelled
"VBI decoder", not "VDI decoder", and it should be identified by numeral 222.

285.   Young states that this schedule system/controller is applicable to existing television
equipment, where the schedule system is "separate from the basic television
equipment. Programmable tuner 202 is shown as part of a cable decoder" (page 25
lines 2-6). It goes on to say (page 25 lines 16-34):

"In the system 180, programmable tuner 202, which may be part of a cable decoder unit, receives a TV signal from antenna 200 and/or from cable input 205. Tuner output 216 goes to a vertical blanking interval (VBI) decoder 222, which may be a closed caption decoder or a high speed teletext decoder. Listing information and other support information, such as cable channel assignment data, will be transmitted over the VBI by one or more local stations or cable channels several times a day or continuously.

When update is required, programmable tuner 202 will be tuned automatically to the station or cable channel carrying the data. After the VBI signal is processed by CPU 228, the listing data is stored in schedule memory 30 232, while the cable channel assignment data is stored in cable-specific RAM memory 238. This data is used to convert generic TV source names, such as HBO, to channel assignments for the specific cable system."

286.   Schedule system/controller 182 is shown in Fig. 22B, which I reproduce below:

FIG.—22B
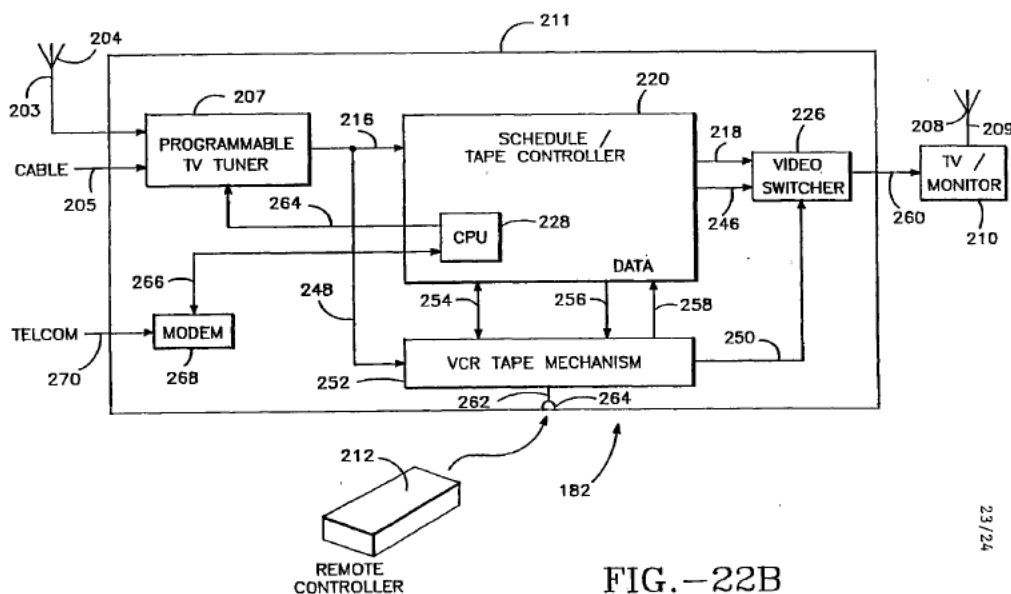
287.   As Young explains, in this case the schedule system/controller is "integrated into a VCR 211. In this version, a cable decoder is not required, and tuner 207 is part of the VCR 211" (page 25 lines 7-9).

288.   After describing the arrangements shown in Figs. 22A and 22B, Young says (page 28 lines 11-16):

"Schedule information may be downloaded from the VBI. Alternatively or supplementally, it may be downloaded from a telecommunication line 270 to modem 268 and to CPU 228 via line 266. Other means of delivering schedule information can

be employed, including the use of a subcarrier channel on the
cable service."

289.   As with Bestler, there is a significant dispute as the disclosure of Young. Virgin,
supported by Mr Adams, contend that it discloses switching between cable and OTA
channels. Rovi, supported by Mr Hassell, contend that Young discloses a cable-only
device. Both Mr Hassell and Mr Adams addressed this issue in their reports and both
were cross-examined on it. To the extent that it is a matter for expert evidence, I
prefer Mr Adams' evidence on this question even approaching it with a degree of
caution as explained above.

290.   Virgin rely on four main aspects of the document. The first is the passage referring to
"over-the-air subscribers" (quoted in paragraph 282 above). As is common ground,
the skilled team would not think that Young meant this literally: there were no OTA
subscribers. Nor can it be a reference to subscribers to re-transmitted OTA channels
(whether as part of a pure re-transmitted OTA package or a mixed re-transmitted
OTA and cable package) since they would be included in the "all cable channels"
previously referred to.   Mr Adams' evidence was that he interpreted Young as
referring to subscribers to a data feed that arrived OTA. This could be programme
information carried in the VBI of the OTA channels, which could not be stripped by
the cable companies. Mr Hassell accepted in cross-examination that this was a
possible interpretation. In my view it makes better sense than any other interpretation.

291.   The second aspect is the passage saying that all broadcast stations will be listed and
then all cable services (quoted in paragraph 283 above). Mr Adams interpreted this as
meaning OTA then cable. Mr Hassell interpreted it as meaning re-transmitted OTA
then cable-specific. I prefer Mr Adams' interpretation since it does not say "all other
cable services". On its own, this is a small point, however.

292.   The third aspect is the statement that the Fig. 22A "receives a TV signal from antenna
200 and/or from cable input 205" (see paragraph 285 above). Mr Adams interpreted
this as meaning exactly what it said: the signal could be an OTA or cable signal. Mr
Hassell acknowledged that this sentence was inconsistent with his view that Young
related only to cable delivery. His evidence was to the effect that this was just a stray
reference in a patent application which, read a whole, was all about cable. If this
sentence stood on its own, I might agree with this; but it does not.

293.   The fourth aspect is what is shown in Fig. 22A. There are two points here. The first is
that item 202 is shown as connected to both the antenna and cable via lines 201 and
205 and is described as "TV tuner/cable decoder". The second is that line 216 goes
from the TV tuner decoder to the TV/monitor (via the video switcher). As Mr Adams
explained, it is clear from this that the device disclosed in Fig. 22A can deliver both
OTA and cable signals to the TV. I did not understand Mr Hassell to dispute this, but
he pointed out that Young does not explicitly describe switching between these
sources (at least, unless you interpret the sentence considered in paragraph 292 above
in that way). Rovi also rely on the fact that the same signal goes to the VBI decoder,
and thus can be used to deliver EPG data through the OTA VBI; but in my this does
not detract from the point Virgin rely on.

294.   Putting all of these points together, I conclude that Young does disclose switching
between OTA and cable signals. In any event, I consider that it would be obvious to

the skilled team that Young's device could be used in that way, and that it would be profitable to do so since it would be attractive to users. On that basis, the difference between Young and claim 1 is that Young does not explicitly disclose a source identifier. It would be clear to the skilled team that such an identifier was necessary, however, and they would know how to implement this. Accordingly, I conclude that claim 1 is obvious. Claims 4 and 5 are also obvious. Since Young discloses an IR emitter, so too is claim 12.

Infringement

295.   Rovi's claim for infringement of 1856 only relates to the TiVo STB. The way in which this operates is described in Virgin's PPD and Addenda. It may be summarised as follows.

296.   The TiVo STB has a single cable input, namely a coaxial cable. All data that arrives on this cable is QAM modulated. The QAM modulated signal carries two sorts of data:

i)   digital television streams, received through QAM tuners; and

ii)   IP data, received through a DOCSIS modem.

297.   Real-time broadcasts (i.e. "live" cable television) are received in the form of digital television streams through the QAM tuners. .

298.   VOD may be received in one of two ways:

i)   for recently-aired BBC programmes, using streams carried by closed circuit IPTV from the BBC's iPlayer service, received via the DOCSIS modem; and

ii)   from Virgin's own VOD Servers ("VM VOD"). This approach uses two-way communication using IP (again through the DOCSIS modem) to set up the playing of a catch-up programme on the VOD Servers, but the programme is then broadcast using spare digital TV capacity and received via the QAM tuners. Virgin VOD covers two sorts of programming: catch-up of recently-aired non-BBC programs, and access to a back catalogue of programmes that are always available (which may or may not be BBC programmes).

299.   The TV Guide information is downloaded by the TiVo STB, via the DOCSIS modem, from computers at the TiVo Service Centre, in particular from servers called the PDK servers. This information is therefore not broadcast to the STB, but rather is actively requested and downloaded on demand by the STB, and it comes from servers that are distinct from the VOD Servers.

300.   Among the data downloaded for each programme, and stored locally in a database, there is:

i)   a "Program" file, which stores the title; and

ii)   a "Schedule" file, which contains the channel and broadcast times for the programme, and also a catch-up flag, which indicates whether it is expected to be available by catch-up once the programme has aired.

301.   What happens when a user selects a programme depends upon the current time relative to the time that the database shows that the programme is to be broadcast. If the programme is currently being broadcast, the system tunes to the correct digital TV channel, so that the programme is displayed on the screen.

302.   If the programme has already been broadcast, a rather complicated series of actions is carried out. The way in which this is done depends on whether one is considering the "Phase 3" or "Phase 4" implementations mentioned in the PPD. An important feature common to both implementations is that, when the user chooses to view a past program, all the TiVo STB knows is the state of the catch-up flag for that program. If the flag shows that the program is supposed to be available on catch-up, the TiVo STB has to request further information from servers in the TiVo Service Centre (which it does by communicating over IP through the DOCSIS modem) about the catch-up possibilities. It does this by conducting what is called an Offer Search, and downloading an Offer file or files.

303.   Under the Phase 3 implementation, and if the Offer Search returns only one Offer file:

   i)   If the user has requested a catch-up program on a BBC channel, that channel will already have a locally-stored "uiElement" file associated with it, which contains the information necessary to download and launch the BBC iPlayer application. The uiElement file is used in combination with an item of data in the Offer file (called the "partnerOfferID"), with the result that the iPlayer application is downloaded and launched, and it then plays the particular program requested.

   ii)   If there is no uiElement file for the channel selected (i.e. if it is a non-BBC channel), the STB has to engage in a series of further communications with Seachange servers, which are located in one of several dozen Regional Headends throughout the country. The result is that a Virgin VOD server in a Regional Headend starts playing the program on a digital TV channel, and the STB is informed which channel that is, so the STB tunes its QAM tuner to the relevant channel.

   iii)   If there is more than one Offer file returned, the STB will prefer Virgin VOD Offers where any are available, and otherwise use the first Offer received. This mechanism results in an error in the event that the Offer files indicate that a program is available up both from the BBC iPlayer service and from the Virgin VOD service.

304.   Under the Phase 4 implementation, the Offer Search is the same, but the actions carried out by the STB do not depend on the presence of a uiElement file. Instead, the STB selects the first Offer received (after giving preference to Offers relating to Virgin Media VOD-provided catch-up, but in a different way to Phase 3), and then an application is launched. Which application is launched depends ultimately on the "partnerID" in the Offer file, which differs as between VM VOD and the BBC. In the former case, the VM VOD Software application will launch, which then communicates with the Seachange servers to set up playback via the QAM tuners as for Phase 3. In the latter case, the iPlayer application is launched and results in streaming via the DOCSIS modem as for Phase 3.

Claim 1

305.   As I have construed it, claim 1 is not infringed. The reasons are as follows.

306.   *Sources and source devices*. The TiVo STB has only one source and source device, namely the incoming coaxial cable. Counsel for Virgin was disposed to accept that there were different source devices, namely the QAM tuners and the DOCSIS modem, for the single source. Even if that is correct, it makes no difference to the result.

307.   *Transmission schemes*. There is only one transmission scheme, namely QAM modulation. The signal that comes in over the cable is QAM modulated whether it is intended for the QAM tuners or the DOCSIS modem. The QAM tuners extract MPEG2 signal streams and DVB Service Information from the QAM signal, whereas the DOCSIS modem extracts IP data from the QAM signal. But these are aspects of the information content, not the transmission scheme.

308.   *Data representing television program information telecast from said sources*. Data is downloaded by the TiVo STB using the DOCSIS modem at six-hourly intervals to populate the TV Guide. As Virgin accept, this data represents television programme information. It is not telecast, however. Nor are the Offer files that are downloaded as a result of the Offer Search.

309.   As Virgin accept, the DVB Service Information Stream is telecast. The only relevant part of this is the Channel Table. I agree with Virgin that the Channel Table is not television programme information. The Channel Table is used to determine what channels should be displayed in the TV Guide for any given user. The fact that it is used as a skeleton on which to hang programme information from the Schedule File does not make it programme information itself. All the programme information displayed in the TV Guide is derived from the data downloaded by the STB using the DOCSIS modem.

310.   *Source identifiers*. Rovi rely on the Schedule file and/or the Offer file as constituting source identifiers. I agree with Virgin that neither constitutes source identifiers in the sense of the claim.

311.   In the case of the Schedule file, there are two reasons for this. First, it is part of the television programme information, not distinct from it. Secondly, all it indicates is when a programme is shown. It does not identify a source or source device. Nor does it, on its own, enable the source of the programme to be identified.

312.   In the case of the Offer file, there are again two reasons for this. First, the Offer files are only downloaded after the user has selected the programme, and so cannot be part of the channel guide information that is stored before the user selection and read after it, as the claim requires. Secondly, the Offer file components relied upon by Rovi (transportType and partnerID) do not represent either sources or source devices. All they do is identify iPlayer as against VM VOD, and neither of those are either sources or source devices.

313.   *Sequence of steps*. As can be seen from the preceding paragraph, Rovi's infringement case involves the steps being performed in a different order to that specified.

Claim 12

314. The only separate issue in relation to claim 12 is whether the TiVo STB has an emitter. As I have construed "emitter", it does. Nevertheless, claim 12 is not infringed for the same reasons as claim 1.

Summary of conclusions

234

315. For the reasons given above, I conclude as follows:

   i)   Granted claim 1 and the combination of claims 1, 2 and 4 are invalid on the ground of added matter, but not EPO claim 1. The same applies to the corresponding product claims.

   ii)   The granted claims and the EPO claims are all obvious over Bestler and the Davis Demonstration. The granted claims are also obvious over the Uniden 4800, but not the EPO claims.

   iii)   If the granted claims were valid, the Alternative Adult Display method of the VHD STBs, but not the Hide Adult Channels/Listings function of the TiVo and VHD STBs, would have infringed them.

   iv)   Even if the EPO claims were valid, Virgin would not have infringed them.

1856

316. For the reasons given above, I conclude as follows:

   i)   1856 is not invalid on the ground of added matter or extension of protection.

   ii)   All the claims of 1856 lack novelty over the Uniden 4800 and are obvious over Young.

   iii)   Even if the claims were valid, Virgin would not have infringed them.