



Neutral Citation Number: [2018] EWHC 889 (Pat)

Case No: HP-2017-000033

IN THE HIGH COURT OF JUSTICE
BUSINESS AND PROPERTY COURTS OF ENGLAND AND WALES
PATENTS COURT

Royal Courts of Justice
Strand, London, WC2A 2LL

Date: 24/04/2018

Before :

MR ROGER WYAND QC
SITTING AS A DEPUTY HIGH COURT JUDGE

Between :

(1) BOSE CORPORATION
(2) BOSE LIMITED
- and -
FREEBIT AS

Claimant

Defendant

MR DANIEL ALEXANDER QC AND MR HENRY WARD (instructed by **Simmons & Simmons LLP**) for the **Claimants/Part 20 Defendants**
MR HUGO CUDDIGAN QC and MR CHRIS AIKENS (instructed by **Innovate Legal**) for the **Defendant/Part 20 Claimant**

Hearing dates: 26, 27 and 28 February, 1,2 and 6 March 2018

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.

.....
MR ROGER WYAND QC

Roger Wyand QC, Deputy High Court Judge:

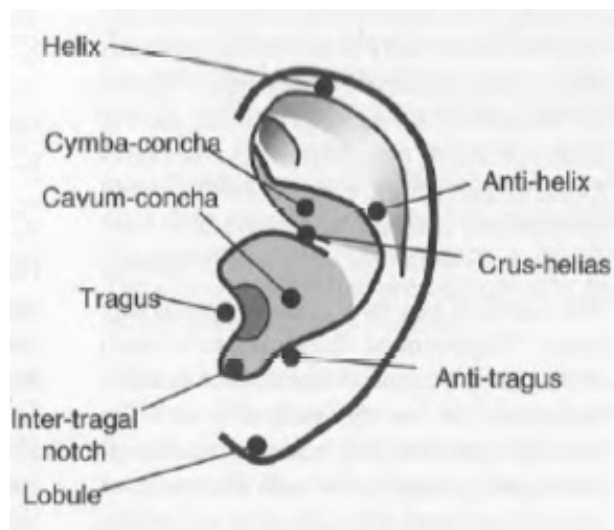
1. This is a patent infringement action. As sometimes happens, it was started as an action for a declaration of non-infringement of two patents of which the Defendant is the proprietor and a declaration that the patents are invalid. The Defendant counterclaimed for infringement. It was agreed by the parties that it would be treated as a conventional patent infringement action with a counterclaim for invalidity.
2. The Defendant has consented to the revocation of one of the patents. There is an application for a conditional amendment to the other patent. The invalidity case is based on a prior publication by the Defendant by the supply and/or sale of a product, the Freebit H1, which is said to be an anticipation, and anticipation by and obviousness over a US patent application, US 2002/0096391, Smith. If the primary prior publication case is made out, it is accepted that the Patent is invalid and the conditional amendment will not cure the invalidity. There are also objections of added matter in the claims as granted and lack of clarity and added matter in the proposed amended claims.

Subject Matter

3. This action concerns European Patent 2177045 (“the Patent”). The title of the Patent is “Improved Earpiece”. The earpiece of the Patent is an ‘in-ear’ as opposed to an ‘over the ear’ device, particularly suitable for use with mobile devices such as mobile telephones or portable music players and the like, although the Patent covers use for more specialist equipment such as hearing aids. It is intended to provide an earpiece that is more comfortable and more stable than prior art devices. There are 5 claims but claims 2 to 5 are dependent claims and no independent validity is claimed in respect of any of them. The only relevant claim for validity is claim 1.

The Human Ear

4. In order to understand the invention it is necessary to know the basic anatomy of the outer ear. Below is a diagram of the outer ear with the relevant parts identified:



5. The following parts are important for understanding the claims of the Patent:

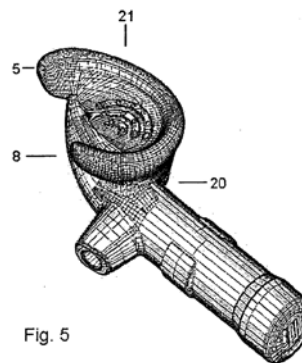
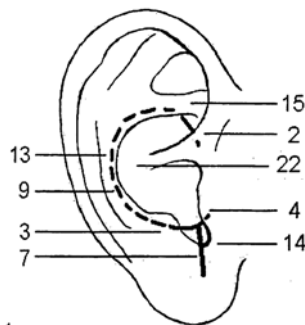
- i) The curved ridge around the outer edge of the top half, called the *anti-helix*;
- ii) The raised ridge of cartilage running outwards from the head, called the *crus-helias*;
- iii) The hollow bowl shaped region called the *concha* (referred to in the Patent as the 'ear mussel'). It is divided into the *cymba-concha* and the *cavum-concha* by the *crus-helias*;
- iv) The *tragus* and *anti-tragus* with the *inter-tragal* notch between them; and
- v) The *ear canal*, shown on the diagram as a dark patch, which is partially hidden by the *tragus*.

The Patent

6. The priority date of the Patent is 1st June 2007. The Patent is a commendably brief document, the specification occupying just over three columns of description and another column of 5 claims. The first column headed "Background Information" of just over one column refers to prior art earpieces and their problems. These problems can be summarised as:
 - i) The use of a bow for the earpiece and attached microphone, which is not good for use with mobile devices;
 - ii) The use of an ear plug in the ear canal which suffers from the variability of the size of people's ear canals making it difficult to mass produce ear plugs to fit a range of people. They also tend to feel uncomfortable and block ear wax in the ear canal;
 - iii) Devices which are retained in the ear by applying outward forces to the inner parts of the ear cavity cause discomfort.
7. The objective of the invention is said to be: *Based on the prior art the object of the invention is to avoid these disadvantages and limitations and simultaneously provide a further improvement in stability and comfortable attachment of an ear unit with the possibility of further functionality.*
8. The summary of the invention is said to be: *provided by a device as disclosed by claim 1. Further features of the invention are disclosed by the remaining dependent claims. The shape of the ear unit keeps the ear canal to certain degree open towards the outer environment for improved comfort when compared to a unit that closes or blocks the ear canal.* This latter feature does not appear in the claims
9. Claim 1 as broken down into integers by the Claimants' expert is as follows:
 - (i) *Ear unit for stable fittings in an ear,*
 - (ii) *wherein said ear unit (10) is shaped as a decremental curve,*
 - (iii) *in that said decremental curve (9) of the outer part of the ear unit (10) corresponds to antihelix (13) of the ear*
 - (iv) *with a surface shaped in such a way that the curve falls along the inner part of the antihelix (13)*

- (v) *and is partly positioned under antitragus (3),*
- (vi) *and that the distance between the ends (5, 8) of the decremental curve is approximately equal to the distance between a first cavity formed under the tragus (4) of the ear and second cavity covered by the lower node (15) of the antihelix of the ear,*
- (vii) *the upper part of the curve projecting in underneath a flap (2) covering the lower part of the second cavity,*
characterized in that
- (viii) *said ear unit has a curvature providing an improved attachment in that*
- (ix) *said curvature follows the inner surface of the ear mussel (22) to provide a contact surface,*
thereby enabling the ear unit to fit closely against the ear mussel when the ear unit (10) is positioned into the ear.

10. Fig. 1, set out below, shows schematically, an ear with a decremental curve inserted (the dotted line). Fig. 5 shows an embodiment with the decremental curve extending from 5 to 8.



11. The lower part, 7 on Fig. 1, is optional and is said to extend *from the curve while providing a guide and a weight for the correct positioning of the ear unit by more or less lying in the intertragic notch of the ear.*
12. The Patent explains that although the outer part of the ear differs from person to person these differences are not so great as with the ear canal, so that only 2 or 3 different sizes will be necessary to cater for the differences. It also states that *investigations show that a contiguous line in the form of a decremental curve will fit in to the ear of nearly everyone.*
13. The pre-characterising part of the claim is the subject of an earlier patent by the same inventor and this design is referred to as Berg 1, being the name of the inventor. The post-characterising part of the claim specifies a second curve which is said to be formed *in such a way that it follows along the inner surface of ear mussel when the ear unit is positioned into the ear. This contact surface provides further stability since a larger area is placed against the ear mussel, and thereby increased comfort.*
14. This second curvature is shown at 21 in Fig. 5 above and can be seen more clearly in Fig. 3 and Fig. 4 below:

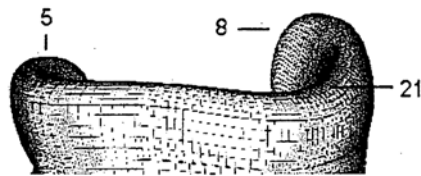


Fig. 3

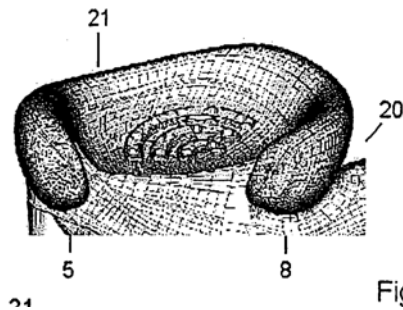
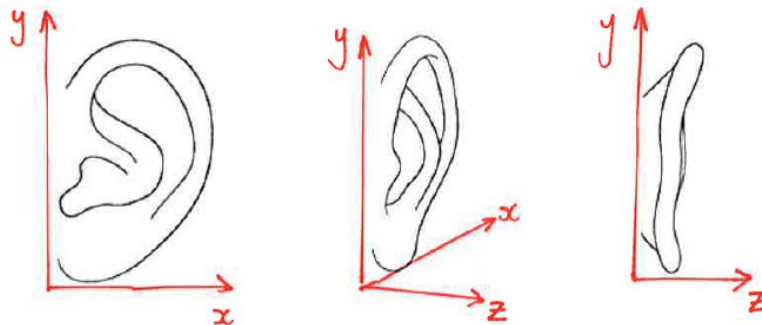


Fig. 4

15. This second curvature is designed to follow the floor surface of the concha which is not flat. The concha is bowl shaped and is split into two parts by the raised ridge of cartilage called the crus-helias. This ridge is less prominent as it approaches the antihelix. In order to follow the concha surface and thereby increase comfort, it is necessary to curve the ear unit not only in the X-Y plane where the decremental curvature is, but also in the Y-Z plane as shown in the diagrams below.



The Proposed Conditional Amendment

16. Freebit proposes an amendment to claim 1 of the Patent in the event that claim 1 is held to be obvious or anticipated by Smith. It is accepted by Freebit that the amendment would not assist if claim 1 is held invalid by prior publication of the Freebit H1 device.
17. Bose say that, in any event, the proposed amendment is not allowable as it lacks clarity and it adds matter.
18. The proposed amendment is to add “*further characterized in that the ear unit (10) is arranged with an incision (20) which positions itself into the intertragic notch (14) when the ear unit (10) is positioned in the ear.*”

The Witnesses of Fact

19. Freebit called two fact witnesses who were cross-examined in respect of the alleged prior publication, Mr Vidar Sandanger and Mr Richard Steinfeldt Berg. Mr Sandanger is the Chief Executive Officer of Freebit and Mr Berg is the inventor of the Patent. Both witnesses are Norwegian. They both speak English well and gave their evidence in English. They had a little difficulty with the precise meaning of some English words but I do not believe this affected their evidence adversely.
20. Mr Sandanger was not able to give first hand evidence on many of the issues as he was not connected with the Defendant until he became CEO in January 2007. However, there were several witnesses who could have given information about what happened in Metafax (the previous name of Freebit) and were involved in the design of the Freebit H1.
21. From Metafax there were multiple potential witnesses who could have given first hand evidence about the events in question for example Mr Asle Berger, who attended every board meeting the minutes of which formed the entirety of Freebit's actual documentary evidence, Mr Gregussen, Mr Sandanger's predecessor during 2006, Mr Hviding, who attended the relevant board meetings and was there in 2006, amongst others. As for the designs, Vidar Pederson actually produced the CAD drawings for all of the H1 Products. These witnesses are not only alive and well and apparently communicating with Mr Sandanger about the case, but they have an active interest in the litigation - they are shareholders in Freebit whose future is said to depend on the case. So their absence cannot be explained by unavailability. The only explanation can be that they were not called because their evidence would have been unhelpful to Freebit in one or more ways, either as to the characteristics of the Freebit H1 (in whatever version) or the commercial position. Mr Sandanger was unable to offer any rational explanation for their absence.
22. It was not just that they were not called when they could have been. Mr Sandanger sat down with the various candidates and they decided that he would give evidence because "*I can do it better than them*". This was not a reference to Mr Sandanger knowing the events better - he wasn't even there for much of the material period. Mr Sandanger said it was because "*I have the oversight... I have the oversight of what has been going on*". In other words, although Mr Sandanger was the least well placed in terms of setting out the facts as they occurred in 2006 before he arrived, he was the best placed to know what needed to be said in the context of the litigation.
23. It is open to the Court to draw adverse inferences from the silence or absence of a witness who might be expected to have material evidence to give on an issue in an action (see the principles set out in *Wisniewski v Central Manchester Health Authority* [1998] PIQR 324 at 340 pre Brooke LJ). In this case I do draw an adverse inference from the absence of these potential witnesses.
24. When, as here, there is an allegation of prior publication by the patentee, it is particularly important that the patentee puts the best evidence before the Court. It is not enough for the patentee to sit back and say the onus is on the party alleging prior publication. The patentee is the party with the best access to the facts and it is incumbent on them to establish those facts either by documents or witness evidence or both once a case to answer has been raised.

25. Mr Berg was attempting to give evidence as to events that happened over ten years previously so, understandably, his evidence was at times contradictory and changed during the course of his cross-examination. Nevertheless, some aspects of his evidence were unsatisfactory. In his second witness statement he said:
- “I have been asked to clarify briefly my involvement in this case for Freebit. I was first contacted by Mr Sandanger about this case in September 2017, when I was told by Mr Sandanger about a case involving Bose and Freebit was taking place in the UK. Mr Sandanger told me that I might be asked to help at some stage. I was not contacted again to help with the case until mid-January 2018 when Mr Sandanger put me in touch with Freebit’s solicitors, Innovate Legal, with a view to me giving written evidence.”
26. In cross-examination it emerged that Mr Berg had been approached by Mr Asle Berger in September 2017. He had about six meetings with Mr Berger about this case. Although he could not recall exactly what they had talked about, he did recall that he had been asked by Mr Berger what he could remember about things back in 2006. He was hired as a consultant in about October 2017 and at that time there was no talk of him being a witness. At the last meeting, in January 2018 there was talk about him being a witness and they stopped considering him as a “helping consultant for research”.
27. This changing story cannot be put down to the passage of time. I found Mr Berg an unsatisfactory witness. I am unable to rely on some aspects of his evidence unless it is corroborated by documents of which there are few.

The Experts

28. Bose’s expert is Graham Frost. Mr Frost has a bachelor’s degree in electronic engineering and a master’s degree in acoustic and vibration technology. For 23 years (starting in 1988), Mr Frost worked at PC Werth, where he was Technical Director. PC Werth is a supplier of audiology products, such as hearing aids, to hearing healthcare professionals. Since he left PC Werth in 2010, Mr Frost has been a technical consultant and participates on a number of British Standard Committees, including for hearing aids and audiometric equipment and procedures.
29. Freebit’s expert is Dr Wayne Staab. Dr Staab has a master’s degree in audiology and a doctoral degree in hearing science. Starting in 1972 he worked for 16 years in hearing aid manufacturing (at Telex Communications, Audiotone and Dahlberg/Miracle Ear). Since 1988, he has been a private consultant. Dr Staab has managed and supervised university and hospital hearing clinical programs, both diagnostic and hearing aid-related and he has taught audiology-focused courses at the University of North Dakota, Michigan State University, the University of Wisconsin-Eau Claire, Arizona State University and Arizona School of Health Science. Dr Staab has acted as an expert for Freebit in similar proceedings in the US.
30. No criticisms of substance were made against either expert. I found their evidence straightforward and helpful.

The Skilled Person

31. There is a disagreement between the parties as to the identity of the skilled person. Freebit submit that the skilled person is someone in the field of consumer electronics and not in the more specialist fields of custom made hearing aids or audiology. Bose, on the other hand say that the skilled person would be more generally someone who designed earpieces for general use so would include an audiologist or would consult an audiologist.
32. Both of the experts are audiologists although neither of them were involved in the field of consumer electronics before the priority date of the patent. There is nothing inventive in involving an audiologist in the design of an earpiece for consumer electronics but I do not think that it makes any difference in this case. I believe that the Patent is directed to the person in the consumer electronics field who would, if necessary, consult an audiologist.

The Common General Knowledge

33. The skilled person would have knowledge of existing earpieces in the consumer electronics field. He or she (I shall refer to the skilled person as “he” for brevity) would also know generally of custom made hearing aids. He would also have a working knowledge of the outer ear, including the variations in the size and shape of the ear canal in particular.
34. The skilled person would also know of the requirements for comfort and stability of earpieces, particularly those that would be worn for extended periods of time.

The Law of Construction

- 35 The approach of this court to the construction of patent claims is now well-established. For present purposes, it is sufficient to refer to the following summary provided by Jacob LJ in *Virgin Atlantic Airways Ltd v Premium Aircraft Interiors Group* [2009] EWCA Civ 1062; [2010] R.P.C. 8, in the main interpreting the judgment of Lord Hoffmann in *Kirin-Amgen v Transkaryotic Therapies (No.2)* [2005] 1 All ER 667¹:

“(i) The first overarching principle is that contained in article 69 of the European Patent Convention.

(ii) Article 69 says that the extent of protection is determined by the claims. It goes on to say that the description and drawings shall be used to interpret the claims. In short the claims are to be construed in context.

(iii) It follows that the claims are to be construed purposively—the inventor's purpose being ascertained from the description and drawings.

¹ That the court should continue to construe patent claims purposefully notwithstanding the new approach to determining the scope of protection of a patent set out by the Supreme Court in *Actavis v Lilly* [2017] UKSC 48 was confirmed by Arnold J in *Mylan v Yeda* [2017] EWHC 2629 (Pat) at [134] - [139]. Henry Carr J agreed in *Illumina v Premaitha* [2017] EWHC 2930 (Pat) at [200] to [202].

(iv) It further follows that the claims must not be construed as if they stood alone—the drawings and description only being used to resolve any ambiguity. Purpose is vital to the construction of claims.

(v) When ascertaining the inventor's purpose, it must be remembered that he may have several purposes depending on the level of generality of his invention. Typically, for instance, an inventor may have one, generally more than one, specific embodiment as well as a generalised concept. But there is no presumption that the patentee necessarily intended the widest possible meaning consistent with his purpose be given to the words that he used: purpose and meaning are different.

(vi) Thus purpose is not the be-all and end-all. One is still at the end of the day concerned with the meaning of the language used. Hence the other extreme of the Protocol—a mere guideline—is also ruled out by article 69 itself. It is the terms of the claims which delineate the patentee's territory.

(vii) It follows that if the patentee has included what is obviously a deliberate limitation in his claims, it must have a meaning. One cannot disregard obviously intentional elements.

(viii) It also follows that where a patentee has used a word or phrase which, acontextually, might have a particular meaning (narrow or wide) it does not necessarily have that meaning in context.

(ix) It further follows that there is no general 'doctrine of equivalents'.

(x) On the other hand purposive construction can lead to the conclusion that a technically trivial or minor difference between an element of a claim and the corresponding element of the alleged infringement none the less falls within the meaning of the element when read purposively. This is not because there is a doctrine of equivalents: it is because that is the fair way to read the claim in context.

(xi) Finally purposive construction leads one to eschew the kind of meticulous verbal analysis which lawyers are too often tempted by their training to indulge.”

36. I shall adopt these principles in construing the Patent.

Issues of Construction

37. The first issue of construction is of general significance, not depending on the meaning of a particular term, and that is, whether the shape of the earpiece is to be judged before insertion into the ear or when it is in situ. Essentially the question is whether the claim covers a resilient ear unit which can adapt to the shape of the ear or whether it is to be made to the required shape before insertion into the ear. The relevant words of the claim are: *“ear unit for stable fittings in an ear, wherein said ear unit is shaped... with a surface shaped in such a way that the curve falls along the inner part of the antihelix and is partly positioned under antitragus ... the upper part of the curve projecting in underneath a flap ... said ear unit has a curvature ... said*

curvature follows the inner surface of the ear mussel to provide a contact surface thereby enabling the ear unit to fit closely against the ear mussel when the ear unit is positioned into the ear.”

38. Freebit submits that the requirements of the claim are satisfied by a product which adopts the required curvature when placed within the ear. Freebit says that a resilient ear unit which provided for the curvature and associated contact surface by its flexibility and resilience achieves the benefit of the invention for the reasons set out in the patent and so it is inherently unlikely that such a limited construction was objectively intended.
39. I cannot accept this. There is no suggestion in the Patent that the ‘shaping’ can be done by the ear itself. The shaping is required in order for the ear piece to be able to fit into the ear. The concept of pushing something into the ear for it to take a shape complementary to the space in the ear is totally different to the disclosure of a shape which enables the unit to fit closely to the ear mussel. It is the shape that is important in the Patent and not the material from which it is to be made. The shape of the curve enables the ear unit to fit closely against the ear. The ear unit must have that shape before it is inserted into the ear.
40. One of the aims of the Patent is to improve over the prior art which involved the ear unit pressing against the ear causing discomfort. That teaches against using an ear unit of flexible material that is not shaped appropriately but adopts the shape by being compressed into shape by the ear when it is inserted.
41. The first specific term requiring to be construed is “decremental” in the feature: *“shaped as a decremental curve, in that said decremental curve of the outer part of the ear unit corresponds to antihelix of the ear with a surface shaped in such a way that the curve falls along the inner part of the antihelix”*.
42. Both experts agree that decremental is not a term of art. In the context of the specification and particularly Fig. 1 of the Patent, I do not think that this is intended to be a very precise term but rather is intended to indicate a curve that generally follows the form of the antihelix in having a decreasing radius along the curve. It is not intended to indicate a regular decrease but rather to be a reasonable fit to an average human antihelix. On the other hand, I believe that the curve must be continuous and cannot have gaps in it. It must be shaped to fall along the inner part of the antihelix and does not do so if it only touches the inner part of the antihelix at various points on the antihelix.
43. The second term requiring to be construed is the description of the second curve in the post-characterising part of the claim: *“said curvature follows the inner surface of the ear mussel to provide a contact surface thereby enabling the ear unit to fit closely against the ear mussel when the ear unit is positioned into the ear”*.
44. Bose argues that the purpose of this feature is to keep the earpiece in place thereby enabling the hearing element to be kept somewhat away from the ear canal. However, this feature is not part of the claim. The purpose of this curvature is clear from [0021] of the Patent which states: *“This contact surface provides further stability since a larger area is placed against the ear mussel, and thereby increased comfort”*.

45. In the context of the specification and the figures, particularly Figs. 3 to 5, it is clear that this second curvature is along the edge of the earpiece that sits in the concha and rests against the bottom of the concha bowl preventing the earpiece from being lifted off the bottom by the crus helias.
46. The third term to be construed appears in the proposed conditional amendment: “*said ear unit is arranged with an incision.*”
47. Bose say that an incision means something that is ‘cut in’ to the device, referring not only to the shape but also to how the shape was created. In the context of the specification and the drawings I do not think that the skilled person would think that this was what the patentee had intended. In the context I believe that this should be taken to indicate a shape in the nature of an incision rather than a shape having been produced by cutting. It is clear how the ‘incision’ is intended to co-operate with the intertragic notch and the meaning is clear.

The Alleged Prior Publication

48. Metafax, as Freebit was then called, arranged for the manufacture of a product, designed by Mr Berg, in South Korea in 2005. A Mr Pedersen was engaged to work with Mr Berg to digitalise Mr Berg’s design to supply to Keumbee, the Korean company selected by Metafax to be the manufacturer of the ear units. The ear unit was called the Freebit H1.
49. In cross-examination, Mr Berg drew the profile of this device and said that it did not have the second curve in the post-characterising part of the claim (“the second curve”) but that it did have a slight ‘waning’ at the top of the decremental curve in the Z-axis. Bose submit that this waning did constitute the second curve. Mr Berg described it as having a substantially planar C-shape. This product was the H1 Type A. There is no challenge to the fact that this was made available to the public and Freebit accepts that it had all the pre-characterising features of the claim but Freebit denies that it had the post-characterising second curve.
50. Freebit say that there were three models of the H1, Type A, Type B and Type C. On the 24th November 2017, in response to a Request for Further Information, Freebit stated: *The internal electronics may have undergone revision, but the Defendant believes that there was only a single shape of the H1 Product.* The Statement of Truth on this response was signed by Mr Sandanger. This response was subsequently amended on the first day of the trial to read: *There were three types of the H1 Product, namely types A, B and C. To the best of the Defendant’s recollection, the design of the shape of types A and B was the same, the only difference between them being the internal electronics. Types A and B had an ear interface made in accordance with Berg. The design of the shape of type C was different to both type A and type B. Type C was made in accordance with the claims of the Patents.*
51. There is a substantial issue of fact concerning the history of the various types, their shapes and the dates on which they were available in Norway.

The Chronology

52. The only contemporaneous documents are the Metafax Board Minutes which are in Norwegian. They have been translated into English by machine. Some were corrected by Mr Sandanger during cross-examination. There are no drawings, samples or products although Mr Berg said that he had had a number of type C products in his possession but that he had lost the last of these shortly before he was asked by Freebit whether he had one. This was, apparently, some time after he had been engaged as a consultant to help Freebit prepare this case. During the course of the trial some documents showing transactions with an air-freight company in the relevant period were obtained, having not apparently been requested earlier. They show some transactions in the relevant period.

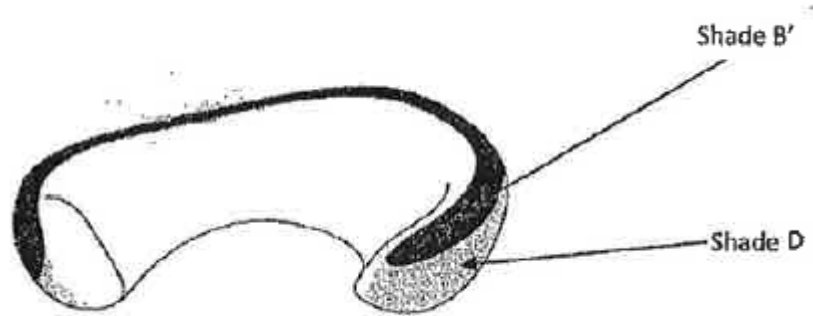
53. A short summary of the most relevant dates is as follows:

Date	Event
1/11/2000	Filing date for priority document for the Berg 1 patent with the C-curve
2003	Berg sells Freebit project to afax
2005	Metafax decides to go ahead with project, Pedersen engaged to digitalise Berg's design
12/2005	Pedersen sends CAD drawings to Keumbee and Berg visits Keumbee in South Korea
13/03/2006	Board Minutes – website for Freebit will be prepared in co-operation with Asono
May/June 2006	Preparation of user guide started. Berg asks Keumbee to reduce height of C-curve at mid-point. Berg not happy with result and not incorporated into product
17/08/2006	Board Minutes – 200 pieces to be delivered 30/09, 3000 on 4/10 and 2000 on 11/10 2006
12/2006	Berg instructs Pedersen to produce CAD drawings incorporating the second curve

8/12/2006	Board Minutes – plan is that 1000 type A Freebits will arrive for Christmas and 1000 new improved type B will arrive in the New Year
18/12/2006	First recorded shipment into Metafax warehouse at Oslo airport. Earliest cached web page on Wayback Machine offering H1 for sale.
01/2007	Sandanger joins Metafax as CEO. New product with second curve shown to Sandanger who is enthusiastic. Keumbee told to halt production of H1 to replace with new product.
02/2007	Decision to file for patent on second curve. Type B batch returned
7/02/2007	Record of third shipment to Metafax warehouse
12/02/2007	First sale of H1 unit by Power
15/02/2007	Board Minutes – errors in type B. Invites plan for development of next Freebit product.
16/02/2007	Article about Freebit H1 published. Said likely to be type A or B
End Feb or beginning Mar 2007	Berg says only batch of type B arrived and most shipped back
19/04/2007	Board Minutes – type B for repair to new type C, delivery expected approx. 20/05
05/2007	Metafax instruct patent attorneys to file application for the Patent.
16/05/2007	Board Minutes – return of type C after repair expected next week.
1/06/2007	Priority date of Patent.

7/06/2007	Records show shipment to Metafax warehouse.
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54. There are conflicting accounts of the dates, particularly as regards the deliveries of the type C products. The Board Minutes are the only truly contemporaneous records. The records of shipments arriving at Oslo have been supplied by Airsped, the handling agent used, and come from contemporaneous records but don't actually state what was delivered or how many. The rest of the dates are from the Freebit witnesses, Mr Berg and Mr Sandanger, trying to recall when events happened from looking at the Board Minutes. The Freebit witnesses say that the products were stored in the Metafax warehouse at the airport for about a week before Metafax had access to them.
55. Freebit say that the types A and B were both the design without the second curve: type B just had different electronics. The type B were found not to work properly, they could not connect to Sony mobiles and were sent back almost as soon as they arrived. The type B were converted to type C when the electronics were fixed and were then sent back to Norway. They didn't arrive in Norway until shortly before the priority date at the earliest, but most likely, shortly after. They were not released to the market until after the priority date.
56. Bose point to the unsatisfactory nature of the evidence from Mr Sandanger and Mr Berg, the absence of any documents that show the shape of the products, the absence of any references as to why the products were being changed other than the technical connection problem with type B and the absence of any reference in marketing to the new 'improved' shape. They say that on the balance of probabilities all of the three versions of the product had the second curve. Mr Berg described the type A/B as having the decremental curve being substantially planar and drew a diagram showing that it tapered slightly at one end. Bose also point out that the review of the product (said to be type A or B), published in a magazine in February 2007, contained the heading "fits like a glove" and Mr Berg claimed that the Norwegian gymnastics team could not dislodge products of the first design. All of this suggests that the second curve was there in at least the type B, if not the type A.
57. During cross-examination the picture below was put to Mr Berg. It was a picture produced in evidence that he had put before the US Patent and Trademark Office in proceedings there and it was said to show how the first Berg patent worked. It shows the decremental curve and shade B is said to be the contact area in the concha.



58. It was put to Mr Berg that this showed a curve in the Z axis.:

“And there is curvature in the Z direction?

9 A. Yes, ever so slightly, I would add in.

10 Q. It is true, is it not, that every Freebit that has ever been
11 produced had some Z axis contouring to make it fit better
12 against the concha?

13 A. Not per se with that main objective. The main objective to
14 have this slight waning, as I would call it, still looking at
15 this picture, is to hit the antihelix better according to
16 where we want to have position at the bottom of the same total
17 overall structure. The very contact surface around the middle
18 section of the flow of the C structure is not that important,
19 for the main reason that the material needed on the outside of
20 the tragus notch to keep it out of the ear canal also keeps it
21 away from the lower part of the bottom of the concha.

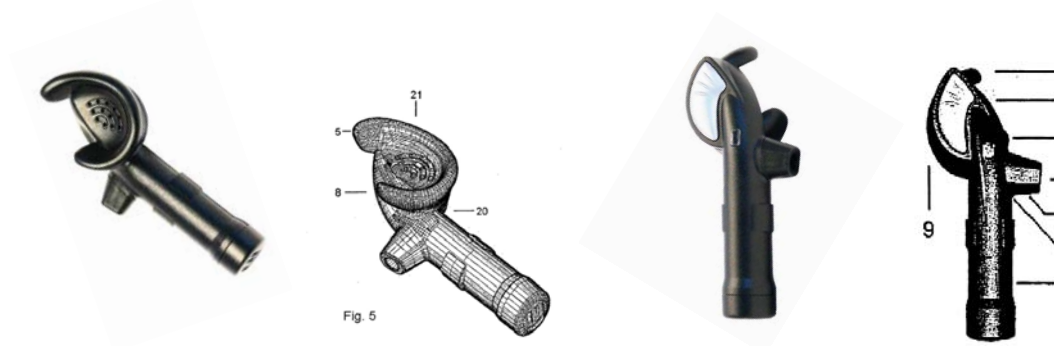
22 Q. Right, but leave aside the purpose of it, the answer to my
23 question is correct, is it not, that it is right that every
24 Freebit produced had some Z axis contouring to make it fit
25 against the concha?

BERG - ALEXANDER

A. Yes, to make a fit. That to me, my Lord, is a purpose phrase.

3That is not what it is all about.”

59. There is a further relevant piece of evidence which is the Asono website which was published in 2006. Images were obtained from the Wayback Machine which are high definition pictures of a Freebit ear unit and can be compared with Fig. 5 and part of Fig. 2 of the Patent:“



60. The contemporaneous User Guide had a low quality picture which also shows curvature in the Z direction. This was said by Freebit to be a picture of a type C product. Mr Sandanger said that the User Guide photographs had been changed from the type B to the type C but the manual was an Asono manual and there would have been no reason to change the photograph as it was only showing how to put the product in the charging cradle.
61. The Asono website also showed a video of a rotating Freebit product. Bose's solicitors extracted a still from this video showing the product side on. This shows a clear curvature in the Z direction:



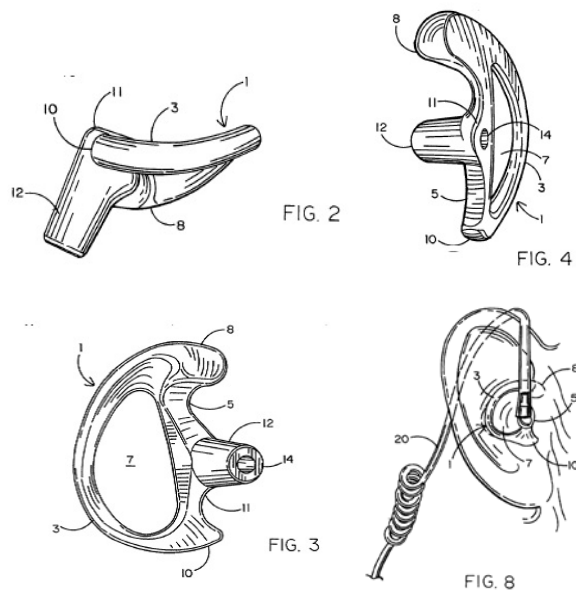
62. When this was put in evidence by Bose the initial response was that this must be a product of distortion but no evidence of this being likely or even possible was put in.
63. Mr Sandanger suggested that it might have been from CAD drawings and Mr Berg speculated that Asono might have got the drawings of the rejected design produced by Keumbee. Again, no evidence was put in to establish this possibility.
64. On the balance of probabilities I find that all of this establishes that there was a second curve as required in the post-characterising part of the claim present in the type A and/or type B ear units and there was a prior publication by the supply of these units before the priority date of the Patent. I am unable to determine whether the type C ear units were made available in Norway prior to the priority date due to the paucity of contemporary documents but the issue is irrelevant in the light of my finding in respect of the type A and/or B units.

Smith Anticipation

65. The Smith US Patent Application is titled "Flexible Ear Insert and Audio Communication Link" and is described in the specification as:

"This invention relates to a flexible ear insert that is adapted to be comfortably and inconspicuously worn in the ear of a user so as to be reliably retained therein when the user is running or experiencing sharp head turns. The flexible ear insert has particular application as a communication link by which to supply clear audio messages from a remote transmitter (e.g. a radio) directly to the ear canal of the wearer."

66. The shape of the earpiece can be seen from Figs. 2, 3 and 4 and its in-ear position from Fig. 8 (Figs. 2, 3 and 4 show an earpiece intended for a left ear whereas Fig. 8 shows an earpiece in a right ear):



67. Smith describes how the device sits in the ear:

“[0025] In the installed condition of FIG. 8, the arcuate band 3 of ear insert 1 is received around the concha bowl of the ear to thereby prevent the insert from falling out of the ear. Because of its flexible nature, the arcuate band 3 is adapted to be compressed and reshaped within the central open air space 7 so as to conform to the shape of the wearer's ear. The cushion 8 formed at the top of ear insert 1 will be received against a ridge at the top of the ear, sometimes known as the helix. The tab 10 which protrudes from the bottom of the insert 1 is positioned to fit within a small notch that lies below the bowl of the ear.

[0026] With the ear insert 1 held snugly in place, the pad 11 at the mid-point of the bridge 5 through which sound channel 14 is formed fits behind the tragus of the ear, whereby the canal tube 12 to which the acoustic tubing 20 is connected, will extend into the bowl of the ear to be positioned directly above and in axial alignment with the ear canal in order to advantageously provide loud and clear audio signals from the audio receiver directly to the ear of the wearer. What is more, the open air space 7 surrounded by the band 3 and bridge 5 at the center of ear insert 1 will be automatically positioned above and aligned with the bowl of the ear to establish a sound passage between the wearer's environment and his ear canal. Therefore, at the same time that the wearer receives communications transmitted from a remote source to the ear insert 1, he will also be able to hear nearby sounds that are transmitted from his surroundings to his ear canal via the air space 7, as well as the open area between the protrusion 10 and pad 11 along bridge 5. Such sounds may include gun shots, shouts for help, spoken words, etc.”

68. It is accepted by Freebit that Smith has all the features of claim 1 except the second curvature. It is denied by Freebit that Smith has the incision required by the proposed amended claim 1.
69. Freebit relies on five aspects of the disclosure of Smith that indicated that his device would not have or adopt a curve corresponding to the typical undulation in the floor of the concha such that it achieves substantial contact with it. These are:
- i) The compressed nature of the device;
 - ii) The air space over the concha;
 - iii) The bowed profile of the device in plan view;
 - iv) The position of tab 10.
70. Mr Frost was cross-examined on these points and how they were consistent with one of the objectives of Smith which Freebit say is to lift the hearing tube away from the concha bowl. However, the objective is to lift the device away from the ear canal rather than from the concha bowl itself. To achieve that objective, the device must touch the concha bowl in order to support the device clear of the ear canal. It is correct that the device is so shaped that it bows upwards in the middle of the decremental curve, between 1 and 3 on Fig. 3, but it can only do that if it is pushing against the concha bowl at the top and bottom of the device. The device will then have a curve in the Y-Z plane. The issue then is whether this curvature *“follows the inner surface of the ear mussel to provide a contact surface thereby enabling the ear unit to fit closely against the ear mussel when the ear unit is positioned into the ear”* as required by the claim.
71. I have construed this to require the contact to be with the ‘floor’ of the concha bowl.
72. Bose’s expert, Mr Frost, in his report referred to the fact that Smith states that the device may be made of a flexible material and that it is apparent that the design and flexibility of the device is intended to ensure that the contact surface of the insert will follow the shape of the concha/antihelix in use. Freebit’s expert, Dr Staab, did not agree with this evidence when it was put to him in cross-examination. He referred to the Shore hardness of the material referred to in Smith and said that it wouldn’t always flex into an empty area suggesting that when the device is compressed there was a very good chance that it will pop out of the ear at the antihelix area. Dr Staab suggested that a softer material would be worse. He said that Smith was talking about compressing into a centre space. He appears to be talking about compressing the device so that it will fit into the concha which is what Smith is clearly talking about but, of course, when the device is compressed, inserted into the concha and then released, it will expand against the concha.
73. Dr Staab accepted that the cushion, identified at 8 in the drawings, provided a better fit because it has a profile that matches the profile of the ear at that point and that if you wanted to improve Smith at the relevant date it would be perfectly natural to improve the fit at the other end as well, if it was not already in contact with the concha.

74. Freebit argue that this would not mean that the device was in contact with the concha along the rest of the device between 10 and 8. The teaching in Smith is to use a flexible material so as to “*tailor the insert to the particular ear of the wearer in order to improve the fit and maximise comfort*”. I accept Mr Frost’s evidence that this means that the contact surface of the insert will follow the shape of the concha/antihelix in use.
75. Thus, although not all implementations of Smith will result in a device that contacts the floor of the concha bowl along the length of its C-curve, it teaches the use of a flexible material that will do so. Therefore, Smith anticipates claim 1 of the Patent if contrary to my finding above, the Patent covers the use of a flexible material that flexes to conform to the shape of the concha bowl. Smith does not anticipate the claim as proposed to be amended as it does not have the incision required by the amendment.

Obviousness over Smith

76. This is a case in which the Pozzoli analysis is appropriate:
- (1) (a) Identify the notional “person skilled in the art”
 - (1) (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?
77. I have identified the skilled person and the common general knowledge. I have also construed claim 1 and the proposed amended claim 1.
78. Leaving aside the issue of whether the shape is preformed or is produced by the pressure of the ear, and on the assumption that I am wrong and Smith does not anticipate the Patent because it does not teach the second curve, the presence of that curve is the difference between claim 1 of the Patent as it stands and Smith.
79. On the basis of Mr Frost’s evidence referred to above, it would be an obvious step to improve Smith by using a flexible material that contacted the floor of the concha at the base of the side wall of the concha.
80. The difference between the proposed amended claim 1 and Smith is the second curve combined with the ‘incision which positions itself into the intertragic notch when the ear unit is positioned in the ear’.
81. The evidence of Mr Frost was that circular earbuds with a stalk extending downwards along the intertragic notch were commonly used in earphones in the early 2000s and that they would have a groove which straddled the lower part of the intertragic notch.

He said that the use of such a space or incision to co-operate with the intertragic notch was a well established and very well known method of positioning devices within the ear at the priority date of the Patent. Dr Staab agreed with this if the device had a part going down from the body of the device sitting in the concha but Smith did not. He pointed out that if one just swivelled the connection between the device and the tube in Smith so that the tube went down instead of up and over the ear, no incision would be needed as the tube connector extends outwards at first and if it were rotated to take the tube down it would clear the intertragic notch without need for an incision.

82. Freebit also submits that modifying the Smith device would involve modifying it for a different purpose to that for which Smith intended his device, namely for use by security personnel. However, the skilled person is in the field of in-ear headphones for personal electronic devices. Such a person would not be wanting something for use by security personnel but would be wanting something for use with personal electronic devices. I accept Mr Frost's evidence that adapting Smith to have a downward pointing part with a gap to fit the intertragic notch would be a natural thing for the skilled person to do. If that is an incision then it is obvious.
83. The proposed amended claim is obvious over Smith.

Added Matter – The Law

84. The general principles articulated by Aldous J in *Bonzel v Intervention (No 3)* [1991] RPC 553 at 574 have been approved on numerous occasions:
- (1) To ascertain through the eyes of the skilled addressee what is disclosed, both explicitly and implicitly in the application.
 - (2) To do the same in respect of the patent as granted.
 - (3) To compare the two disclosures and decide whether any subject matter relevant to the invention has been added whether by deletion or addition. The comparison is strict in the sense that subject matter will be added unless such matter is clearly and unambiguously disclosed in the application either explicitly or implicitly.
85. The reason for the rule was explained by the Enlarged Board of Appeal of the EPO in G1/93 *ADVANCED SEMICONDUCTOR PRODUCTS/Limiting feature* [1995] EPOR 97 at [Reasons 9]:
- “With regard to Article 123(2) EPC, the underlying idea is clearly that an applicant shall not be allowed to improve his position by adding subject-matter not disclosed in the application as filed, which would give him an unwarranted advantage and could be damaging to the legal security of third parties relying upon the content of the original application.”
86. It has been often stated the legal security of third parties would be affected if this were not the rule because the applicant or patentee could gain an unwarranted advantage in two ways if subject-matter could be added: first, he could circumvent the “first-to-file” rule, namely that the first person to apply to patent an invention is entitled to the resulting patent; and secondly, he could gain a different monopoly to that which the originally filed subject-matter justified (see e.g. in *Vector Corporation v Glatt Air Techniques Inc* [2007] EWCA Civ 805). See also *Liversidge v Owen Mumford Ltd &*

Anor [2012] EWPC 33 on the importance of being able to ignore applications which do not appear to have relevance because the skilled person is not doing anything which would require the particular feature as described in the application as filed to be included.

87. One further point has been emphasised inter alia by Kitchin J in *European Central Bank v Document Security Systems* [2007] EWHC 600 (Pat), namely the importance of avoiding hindsight. As he said, “Care must be taken to consider the disclosure of the application through the eyes of a skilled person who has not seen the amended specification and consequently does not know what he is looking for”.
88. A particular, and sometimes subtle, form of added matter is “intermediate generalisation”. Pumfrey J described this in *Palmaz's European Patents* [1999] RPC 47, 71 as follows:

“If the specification discloses distinct sub-classes of the overall inventive concept, then it should be possible to amend down to one or other of those sub-classes, whether or not they are presented as inventively distinct in the specification before amendment. The difficulty comes when it is sought to take features which are only disclosed in a particular context and which are not disclosed as having any inventive significance and introduce them into the claim deprived of that context. This is a process sometimes called 'intermediate generalisation.’”

Added Matter – The Facts

89. Bose raises two added matter objections. The first is to the claim as granted and the second is to the proposed amended claim.
90. The wording in the priority document of the part of the claim that is now the post-characterising part of the claim was: “*having a curvature providing an improved attachment in that said curvature follows the bottom of the ear mussel*”. In the claim as granted this reads: “*has a curvature providing an improved attachment in that said curvature follows the inner surface of the ear mussel to provide a contact surface, thereby enabling the ear unit to fit closely against the ear mussel when the ear unit is positioned into the ear*”.
91. Bose say that this is an intermediate generalisation. They say that the only disclosure of this feature is at page 3 lines 31-32 of the priority document and this is in the context of a specific embodiment which has a hearing element retracted slightly relative to the curve such that there is the formation of an opening between the auditory canal and its surroundings. Bose submit that, if the claim is construed to embrace a device in which some of the curve that follows the ear concha may be formed by part of the unit that comprises the hearing element, then there is an intermediate generalisation. The disclosure of that curve has been stripped of its intrinsic functional and structural context, i.e. that the curve forms an opening between the auditory canal and its surroundings.
92. The Patent is subject to Opposition proceedings in the European Patent Office and a hearing before the Technical Board of Appeal is imminent. I have seen the Preliminary Opinion prepared for this hearing. It deals with this objection in paragraphs 16.4 to 16.6. Whilst this opinion is without prejudice to the board’s final

opinion and, of course, it is given before there has been an oral hearing before the board, I find this opinion cogent. It points out that in the passage relied on by Freebit at page 3 of the priority document, while some features are expressly referred to as being “optional”, the retraction of the hearing element is not so described. It notes that claim 1 as granted embraces the possibility that the curvature which follows the surface of the ear mussel relates to the part of the unit comprising the hearing element. However, this possibility is excluded by the description immediately above the passage relied on, which describes the hearing element as being retracted slightly relative to the curve. This feature has been omitted from claim 1 and appears to have an intrinsic functional and structural relationship with the feature that the curvature follows along the inner surface of the ear mussel. On this basis the board doubts that this is directly and unambiguously based on the application documents as filed.

93. I agree with this assessment and find that the claims as granted add matter over the priority document if they are construed to cover an ear unit in which part of the decremental curve is formed by the hearing element. If, however the claims are not to be construed as covering an ear unit in which part of the decremental curve is formed by the hearing element then there is no added matter.
94. The second alleged added matter objection relates to the incision claimed in the proposed amended claim: *“said ear unit is arranged with an incision which positions itself into the intertragic notch when the ear unit is positioned in the ear.”*
95. Here, Bose submit that in the priority document the incision is specifically positioned and is designed to have a specific function of positioning the downward projecting part to align with the intertragic notch for balancing the downward projecting part.
96. Freebit point out that the incision is referred to in the passage at the bottom of page 3 of the priority document without mention of the downward projecting part: *“The ear unit 10 is optionally arranged with an incision 20 so that it positions itself into the intertragic notch 14 when the ear unit 10 is positioned in the ear. This incision provides further stability and increased comfort”*.
97. The downward projecting part is also said to be optional but is not referred to in the description of the incision. The downward projecting part is shown with the notch in Fig. 4 which is said to show *“the curvature of Fig. 3 from the opposite side and also an incision shaped in such a way that the incision is stabilized comfortably in the intertragic notch”*. Fig. 5 is said to show *“an embodiment of the present invention comprising the curvature fitting closely against the ear mussel, the incision positioned stably into the intertragic notch and a part extending down from the ear unit”*.
98. The incision is not tied to the function of stabilising the downward projecting part and its introduction into the claim by the proposed amendment is not an intermediate generalisation adding matter.

Infringement

99. I have construed claim 1 of the Patent to require the ear unit to be shaped in the necessary way before insertion into the ear. The Bose units are not pre-shaped with the second curvature but are planar in the Y-Z plane. Therefore there is no

infringement. If I am wrong on that construction then I find that the Bose units would infringe the Patent, if valid.

100. The Bose units do adopt the shape required by the Patent when they have been inserted in the ear. They are pre-shaped to a degree which allows them to form a decremental curve shape and their flexibility or softness enables them to form the second curve increasing their contact with the surface of the concha bowl. They do not have an incision as required by the proposed amendment – or if they do, that is an obvious feature.

Summary

1. The Patent is invalid as it was anticipated by the supply of the Freebit H1 type A/B units in Norway.
2. The claims as granted added matter.
3. The Patent does not cover an ear unit which is not shaped with the required curves until it is inserted in the ear when its resilience and flexibility allows it to adopt the shape of the ear. If it did cover such an ear unit it would be anticipated by Smith
4. The proposed amendment would be allowable and would avoid anticipation by Smith but would be obvious over Smith. It would not avoid anticipation by the Freebit H1 ear units.
5. The Bose ear units do not infringe.