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**Datasheet for the decision
of 8 April 2024**

Case Number: T 0211/22 - 3.2.02

Application Number: 16822152.1

Publication Number: 3393384

IPC: A61B18/20, A61B18/00

Language of the proceedings: EN

Title of invention:
A HAIR CUTTING DEVICE

Patent Proprietor:
Koninklijke Philips N.V.

Opponent:
Hoefler & Partner Patentanwälte mbB

Headword:

Relevant legal provisions:
EPC Art. 54, 56, 83, 84, 113(1), 123(2)
EPC R. 103(1) (a)

Keyword:

Right to be heard - opposition procedure - substantial
procedural violation (no)
Claims - clarity (yes)
Sufficiency of disclosure - (yes)
Amendments - extension beyond the content of the application
as filed (no)
Novelty - (yes)
Inventive step - (yes)

Decisions cited:

T 1808/06

Catchword:



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Case Number: T 0211/22 - 3.2.02

D E C I S I O N
of Technical Board of Appeal 3.2.02
of 8 April 2024

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
15 November 2021 concerning the maintenance of
European Patent No. 3393384 in amended form**

Composition of the Board:

Chairman M. Alvazzi Delfrate
Members: D. Ceccarelli
N. Obrovski

Summary of Facts and Submissions

I. The opponent appealed against the Opposition Division's decision that, account being taken of the amendments according to auxiliary request 1, the patent and the invention to which it relates met the requirements of the EPC.

II. Oral proceedings took place on 8 April 2024.

The appellant requested that the decision under appeal be set aside and that the patent be revoked. It further requested reimbursement of the appeal fee due to substantial procedural violations during the opposition proceedings.

The respondent requested that the appeal be dismissed or, as an auxiliary measure, that the patent be maintained on the basis of auxiliary request I, filed with the reply to the statement of grounds of appeal.

III. The following documents are mentioned in this decision:

D1: WO 2017 /079339 A1

D2: US Application Number 62/249,704

D3: WO 2014/143670 A1

D4: H. Ding et al., "Refractive indices of human skin tissues at eight wavelengths and estimated dispersion relations between 300 and 1600 nm", Phys. Med. Biol. 51, 2006, 1479-89

IV. Claim 1 of the request found allowable by the Opposition Division (main request) reads as follows:

"A hair cutting device (2) for cutting hair (112) on

a body of a subject, the hair cutting device (2) comprising:

a light source (6) for generating laser light at one or more specific wavelengths corresponding to wavelengths absorbed by one or more chromophores in hair (112); and

a cutting element that comprises an optical waveguide (4) that is coupled to the light source (6) to receive laser light, wherein the optical waveguide (4) comprises a core (131) and a cladding (132) surrounding the core (131), wherein the refractive index of the cladding (132) is lower than the refractive index of the core (131),

wherein a portion of a side wall of the optical waveguide (4) forms a cutting face (133) for contacting hair (112), wherein the cutting face (133) is a portion of the side wall of the cladding (132) and comprises a portion of the cladding (132) that is thinner than the cladding (132) on other portions of the optical waveguide (4),

and wherein the optical waveguide (4) at the cutting face (133) has a refractive index in the range 1.48-1.54 so as to be equal to or lower than the refractive index of hair (112) and higher than the refractive index of skin (113)."

Claims 2 and 3 are dependent claims.

V. The appellant's arguments relevant to this decision can be summarised as follows.

Alleged substantial procedural violations

During the first-instance proceedings, on insufficiency of disclosure, the appellant had provided detailed arguments why it would have been impossible to determine values of the refractive index of the optical waveguide at the cutting face in the claimed range and, at the same time, higher than the refractive index of skin. The impugned decision did not address these arguments. This amounted to a violation of the appellant's right to be heard.

In the impugned decision, the Opposition Division had indicated that the subject-matter of claim 1 of the then pending auxiliary request 1 comprised two distinguishing features over the disclosure of D1. However, one of these features had not been discussed in the oral proceedings, and no reasons had been provided in the impugned decision why it was not known from D1. On the other feature, i.e. the cutting face comprising a portion of the cladding thinner than the cladding on other portions of the optical waveguide, arguments provided by the appellant on the disclosure of "re-cladding" in D1 had been ignored. These constituted further violations of the appellant's right to be heard.

In the first-instance proceedings, the appellant had provided arguments why several embodiments of the description (particularly those depicted in Figures 5, 6 and 7) did not fall within the scope of the claims according to the then pending auxiliary request 1 and why there should be a prominent indication in the specification (with reference to the Guidelines F-IV.4.3 and established case law) that these embodiments were not covered by the claims. These

arguments had been ignored in the impugned decision, this amounting to a further violation of the appellant's right to be heard.

These violations of the appellant's right to be heard had affected the proceedings because if the appellant's objections had been successful, the patent would have had to be revoked. Hence, they justified the reimbursement of the appeal fee.

Moreover, in addressing the objections of insufficiency of disclosure in the impugned decision, the Opposition Division had broadly stated that the original application disclosed several examples. However, sufficiency of disclosure had to be assessed on the basis of the patent, not the application. Sections 25.2 and 25.3 of the impugned decision were contradictory because they provided conflicting interpretations of what had to be regarded as "skin". Section 31.1 of the impugned decision stated that a figure alone could not be taken as the only basis for destroying novelty. This statement had been based on an incorrect passage from the Guidelines, which had been applied incorrectly and in violation of established case law. All this amounted to inadequate reasoning which resulted in a further substantial procedural violation justifying the reimbursement of the appeal fee.

Clarity

The subject-matter of claim 1 of the main request was unclear due to the "so as to be" formulation which had been added during the opposition proceedings.

This formulation allowed two different and contradictory interpretations which resulted in a lack

of clarity.

According to a first interpretation, the refractive index of the optical waveguide at that cutting face had to satisfy two independent requirements, namely being in the range 1.48 to 1.54 and being equal to or lower than the refractive index of hair and higher than the refractive index of skin.

According to a second interpretation, the refractive index of the optical waveguide at the cutting face had to be in the range 1.48 to 1.54, which had the consequence that the refractive index would be equal to or lower than the refractive index of hair and higher than the refractive index of skin. However, this second interpretation implied a limitation of the refractive index of skin which did not reflect reality because the refractive index of skin could be as high as 1.54 (paragraph [0036] of the patent). Otherwise, it would be redundant.

Hence, if any, the first interpretation had to be adopted.

The arrangements depicted in Figures 5 to 7 of the patent did not fall under the scope of the amended claims according to the main request. When filing the amended claims, the proprietor had only deleted, in the description of the figures, the wording specifying that these figures were according to specific embodiments but had maintained their description without amendment. This was in violation of the established case law (T 1808/06) and the Guidelines F-IV.4.3(iii), which stated that merely changing the wording "invention" to "disclosure" and/or the wording "embodiment" to "example", "aspect" or similar was not sufficient to

clearly state that a part of the description did not fall under the scope of the claimed invention. It had to be explicitly specified that this part of the description did not describe part of the claimed invention. It followed that the specification rendered the claims unclear since it implied that the scope of protection could be different from that defined in the claims.

Sufficiency of disclosure

Claim 1 according to the main request specified that the optical waveguide at the cutting face had a refractive index in the range 1.48 to 1.54 so as to be equal to or lower than the refractive index of hair and higher than the refractive index of skin.

This feature comprised two contradictions which made it impossible for the person skilled in the art taking the teaching of the whole patent into account to carry it out. It was not possible to set a refractive index such that it was higher than that of skin and at the same time equal to or lower than the refractive index of hair, and it was not possible to select a refractive index from the given range 1.48 to 1.54 that was also higher than the refractive index of skin.

Paragraph [0031] of the patent taught that the lowest value of the refractive index of hair was 1.545. Paragraph [0036] of the patent taught that the highest value of the refractive index of skin was 1.54 or even higher. Hence, it was not possible to have a refractive index higher than that of skin and, at the same time, lower than or equal to that of hair. Moreover, a refractive index in the range 1.48 to 1.54 was not higher than that of skin. In section 25.2 of the

impugned decision, the Opposition Division had acknowledged that there could have been a situation in which the conditions set out in the claim might not be fulfilled. This confirmed that the invention could not be carried out over the whole scope of the claim, which did not impose any limitation to specific types of skin. The respondent's argument that the refractive index of skin had to be understood as that of the epidermis was inconsistent as the claim referred to skin and not to epidermis, which was only a part of the skin. Skin as a whole included all layers of skin. Paragraph [0036] of the patent distinguished between skin, epidermis and stratum corneum. Moreover, the patent explained that the stratum corneum, which had a refractive index in the range of 1.5 to 1.54 (paragraph [0036]), was the most important part of the skin since it was the part which would be in contact with the optical fibre and therefore relevant for the coupling of light.

Extension of subject-matter

The inclusion of only one of the features defined in claim 8 as granted in claim 1 of the main request amounted to a non-allowable intermediate generalisation.

The omitted feature of the refractive index of the core being lower than or equal to the refractive index of the hair and higher than the refractive index of the skin was structurally and functionally linked to the feature of the refractive index of the cladding being lower than the refractive index of the core, and even with the features defined in claim 9 as originally filed. Isolating the feature of the refractive index of the cladding was not (positively) supported by the

patent as a whole.

The refractive index of the core was critical when the cladding at the cutting face was a very thin layer (thinner than the evanescent field described in paragraph [0048] of the patent). This was because the thin cladding at the cutting face was one way for light to couple from the core to the hair via the cladding.

Claim 1 as granted included the feature that the cutting face of the fibre has the right refractive index (lower than that of hair but higher than that of skin). This was necessary to allow light to couple out into the hair but not into the skin when the fibre was in contact with skin and hair. However, claim 1 as amended during opposition defined that the cutting face was part of the cladding. Since there was no light in the cladding (as the refractive index of the cladding had to be lower than the refractive index of the core), the refractive index of the cutting face, i.e. part of the cladding, had become irrelevant. It was essential that the core, which was surrounded by the cladding, had the right refractive index for hair and skin to allow light to be coupled out of the core through the cladding. Without such a definition for the core, the invention did not make sense since either no light would be coupled out or light would be coupled into skin.

It followed that the omitted feature was essential for the invention as defined in claim 1 of the main request to work.

Novelty

The subject-matter of claim 1 of the main request

lacked novelty over D1 and D3.

D1 was prior art under Article 54(3) EPC since it validly claimed priority from D2, filed prior to the priority date of the patent.

Both D1 and D3 disclosed a hair cutting device comprising a light source for generating laser light at a wavelength absorbed by chromophores in hair and an optical waveguide coupled to the light source to receive laser light, the optical waveguide having a core and a cladding. A portion of the side wall of the optical waveguide formed a cutting face for contacting hair (Figure 5 of both documents). The contoured portion 132 on Figure 5 included a cutting surface and was covered with a thinner coating or a re-cladding surrounding the core (paragraphs [0064], [0065], [0076], [0094] and [0099], and Figures 4 and 5 of D1 and paragraphs [0030] and [0036], and Figures 4 and 5 of D3). The cladding and the coating (re-cladding) of D1 and D3, together, could correspond to the cladding surrounding the core according to claim 1 of the main request. The claim did not specify that the cladding had to be integrally formed or made of a single piece. Hence, both D1 and D3 disclosed a cutting face comprising a portion of the cladding thinner than the cladding on other portions of the optical waveguide. Moreover, this feature, which, as broad as it was, had no technical effect, was disclosed by any standard optical fibre with a cladding with uneven thickness or different thicknesses.

Inventive step

If D3 was not considered to disclose a cladding surrounding the core and a cutting face comprising a

portion of the cladding thinner than the cladding on other portions of the optical waveguide, the subject-matter of claim 1 of the main request was not inventive when starting from D3.

A cladding on the cutting face had the technical effect of providing some protection. However, this effect was already provided by the re-cladding of D3. The objective technical problem solved by the distinguishing feature could only be the provision of an alternative protection.

Paragraph [0030] of D3 disclosed different options for providing the re-cladding. The person skilled in the art would have provided a re-cladding of the same material as that of the cladding surrounding the core in D3 as one of several obvious equivalent alternatives.

VI. The respondent's arguments relevant to this decision can be summarised as follows.

Alleged substantial procedural violations

Both parties had been equally and fairly treated by the Opposition Division. The appellant appeared to be primarily dissatisfied with the Opposition Division's findings rather than with the procedure. The reasoning in the decision was clear. The request for refund of the appeal fee was unfounded and should not be granted.

Clarity

Claim 1 of the main request was clear and required that the refractive index of the optical waveguide at the cutting face had to be equal to or lower than the

refractive index of hair, higher than the refractive index of skin and within the range of 1.48 to 1.54.

Sufficiency of disclosure

The invention as defined in claim 1 of the main request was sufficiently disclosed.

The refractive index of hair was disclosed as illustrated in Figure 3 and explained in paragraph [0031] of the patent to be between 1.545 and 1.555. The refractive index of skin was illustrated in Figure 4 and - as discussed in paragraph [0035] - could be in the range of 1.42 to 1.47. The claim defined that the refractive index of the optical waveguide at the cutting face was in the range 1.48 to 1.54, which was an interval perfectly matching the further definition in the claim in that all values in this range were lower than the refractive index of hair and higher than the refractive index of skin.

Paragraph [0036] of the patent explained that the refractive index of one very specific sub-layer of the epidermis, namely the stratum corneum, could vary depending on hydration and the presence of other substances like creams, oils, etc. Only this sub-layer, depending on the other substances, could have a refractive index in the range 1.5 to 1.54. However, the refractive index of skin was not the refractive index of the stratum corneum but rather that of the epidermis. D4, referred to in paragraph [0034] of the patent, made this clear as it explained that the stratum corneum, due to its small thickness, had no significant effect on the refractive index of skin (page 1487, second paragraph). The first 100 μm of the skin, most of which was constituted by the epidermis,

dominated the tissue response as far as the refractive index was concerned (page 1488, first paragraph).

Extension of subject-matter

The feature of claim 1 of the main request on the refractive index of the cladding being lower than the refractive index of the core was based on claim 8 of the application as filed.

This feature was not inextricably linked with the other feature of claim 8 of the application as filed according to which the refractive index of the core was lower than or equal to the refractive index of the hair and higher than the refractive index of the skin. This was derivable from paragraph [0051] of the patent.

Moreover, claim 1 of the main request required that the refractive index of the optical waveguide at the cutting face be higher than the refractive index of skin and that the refractive index of the core be higher than the refractive index of the cladding. This implied that the refractive index of the core had to be higher than the refractive index of skin. If the refractive index of the core was not lower than or equal to the refractive index of the hair, no light could be coupled - through the evanescent field in the cladding - from the core (where the light was travelling) to the hair. Hence, implicitly, the refractive index of the core also had to be lower than or equal to the refractive index of hair.

Novelty

The subject-matter of claim 1 of the main request was novel over both D1 and D3.

These documents did not disclose an optical waveguide with a cladding surrounding a core and a cutting face comprising a portion of the cladding thinner than the cladding on other portions of the optical waveguide. Neither D1 nor D3 disclosed that the re-cladding surrounded the waveguide. Re-cladding implied the removal of a portion of the cladding and the replacement of this portion with a coating of a different material. However, this did not amount to a cutting face comprising a portion of the cladding being thinner than the cladding on other portions of the optical waveguide. The term "thinner" meant having a reduced thickness, not being of a different/replaced material.

Inventive step

The prior art did not teach to implement the distinguishing feature of claim 1 of the main request in the device according to D3. The person skilled in the art would not have removed a portion of the cladding of the optical waveguide of D3, as taught in that document, and then provided it with a re-cladding of the same material. Absent any reference to the distinguishing feature in the prior art, any problem-solution approach had to fail.

It followed that the subject-matter of claim 1 of the main request was inventive.

Reasons for the Decision

1. The patent

The invention as defined in claim 1 of the main request is a hair cutting device comprising a light source for generating laser light at one or more wavelengths corresponding to wavelengths absorbed by one or more chromophores in hair.

A chromophore is the part of a molecule that gives the molecule its colour. In the hair cutting device, the laser light is absorbed by the chromophore and converted into heat which burns or otherwise destroys the bonds in the molecules of the hair (paragraph [0026] of the patent).

Figure 7 of the patent, reproduced below, schematically illustrates the working principle of the device as claimed.

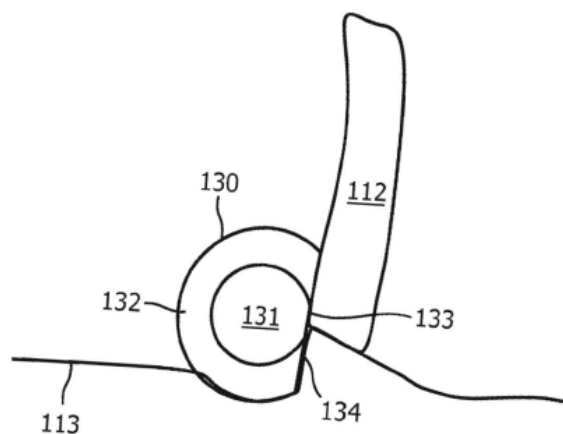


FIG. 7

The hair cutting device includes a cutting element that comprises an optical waveguide that is coupled to the light source to receive laser light.

The optical waveguide, which can be in the form of a fibre optic (130), comprises a core (131) and a cladding (132) surrounding the core.

The refractive index of the cladding is lower than the refractive index of the core. This is to keep the light within the core in the optical waveguide as it is transmitted from the light source.

A portion of a side wall of the optical waveguide forms a cutting face (133) for contacting hair (112).

The cutting face is a portion of the side wall of the cladding and comprises a portion of the cladding thinner than the cladding on other portions of the optical waveguide (this is not illustrated in Figure 7).

The optical waveguide at the cutting face has a refractive index in the range 1.48 to 1.54 so as to be equal to or lower than the refractive index of hair and higher than the refractive index of skin (113).

By selecting a refractive index that is equal to or lower than the refractive index of hair and higher than the refractive index of skin, laser light can couple into hair when hair is in contact with the cutting face, but light will not be able to couple into the skin, thus reducing the risk of burning or irritating the skin (paragraph [0021] of the patent).

2. Alleged substantial procedural violations

The appellant argued that the Opposition Division had committed a number of substantial procedural violations

and that the appeal fee should be reimbursed for this reason.

- 2.1 One alleged substantial procedural violation had to do with the appellant's objection of insufficient disclosure of the feature of the refractive index at the cutting face of the optical waveguide, which had to be equal to or lower than the refractive index of hair and higher than the refractive index of skin. In the appellant's view, this objection had not been addressed in the impugned decision, this being a violation of the appellant's right to be heard.

The Board concludes that the reasoning in the impugned decision on sufficiency of disclosure (points 24 and 25) shows that the Opposition Division considered the appellant's arguments. There is also sufficient reasoning for the parties and the Board to understand why the Opposition Division concluded that the invention as defined in claim 1 of the main request was sufficiently disclosed.

The Opposition Division explained that the patent disclosed, in Figure 3 and paragraph [0031], that the lowest refractive index of hair was 1.5425. It also explained that although the patent disclosed that the uppermost layer of the skin could have a refractive index of up to 1.54, in most cases a refractive index in the range 1.48 to 1.54 would be equal to or lower than the refractive index of hair and higher than the refractive index of skin (point 25.2 of the impugned decision). The Opposition Division also stated that the term "skin" in the claim had to be interpreted as "skin as a whole" and not "any specific layer within the skin". This addresses the appellant's argument that the refractive index of skin could be as high as 1.54, in

contradiction with the claim requirement that a refractive index in the range of 1.48 to 1.54 was higher than the refractive index of skin. Whether the reasoning is correct is irrelevant for assessing an alleged procedural violation. The assessment of the correctness of the reasoning and the conclusions based on it is a matter of substance, not procedure. Hence, the appellant's right to be heard (Article 113(1) EPC) was observed for the objection of insufficient disclosure, and no procedural violation took place.

2.2 In the impugned decision, the Opposition Division concluded that the subject-matter of claim 1 of the current main request was novel over D1 and D3 on the basis of two distinguishing features: 1) the cutting face comprising a portion of the cladding being thinner than the cladding on other portions of the optical waveguide and 2) the optical waveguide at the cutting face having a refractive index in the range 1.48 to 1.54 so as to be equal to or lower than the refractive index of hair and higher than the refractive index of skin.

2.2.1 As regards the first distinguishing feature, the appellant argued that it had pointed to passages of D1 which disclosed re-cladding and that these arguments had not been considered. However, the Opposition Division addressed these arguments in point 31.1 of the impugned decision, in which it explained that "the embodiments of fig. 11-14 are not disclosed in the priority document, and therefore, all the embodiments disclosing re-claddings are not to be considered when assessing novelty (document D1 is an Article 54(3) EPC prior-art document)". Hence, the appellant's right to be heard (Article 113(1) EPC) was observed with regard to this distinguishing feature, and no procedural

violation occurred.

- 2.2.2 As regards the second distinguishing feature, i.e. the optical waveguide at the cutting face having a refractive index in the range 1.48 to 1.54 so as to be equal to or lower than the refractive index of hair and higher than the refractive index of skin, the appellant argued that it had not been discussed in the oral proceedings and no reasons had been provided in the impugned decision as to why this feature was not disclosed in D1.

However, the explanations on the feature of a portion of the cladding being thinner than the cladding on other portions of the optical waveguide are sufficient for the Opposition Division's decision that D1 did not deprive the subject-matter of claim 1 of the current main request of novelty. Thus, even if the Opposition Division committed a procedural violation in respect of the second distinguishing feature, it would not be a substantial one justifying the reimbursement of the appeal fee (Rule 103(1)(a) EPC) as a different conclusion on the second distinguishing feature would not have changed the decision that the subject-matter of claim 1 of the current main request was novel over D1.

- 2.3 The appellant also argued that its objections to the description had not been considered in the impugned decision.

This is not convincing either. The Opposition Division stated that the description was in conformity with the amended claims and explained why (points 36.1 and 36.2). It considered that the paragraphs on embodiments no longer covered by the claims had been

deleted and that Figures 5 to 7 had been described as a mere illustration of different optical fibre cutting elements and not as embodiments of the invention. This shows that the Opposition Division considered that the requirements of clarity (Article 84 EPC) and the Guidelines (F-IV.4.3) were met, also in view of the appellant's arguments to the contrary. Hence, the appellant's right to be heard (Article 113 EPC) was not infringed. Whether the Opposition Division reached the correct conclusion on the basis of the Guidelines is not a matter of procedure but of substance.

- 2.4 As regards the appellant's arguments on alleged inadequate reasoning, the reasons provided enable the Board and the parties to understand why the Opposition Division took its decisions on the points in dispute. Hence, no substantial procedural violation occurred.

Irrespective of the merits of the appellant's line of argument that the impugned decision erroneously and curtly referred to "several examples" in the "original application" and to the "skin as a whole", the remaining reasoning in points 24 and 25 of the impugned decision, on the disclosure of the refractive indexes of hair and skin, enables the Board and the parties to understand why the Opposition Division considered that the invention as defined in claim 1 of the current main request was sufficiently disclosed. The Opposition Division distinguished between the stratum corneum and "skin as a whole" when referring to skin's refractive index. This is a clear indication that the Opposition Division considered the range of the refractive index of the epidermis as disclosed for Figure 4 (paragraphs [0034] and [0035]) to be the refractive index of skin within the meaning of claim 1 of the current main request.

The choice of the wording "a figure alone cannot be taken as the only basis" in the impugned decision may have not been the most appropriate. Still, it is clear from the impugned decision that, and the reasons why, the Opposition Division considered that Figure 5 of D1 did not anticipate the feature of the cutting face comprising a portion of the cladding being thinner than the cladding on other portions of the optical waveguide (point 31.1, first two sentences).

It follows that the reasoning in the impugned decision is not deficient, and no substantial procedural violation was committed. Again, whether the Opposition Division's conclusions and the reasoning itself are correct on the merits is a matter of substance, not procedure.

2.5 In conclusion, the Board cannot establish any substantial procedural violation which justifies the reimbursement of the appeal fee under Rule 103(1)(a) EPC.

3. Clarity

3.1 The appellant argued that the expression "so as to be" in claim 1 of the main request lacked clarity and proposed two possible interpretations of the claim wording.

A feature in a claim must, however, not be construed in isolation but in context. The expression means, in context, that the cutting face of the optical waveguide has a refractive index in the range 1.48 to 1.54. As a consequence, this refractive index is equal to or lower than the refractive index of hair and higher than the

refractive index of skin. This is based on a plain reading of the expression "so as to", normally synonymous with "in order to". Contrary to the appellant's arguments, this is not in contrast with reality but is clearly supported by paragraphs [0034] and [0035] of the patent for the "the refractive index of skin". These paragraphs imply that, in the patent, the refractive index of skin corresponds to that of the epidermis and lies in the range of 1.42 to 1.47. Paragraph [0034] states that Figure 4 "illustrates the real and imaginary refractive indexes of skin (specifically the upper layer of skin - the epidermis)", and paragraph [0035] explicitly mentions the range of the refractive index of skin.

The claim construction is also in line with the Opposition Division's reasoning according to which "so as to be" simply indicated the purpose of the technical characteristics listed previously in the claim (point 28.1 of the impugned decision). Indicating the purpose of a feature in a claim is not uncommon, does not result in redundancy and may even enhance clarity.

It follows that the appellant's objection of lack of clarity (Article 84 EPC) of the wording of claim 1 of the main request cannot succeed.

- 3.2 The appellant argued that the description of the arrangements depicted in Figures 5 to 7 of the patent rendered the claims unclear since it implied that the scope of protection could be different from that defined in the claims.

The Board agrees that contradictions between the claim wording and the description can, generally speaking, lead to a lack of clarity of the subject-matter for

which protection is sought. Decision T 1808/06 (see Reasons 2) and the Guidelines F-IV.4.3(iii) cited by the appellant are to be read to mean that such contradictions should be carefully avoided. Whether there are such contradictions and, if so, how they should be dealt with does, however, depend on the circumstances of each case.

In the case at hand, the description of the arrangements shown in Figures 5 to 7 of the patent does not contradict the subject-matter of the claims of the main request.

Claim 1 of the main request expressly requires a cladding surrounding the core and a cutting face being a portion of the side wall of the cladding and comprising a portion of the cladding that is thinner than the cladding on other portions of the optical waveguide.

It is immediately apparent that the arrangement according to Figure 5 comprises no cladding, the arrangement according to Figure 6 comprises a uniform cladding and the arrangement according to Figure 7 comprises no cladding on the cutting face. The description does not state anywhere that these arrangements are in accordance with claim 1 of the main request either. Hence, the person skilled in the art is left with no reason to believe that the arrangements shown in Figures 5 to 7 of the patent fall under the scope of the claims.

It follows that the subject-matter of the claims according to the main request is clear (Article 84 EPC), also in view of the description.

4. Sufficiency of disclosure

The appellant argued, in essence, that the patent did not disclose how to set a refractive index higher than that of skin and at the same time equal to or lower than that of hair and that a refractive index in the range of 1.48 to 1.54 was higher than the refractive index of skin.

Sufficiency of disclosure has to be assessed in view of the disclosure of the patent as a whole.

The person skilled in the art is taught by the patent that the "refractive index of skin" refers to the refractive index of the epidermis (paragraphs [0034] and [0035]) and varies in the range of 1.42 to 1.47. The fact that the epidermis is only a layer of the skin and that paragraph [0036] of the patent distinguishes between skin, epidermis and stratum corneum is not decisive here. As the respondent pointed out, in the patent, the refractive index of the epidermis is of importance. D4, referred to in paragraph [0034] of the patent, supports this as it explains that the stratum corneum, due to its small thickness and contrary to the appellant's arguments, has no significant effect on the refractive index of skin (page 1487, second paragraph) and that the first 100 μm of the skin, most of which is constituted by the epidermis, dominate the tissue response as far as the refractive index is concerned (page 1488, first paragraph).

Paragraph [0031] of the patent teaches that "the refractive index of hair is between (approximately) 1.545 and 1.555, although there will be variations between individuals". According to Figure 3 of the patent, the refractive index of skin could not be lower

than 1.54.

Consistently, claim 1 of the main request states that the cutting face has a refractive index in the range 1.48 to 1.54 so as to be equal to or lower than the refractive index of hair and higher than the refractive index of skin.

Whether the stratum corneum may have a refractive index higher than or within the claimed range is therefore irrelevant for sufficiency of disclosure.

In conclusion, the invention as defined in claim 1 of the main request is sufficiently disclosed (Article 83 EPC).

5. Extension of subject-matter

Claim 1 of the main request is based on claims 1 to 3 and 7 to 9 of the application as filed.

Claim 8 of the application as filed, which corresponds to claim 8 of the patent as granted, specifies that the refractive index of the core is lower than or equal to the refractive index of the hair and higher than the refractive index of the skin and that the refractive index of the cladding is lower than the refractive index of the core.

The appellant argued that the feature that the refractive index of the core is lower than or equal to the refractive index of the hair and higher than the refractive index of the skin had been omitted from claim 1 of the main request, this resulting in a non-allowable intermediate generalisation.

The Board does not share this view.

Claim 1 of the main request defines that the optical guide, at the cutting face, has a refractive index lower than or equal to the refractive index of the hair and higher than the refractive index of the skin. Since the light has to travel within the core, as the appellant also pointed out, because the claim requires that the refractive index of the cladding be lower than the refracting index of the core, the light coupling at the cutting surface has to be between the core and the hair (by means of the evanescent field through the thin cladding, as explained in paragraph [0048] of the patent). The claim does not define that the cutting face has a refractive index in the specified range but that the optical waveguide at the cutting face does. Hence, claim 1 of the main request implicitly contains the limitation that the refractive index of the core is lower than or equal to the refractive index of the hair. Otherwise, as the appellant pointed out, the light coupling to hair would not be possible, and the invention would make no technical sense. Such a claim construction has to be excluded for this reason alone.

Claim 1 of the main request implicitly also requires that the refractive index of the core be higher than the refractive index of skin. This is because the claim defines that the refractive index of the optical waveguide at the cutting face is higher than the refractive index of skin and that the refractive index of the core is higher than the refractive index of the cladding.

It follows that the feature of claim 8 of the application as filed that the refractive index of the core is lower than or equal to the refractive index of

the hair and higher than the refractive index of the skin has not been omitted from claim 1 of the main request.

As a consequence, the appellant's objection of added subject-matter (Article 123(2) EPC) is not successful.

6. Novelty

The appellant argued that both D1 and D3 deprived the subject-matter of claim 1 of the main request of novelty.

It is common ground that D1 and D3 each discloses a hair cutting device (schematically shown in Figure 5, which is the same in each of these documents, reproduced below) which comprises a light source for generating laser light at a wavelength absorbed by chromophores in hair (134) and a cutting element with an optical waveguide (104) that is coupled to the light source to receive laser light, the optical waveguide having a core (114) and a cladding (116), and in which a portion of the side wall of the optical waveguide forms a cutting face (132) for contacting hair.

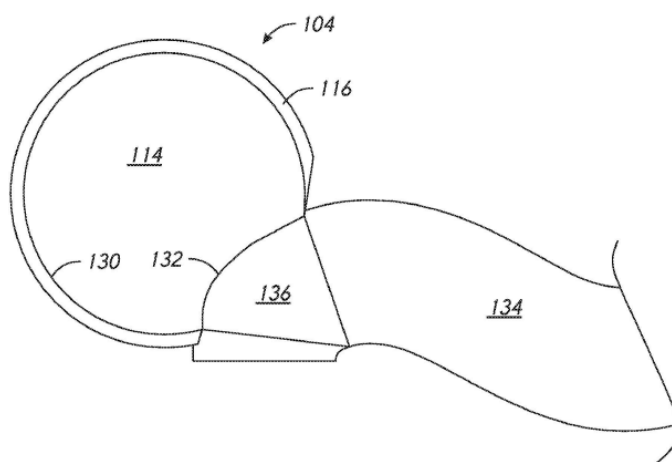


FIG. 5

The appellant argued that D1 and D3 disclosed that the cutting face comprised a portion of the cladding as defined in claim 1 of the main request.

It is acknowledged that D1 and D3 disclose (paragraph [0065] of D1 and paragraph [0030] of D3) that cutting face 132 could be covered with a coating or re-cladding. However, such a coating would not be the cladding according to the claim, which has to surround the core. There is no direct and unambiguous disclosure in D1 or D3 of the application of the coating or re-cladding all around the core. The appellant's argument that cladding 116 together with the coating (re-cladding) on the cutting surface corresponded to the cladding according to claim 1 of the main request is not convincing. Claim 1 defines "a cladding surrounding the core" and refers to the refractive index, the side wall and a portion of "the cladding". This makes clear that the cladding according to claim 1 must be unitary, i.e. a layer of one material surrounding the core. The appellant's argument that any normal optical fibre with a cladding with uneven thickness or different thicknesses would anticipate the cladding defined in claim 1 of the main request is not convincing either. The claim defines a portion of the side wall of the cladding not only being thinner than the cladding on other portions of the optical waveguide but also having the function of a cutting face (for cutting hair through the application of laser light travelling in the core of the optical waveguide).

It follows that the subject-matter of claim 1 of the main request is novel (Article 54(1) and (2) EPC) over both D1 (irrespective of the validity of its priority claim from D2) and D3 by virtue of the feature of the

cladding surrounding the core and a portion of which being a cutting face comprising a portion of the cladding thinner than the cladding on other portions of the optical waveguide.

7. Inventive step

The appellant submitted that the subject-matter of claim 1 of the main request lacked an inventive step when starting from D3.

The appellant argued that the technical problem solved by the distinguishing feature identified above was the provision of an alternative means for protecting the cutting face of the optical waveguide.

Even if this were accepted as the objective technical problem, the Board would see no obvious reasons why the person skilled in the art, starting from D3, would have provided a cladding as claimed.

Although paragraph [0030] of D3 discloses different options of re-cladding, it is unrealistic that the person skilled in the art, attempting to provide an optical waveguide as described in D3, would have first manufactured an optical waveguide with a core and a cladding, then completely removed the cladding on a portion of the waveguide, and then re-applied a thinner cladding of the same material on the same portion according to the teaching of D3. Since the result of such a process would have been obtained in a much simpler way by just removing part of the cladding on the same portion, it has to be concluded that D3 neither teaches nor renders obvious such a result.

It follows that the subject-matter of claim 1 of the

main request is inventive (Article 56 EPC) when starting from D3.

8. In conclusion, none of the appellant's objections prejudice the maintenance of the patent on the basis of the main request.

Order

For these reasons it is decided that:

1. The appeal is dismissed.
2. The request for reimbursement of the appeal fee is refused.

The Registrar:

The Chairman:



A. Chavinier-Tomsic

M. Alvazzi Delfrate

Decision electronically authenticated