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Datasheet for the decision of 26 August 2014

Case Number: T 0093/11 - 3.2.07

Application Number: 06772640.6

Publication Number: 1899121

IPC: B26B21/60

Language of the proceedings: EN

Title of invention:
RAZOR BLADES

Patent Proprietor:
The Gillette Company

Opponent:
Eveready Battery Company, Inc.

Headword:

Relevant legal provisions:
RPBA Art. 12(1), 12(2), 13(1)
EPC Art. 56

Keyword:
Admission of late filed new main and first auxiliary request into the proceedings - justification for late filing (yes)
Inventive step - obvious alternative

Decisions cited:

Catchword:

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Case Number: T 0093/11 - 3.2.07

D E C I S I O N
of Technical Board of Appeal 3.2.07
of 26 August 2014

Appellant: (Patent Proprietor)	The Gillette Company One Gillette Park- 3E Boston, MA 02127 (US)
Representative:	Pierce, Christopher James Hoyng Monegier LLP Rembrandt Tower 31st Floor Amstelplein 1 1096 HA Amsterdam (NL)
Respondent: (Opponent)	Eveready Battery Company, Inc. 533 Maryville University Drive St Louis, Missouri 63141 (US)
Representative:	Von Kreisler Selting Werner - Partnerschaft von Patentanwälten und Rechtsanwälten mbB Deichmannhaus am Dom Bahnhofsvorplatz 1 50667 Köln (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 3 November 2010 revoking European patent No. 1899121 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	H. Meinders
Members:	H. Hahn
	I. Beckedorf

Summary of Facts and Submissions

I. The patent proprietor (appellant) lodged an appeal against the decision of the Opposition Division to revoke European patent No. 1 899 121.

II. In the present decision the following documents of the opposition proceedings are cited:

D1 = US-A-3 743 551
D4 = US-B-6 684 513
D5 = US-A-3 774 703

While the following documents were submitted in the appeal procedure:

D6 = US-A-3 711 171
D7 = US-A-3 090 094
D8 = Zhu Y.M et al., "Laser Processing of Plasma-Sprayed Chromium Oxide Ceramic Coatings", Environmental Degradation of Ion and Laser Beam Treated Surfaces; Chicago, Illinois, USA, 26-29 Sept. 1988, pages 83-91, 1989

III. An opposition had been filed against the patent in its entirety under Article 100(a) EPC, for lack of novelty and inventive step.

The Opposition Division held that the subject-matter of claim 1 of the main request dated 21 September 2010 complied with Articles 84 and 83 EPC and was novel, particularly with respect to D1, but lacked inventive step over a combination of the teachings of D1 and D4. The Opposition Division further considered that the lack of inventive step conclusion likewise applied to

the subject-matter of claim 1 of the auxiliary request. Consequently, the patent was revoked.

IV. With a communication dated 13 June 2014 and annexed to the summons to oral proceedings the Board presented its preliminary opinion with respect to the claims 1-9 of the main request (identical with the main request underlying the impugned decision) and on claims 1-8 of the first auxiliary request as filed together with the statement of grounds of appeal.

First of all, both requests appeared not to be formally allowable for contravening Rule 80 EPC and Articles 84 and 123(2) EPC.

Furthermore, the subject-matter of the claims 1 of both requests appeared to lack novelty over D1 in the light of D6-D8.

The Board remarked further that in case that novelty of a formally allowable request (in terms of Rule 80 EPC and Articles 84, 123(2) and (3) EPC) would be acknowledged in respect of D1 then the issue of inventive step would be discussed. This discussion would take account of the problem-solution approach based on the distinguishing feature(s) over the closest prior art and its(their) effect(s) and whether or not the person skilled in the art, when starting from the razor blade of the closest prior art, would have any incentive to modify that razor blade by applying the teaching of another prior art, and/or by (additionally) applying his common general knowledge. It appeared that either D1 or D4 could be considered as the closest prior art document for the claimed razor blades and as the most promising springboard to the invention.

In this context the Board made the following further remarks:

The appellant used for a part of its inventive step argumentation - based on the problem-solution approach with respect to claim 1 of the main request and a combination of the teachings of D1 and D4 - a further teaching (D5) to have a "pointer away" from the invention, thus is support of inventive step. That was a point to be discussed.

The appellant alleged that the use of chromium nitride provides an improved shave and increases the longevity of the life of the blade but the patent in suit does not contain any comparison in this respect with the prior art. Neither has the appellant submitted any further evidence in this respect during the entire proceedings so that this - unproven - alleged effect cannot be considered for the problem-solution approach.

The use of chromium nitride as a sublayer under a PTFE layer was already known from D1. Furthermore, since D1 aimed to improve the razor blade of the state of the art having a chromium coating on which a PTFE layer is applied (see column 1, lines 20 to 28) it appeared to be clear to a skilled person that the chromium nitride served to better adhere the PTFE coating. Insofar, the appellant’s argument that the skilled person would foresee a layer (consisting) of chromium under the PTFE layer, could not hold.

The disclosure of D4 had also to be seen in the light that D4 generally mentions an “overcoat layer of a chromium containing material” (see abstract; column 1, lines 32 to 44; column 2, lines 14 to 16; column 3, lines 5 to 9; claims 1, 20) which, however, is stated

preferably to be "made of chromium or a chromium containing alloy compatible with PTFE" such as a chromium platinum alloy (see column 1, lines 51 to 54; column 2, lines 4 to 12; column 3, lines 9 to 12; claims 3, 8, 9, 22). Thus it did not appear to be credible that the skilled person when starting from D4, and knowing the teaching of D1 (or D5), would foresee an exclusively chromium layer. He would – when trying to provide an alternative razor blade (a more specific or ambitious technical problem was not credible in view of the fact that an improvement in comparison to the state of the art has not been proven by any experimental data) at least perform experiments with the chromium containing material according to D1 (or D5), i.e. chromium nitride. It appeared that thereby he would arrive at the subject-matter of claim 1 of the main and the first auxiliary request without inventive skills.

V. With letter dated 26 July 2014 submitted on the same date by fax the appellant filed, as a response to the Board's communication, a new main and new first to fourth auxiliary requests, explaining the basis of the amendments made therein. It submitted also further arguments with respect to the main and first auxiliary request and the formal objections as well as the substantive objections raised thereto under Articles 54 and 56 EPC. The second, third and fourth auxiliary requests were only submitted for the case that the main and first auxiliary request were not admitted into the proceedings.

VI. Oral proceedings before the Board were held on 26 August 2014. First, the issue of admission of the main request and the first auxiliary request into the proceedings was discussed. Thereafter, since novelty

was not contested by the respondent, it was discussed whether the subject-matter of the claims 1 of the main request and of the first auxiliary request involves inventive step when starting from the teaching of the closest prior art D4 and combining it with the teachings of D1 and/or D5.

a) The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of the main request or on the basis of the first auxiliary request, both filed with letter of 26 July 2014.

b) The respondent requested that the appeal be dismissed.

At the end of the oral proceedings the Board announced its decision.

VII. Claim 1 of the **main request** reads as follows (amendments as compared to claim 1 of the patent as granted are in bold; emphasis added by the Board):

"1. A razor blade (10) comprising a substrate (12) with a cutting edge defined by a sharpened tip and adjacent facets (22), a layer of hard coating (16) on said cutting edge, **said hard coating (16) is being made of a carbon containing material; wherein said carbon containing material comprises diamond; or said hard coating comprises diamond-like carbon material; or said hard coating comprises amorphous diamond material,** characterized by an overcoat layer (18) of chromium nitride on said layer of hard coating, and an outer layer (20) of polytetrafluoroethylene coating over said overcoat layer (18)".

VIII. Claim 1 of the **first auxiliary request** reads as follows (amendments as compared to claim 1 of the main request are in bold; emphasis added by the Board):

"A razor blade (10) comprising a substrate (12) with a cutting edge defined by a sharpened tip and adjacent facets (22), a layer of hard coating (16) on said cutting edge, said hard coating (16) is being made of a carbon containing material; wherein said carbon containing material comprises diamond; or said hard coating comprises diamond-like carbon material; or said hard coating comprises amorphous diamond material, characterized by an overcoat layer (18) of chromium nitride on said layer of hard coating, and an outer layer (20) of polytetrafluoroethylene coating over said overcoat layer (18), **wherein the overcoat layer bonds the outer layer to the hard coating.**"

IX. The appellant argued, insofar as relevant for the present decision, essentially as follows:

The features incorporated into the claims 1 of the main request and the first auxiliary request are based on the dependent claims 2-5 of the patent as granted. Therefore they are based on the same subject-matter that has been considered from the beginning of the opposition procedure and during the appeal proceedings. These amendments now restrict the invention to the very core of the patent in suit.

The amendments made therein are a response to the novelty objection raised by the Board in its communication annexed to the summons to oral proceedings, which was based on the new evidence D6-D8 submitted by the respondent at the appeal stage and the corresponding "Wikipedia" pages supplied by the Board.

The Opposition Division in its decision did not consider chromium oxide as a hard layer material and as a ceramic material. It was only through documents D6-D8, which are evidence that chromium oxide is a ceramic material that forms a hard layer, that the Board could raise a lack of novelty objection. Therefore these amendments made in the main request and in the first auxiliary request are the direct response to the Board's communication. Furthermore, these amendments also overcome the formal objections that were raised in that same communication.

The amendments made in the claims 1 of the main request and first auxiliary request are also expedient to procedural economy since the formal objections and novelty objections are overcome with one set of requests. There is also no change of argumentation. It is simply narrowing down the subject-matter claimed to the core of the invention.

D1 clearly does not disclose the feature of a hard coating made of a carbon containing material, wherein said carbon containing material comprises diamond, or comprises diamond-like carbon material, or comprises amorphous diamond. The respondent agreed already in its notice of opposition that this subject-matter, previously claimed in claims 2-5 of the patent as granted, is not disclosed in D1.

D4 is now the closest prior art document for the claims of the main request and was published in February 2004, shortly before the priority date (June 2005) of the present application. It concerns the hard coating technologies in place at the priority date. The skilled person concerned with improving diamond comprising hard razor blades would see D4 as the most promising

starting point for further research or for improving this type of blade.

D1 is less relevant than D4. Firstly, it dates back a long time from D4, being published in 1973, and reflects technology which was out of date at the priority date of the present invention. Secondly, it provides no discussion in relation to the required hardness of razor blades, but only to the adhesion of polytetrafluoroethylene (PTFE). Thirdly, it provides no teaching as to razor blades having diamond material coatings. The skilled person seeking to improve diamond comprising hard razor blades would thus not start from D1, but would instead start from D4.

D4 indicates specifically that chromium metal and chromium alloys (e.g. CrPt) (see column 3, line 15) have been shown to be an effective adhesive layer for bonding PTFE to a diamond containing razor blade. Claim 1 of the main request differs from D4 in that the layer adhering the diamond material and the PTFE together is chromium nitride instead.

The inventors identified that chromium nitride forms an excellent adhesive medium between diamond materials and PTFE. That is, it does not only bond well with PTFE but also bonds well with the diamond coating. The problem to be solved starting from D4 is thus the provision of a layer that provides improved adhesion to the hard coating of diamond as well as the PTFE layer (see patent in suit, paragraphs [0005] and [0010]).

Nowhere in the prior art has there been any disclosure of the ability of chromium nitride to bond to hard coatings of diamond materials. Notably, diamond comprising materials are not materials to which matter

readily adheres, and so provision of a material that adheres well to diamond is of itself already a challenging task. It is then more challenging to identify a material that adheres well to both diamond and PTFE.

While it is noted that D1 shows chromium nitride forming a layer under PTFE and being bonded thereto, the chromium nitride layer in that case is bonded on its underside to chromium oxide. D1 provides no teaching or indication that could lead to an understanding that chromium nitride could be suitable to adhere to diamond material, or indeed any material other than the chromium oxide as disclosed in D1. The prior art citations thus offer no teaching which would make it obvious that chromium nitride would be a suitable adhesive material for attachment to diamond material layers.

In addition, chromium nitride does not offer only good adhesion to diamond materials, but also forms a harder material layer than chromium metal or a chromium alloy since it is a ceramic material with strong ionic bonding, while chromium metal has weaker metallic bonding. Thereby this adhesive layer can contribute to the hardness of the blade and increase longevity. Consequently, there is an improvement compared to the closest prior art razor blade and the problem to be solved is not to "merely find an alternative".

The definition "chromium containing materials" in D4 has a fairly broad scope but it is agreed that chromium nitride is covered by this definition. Concerning the adhesion it is at least as good as the chromium metal or a chromium alloy according to D4.

Claim 1 of the first auxiliary request excludes any additional layers between the hard coating and the PTFE layer since it specifies that the chromium nitride is bonded to both the hard coating and the PTFE layer.

Therefore the claimed subject-matter of both requests is not obvious and meets the requirements of Article 56 EPC.

X. The respondent argued, insofar as relevant for the present decision, essentially as follows:

Both requests were quite late filed, i.e. only one month before the scheduled oral proceedings. The appellant could have filed them much earlier since more than 2 years had expired between the the statement of the grounds of appeal dated 11 March 2011 and the filing of these new requests.

Since the the patent was revoked by the Opposition Division in its impugned decision, the burden of proof for inventive step now lies with the patent proprietor. The appellant in its argumentation refers to effects such as an improved adhesion or advantages such as longevity of the claimed razor blades, however without having submitted at any time any evidence for this.

The problem to be solved as mentioned by the appellant has no basis in the patent in suit. Paragraph [0005] of the patent only states that "The inventors have found that chromium nitride provides particularly good adhesion of the polytetrafluoroethylene coating" but not that chromium nitride has an improved adhesion **on hard coatings of diamond, diamond-like carbon or amorphous diamond.** The same holds with respect to paragraph [0010] which only mentions that the "use of a

chromium nitride overcoat layer provides an improved adhesion of the polytetrafluoroethylene outer layer to the hard coating". Therefore the appellant presents an artificial problem which was not the one recognised from the outset in the patent nor the application (identical with the published WO-A-2006/138153).

Furthermore, it is clear from the patent in suit as granted (see paragraph [0015]) as well as from the underlying WO-A-2006/138153 (see page 4, lines 3 to 7) that all the materials to be used for the hard coating layer (i.e. carbon containing materials, nitrides, carbides, oxides or other ceramic materials) provide a good adhesion to chromium nitride. There was no particular reason - as far as adhesion goes - to work with diamond, DLC or amorphous diamond.

D4 represents the closest prior art since it discloses a maximum of overlapping features due to the identical layer structure (exactly the same as that of claim 1 of the first auxiliary request) and it mentions the same technical problem as the patent in suit (see paragraph [0005]) of providing a good adhesion of PTFE to the hard coating layer (see D4, column 2, lines 14 to 16; claim 1 and figure 1).

The hard coating of D4, like the coating of the patent in suit (see patent, paragraph [0015]), serves to provide improved strength, corrosion resistance and shaving ability. It can be made of carbon containing materials (e.g. diamond, amorphous diamond or DLC), nitrides, carbides, oxides or other ceramic materials (see column 2, lines 52 to 57). The overcoat of D4 has the intended function of reducing the tip rounding of the hard coated edge and to facilitate bonding of the outer layer to the hard coating while still maintaining

the benefits of both (see column 3, lines 5 to 8), which is identical to that of the patent in suit (see patent, paragraph [0016]). The outer layer of PTFE according to D4 serves the identical purpose as the outer layer of the patent in suit (see paragraph [0017]), i.e. to provide reduced friction (see column 3, lines 15 to 17).

The razor blade according to D4 is distinguished from the subject-matter of the claims 1 of both requests by an overcoat of a chromium containing material (see column 3, lines 8 to 10), instead of the chromium nitride as now claimed. However, D4 addresses the same problem as that of the patent in suit (see paragraph [0005]). In fact quite a few of the paragraphs of the patent in suit have identical wording as D4.

Document D4 therefore provides already a very strong incentive for the skilled person to look for further improvements in the chromium containing materials as proposed by D4.

The hard coating of chromium oxide of D1 corresponds to one of the hard coatings in the patent in suit, i.e. an oxide, which serves to adhere the chromium nitride coating to the razor blade. However, in D1 adhesion of the chromium nitride is no issue. Therefore, if the appellant now argues that adhesion is an issue it has the burden of proof that an improvement exists. Evidence to this effect, however, has not been provided by the appellant. Consequently, there exists no difference over the disclosure of D1.

Furthermore, D4 does not distinguish between carbon-containing materials and the other ceramic materials (see column 2, lines 52 to 57) so that it has to be

concluded that there exists no particular adhesion problem between any of these hard coating layers and the overcoat. This conclusion applies likewise to the patent in suit.

The appellant has "selected" diamond and chromium nitride as the preferred materials for the razor blade but there is no evidence for an improvement achieved by this "selection".

Therefore the subject-matter of the claims 1 of the main request and of the first auxiliary request does not involve inventive step.

Reasons for the Decision

1. Admission into the proceedings of the main request and first auxiliary request (Article 12(1), 12(2) and 13(1) RPBA)

1.1 The respondent argued that both requests were quite late filed, i.e. only one month before the scheduled oral proceedings, and that the appellant could have filed them much earlier.

1.2 The appellant argued that the features incorporated into the claims 1 of the main request and the first auxiliary request are based on the dependent claims 2-5 of the patent as granted. This is not new matter and through these amendments the claim is now restricted to the very core of the invention.

The amendments made take account of the novelty objection raised by the Board in its communication annexed to the summons to oral proceedings, based on the new evidence D6-D8 submitted by the respondent at

the appeal stage and the "Wikipedia" print-outs supplied by the Board in connection with the opinion of the Opposition Division in its decision, which did not consider chromium oxide to be a hard layer material, nor as a ceramic material and therefore had acknowledged novelty. Therefore these amendments are the direct result of the Board's communication. Furthermore, they also overcome the formal objections of the Board, which is procedurally expedient. Finally, they simply narrow down the subject-matter claimed to the core of the invention.

1.3 The Board considers that, although the (new) main request and (new) first auxiliary request were only submitted one month before the scheduled oral proceedings, they are a direct reaction to the Board's communication. These requests are also expedient to the procedure since they now focus on the core of the invention. This is due to the fact that the features added to the claims 1 of these two requests are based on the preferred embodiments according to the dependent claims 2-5 of the patent as granted. They also correspond to the working example described in the description of the patent in suit (see paragraph [0018]).

The restriction of the claimed subject-matter according to the claims 1 of the main request and the first auxiliary request does not complicate matters since the same documents as already considered during the opposition proceedings remain relevant to the issue of inventive step. In the present case, the change in closest prior art from D1 to D4 (see below) can be easily dealt with.

The Board further considers that there is no general prohibition to react to a Board's communication by submitting new requests, let alone when these take account of all the objections raised or repeated therein. Furthermore, the main request and the first auxiliary request are considered to represent one example as how the Board expects parties to react to its communication. Through these requests which deal with the formal objections (see point IV above) the number of issues to be discussed at the oral proceedings is substantially reduced.

According to Article 12(2) RPBA the statement of grounds of appeal and the reply thereto shall contain a party's complete case. Any amendment to a party's case after it has filed its grounds of appeal or reply may be admitted and considered at the Board's discretion which shall be exercised in view of inter alia the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy (Article 13(1) RPBA).

Therefore, in the present case, taking account of the above facts, the Board allows the amendment of the appellant's case and admits the main request and first auxiliary request into the proceedings.

2. *Admissibility of amendments (Rule 80 and Article 123(2) and (3) EPC)*

Since the Board considers that the subject-matter of the claims 1 of the main request and of the first auxiliary request does not involve inventive step (see point 4 below) there is no need to consider in this decision whether the amendments made therein comply with Rule 80 and Articles 123(2) and (3) EPC.

3. Novelty (Article 54 EPC)

The Board is satisfied that the subject-matter of the claims 1 of the main request and the first auxiliary requests is now novel over the disclosure of document D1, the document the Board found anticipating the previous claim 1 (Article 54 EPC). This is due to the fact that D1 does not disclose a hard coating being made of a carbon containing material which either comprises diamond, or comprises diamond-like carbon material, or comprises amorphous diamond material but only discloses a hard coating being made from chromium oxide (see D1, column 1, lines 59 to 64; and claim 2).

As regards D4, see the discussion on inventive step below.

The Board further remarks that the respondent at the oral proceedings no longer disputed novelty of the subject-matter of the claims 1 of the main and first auxiliary requests.

4. Inventive step (Article 56 EPC)

Claim 1 of the first auxiliary request

4.1 The Board comes to the conclusion that the subject-matter of claim 1 of the more restricted first auxiliary request - which, when compared to claim 1 of the main request (see point VII above), includes the additional feature that the overcoat layer of chromium nitride bonds the outer layer of PTFE to the hard coating (see point VIII above) and thereby excludes the presence of any further layer(s) between the specified

layers - lacks inventive step over the combined teachings of D4 and D1 for the following reasons.

4.2 It is uncontested that D4 represents the closest prior art for the subject-matter of claim 1 of the first auxiliary request. D4 also represents the most promising springboard towards the invention (see Case Law, 7th edition 2013, section I.D.3.4).

4.2.1 D4 relates to a razor blade comprising a substrate with a cutting edge defined by a sharpened tip and adjacent facets and a layer of hard coating on said cutting edge, said hard coating being made of diamond, amorphous diamond or diamond-like carbon material, and an overcoat layer of a chromium containing material on said hard coating layer, and an outer layer of PTFE coating over said overcoat layer (see claims 1, 2 and 6, as well as column 1, lines 38 to 43).

The razor blade of D4 thus has the identical layer structure as the one required by claim 1 of the first auxiliary request.

4.2.2 The subject-matter of claim 1 of the first auxiliary request (see point VIII above) is distinguished from said razor blade according to D4 only by the overcoat layer being of chromium nitride.

4.3 With respect to the effect of this feature the patent in suit mentions that "The inventors have found that **chromium nitride provides particularly good adhesion of the polytetrafluoroethylene coating**" (see paragraph [0005]) and that the "use of a **chromium nitride overcoat layer provides an improved adhesion of the polytetrafluoroethylene outer layer to the hard coating**" (see paragraph [0010]).

4.3.1 In this context it needs to be considered that the hard coating of claim 1 of the patent as granted (see paragraph [0015]) identically with the hard coating of the underlying application as originally filed (corresponding to the published WO-A-2006/138153; see page 4, lines 3 to 7) was **not** restricted to the carbon containing materials now specified in claim 1 of the first auxiliary request. The specifications of the patent in suit or of its application WO-A-2006/138153 are completely silent on the question whether particular measures have to be applied in order to obtain a good adhesion of the chromium nitride, depending on the specific material for the hard coating layer below it (carbon containing materials, nitrides, carbides, oxides or other ceramic materials). It is not apparent from these specifications that specific conditions need to be fulfilled to deposit the chromium nitride on a hard coating made of, for example, a diamond or diamond-like carbon layer in order to obtain a good adhesion with it. It is likewise not apparent from these specifications that the adhesion of chromium nitride on one material of the aforementioned groups of materials for the hard coating would be better than on another. Taking account of this fact it has to be concluded that **all** these hard coating layer materials can be used in an equal manner and that all of them provide a good adhesion to the overcoat layer of chromium nitride.

4.3.2 Consequently, there is no support in the specification of the patent in suit that chromium nitride has an improved adhesion on hard coatings of diamond, diamond-like carbon or amorphous diamond nor that it would be more difficult to adhere to these particular hard coating materials, as argued by the appellant.

The Board remarks in this respect that the appellant has **not** submitted any evidence for this or other effect(s) of the chromium nitride overcoat layer nor of any further advantage of the claimed razor blade when compared with the prior art D4.

4.3.3 However, the patent in suit had been revoked by the impugned decision and therefore the burden of proof shifts to the appellant (see Case Law of the Boards of Appeal, 7th edition 2013, section III.G.5.2.1). Although the deficiency with respect to such evidence had already been addressed by the Board in its communication annexed to the summons (see point IV above) the appellant has **not** discharged this burden of proof.

Consequently, the appellant's arguments based on these unproven effects or unproven improvements such as the alleged longevity obtained by the claimed razor blade cannot be accepted and therefore will **not** be considered for the problem-solution approach (see Case Law of the Boards of Appeal, 7th edition 2013, section I.D.4.2). The technical problem as proposed by the appellant therefore cannot hold.

4.3.4 In applying the problem-solution approach the Board considers that the definition of the technical problem to be solved, starting from the razor blade of the closest prior art D4, has to take account of the following facts:

First of all, D4 mentions the same technical problem as the patent in suit (see paragraph [0005]) of providing a good adhesion of PTFE to the hard coating layer (see D4, column 2, lines 14 to 16). D4 suggests the use of a

chromium containing material for the overcoat layer which has the intended function of reducing the tip rounding of the hard coated edge and to facilitate bonding of the outer layer to the hard coating while still maintaining the benefits of both (see column 3, lines 5 to 8) which function is identical to that of the patent in suit (see patent, paragraph [0016]). The outer layer of PTFE according to D4 serves the identical purpose as the outer layer of the patent in suit (see paragraph [0017]), i.e. to provide reduced friction (see column 3, lines 15 to 17).

Further, the hard coating of D4 - likewise as that of the patent in suit (see patent, paragraph [0015]) - serves to provide improved strength, corrosion resistance and shaving ability and can be made from carbon containing materials (e.g. diamond, amorphous diamond or DLC), nitrides, carbides, **oxides** or other ceramic materials (see column 2, lines 52 to 57).

The overcoat layer according to D4 is preferably chromium metal or a chromium platinum alloy (see D4, column 3, lines 9 and 10).

Finally, D4 does not distinguish between carbon-containing materials and these other ceramic materials including oxides (see column 2, lines 52 to 57) so that the skilled person must conclude that there exists a good adhesion adhesion between all these hard coating layer materials and the overcoat material.

Document D4 thus provides a very strong incentive for the skilled person to look for another chromium containing material, as an alternative to the preferred chromium metal or chromium platinum alloy, which is suitable to adhere to a hard coating of an oxide.

4.3.5 In view of the above, the problem is therefore considered to be only the provision of an alternative overcoat layer, which also adheres well to PTFE. A more specific or ambitious technical problem is **not** credible in view of the missing evidence or experimental data concerning a comparison with the razor blades of the state of the art (see point 4.3.3 above).

4.4 The Board considers that the solution to this problem is obvious to the person skilled in the art, for the following reasons.

4.4.1 D1 discloses a chromium nitride overcoat layer for adhering a PTFE layer to a stainless steel razor blade having a hard coating (see claims 1, 2 and 8). The hard coating of **chromium oxide** on the stainless steel razor blade substrate of D1 corresponds to one of the hard coatings disclosed in D4, i.e. an **oxide**, which serves in D1 to adhere the chromium nitride coating with the outer PTFE coating to adhere to the razor blade.

As acknowledged by the appellant chromium nitride represents a chromium containing material.

4.4.2 It is therefore considered to be obvious that the person skilled in the art would apply the chromium nitride overcoat of D1 as another embodiment of a "chromium containing material" onto the razor blade of D4 having a hard coating made from carbon containing materials, e.g. diamond, amorphous diamond or DLC.

Thereby the person skilled in the art arrives at the subject-matter of claim 1 of the first auxiliary request without inventive skills. Consequently, claim 1

of the first auxiliary request lacks inventive step (Article 56 EPC).

4.5 Since claim 1 of the first auxiliary request is narrower in scope than claim 1 of the main request which latter does not require that chromium nitride is in direct contact with the PTFE layer and the hard coating layer (compare points VII and VIII above) the above conclusion with respect to claim 1 of the first auxiliary request applies *a fortiori* to claim 1 of the main request.

The Board therefore concludes that its subject-matter does not comply with the requirements of Article 56 EPC either. The main request and the first auxiliary request are therefore not allowable under Article 56 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Nachtigall H. Meinders

Decision electronically authenticated