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**Datasheet for the decision
of 20 October 2005**

Case Number: T 0593/04 - 3.2.07

Application Number: 98307575.5

Publication Number: 0906814

IPC: B26B 21/40

Language of the proceedings: EN

Title of invention:
Razor with in situ sensor

Patentee:
Warner-Lambert Company LLC

Opponent:
The Gillette Company

Headword:

-

Relevant legal provisions:
EPC Art. 54, 56, 84, 123(2)(3), 107
EPC R. 20, 61, 64, 65

Keyword:
"Admissibility of the patent proprietor's appeal (yes)"
"Inventive step (yes)"

Decisions cited:
J 0026/95, T 0870/92, T 0019/97

Catchword:

-



Case Number: T 0593/04 - 3.2.07

DECISION
of the Technical Board of Appeal 3.2.07
of 20 October 2005

Appellant:
(Opponent)

The Gillette Company
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Boston, MA 02199-8004 (US)

Representative:

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Appellant:
(Patent Proprietor)

Warner-Lambert Company LLC
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Morris Plains, NJ 07950 (US)

Representative:

Johnstone, Helen
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Decision under appeal:

Interlocutory decision of the Opposition
Division of the European Patent Office posted
9 March 2004 concerning maintenance of European
patent No. 0906814 in amended form.

Composition of the Board:

Chairman: H. Meinders
Members: H. Felgenhauer
C. Holtz

Summary of Facts and Submissions

I. The patent proprietor as well as the opponent filed an appeal against the interlocutory decision of the Opposition Division maintaining European patent No. 0 906 814 as amended.

II. Independent claims 1, 11, 12 and 13 filed during the oral proceedings before the Board read as follows:

"1. A razor system comprising a razor head, having one or more blades (11, 12; 21, 22) and a handle (30; 40), wherein the razor head further comprises one or more *in situ* sensors for producing one or more signals based on forces encountered during shaving, each of the *in situ* sensors consisting of piezoelectric material (23) in the form of a polymer film (14, 15) which is directly applied to one or more of the one or more blades (11, 12; 21, 22), the handle (30, 40) further comprising one or more receptors (38) for receiving the one or more signals from the one or more *in situ* sensors and wherein conducting means (18, 34) extend from the one or more *in situ* sensors to the receptor (38) to provide an electrical circuit between the one or more *in situ* sensors and the one or more receptors (38)."

"11. A razor system comprising a razor head, having at least two blades (11, 12; 21, 22) and a handle (30; 40), wherein the razor head further comprises one or more *in situ* sensors for producing one or more signals based on forces encountered during shaving, each of the one or more *in situ* sensors consisting of piezoelectric material (23) being in the form of a spacer (23) located between two of the at least two blades, and the

handle (30, 40) further comprising one or more receptors (38) for receiving the one or more signals from the one or more *in situ* sensors and wherein conducting means (18, 34) extend from the one or more *in situ* sensors to the receptor (38) to provide an electrical circuit between the one or more *in situ* sensors and the one or more receptors (38)."

"12. A razor head having one or more blades (11, 12; 21, 22) and one or more *in situ* sensors for producing a signal based on forces encountered during shaving, each of the *in situ* sensors consisting of piezoelectric material (23) in the form of a polymer film (14, 15) which is directly applied to one or more of the one or more blades (11, 12; 21, 22)."

"13. A razor head having at least two blades (11, 12; 21, 22) and one or more *in situ* sensors for producing a signal based on forces encountered during shaving, each of the *in situ* sensors consisting of piezoelectric material (23) and being in the form of a spacer (23) located between two of the at least two blades."

III. Opposition had been filed against the patent as a whole based on the grounds of opposition according to Article 100(a) EPC (lack of novelty and of inventive step).

IV. The Opposition Division held that taking into account the amendments of the patent according to the then second auxiliary request it meets the requirements of the EPC.

In the decision under appeal *inter alia* the following documents have been taken into consideration

D1: US-A-3 274 682

D4: JP-A-04 105 685

D5: JP-A-04 250 189

D8: US-A-5 633 552

D17: US-A-5 251 376.

of the additional documents filed in the appeal proceedings the following are relevant for the present decision:

D23: English language translation of D4

of a compilation of documents D24 to D47 filed by the appellant/opponent with its grounds of appeal the documents:

D24: AMP Incorporated, "Piezo Film Sensors" information brochure, 1993

D26: AMP Incorporated, "Piezo Film Vibration Sensors: New Techniques for Modal Analysis", revised May 1993

D30: Pennwalt Corporation, "Kynar Piezo Film Product Summary and Price List", 1988

D31: Pennwalt Corporation, "Kynar Piezo Film Technical Manual", 1987 and

D39: US-A-5 136 202,

to which reference has been made in the oral proceedings before the Board. In the oral proceedings the appellant/opponent further submitted:

D48: US-A-3 842 499,

D49: US-A-3 842 502 and

a copy of a document headed "Assignment, Authorisation and Consent" dated 2 March 2004.

V. Oral proceedings before the Board of Appeal were held on 20 October 2005.

(i) The appellant/proprietor requested that the decision under appeal be set aside and that the patent be maintained with claims 1 to 20 and description pages 2 to 4, filed in these oral proceedings, and figures 1 to 9 as granted.

(ii) The appellant/opponent requested that the decision under appeal be set aside and the patent be revoked.

VI. The submissions of the appellant/proprietor can be summarised as follows:

- (i) There is no doubt with respect to the legal entity of Warner-Lambert Company LLC presently being party to the appeal proceedings as patent proprietor as well as appellant. Irrespective of whether the patent has been assigned to another company, the proprietor shown in the European Patent Register is the one to be considered as such in these appeal proceedings and is furthermore represented in a manner satisfying the requirements of the EPC in this respect.

If necessary the inconsistency possibly raised with its letter of 20 September 2005 could be clarified by documents relating to the identity of the patent proprietor. The oral proceedings could continue on the substantive issues of the appeal.

- (ii) Claims 1, 11, 12 and 13 have been amended with respect to the type of *in situ* sensors utilised. These claims have now been limited to a razor system and a razor head with *in situ* sensors of piezoelectric material, one of the two alternatives presented in dependent claims as granted.
- (iii) Claims 1 and 12, according to which each of the *in situ* sensors is in the form of a polymer film, have further been amended

concerning the location of each *in situ* sensor. By defining that the polymer film is directly applied to one or more of the one or more blades it has been made clear that for the razor system and the razor head defined by these claims each of the polymer films is attached to one of the blades and not to an element of the razor system or the razor head adjacent to the blade(s).

- (iv) The amendments of these claims are such that the requirement of Article 123(2) EPC is satisfied.
- (v) The subject-matters of claims 1 and 12 concerning a razor system and a razor head with one or more *in situ* sensors consisting of piezoelectric material in the form of a polymer film directly applied to one or more of the one or more blades are novel and involve an inventive step with respect to document D1 or D4 considered in combination with any of the documents D24 to D47 disclosing that piezoelectric sensors can be in the form of a polymer film.
- (vi) The subject-matters of claims 11 and 13 concerning a razor system and a razor head wherein each *in situ* sensor is in the form of a spacer are novel and also involve an inventive step with respect to documents D17, D48 or D49 considered in combination with document D1.

VIII. The submissions of the appellant/opponent can be summarised as follows:

- (i) The appellant/opponent questions the identity of the appellant/proprietor. The written submission from the proprietor dated 20 September 2005 contains the name Warner-Lambert Company LLC, but mentions also, below the signature of its representative, "for Eveready Battery Company Inc.", which made the identity of the true appellant/proprietor uncertain. From the assignment as filed in the oral proceedings it can be concluded that Warner-Lambert Company LLC assigned all its assets to Energizer Holdings. The latest recording in the EPO patent register relates to a change of Warner-Lambert Company into Warner-Lambert Company LLC, made on 6 April 2005. These circumstances raise the question of admissibility of the appeal filed by Warner-Lambert Company on 7 May 2004.

The representative has not presented any further authorisation, neither for Warner-Lambert Company LLC nor for Eveready Battery Company Inc, so it is doubtful whether the oral proceedings can continue.

- (ii) The amendments of claims 1 and 12 defining that each of the *in situ* sensors consists of piezoelectric material in the form of a polymer film lead to the requirement of Article 123(2) EPC not being satisfied,

since as sensors in the form of a polymer film only such made of a particular material, namely PVDF, have been originally disclosed.

(iii) The further amendments of claims 1 and 12 defining that the polymer film is directly applied to one or more of the one or more blades is unclear since it is not clearly defined whether the expression "directly applied" relates to a functional feature by which - an adjacently applied sensor - cooperates with a blade or whether it relates to the attachment of the sensor on a blade as a constructional feature.

(vii) The subject-matters of claims 1 and 12 concerning a razor system and a razor head with one or more *in situ* sensors consisting of piezoelectric material in the form of a polymer film do not involve an inventive step. According to a first line of argument the subject-matter of these claims is obvious if, starting from document D1 as closest prior art, the person skilled in the art considers one of documents D24 to D47 according to which it is known to use piezoelectric sensors in the form of a polymer film. According to a second line of argument the subject-matter of these claims is obvious if, starting from document D4 and D23 (its translation into English) as closest prior art, the person skilled in the art considers any of documents D24 to D47 according to which the use of piezoelectric

material in the form of a polymer film is well known.

(viii) The subject-matters of claims 11 and 13 concerning a razor system and a razor head wherein each *in situ* sensor is in the form of a spacer do not involve an inventive step with respect to any of the documents D17, D48 or D49 considered as closest prior art in combination with document D1.

Reasons for the Decision

1. *Identity of the appellant/proprietor*

1.1 A transfer of the patent can only be recorded in the European patent register at the request of an interested party, on production of supporting evidence and payment of the appropriate fee to the EPO. Such a transfer becomes effective before the EPO only at the date all conditions are considered fulfilled by it (Rule 20(1), (2) and (3) in conjunction with Rule 61 EPC).

In appeal proceedings, substitution of another party for the patent proprietor is possible only once the relevant department of first instance has made the entry or where there is clear-cut evidence of a transfer (see J 26/95, OJ EPO 1999, 668). The original party, as long as the transfer has not been proven, remains a party to the proceedings, with all its rights and obligations (see T 870/92, not published in OJ EPO). Further relevant case law can be found in "Case Law of

the Boards of Appeal of the European Patent Office", 4th ed. 2001, page 396 et seq. and page 507 et seq.

- 1.2 For the present patent the European patent register mentions "Warner-Lambert Company" as patent proprietor up to 6 April 2005, when a name change from "Warner-Lambert Company" to "Warner-Lambert Company LLC" was recorded. A name change, however, does not result in a change in legal identity (see also T 19/97, not published in OJ EPO).

No request for record of a transfer of the present patent has been submitted by any party with an interest in these proceedings, nor has the appropriate fee been paid.

- 1.3 The submission of 20 September 2005 and the assignment produced by the appellant/opponent in the oral proceedings - even though submitted by a party with an interest in the proceedings - cannot be considered as clear-cut evidence of such a transfer for the following reasons:

The submission does not include any agreement by both parties to such a transfer. The assignment lacks specific reference to the patent in suit and the agreement of the assignee to the transfer.

For the purposes of this decision the patent proprietor is therefore considered to be Warner-Lambert Company LLC.

2. *Admissibility of the appeal of the patent proprietor
(Article 107 and Rules 64 and 65 EPC)*

2.1 According to Article 107 EPC, any party to proceedings adversely affected by a decision may appeal; Rule 64(a) EPC requires the appeal to contain the name and address of the appellant in accordance with Rule 26(2)(c) EPC.

If the party adversely affected by the decision under appeal is identical to the party that appeals, the appeal is considered admissible in this respect (Rule 65 EPC). The decision under appeal, dated 9 March 2004, states Warner-Lambert Company as patent proprietor. The appeal has been filed on 7 May 2004 in the name of Warner-Lambert Company, within the applicable time limit.

The Board concludes from the above that the appeal having been filed by the same party as the one adversely affected by the decision under appeal, is admissible in this respect. The other conditions for an admissible appeal of the patent proprietor are also fulfilled.

2.2 At the oral proceedings the appellant/opponent argued for the first time in these appeal proceedings that the patent proprietor has ceased to exist at the time of filing the appeal, having transferred all its assets to another party. Therefore the appeal was to be considered inadmissible. Further, the assets must have included the patent in suit, so after the transfer of the patent to another party the present representative does not have the necessary authorization from the new proprietor and therefore it is doubtful whether the

oral proceedings could continue. The above conclusions could be reached from the following facts:

The submission of the patent proprietor filed on 20 September 2005 mentions Warner-Lambert Company LLC as appellant/proprietor, but also mentions "for Eveready Battery Company, Inc." at the bottom of the substantive argumentation sheets as well as below the signature of the representative at the end of the latter. It is thus not clear whether the former or the latter is the patent proprietor.

According to the "assignment, authorization and consent" of 2 March 2004 produced in the oral proceedings it is clear that Warner-Lambert Company LLC has ceased to exist even before the decision under appeal was communicated to the parties. According to this assignment the interest of Warner-Lambert Company LLC in the opposition against European patent 0 722 379 has in the end been transferred to Eveready Battery Company, Inc. Such an interest can, according to the case law of the Boards of Appeal, only be transferred together with all the business assets in the interest of which the opposition had been filed. These assets must have included the present patent. Thus Warner-Lambert Company LLC no longer had any assets, so no longer existed after the transfer on 2 March 2004. It could therefore not appeal the decision dated 9 March 2004.

- 2.3 The Board has considered this question insofar as it is relevant for the present case in which Warner Lambert Company LLC is the patent proprietor instead of being the opponent, as is the case in the opposition against

European Patent 0 722 379. Where a patent is at stake the issue is not whether the patentee has ceased to exist, but who is the proprietor of the patent, as that capacity is one of the factors determining the right to appeal.

- 2.3.1 The Board establishes that the submission of 20 September 2005 mentions "proprietor and appellant: Warner Lambert Company" as well as "submission by Warner Lambert Company LLC (proprietor/appellant)", as well as "Eric Potter Clarkson for Eveready Battery Company" at the bottom of each page of the substantive part of the submission and below the signature of the representative at the end of it.

For the Board at most it could provide a pointer to Eveready Battery Company, Inc. being the new proprietor. That issue, however, has already been dealt with in point 1.3 above.

- 2.3.2 The Board further establishes that the document entitled "assignment, authorization and consent", refers to the "interests" of Warner-Lambert Company LLC in the opposition proceedings against European Patent 0 722 379, which have been acquired by Energizer Holdings, Inc. on 28 March 2003, the latter contributing "its rights in said opposition proceedings" to Eveready Battery Company, Inc. The document further mentions that Warner-Lambert Company LLC "does sell, assign and transfer outright and absolute unto Eveready Battery Company, Inc. any and all interest Warner-Lambert Company LLC may have in and to such opposition proceeding". It is dated 2 March 2004.

Following the appellant/opponent's line of argumentation the transfer of the interests of Warner-Lambert Company LLC in the opposition proceedings entailed the transfer of all **related** assets of this company, i.e. these would by necessity have included the patent in suit, thus resulting in a transfer of the patent to Eveready Battery, Inc. That issue, however, has already been dealt with in point 1.3 above.

- 2.3.3 Apart from this document the appellant/opponent has not submitted any further evidence as to what has happened with the patent.

Considering the above the Board sees no reason to declare the appeal of the patent proprietor Warner Lambert Company LLC inadmissible.

3. *Representation*

The application at the basis of the patent in suit has been filed by a professional representative within the same association of attorneys as has been used by the applicant, Warner-Lambert Company, in the further grant, opposition and appeal proceedings. In the opposition and appeal proceedings the submissions have been signed by another professional representative within that association.

According to the decision of the President of the EPO (OJ EPO 1991, 489) a signed authorisation is only required by a professional representative in the case of:

- a change of representative involving a professional representative not being a member of the same association and without there being a notification that the previous representative's authorisation has been terminated,
- circumstances of the particular case necessitating this, particularly in case of doubt of the professional representative's entitlement to act.

For the Board neither of these cases applies nor does a change of name of the proprietor result in a change of the legal entity of the proprietor (see point 1 above), therefore there is no need to require an authorisation from Warner-Lambert Company LLC for the present professional representative. The oral proceedings before the Board therefore did not need to be interrupted nor adjourned for this matter.

4. *Amendments*

Article 123(3) EPC

- 4.1 Claims 1, 11, 12 and 13 have been amended as compared to claims 1, 13, 14 and 18 as granted in that in each of these claims the type of *in situ* sensor(s) referred to has been further defined. In the case of claims 1 and 12 this applies likewise with respect to the location of attachment of the sensor(s).
- 4.2 Referring in each of these claims to *in situ* sensors **consisting of piezoelectric material** and deleting dependent claims 2, 13, respectively 15 and 18 as granted, the claimed razor system and razor head are

each limited to one of the two alternatives as defined in these claims.

Claims 1, 11, 12 and 13 are further limited in this respect in that they define that the *in situ* sensors **consist of** such piezoelectric material, whereas according to dependent claims 2 and 13, respectively 15 and 18 as granted the *in situ* sensors **comprise** such material.

The requirements of Article 123(3) EPC are therefore met.

Article 123(2) EPC

4.3 The amendments have been made in response to an objection of the appellant/opponent according to which the *in situ* sensors made of piezoelectric material are only disclosed in the application as filed either in the form of a polymer film or in the form of a spacer.

The Board is satisfied that the present limitation to *in situ* sensors consisting of piezoelectric material, either in the form of polymer film (claims 1 and 12) or in the form of a spacer (claims 11 and 13), satisfies the requirement of Article 123(2) EPC, since such sensors are disclosed in the application as filed (see page 4, paragraph 1; page 5, paragraph 1).

4.4 The appellant/opponent objects to the further amendment of claims 1 and 12 according to which the piezoelectric material is in the form of a polymer film. It is of the opinion that in the application as filed such piezoelectric sensors are only disclosed for a

particular type of polymer, namely PVDF (polyvinylidene fluoride).

- 4.5 The disclosure in the first paragraph of page 4, referred to by the appellant/opponent in support of its argument, starts with the general statement according to which sensors are preferably constructed from either a piezoelectric material or a piezoresistive material which produces an electrical signal or resistance change when they are strained (page 4, lines 8 - 10). This general statement is followed by a reference to a **preferred type of piezoelectric material, namely PVDF as piezoelectric polymer**, which is referred to as being very flexible and as providing a good, strong electrical signal (page 4, lines 10 - 14). Following this statement it is indicated that "**One preferred form of the piezoelectric polymer sensor is a film** which is applied directly to or close to the blades within the razor head." (bold type added by the Board).

In the part of the description relating to PVDF as a particular type of piezoelectric polymer material no reference is made to its form (film) and vice versa in the part of the description relating to the form of the material (film) it is solely referred to as being polymer without a restriction to a particular type of polymer like PVDF.

From the foregoing it is evident that to the person skilled in the art reading this portion of the description that the statement according to which "one preferred form of the piezoelectric polymer sensor is a film ..." is not restricted to PVDF as a particular type of polymer. Thus the corresponding amendments of

claims 1 and 13 satisfy the requirement of Article 123(2) EPC.

- 4.6 Claims 1 and 12 have further been amended with respect to the location of the sensor in the form of a polymer film, defining that it is **directly applied** to one or more of the one or more blades as disclosed as an alternative in the patent in suit (column 3, lines 18, 19) and in the application as filed (page 4, lines 15, 16).

According to the appellant/opponent the introduction of the qualifier "directly applied" renders this feature and thus claims 1 and 12 unclear, since it can be understood as having two meanings, one referring to the cooperation or contact between an *in situ* sensor in the form of a polymer film and an adjacent blade due to forces encountered during shaving, and the other relating to the location and manner in which such an *in situ* sensor has been attached to the one or more blades.

According to the appellant/proprietor the expression "directly applied" clearly defines that the *in situ* sensor in question, being in the form of a polymer film, is attached to the blade.

- 4.7 The Board concurs with the view of the appellant/proprietor, which firstly is *prima facie* supported by the wording of this feature.

Secondly, considering the description of the patent in suit (column 3, lines 16 - 19) it follows from the context in which the term "directly applied" is used,

namely as an alternative to the *in situ* sensor being a film applied "close to the blades".

Furthermore, considering this feature as a structural feature relating to the attachment of each *in situ* sensor, and not as a functional feature defining the interaction of an *in situ* sensor with an associated blade, is in line with the remaining features of claims 1 and 12 defining a razor system and a razor head, respectively, by further structural features.

These amendments thus do not render the subject-matter of claims 1 and 13 unclear (Article 84 EPC).

5. *Novelty*

Novelty remained undisputed and as it can be concluded from the following discussion of the prior art with respect to inventive step, none of the documents considered discloses a razor system or a razor head comprising all of the features of claims 1, 11, 12 or 13, respectively. The subject-matters of these claims are thus novel in the sense of Article 54 EPC.

6. *Inventive step*

6.1 *Claims 1 and 12*

6.1.1 According to a first line of argument of the appellant/opponent the razor system according to claim 1 and the razor head according to claim 12 do not involve an inventive step starting from document D1 as closest prior art and considering any one of documents D24 to D47, in particular D24, D26, D30, D31 or D39,

according to which it is well known to the person skilled in the art that sensors of piezoelectric material can be in the form of a polymer film.

6.1.2 Compared with the features of claim 1, document D1 discloses a razor system comprising a razor head (3), having one blade (4) and a handle (2), wherein the razor head further comprises one *in situ* sensor (pick-up 17), for producing a signal based on forces encountered during shaving, the *in situ* sensor consisting of piezoelectric material (it is a piezoelectric crystal), the handle further comprising a receptor (18) for receiving the signal from the *in situ* sensor, and wherein conducting means (21, 22) extend from the *in situ* sensor to the receptor to provide an electrical circuit between the *in situ* sensor and the receptor (cf. column 2, lines 52 - 60; column 3, lines 40 - 63; figures 1 - 6).

The razor system according to claim 1, and correspondingly the razor head according to claim 12, differs in respect of the **structure** and the **location** of the *in situ* sensor in that the piezoelectric material is in the form of a **polymer film** which is **directly applied to a blade**.

Concerning the **structure of the sensor** document D1 discloses as only example of a suitable transducer an *in situ* sensor 17 in the form of a piezoelectric crystal (column 3, lines 40 - 49).

Concerning the **location and attachment of the sensor** document D1 discloses that the sensor is mounted in a complementary shaped recess (20) in the upper face of a

guard plate (9)(column 3, lines 50 - 52), which also serves as a rest for the blade in its operative position in which it is clamped between the guard plate (9) and a top plate (13)(column 3, lines 29 - 39).

Concerning the **interaction of the sensor and the associated blade** D1 discloses that the sensor is "so disposed in the upper face of the guard plate 9, that when the blade 4 is disposed in operative position in the head 3 it rests on the upper face of the pick-up 7 in intimate contact therewith" (column 3, lines 52 - 57).

- 6.1.3 Starting from document D1 as closest prior art the problem to be solved with respect to the subject-matter of claim 1 or 12 can be seen in the general desire to improve the sensitivity of the sensor provided.

This problem is solved according to claims 1 and 12 in that a different type of sensor is provided, which consists of piezoelectric material in the form of a polymer film.

Even further improvement of the sensitivity is obtained according to claims 1 and 12 in that the sensor consisting of piezoelectric material in the form of a polymer film is positioned at a location, differing from the one according to D1, by directly applying this polymer film to one or more of the one or more blades.

- 6.1.4 According to the appellant/opponent, it is obvious for the skilled person to replace the piezoelectric crystal sensor known from D1 by one being made of piezoelectric polymer film, which as such is known for its good sensitivity and its broad applicability as indicated by

any of documents D24 to D47. In the oral proceedings in particular documents D24 (page 7), D26 (page 11: table I "Comparison of Piezoelectric Materials"), D30 (page 8), D31 (page 1, figure 1 and page 9, "3. Piezo Film Properties") and D39 (figure 1 with piezo electric film means 16) have been relied upon.

Based on these piezoelectric sensors in the form of a polymer film, the properties of these sensors and the applications for these sensors disclosed in these documents, the appellant/opponent argued that using the information of any one of these documents evidently leads the person skilled in the art to replace, within the razor system according to D1, the sensor in the form of a piezoelectric crystal by one in the form of a polymer film being of higher sensitivity. In support of this argument the appellant/opponent referred in particular to the thickness of 9, 28, 52 or 110×10^{-6} meter disclosed in D24 for piezoelectric film (cf. page 7, "Typical Properties of Piezo Film"), indicating that any such thickness would be adequate to replace the piezoelectric crystal according to D1.

Further, in addition to replacing the known sensor by one of polymer film, it is obvious that such a film is placed directly on the associated blade to further improve the sensitivity of the sensor.

The appellant/proprietor did not object to the argument that it would have been obvious to solve the problem indicated above by replacing, within the razor system according to D1, the known sensor by one in the form of a polymer film. It, however, objected to the further

argument that it was obvious to apply the piezoelectric film directly to the blade.

6.1.5 The Board concurs with the opinion of the appellant/proprietor. There may be various reasons for the skilled person to replace the piezoelectric material of the known sensor, which is in the form of a piezoelectric crystal, by one in the form of a polymer film, in order to solve the problem indicated above. Beyond that there is no indication, however, to be derived from document D1 or any of documents D24 to D47 suggesting that the polymer film replacing the piezoelectric crystal should not be placed at the same location as the sensor known from D1, namely the guard plate, but at a different location, namely on the blade itself.

Besides D1 not giving any indication for such a change with respect to the location of the sensor, in this respect it also needs to be taken into consideration that, as pointed out by the appellant/proprietor, according to D1 the blade is clearly a disposable item. For this reason it cannot be considered as coming within regular design practice to change the location of the sensor from one in which the sensor is attached to the apparatus as such, to one in which it is - outside of the apparatus as such - fixed to the blade, which is known to be a disposable item.

6.1.6 Furthermore, the Board concurs with the argument of the appellant/proprietor that changing the location of the sensor, from the razor head being a portion of the razor system to a blade being a disposable item, requires various modifications on the part of the razor

system, in particular with respect to the conducting means. This necessitates a departure from the structure of the razor system according to document D1, for which no indication is given. This applies correspondingly with respect to the modification required on the part of the razor blade.

The razor system according to claim 1 thus involves an inventive step (Article 56 EPC) with respect to the one disclosed in document D1 considered in combination with any of documents D24 to D47. This applies for corresponding reasons with respect to the razor head according to claim 12.

6.1.7 According to a second line of argument of the appellant/opponent the razor system according to claim 1 and the razor head according to claim 12 do not involve an inventive step starting from document D4 and its translation into English given by D23 as closest prior art and considering either one of documents D24 to D47, in particular the ones referred to with respect to the first line of argument, according to which it is well known to the person skilled in the art that sensors of piezoelectric material can be applied in form of polymer films.

6.1.8 Document D4/D23 discloses an electric razor comprising an external edge which, during operation, comes into contact with a skin to be shaved. The external edge is covered "with material for enabling pressure received from an external section, to be converted to voltage or current" (first paragraph of the abstract). In document D23 the external edge is referred to as "outer blade" (cf. claim 1). The material covering the external edge

results in a piezoelectric sensor consisting of PZT and $\text{PbZrO}_3\text{-PbTiO}_3$ (cf. D4, "Constitution"). In D23 this material is referred to as PZT ($\text{PbZrO}_3\text{-PbTiO}_3$) and according to this document the PZT layer is formed only on a side which contacts the skin (page 7, paragraphs 3, 4). After the PZT layer is formed, as an abrasion-resistant layer, a TiN layer is formed (D23, page 8, paragraph 3; D4, figures 3a and 3b).

According to the appellant/opponent the razor system according to documents D4/D23 has the external edge as the blade to which an *in situ* sensor consisting of piezoelectric material is directly applied. Based on this understanding the razor system according to claim 1 is distinguished from the one according to documents D4/D23 essentially only in that the piezoelectric material is in the form of a polymer film, whereas according to documents D4/D23 it is in form of a PZT layer.

According to the appellant/opponent it is obvious that, starting from documents D4/D23 as closest prior art, the piezoelectric material of the sensor being PZT can be replaced by material in the form of a polymer film, which according to documents D24 to D47 is widely known. Consequently the razor system according to claim 1 and the razor head according to document D12 cannot be considered as involving an inventive step.

The appellant/proprietor did not object to the understanding according to which the external edge according to documents D4/D23 is considered as being a blade as referred to in claims 1 and 12 of the patent in suit.

The further allegation of the appellant/proprietor that the forces being measured by the *in situ* sensor in either case, namely the razor system according to claim 1 and the razor system according to documents D4/D23, differ, does not relate to a difference with respect to a structural feature of claims 1 and 12. The Board cannot consider this argument as being valid since a sensor directly applied to the blade of the razor system according to claim 1 or to a razor head according to claim 12 and a sensor directly applied to the external edge according to D4/D23 cannot be considered as sensing different forces if, as is undisputed, the external edge according to D4/D23 is considered to be a blade as provided according to claims 1 and 12.

6.1.9 Based on this understanding of the subject-matter of claim 1, and correspondingly of the one of claim 12, on the one hand and the understanding of the disclosure of D4/D23 on the other hand, the razor system according to claim 1 and the razor head according to claim 12 are essentially distinguished from D4/D23 in that the sensor consists of piezoelectric material in the form of a polymer film. As material for the known sensor, D4/D23 disclose PZT as indicated above.

6.1.10 The problem to be solved in view of D4/D27 can thus be seen in providing an alternative material for the sensor.

This problem is solved by the razor system according to claim 1 and the razor head according to claim 12 in that each of the *in situ* sensors consists of piezoelectric material in the form of a polymer film.

6.1.11 The appellant/proprietor argued with respect to obviousness that the person skilled in the art **could** replace the PZT layer sensor according to documents D4/D23 by one made of a piezoelectric polymer film but that no indication is given that he **would** actually do so.

Irrespective of whether or not the external edge according to documents D4/D23, which has openings for hair to be shaved (D23, page 3, paragraphs 2 and 3 from bottom; page 7, paragraph 2) and which cooperates with an inner blade moved for shaving (D23, claim 1; paragraph bridging pages 6 and 7), can be understood as being a blade as mentioned in claims 1 and 12 the Board concurs with this argument of the appellant/proprietor.

The reason is that the appellant/opponent has not given a convincing reason why the person skilled in the art **would** actually replace the sensor of PZT material as known from documents D4/D23 by one consisting of piezoelectric material in the form of a polymer film.

The Board furthermore is of the opinion that it needs to be taken into consideration that the PZT layer sensor according to documents D4/D23 is, due to its direct contact with the skin to be shaved, covered by an abrasion resistant TiN layer (cf. D23, page 8, paragraph 3). No advantage can be achieved by replacing the PZT layer with a polymer film as it has neither

been shown that it is compatible with such a TiN abrasive resistant layer, nor that, with respect to material properties related to abrasion (like pressure resistance etc.) it is as suited as a layer of PZT.

In the view of the Board this holds true irrespective of D23 disclosing, for a different embodiment without a piezoelectric sensor, that a film of insulation material being made of polyimide, teflon, parylene, etc. provided as insulation layer on the external edge is covered by a TiN layer. According to this embodiment increase of the resistance of the TiN layer due to decreasing thickness of this layer serves as an indicator for the abrasion of the layer (page 10, paragraph 2 from bottom; paragraph bridging pages 10, 11). Since according to this embodiment a piezoelectric sensor in the form of a polymer film is not provided, the fact that different plastic materials can be covered by a layer of TiN cannot be considered as suggesting that a piezoelectric material in the form of a polymer film could likewise be covered by a layer of TiN and more importantly that the plastic material should be replaced by piezoelectric material in the form of a polymer film.

Consequently the razor system according to claim 1 and, for corresponding reasons, the razor head according to claim 12 involve an inventive step (Article 56 EPC) with respect to documents D4/D23 considered in combination with any one of documents D24 to D47.

6.2 *Claims 11 and 13*

6.2.1 According to the appellant/opponent the subject-matter of claims 11 and 13 concerning a razor system and a razor head, wherein each *in situ* sensor is in the form of a spacer, do not involve an inventive step with respect to document D17, D48 or D49 considered as closest prior art in combination with document D1.

Documents D48 and D49 have been introduced by the appellant/opponent in the oral proceedings before the Board. Although late filed, these documents were admitted into the proceedings since *prima facie* they come closer to the subject-matter of claims 11 and 13 than document D17 relied upon with respect to a razor system with an *in situ* sensor consisting of piezoelectric material in the form of a spacer. This will become apparent from the following discussion of these documents.

According to the appellant/opponent it is obvious for the person skilled in the art starting from document D17, D48 or D49 as closest prior art to mount two or more blades by placing a spacer in between, which simultaneously serves as an *in situ* sensor, and which for one blade is known from document D1, thus rendering the subject-matter of claims 11 and 13 obvious.

According to the appellant/proprietor, D17 discloses a razor system in which cutting forces act to position the blades. The razor system operating favourably in this manner there is no need to further measure these cutting forces acting on the blade. Thus document D17

considered in combination with document D1 does not lead to the subject-matters of claims 11 and 13.

With respect to documents D48 and D49 the appellant/proprietor argued that both relate to a razor system comprising two blades which are assembled in a blade assembly in which both blades are permanently joined to a spacer. According to these documents the assembly can be used in conventional razor systems. Consequently, such an assembly could possibly be used in the razor system according to document D1 with an *in situ* sensor mounted in the upper face of a guard plate. Combined consideration of document D48 or D49 with document D1 however does not lead to the assembly according to documents D48 and D49 being modified such that the *in situ* sensor provided on the razor head according to document D1 is moved to become a spacer in the assembly of the two blades. Furthermore according to the appellant/proprietor it needs to be taken into consideration that such a modification would require substantial constructional changes to the assembly of razor blades according to D48 or D49 as well as to the razor system according to D1. For neither one of these changes an indication is given.

- 6.2.2 Document D17 discloses a razor system with a razor head in which a single or double razor blade is yieldingly mounted such that the position of the razor blades remains constant during shaving, thus leading to an optimum shaving efficiency (column 2, lines 9 - 23). Pressure applied to a blade during shaving pivots the blade against a compression spring, this pivoting movement being enhanced by a guide strip which assumes an active role by transferring the frictional forces

that occur during shaving in pivoting the respective blade (column 5, lines 3 - 24).

The razor system according to claim 11 differs from the one according to D17 essentially in that the razor head comprises one or more *in situ* sensors and that each of the sensors consists of piezoelectric material being in the form of a spacer located between two blades.

Corresponding to the arguments of the appellant/proprietor the Board is of the opinion that since according to document D17 cutting forces acting on the blades are directly used to optimally position the blades there is no need to also measure these forces.

If, irrespective of the above considerations starting from document D17, a problem is to be solved according to which forces encountered during shaving on the blades are to be measured (cf. patent in suit, column 1, lines 23 - 29) consideration of document D1 could possibly lead to a sensor being provided on an element corresponding to the guard plate of the razor head according to this document, on which the blade assembly according to D17 would then rest.

No indication, however, is given to change the blade assembly according to D17 comprising two blades being fused or glued together (column 4, lines 21 - 27; figures 2, 4, 5, 7, 9, 10) such that the sensor is not located outside the blade(s) as it is the case according to D1 but provided in the form of a spacer in between the two blades of the blade assembly according to D17.

Starting from document D1 as closest prior art and considering document D17 would for the same reasons as given above likewise not lead to the subject-matter of claim 11. As indicated above no indication is given for a change of the location of the sensor from a guard plate of the razor head as known from D1 to a location in between two blades, which according to D17 are provided in an assembly comprising the two blades in fixed arrangement.

- 6.2.3 The above considerations hold correspondingly true with respect to document D48 or D49 considered in combination with document D1.

According to document D48, two blades are provided within a blade assembly for use in conventional razor systems (column 2, lines 31 - 58). For this purpose the two razor blades are permanently joined to a spacer (column 2, lines 46 - 52; column 4, lines 62 - 65).

The razor system according to claim 11 differs from the one according to document D48 essentially in that the razor head comprises one or more *in situ* sensors and that each of the sensors consists of piezoelectric material being in the form of a spacer located between two blades.

In view of these distinguishing features and starting from document D48, a problem to be solved could be seen in the measurement of forces encountered on the blades during shaving (cf. patent in suit, column 1, lines 23 - 29).

As indicated by the appellant/proprietor D48 is completely silent with respect to such a problem and with respect to its solution.

Starting from document D48, consideration of document D1 could possibly lead to the sensor assembly according to D17 - due to its compatibility with conventional razor systems - being used with a razor head according to document D1. In such case the blade assembly would rest on the guard plate on which according to D1 a sensor is mounted.

Since both blades are permanently joined to the spacer, e.g. by spot welding (cf. column 6, lines 28 - 38) it is clear that provision of one sensor as provided according to D1 suffices.

Beyond that the combined consideration of documents D48 and D1 does not give any indication which would lead to the sensor being provided as spacer between two blades as defined in claim 11.

Furthermore provision of a sensor in the form of a spacer in the blade assembly according to D48 would require substantial constructional modifications to the razor system according to D1 as well as to the razor blade assembly according to D48. For neither one of these modifications an indication is given.

The above applies correspondingly with respect to document D49 according to which likewise two blades are permanently fixed to a spacer element (cf. column 1, lines 53 - 56; column 2, lines 16 - 26).

The above considerations with respect to claim 11 apply correspondingly with respect to claim 13, for which the distinguishing features with respect to documents D17, D48 and D49 are the same as the ones considered with respect to claim 11.

6.2.4 The subject-matter of claims 11 and 13 thus involves an inventive step (Article 56 EPC).

Order

For these reasons it is decided that:

1. The appeal of the appellant/opponent is dismissed.
2. The decision under appeal is set aside.
3. The case is remitted to the first instance with the order to maintain the patent with the following documents, filed in the oral proceedings:
 - claims 1 - 20,
 - description pages 2 to 4, and
 - figures 1 to 9 as granted.

The Registrar:

The Chairman:

G. Nachtigall

H. Meinders