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**Datasheet for the decision
of 10 May 2007**

Case Number: T 0923/05 - 3.2.04

Application Number: 96930087.0

Publication Number: 0845956

IPC: A46B 7/06

Language of the proceedings: EN

Title of invention:
Toothbrush

Patentee:
SmithKline Beecham Consumer Healthcare GmbH

Opponent:
UNILEVER N.V. Rotterdam/UNILEVER PLC London

Headword:
-

Relevant legal provisions:
EPC Art. 100(a)

Keyword:
"Inventive step - main request, first and second auxiliary requests (no); third auxiliary request (yes)"

Decisions cited:
-

Catchword:
-



Case Number: T 0923/05 - 3.2.04

D E C I S I O N
of the Technical Board of Appeal 3.2.04
of 10 May 2007

Appellant: UNILEVER N.V. Rotterdam/UNILEVER PLC London
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 28 April 2005
rejecting the opposition filed against European
Patent No. 0845956 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: M. Ceyte
Members: C. Scheibling
T. Bokor

Summary of Facts and Submissions

I. By its decision dated 28 April 2005 the Opposition Division rejected the opposition. On 28 June 2005, the Appellant (opponent) filed an appeal and paid the appeal fee simultaneously. The statement setting out the grounds of appeal was received on 2 September 2005.

II. The patent was opposed on the grounds based on Article 100(a) EPC (lack of inventive step).

III. The following documents played a role in the present proceedings:

D1: WO-A-92/17093

D2: DE-A-1 657 299

D6: US-A-3 188 672

IV. Claims 1 and 14 according to the main request (as granted) read as follows:

"1. A toothbrush comprising a handle (1) with a head (2), both made of plastics material, the head (2) and the handle (1) being disposed along a longitudinal toothbrush axis, the head having a base end (3) adjacent to the handle and a tip end (8) remote from the handle, the head (2) having bristles (4) extending from a bristle face (5) of the head (2), the head (2) comprising bristle-bearing segments resiliently and flexibly linked to each other, the head (2) comprising two such segments, the first segment being a substantially rigid base segment (6) integrally rigidly adjoining the

toothbrush handle (1) and extending from the base end (3) of the head (2) to a link region (9, 10, 16, 17, 20, 21) situated between the base end (3) and the tip segment (7), and a second segment being a substantially rigid tip segment (7) extending from the tip end (8) of the head (2) to the link region (9, 10, 16, 17, 20, 21), the tip segment (7) being flexibly and resiliently linked at the link region (9, 10, 16, 17, 20, 21) to the base segment (6), the link region (9, 10, 16, 17, 20, 21) comprising a widthways extending groove (9, 16, 20) in the plastic material of the head, characterised in that the groove (9, 16, 20) is open at the bristle face (5) of the head (2) having a depth of part of the thickness of the head (2) such that the plastics material at the bottom of the groove forms a thin link of plastics material between the segments, and the groove (9, 16, 20) is wholly or partly filled with an elastomeric material (10)."

"14. A process in which a toothbrush as claimed in anyone of the preceding claims is made, being an injection moulding techniques in which a plastics material skeleton is first made by injection moulding, then elastomer is introduced by a subsequent injection moulding step, in which the elastomer (10) is injected as a hot fluid and bonds to the plastics material."

Claim 1 according to the first auxiliary request is a combination of the features of claims 1 and 7 as granted. Claim 12 according to the first auxiliary request refers to a process in which a toothbrush as claimed in claim 6 is made and comprises in

combination the features of claims 14 and 15 as granted.

Claim 1 according to the second auxiliary request is a combination of the features of claims 1, 7 and 8 as granted. Claim 12 according to the second auxiliary request comprises in combination the features of claims 14 and 15 as granted.

Claim 1 according to the third auxiliary request reads as follows:

"1. A process in which a toothbrush comprising a handle (1) with a head (2), both made of plastics material, the head (2) and the handle (1) being disposed along a longitudinal toothbrush axis, the head having a base end (3) adjacent to the handle and a tip end (8) remote from the handle, the head (2) having bristles (4) extending from a bristle face (5) of the head (2), the head (2) comprising bristle-bearing segments resiliently and flexibly linked to each other, the head (2) comprising two such segments, the first segment being a substantially rigid base segment (6) integrally rigidly adjoining the toothbrush handle (1) and extending from the base end (3) of the head (2) to a link region (9, 10, 16, 17, 20, 21) situated between the base end (3) and the tip segment (7), and a second segment being a substantially rigid tip segment (7) extending from the tip end (8) of the head (2) to the link region (9, 10, 16, 17, 20, 21), the tip segment (7) being flexibly and resiliently linked at the link region (9, 10, 16, 17, 20, 21) to the base segment (6),

the link region (9, 10, 16, 17, 20, 21) comprising a widthways extending groove (9, 16, 20) in the plastic material of the head,
the groove (9, 16, 20) is open at the bristle face (5) of the head (2) having a depth of part of the thickness of the head (2) such that the plastics material at the bottom of the groove forms a thin link of plastics material between the segments, and the groove (9, 16, 20) is wholly or partly filled with an elastomeric material (10),
in its unstressed state the bristle face (5) of the tip segment (7) forms an angle of less than 180° with the bristle face (5) of the base segment (6),
being an injection moulding techniques in which a plastics material skeleton is first made by injection moulding, then elastomer is introduced by a subsequent injection moulding step, in which the elastomer (10) is injected as a hot fluid and bonds to the plastics material,
characterised in that firstly a plastics material skeleton of only the plastics material parts is made by injection moulding, with the bristle face (5) substantially flat, then the tip segment (7) is folded such that the tip segment forms an angle of less than 180° with the with the bristle face (5) of the base segment (6), then the elastomer (10) is injected into the link region (9, 10, 16, 17, 20, 21)."

V. Oral proceedings before the Board took place on 10 May 2007.

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

He mainly argued as follows:

The problem to be solved by the invention cannot be seen in avoiding that the elastomeric material in the grooves wears away. This problem is neither identified in the application as filed nor solved by the patent in suit. The problem to be solved is therefore to find an alternative to a toothbrush provided with a groove and elastomeric material. There are only two ways of providing a groove, by forming a groove either on the back side of the head or the bristle side. Thus, to have the groove on the bristle side was an obvious choice, all the more D2 and D6 show such a groove arrangement. Consequently, claim 1 as granted does not involve an inventive step.

The additional features of the first and second auxiliary requests are obvious design alternatives which do not solve any particular technical problem and which are suggested by D1, Figure 3; D3, Figure 1 and D2, Figures 5, 15, 17. Therefore, these features cannot confer inventiveness to the claimed subject-matter either.

The process of making a toothbrush according to the third auxiliary request is mainly based on state of the art processes and it is clear for a skilled person that there is no other way of producing an angled tooth brush. Thus, the subject-matter of claim 1 of the third auxiliary request does not involve an inventive step either.

The Respondent (patentee) countered the Appellant's arguments and mainly argued as follows:

The problem of elastomeric material being worn away can be derived from the original application, because it is clear therefrom that by providing the elastomeric material at the bristle face, the bristles protect the elastomeric material against rubbing.

Furthermore, the toothbrush according to D1 is of a different structure comprising a frame and does not exhibit grooves in the meaning of the patent in suit.

The toothbrush according to D2 is also of a radically different structure comprising a stiff base and no elastomeric material. Furthermore, in D2 the grooves are not filled with a flexible material. D6 shows a toothbrush having grooves at the back and the bristle side, but no elastomeric material in the grooves. Therefore, D6 cannot address the problem of elastomeric material being worn away.

The additional features claimed in the first and the second auxiliary request contribute to solve the problem of concentrating the flexibility in the tip of the head and of cleaning the back surface of the teeth. None of the cited documents addresses these problems. Therefore, claim 1 according to the first and second auxiliary requests involve an inventive step.

None of the cited documents refers to a process for making a toothbrush as claimed. Therefore, the subject-matter of claim 1 of the third auxiliary request involves an inventive step.

The Respondent requested that the appeal be dismissed and the patent be maintained as granted (main request) or that the decision under appeal be set aside and the patent be maintained on the basis of the claims according to the first or the second auxiliary requests filed with letter of 12 January 2006 or on the basis of the claims of the third auxiliary request comprising claims 1 and 2 as filed with letter of 2 April 2007 and claims 3 to 12 as filed with letter of 12 January 2006.

Reasons for the Decision

1. The appeal is admissible.
2. *Main request - Inventive step:*
 - 2.1 The toothbrush according to claim 1 as granted differs from that of D1 in that the groove is open at the bristle face. This point was undisputed by the parties.
 - 2.2 The technical problem stated in the patent specification (paragraph [0003]) is "to provide a toothbrush in which the flexibility of the head is concentrated in the tip of the head remote from the handle so as to improve the ability of the toothbrush to clean surfaces of the teeth which face the back of the mouth".
 - 2.3 D1 describes a toothbrush with a head comprising two segments which are flexibly and resiliently linked by a link region in form of a groove in the plastic material of the head (D1, page 3, lines 3 to 6;

figures 3C, 3D). When the two segments are in an angled position with respect to each other as shown in Figure 3D the bristles of the tip segment are inclined with respect to the handle and thus provide a better access the back side of the teeth.

Thus, D1 already solves the problem stated in the patent specification so that the problem to be solved must be redefined.

- 2.4 Starting from D1 as closest prior art and considering the features distinguishing the toothbrush of claim 1 from that disclosed by D1, the inherent objective problem solved by the invention may be seen in providing an alternative to the link region of the tooth brush head.
- 2.5 The Respondent considered that the problem to be solved by the invention is that of preventing the soft elastomeric material in the grooves wears away during brushing.
- 2.6 However, the application as filed does neither refer nor even suggest that there could be a problem of elastomeric material being worn away so as to reveal the sharp edges of the grooves. There are four embodiments shown in the figures. The first is represented by figures 1 to 4, the second by figures 5 to 8, the third by figures 9 to 11 and the fourth by figures 12 to 15. The second, third and fourth embodiments which also are part of the claimed invention do not solve the problem of elastomer being worn away, since in these embodiment there is elastomer on the reverse face of the tooth brush head.

Moreover such problem is not solved by the claimed invention, unless claim 1 requires that the groove must not extend through the head and also that there is no elastomer on the reverse face. No such features are found in claim 1.

The Respondent argued that providing the elastomer at the bristle side implies that the bristles protect the elastomer, which is an advantage that can be recognised as such and that therefore the problem can be derived from the application. However, the application does not mention this advantage and an alleged effect of a described feature cannot be taken into account when determining the problem underlying the invention for the purpose of assessing inventive step, if it cannot be deduced by the skilled person from the application as filed considered in relation to the closest prior art.

- 2.7 It is common knowledge for a skilled person that in order to obtain a flexible link the thickness of the head has to be reduced, i.e. a groove has to be formed. There are only two possibilities of forming a groove, i.e. by providing either the back of the head or the bristle side of the head with a groove. To have the groove open at the bristle face is an obvious alternative to having the groove open at the non-bristle bearing face or back of the head as known from D1. Accordingly it would be obvious to the skilled person to choose a groove open at the bristle face as an alternative to a groove open at the back of the head. To fill such a groove, open at the bristle face with an elastomeric material is taught by D1 which discloses the filling of a groove with elastomeric

material to improve the flexibility and/or resilience of the head and to reduce the contamination of the grooves by toothpaste deposits.

Moreover, to have the groove open at the bristle side for forming a link region is already depicted in D6, figure 4 and D2, figure 5, so that there was obviously no prejudice against this disposition.

- 2.8 The Respondent argued that the toothbrush of D1 is of a different kind and does not exhibit a groove in the meaning of the patent in suit.

It is correct that in D1 the segments of the head are located in a frame. However, the wording of claim 1 does not exclude such a disposition. Furthermore, according to the patent in suit a "groove" is a reduction of the thickness of the head that can have different cross-sectional shapes (paragraph [0016]), and may pass, in places, completely through the thickness of the head leaving bridges of head material (paragraph [0015]). Thus, Figure 3 of D1 shows a groove (38) in the meaning of the patent in suit.

The Respondent also argued that the claimed solution has the further advantage of avoiding the wear problem. However, if the claimed solution is obvious for a skilled person in view of the closest prior art document and the objective problem to be solved, then even if the claimed solution inevitably achieves an additional advantage which solves a further problem, such a "bonus effect" cannot confer inventiveness on an otherwise obvious solution.

Consequently, the subject-matter of claim 1 according to the main request does not involve an inventive step.

3. *First auxiliary request:*

3.1 Amendments:

Claim 1 of the first auxiliary request comprises in addition to the features of claim 1 as granted, those of claim 3 as originally filed (WO-A-97/07707) (claim 7 as granted), i.e. that "the base segment extends for at least 60% of the distance between the base and the tip of the head."

This amendment does not contravene the requirements of Article 123 EPC.

3.2 Inventive step:

3.2.1 This additional feature is related to the problem stated in paragraph [0003] of the patent specification that is "to provide a tooth brush in which the flexibility of the head is concentrated in the tip of the head remote from the handle, so as to improve the ability of the tooth brush to clean surfaces of the teeth which face to back of the mouth."

3.2.2 However, D1, Figure 3, shows a toothbrush exhibiting a head comprising two segments and a link region, the first segment adjoining the handle comprises seven tufts of bristles and thus, is longer than the second tip segment that comprises six tufts. Furthermore, it is obvious for a skilled person that flexibility will be all the more concentrated in the tip of the head as

the link region is located near of the end of the tip of the head.

Moreover, the patent in suit does not disclose any special effect in relation with the specific value of at least 60% of the distance between the base and the tip. Therefore, this value can only be considered as a normal design concept.

3.2.3 Consequently, the subject-matter of claim 1 according to the first auxiliary request does not involve an inventive step.

4. *Second auxiliary request:*

4.1 Amendments:

Claim 1 of the second auxiliary request comprises in addition to the features of claim 1 of the first auxiliary request, those of claim 4 as originally filed (claim 8 as granted) i.e. that in its unstressed state the bristle face of the tip segment forms an angle of less than 180° with the bristle face of the base segment.

This amendment does not contravene the requirements of Article 123 EPC.

4.2 Inventive step:

4.2.1 This additional feature is related to the same problem as stated above, i.e. that of providing a tooth brush in which the flexibility of the head is concentrated in the tip of the head remote from the handle, so as to improve the ability of the tooth brush to clean surfaces of the teeth which face to back of the mouth.

4.2.2 D1 addresses the problem of reaching all parts of the teeth (i.e. also the back of the teeth), see page 1, second paragraph and indicates that one of the attempts to overcome some of these difficulties consisted in proposing angled-head toothbrushes (page 1, lines 21 to 23), i.e. toothbrushes comprising successive segments which form an angle of less than 180° with each other. It is clear for a skilled person that in use the bristles of the tip segment of a toothbrush with an angled-head are inclined toward to the handle and thus, that the bristles of this segment better access the back side of the teeth.

Furthermore, D2 addresses the problem of cleaning the interdental spaces (page 2, second paragraph) and proposes a toothbrush comprising successive segments which form an angle of less than 180° with each other, so that the bristle face of the toothbrush has a general concave shape.

4.2.3 Thus, it is known from D1 and D2 to improve the cleaning of the less accessible parts of the teeth by providing a toothbrush comprising segments which form an angle of less than 180° with each other.

4.2.4 Therefore, the additional features of claim 1 of the second auxiliary request correspond merely to an obvious design concept in view of the problem to be solved. Consequently, the subject-matter of claim 1 of the second auxiliary request does not involve an inventive step either.

5. *Third auxiliary request:*

5.1 Amendments:

Claim 1 according to the third auxiliary request has been drafted as a process claim and comprises the features of claims 1, 8, 14 and 15 as granted. The requirements of Article 123 EPC are met.

5.2 Inventive step:

5.2.1 This process for making a toothbrush comprises the steps of first making a plastic material skeleton with a substantially flat bristle face, then folding the tip segment to form an angle of less than 180° with the bristle face of the base segment and finally injecting the elastomer into the link region.

In the claimed first moulding step an injection mould part is provided with bristle pins to define the bristle holes. Since the head of the plastic material skeleton has a substantially flat bristle face, the bristle pins can be easily removed from this part mould.

The above steps are neither known nor suggested by any of the documents cited in the proceedings.

5.2.2 The Appellant argued that the claimed process cannot involve an inventive step, since there is no other economical and easy way of producing a toothbrush with an angle head.

However, in absence of any evidence such a statement cannot be accepted, all the more the Respondent has indicated another possible way of manufacturing an angled head toothbrush, showing that other solutions

would be possible as well. The Appellant argued that the alternative manufacturing process referred to by the Respondent would be more expensive than the claimed one and thus, disregarded by a skilled person. The fact that a process might be more or less expensive is irrelevant for assessing inventive step, a process being not rendered obvious simply because it is economical. Furthermore, comparing the costs of the claimed process with respect to another implies knowledge of the invention and thus can only be based on hindsight.

5.2.3 Accordingly, in absence of any pointer in the cited prior art that could lead the skilled person to the claimed process, the subject-matter of claim 1 according to the third auxiliary request involves an inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside
2. The case is remitted to the department of first instance with the order to maintain the patent in the following version:

Description: columns 1 to 10 filed during oral proceedings

Claims: 1 and 2 filed with letter of 2 April 2007
3 to 12 filed with letter of 12 January 2006 (third auxiliary request)

Drawings: Figures 1 to 7 filed during oral proceedings

The registrar:

The Chairman:

G. Magouliotis

M. Ceyte