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D E C I S I O N
of 14 May 2003

Case Number: T 0762/02 - 3.2.4

Application Number: 99203321.7

Publication Number: 0966901

IPC: A46B 7/06

Language of the proceedings: EN

Title of invention:
Contouring toothbrush head

Applicant:
Colgate-Palmolive Company

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - yes"

Decisions cited:
-

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Case Number: T 0762/02 - 3.2.4

D E C I S I O N
of the Technical Board of Appeal 3.2.4
of 14 May 2003

Appellant: Colgate-Palmolive Company
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 18 February 2002 refusing European patent application No. 99 203 321.7 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: C. A. J. Andries
Members: M. G. Hatherly
H. Preglau

Summary of Facts and Submissions

I. On 17 April 2002 the appellant (applicant) filed a notice of appeal against the examining division's decision of 18 February 2002 refusing the European patent application 99 203 321.7 (publication EP-A-0 966 901), a divisional application of European patent application 96 944 453.8 (publication EP-A-0 871 382 and International publication WO-A-97/24048), for lack of inventive step.

The appeal fee was paid simultaneously and the statement of grounds of appeal was received on 18 June 2002.

II. After correspondence between the appellant and the board, oral proceedings took place on 14 May 2003 during which the appellant presented a new version of the patent application, arguing that the subject-matter of its independent claims was novel and inventive.

III. In this new version, claim 1, the sole independent device claim, reads:

"A toothbrush:
- having an articulated head and a handle (12), said head having two sections (14, 16) to thereby define a composite head having an upper and a lower surface;
- said two sections (14, 16) having respective longitudinally spaced ends facing each other;
- each said head sections (14, 16) having a plurality of tufts of bristles (20, 22; 20, 70; 20,72) extending from a bottom surface (24, 26) thereof;
- an elastomer section (18) located between said spaced ends;

- which elastomer section (18) is deformed during brushing whenever said two head sections (14, 16) bend relative to each other;
- the head section (14) being nearest to the handle being collinear with the handle (12);
- the section furthest from the handle having a free end facing away from said handle;
- said elastomer section (18) being made of a first elastomeric material;
- the handle (12) having a handgrip area made of a second elastomeric material;
- the first and second elastomeric materials being different and having different shore hardness values."

Claim 5, the sole independent method claim reads:

"A method to produce a toothbrush according to one of the previous claims, comprising the step of moulding a skeleton of a head and a handle (12) and locating or injecting a first elastomeric material (18) in part of the head, characterized in locating or injecting a second elastomeric material on part of the handle (12), wherein the first elastomeric material and the second elastomeric material are materials having different shore hardness values."

IV. The following documents are on file

D1: WO-A-92/17093

D2: FR-A-2 652 245

D3: DE-U-9 402 125.2

D4: EP-A-0 336 641

D5: US-A-5 373 602

D6: DE-C-3 923 495

D7: WO-A-94/05183

D8: DE-A-1 657 299

D9: GB-A-647 924

D10: US-A-2 685 703

D11: US-A-3 188 672

D12: GB-A-412 414

D13: GB-A-189 335

D14: FR-A-1 247 433

D15: DE-C-3 840 136

D16: US-A-5 393 796

D17: WO-A-96/02165 (published 1 February 1996).

V. The appellant requests that the decision of the examining division be set aside and that a patent be granted in the following version:

- claims 1 to 5 as filed during the oral proceedings,

- description: pages 1 to 8 as filed during the oral proceedings, and

- drawings: Figures 1 to 4 and 6 to 8 as filed during the oral proceedings.

Reasons for the Decision

1. The appeal is admissible.

2. *Article 76(1) EPC*

The present European patent application is a divisional application of European patent application 96 944 453.8 which has the European publication number EP-A-0 871 382 and was published by WIPO under International publication number WO-A-97/24048.

Article 76(1) EPC states that the "European divisional application ... may be filed only in respect of subject-matter which does not extend beyond the content of the earlier application as filed".

Moreover Article 123(2) EPC states that "A European patent application or a European patent may not be amended in such a away that it contains subject-matter which extends beyond the content of the application as filed."

Therefore the present divisional application needs to be compared with the parent application WO-A-97/24048 and also with the originally filed divisional application.

3. *Article 76(1) EPC - claim 1*

3.1 The present claim 1 is closest to claim 1 of

WO-A-97/24048.

3.2 The feature of

> "said spaced ends joined by a thin bridge formed integrally with said two sections"

in lines 6 and 7 (page numbering) of claim 1 of WO-A-97/24048 is not present in the present claim 1.

This is allowable since the feature is not present in independent claim 8 of WO-A-97/24048 (and the head shown in Figure 6 of WO-A-97/24048 has no integral bridge).

3.3 Line 8 of claim 1 of WO-A-97/24048 states that the tufts of bristles extend "orthogonally" from a bottom surface.

The omission of "orthogonally" from the present claim 1 is allowable because "orthogonally" is not present in independent claim 10 of WO-A-97/24048 (and the tufts 70 shown in Figure 7 of WO-A-97/24048 do not extend orthogonally from the bottom surface of head section 16).

3.4 The feature

> "one of said head sections being coaxial with said handle"

in line 10 of claim 1 of WO-A-97/24048 is amended in lines 12 and 13 of the present claim 1 to

> "the head section (14) being nearest to the handle

being collinear with the handle (12)".

The common meaning of "collinear" is "lying on the same line", this means in a straight line regardless of whether one is viewing from above or from the side. The common meaning of "coaxial" is very similar, namely "having a common axis", again regardless of from where one is viewing.

The appellant argued in lines 4 to 7 on page 3 of the letter of 7 January 2003 that "collinearity means the same axis in at least one view".

If "collinear" is to have anything other than the common meaning then the board considers that this should be clear from the present application. However lines 32 to 35 of page 3 of the present description (equivalent to column 3, lines 1 to 4 of EP-A-0 966 901 and page 4, lines 7 to 10 of WO-A-97/24048) states with reference to Figure 1:

> "That portion of the head nearest the handle is designated as section 14 and is collinear with the handle, while that portion of the head most remote from the handle is designated as section 16."

Thus the portion 14 and the handle 12 are shown by both Figure 1 (side view) and Figure 2 (plan view) in line and are described as collinear. On the other hand section 16 and handle 12, which are shown in line in the plan view of Figure 2 but angled in the side view of Figure 1, are not described as collinear.

Therefore the board does not accept the appellant's definition of "collinear" in the present claim 1 as

being "the same axis in at least one view" but remains with the common meaning of "collinear" as "lying on the same line" regardless of from where one is viewing.

Replacing "one of said head sections being coaxial with said handle" in claim 1 of WO-A-97/24048 with "the head section (14) being nearest to the handle being collinear with the handle (12)" is allowable because

- in the present application "coaxial" and "collinear" mean the same,

- page 4, lines 7 to 10 of WO-A-97/24048 uses the term collinear, and

- the present claim 1 specifies which head section is collinear and so is more specific than claim 1 of WO-A-97/24048.

3.5 Lines 10 to 13 of claim 1 of WO-A-97/24048 specify the feature

> "the other of said two head sections normally being an angle with said handle, whereby said two head sections are normally at an angle relative to each other"

and line 15 of claim 1 of WO-A-97/24048 adds that the head sections are bent during brushing

> "towards alignment with each other".

The omission of these features from the present claim 1 is allowable since they are not present in independent claim 10 of WO-A-97/24048 (and the head sections 14

and 16 shown in Figures 7 and 8 of WO-A-97/24048 are normally aligned and so cannot be bent towards alignment).

3.6 Lines 14 and 15 of the present claim 1 specify the feature of "the section furthest from the handle having a free end facing away from said handle". This is not in claim 1 of WO-A-97/24048 but can be seen from all the Figures of WO-A-97/24048.

3.7 Lines 16 to 21 of the present claim 1 concern a first elastomeric material in the elastomer section (already specified in line 9 of the present claim 1) and a different second elastomeric materials with a different Shore hardness value in a handgrip area of the handle.

Lines 25 to 27 of page 4 of WO-A-97/24048 states that "The handle and head sections are molded from a plastic or resin such as polypropylene." Moreover Figures 1 to 3 and 6 to 8 of WO-A-97/24048 show no interface between the handle 12 and the head section 14 and thus imply they are made from the same material. Further, page 8, line 28 to page 9, line 1 of WO-A-97/24048 explains that "elastomeric material is used to a greater or lesser extent, particularly in the finger gripping portion of the brush." Lines 7, 8 and 15 to 24 of page 9 of WO-A-97/24048 specify elastomeric material in the handgrip area.

Thus it can be derived that elastomeric material is not the only material of the handle, i.e. that the handle has a handgrip area made of elastomeric material.

That the aforesaid elastomeric materials are different with different Shore hardness values can be derived

from lines 18 to 22 on page 9 of WO-A-97/24048.

3.8 Thus the present claim 1 is unobjectionable under Article 76(1) EPC.

4. *Article 76(1) EPC - dependent claims 2 to 4*

The present claim 2 is derivable from page 9, lines 22 to 24 of WO-A-97/24048.

The present claim 3 is derivable from page 5, lines 22 to 24 or Figures 1, 4 and 6 of WO-A-97/24048.

The present claim 4 is derivable from Figure 4, lines 6 and 7 of claim 1 of WO-A-97/24048, and the second paragraph of page 6 of WO-A-97/24048.

Thus the present dependent claims are unobjectionable under Article 76(1) EPC.

5. *Article 76(1) EPC - independent method claim 5*

5.1 WO-A-97/24048 contains no method claim.

However the second paragraph on page 9 of the description of WO-A-97/24048 discloses a "method of manufacturing brushes according to the present invention".

5.2 Page 4, lines 25 to 27 of the description of WO-A-97/24048 states that "The handle and head sections are molded from a plastic or resin such as polypropylene". The second paragraph on page 9 of the description of WO-A-97/24048 states that "the handle and elastomer for the grip and the head areas are

molded using a three-shot molding technique. The elastomer is introduced into the head area separately from the handgrip area."

From this is derivable that the head and handle are moulded first and then the elastomer for the head and the elastomer for the handle introduced in the final two shots.

Page 9, lines 18 to 21 of WO-A-97/24048 specifies using different elastomeric materials of different Shore hardnesses for the head section and the hand grip section.

5.3 Thus the present claim 5 is unobjectionable under Article 76(1) EPC.

6. *Article 123(2) EPC - the claims*

6.1 All features added to claim 1 of the originally filed divisional application to arrive at the present claim 1 are derivable from the remainder of the originally filed divisional application.

6.2 The present claim 2 is essentially the same as claim 3 of the originally filed divisional application.

The present claim 3 is derivable from page 5, lines 11 to 13 or Figures 1, 4 and 6 of the originally filed divisional application.

The present claim 4 is derivable from claim 6 and page 6, lines 3 to 7 of the originally filed divisional application.

6.3 The present claim 5 adds to claim 7 of the originally filed divisional application that the method is "to produce a toothbrush according to one of the previous claims" and that the elastomeric materials have different Shore hardness values (derived from page 8, lines 28 to 31 of the originally filed divisional application).

6.4 Thus the present claims are unobjectionable under Article 123(2) EPC.

7. *Articles 76(1) and 123(2) EPC - the description and drawings*

The description and drawings of the originally filed divisional application are the same as those of WO-A-97/24048.

The present description and drawings are the same as those of the originally filed divisional application except for adaptation to the present claims 1 and 5, acknowledgement of the prior art, deletion of Figure 5 and the corresponding description, and attention to Rule 35(12) EPC.

Thus there is no objection under Articles 76(1) and 123(2) EPC to the present description and drawings.

8. *Novelty - claims 1 and 5*

The last line on page 2 of the examining division's decision accepts that the subject-matter of the independent device and method claims then on file was novel. Since then these claims have been restricted so that the examining division's finding should still be

valid for the new claims.

Moreover also the board sees no novelty-destroying document amongst those on file and so finds the subject-matter of the present claims 1 and 5 novel (Articles 52(1) and 54 EPC).

9. *Closest prior art - claim 1*

9.1 The board considers that the closest prior art or starting point for the present invention as defined by the present claim 1 is D1.

9.2 The present claim 1 includes the features of

- "an articulated head and a handle (12), said head having two sections (14, 16) to thereby define a composite head", and

- "the section furthest from the handle having a free end facing away from said handle".

9.2.1 Figures 3A to 3F of D1 show a toothbrush having a handle 33 and an articulated head 31 of two sections 37.

However the head is not **defined** by these two sections 37 because there is also a frame 32 integrally formed with the handle 33 and surrounding the head 31 (see page 9, lines 3 to 15).

Moreover the section 37 furthest from the handle 33 is connected to the frame by bridging portion 34 and so this section does not have a **free** end facing away from said handle.

9.2.2 Figures 1A to 1F of D1 show a toothbrush having a handle 12 and an articulated head 11 of several sections 15. The section 15 furthest from the handle 11 has a free end facing away from said handle.

However the head is not defined by two sections because there are many more than two sections 15.

9.2.3 The toothbrush heads shown in the other Figures of D1 have a frame and/or more than two sections.

9.2.4 However page 2, line 27 to page 3, line 6 of D1 states (with underlining by the board) that

> "The head may be in a variety of segmented forms. For example in a first form, suitable both for when the head is formed as an integral extension of the handle or when the head is surrounded by a frame, the head may have bristles mounted in one face, and the opposite face may have one or more grooves therein. In such a head the lands between the grooves comprise the segments, and flexible resilient linking occurs about the thinned regions of head material at the bottom of the grooves.
>
> In this first form of head, one or more of the grooves should be transverse to the longitudinal axis of the handle, to provide flexibility of the head in a plane containing this axis."

Thus D1 implicitly discloses a head without a frame but with one groove i.e. with two sections of which the section furthest from the handle has a free end facing away from said handle.

9.3 The board will continue by referring to the toothbrush shown in Figures 1A to 1F of D1 (i.e. with no frame) rather than that shown in Figures 3A to 3F of D1.

9.4 Further comparing it with the present claim 1, the composite head of the toothbrush shown in Figures 1A to 1F of D1 has

- an upper and a lower surface;

- several sections (but could have just two sections - see the above section 9.2.4) (segments 15) having respective longitudinally spaced ends facing each other;

- each said head section 15 having a plurality of tufts 13 of bristles extending from a bottom surface thereof;

- an elastomeric material section 17 located between said spaced ends;

- which elastomeric material section 17 is deformed during brushing whenever said several (or just two) head sections 15 bend relative to each other (compare Figures 1D and 1F);

- the longitudinal axis of the head section nearest to the handle being tilted (and thus not collinear, see the above section 3.4) to the longitudinal axis of the handle 12; and

- the section 15 furthest from the handle 12 having a free end facing away from said handle.

9.5 The handle is not shown in Figures 1A to 1F (or indeed in any of the other Figures of D1) as having any elastomeric material. However the first paragraph of page 6 of D1 states that "The handle ... may however be advantageously made in the form described in EP-0336641-A, the contents of which are included by reference, more particularly as described in column 1 lines 36 - 49 thereof."

Thus the prior art includes a toothbrush as discussed in the above sections 9.2 to 9.4 having a handle as set out in D4.

9.6 Figures 1 to 5 of D4 show a specific embodiment of a toothbrush handle, and lines 39 to 42 of column 3 explain that "Each face of the grip portion 16 of the handle carries an embossed rubber or rubber-like grip mat 26 to improve hand grip of the handle 14, particularly when wet."

9.7 Thus the board concludes that the toothbrush of D1 (as discussed in the above sections 9.2 to 9.4) has a handle having a handgrip area made of an elastomeric material (particularly because the only specific handle shown in D4 is that in Figures 1 to 5).

9.8 D1 states that "the grooves may be wholly or partly filled with an elastomeric material" (see e.g. page 3, lines 24 to 26) but gives no details of what this elastomeric material should be.

D4 states in lines 39 to 41 of column 3 that "Each face of the grip portion 16 of the handle carries an embossed rubber or rubber-like grip mat 26" and in lines 1 to 3 of column 4 specifies the Shore hardness of these grip mats.

Therefore it is not derivable from D1 and D4 that the elastomeric material in the head of D1 is different from that of the grip mat 26 in the handle of D4.

Following more closely the wording of the present claim 1, there is no disclosure that, in the D1(D4) toothbrush (see the above sections 9.5 to 9.7), the elastomer section in the head located between said spaced ends is a first elastomeric material and the elastomeric material in the handgrip area in the handle is a second elastomeric material, the first and second elastomeric materials being different and having different Shore hardness values.

10. *Problem, solution and inventive step - claim 1*

10.1 The problem, formulated so as not to point towards the solution, is to improve the flexibility properties of the D1 (D4) toothbrush.

The solution is to choose the elastomeric materials and in particular their Shore hardnesses separately for the grooves in the head and for the handgrip area of the handle.

10.2 Prior to the oral proceedings the board had considered it obvious to select the elastomeric material in the head to suit its function of flexing and the elastomeric material in the handle to suit its function

of gripping and accordingly that different elastomeric materials would be expected.

The appellant argued in the oral proceedings that the board's provisional view was wrong.

10.3 Lines 12 to 22 of page 3 of D1 disclose that "the depth and/or width of the grooves, and/or the frequency of the grooves per unit distance, along the length and/or across the breadth of the head may be varied" in order to vary "the flexibility and/or resilience of linking and consequently of the whole head along the length and/or across the breadth of the head". Lines 24 to 27 of page 3 of D1 add that "one or more of the grooves may be wholly or partly filled with an elastomeric material. In this way too the flexibility and/or resilience of the head may be varied ...".

Thus in D1 the flexibility of the head is changed by varying the depth, width and frequency of the grooves and wholly or partly filling them with the elastomeric material. Varying the depth, width and frequency of the grooves in D1 means that, to change the flexibility of the head from hard to medium to soft, it is necessary to change the mould in which the head is made. Providing such moulds is however extremely expensive. Moreover, assuming there is a single production line used at different times for the different hardness heads, then the moulds must be exchanged before toothbrushes with a different hardness can be produced.

10.4 The present description discloses various elastomers for the head section (see page 4, line 24 to page 5, line 3 as filed during the oral proceedings) and states that the elastomer in the head and the elastomer in the

handgrip area are different with different Shore hardness materials (see page 8, lines 15 to 23 as filed during the oral proceedings). The degree of flexing of the head under brushing load depends on which elastomeric material is selected for the head. Thus in addition to the ways set out in D1 for varying the flexibility of the head, the present application discloses the additional way of varying head flexibility by varying the elastomeric material in the head. This additional way of changing the elastomeric material allows the flexibility of the head to be varied without changing the dimensions of the grooves and so without changing the mould.

10.5 However, if the same elastomeric material is used in the head and for the handgrip area of the handle, then changing the elastomeric material in the head necessary involves a change in the elastomeric material in the handgrip area. This may result in the elastomeric material in the handgrip being unsuitable for its purpose.

By having different elastomeric materials in the head and in the handgrip area, varying flexibility requirements of the head can be satisfied while still satisfying the gripping requirements in the handgrip area of the handle.

10.6 Prior to the oral proceedings the board had considered different elastomeric materials in the head and in the handle handgrip area to be obvious. However there is no disclosure available to the board that supports this assessment, indeed the appellant is adamant that no such disclosure exists in 5000 closely related prior art documents. Moreover D7 (see section 10.7 below)

points in the opposite direction, and there are advantages (see the sections 10.4 and 10.5) of having different elastomeric materials. Therefore the board questions whether its initial assessment was correct.

The board recognises that the normal choice of the skilled person would be to have the same elastomeric material in the head and in the handle handgrip area because then there is a single source of material. The question is whether choosing different materials would also be obvious.

10.7 D7 discloses a toothbrush with separate areas of the same material injected by a single step, multi-point injection process. This process leads away from using different elastomeric materials in different areas of the toothbrush. While at first sight the D7 process is advantageous economically it does not achieve the advantage of variation of head flexibility without mould change that is achieved by the present invention (see the above sections 10.4 and 10.5).

10.8 Figures 11 and 12 of D6 show and lines 29 to 56 of column 4 describe a toothbrush with slots 45, 46 and 47 in the region between the handle 1 and the neck 2 with such a depth that elastic bridges 48 remain that contribute to the elasticity in this region. These slots are filled with elastic plastic portions 25, 26 and 27 which are deformed when brushing. Lines 47 to 53 of column 3 state that the thickness and shape of the bridge and the size and shape of the openings and the various elasticities of the rubber-like plastic filling the openings can be so varied in manufacture that in the end result the individual desired elasticity is achieved. While the last cited passage is part of the

description of Figures 1 and 2, the board considers that it implicitly applies also to the toothbrush of Figures 11 and 12. Moreover in D6, claim 1 (which covers all embodiments, i.e. also Figures 11 and 12) states that the desired elasticity of the elastic region is predominantly determined by the choice of the elastic plastic material.

Thus different elasticities of the D6 brush can be arrived at by choosing different plastic materials to fill the openings without needing to modify the shape (and thus the expensive mould) of the brush body (see column 2, lines 47 to 52).

This advantage of the D6 brush is the same as that set out in the above section 10.4. However D6 does not deal with elasticity in the toothbrush head and so even if the teaching of D6 were applied to the D1(D4) toothbrush, the result would not be a toothbrush with different elastomeric materials with different Shore hardnesses in the head and in the handle handgrip area.

10.9 The remaining documents on file either do not directly concern toothbrushes (D16) or do not concern flexibility of the toothbrush head (D15) or do not concern flexibility in the handle handgrip area (D2, D3, D5, D8 to D14 and D17). Therefore none of these documents helps in deciding whether it is obvious to provide different elastomeric materials with different Shore hardnesses in toothbrush head and handle handgrip area.

10.10 The board thus has real doubts as to the correctness of its earlier view on inventive step. These doubts must work in the appellant's (applicant's) favour because a

patent application should only be refused if the board is sufficiently certain that its obviousness argument is correct.

The board thus must decide that the subject-matter of the present claim 1 is not obvious (Articles 52(1) and 56 EPC).

11. Claim 5, the sole independent method claim, specifies a method to produce a toothbrush according to one of the device claims. It specifies a three-step moulding method using different elastomeric materials having different Shore hardness values in the head and the handle. None of the documents on file suggest such a method which moreover can be seen as non-obvious essentially for the same reasons as those advanced in support of the independent device claim 1.

12. Thus the present claims 1 and 5 are patentable as are claims 2 to 4 which are dependent on claim 1.

13. A patent can therefore be granted in the version on file.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to grant a patent in the following version:

- claims 1 to 5 as filed during the oral

proceedings,

- description: pages 1 to 8 as filed during the oral proceedings, and

- drawings: Figures 1 to 4 and 6 to 8 as filed during the oral proceedings.

The Registrar: The Chairman:

G. Magouliotis C. Andries