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D E C I S I O N
of 23 June 2003

Case Number: T 0272/01 - 3.2.4

Application Number: 93925122.9

Publication Number: 0708609

IPC: A46B 9/04

Language of the proceedings: EN

Title of invention:
Toothbrush

Patentee:
GILLETTE CANADA INC.

Opponent:
SmithKline Beecham plc

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty - yes"
"Inventive step - yes"

Decisions cited:
-

Catchword:
-

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Case Number: T 0272/01 - 3.2.4

D E C I S I O N
of the Technical Board of Appeal 3.2.4
of 23 June 2003

Appellant: (Opponent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 12 February 2001 rejecting the opposition filed against European patent No. 0708609 pursuant to Article 102(2) EPC.

Composition of the Board:

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

Summary of Facts and Submissions

I. The opposition division's decision rejecting the opposition against European patent No. 0 708 609 was posted on 12 February 2001.

On 2 March 2001 the appellant (opponent) filed an appeal and paid the appeal fee. The statement of grounds was filed on 12 June 2001.

II. Claim 1 as granted reads:

"A toothbrush exhibiting superior interproximal and gingival margin cleaning comprising:

(a) an elongated handle member (12);

(b) a head member (14) connected to one end of the handle member (12) comprised of a "toe" portion (20) distal to the handle and a "heel" portion (22) proximal to the handle and adjacent said toe portion;

(c) a multiplicity of bristles (24) extending from the heel portion (22), the distal ends of said bristles forming a longitudinally aligned concave shape; and

(d) a multiplicity of bristles (30) extending front the toe portion (20); characterized in that the longitudinally aligned concave shape is a groove (28) which extends the entire length of the heel portion (22), and the distal ends of the bristles of the heel portion proximal to said toe portion (20) form a generally linear profile when viewed from the side, and in that the side profile view of the distal ends of all

of the bristles extending from the toe portion forms a generally linear surface which forms an obtuse angle relative to said generally linear profile of the distal ends of the bristles extending from the heel portion proximal to said toe portion, and the side profile of the toe portion results in a wedge-shape with the tallest toe portion bristles being at the end of the head (14) which is distal to said handle (12)."

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

D1: US-A-1 018 927

D3: US-A-4 882 803

D6: US-A-4 800 608

D7: US-A-4 109 339

IV. Both parties attended oral proceedings on 23 June 2003.

During the appeal proceedings the appellant argued that the toothbrush defined by claim 1 lacked novelty over the teachings of D1 and lacked inventive step over the teachings of the prior art documents on file combined in various pairs and groups.

During the appeal proceedings the respondent (patentee) countered the appellant's arguments.

V. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

The respondent requested that the appeal be dismissed and that the patent be maintained unamended.

Reasons for the Decision

1. The appeal is admissible.

2. *Interpretation of claim 1*

2.1 The expression "generally linear" is used in claim 1 concerning the distal ends of the bristles of the heel and toe portions (lines 8 to 17 of column 6).

2.2 The present Figures 8 to 10 each show a straight line 26 representing the distal ends of the bristles 24 of the heel portion 22 proximal to the toe portion 20, and a straight line representing the distal ends of the bristles 30 of the toe portion 20.

However the distal ends of the bristles in each portion will in practice not be precisely in a straight line because of inaccuracies in cutting the bristles and setting them in the handle, and because the distal ends may not be perfectly plane but may be jagged or rounded.

2.3 Thus it is reasonable to weaken the precise term "linear" by prefixing it with the word "generally". The board considers that the resulting term "generally linear" means a close approximation of a straight line

but does not cover a line which deviates substantially from a single straight line.

2.4 Claim 1 specifies in lines 11 to 14 of column 6 "that the side profile view of the distal ends of all of the bristles extending from the toe portion forms a generally linear surface". This need not mean that said surface is planar but that, in all longitudinal sections of the toe portion, the side profile view is generally linear. If, as envisaged in column 5, line 43 of the description, the heel groove is to extend up into the toe region then the groove must be so constructed that the generally linear surface still exists.

2.5 Claim 1 refers in lines 19 to 21 of column 6 to "the **tallest** toe portion bristles being at the end of the head (14) which is distal to said handle (12)."

This is clearly the case in Figures 8 and 9 of the present patent. However in Figure 10 the wedge shape is created by positioning toe bristles 30 of the same length at an angle. The embodiment of Figure 10 is clearly intended to be an embodiment of the invention and the reader would immediately realize that this part of the claim has to be interpreted (in accordance with Article 69(1) EPC) as meaning that the distal ends of the bristles have to be **highest** at the end of the head which is distal to the handle (i.e. the highest point of the profile).

3. *Novelty - claim 1 - D1*

3.1 D1 discloses a toothbrush having the features of the pre-characterising portion of the present claim 1.

3.2 The present claim 1, in lines 5 to 8 of column 6, specifies that "the longitudinally aligned concave shape is a groove (28) which extends the entire length of the heel portion (22)".

The two transverse rows of tufts of bristles on the left of Figures 1 to 3 of D1 make up the toe portion (using the terminology of the present claim 1) while the six rows on the right make up the heel portion.

Lines 72 to 81 of the right hand column of page 1 of D1 state that "The bristles b are cut or arranged so that a central longitudinal groove c is had, which groove, however, does not extend throughout the entire length of the brush head, but stops short of the point B. As shown in Fig.3, the groove terminates at C which is in the first one of the transverse rows having the smaller number of tufts, thus leaving intact the other transverse row which is next to the point B."

Thus, in the particular embodiment, the groove c does not extend the entire length of the heel portion.

The appellant however argues in lines 3 to 6 on page 4 of the statement of grounds of appeal that "Although the specific embodiment illustrated in D1 shows its groove ending at C before the third tuft from the tip end, nothing in D1 excludes or prejudices against the possibility of the groove extending at least as far as

the second tuft from the tip end, provided only that the groove ends short of the peak B."

However, even if this possibility might be within the general disclosure of D1, it is not disclosed directly and unambiguously. The general disclosure does not take away the novelty of the specifically claimed arrangement of the groove extending the entire length of the heel portion.

The appellant argues in lines 7 to 9 of page 4 of the statement of grounds of appeal that "There is no reason why the skilled person would not seriously contemplate extending the groove toward the tip of the head remote from the handle, beyond the position C shown in the specific embodiment of D1, within the general disclosure of D1."

However even if this argument were correct it would only affect inventive step and the claimed feature would still be novel.

3.3 The present claim 1, in lines 8 to 11 of column 6, specifies that "the distal ends of the bristles of the heel portion proximal to said toe portion (20) form a generally linear profile when viewed from the side".

Figure 2 of D1 is a side view of the toothbrush. The six transverse rows of tufts of bristles on the right of the Figure make up the heel portion. The tops of these tufts are shaped so that in side view the distal ends of the bristles are arranged along a saw toothed line. This line should be compared with the straight line shown in Figures 8 to 10 of the present patent

which in practice would be marred only by inaccuracies and tip rounding.

The board finds that the saw toothed line of the distal ends of the bristles in D1 is not "generally linear" as required by the present claim 1.

The appellant argues in line 21 of page 4 of the statement of grounds of appeal that "D1 is silent about the profile of the ends of its heel portion bristles" and in lines 26 to 28 that "The skilled reader would seriously contemplate replacement of the pointed ends of the "heel" bristles of the specific embodiment of D1 with flat-ended tufts with their ends in a linear profile."

However even if this argument were correct it would only affect inventive step and the claimed feature would still be novel.

3.4 The present claim 1, in lines 11 to 14 of column 6, specifies that "the side profile view of the distal ends of all of the bristles extending from the toe portion forms a generally linear surface".

Lines 37 to 43 of the left hand column of page 1 of D1 state that "At the forward end of the brush head are several tufts of bristles which are bunched or grouped closely together to form a prominent projecting point B. The bristles of this group are cut so that the contour thereof is given a transverse and longitudinal curve."

From this statement and from the side view F of the toe portion presented by Figure 2 of D1, it is clear that the side profile of the toe portion is curved and not generally linear. The line shown in Figure 2 of D1 linking the distal ends of the toe portion bristles rises in a curve from the heel portion to the peak and then descends in a curve towards the end of the toothbrush furthest from the handle.

Accordingly it is clear that the feature specified at the start of this section 3.4 is not disclosed by D1.

Moreover the present claim 1, in lines 13 to 16 of column 6, specifies that the "generally linear surface" of the toe portion "forms an obtuse angle relative to said generally linear profile of the distal ends of the bristles extending from the heel portion proximal to said toe portion". However the toe portion of D1 is curved in side view and so there is no single angle between it and the heel portion because an infinity of lines can be drawn tangential to the curved toe portion with an infinity of angles between them and the heel portion.

3.5 The present claim 1, in lines 19 to 21 of column 6, specifies "the tallest toe portion bristles being at the end of the head (14) which is distal to said handle (12)."

However the toe portion of D1 rises in a curve from the heel portion to the peak and then descends in a curve towards the end of the toothbrush furthest from the handle. Thus the tallest (i.e. the highest of the

profile) bristles are not at the end of the head which is distal to the handle.

3.6 Thus in at least five ways the toothbrush defined by the present claim 1 differs from that disclosed by D1.

3.7 In the appeal proceedings the appellant only cited D1 when arguing lack of novelty of the subject-matter of claim 1. The board does not see that novelty would be destroyed by any of the other documents on file.

3.8 The board thus finds the subject-matter of claim 1 novel (Articles 52(1) and 54 EPC).

4. *Inventive step - claim 1*

4.1 In the oral proceedings before the board, the appellant relied on documents D1, D3, D6 and D7, combining them in various ways to argue that the toothbrush of claim 1 lacked inventive step.

4.2 D3

4.2.1 D3 discloses an "apparatus for cleaning the interproximal surfaces of the teeth, the gum margins, grooves and embrasures thereof", see column 1, lines 5 to 9.

4.2.2 Figure 2 of D3 shows bristles at the end of the head portion 6 distal from the handle portion (numbered 3 in Figure 1) and so it can be said that there is a bristled toe portion. However neither the Figures nor the remainder of D3 disclose any other bristles than those at the toe portion, indeed column 5, lines 19

to 22 states that the apparatus has "a single row of a plurality of tufts of bristles fixedly attached to the face of said head portion and disposed substantially perpendicularly thereof".

4.2.3 The board considers that the skilled person would learn from D3 that bristles are to be provided **only** at the toe portion and so would not consider providing bristles extra to those at the toe portion. Firstly, the description refers to a **single** row of a plurality of tufts of bristles, see the above section 4.2.2. Secondly, the advantage of the D3 apparatus of being able to easily access the teeth (see e.g. Figure 1) would be diminished if further rows of bristles were added because one would then return to the type of toothbrush criticized in the description of the prior art in D3, e.g. one in which "the bulk of the head portion of the brush as well as the size and arrangement of the bristle tufts preclude substantial penetration of the bristles into these difficult-to-reach areas", see column 1, lines 56 to 59. Thirdly, it seems from column 4, lines 60 to 64 and column 5, lines 1 to 5 that D3 concerns an apparatus for flossing which is **additional** to a conventional toothbrush, the **two** apparatuses being used in a daily regimen of dental hygiene, thus teaching away from a single apparatus for conventional brushing and for replacing the action of flossing.

4.2.4 The board considers that, if the skilled person were to start from the D3 apparatus and attempt to improve it in some way, then the result would still be an apparatus to perform the flossing step (see column 4, lines 60 to 64) not a toothbrush for use also for

conventional brushing. If the skilled person wished to design a toothbrush offering also conventional brushing (i.e. the sole implement needed for dental hygiene) then he would start from one of the many "sole implement" toothbrushes in the prior art.

4.2.5 Thus the presently claimed toothbrush could not be arrived at in an obvious manner starting from D3 because it would not be a suitable starting point and, even if it were an acceptable starting point, the modifications to it needed to arrive at the claimed toothbrush would not be obvious.

4.3 D7

4.3.1 D7 discloses "a toothbrush adapted to be used to brush the teeth of another such as a child or an animal", see column 1, lines 5 to 7. Independent claims 1 and 4 specify cleaning the teeth of another animal or person. Lines 49 and 50 of column 2 state that "An important feature of the invention is the shape of the handle 12, as described in conjunction with FIGS. 1, 5, 6, 7 and 8." Figures 1 and 5 show that the handle 12 is bent in two planes to make brushing another's teeth easier.

4.3.2 Lines 34 to 51 of column 3 of D7 state that "In a particular embodiment adapted for use of canines, as shown in FIGS. 2, 3 and 4, the head 14 comprises three rows of tufts 16 along the axis of the handle 12, the tufts defining a trough 30 with side ridges 32 which culminate in a narrowed peak 24. ... The central trough 30 of the brush head 14 confronts the relatively long, thin forward teeth, the sides of the ridges 32 of the brush head 14 confront the sides of the same teeth and

also scrub the sides of the teeth, including the gum line. The peak 24 of the brush head 14 is also useful in cleaning between and directly behind the cuspid teeth where there is a large gap."

4.3.3 Independent claim 4 of D7 is directed to "A toothbrush adapted for cleaning the teeth of another animal or person" and claim 5 which is dependent thereon specifies the central longitudinal trough of bristles. While formally it appears that the trough can be provided in the brush for humans, the description of the particular embodiment clearly indicates that the trough is only provided in brushes for canines.

4.3.4 Thus the board considers that the embodiment of the toothbrush having a trough 30 (see Figures 3 and 4) and a peak 24 (see Figures 1 and 2) is unusual in two ways, firstly that it is not used by someone brushing his own teeth and secondly that it is used for brushing a canine's teeth. The board considers that these factors make it unlikely that the skilled person would start from it when wishing to arrive at a toothbrush for conventional use or even make use of its teachings when modifying a toothbrush for conventional use.

4.3.5 Moreover, unlike the present claim 1, it can be seen from Figure 1 of D7 that the tallest toe portion bristles are not at the end of the head which is distal to the handle.

4.3.6 Still further, the trough shown in Figures 3 and 4 of D7 includes a central convex portion (the distal ends of the bristles of the central tuft shown in cross section) and so it is doubtful whether the distal ends

of the bristles form a longitudinally aligned concave shape as required by the present claim 1.

4.4 D6

4.4.1 D6 discloses a toothbrush whose "angled bristle head provides superior cleansing of the lingual, buccal, embrasure, and distal aspects of the teeth and gums", see the abstract.

4.4.2 The side views of Figures 3, 7 and 8 of D6 are similar to the side view of Figure 10 of the present patent but, unlike the toothbrushes of D6, the present claim 1 specifies that the distal ends of the heel portion bristles form a longitudinally aligned concave shape which is a groove extending the entire length of the heel portion.

4.4.3 D6 is nevertheless a realistic starting point for a skilled person wishing to develop an improved toothbrush.

4.5 The board will now consider the theoretically possible combinations of pairs of these four documents D1, D3, D6 and D7.

4.6 Starting from D1, various changes would be needed to it to arrive at the claimed toothbrush.

4.6.1 The board does not consider that the skilled person **would** replace the domed toe portion of D1 by the wedge shaped toe portion of D3 because the latter toe portion is disclosed for use on its own, see the above section 4.2.3. Moreover even if the combination were

made, it would still not yield the claimed toothbrush because the heel portion would still be that of the D1 toothbrush i.e. the distal ends of the heel portion bristles proximal to the toe portion would not form a generally linear profile when viewed from the side and the groove would not extend the entire length of the heel portion.

4.6.2 It does not seem that it would occur to the skilled person to start from the toothbrush of D1 and then modify it using the teachings of D6 because the skilled person would realize that the D6 toothbrush (patented in 1989) was a much more modern toothbrush than that of D1 (patented in 1912) and would therefore be more likely to start from D6 instead. If he did try to modify D1 using D6, he might choose modifications which took him further away from the invention e.g. he might replace the grooved heel portion of D1 by the plane heel portion of D6. The board sees no reason why he would choose to exchange only the toe portions. In any case a groove extending the entire length of the heel portion is disclosed by neither D1 nor D6 so that their combination could not yield the claimed toothbrush.

4.6.3 The board cannot see that the skilled person would modify the toothbrush of D1 using the teachings of D7. The latter, as explained in section 4.3 above is in an unusual field and its combination with D1 would be a theoretical one based on a knowledge of what one wanted to achieve i.e. based on knowledge of the present invention. In any case a toe portion in which the tallest bristles are at the end of the head which is distal to the handle is disclosed by neither D1 nor D7

so that their combination could not yield the claimed toothbrush.

4.7 As explained in the above section 4.2 (in particular 4.2.4), the board considers D3 to be an inappropriate starting point from which a person skilled in the art could never proceed in an obvious way to the claimed invention.

4.8 Starting from D6

4.8.1 The board sees no reason why, if the skilled person were to start from the D6 toothbrush, he would modify it using the teachings of D1. He would regard D1, patented 77 years earlier, as a backward step. The alleged modification could only be the result of an *ex post facto* analysis and in any case would not yield the presently claimed toothbrush because of the lack of a full length heel portion groove.

4.8.2 If the skilled person were to modify the toothbrush of D6 using the teachings of D3, the result could not be a toothbrush with a full length heel portion groove since neither document discloses this.

4.8.3 The board cannot see that the skilled person starting from the D6 toothbrush would modify it using the teachings of D7 since the latter is in an unusual field and unlikely to be considered by the skilled person not wishing to design a canine toothbrush or one to be used on other people.

Even if the skilled person were to combine the teachings of D6 and D7 there would be various possibilities which would move the resulting toothbrush even further away from the presently claimed toothbrush e.g. by taking the D7 head portion instead of that of D6. There is no reason to suppose that the skilled person would make the precise choices necessary to move closer to the present toothbrush. Moreover since the sole independent claim 1 of D6 specifies in column 6, lines 37 to 39 that "the bristle ends of the bristle ends attached to the distal segment forms a plane facing and intersecting the plane of bristle ends formed by the bristles attached to the intermediate segment", the skilled person would see a grooved heel portion as contrary to what D6 teaches as essential.

Moreover, as stated in section 4.3.6 above, the board is doubtful as to whether the distal ends of the bristles form a longitudinally aligned concave shape as required by the present claim 1. Thus it is doubtful that combining D6 and D7, even if this were obvious and even if it were done in exactly the way alleged by the appellant, would yield the claimed toothbrush.

4.9 As explained in the above section 4.3, the board considers D7 to be an inappropriate starting point. Moreover D7's combination with D1 would not yield the toe portion in which the tallest bristles are at the end of the head which is distal to the handle. The board cannot imagine that the skilled person would start from the D7 brush with its special use and then modify the tip into that of D3 tip which carries out a replacement operation to that of flossing. The comments

in section 4.8.3 concerning D6 and D7 apply largely also to the reverse combination D7 and D6.

4.10 The appellant argues that the features of the heel portion (entire length groove and side view generally linear profile) and the toe portion (wedge shape, generally linear surface and obtuse angle with the heel portion) represent a mere collocation of known features, each of which performs only its known and predicted function, showing no inventive step.

4.10.1 The board cannot agree with the appellant on this point. The heel and toe portions cannot be regarded as independent in the sense of a collocation. Each of the two portions has to be designed with the other in mind since each must do its job despite the presence of the other adjacent to it. Thus the heel portion cannot be such that it prevents the toe portion accessing the teeth. The claim explains the relative positions and orientations of the heel and toe portions ("a "heel" portion (22) ... adjacent said toe portion" and "the toe portion forms a generally linear surface which forms an obtuse angle relative to said generally linear profile of the distal ends of the bristles extending from the heel portion proximal to said toe portion").

4.10.2 Moreover no pair of the four prior art documents D1, D3, D6 and D7 relied upon by the appellant unambiguously has all the features of claim 1.

4.11 The appellant's combinations of teachings of the prior art are made with knowledge of the invention and rely on cherry-picking from the prior art just those features he needs. Many combinations rely on the

toothbrush of D1 having features which in fact it does not have (see the above section 3). Even if one could accept that the skilled person would seriously contemplate modifying the teaching of one of these document with the teaching of another, there would be a number of choices to be made on which parts were to be modified and which were to be left unchanged (e.g. in the combination of D1 and D6 whether the toe portion is to be that of D1 or that of D6). To argue that the skilled person would make precisely the choices which are needed to come as closely as possible to the claimed toothbrush is to rely on an *ex post facto* analysis. Moreover the combinations in fact fail to yield the claimed subject-matter (see the above section 4.10.2).

4.12 At the bottom of page 13 of the statement of grounds of appeal the appellant states that 14 other documents from the opposition proceedings "may be combined individually with the combinations of pairs of documents presented above in combinations (1)-(6) to reinforce the demonstration of lack of inventive step."

The appellant gives no precise explanation here of what the skilled person would combine and why the appellant considered the opposition division to be wrong in ruling out the obviousness of such combinations. Even the subsequently cited example of "D7 may be additionally combined with D1 and the specific documents referred to in combinations (1), (2) and (3) to show a heel portion with a full length groove combined with a pointed toe, the lines of the ends of the toe and heel bristles meeting at an obtuse angle" is a mere recitation of the features of claim 1 and

lacks an analysis of how the skilled person would achieve them.

The board cannot see that the skilled person would (as opposed to merely could) combine these documents in such a way as to arrive at the claimed subject-matter. In the appeal proceedings the appellant has not set out a logical chain that would be followed by the skilled person and the board cannot see one.

Moreover in the oral proceedings the appellant restricted himself to the four documents D1, D3, D6 and D7 which he implicitly regards as the most relevant documents. The inventive step arguments based on these documents do not succeed and are not improved by adding further documents from which the skilled person would need to select just those features needed to arrive at the claimed subject-matter.

4.13 The board thus cannot see that any of the prior art documents on file (taken singly or in any combination of any number) would lead the skilled person in an obvious manner to the subject-matter of claim 1 as granted.

4.14 The board thus finds that the subject-matter of claim 1 as granted is not obvious (Articles 52(1) and 56 EPC).

5. Thus claim 1 as granted is patentable as are claims 2 to 16 which are dependent thereon. Accordingly the patent can be maintained unamended i.e. as granted.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Magouliotis C. Andries