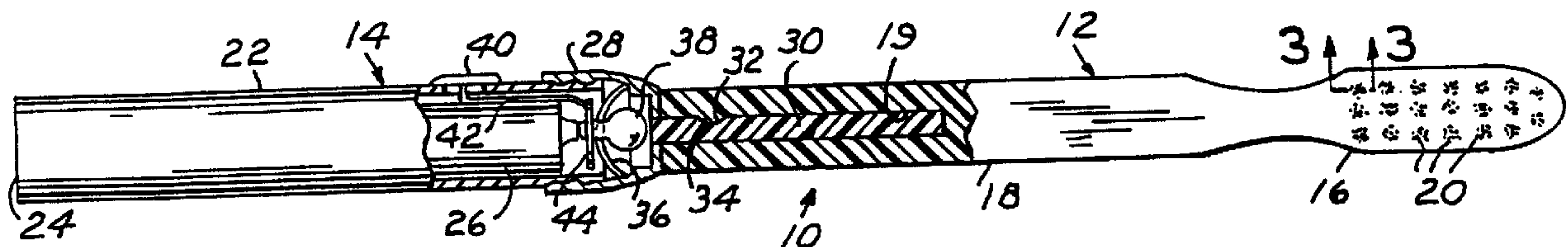




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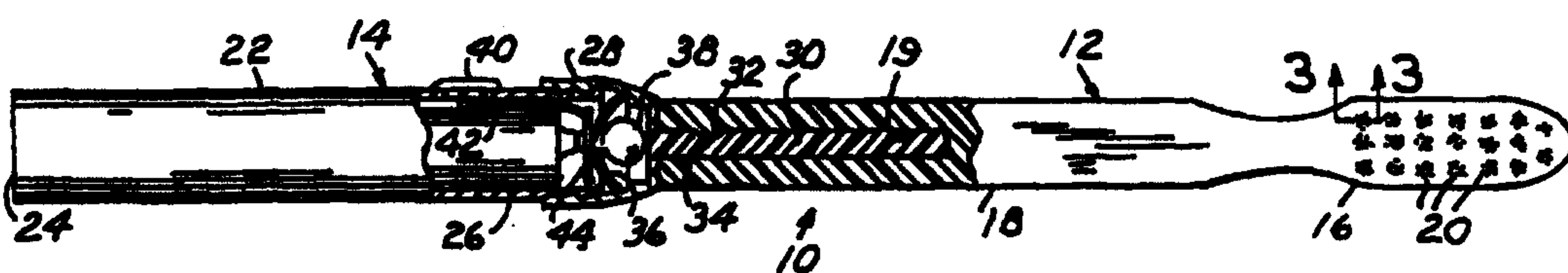


(57) **Abrégé/Abstract:**

An illuminated toothbrush (10) is formed by a clear plastic body (12) toothbrush having modified plastic filament (45) bristle tufts (20) in its head portion (16) for admitting light into the bristles from a light source illuminated shaft (30) inserted into a socket (19) in the end of the toothbrush handle (18) opposite the head (16).

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(21) International Application Number: PCT/US98/12230 (22) International Filing Date: 11 June 1998 (11.06.98) (30) Priority Data: 08/935,558 23 September 1997 (23.09.97) US (71)(72) Applicant and Inventor: CRISIO, Raymond, A., Jr. [US/US]; Suite C, 1801 North Belt West, Belleville, IL 62226 (US). (74) Agent: RHEA, Robert, K.; Suite 305, 5350 S. Western, Oklahoma City, OK 73109 (US).		(81) Designated States: AU, BB, BG, BR, CA, CN, CU, CZ, HU, ID, IL, IS, JP, KE, KP, KR, LC, LK, LT, MG, MK, MX, NO, NZ, PL, PT, RO, RU, SD, SG, SK, TT, UA, UZ, YU, Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i>
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ILLUMINATED TOOTHBRUSH

Technical Field

1 This invention relates to toothbrushes and more
2 particularly to an illuminated bristle toothbrush.

3 As is well known the best prevention of dental decay
4 and gum disease is a thorough brushing of the teeth following
5 each meal or eating food. Almost everyone in advanced
6 societies has at least one toothbrush. However, tooth decay
7 and gum disease is still prevalent possibly as a result of
8 failure to clean or brush the teeth after eating or improper
9 use of the toothbrush. Since the majority of toothbrushes do
10 not provide light or illumination of the teeth or interior
11 of the mouth while brushing, the user of the toothbrush is
12 not able to see food remaining in the mouth which the
13 toothbrush could remove. Furthermore, children dislike the
14 chore of brushing their teeth.

15 Background Art

16 The Prior Art discloses a number of toothbrushes having
17 optical fibers forming the bristles which are illuminated by
18 light projected against one end of the bristles by a light
19 source in the toothbrush handle. However, this results in a
20 necessary increase in size of the handle and brush head to
21 accommodate the numerous optical fibers. Furthermore,
22 optical fibers have a minimum allowable bend radii resulting
23 in an enlarged bristle supporting head portion of the
24 toothbrush to accommodate the bends of the fibers.

25 United States patent no. 4,779,173, issued October 18,
26 1988 to Carr et al. for Illuminated Brush Device features a
27 toothbrush having optical fibers extending longitudinally
28 through the handle portion of the brush and turned upwardly
29 at the brush head to form the tooth brushing bristles. The

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1 handle is axially connected with the bulb end of the flash-
2 light for lighting the ends of the optical fibers adjacent
3 the bulb and transmitting such light to the other ends of the
4 fiber bristles to form an illuminated brush head.

5 United States patent no. 5,030,090, issued July 9, 1991
6 to Maeda et al. for Optical Toothbrush And Method Of Use and
7 United States patent no. 5,160,194, issued November 3, 1992
8 to Feldman for Toothbrush With Externally Illuminated
9 Bristles are examples of patents showing the further state-
10 of-the-art.

11 The Maeda et al. patent illuminating one end of photo-
12 transparent fibers to illuminate the opposite end of the
13 fibers and from a light source to illuminate the interior of
14 a patient's mouth.

15 The Feldman patent disclosing a flashlight handle
16 having a bulb shining on the exterior of bristles at the head
17 end of a toothbrush.

18 Disclosure of the Invention

19 A source of light such as a flashlight has its lens end
20 portion modified to axially support a clear plastic shaft
21 which enters a socket in the handle of a clear plastic
22 toothbrush. Bristles in the head of the toothbrush are
23 formed by nylon filaments having hemispherical end surfaces
24 and doubled back upon themselves and embedded in the tooth-
25 brush head with the wall surface of the return end bends of
26 the bristle fibers roughened to break through the exterior
27 seal, as by sandpaper, before insertion into the brush head
28 during conventional manufacture of the toothbrush. Light
29 from the lamp of a source of light passes through the axial
30 shaft, toothbrush handle and enters the bristle filaments to
31 illuminate the ends of the toothbrush bristles.

32 Brief Description of the Drawings

33 Figure 1 is a top view of parts broken away and
34 sectioned for clarity;

35 Figure 2 is a fragmentary partially exploded view;

36 Figure 3 is vertical cross-sectional view taken
37 substantially along the line 3---3 of Fig. 1; and,

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1 Figure 4 is a greatly enlarged view of one filament of
2 the toothbrush bristles modified intermediate its ends for
3 admitting light into the filament.

4 Best Mode for Carrying Out the Invention

5 Like characters of reference designate like parts in
6 those figures of the drawings in which they occur.

7 In the drawings:

8 The reference numeral 10 indicates an illuminated
9 toothbrush comprising a modified toothbrush body 12 axially
10 connected at one end with a light source, such as a flash-
11 light 14. The toothbrush body 12 is of conventional con-
12 struction formed from clear light ray conducting plastic
13 having a head portion 16 at one end axially integrally
14 connected with a handle portion 18 having a central socket 19
15 extending inwardly from its end opposite the head 16. The
16 head 16 is provided with a plurality of rows of brush bristle
17 tufts 20, as presently described in more detail.

18 The flashlight 14 is similarly of substantially
19 conventional construction having a battery case 22 closed at
20 one end 24 and containing a plurality of dry cell batteries
21 26, only one being shown. The end of the battery case 22
22 opposite its closed end is closed by a cap 28 axially
23 supporting one end of a clear light ray transmitting plastic
24 rod or shaft means 30 which is cooperatively received by the
25 toothbrush handle socket 19. The shaft wall surface is
26 provided with an indentation 32 cooperatively nesting a lug
27 34 protruding from the inner wall surface forming the socket
28 19 to maintain the toothbrush 12 connected with the flash-
29 light 14. The toothbrush handle 18 is longitudinally slit or
30 slotted, as at 35, from its end opposite the head 16 to
31 permit lateral flexing of opposite portions in the socket
32 area for receiving the shaft 30.

33 The flashlight 14 includes a reflector 36 centrally
34 supporting a bulb 38, disposed adjacent one end of the shaft
35 30, having its base contacting the battery 26 positive
36 terminal and electrically energized by a switch 40 moving a
37 terminal 42 into contact with an electrical ground 44 for

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1 illuminating the bristles of the tufts 20, as presently
2 explained.

3 The bristle tufts 20 are preferably formed from uniform
4 diameter natural color nylon filaments 45 of selected length
5 having a finish enhancing tuft efficiency, complying with
6 United States Food and Drug Administration regulations,
7 presently marketed by Dupont under the trademark TYNEX. The
8 filaments may be obtained from Dupont, P.O. Box 1217,
9 Parkersburg, WV 26102-1217. A plurality of the filaments 45
10 form one of the toothbrush tufts 20 and in the manufacture of
11 the toothbrush the filaments 45 are doubled back upon
12 themselves in substantial U-shape (Fig. 4), so that their
13 respective ends are of substantial equal distance from its
14 bight portion 46 and substantially describe a hemispherical
15 surface 48 at the respective ends thereof, highly preferred
16 in the brushing of teeth to minimize damage to gums. Prior
17 to embedding the bristle tufts 20 in the head portion 16,
18 during manufacture of the toothbrush 16 the bight portion 46
19 of the filaments 45 have the finished "skin" or surface
20 roughened, as by sandpaper or sandblasting, indicated by the
21 dots on the filament bight portions 46 (Fig. 4) which permits
22 light to enter the individual strand or filaments 45 in the
23 respective tufts 20. Light emitted by the lamp is transmit-
24 ted by the shaft means 30, the clear plastic toothbrush
25 handle 18 and its head 16 and enters the individual filaments
26 45 of the respective tufts through the bight portions and
27 glows at the end surfaces 48 of the filaments 45.

28 Industry Applicability

29 The use of illuminated toothbrush bristles will, it is
30 believed, substantially reduce the incidence of tooth decay
31 and gum disease.

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CLAIMS:

1. An illuminated toothbrush, comprising a toothbrush having a body including a head portion and a handle portion, said handle portion having an axial longitudinally extending socket in its end portion opposite the head portion, a plurality of rows of toothbrush bristle tufts cooperatively projecting laterally from said head portion, each of said tufts comprising a plurality of plastic filaments of uniform length and diameter and having an exterior surface provided with light ray admitting areas substantially medially the ends thereof, said plastic filaments being doubled back upon themselves and embedded in said head portion, light producing means including a light bulb and a reflector, a cap shielding said light bulb, light conducting shaft means axially connected at one end portion with said cap for receiving light rays from said lamp bulb and disposed at its other end portion within said handle socket, and, energizing means including a source of electrical energy for energizing said bulb, whereby light is transmitted by said shaft means and said toothbrush body into said brush bristle tufts for illuminating the ends of the respective plastic filaments.

2. The toothbrush according to claim 1 in which the energizing means includes a case axially connected with said cap, a battery in said case, and, an electrical circuit including a switch connecting said battery with said light bulb.

