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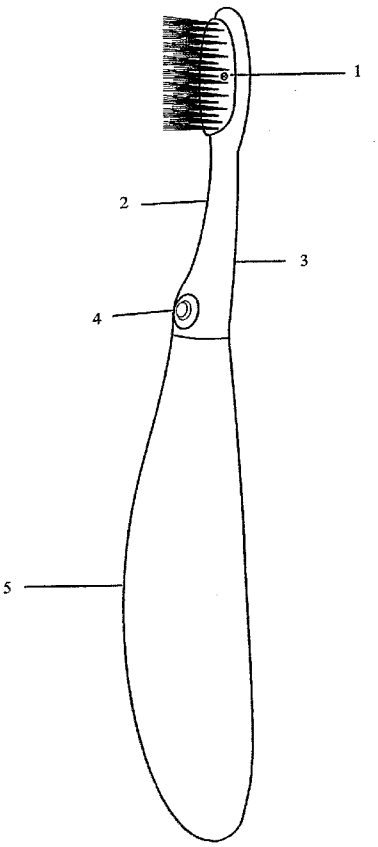
Published:
— *with international search report*

[Continued on next page]

(54) **Title:** TRIGGER SPRAY TOTHBRUSH



(57) **Abstract:** A sanitised, ergonomic and improved mist-spray toothbrush consists of a cap (22) for toothbrush-head, a light trigger actuator (4) with a manual mist-pump at the brush-neck (2), a mist-nozzle at the brush-head, a reservoir (5) in the handle, and which can be easily operated by lightly pressing a button-switch in a round aperture with a finger while holding, using, and brushing. It can dispense a mist-liquid specially of all oral health-hygiene-cosmetic applications including a dentifrice, cleaning/polishing agents, mouth-wash/ freshener, and antibacterial/antiviral agents, or in general any other purpose applications including medical, therapeutic, health, hygiene, and cosmetics.

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

TRIGGER SPRAY TOOTHBRUSH

FIELD OF INVENTION:

The present invention relates to the field of manually operated trigger mist-spray toothbrushes for dispensing desired liquid solutions from the reservoir within the handle, a device that will incorporate toothbrush, dentifrice, and tongue cleaner in one simple to use instrument, and more particularly to a trigger actuated manual spray pump in a toothbrush with an ergonomic trigger which enables consumers or users to operate for extended periods of time with ease while using.

BACKGROUND OF THE INVENTION:

The oral health and hygiene is the most sought after field all over the world, and almost all communities in the world are desperately looking for a more efficient, convenient, hygienic, and easy to use and carry, self-sanitising, and self-sufficient fountain-toothbrush.

Our mouth attracts thousands of harmful micro-organisms along with the good ones. Almost everyone in the world habitually cleans the teeth and the mouth daily with something and the largest chunk of people still use the traditional toothbrush with toothpaste or toothpowder. Even the toothbrush attracts, colonises and breeds harmful micro-organisms (bacteria, viruses and microbes); and keeping it cleaned or sanitized between the uses, is critical for preventing certain diseases and illness.

Unlike those series of revolutionary inventions in making of fountain pens, many inventions all over the world have been trying to effectively put together the toothbrush and toothpaste (dentifrice), but have not succeeded to attract the market because of some technical snags and flaws. Many abortive attempts in the prior art have been made for making a two-in-one or built-in system in the name of 'fountain toothbrush', 'pen toothbrush' and 'dentifrice dispensing toothbrush',

but hardly any so far has successfully meet the popular demand of the people and the market.

People who travel are often restricted with the amount of items that they can carry with them. Thus, a need exists for a device that will incorporate toothbrush, dentifrice and tongue cleaner that people use for dental hygiene in one simple to use instrument, which in a more hygienic way can easily be transported without occupying a great deal of space.

There are some electric tooth spraying or streaming pump devices without brush for cleaning teeth and mouth, which is expensive, cumbersome and not very effective.

Besides allowing effective and convenient oral hygiene, whether in home or outside, the subject device of the present invention has the following distinguishing characteristics: ease of use, disposable, portable (it can even be stored inside small handbag), elasticity (which allows easy holding even in the absence of a handle), the presence of a capsule (or dispenser) in the handle to distribute the desired liquid.

While some devices in the prior art fulfil their respective, particular objective and requirements, but no patent describe such a toothbrush with a trigger actuated manual pumping system for allowing desired fluid / liquid solution to be pumped independently from within the reservoir in the handle of the toothbrush by a easy, reliable, and simple mechanism.

In this respect, the toothbrush with trigger mist pumping system according to the present invention substantially departs from the conventional concepts and designs of the prior art, and in doing so provides an apparatus primarily developed for the purpose of oral application, allowing the desired fluid to be pumped and

sprayed independently through the nozzle drawn from within the body of the toothbrush.

Therefore, it can be appreciated that this new and improved invention of toothbrush is devised and designed with a greater concern to be more cost-effective, simple, hygienic, ergonomic, utility, easy to use and carry, and easy to manufacture, i.e. convenient for industrial design-production-application application with few components/parts. It can effectively and independently spray the desired liquid solutions to the desired place of the teeth or in the mouth from the toothbrush itself. In this regard, the present invention substantially fulfils a variety of concerns and needs.

THE OBJECTS / SUMMARY OF THE INVENTION:

The present invention provides a simpler built-in spray mechanism in the 'Trigger Spray Toothbrush', devised and designed to provide an instant, easy and convenient way for not only preventing any contamination of the bristle sanitised with the routine application of antibacterial/antiviral solution, but to clean the teeth effectively, and still open to additional applications for medicinal, therapeutic and freshening need.

The primary object of the invention is to provide a self-sanitising, trigger actuated mist-pump-spray manual toothbrush, which is contrary to the conventional or traditional toothbrush and toothpaste/toothpowder practise. The toothbrush has a conveniently designed button-trigger-lever mechanism to actuate the manual pump to draw liquid solution from the reservoir in the handle to be used in the brushing operation. The reservoir in a transparent plastic handle portion will allow users to see the remaining amount of liquid solution. The ergonomically designed elongated fat handle of the toothbrush will allow sufficient space within to store required amount of desired liquid solution, and fit comfortably in the hand with better grip and manoeuvrability. It is to make choice for the manufacturer of the

present invention refillable or non-refillable, as both options are given. The airtight plastic cap of the toothbrush-head will prevent any contamination and protect from germs to breed and dirt to accumulate over the bristle and the nozzle.

The disinfecting agent in the liquid solution within the trigger spray toothbrush has the potential to dramatically reduce the chances of re-introducing harmful micro-organisms to the mouth that may otherwise linger on the toothbrush during an illness. During healthy periods, the present invention provides a convenient method for the general improvement of oral hygiene practices. In addition, there may be a reduced risk of cross-infection between a sick family member and those who store their toothbrushes within close proximity of the infected instrument.

Other objects, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

DESCRIPTION OF THE ACCOMPANYING DRAWINGS / OF PREFERRED EMBODIMENTS

Further aspects of the present invention will become apparent from the following description, with reference to the accompanying drawings in which:

Referring to **FIG. 1**, a trigger spray toothbrush, which embodies the invention, comprises a reservoir **5** filled with desired liquid solution in the hallowed handle, a manually actuated button shaped trigger 4 in an ergonomic cavity to comfortably fit the finger, which can be fitted after fixing the lever trigger mechanism. It also shows the nozzle 1 at the root of the bristle, 2 is the neck of the toothbrush where pump mechanism is enclosed.

Referring to **FIG. 2**, shows the upper body of the trigger spray toothbrush, where the internal passage is a part of the body: nozzle 6, pipeline 7, space for piston to

move 8, windows for inserting lever of the trigger 9, hook to hinge the lever of the trigger 10, the round space in the cavity for the press button 11, empty space for the movement of lever of the trigger 12, small hole for drain 13, and hook to attach the bottom portion of the toothbrush 14. This has an option of both hook fixture or screw mount to attach the handle of the toothbrush.

Referring to **FIG. 3**, shows a spring 15 and a plastic or glass ball 16.

Referring to **FIG. 4**, shows a top perspective view of the lower mechanism of the manual pump.

Referring to **FIG. 5**, shows a side perspective view of the lower mechanism of the manual pump.

Referring to **FIG. 6**, shows a top perspective view of the lower mechanism 17 of the manual pump, with spring 15 and ball 16.

Referring to **FIG. 7**, shows a side perspective view of the upper portion of the toothbrush, spring 15, ball 16 and lower body of the pump is inserted into the internal cylindrical space 8. Then lever trigger is inserted through the window 9, and it's axis is fixed on the hinges 10 (to allow swing), this push the lower portion of the pump to work as piston. Rubber washer 19 is for making the toothbrush leak proof, when attached with the handle of the toothbrush. A flexible transparent tube 20 is fixed on the bottom of lower body of the pump 17.

Referring to **FIG. 8**, shows a side perspective view of the entire trigger spray toothbrush, along with toothbrush-head-cap 22, and when the spray comes out 23.

The Trigger Spray Toothbrush is comprised of a cylindrical transparent plastic container / reservoir in the handle, a switching mechanism attached to the pump mechanism in the middle, and a nozzle in the centre of the bristle root atop. A

manual pump mechanism, actuated by a lever type trigger to draw desired liquid solution from an internal reservoir located in the handle.

* * * * *

CLAIMS

What is claimed is:

1. A sanitised mist-spray toothbrush consists of a cap for toothbrush-head, a light trigger actuator with a manual mist-pump at the brush-neck, a mist-nozzle at the brush-head, a reservoir in the handle, and which can be easily operated by lightly pressing a button-switch in a round aperture with a finger while holding, using, and brushing. It can dispense a mist-liquid specially of all oral health-hygiene-cosmetic applications including a dentifrice, cleaning/polishing agents, mouth-wash/freshener, and antibacterial/antiviral agents, or in general any other purpose applications including medical, therapeutic, health, hygiene, and cosmetics.

2. A liquid spray gun comprising a body assembly including a nozzle portion with an outlet end, said nozzle portion having a liquid passageway extending from an inlet end to an outlet end opening through the outlet end of the nozzle portion, said body assembly having a first air passageway extending from an inlet end to an outlet end at the outlet end of said nozzle portion, said outlet end of said first air passageway extending around said outlet end of said liquid outlet passageway and being shaped to direct air under greater than atmospheric pressure against liquid flowing out of the outlet end of the liquid outlet passageway to propel the liquid away from the outlet end of the nozzle portion while shaping the liquid into a generally conical stream about an axis, said body assembly including horns projecting past the outlet end of the nozzle on opposite sides of said axis, said body assembly having a second air passageway extending from an inlet end to outlet passageways and apertures spaced along said horns from the outlet end of the nozzle and facing opposite sides of said axis, said outlet passageways and apertures being shaped to direct air under greater than atmospheric pressure flowing through said second air

passageway against opposite sides of a stream of liquid formed by air flowing through the first air passageway to reshape that stream of liquid into a wide elongate stream, said liquid spray gun further including a platform portion having through air distribution passageways including an inlet opening adapted to be connected to a supply of air under greater than atmospheric pressure, first and second air outlet openings, means for separately regulating the flow of air through said first and second air outlet openings of said air distribution passageways, and manually operated means for stopping or allowing flow of air through said outlet openings of said air distribution passageways, and said platform portion and said nozzle portion having manually operable means for releasably mounting said nozzle portion on said platform portion with said first and second air outlet openings of said air distribution passageways communicating with the inlet ends of said first and second passageways.

* * * * *

FIGURE-1

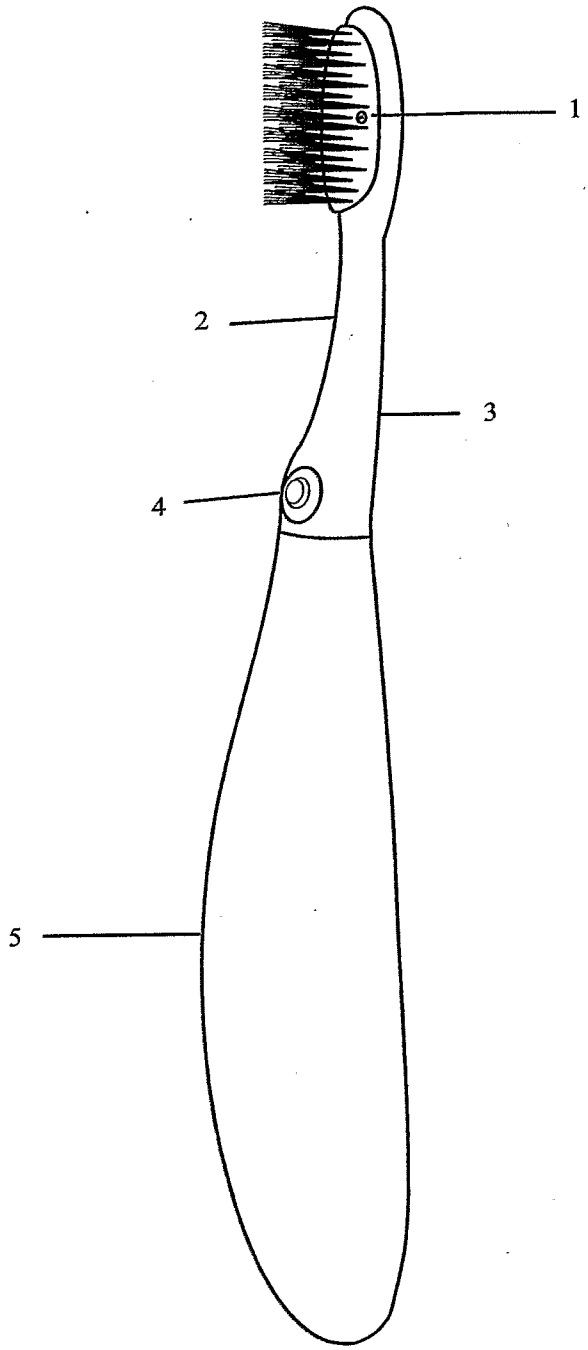


FIGURE-2

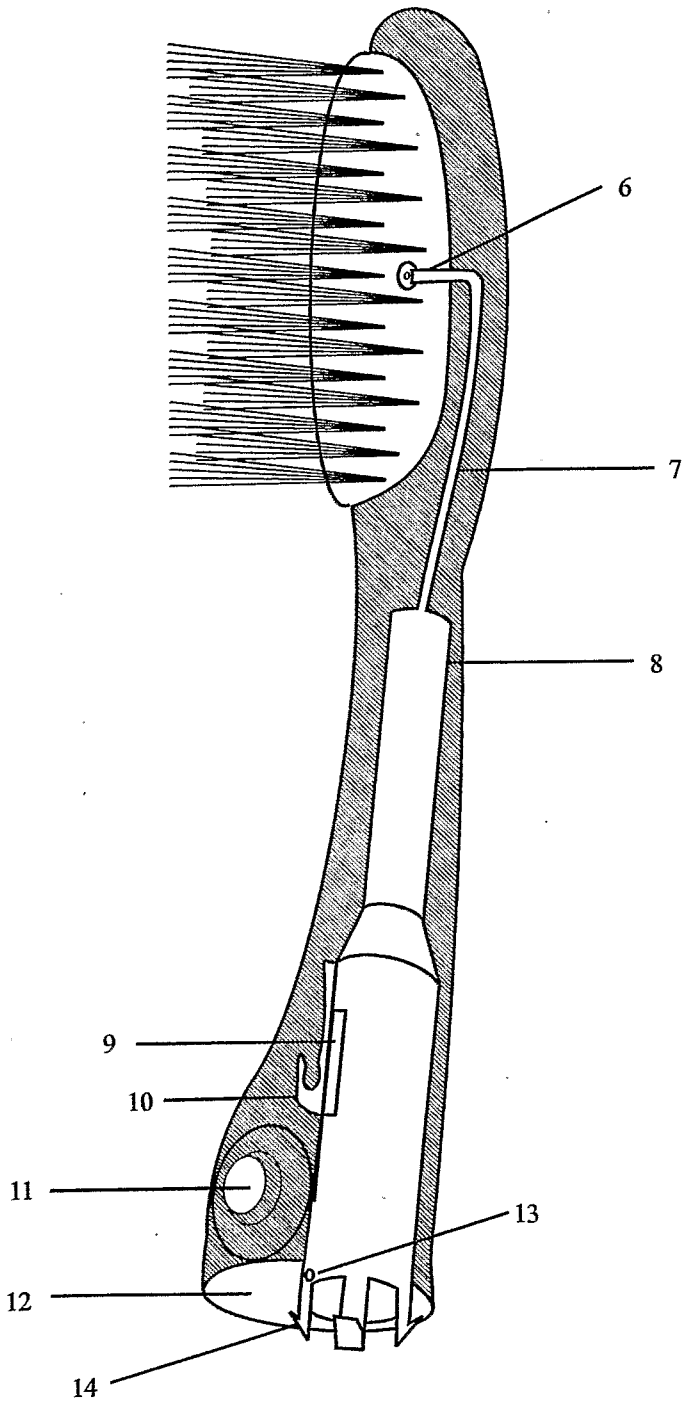


FIGURE-3

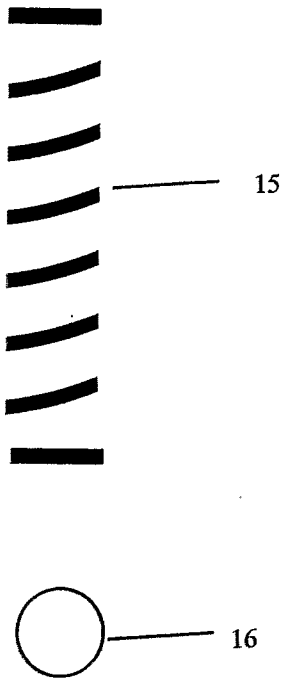


FIGURE-4

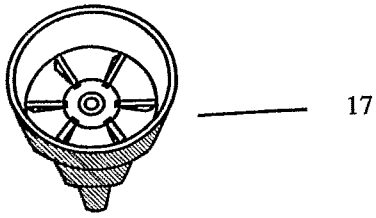


FIGURE-5

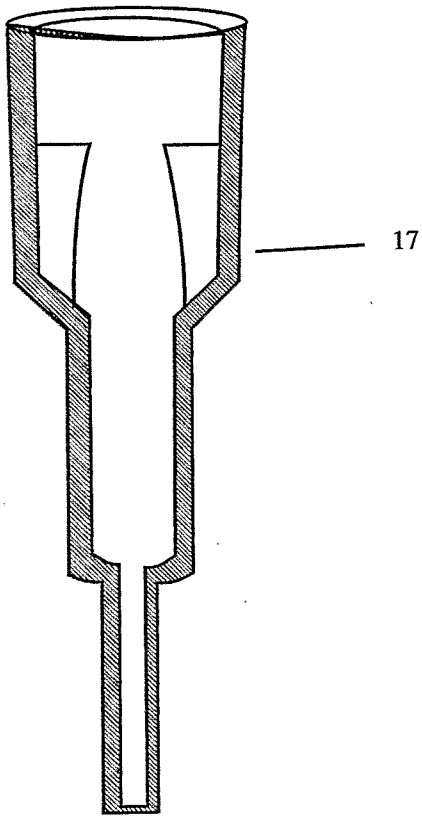


FIGURE-6

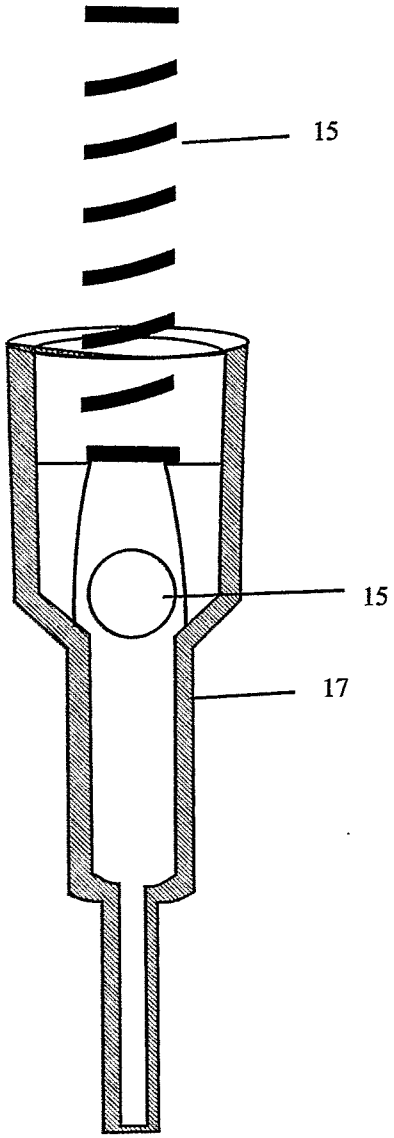


FIGURE-7

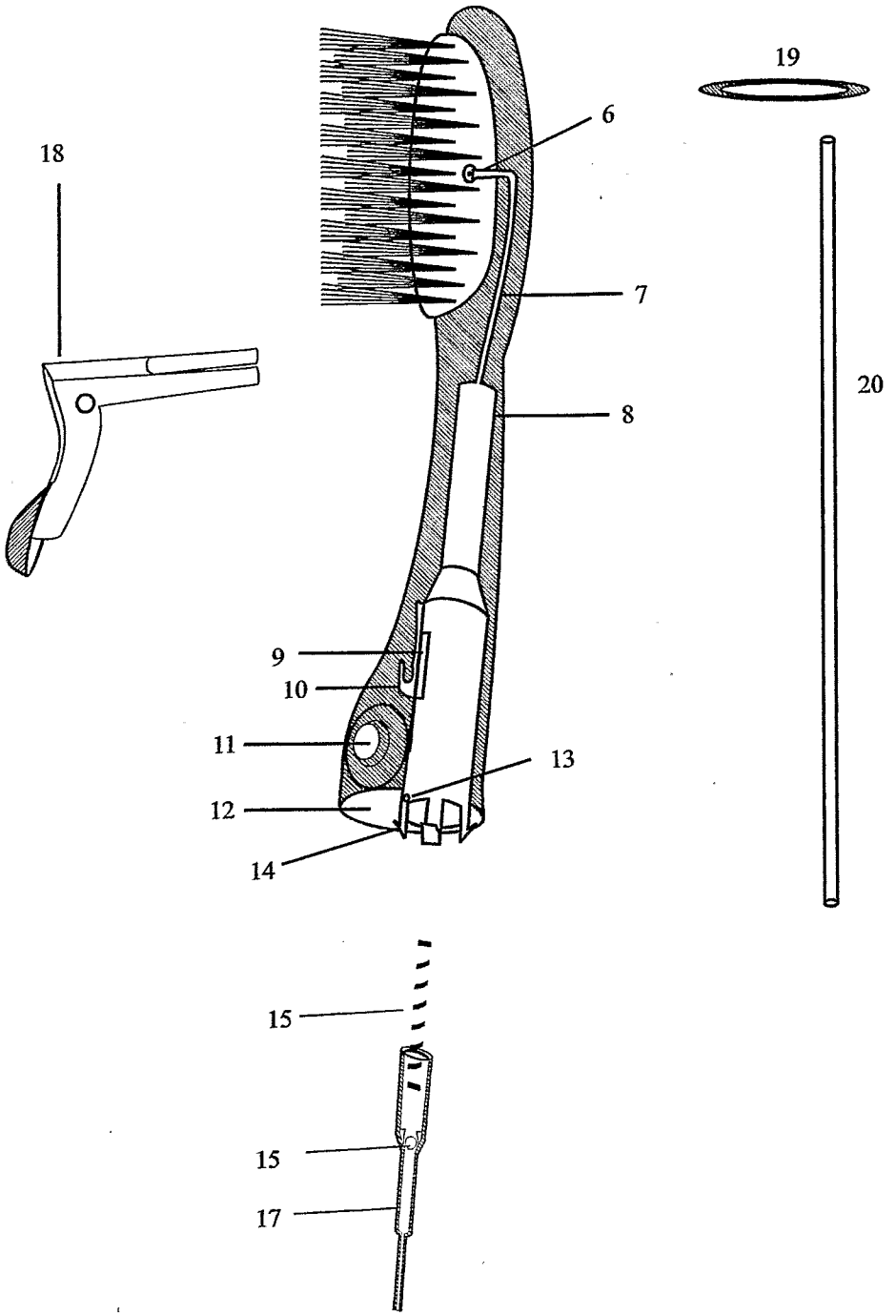
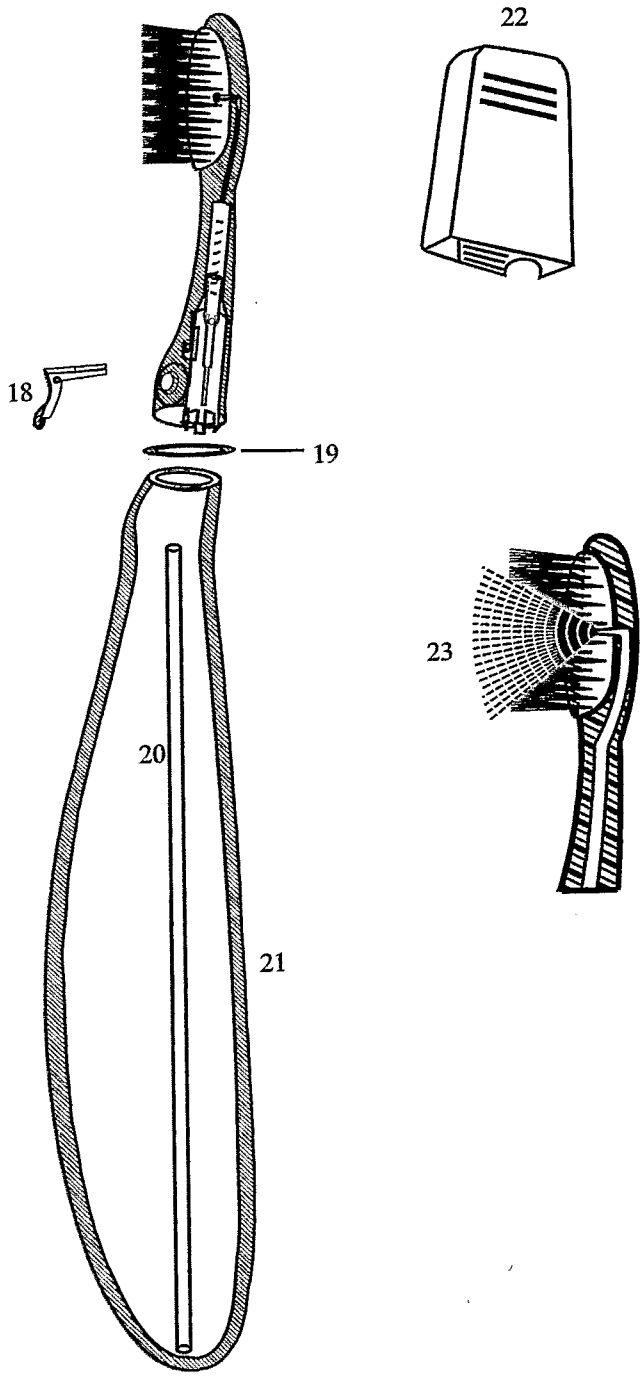


FIGURE-8



INTERNATIONAL SEARCH REPORT

International application No
PCT/IN2006/000412

A. CLASSIFICATION OF SUBJECT MATTER
INV. A46B11/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A46B A61C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97/22281 A (PUURUNEN JUHA PEKKA [FI]) 26 June 1997 (1997-06-26) page 4, line 16 - page 6, line 34; figures page 8, line 25 - page 9, line 10	1
X	WO 03/103985 A (GORDON DAVID C [US]) 18 December 2003 (2003-12-18) page 2, line 15 - page 3, line 24; figures 1,2	1
E	WO 2007/020660 A (SINGH MITHILESH KUMAR [IN]; SINGH SURINDER [IN]) 22 February 2007 (2007-02-22) the whole document	1

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 March 2007	28/03/2007

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Dinescu, Daniela

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IN2006/000412

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 2
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 2

Art. 17 (2) (a) (ii) and (b) and Rule 5.1 PCT
Claim 2 is not supported by the description.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IN2006/000412

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