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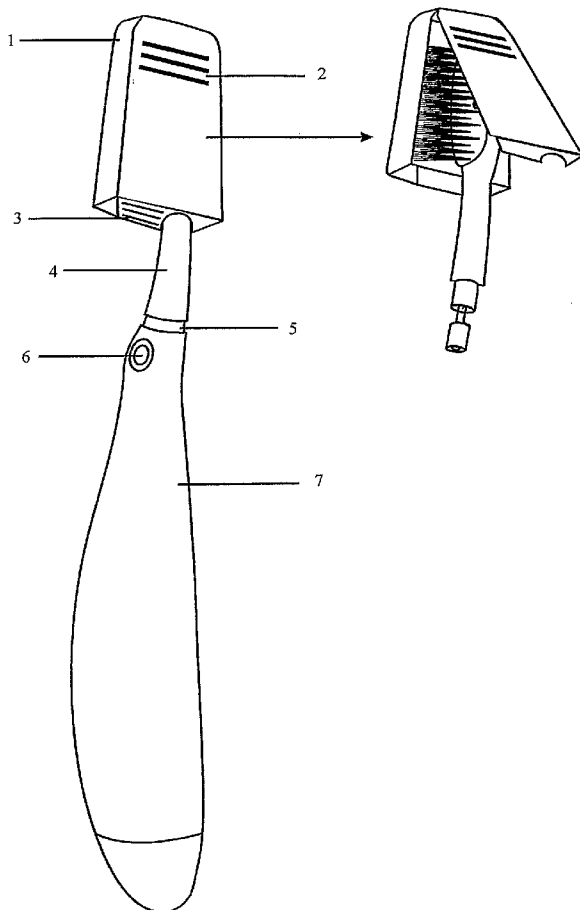
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- (71) Applicants and
(72) Inventors: SINGH, Mithilesh, Kumar [IN/IN]; 322, Janaki Apartments, Plot No. 7, Sector 22, Dwarka, New Delhi 110 075 (IN). SINGH, Surinder [IN/IN]; A-1/361, Second Floor, Paschim Vihar, New Delhi 110 063 (IN).
- (74) Agent: SINGH, Mithilesh, Kumar; A-803, Sheetal Vihar Apartments, Plot No. 10, Sector-23, Dwarka, New Delhi 110 075 (IN).

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(54) Title: THE SPRAY TOOTHBRUSH



(57) Abstract: A self-sanitising, low profile, fine mist, refillable or disposable, and push-button-manual-finger-operated-pump-type "spray toothbrush" comprising: a nozzle (8) at the root of the bristle (9) for dispensing any desired fluid/liquid from the reservoir within the handle (7) of the toothbrush (either or combination of a dentifrice, mouthwash, freshener, and antibacterial/antiviral for therapeutic, oral health-hygiene-cosmetics, or in any otherwise application); a push-button (6) lever-type actuator of the mist-spray-pump; a hygienic collapsible toothbrush-head-cap (1), having ergonomically designed tongue cleaner/scrapper; and a flexible toothbrush-neck (4), which moves or retracts vertically, providing shock-absorption and cushion.

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THE SPRAY TOOTHBRUSH

FIELD OF INVENTION:

The present invention relates to a new and improved construction of spray toothbrush with a transparent collapsible cap having provision for tongue cleaning or scrapping, comprising a reservoir and manual pump for dispensing a fluid dentifrice, antibacterial, antiviral, mouth-wash, mouth-fresh, and / or any kind of tooth or oral care.

The present invention relates to fluid dispensing, refilling, reusable, disposable, and self-sanitising 'spray toothbrushes', with more hygienic cap, which contain desired fluid composition in the handles (either or combination of a dentifrice, mouthwash, freshener, and antibacterial / antiviral for therapeutic, oral health-hygiene-cosmetics, or in any otherwise application). However, the invention is not to be limited to such use, and hence the prior art and possible applications of the invention as discussed below are given by way of example only.

BACKGROUND OF THE INVENTION:

With the ever-increasing concern of oral health and hygiene, all over the world, there is a growing demand for a more hygienic, convenient and self-sufficient toothbrush.

The toothbrush attracts, colonises and breeds harmful microorganisms (bacteria, viruses and microbes); and keeping it cleaned or sanitized between the uses, has been of a prime concern.

There have been many proposals and inventions all over the world to put together the toothbrush and toothpaste (dentifrice), like those series of revolutionary inventions in making of fountain pen.

Contrary to the traditional concept of separate toothbrush and toothpaste, a large number of inventions for making a two-in-one or built-in system in the name of 'fountain toothbrush', 'pen toothbrush' and 'dentifrice dispensing toothbrush', are in the spot of some limitations and constrains to become a popular choice of the concerned industry and the people worldwide.

Cleaning teeth several times a day is widespread, which is conditioned by multiple factors, such as ergonomics, portability, effectiveness, convenience to carry and use, service and maintenance, and packaging. Furthermore traditional type toothbrushes and toothpastes do not allow easy reach to all corners of the oral cavity.

The aim of the present invention is to create a device suitable to improve the prevention of oral diseases and dental hygiene, obviating the above-mentioned inconveniences and/or limitations.

However, the conventional teeth sprayer needs electrical power to drive the pump to work, so a high cost is involved in using the conventional teeth sprayer. That is, the special miniature motor required is costly, as are the batteries required to drive the motor. To overcome such shortcomings, the present invention provides a dental hygiene sprayer to mitigate or obviate the aforementioned problems.

Beside providing the effective and convenient oral hygiene, whether in home or outside, 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.

A fountain toothbrush of this type has been described in U.S. Patent No. 3,937,582. However, when manufacturing this bristle carrier by using modern production methods, it is difficult to ensure that the outflow of dentifrice during the non-use of the toothbrush is completely prevented e.g. when the latter is held with the bristles pointing downwards.

Dispenser devices of this type are known to the art in numerous constructional embodiments. They are typically quite complicated in construction and accordingly expensive. Furthermore, they simultaneously markedly inhibit the free construction or design of the apparatus with which such dispenser devices are employed. Thus, it is for instance difficult to construct the reservoir as a cartridge, since for the purpose of connecting the same with the pump there is required a detachable conduit connection. Moreover, the valve arrangement of the state-of-the-art dispenser devices employ automatically activated or even better stated pressure-activated valves, since the positive actuation of the valves requires a complicated valve mechanism which cannot readily be employed for spatial, cost or also functional reasons.

Toothbrushes, which contain toothpaste in their handles, are known in the art. U.S. Pat. No. 4,221,492 is an example of such toothbrushes. Such toothbrushes have the advantage of eliminating the need for both a toothbrush and a toothpaste tube. In the past, such toothbrushes have been intended for long-time use. As a result, the issue of refilling the handles with toothpaste has had to be addressed. Complex and expensive solutions to this problem have appeared. Also, in the prior toothbrushes, valves have been used which prevent the expulsion and waste of toothpaste and the contact of the toothpaste with air which would result in caking. Such valves add significantly to the cost of the toothbrushes. Thus, there is a need for toothbrushes, which contain liquid toothpaste in their handles, yet are simple in design and inexpensive to manufacture.

The present invention relates to a toothbrush with pumping system and more particularly pertains to a toothbrush, which selectively dispenses toothpaste, mouthwash, and antibacterial rinse when desired by the user.

People who travel are often restricted with the amount of items that they can carry with them. Most people do not wish to sacrifice the number of personal hygiene items that they use on a daily basis. Thus, a need exists for a device that will incorporate most items that people use for dental hygiene in one simple to use instrument that can also be easily transported without occupying a great deal of space.

By way of example, U.S. Pat. No. 5,208,933 to Lustig discloses a powered dental tool for cleaning teeth with a supply cartridge incorporated, capable of dispensing liquid toothpaste. U.S. Pat. No. 5,458,563 to Stewart discloses a toothbrush and pump assembly with a fluid supply and means for fluid extraction, for use by bedridden patients. U.S. Pat. No. 4,017,974 to Sotman discloses a means for spraying water from a dental hand piece. U.S. Pat. No. 2,959,749 to Perry discloses a toothbrush used in conjunction with a water faucet. U.S. Pat. No. 5,170,525 to Cafaro discloses a battery-operated toothbrush, which employs multiple motorized brush groups.

While these devices fulfil their respective, particular objective and requirements, the aforementioned patents do not describe a toothbrush with pumping systems for allowing toothpaste, mouthwash, and antibacterial rinse to be pumped independently from the toothbrush.

Therefore, it can be appreciated that there exists a continuing need for a new and improved toothbrush with cost effective manual pumping systems, which can be used for allowing liquid dentifrice, mouthwash, and antibacterial rinse to be pumped and sprayed independently to the desired place of the teeth from the toothbrush. In this regard, the present invention substantially fulfils this need.

The thin flexible bristles are smooth members of which the ends are cut off at right angles and are often rounded to dome-like tips. Toothbrushes of this type and the mechanism of toothbrushing play an important part in oral hygiene. It has been shown unequivocally that toothbrushing is instrumental in reducing dental decay. See, for example, Fosdick, L. S. J. Am. Dent. Assoc., 40, 133 (1950). Furthermore, regular brushing with a cosmetic dentifrice further reduces the incidence of decay among susceptible subjects.

The present invention relates generally to a dental hygiene product namely a flexible neck toothbrush. More particularly, the present invention relates to a toothbrush having a handle portion pivotally connected to a neck portion having a dental brush. A coil spring interconnected between the handle portion and the neck portion allows the neck portion to pivot when a threshold pressure is exceeded on the face of the dental brush. The threshold pressure is a pressure

upon the dental brush just below that which causes tooth abrasion and gum damage. Accordingly, it is desirable to brush the teeth with a light pressure and proper bristle orientation to avoid damage to the hard and soft tissues of the mouth.

THE OBJECTS & SUMMARY OF THE INVENTION:

A self-sanitising, low profile, fine mist, refillable or disposable, and push-button-manual-finger-operated-pump-type 'spray toothbrush' comprising:

- A nozzle at the root of the bristle for dispensing any desired fluid / liquid from the reservoir within the handle of the toothbrush (either or combination of a dentifrice, mouthwash, freshener, and antibacterial / antiviral for therapeutic, oral health-hygiene-cosmetics, or in any otherwise application);
- A push-button lever-type actuator of the mist-spray-pump;
- A hygienic collapsible toothbrush-head-cap, having ergonomically designed tongue cleaner / scraper; and
- A flexible toothbrush-neck, which moves or retracts vertically, providing shock-absorption and cushion.

To overcome the above limitations, the present invention provides a simpler built-in spray mechanism in the 'Spray Toothbrush', designed to provide an instant, easy and convenient way for not only keeping the contaminated surfaces of the toothbrush sanitised with the routine application of antibacterial/antiviral solution, but also to clean the teeth properly and to provide therapeutic and freshening application.

A primary object of the invention is to provide a toothbrush, with a flexible neck, easy to use press-button-type reliable manual mist-spray pump, and has a reservoir within the handle for holding dentifrice to be used in the brushing operation, which is an elongated unit as well as fits comfortably in the hand.

By disinfecting the toothbrush, the Sanitised Toothbrush Spray has the potential to dramatically reduce the chances of re-introducing bacteria to the mouth that may otherwise linger on the toothbrush during an illness. During healthy periods, the Sanitised Toothbrush Spray 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.

The present invention relates to an ergonomic toothbrush having a flexible neck and adaptively designed handle to prevent tooth abrasion and gum damage during use.

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.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS:

These and other attributes of the invention will become more clear upon a thorough study of the following description of the best mode for carrying out the invention, particularly when viewed in conjunction with the drawings, wherein:

FIG. 1 is a perspective view of the Toothbrush, also showing opened toothbrush-head-cap separately.

FIG. 2 is a perspective view of some of the internal parts and mechanism of the Spray Toothbrush

FIG. 3 is an exterior, internal and sectional view of an air spray toothbrush according to a further aspect of the present invention.

FIG. 4 shows a flow chart of an outlined view of the pump mechanism in an air spray toothbrush configured in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

As shown below, the description refers to the relevant drawings in order to describe the present invention more clearly, and such description is not to be interpreted as limiting the present invention in any way.

As can be seen by the reference to the drawings, and in particular to **FIG. 1**, the Spray Toothbrush comprises in general a toothbrush-head-cap **1** for preventing the bristle from any kind of contamination from the external source, the tongue cleaner / scrapper strip **2**, the toothbrush-head-cap may be opened by press-opening the grip **3**, the neck **4** is flexible which moves up and down upon a built coil spring to provide shock absorption and cushion on a track that prevents it to rotate, the moving space of the track **5**, the push-button **6** based on lever mechanism actuates the manual pump to spray the desired liquid, from the handle of the toothbrush-bottom **7** which is the reservoir for storing the desired liquid.

As shown in **FIG. 2**, the Spray Toothbrush comprises of the constituent / internal parts of the present invention, which in general comprises of a nozzle **8**, bristle **9**, slot **10** for free vertical movement of the brush head attached to the pump and

switching mechanism, pipeline 11 for pressurised fluid to get released at the jet, and piston 12 in pump mechanism.

As shown in **FIG. 3**, is an exterior, internal and sectional view of the spray toothbrush according to a further aspect of the present invention. It shows the entire assembled unit of the present invention, partially showing the exterior and interior, and the spray coming out from the nozzle of the spray toothbrush at the root of the fitted bristle.

FIG. 4 shows a flow chart of an outlined view of the pump mechanism and parts separately inside the spray toothbrush configured in accordance with the present invention, which consists of coil-spring 17, ball 16, cylindrical chamber 15, flexible transparent pipe 14, part 18, washer 19, piston-part 20, spring 21, part 22, washer 23, push-button-lever 24, lid-mount 25, internal pipeline in the neck and the head of the toothbrush 26, and the nozzle 27.

INDUSTRIAL APLICABILITY / EXAMPLES

As described above, the self-sanitising, low profile, fine mist, refillable or disposable, and push-button-manual-finger-operated-pump-type 'spray toothbrush' according to the present invention can be operated by manually pressing the push-button in horizontal direction even with a very short distance of movement in a circular-motion by the actuating lever to facilitate the vertical movement of the piston in the chamber of the pump, which contributes to the beauty and utility of a final product, 'the Spray Toothbrush', containing desired liquid to be sprayed from the built-in pump. The spray toothbrush according to the present invention can be smoothly pumped without any wasteful spill and leakage, and also fabricated with a small number of constituent parts resulting in the remarkable reduction of its manufacturing as well as assembly cost. In addition, it can start to pump with a small empty pumping numbers.

As the present invention may be embodied in several forms without departing from the spirit or the essential characteristics thereof, it should also be understood that the above-described examples are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be construed broadly within its spirit and scope as defined in the appended claims, and therefore all changes and modifications that fall within the meets and bounds are therefore intended to be embraced by the appended claims.

CLAIMS

What is claimed is:

1. A self-sanitising, low profile, fine mist, refillable or disposable, and push-button-manual-finger-operated-pump-type 'spray toothbrush' comprising:
 - A nozzle at the root of the bristle for dispensing any desired fluid / liquid from the reservoir within the handle of the toothbrush (either or combination of a dentifrice, mouthwash, freshener, and antibacterial / antiviral for therapeutic, oral health-hygiene-cosmetics, or in any otherwise application);
 - A push-button lever-type actuator of the mist-spray-pump;
 - A hygienic collapsible toothbrush-head-cap, having ergonomically designed tongue cleaner / scraper; and
 - A flexible toothbrush-neck, which moves or retracts vertically, providing shock-absorption and cushion.
2. The spray toothbrush according to claim 1, wherein the said push-button-manual-finger-operated pump for dispensing through the nozzle at the root of the bristle any desired fluid / liquid from the reservoir within the handle of the toothbrush.
3. The spray toothbrush according to claim 1, wherein the bottom-portion, that is the handle of the spray toothbrush, is the reservoir for storing desired liquid and made of hard transparent plastic having visual indication of depleting liquid, which is elongated with round edged in shape, hollowed from inside, and opening from the top. It may be filled from the bottom-end, by opening a screw-mounted cap.
4. The spray toothbrush according to claim 1, wherein the said hygienic collapsible toothbrush-head-cap, has ergonomically designed tongue cleaner / scraper said first portion is inclined with respect to said second portion by an angle of inclination.
5. The spray toothbrush according to claim 1, wherein the said tongue cleaning device on the outer surface of the collapsible toothbrush-head-cap is formed of a polymeric material, which is a food grade plastic.
6. The spray toothbrush according to claim 1, wherein the said tongue cleaning ribs deviced on the outer surface of the collapsible toothbrush-head-cap are substantially parallel to one another, wherein said cleaning surface on each of said cleaning ribs is convex, wherein said cleaning

surface on each of said cleaning ribs is formed of a pair of outwardly projecting, conterminous, converging surfaces that connect along a linear apex, said converging surfaces having an angle of convergence which is non-acute.

7. The spray toothbrush according to claim 1, wherein the said flexible toothbrush-neck, which moves or retracts vertically by a coil spring within, providing shock-absorption and cushion.

* * * * *

FIGURE-1

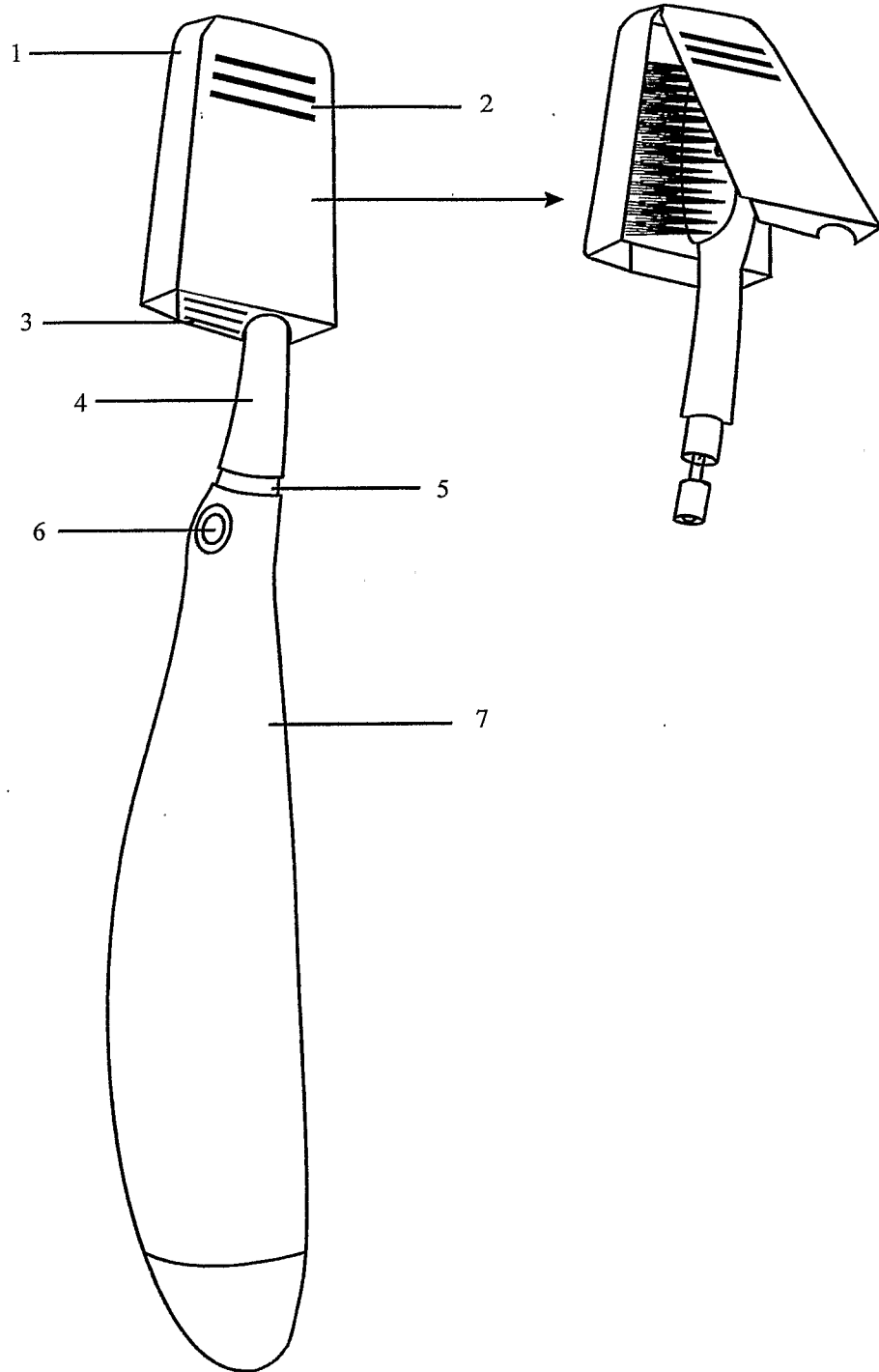


FIGURE-2

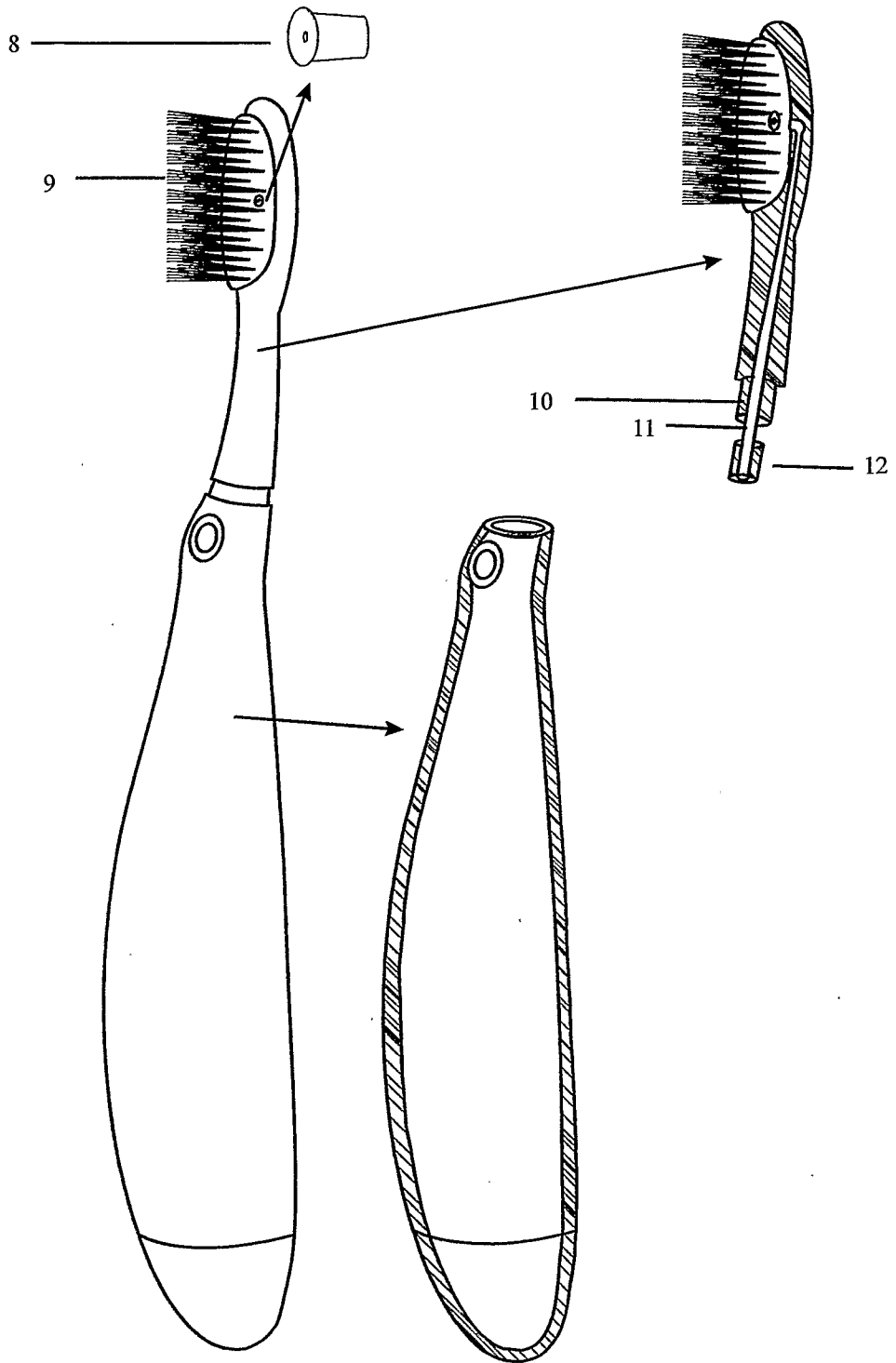


FIGURE-3

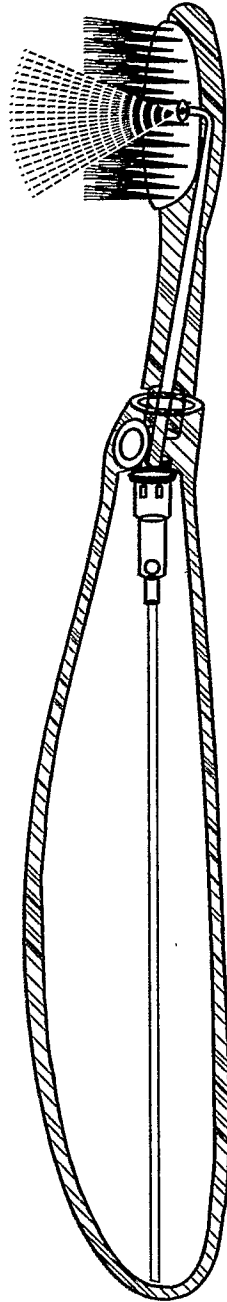
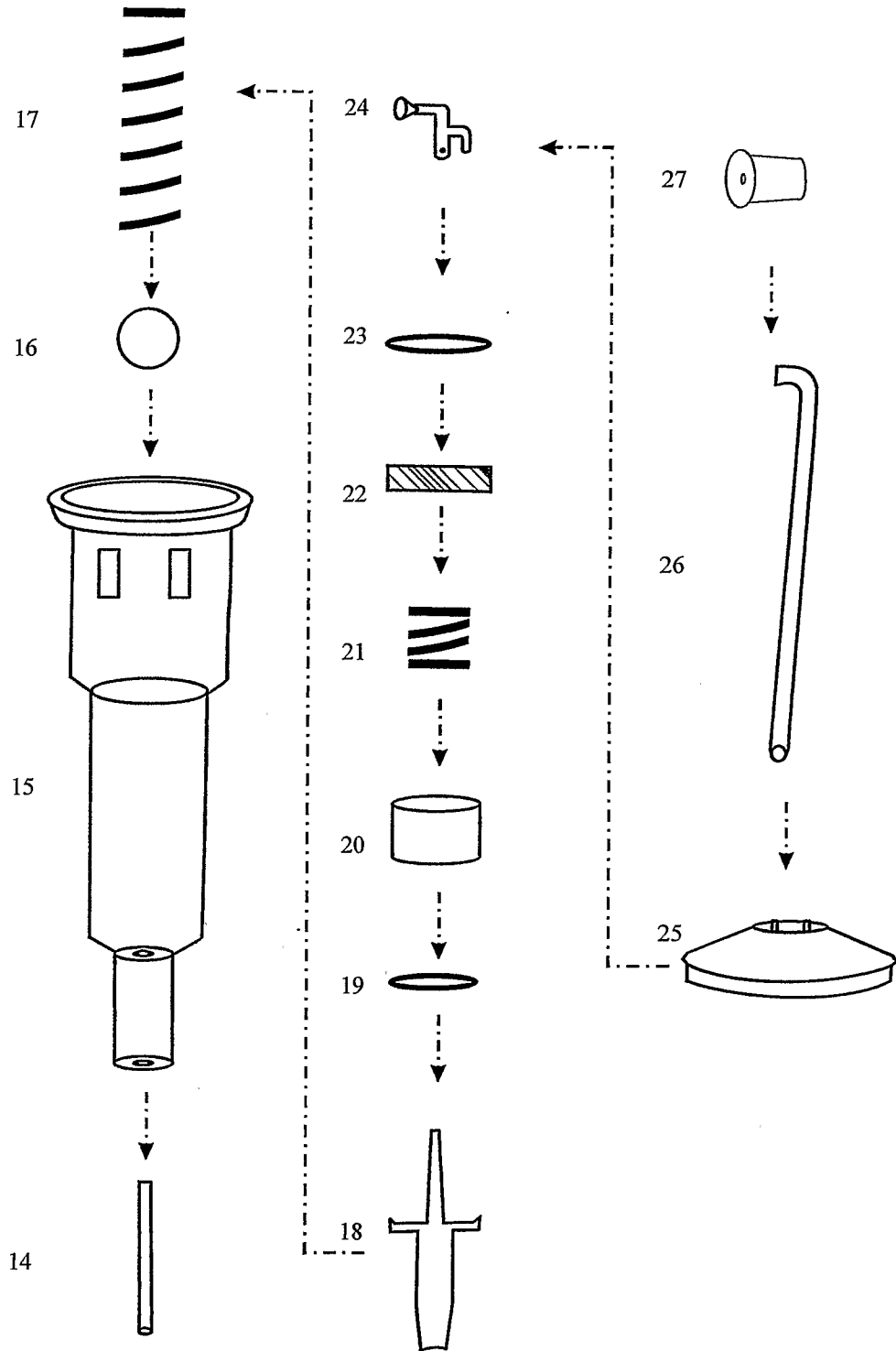


FIGURE-4



INTERNATIONAL SEARCH REPORT

International application No

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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)
A61B 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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2004/021958 A (REHCO LLC [US]) 18 March 2004 (2004-03-18) abstract paragraphs [0008], [0019], [0020], [0025], [0030], [0031] figures 1-5	1-7
Y	WO 01/34042 A (FREIJ BENGT [SE]) 17 May 2001 (2001-05-17) page 2, lines 7-24 page 3, lines 8-12 page 4, lines 1-5 claims 1-4,7	1-7
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Further documents are listed in the continuation of Box C.

See patent family annex.

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- *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
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- *&* document member of the same patent family

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Name and mailing address of the ISA/

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

Authorized officer

WITKOWSKA-PIELA, A

INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2002/015612 A1 (AOYAMA YOSHIHIRO [JP]) 7 February 2002 (2002-02-07) abstract paragraphs [0049], [0080] - [0082] figure 17 -----	1-7
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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