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Segerstad

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[54] **RESERVOIR BRUSH FOR THE APPLICATION OF AGENTS ON TO SURFACES**

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[52] **U.S. Cl.** **401/173,** 15/176, 401/290

[51] **Int. Cl.** **A46b 11/02**

[58] **Field of Search** ..... 401/150, 171–177, 401/184, 289, 290; 132/80 R, 81; 15/104.94

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Primary Examiner—Daniel Blum
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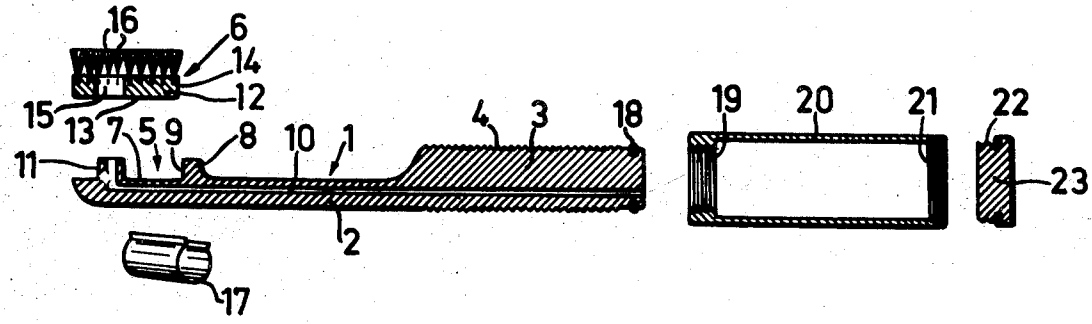
[57] **ABSTRACT**

A reservoir brush comprising a brush body including a shank with a through hole or duct, and an enlarged end portion having external threads engaging internal threads of a cylindrical receptacle for a more or less viscous treating agent such as a tooth paste. At its other end the shank is provided with a flat support surface having a first stud extending at right angles thereto, said stud having a hole communicating with the duct of the shank, and a second stud extending from one end of the support surface at right angles thereto and having a flat surface facing the hollow stud. The flat support surface of the shank is adapted to receive a correspondingly shaped detachable brush element having a through hole matching the hollow stud extending from the flat support surface, and an end surface adapted to engage the flat surface of the second stud. A resilient means is provided to keep the brush element in a firm engagement with the support surface.

3 Claims, 4 Drawing Figures



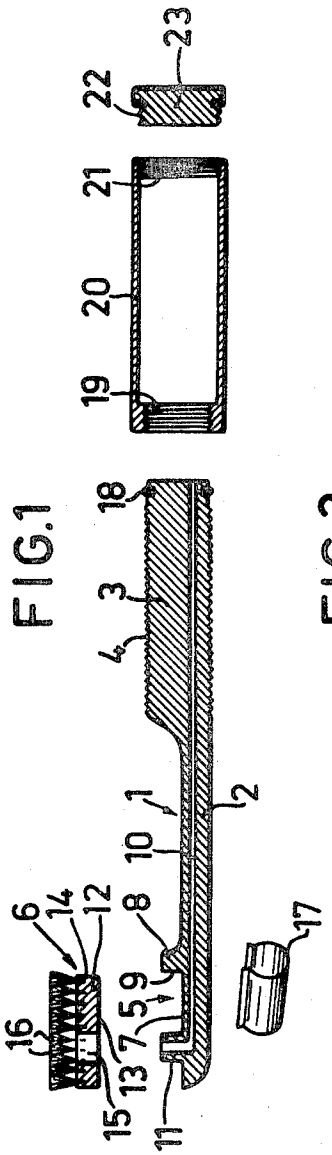


FIG.1
23
22
21
20
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18
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12
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15
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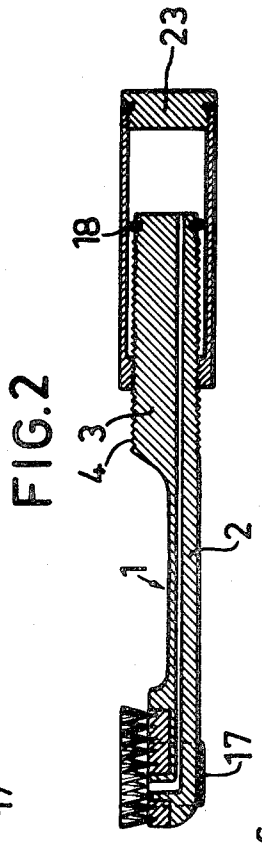
FIG.2
23
18
3
4
1
2
17

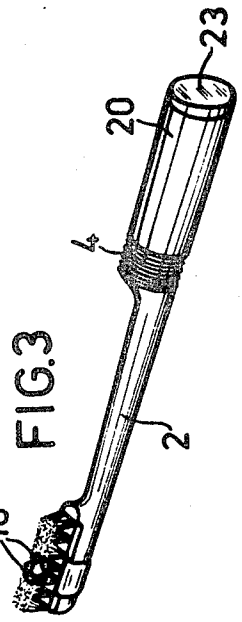
FIG.3
23
20
4
2
16

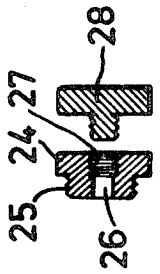
FIG.4
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RESERVOIR BRUSH FOR THE APPLICATION OF AGENTS ON TO SURFACES

BACKGROUND OF THE INVENTION

The present invention relates to a reservoir brush for application of various viscous fluid treating agents on to surfaces and more particularly to a brush of the type the shank of which has a longitudinally extending duct communicating at one end in the region of the bristle tufts and at its other end with the interior of a cylindrical reservoir adapted to keep a treating agent such as a paint, a tooth paste, a shoe polish or the like, said reservoir threadedly engaging an enlarged cylindrical plunger-like end portion of the shank and adapted to be operated so as to pressurize the agent contained in the reservoir to feed it through the duct to the brush element.

Prior reservoir brushs of this type are impaired by several defects. Thus, it has been found that, upon turning the reservoir on the enlarged threaded cylindrical portion of the shank, the treating agent contained in the reservoir will be forced into the interstices between the outer threads of the cylindrical portion of the shank and the interior threads of the reservoir, this resulting in a substantially increased sliding friction and the tendency of solidification of the treating agent escaped into the gaps between the threads, the brush thus becoming unfit for use. Another defect of known reservoir brushes is the fact that the duct emerges at the surface of a brush plate in which the bristles or tufts are attached, causing the agent such as, for instance, tooth paste, to be squeezed laterally outwards into the free space surrounding the holes within which the tufts are secured and firmly compressed, but is more or less prevented from being supplied to the operating surface in the region of the free ends of the bristles, as desired. A further drawback of known reservoir brushes of the above-described type is the fact that the bristles, being those parts of the brush which are most subjected to wear, will be worn-out within a relatively short period of time which implies that the brush has to be substituted.

SUMMARY OF THE INVENTION

In view of the above-described deficiencies in the art it is an object of this invention to provide a reservoir brush of the above-mentioned type, which allows a simple non-smeary charging with treating agent from various types of supply containers without the formation of air pockets.

It is another object of the present invention to provide a reservoir brush which permits a simple and exact feeding of the agent so as to render it possible with little expenditure of force and with good tightening to build up high pressures within the duct.

A still another object of the invention is to provide a reservoir brush having a replaceable brush element adapted without leakage or lateral losses to direct the treating agent to the operative surface of the brush.

Other objects and many of the attendant advantages of the present invention will be evident from the following description and the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded diametrical sectional view of an exemplary reservoir tooth brush according to the invention;

FIG. 2 is a longitudinal sectional view of the assembled reservoir tooth brush;

FIG. 3 is a view in perspective of FIG. 2; and

FIG. 4 is a sectional view of a modified form of an end closure.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. 1 there is shown a reservoir tooth brush comprising a brush body 1 which is the principal or supporting element of the reservoir brush. The brush body 1 includes a shank 2 having at its rear end an enlarged cylindrical solid plunger 3 provided with external threads 4, said shank being at its front end shaped as a brush element support 5. Said brush element support 5 is adapted to constitute a seat for the mounting of a detachable brush element 6, and constitutes a continuation of the shank 2 and is provided with a flat top surface 7 and a raised stud 8 having a flat front surface 9 extending at right angles from the flat surface 7. The brush body 1 is provided with an axial duct 10 extending from the end face of plunger 3 and debouching into a hollow stud 11 extending outwards at right angles to the flat surface 7 of the brush element support 5 from a point at its longitudinal center axis between the front surface 9 of the stud 8 and the free end of the brush element support 5.

The brush element 6 consists of a plane parallel base plate 12 with a plurality of tufts or bristles 18 extending perpendicularly therefrom. The base plate 12 has a flat bottom surface 13 adapted to engage tightly the flat top surface 7 of the brush element support 5, and an end surface 14 extending at right angles to the bottom surface 13 and adapted to engage the perpendicular surface 9 of the brush element support 5. The heighth of the raised hollow stud 11 extending from the top surface 7 of the brush element support 5 is of the same size as the thickness of the base plate 12 of the brush element 6 or, if desired, slightly large, so that with the brush element 6 mounted in its position on the brush element support 5, the hole in the stud 11 communicating with the duct 10 will debouch substantially at the same level as the top surface of the base plate 12 or at a small distance above the top surface, it being noted, however, that the heighth of the hollow stud 11 of course is not allowed to extend to such a level that as a result of the resilience of the bristles, the stud is interfering with the object being treated, e.g. the teeth.

In the base plate 12 of the brush element 6 there is a through hole 15 the center distance of which from the end surface 14 of the base plate 12 is substantially the same as the center distance between the stud 11 and the surface 9 of the stud 8 of the brush element support 5, and the inside diameter of which is slightly smaller than the outside diameter of the hollow stud 11 extending from the brush element support 5 so that the base plate can be threaded with slip fit over the stud until the surfaces 7 and 13 are brought into engagement. The abutting surfaces 9 and 14 of the stud 8 and base plate 12, respectively, prevent pivoting of the brush element on the stud 11.

Preferably, the bristles or tufts extending from the base plate 12 adjacent the hole 15 are attached to the base plate in an annular arrangement of closely spaced bristles or tufts so as to provide a tubular tuft or tufts of bristles 16 directing the agent ejected from the hole

in the stud outwards to the operative area of the brush element.

For the purpose of securing the brush element to the support 5 a spring strap or slip 17 is arranged in part to surround the brush element support 5 and the brush element 6 positioned thereon so that the latter is secured with a safe easily disengagable spring locking engagement.

The hindmost end portion of the plunger 3 of the brush body 1 is unthreaded and provided with a sealing ring (O-ring) 18 engaging the internal surface of a cylindrical receptacle 20 being provided at its fore end (the end facing the brush element support 5) with a few internal threads 19 to engage the external threads 4 of the plunger 3 of the brush body 1, the diameter of the smooth internal surface of the cylinder being slightly larger than the largest diameter of the internal threads 19, i.e. slightly larger than the diameter of the free cross-sectional area of the cylinder plus twice the depth of the threads.

The end portion of the cylinder 20 farthest remote from the brush element support 5 is provided with a few internal threads 21 to engage corresponding external threads 22 of an end closure 23.

As will be apparent from the foregoing description, the reservoir tooth brush according to the invention is composed of four separate elements which are easily mountable and dismountable, viz. (1) a hollow brush body 1 having a brush element support 5 at one end and an externally threaded plunger 3 at the other; (2) a brush element 6 with a spring clip 17, (3) a cylinder 20; and (4) an end closure 22 for the cylinder.

The mounting of the brush element 6 on the brush element support 5 has been described earlier. To mount the cylinder 20 and charge it with a treating agent such as tooth paste, the brush body 1, its shank foremost, is inserted through the cylinder 20 until its internal thread 19 abuts the external thread 4 of plunger 3, whereupon the cylinder is rotated a few turns and advanced in a direction away from the brush element support 5 and its free end moved past the sealing ring 18 and outside the rear end surface of the plunger 3 to provide a cylindrical chamber open at one end, into which the treating agent is charged progressively while rotating the cylinder 20 until further rotation is prevented when the sealing ring comes into contact with the internal thread 19 of the cylinder 20, care being taken all the time that the agent is charged without formation of air bubbles. The cylinder 20 charged with agent is then sealed by screwing on the end closure 23. The brush is then ready for use. By rotating the cylinder 20 in the opposite direction as before, the plunger 3 will pressurize the agent charged into the cylinder so that it is forced through the duct 10 to the brush element 6. When the desired amount of agent has been supplied to the brush element, the rotation of the cylinder is stopped. When it is desired the next time to apply agent on to the brush element, the operation is carried out in the same way, and continued repeatedly until the cylinder is exhausted of its contents. In a refilling operation the end closure 23 is removed and the cylinder 20 rotated as previously described in the opposite direction to its extended position while simultaneously recharging it with tooth paste. When it is desired to lean the tooth brush, its elements are dismounted, and the elements cleaned separately.

According to a modification of the invention, shown in FIG. 4, the cylinder 20 is provided with a double threaded screw nipple 24 having an external thread 25 engaging the internal thread 21 of the cylinder 20, and a central aperture 26 having an internal thread 27 matching the thread of the neck of a conventional collapsible cream tube charged with tooth paste, for instance. An externally threaded stopper 28 serves as a closure member of aperture 16. Charging of the cylinder 20 is effected in the same way as described earlier except for ejecting the treating agent directly into the cylinder from the collapsible cream tube securedly screwed into the nipple 24. Subsequently to the refilling operation the collapsible tube is unscrewed and the stopper 28 screwed on.

It is of course possible to use other connecting means known in the art to secure the brush element 6 to its support 5 or to fasten the end closure to the cylinder 20. Thus, for instance, it is possible to secure the brush element to its support by means of a bayonet catch made from the same material as that of the brush body (e.g. nylon) so that the spring strap described above is superfluous.

Various modifications and other embodiments of the invention, in addition to those shown and described herein, will be apparent to those skilled in the art from the foregoing description and drawings. Such other embodiments and modifications are intended to fall within the scope of the appended claims.

What is claimed Is;

1. A reservoir brush for the application of fluids onto a surface comprising in combination:

a. a brush body constituting the supporting element of the reservoir brush, said brush body including a shank and an enlarged cylindrical plunger having external threads integral with and positioned at the rear end of said shank, said shank having a brush element support at its front end having a flat surface, said brush element support further having a cylindrical stud with a coaxial bore which extends outwards at right angles to said flat support surface, said brush element support further having an elevated stud having a flat front surface extended at right angles to said flat support surface, said cylindrical stud and said elevated stud serving as brush element guiding means; an axial opening extending through said brush body and communicating with the bore of said cylindrical stud and the rear of said plunger, and a sealing ring cooperating with said plunger and positioned at the rear end thereof;

b. a cylindrical receptacle having internal threads at the forward end thereof and threadably and detachably engaging said plunger, said cylindrical receptacle having a smooth internal surface with a diameter slightly larger than the largest diameter of said internal threads;

c. an end closure detachably connected to the rear end of said cylindrical receptacle;

d. a brush element detachably connected to said brush element support and comprising a base plate having a plurality of bristle tufts extending perpendicular thereto, said base plate having a flat bottom surface adapted to engage the corresponding flat surface of said brush element support, said brush element further having guiding means adapted to engage the corresponding guiding means of said brush element support and comprising a through

opening in said base plate adapted to engage the external surface of said cylindrical stud of said brush element support and a flat end surface on said base plate of said brush element adapted to engage the flat front surface of the elevated stud of said brush support element; and

e. a spring clasp detachably connecting said brush element to said brush element support.

2. The reservoir brush of claim **1** wherein the bristle tufts extending from the base plate of said brush element adjacent said opening therein are attached to said base plate in an annular arrangement of closely spaced bristle tufts so as to provide a tube of bristles adapted to direct treating fluids ejected from the bore of the cylindrical stud of said brush element support outwardly to the operative area of the brush element.

3. The reservoir brush of claim **1** wherein said cylindrical receptacle has internal threads at its rear end and said end closure comprises a double threaded screw nipple having external threads threadably engaging the internal threads at the rear end of said cylindrical receptacle and a central aperture having internal threads and a stopper having external threads and threadably engaging the threaded aperture of the said screw nipple.

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