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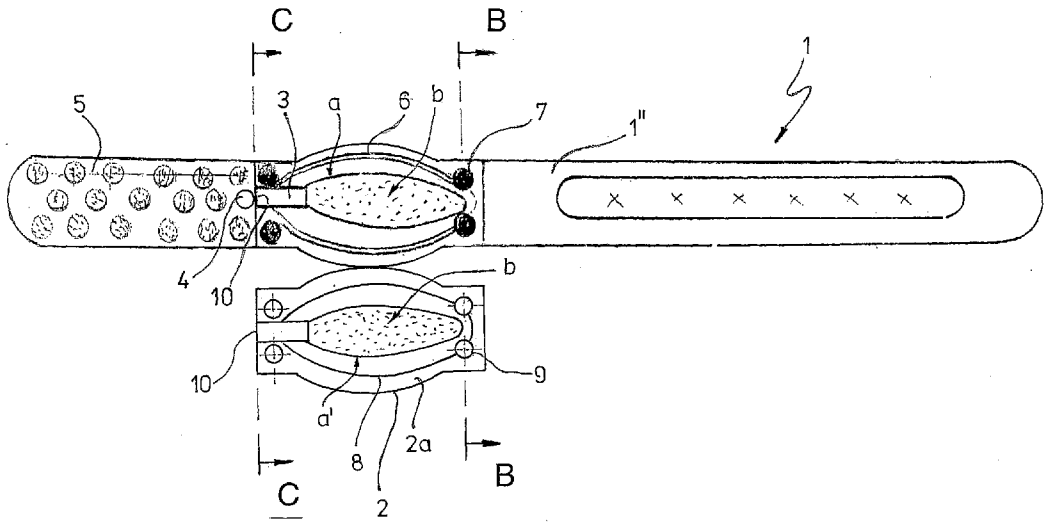
(54) **Title:** TOOTHBRUSH



(57) **Abstract:** The invention refers to a toothbrush for single use, provided with a tank for the toothpaste. The toothbrush consists of a body (1) provided with a head (1') and a handle (1") connected by a central area (1"'), which has a tank filled with a cleaning medium (b) provided with profiled channels (3, 4) for it. The central area (1"') is provided with an elliptical cavity (a) that extends with the profiled channel (3). The cavity is tightly sealed with a lid (2) by using a sealing rib (8) that is restrained in a channel (6), and some fixing pins (9) that fit in some orifices (7), thus forming the tank of the toothbrush.

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Toothbrush

The invention refers to a toothbrush for single use provided with a tank for toothpaste.

It is known that patent no. US 4865481 refers to a set of toothbrush which consists of a dose of toothpaste, mouth water and dental floss. The toothpaste is stored in a flexible tank and goes out of it through a calibrated hole which is provided on the brushing head of the toothbrush. The calibrated hole provides a great number of terminal orifices on the base of the brushing head, through which the flexible tank is evacuated, so that the toothpaste can be distributed through the calibrated hole on the base of the brushing head. The tank for the mouth water is independent: it is fixed adjacent on the handle of the toothbrush and can be used by compression. The dental floss is stored inside of a section provided along the superior area of the main body of the toothbrush (handle) and it can be quickly pulled out of it in order to be used an then thrown to the bin.

The drawback of this toothbrush consists in the fact that the tank for the toothpaste, which is provided on the brushing head, may injure the buccal cavity during the using of the brush and it is also unhandy to be used.

The technical problem solved by this invention consists in the design of a toothbrush for single use that has to exclude the possibility of reusing it.

According to the invention, this toothbrush eliminates the drawbacks of the previous known toothbrushes in the following respect: it is a toothbrush for single use that has a tank for toothpaste, consisting of a body provided with a brushing head and a handle, which are connected by a central area. The tank is in the central area and it is filled with a cleaning medium, being provided with profiled channels (outlet canals) for it. The central area also provides an elliptical cavity that extends with the profiled channel. The cavity is tightly sealed with a lid by using a sealing rib, which is restrained in a channel, and some fixing pins that fit in some orifices, thus forming the tank of the brush.

The toothbrush, in another constructive version, consists of a body and a head, which has a tank on it, provided with a profiled channel for a cleaning medium. The tank is located on the brushing head (above it) and consists of an elliptical cavity designed on the head of the brush. The cavity has got the profiled channel in its center, and it is tightly sealed with a lid, by using some fixing pins that fit in some orifices. The lid has got a die,

which is located in the middle of its inside area, used for punching the sealing membrane of the profiled channel (outlet canal).

In the third constructive version, the toothbrush has got a cavity, which is in fact the tank of the brush itself, designed centrally inside of the brushing head, along the symmetry axis. A piston slides tightly inside the tank and it is provided at its inner end with some triangular prominences which, by pressing, fit in some triangular recesses displayed in two rows inside the cavity.

According to the invention, the toothbrush has the following advantages:

- It incorporates, within the same assembly, two different objects that are closely connected: the toothbrush and the tank containing the cleaning medium: toothpaste or tooth gel;
- It is safe to use;
- It can also be used by visually-disabled people who, in this case, use their tactile senses;
- It insures the single use, as in the case of an eventual try of reloading with a cleaning agent, the clips shall break along the weakened section;
- It excludes the eventual try of gluing the contact surfaces with an adhesive or using the ultrasounds, as being very expensive operations requesting a lot of time, the assembling being performed by pressing;
- It is easy to handle, and at the same time, it solves a problem of public health, offering an increase comfort to the user;
- It is a cheap and simple solution regarding its construction.

There are further presented some examples of materializing the invention, concerning the figures 1 – 12 that represent:

- figure 1, longitudinal section through the toothbrush for single use, in a first version;
- figure 2, view of performance, with the lid of the tank before being fixed ;
- figure 3, section of the tank with its lid before being fixed, following the A-A direction, in figure 1;
- figure 4, section displaying the fixing system of the lid of the tank, following the B-B and C-C directions in figure 1;
- figure 5, longitudinal section through the toothbrush for single use, in another version of construction;

- figure 6, view of performance (plan view) with the lid of the tank before being fixed;
- figure 7, section of the tank with the lid unfixed, according to the D-D direction, in figure 5;
- figure 8, section, according to the E-E direction in figure 5, presenting the fixing system of the lid of the tank;
- figure 9, horizontal plan view of the toothbrush in another constructive version;
- figure 10, side view of the toothbrush in figure 9;
- figure 11, horizontal plan view of the toothbrush with a partial section through its head, in figure 9;
- figure 12, side view of the toothbrush with a partial section through its head, in figure 9;
- figure 13, detail for the pressing button of the toothbrush in figure 9.

According to the invention, the toothbrush is constructed in one piece of a body **1,** which **is** divided into three parts, so that at the superior end one can find the head of the brush **1'**, at the inferior end one can find the handle of the toothbrush **1"** and in the middle area **1"'** it is provided with a tank for the toothpaste. The tank is covered by a lid **2**, injected of the same material as the body of the toothbrush and in the same time with it, as it is presented in figure 2.

The central area **1"'**, in order to become the future tank, has an elliptical cavity **a** in its middle, designed for being filled with a cleaning medium **b.** The cavity extends with a profiled channel **3** of the cleaning medium, till in the head of the toothbrush, where connects with another transversal channel **4** that evacuates on the brushing head of the toothbrush, near the central area of it.

Around the elliptical cavity **a,** there are a channel **6** and some orifices **7,** which are found in even number (4 or 6), for fixing and sealing the lid **2,** thus obtaining the tank of the toothbrush.

The lid **2,** which is made of the same material as the body of the toothbrush, has a central area that covers the **a** cavity, which has a thinner thickness of the section of the material, having the role of an elastic membrane **a'.** This flexible membrane allows the pressing by pushing the cleaning medium, which may be toothpaste or tooth gel, so that this one can go out in a well determined quantity that should be enough for an efficient

brushing. This cleaning medium goes out through the profiled channel **3** and the transversal one **4,** right in the brushing area.

The lid **2** is also provided with a channel for the toothpaste evacuation, on the inner side **2a.** It integrates when joining, the profiled channel **3** and a rib **8** and some pins **9,** named clips, in order to fix and seal it in the channel **6** and the orifices **7** provided in the central area **1'''**of the toothbrush.

For closing the profiled channel **3** in order to keep the cleaning medium **b** inside, the lid **2** has a closing membrane **10** in front of the profiled channel. The membrane is very thin and yields to the pressure of the cleaning agent that enters the transversal channel **4,** which is provided in the body of the toothbrush and extends the profiled channel **3.** The clips **9** and the orifices **7** are taper shaped, with the big base towards the body of the toothbrush so as to insure a perfect closing on one hand, and the impossibility of opening the lid for an eventual reloading, thus insuring the single use character of the toothbrush on the other hand.

According to the invention, the toothbrush for single use can be designed in different sizes and types, according to its use, such as: for adults, for children, when traveling, etc.

The toothbrush for single use can also be used by visually-disabled people who, in this case, use their tactile senses.

According to the invention, in another constructive version as designed in the figures 5 and 6, the toothbrush has the tank containing the cleaning agent **b** located (above) on the upper area of the brushing head **1'a.** The tank is made of two parts: the body itself of the toothbrush **1'a,** where, above the brushing head **5,** there is an elliptical cavity **c,** covered by a lid **2,** made of the same material as the body of the toothbrush, which has a central area that covers the cavity **c,** which has a thinner thickness of the section of the material, having the role of an elastic membrane **c',** which allows the pressing by pushing the cleaning medium **b** directly to the brushing head, through an orifice **11** of an profiled channel **12,** covered by design of a thin membrane **13** that is punched when using the toothbrush, as a result of the die **13** pressed against it. The die is obtained by injection, at the same time with the lid **2'** and designed on the inner side of it. The fixing and sealing operations are made by using some clips **15,** provided on the inner side of the lid **2',** which fit in some orifices **16** that located on the external surface of the lid of the toothbrush **1'a.**

The toothbrush, according to the invention, in the third constructive version, as it is presented in figure no. 11, has a cavity **d,** designed on the head of the brush **1'b**, along the symmetry axis, which is in fact the tank of the brush and may have any shape in its section. A piston **17** having the same shape as the tank slides tightly inside of it, and it is provided with some triangular prominences **18,** which are diametrically opposed to the end of the piston **17,** prominences that are to be fit on the wall of the cavity of the tank **d,** where there are some triangular recesses **e** and **f** displayed diametrically opposed in two rows. The first row of recesses **e** is used to fix the piston after the tank has already been filled with the cleaning medium, concerning its emptying; and the second row of recesses **f** marks the end of the stroke of the piston, and in the same time making its recurrence not possible. We should also mention the fact that at a full push, the piston covers completely the cavity in the head of the toothbrush, being not possible to pull it out without damaging the toothbrush, thus insuring the single use of it.

The cavity of the tank **d** is continued with a profiled channel **19** that contacts the external area in the central section of the brushing head.

The store of the cleaning medium in the cavity of the tank **d,** is on one hand performed by the piston **17**, and on the other hand, at the end of the profiled channel **19** it is performed by a very thin membrane **20,** which is made of the same material as the body of the toothbrush and which yields at the pressing force of the piston.

At the end of the profiled channel **19** it is advisable to provide the brushing area **4** in a concentric shape, so that the cleaning medium can be directed towards the external area.

The orifice **21** is provided in the body of the piston in front of the prominence **18,** so that the piston can move. The orifice forms a weakened section but flexible enough so that the prominences **18** can enter the recesses **e** and respectively **f**.

Along the piston **17,** a non figurative channel is provided, used for evacuating the air when it is introduced in the tank, in order not to put on a very high pressure on the cleaning medium that could break the membrane **20** placed at the head of the profiled channel.

On both inferior and superior surfaces of the handle of the toothbrush there may be inscriptions concerning the eventual user personalization, manufacturer's trademark, commercials etc.

The capacity of the tank is about 1 – 1.5 ml of cleaning medium, toothpaste or gel, a quantity that is sufficient for an efficient brushing.

After the use both the toothbrush and the package are to be thrown to the bin.

In order to be properly functional and hygienically kept for as long as possible, the device is packed in a plastic bag hermetically sealed. The guarantee terms are to be written on the package.

Claims

1. A toothbrush consisting of a body **(1)** provided with a head **(1')** and a handle **(1")** connected by a central area **(1"')**, which has a tank filled with a cleaning medium **(b)** provided with profiled channels **(3, 4)** for it, **characterized by the fact that** the central area **(1"')** has an elliptical cavity **(a)** that extends with the profiled channel **(3)**, a cavity that is tightly sealed with a lid **(2)** by the use of a sealing rib **(8)** that is restrained in a channel **(6)** and of some fixing pins **(9)** that fit in some orifices **(7)**, forming the tank of the toothbrush.

2. According to the claim no. 1, a toothbrush **characterized by the fact that,** the sealing channel **(6)** is designed around the elliptical cavity **(a)**, and the locking orifices **(7)** are placed on the edge of the central area **(1"')**.

3. According to the claim no. 1, a toothbrush **characterized by the fact that,** the lid **(2)** is made of the same material as the body of the toothbrush **(1)**, being provided in the central area with a flexible membrane **(a')**. The membrane covers the elliptical cavity **(a)** and it has a thinner thickness of the material in section, a membrane that allows the evacuation of the cleaning medium **(b)** by pressing.

4. According to the claim no. 1, a toothbrush **characterized by the fact that,** the lid **(2)** is provided on the inner face **(2a)** with the sealing rib **(8)** and with the fixing pins **(9)** that yield when opening the lid.

5. According to the claim no. 1, a toothbrush **characterized by the fact that,** the lid **(2)** is provided with a sealing membrane **(10)**, which obturates the profiled channel **(3)** when opening the cavity, a membrane that is removed when evacuating the cleaning medium.

6. A toothbrush, according to the claims no. 2 and 4, **characterized by the fact that,** the sealing of the lid **(2)** on the central area **(1"')** is performed by pressing the rib **(8)** into the sealing channel **(6)** and by pressing the pins **(9)** in the orifices **(7)** provided on the central area.

7. A toothbrush consisting of a body **(1)** provided with a head **(1'a)** which has a tank filled with a cleaning medium **(b)** provided with profiled channels **(12)** for it, **characterized by the fact that,** the tank is located above the head of the brush **(1'a)**

being in fact an elliptical cavity (**c**) designed on the head of the brush. This elliptical cavity extends with the profiled channel **(12)** and it is tightly sealed with a lid **(2')**, by using some fixing pins **(15)** that fit in some orifices **(16).** The lid is provided in the middle of its inner face with a die (**14**), used to punch the sealing membrane (**13**) of the profiled channel.

8. According to the claim no. 7, a toothbrush **characterized by the fact that,** the fixing pins **(15)** are located on the inner face of the lid (**2'**), and the orifices (**16**) that restrain these pins are located on the external face of the lid (**1'a**), and thus, after the locking, the pins (**15**) yield when opening the lid.

9. According to the claim no. 7, a toothbrush **characterized by the fact that,** the lid **(2')** is made of the same material as the body of the toothbrush (**1**), being provided on its central area with a flexible membrane (**c'**). This membrane covers the elliptical cavity (**c**) and has a thinner thickness of the material in section. This membrane allows the evacuation of the cleaning medium **(b),** by pressing.

10. A toothbrush, according to the claims no. 7 and 8, **characterized by the fact that,** the sealing of the lid **(2')** on the head of the toothbrush (**1'a**) is performed by pressing the pins (**15**) in the orifices (16) that are provided on the head of the toothbrush.

11. A toothbrush consisting of a body **(1)** provided with a head **(1'b)** which has a tank filled with a cleaning medium **(b)** provided with a profiled channel (**19**) for it, **characterized by the fact that,** a cavity **(d)** is provided in the head of the brush (**1'b),** along the symmetry axis, which is in fact the tank of the brush. A piston **(17)** slides tightly inside of it, and it is provided with some triangular prominences (**18**) towards its interior end; prominences that are to be fit by pressing in some triangular recesses (**e** and **f**) displayed in two rows in cavity (**d**).

12. According to the claim no. 11, a toothbrush **characterized by the fact that,** the piston (**17**) has an orifice (**21**) provided towards its interior end, in the central area and in front of the triangular prominences (**18**). This orifice insures the flexibility of the triangular prominences when the piston (**17**) enters the triangular recesses (**f**) by pressing.

13. According to the claim no. 11, a toothbrush **characterized by the fact that,** the triangular recesses (**e, f**) of the cavity (**d**) are located exactly opposite to a profiled channel (**19**) that releases the paste on the brushing head, so that the emptying of the cavity (**d**) which was previously filled with the cleaning medium (**b**) can occur when the

triangular prominences (**18**) of the piston enter the recesses (**f**) of the cavity, thus symbolizing the emptying of the tank.

14. According to the claim no. 11, a toothbrush **characterized by the fact that,** on the joining area of the cavity of the tank (**d**) and the base of the brushing head **(4),** there is a sealing membrane obtained by injection **(20).** This membrane is thin and yields under the pressure of the cleaning medium.

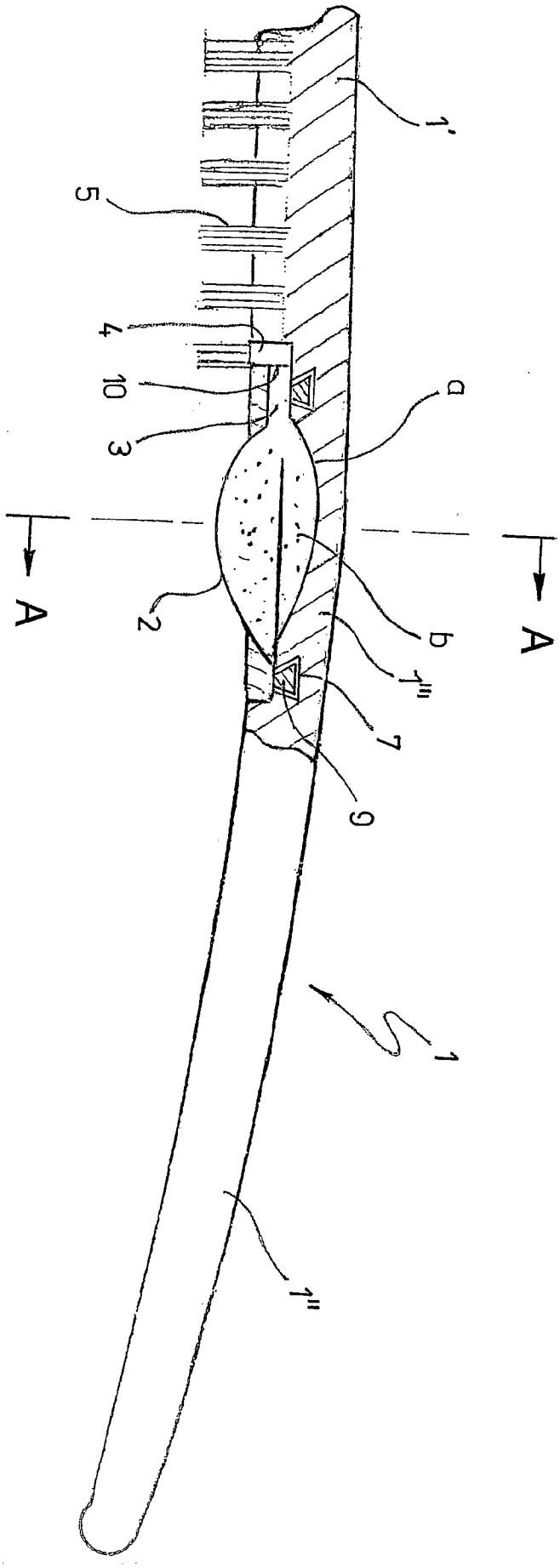


Fig. 1

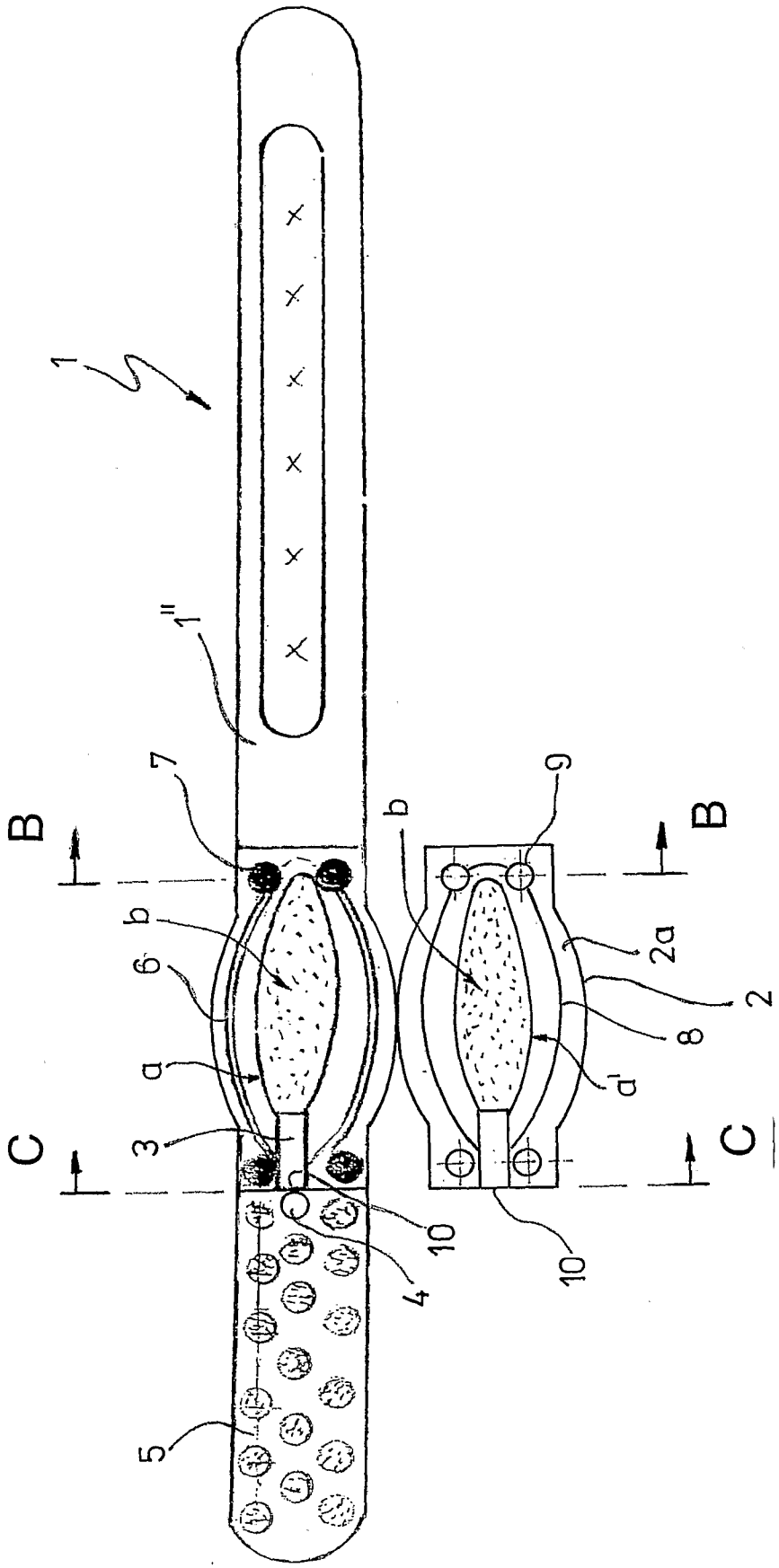


Fig.2

Secțiunea A - A

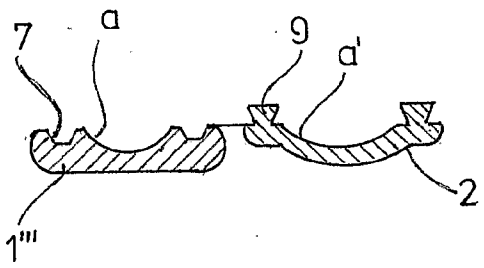
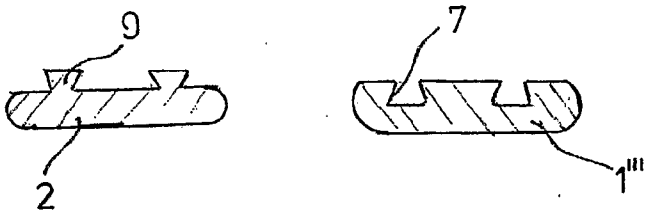


Fig.3

Secțiunea B - B



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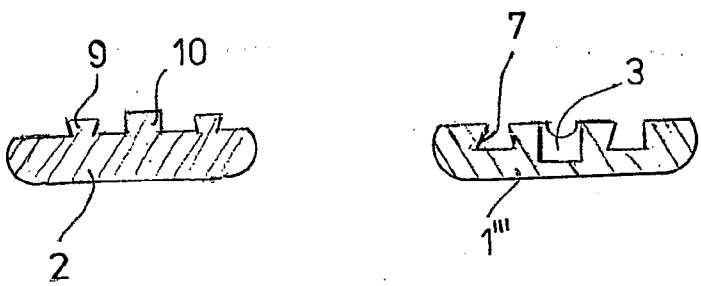

Fig.4

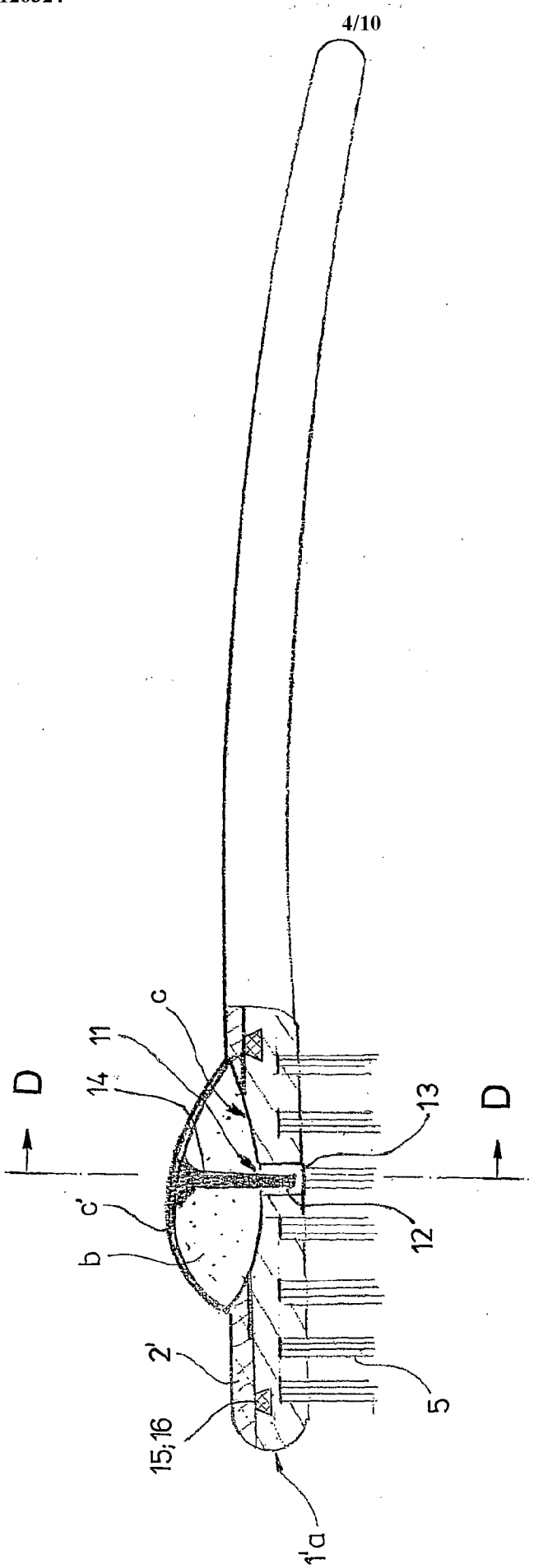

Fig. 5

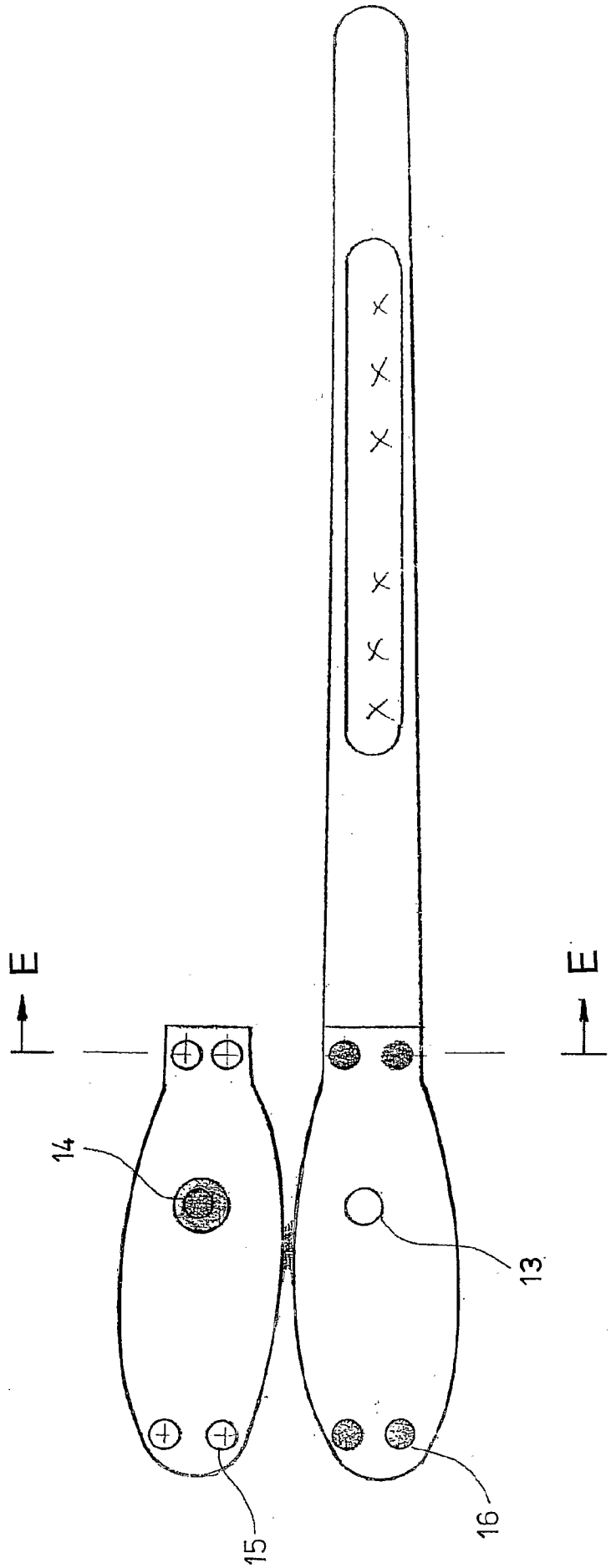

Fig. 6

Secțiunea D - D

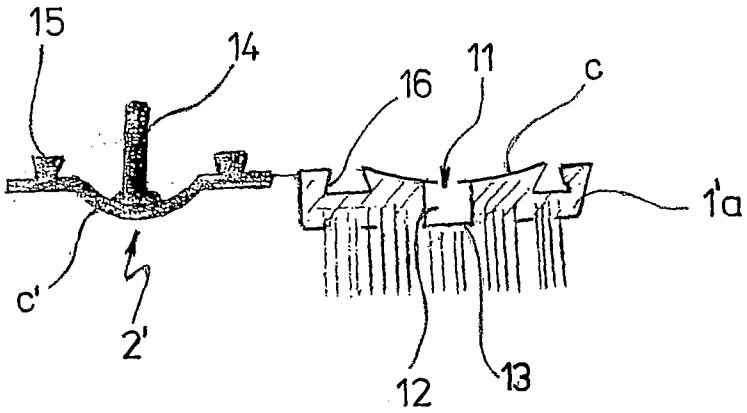

Fig. 7

Secțiunea E - E

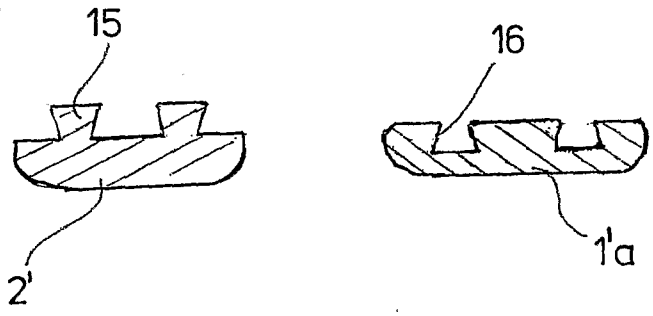

Fig. 8

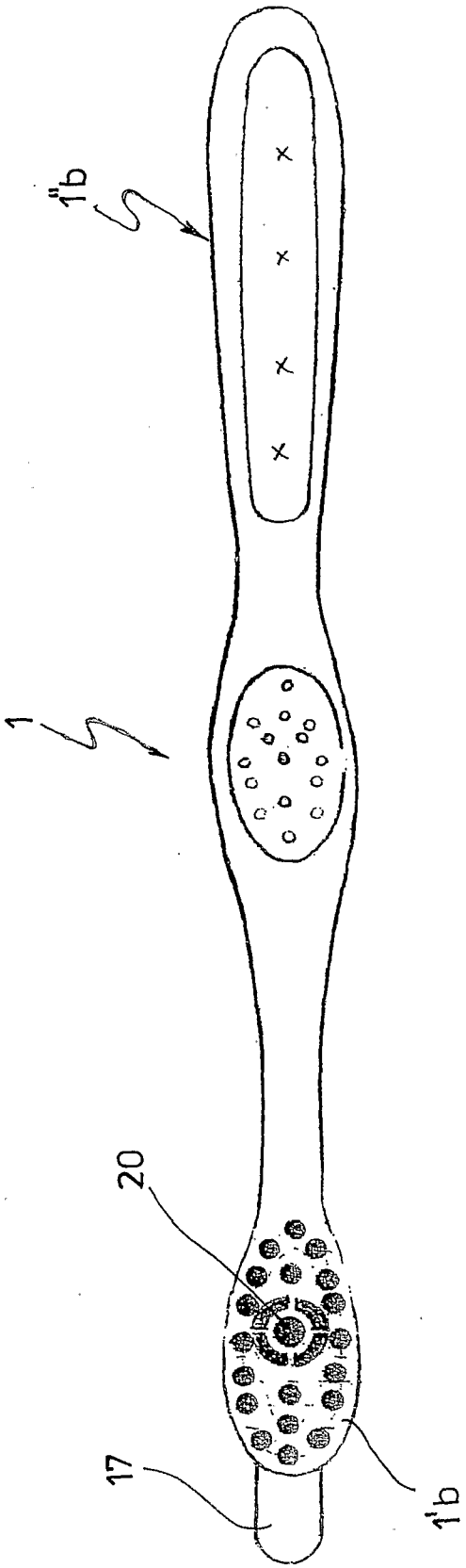

Fig. 9

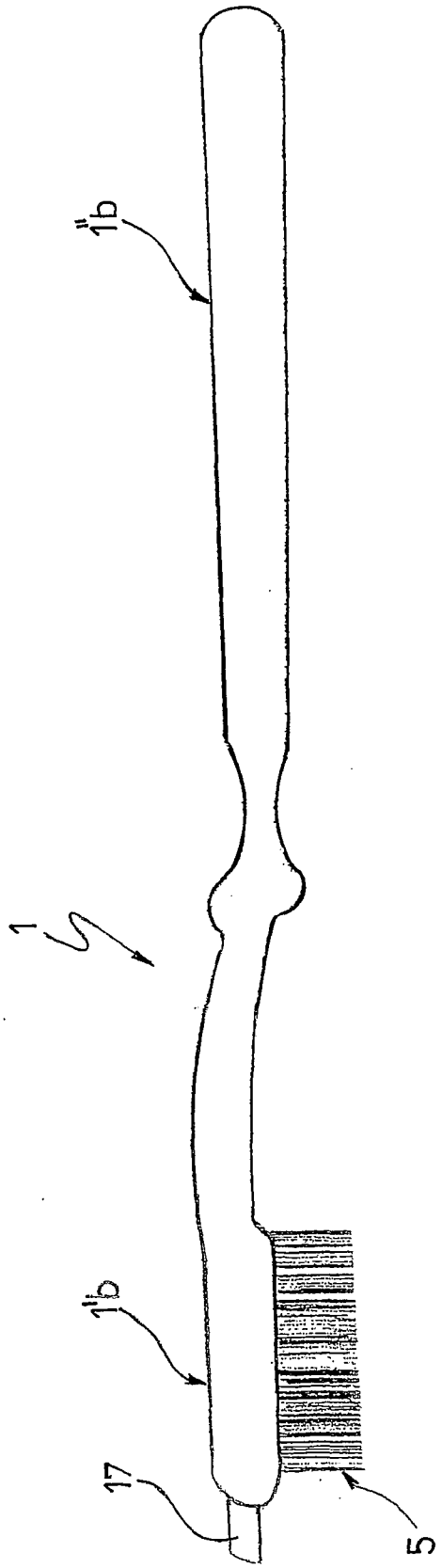

Fig.10

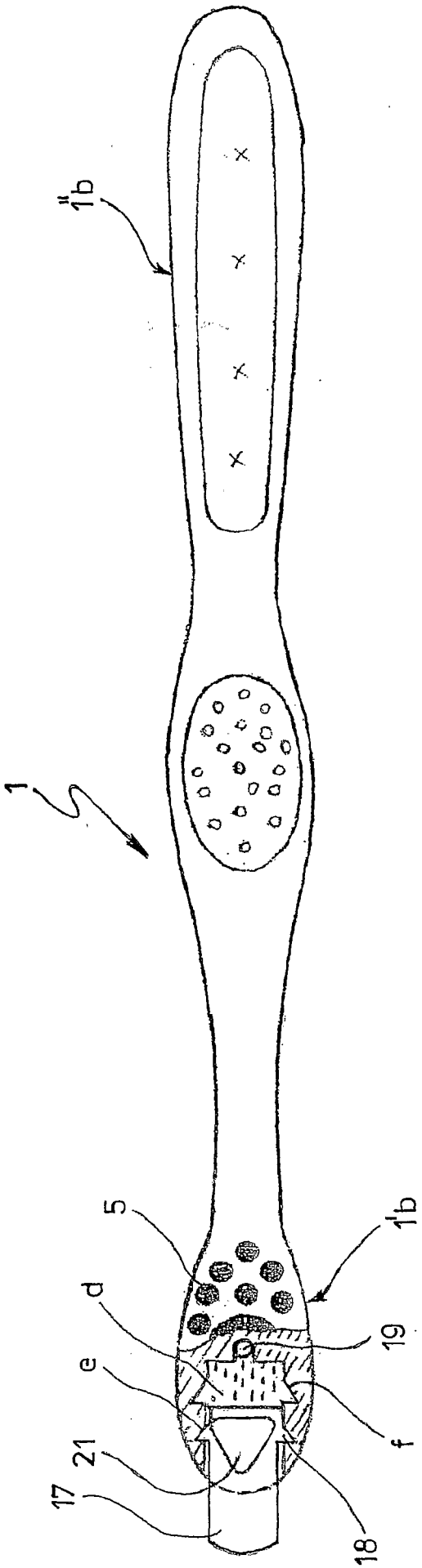

Fig.11

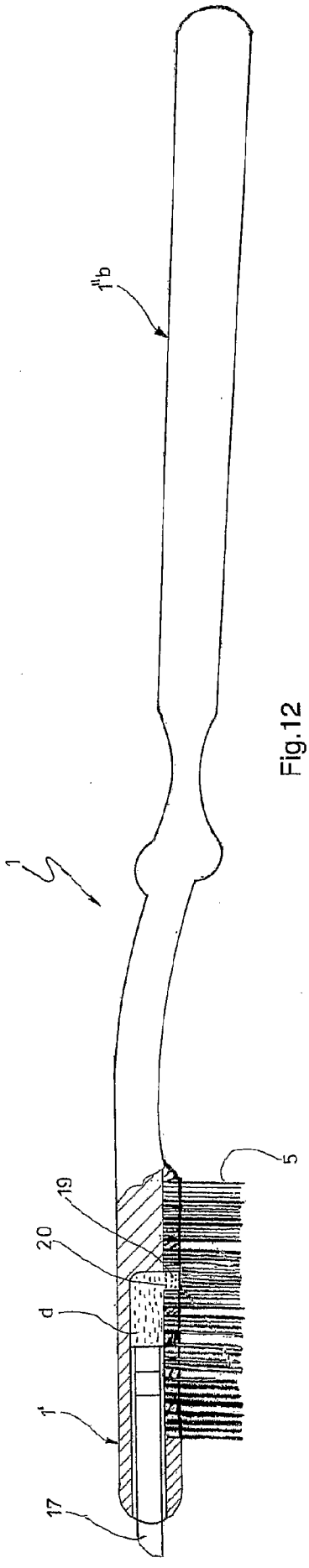

Fig.12

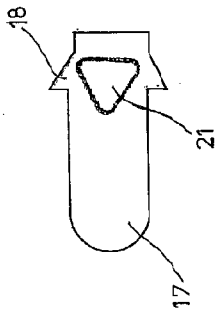

Fig.13