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(54) Title: TOOTBRUSH HEAD DEVICE

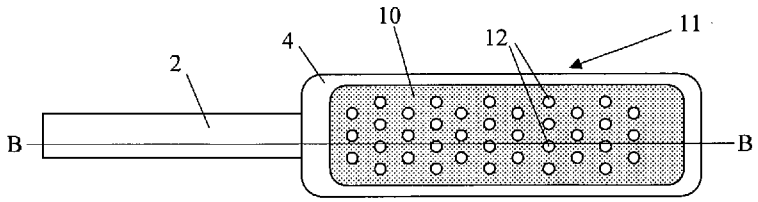

Fig. 3a

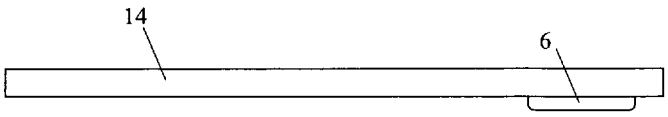

Fig. 3b

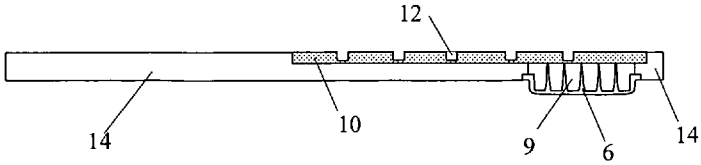

Fig. 3c

(57) Abstract: A toothbrush head device comprising a compressible pad arranged on a first side of the toothbrush head is described. The pad may be filled with gas and/or comprises polishing means. A method for making such a device on a toothbrush head is also described.

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Toothbrush head device

The present invention relates to a toothbrush head device. More precisely, the invention relates to a toothbrush head with a polishing means and a method for the manufacture thereof.

Dental hygiene and dental care are important factors in obtaining healthy teeth. Developments are constantly being made to optimise dental care equipment and make it more efficient and functional.

The present invention relates to one such further development, and its object is to provide a device for polishing teeth which gives the user the possibility of easy and daily access to a polishing means, the device at the same time being gentle and not causing the teeth any damage. It is desirable that the device can be included in a toothbrush without this affecting the possibility of performing conventional toothbrushing, but rather that it is advantageously combinable with different types of cleaning or brushing devices.

The present invention provides a toothbrush head device characterised in that it comprises a compressible pad arranged on a first side of the toothbrush head. The pad may be filled with gas.

In one embodiment, the surface of the pad, when the pad is not compressed, is raised above the basic plane of the first side of the toothbrush. In another embodiment, the outer surface of the pad is equipped with polishing means.

In one aspect of the invention, the pad constitutes at least a part of a flexible wall of a gas-tight chamber which contains a compressible gas. The pad may be designed such that only an outer wall of the gas-tight chamber consists of an elastic material. Alternatively, the pad can be obtained by attaching a balloon-like gas-tight chamber made of an elastic material onto a toothbrush head.

The pad on the inside thereof may be configured with studs to give it more stability and reversibility.

In one embodiment, the pad is arranged on the distal end of the first side of a toothbrush head in relation to a neck portion connected to the head. On an opposite, second side of

the toothbrush head there may be arranged a teeth cleaning means in the form of bristles and/or elastic dental care elements.

The invention further comprises a method for manufacturing a toothbrush head, characterised in that it comprises

- moulding a first head part of a first plastic material, the first head part comprising a first side and a second side and a through opening between the two sides;
- moulding a pad-like device of an elastic second plastic material in a part of the opening to the first part, the pad-like device on the first side covering the opening and forming a pad that is raised above the surface of the first side;
- securing a separately manufactured plate in the opening on the second side.

In one aspect of the invention, the pad-like device, the first head part and the plate together form a gas-tight chamber.

The method may further comprise attaching bristles or bristle-like elements to the plate before and/or after it is secured to the first part.

The pad-like device may comprise studs that extend from the back of the pad and into the opening.

In one embodiment of the invention, the method comprises moulding a third plastic material to the second side of the first head part before the plate is secured to the opening, the third plastic material comprising an opening for receiving the plate.

In another embodiment, the method for manufacturing a toothbrush head comprises moulding a fourth plastic material to the first side of the first head part before the pad-like device is moulded, the fourth plastic material comprising an opening for the moulding-in of the pad.

The plate may comprise an elevation adapted for insertion into the opening on the second side of the first part. Furthermore, the plate can be fastened to the first head part by gluing, ultrasonic welding or by the moulding-on of a sixth plastic material.

The term toothbrush as used herein is intended to comprise all types of dental and/or oral care device which may comprise bristle-like elements, but which also instead of or

together with the bristle elements may comprise cleaning and/or polishing elements in the form of elastic lamellae, knobs, studs or the like.

The term toothbrush head here refers to the part of a dental care device which comprises cleaning and/or care elements and which on use is inserted into the user's mouth. At the opposite end of a dental care device there will normally be a handle with a grip that the user can hold when the device is in use. The front of a toothbrush head is the side of the head carrying the cleaning and/or care elements. The longitudinal direction of a tooth brush should be understood to mean the direction along the handle and up through the toothbrush head.

The term "gas-tight" and similar terms are used herein to describe a chamber/vessel/space that is separated from the surroundings in such a way that under normal conditions of use for toothbrushes there is no exchange of gas between the chamber/vessel/space and the surroundings. Where the chamber is formed by a joining together of several parts, both the individual parts and the join(s) will have such gas-tight property.

The present invention will now be described in more detail with reference to the attached figures, wherein:

Figure 1 shows a first head part of a toothbrush head seen from the front.

Figure 2a shows a first head part equipped with a pad-like device seen from the front.

Figure 2b shows a first head part equipped with a pad-like device seen from the side.

Figure 2c shows a cross-section of a first head part equipped with a pad-like device seen from the side.

Figure 3a shows a first embodiment of a toothbrush head according to the invention seen from the front.

Figure 3b shows a first embodiment of a toothbrush head according to the invention seen from the side.

Figure 3c is a cross-section of a first embodiment of a toothbrush head according to the invention seen from the side.

Figure 4a shows a second embodiment of a toothbrush head according to the invention seen from the front.

Figure 4b shows a second embodiment of a toothbrush head according to the invention seen from the side.

Figure 4c is a cross-section of a second embodiment of a toothbrush head according to the invention seen from the side.

Figure 5a shows a third embodiment of a toothbrush head according to the invention seen from the front.

Figure 5b shows a third embodiment of a toothbrush head according to the invention seen from the side.

Figure 5c is a cross-section of a third embodiment of a toothbrush head according to the invention seen from the side.

Figure 6a shows a fourth embodiment of a toothbrush head according to the invention seen from the front.

Figure 6b shows a fourth embodiment of a toothbrush head according to the invention seen from the side.

Figure 6c is a cross-section of a fourth embodiment of a toothbrush head according to the invention seen from the side.

Figure 1 shows a first head part 14 of a toothbrush head according to the present invention seen from the front. The first head part 14 of the toothbrush head comprises an edge 4 which delimits the head, a depression 5 for receiving a plate and a through opening 1. The first part further comprises a part of a neck portion 2 which illustrates where the toothbrush head is intended to be connected to the handle part (not shown). The forming of the neck and any handle part can be done in any way independent of the toothbrush head. The first head part 14 is made of a first plastic material, in one or more mouldings. It is possible to mould the whole or parts of a possible handle or neck portion simultaneously with the parts 4 and 5. Figure 2a shows a toothbrush head 11 comprising the first part 14 illustrated in Figure 1 equipped with a pad-like device 6 which covers the opening 1. The pad-like device 6 comprises studs 8 which extend into the opening 1 towards the depression 5. Figure 2b shows the toothbrush head 11 from the side and shows how the pad-like device 6 is raised above the surface of the back of the first head part 14. The surface 7 of the pad-like device on the back of the toothbrush head may comprise structural elements in the form of, e.g., lamellae, studs, dimples and similar means which affect the polishing properties of the surface, but the surface 7 may also be smooth. The pad-like device consists of an elastic second plastic material which preferably is moulded firmly to the first head part. Figure 2c shows a cross-section of the toothbrush head along the line A-A. The figure shows the depression 5 for receiving a plate, and the second plastic material which constitutes the pad-like device 6 equipped with studs 8. The studs 8, in a preferred embodiment of the invention, are present to control the compressibility of the pad and to ensure that the shape of the pad is reversible so that after having been compressed it returns to its original form. The

presence, the number and distribution of optional studs will depend on the size, material thickness and material choice of the pad.

Figure 3a shows a first embodiment of a toothbrush head 11 according to the invention seen from the front after a plate 10 has been placed in the depression 5. Figure 3b is a side view of the toothbrush head. The plate 10 has been made separately of a fifth plastic material, and in this embodiment is formed with holes/apertures 12 for attachment of teeth cleaning means in the form of bristles or other types of cleaning means. These teeth cleaning means can be attached to the plate 10 after it has been connected to the first part 14 or they may be attached to the plate before it is secured to the first head part 14. From Figures 3a and 3b it can be seen that the plate is configured so that it forms an approximately plane surface with the toothbrush surface on the front, in contrast to the pad-like device 6. Figure 3c shows a cross-section along the line B-B in the longitudinal direction through the toothbrush head shown in Figure 3a. When the plate 10 is fitted, a gas-filled chamber 9 will be formed between the plate 10 and the pad-like device 6. The gas in this chamber is preferably air. The plate is attached to the first head part 14 in such a way that a gas-tight join is formed. The gas inside the chamber 9 is sealed off and the pad-like device 6 thus forms a pad on the back of the toothbrush head that can be compressed by applying pressure to the surface 7 due to the compressible property of the gas. At the same time, the gas pressure will increase in the chamber and cause the surface 7 to return to its initial position when the pressure load against the surface 7 ceases.

The fixing of the plate in the first head part can take place in any way, for example, by gluing, ultrasonic welding or moulding-on of an additional plastic material in the join between the plate and the first head part. The plate and/or the edge of the head part to which the plate is to be fastened can in addition be adapted to the bonding method and they comprise inclined portions, special surfaces or studs which can function as energy concentrators for ultrasonic welding. The plate may also be configured with ducts or depressions for receiving an additional plastic material.

Figures 4a and 4b show a second embodiment of a toothbrush head 111 according to the invention from the front and the side, respectively. In this embodiment, a pad-like device 106 and a third plastic material 3 are moulded to a first head part 13. The third plastic material 3 in this case forms an opening for the insertion and encapsulation of a plate 110 with holes 112 for attachment of teeth cleaning means in the form of bristles or other types of cleaning means. Figure 4c shows a cross-section through the

toothbrush head 111 along the line C-C. In this embodiment, the plate 110 comprises a raised portion 15 that is adapted to and inserted into the opening in the head part 13 so that the studs on the pad-like device 106 abut against the raised portion 15 of the plate 110. The plate 110 is secured in a gas-tight manner to the third plastic material and optionally also to the first head part 13, thereby forming a sealed chamber 9.

It is also possible to make the first head part of one or more plastic materials before the pad is moulded firmly to the first head part.

Figures 5a, 5b and 5c show a further embodiment of a toothbrush head 211 according to the invention seen respectively from the front, the side and as a cross-section along the line D-D. In this embodiment, the first head part 114 comprises an edge 104 around a depression. A plate 110 with holes 112 for attachment of teeth cleaning means in the form of bristles or other types of cleaning means is placed in the depression. Between the plate 110 and the edge 104 there is inserted a sixth plastic material 16 which moulds the plate 110 and the first head part 114 firmly to each other.

Figures 6a and 6b are a front view and a side view, respectively, of a fourth embodiment of a toothbrush head 311 according to the present invention. In this embodiment a fourth plastic material 317 is moulded to a first head part 302 and a pad-like device 306 is moulded to the fourth plastic material. The fourth plastic material 317 in this embodiment forms an opening for moulding in the pad-like device 306. A plate 110 with openings 112 for attachment of teeth cleaning means in the form of bristles or other types of cleaning means is arranged in an opening in the first head part 302. Figure 6c shows a cross-section through the toothbrush head 311 along the line E-E. In this embodiment, the plate 110 comprises a raised portion 15 which is adapted to and inserted into the opening in the fourth plastic material 317 so that the studs on the pad-like device 306 abut against the raised portion 15 on the plate 110. The plate 110 is secured in a gas-tight manner to the fourth plastic material and optionally also to the first head part 302, thereby forming a sealed chamber 9.

The object of the figures is to illustrate the invention. The scope of the present invention is defined by the attached claims.

The first, third, fourth, fifth or sixth plastic material that are used for the manufacture of a toothbrush head may be freely selected from any plastic material suitable for oral use and for shaping by moulding. Examples of such a material are polypropylene (PP),

ABS (copolymerisate of acrylonitrile, butadiene and styrene monomers), PMMA (polymethyl methacrylate) and the like.

The second plastic material of which the pad-like device is made is preferably a thermoplastic elastomer, which can be based on PP, ABS and the like. The sixth material may also be a thermoplastic elastomer which can be selected from the same group.

Patent claims

1.
A toothbrush head device comprising a compressible pad arranged on a first side of the toothbrush head, characterised in that the pad is filled with gas.

2.
A toothbrush head device according to claim 1, characterised in that the surface of the pad, when the pad is in a non-compressed state, is raised above a basic plane of the first side of the toothbrush head.

3.
A toothbrush head device according to claim 1 or 2, characterised in that the surface of the pad is equipped with polishing means.

4.
A toothbrush head device according to any one of claims 1-3, characterised in that the pad constitutes at least a part of a flexible wall of a gas-tight chamber which contains a compressible gas.

5.
A toothbrush head device according to any one of claims 1-4, characterised in that the pad on the inside is configured with studs.

6.
A toothbrush head device according to any one of claims 1-5, characterised in that the toothbrush head further comprises a neck portion and that the pad is arranged on the distal end of the first side in relation to the neck portion.

7.
A toothbrush head device according to any one of claims 1-6, characterised in that on the opposite second side of the toothbrush head there is provided a teeth cleaning means in the form of bristles and/or elastic dental care elements.

8.
A method for manufacturing a toothbrush head, characterised in that it comprises:
- moulding a first head part of a first plastic material, the first head part

comprising a first side and a second side and a through opening between the two sides;

- moulding a pad-like device of an elastic second material in a part of the opening to the first part, the pad-like device on the first side covering the opening and forming a pad that is raised above the surface of the first side; and
- securing a separately made plate in the opening on the second side.

9.

A method for manufacturing a toothbrush head according to claim 8, characterised in that the pad-like device, the first head part and the plate together form a gas-tight chamber.

10.

A method for manufacturing a toothbrush head according to claim 8 or 9, characterised in that it further comprises attaching bristles or bristle-like elements to the plate before and/or after the plate is secured to the first part.

11.

A method for manufacturing a toothbrush head according to claim 8, 9 or 10, characterised in that the pad-like device comprises studs that extend from the back of the pad and into the opening.

12.

A method for manufacturing a toothbrush head according to any one of claims 8-11, characterised in that it further comprises moulding a third plastic material to the second side of the first head part before the plate is secured in the opening, the third plastic material comprising an opening for receiving the plate.

13.

A method for manufacturing a toothbrush head according to any one of claims 8-11, characterised in that it further comprises moulding a fourth plastic material to the first side of the first head part before the pad-like device is moulded, the fourth plastic material comprising an opening for the moulding-in of the pad.

14.

A method for manufacturing a toothbrush head according to any one of claims 8-13, characterised in that the plate comprises a raised portion adapted for insertion into the opening on the second side of the first part.

15.

A method for manufacturing a toothbrush head according to any one of claims 8-14, characterised in that the plate is fastened to the first head part by gluing, ultrasonic welding or by moulding-on of a sixth plastic material

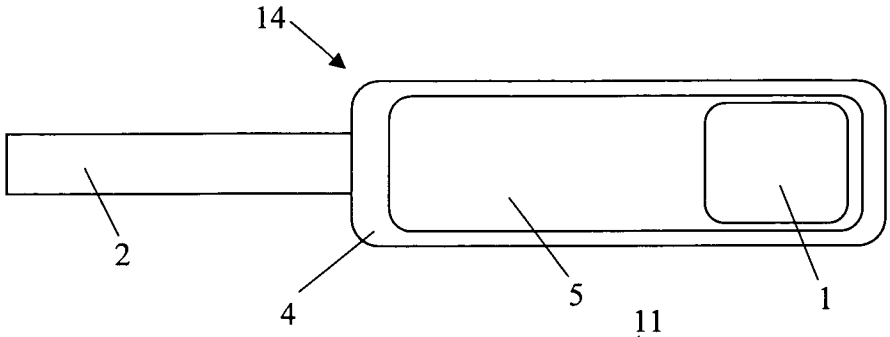

Fig. 1

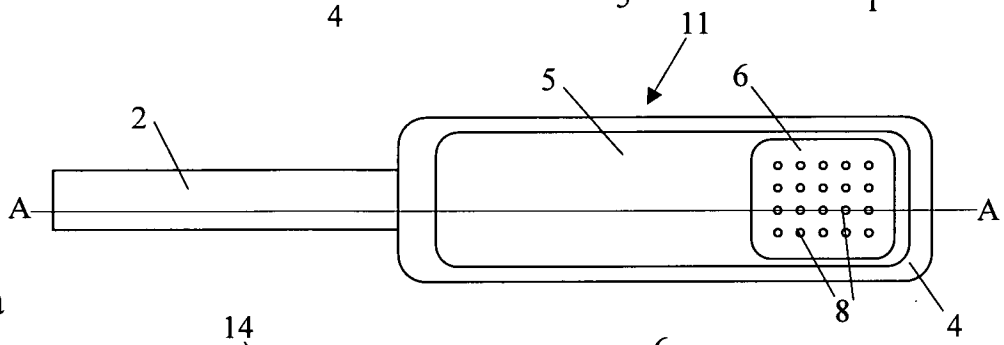

Fig. 2a

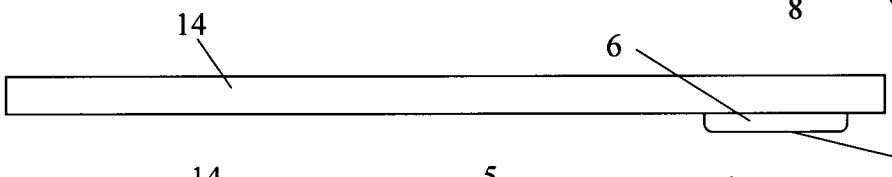

Fig. 2b

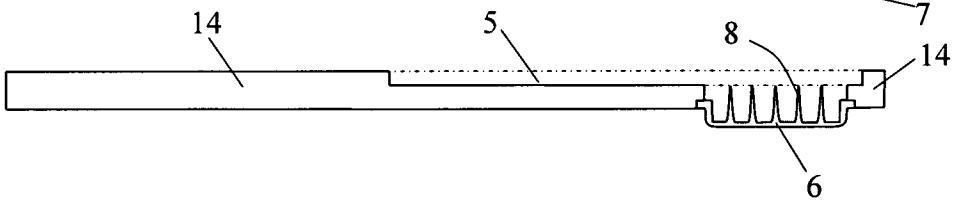

Fig. 2c

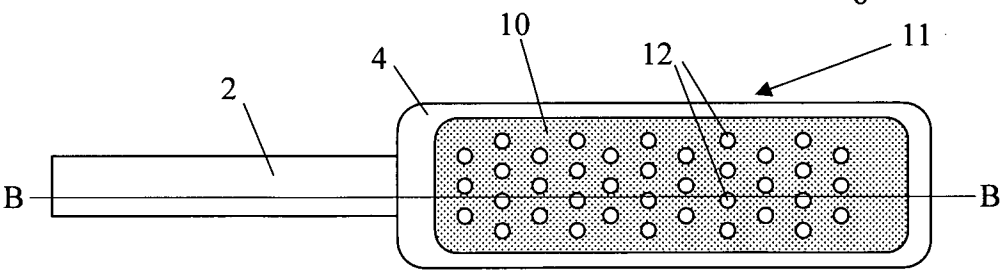

Fig. 3a

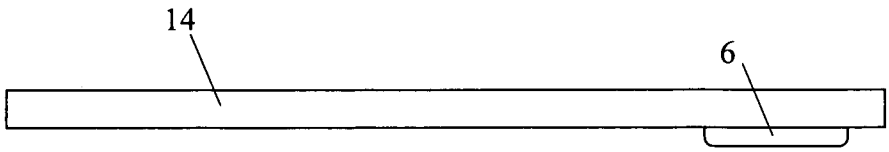

Fig. 3b

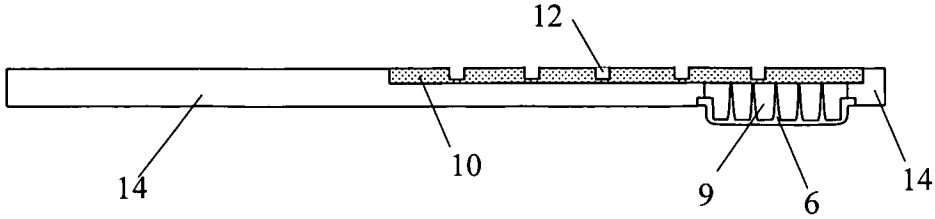

Fig. 3c

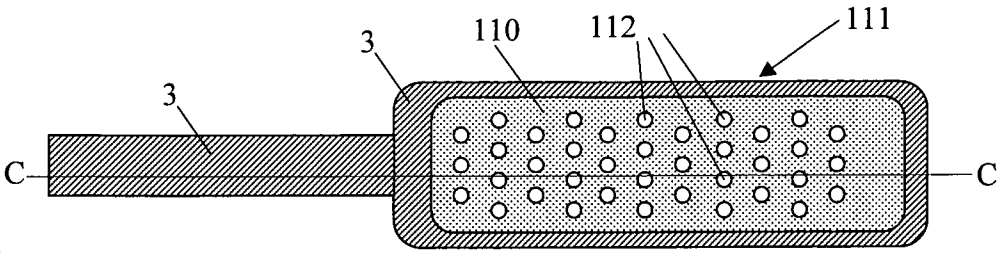

Fig. 4a

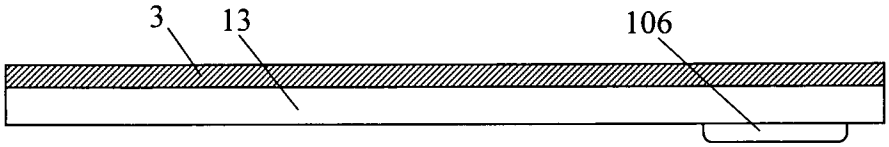

Fig. 4b

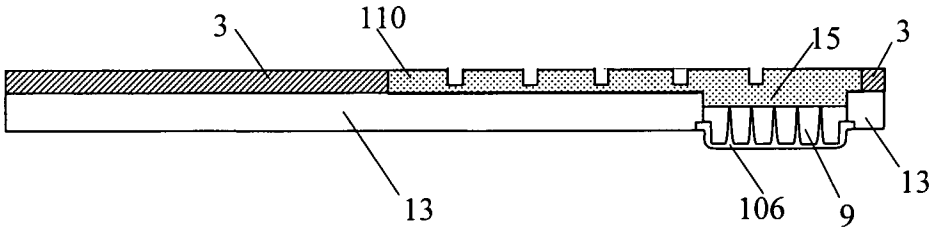

Fig. 4c

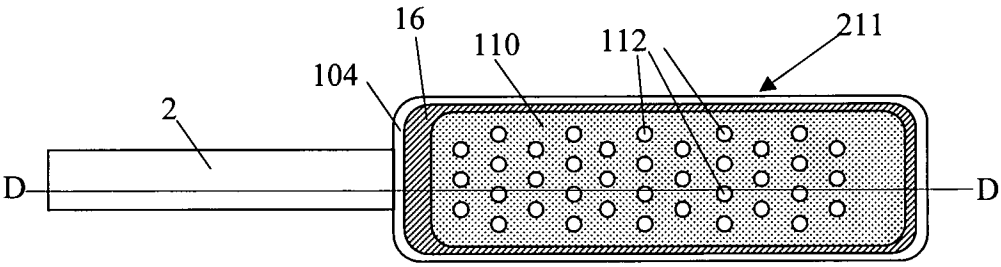

Fig. 5a

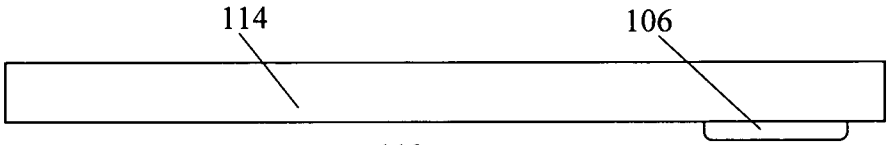

Fig. 5b

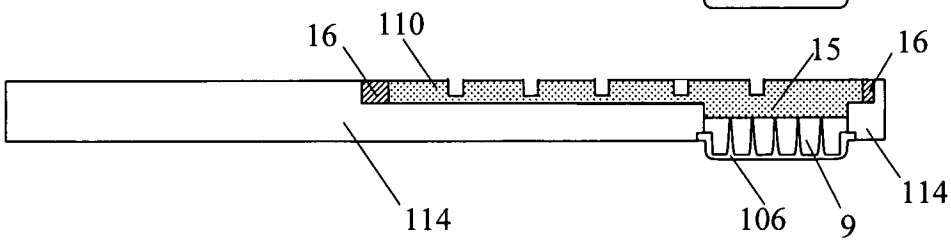

Fig. 5c

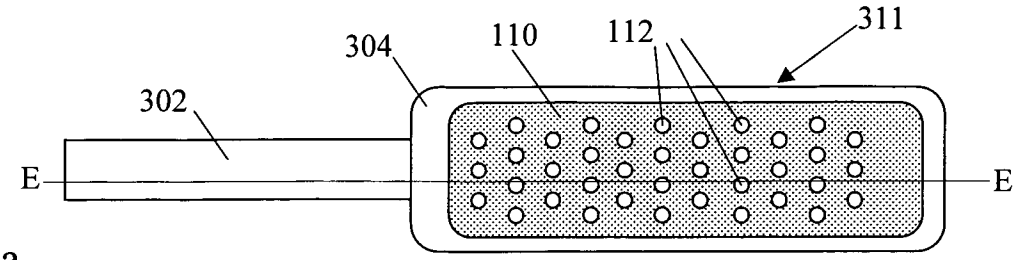

Fig. 6a

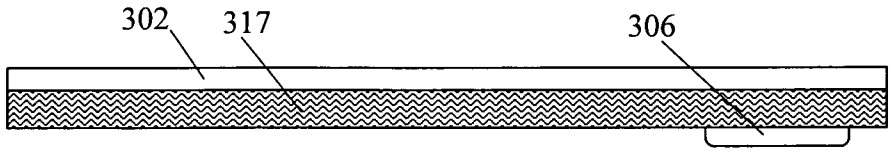

Fig. 6b

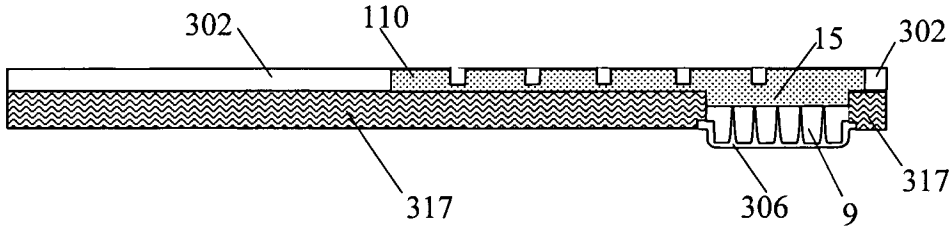

Fig. 6c

INTERNATIONAL SEARCH REPORT

International application No.
PCT/NO2010/000225

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

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)

IPC:A46B, A46D, A61H

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

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, PAJ, 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	GB 524135 A (LOMO GUM MASSAGER CO), 30 July 1940 (1940-07-30); page 1, line 89 - page 2, line 31; figures 1,3-5	1-4, 6
Y		5, 7
A		8-15
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X	US 2176309 A (OPAL LOVE EDNA ET AL), 17 October 1939 (1939-10-17); page 2, column 1, line 7 - line 43; figures 5-6,8	1-4, 6
Y		5, 7
A		8-15
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X	US 5325560 A (PAVONE BERNADINO J ET AL), 5 July 1994 (1994-07-05); column 2, line 61 - column 3, line 11; figures 5-7	1-4, 6
Y		5, 7
A		8-15
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☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
10-09-2010	13-09-2010

Name and mailing address of the ISA/SE	Authorized officer
Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. + 46 8 666 02 86	Tommy Blomberg Telephone No. + 46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.
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Y		5, 7
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Y	DE 10028530 A1 (KIPPER ROBERT), 13 December 2001 (2001-12-13); column 3, paragraph [0033] - paragraph [0038]; figures 4-7B	5
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International Patent Classification (IPC)

A46B 15/00 (2006.01)
A46D 3/04 (2006.01)
A46B 17/08 (2006.01)
A46B 9/04 (2006.01)

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