

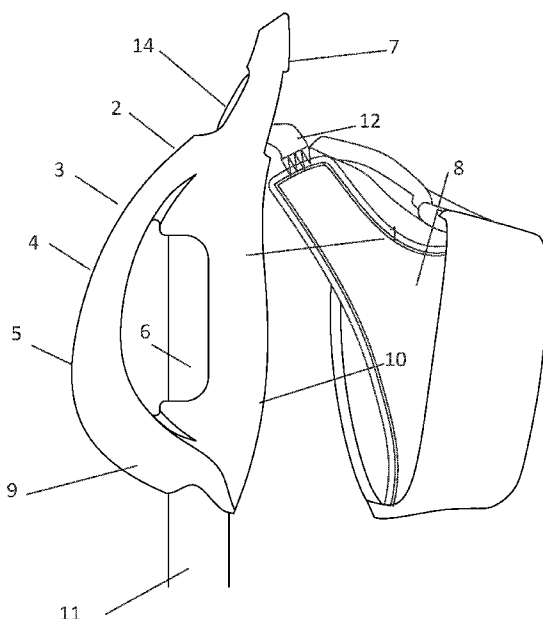


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(54) Title: POLE HANDLE

Fig 2



(57) Abstract: It is described a handle element (1) comprising a front part (13), a rear part (21) and a support part (9) that form a triangle. At the transition between the front part (13) and the rear part (21), there is arranged an upper tapered section (7) comprising at least one recess, where the surface of the front part (13) has a curved shape for placement of the fingers (2, 3, 4, 5) of a partly closed hand. It is also described a handle for a pole or stick and a pole with such a handle element.



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## POLE HANDLE

The present invention relates to a handle element for use with sticks or poles. The invention also relates to a handle for a stick with such handle element and a pole  
5 with the handle element.

Thereby, the invention relates to a handle for pole, especially, but not exclusively, for cross country skiers (including biathlon and Nordic combined) and roller skiers both using classic and skating technique. The handle can also be used for Nordic  
10 walking, without the use of skis. The invention also relates to arrangement for anchoring of hand strap.

When skiing, be it for recreation, training or competitions, the special character of the activity indicates that the athletes increasingly are focusing on optimum  
15 equipment, including poles. The development of cross country technique, with a shift towards a larger part of the total power originating from the upper part of the body due to more active use of the poles, have set focus on optimisation of the pole equipment - poles with straps. While the focus among manufacturers mainly has been towards developing lighter, stronger and stiffer pole tubes (e.g. in carbon  
20 fibre), there has been less attention devoted to the design of the pole handle.

The element that form the starting point for the invention is the hand position. The most common design of a pole handle is that of a handle, often constructed as a cork coated plastic sleeve that is pushed down on the end of a tube and glued to  
25 the tube. An example of this is shown in PCT/NO00/00009. These handles are slightly oval or close to cylindrical about the pole tube and follow an approximately straight extension of the pole tube.

There have been used pole handles which are especially designed to fit the hand  
30 gripping about the handle. There have been used liner elements protected by leather and cork attached directly on the handle. Handles have also been designed ergonomically to better utilise the human body during activity by activating larger muscle groups in the back of the user. An example is a solution from the manufacturer Swix Sport AS, where a plastic lining is attached laterally to the  
35 upper half of the handle. There are also handles that are distinguished by the main part being bevelled in a direction transversely of the walking direction during use. An example is shown in NO 324425 B1. This publication describes a solution similar

to the pole handle in the present description, but the design differs substantially, as other biometrical effects are obtained than by the present pole handle. This is due to a main difference between the handles, in that the handle according to the invention inclines along the walking direction during use, not across it, as is the  
5 case in the referred publication.

US 4.775.168 describes a skiing pole with a handle being adapted to force the pole forwards during a stroke. The handle has a finger grip attached to the pole and a palm element being rotatably coupled to the top of the finger grip. A spring pushes  
10 the finger grip away from the palm element. The arrangement is intended to help the user get the pole further behind for each stroke.

FR 2503571 describes a handle with an open cavity at the rear part of the insertion of the pole in the handle. The cavity provides increased flexibility in the handle.  
15

In general, there will be a need within sports, and especially with competitive sports, for pole handles with improved biometrical properties. Sticks or poles that, in an improved manner, transfer power from the body to the stick or pole, will give the user an advantage in relation to known sticks or poles.

20 It is therefore an object of the present invention to provide an improved handle element for use with the handle of a pole or stick and an improved pole with improved biometrical properties, such as an improved transfer of power between the user and the pole.

In accordance with the present invention, it is provided a handle element  
25 comprising a front part, a rear part and a support part or web forming a triangular form, at the transition between the front part and the rear part, there is arranged an upper tapered section comprising a recess, the surface of the front part has a curved shape for placement of the fingers of a partly closed hand, with an increasing slope towards the upper tapered section, a cavity is provided in the  
30 handle element suitable for introduction of a pole tube.

Such a handle element will give a more ergonomical grip for the user of a pole or stick with such a handle element. It will also be able to provide an improved transfer of power from the upper body of the user, through the hand to the pole or stick and further down to the ground, which will lead to an improved performance  
35 for the user.

The rear side part of the handle element comprises a curved liner corresponding to a curve in a partly closed palm, suitable for supporting the palm during use. This gives good contact between palm and handle element and thereby an improved grip compared to known handle elements with a mainly cylindrical shape.

- 5 In one embodiment, the handle element has an opening arranged between the front part, the rear part and the support part. The opening will lower the weight of the handle element. The opening will also enable a certain flexibility in the front and rear part of the handle element, if desirable.

10 The recess in the upper section of the handle element is provided with one or more transversal struts suitable for receiving bands from a hand strap, so that the handle element can be used with, for example, a skiing pole or a Nordic walking stick in a commonly known manner. The transversal struts may have a cross sectional design simplifying receipt of the bands of the hand strap. At the same time, the gap  
15 between the transversals struts should be such that the bands are partly locked by friction between the band and the transversal struts.

The angle between an axis running from a front lower point and an upper point in the front part of the handle element and a pole axis running through the pole tube, can advantageously be between 45 and 10 degrees, preferably between 35 and 25  
20 degrees and most preferably between 31 and 29 degrees. In this range for the angle, one will obtain a good gripping angle in the hand between the fingers and the palm, and a natural flection of the fingers around the handle of a pole or stick with a handle element according to the invention.

The upper part can comprise a support area as an extension of the surface of the rear side section, suitable for further support of the hand during use. It is an  
25 advantage if this part of the surface of the front part supporting the index finger, is situated above the end section of the pole tube, as this gives a further improved power transfer from hand to pole or stick.

In one aspect of the invention the cavity comprises a fitting surface suitable for abutting against an end area of a pole tube. Such a fitting surface will provide  
30 support for the pole tube in the handle element and contribute to a good transfer of power between pole tube and handle element.

The fitting surface can comprise at least one depression corresponding with at least one projection on the end area of the pole tube, or the fitting surface can comprise at least one projection corresponding to at least one depression in the end area of the pole tube. The depressions and projections will support the tube sideways in the  
5 handle element, so that it does not detach during use.

The invention also relates to a handle for a pole or stick comprising a handle element as described above, where a hand strap is coupled to the at least one recess in the upper part of the handle element. Such a handle can be used in all types of tubes or pipes for sticks or poles, and will give an improved transfer of  
10 power compared to prior art handles.

The invention also relates to a pole comprising a handle element as described above, where a pole tube is arranged in the cavity. Such a pole will give an improved transfer of power compared to known poles, and will consequently be able to yield a higher speed and/or lower energy consumption for the user during  
15 skiing.

Thereby, the present invention relates to handles for poles with arrangement for anchoring of hand strap, where the handle is ergonomically designed to optimise the transfer of power from forearm and hand to pole and ground during use, where the front part of the handle is substantially expanded with increasing frontal slope.  
20 The front part of the handle can advantageously have an angle to the vertical axis of between 45 and 10 degrees.

The front part of the handle can preferably have an angle of between 35 and 25 degrees, while an angle of between 31 and 29 degrees can be most preferred.  
25 The front part of the handle can form a suitable support plane for the fingers. The handle can also be moderately expanded dorsally - in the rear side of the handle, to create a support plane for the palm during use.

A support web connects the lower section of the handle to support the front part. The upper section of the handle has a cavity through the handle with one or more  
30 horizontal struts, between which band from the hand strap can be threaded, and anchored back on the main section of the hand strap, for effective regulation of the length of the hand strap. The hand strap can be fastened with hooks and loops or similar arrangements.

The main part of the handle is tapered towards the top, but has maintained a support plane at the rear, so that the hand will have a support surface that contributes to effective backwards leading of the pole. This support plane should  
5 have such an extent that the support surface for the hand is sufficiently long. Preferably is the support plane designed so that the extension contributes to a sufficient interface towards the palm between the index finger and the thumb.

10 The invention will now be further described with reference to the attached drawings, where:

Fig. 1 shows an example of a right handle seen from the left, with hand.  
Fig. 2 shows an example of a left handle seen from the left.  
Fig. 3 shows an example of a handle with hand strap, seen from above.  
15 Figs. 4a and b show examples of a left handle seen from the right.  
Fig. 5 shows an example of a handle seen from the front.  
Fig. 6 shows an example of a handle seen from the back.  
Figs. 7a and b show cross sections through a handle.  
Fig. 8 shows an example of a handle with angle applied for the main section of the  
20 front part.

Fig. 1 shows upper part of a pole according to the invention. More specifically does the figure show a right handle seen from the left, with a hand about to grip the handle of the pole. The pole comprises a gripping part 1, a hand strap 8 and a pole  
25 tube 11. The gripping part 1 is mounted on the pole tube 11, the strap 8 is anchored to the end of the pole tube 11 and the upper section of the gripping part 1.

Fig. 2 shows an example of a left handle seen from the left. The front part 13 of the gripping section is designed to provide each finger with support area for maximum  
30 transfer of power from hand to pole. As a result, does the support area for index finger 2 have a less slanted slope than the middle finger 3, ring finger 4 and little finger 5, plus that it is substantially closer to the axis of the pole tube, so that the momentum can be transferred directly downwards in the length direction of the pole. The support area for the index finger 2 should be arranged over the length  
35 axis of the pole tube.

The rear section or backside section 21 of the gripping part, seen in the walking direction, that is, the area of the gripping part that will lie towards the palm of the user's hand, has a curved expansion 10 to create an optimum support plane towards the palm during use. Even if the gripping part of the handle is tapered  
5 towards the top, there is also maintained mass in the upper part 7 of the gripping part 10, to create a support plane towards the hand when the pole is led backwards during use.

To attend the requirements for low weight, the material between the front part and  
10 the pole tube is removed, so that an opening 6 is created. Furthermore, to attend to the requirements for robustness, a support part or web 9 is maintained in the lower area of the gripping part 10, angled in relation to the pole tube, so that it is in a substantially lying position during use, when the pole tube is held vertically. It is also possible to obtain the desired biometrical effect without removing the  
15 material or mass between the front part and the pole tube, but it is preferred, to reduce weight. Thereby, in the shown example, one can say that the gripping part 1 is formed by a rear part 21, a front part 13 and a support part or web 9, which will form a triangle in relation to each other.

To optimise the grip of the hand in and around the handle, an arrangement for  
20 anchoring of the hand strap 8 is a part of the invention, see e.g. figs. 3-5. Through a cavity in the upper part 14 of the gripping part, bands from the hand strap are threaded through the handle, around one or more horizontal struts 18. The struts can have an elliptic or circular cross section. Thereafter, the band is threaded back  
25 to the main part of the hand strap, where a tightening mechanism 12, see e.g. figs. 4a or 4b, formed as a tightening buckle, hooks and loops or another fastening arrangement, can regulate the effective length of the strap. The handle is intended to be used with a hand strap 8 designed as a sleeve surrounding the wrist and thumb, but can also be used with a conventional loop around the wrist.

30

Figs. 7a and 7b show cross sections through handles according to the invention. The gripping part 1 is arranged on and partly surrounding the pole tube 11. The pole tube 11 is introduced into the gripping part 1 of the handle through a bore or cavity through the gripping part corresponding to the outline or cross section of the  
35 pole tube 11. The pole tube 11 is pushed through the gripping part 1 until the end face 19 of the pole tube abuts a corresponding fitting surface 20 inside the cavity of the gripping part. For cylindrical pole tubes, will the design of the pole tube be

cylindrical, but the cavity can be adapted to different designs of pole tubes (oval, elliptic, triangular or the like).

5 Thereby, the invention relates to a handle with arrangement for anchoring of a hand strap, where the front part is substantially expanded with an increasing slope in the walking direction of the handle during use, so that the lower part of the front part will be further away from the pole tube than the upper part. This is done to create a natural support area for the complete hand, inclusive fingers, during work out. The front part of the handle has an angle different from the vertical axis of the pole tube. The angle can be described as an axis between the outer frontal point 15 of the handle and the outer point of the handle seen from a ground plane, in upright position 16 shown in figure 8.

15 The angle between a pole axis 17 through the pole tube and the axis between front point 15 and upper point 16 of the front part 13, can be between 45 and 10 degrees, preferably between 35 and 25 degrees and most preferred between 31 and 29 degrees. This relates to a handle fitted to a male adult. For humans with different height, physique, hand size or shape, other angles may give the best transfer of power. One can for example envisage that a child may need another angular position. If the poles or sticks are intended for use by a sitting person, e.g. a wheelchair user or sledge hockey player, it is also conceivable that the best angle would be another than the above suggested. A skilled person within the art will be able to find the best angle for different uses of the pole or stick, without departing from the scope of the present invention.

25

As the front part of the handle is shaped to follow the normal anatomy, tests at the Norwegian School of Sport Sciences have indicated that several desirable biometrical effects can be achieved:

- 30 1) The forearm muscles will to a greater extent get activated through the pushing phase, which contributes to a greater generation of power.
- 2) The angle of the main part or the angle of the gripping part in relation to the pole angle will, during use, cause a vector that counterbalances the tendency of the pole to bend or vibrate.
- 35 3) Great power may be produced in a longer phase of the push, as the handle enables transfer of power from more muscle groups.

The dimension of the handle may vary. Different hand sizes will require different handle sizes. The handle can be produced in different sizes through proportional alterations related to the different axes of the handle. The handle can be moulded in different plastic compositions and possibly lined with cork or other desired materials on chosen areas to maintain the insulating properties of the handle. The handle according to the invention can also be manufactured in any other suitable material.

The handle according to the invention is ergonomically adapted to the shape of the hand and work requirements during skiing, with the intention to create improved conditions for transfer of power from arms/hands through the poles or sticks to the ground during use. The gripping part 1 of the handle has a front part 13 that is substantially expanded with an increasing slope frontally on the handle in the walking direction during use. The front part 13 is supported by a support web 9 in the part of the handle facing the ground during use. The handle has an arrangement for anchoring 14 of a hand strap 8 comprising a cavity with one or more horizontal struts, around which the strap can be threaded to enable regulation of the effective length of the hand strap. The effective length of the hand strap is maintained by known mechanisms such as hooks and loops, buckles or the like.

## Claims

1. A handle element (1) comprising a front part (13) and a rear part (21),  
**characterised in that** the handle element (1) further comprises a support  
part (9) which, together with the front part (13) and the rear part (21) form  
5 a triangle, at the transition between the front part (13) and the rear part  
(21) there is arranged an upper tapered section (7) comprising at least one  
recess, the surface of the front part (13) has a curved shape for placement  
of the fingers (2, 3, 4, 5) of a partly closed hand, with an increasing slope  
towards the upper tapered section (7), a cavity, suitable for introduction of a  
10 pole tube (11), is provided in the handle element.
2. Handle element according to claim 1, **characterised in that** the rear part  
(21) comprises a curved expansion (10) corresponding to a curve in a partly  
closed palm, suitable for support of the palm during use.  
15
3. A handle element according to claim 1 or 2, **characterised in that** an  
opening (6) is provided between the front part (13), the rear part (21) and  
the support part (9).
- 20 4. A handle element according to claim 1 or 2, **characterised in that** the  
recess in the upper part (7) is provided with one or more transversal struts  
(18) suitable for receiving bands from a hand strap (8).
- 25 5. A handle element according to any of the preceding claims, **characterised  
in that** the angle between an axis running from a frontal point (15) and an  
upper point (16) in the front part (13) and a pole axis (17) running through  
the pole tube (11) is between 45 and 10 degrees, preferably between 35  
and 25 degrees and most preferably between 31 and 29 degrees.
- 30 6. A handle element according to any of the preceding claims, **characterised  
in that** the upper part (7) comprises a support plane as an extension of the  
surface of the rear part (21), suitable for further support for the hand during  
use.
- 35 7. A handle element according to any of the preceding claims, **characterised  
in that** the cavity comprises a fitting surface (20) suitable for abutting an  
end face (19) of the pole tube (11).

8. A handle element according to any of the preceding claims, **characterised in that** the fitting surface (20) comprises at least one depression corresponding to at least one projection on the end face (19) of the pole tube, or the fitting surface (20) comprises at least one projection corresponding to at least one depression on the end face (19) of the pole tube.
9. A handle for pole or stick, **characterised in that** it comprises a handle element according to any of the preceding claims, where a hand strap (8) is anchored to the at least one recess in the upper part (7) of the handle element.
10. A pole **characterised in that** it comprises a handle element according to any of the claim 1-8, where a pole tube (11) is arranged in the cavity.

Fig 1

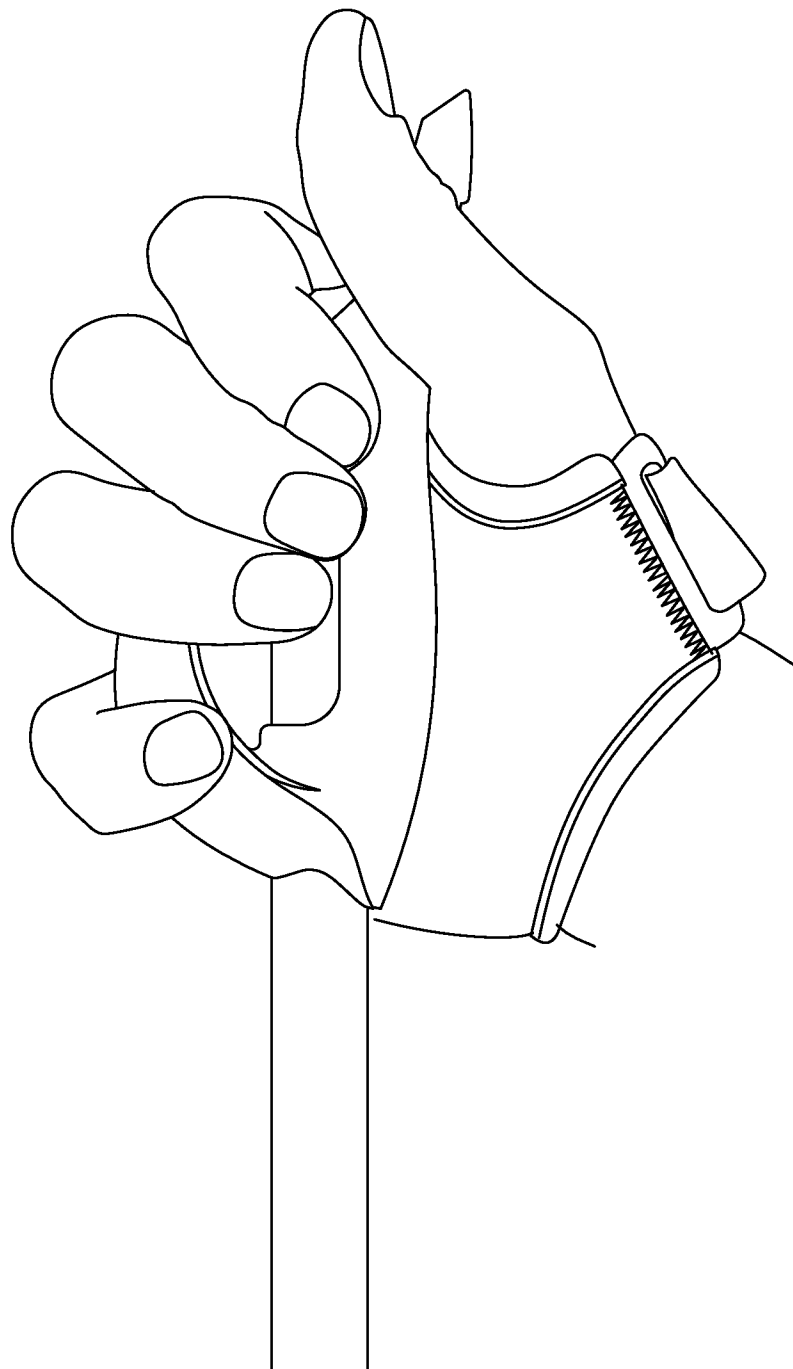


Fig 2

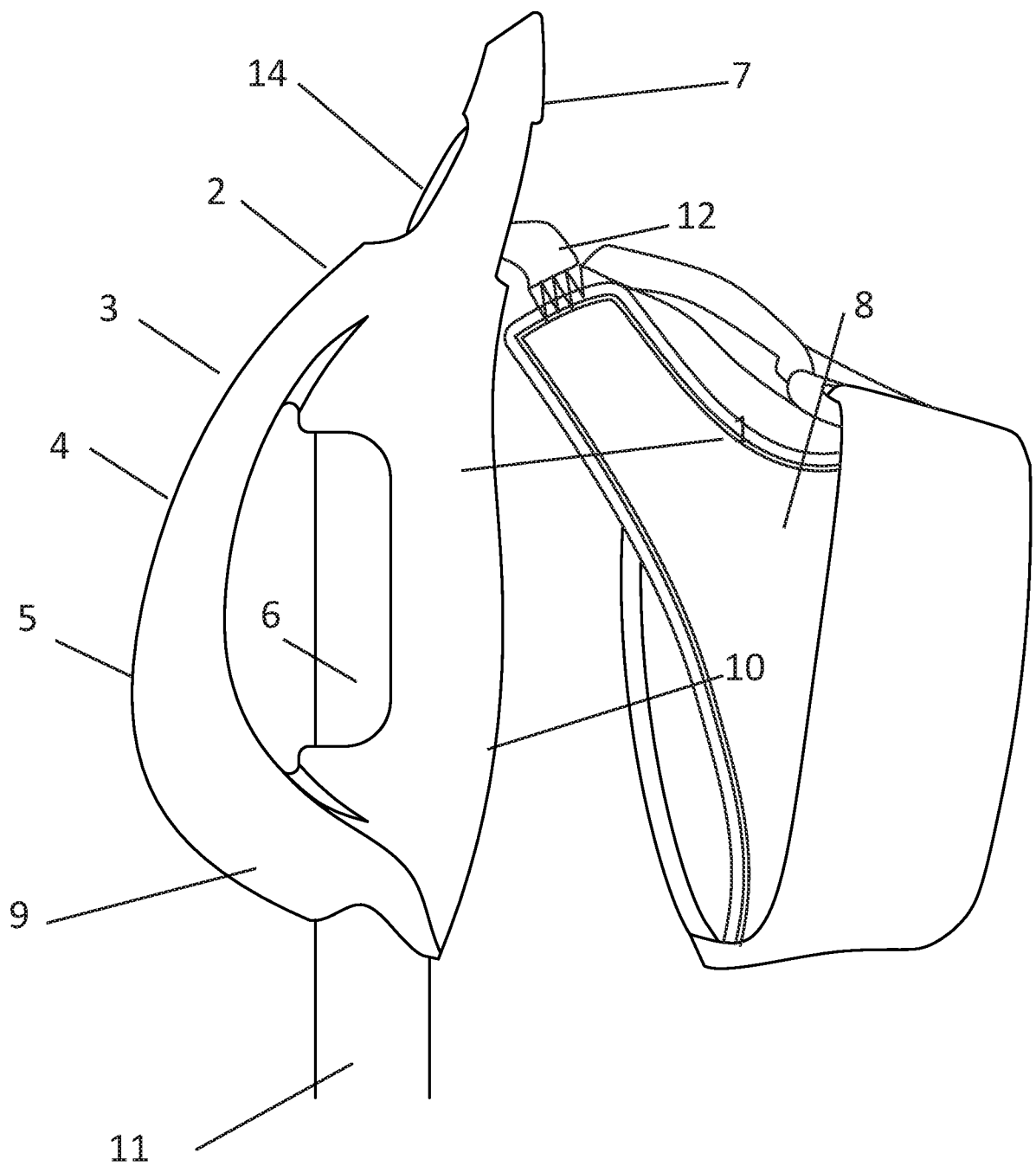


Fig 3

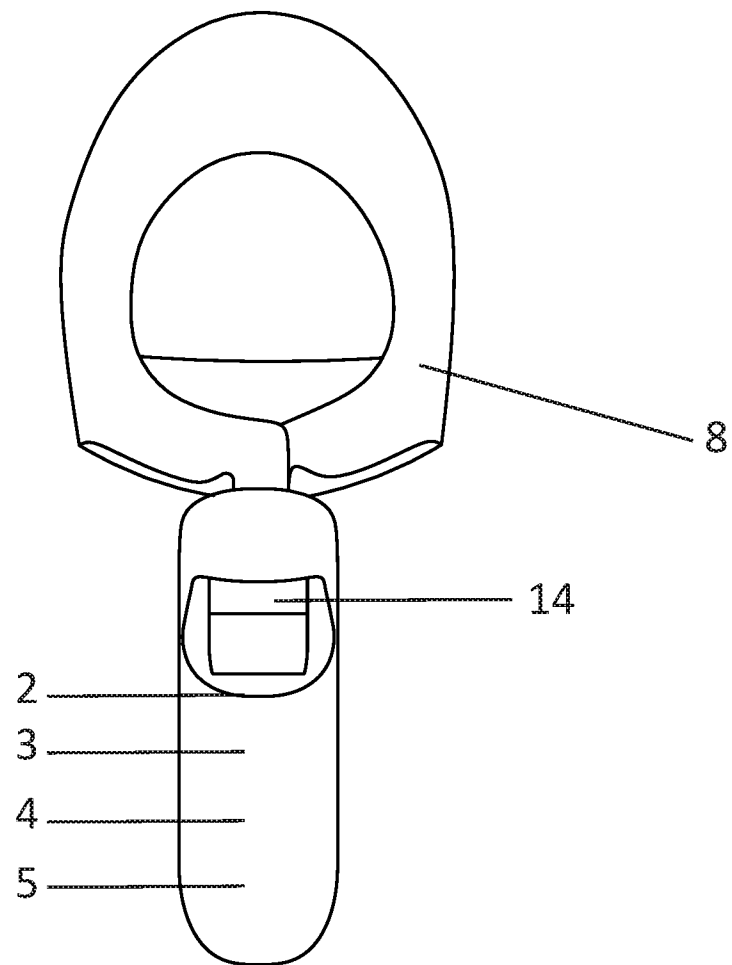


Fig 4a

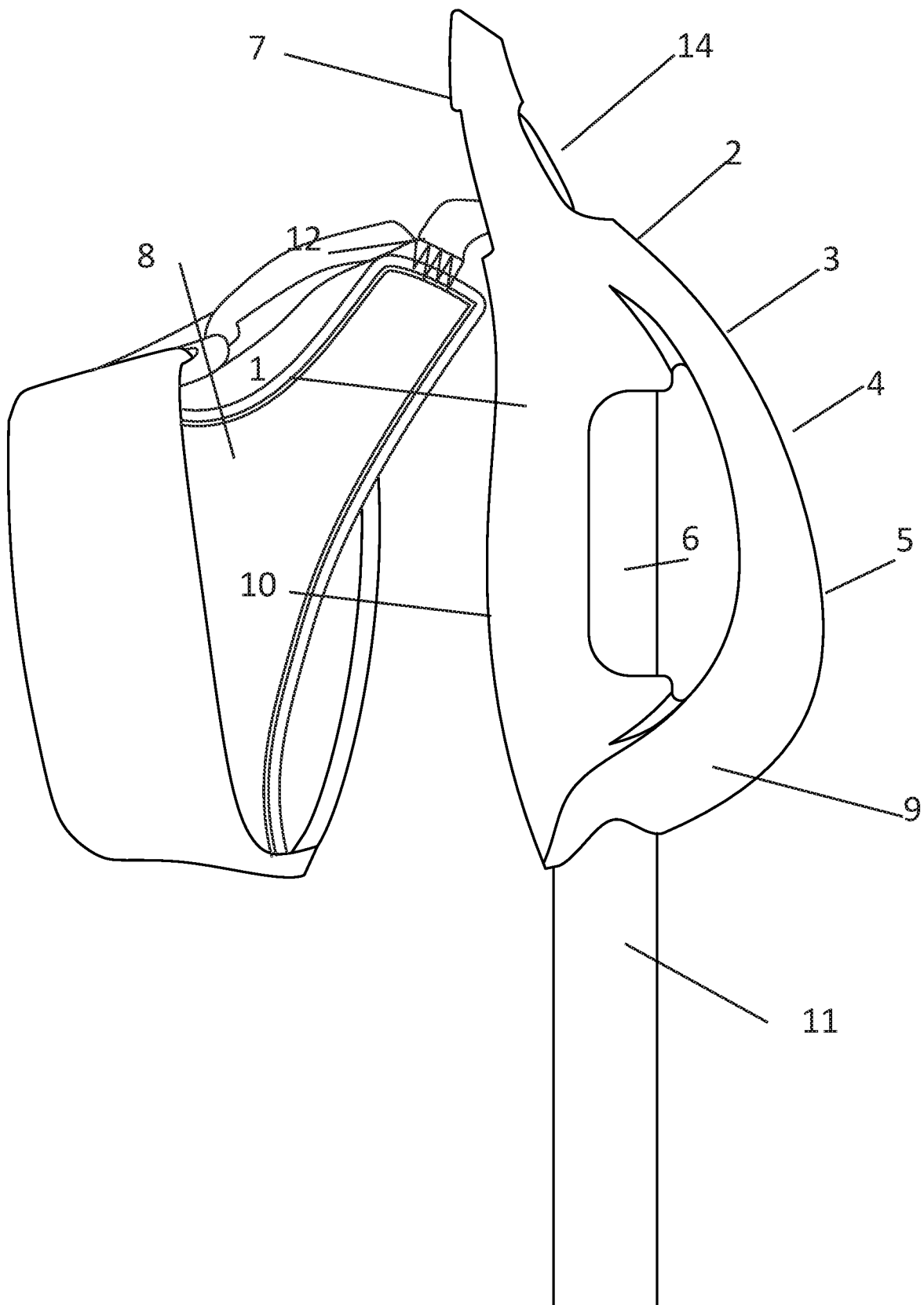


Fig 4b

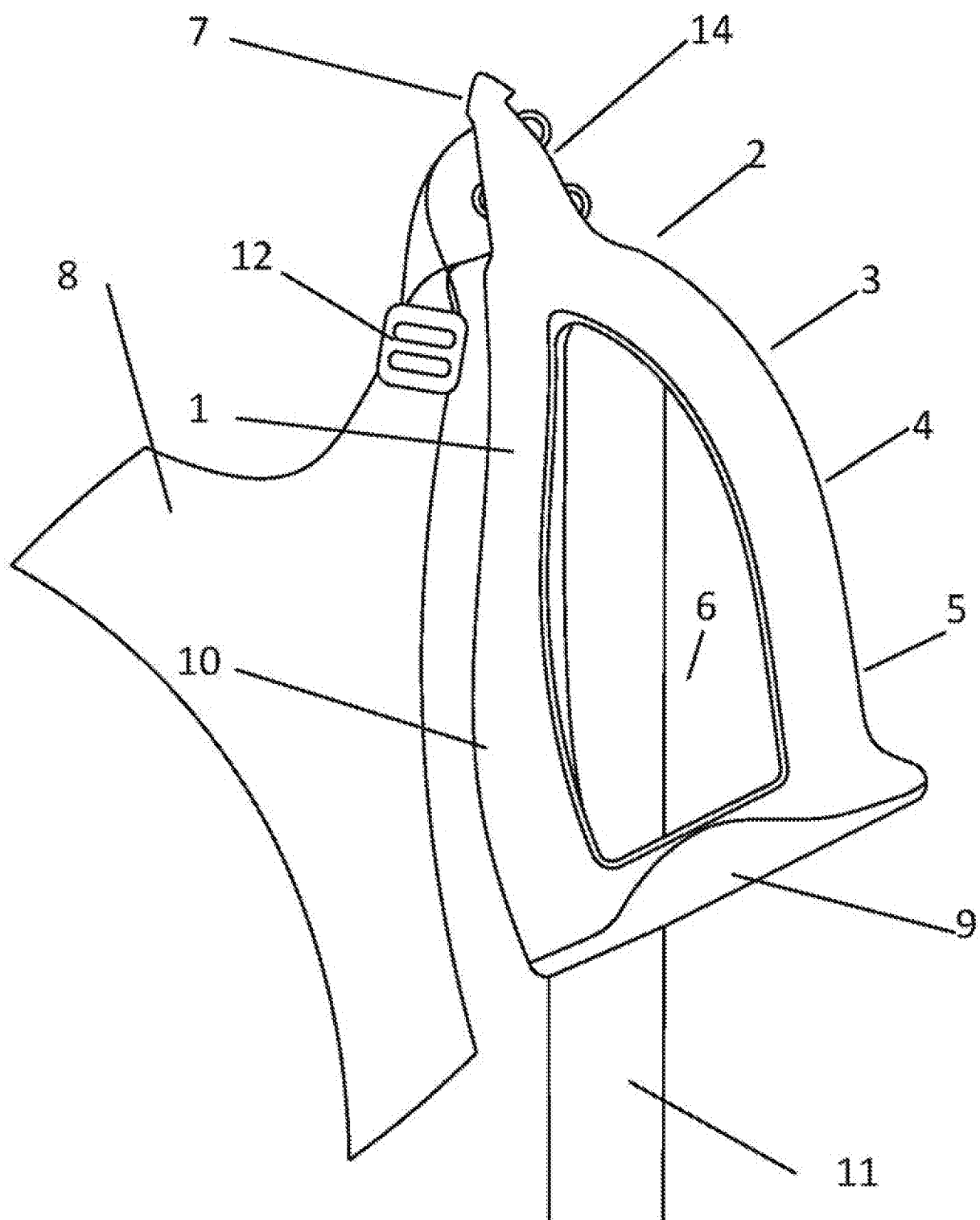


Fig 5

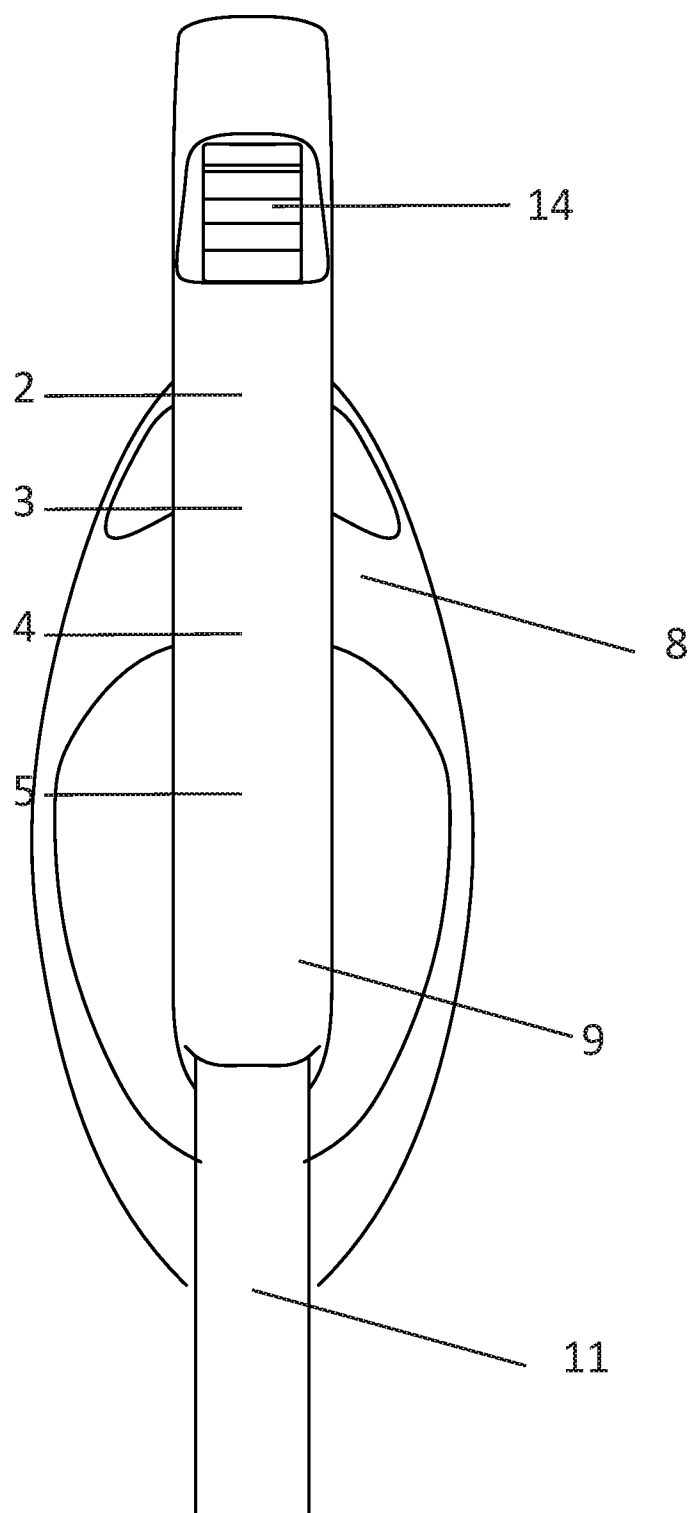


Fig 6

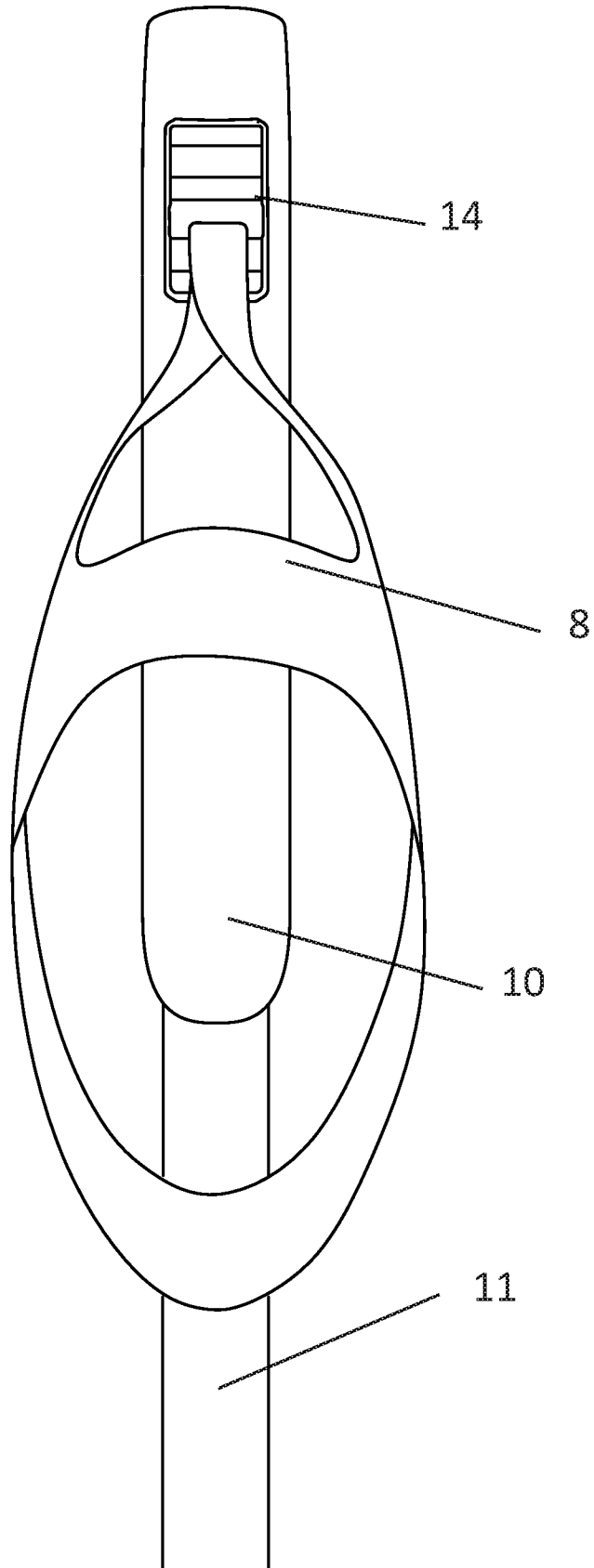


Fig 7a

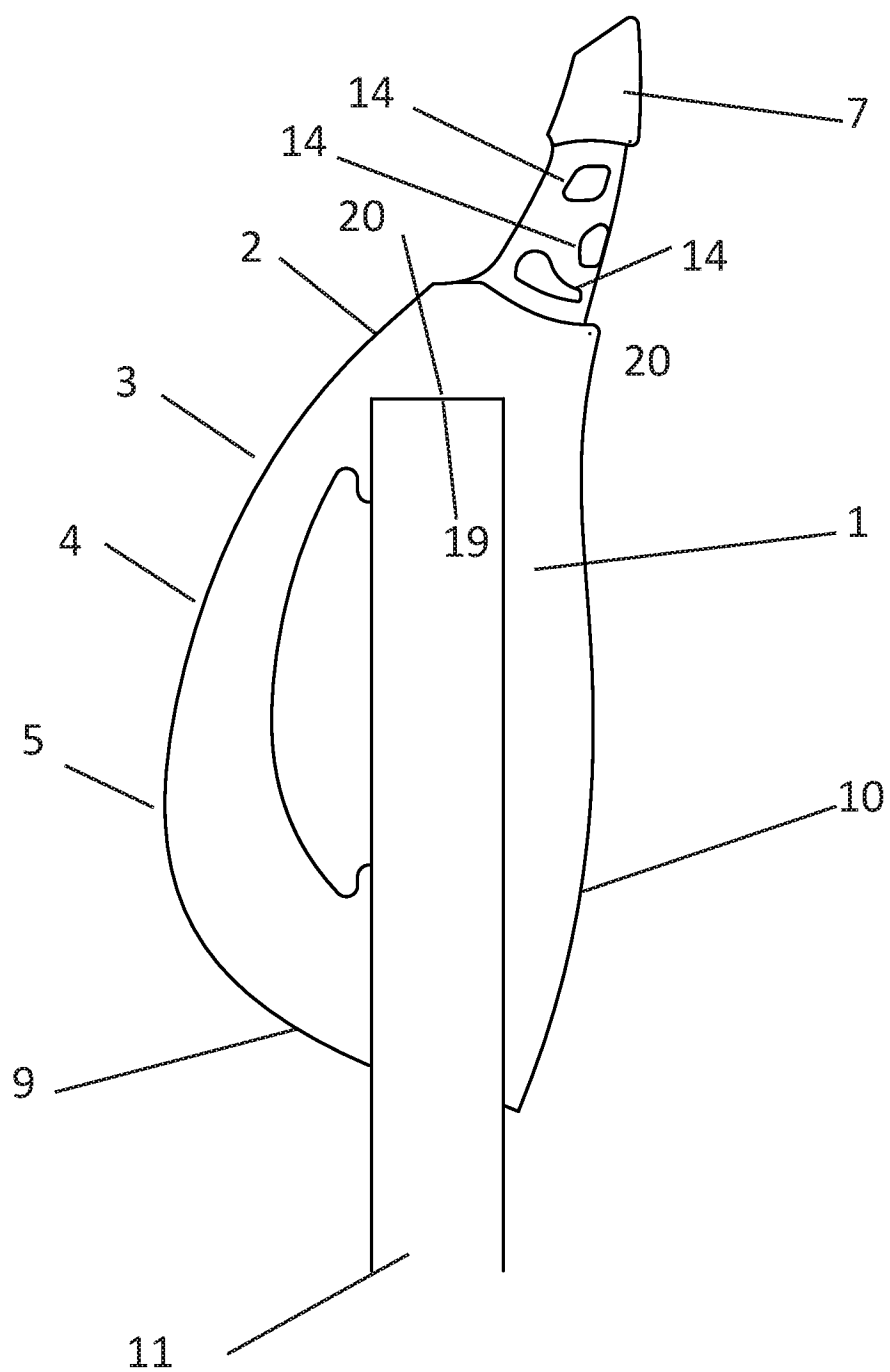
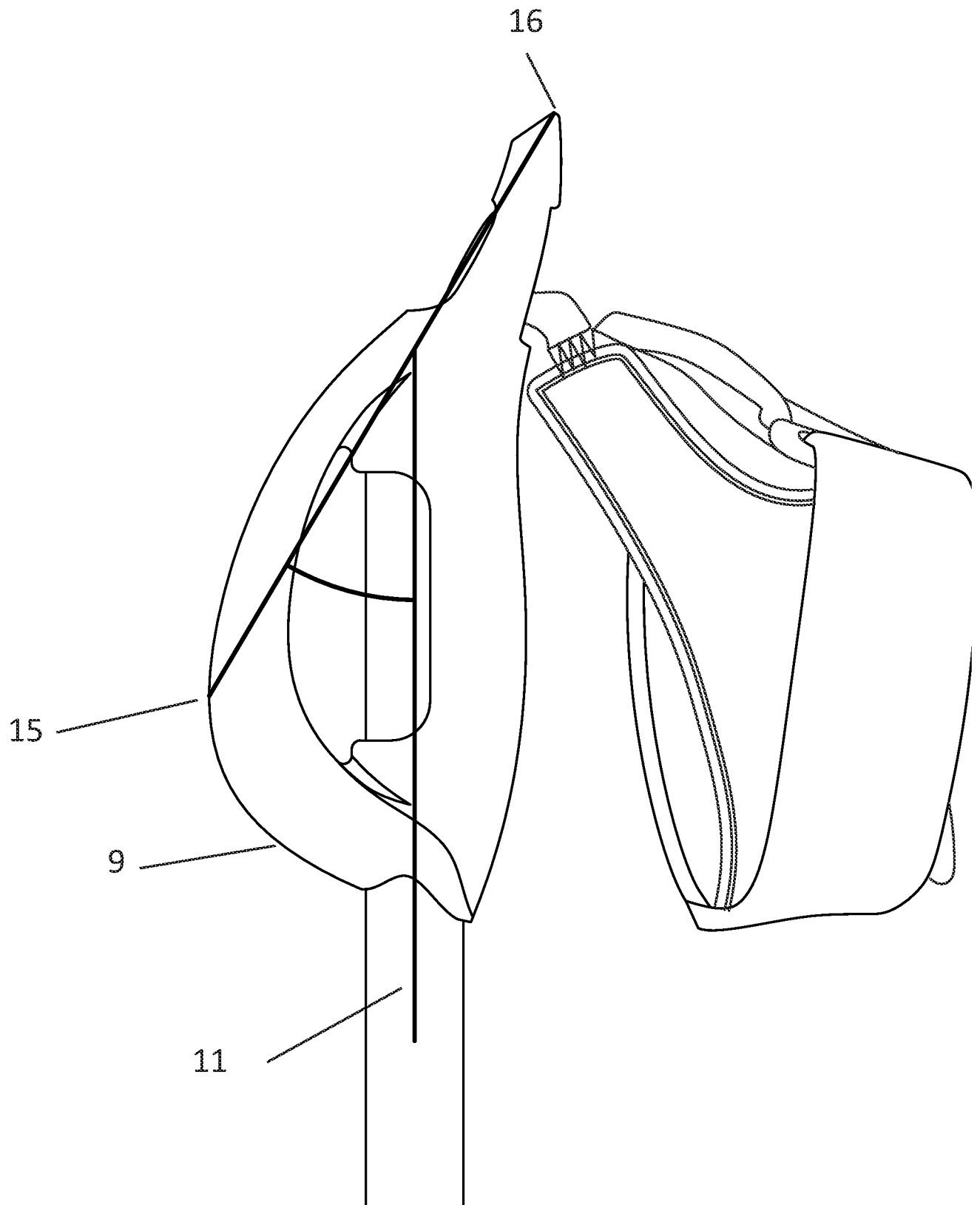




Fig 8



# INTERNATIONAL SEARCH REPORT

International application No  
PCT/N02014/050032

A. CLASSIFICATION OF SUBJECT MATTER  
INV. A63C11/22  
ADD.

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)  
A63C

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 practicable, search terms used)

EP0-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                      | Relevant to claim No. |
|-----------|---------------------------------------------------------------------------------------------------------|-----------------------|
| X         | US 5 316 340 A (MALTSEV ALEXANDR A [RU])<br>31 May 1994 (1994-05-31)<br>column 2; figures 1-4<br>-----  | 1-10                  |
| A         | DE 26 28 142 A1 (TMC CORP)<br>12 May 1977 (1977-05-12)<br>figure 10<br>-----                            | 1                     |
| A         | FR 2 503 571 A3 (BERTELE GIANMARCO [IT])<br>15 October 1982 (1982-10-15)<br>the whole document<br>----- | 1                     |



Further documents are listed in the continuation of Box C.



See patent family annex.

\* Special categories of cited documents :

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Brunie, Franck

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/N02014/050032

| Patent document<br>cited in search report |    | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|-------------------------------------------|----|---------------------|----------------------------|---------------------|
| US 5316340                                | A  | 31-05-1994          | AT 139135 T                | 15-06-1996          |
|                                           |    |                     | CA 2079789 A1              | 05-08-1992          |
|                                           |    |                     | DE 69211506 D1             | 18-07-1996          |
|                                           |    |                     | DE 69211506 T2             | 24-10-1996          |
|                                           |    |                     | EP 0546183 A1              | 16-06-1993          |
|                                           |    |                     | FI 924443 A                | 02-10-1992          |
|                                           |    |                     | NO 923853 A                | 16-11-1992          |
|                                           |    |                     | RU 2005524 C1              | 15-01-1994          |
|                                           |    |                     | US 5316340 A               | 31-05-1994          |
|                                           |    |                     | WO 9213612 A1              | 20-08-1992          |
| -----                                     |    |                     |                            |                     |
| DE 2628142                                | A1 | 12-05-1977          | NONE                       |                     |
| -----                                     |    |                     |                            |                     |
| FR 2503571                                | A3 | 15-10-1982          | NONE                       |                     |
| -----                                     |    |                     |                            |                     |