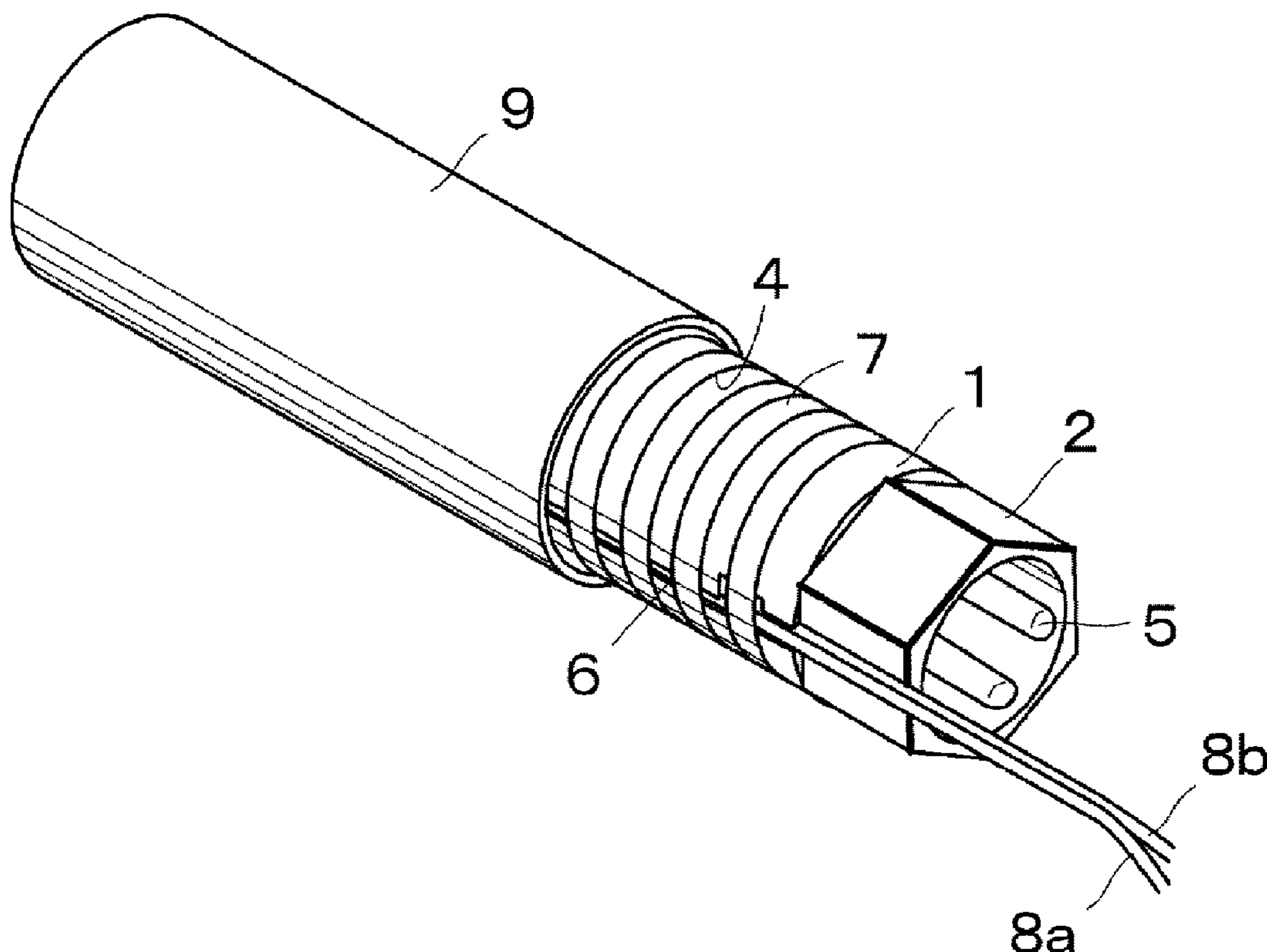




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(54) Title: HAND GRIP MEMBER WITH ELECTRIC HEATER



(57) Abrégé/Abstract:

A hand grip member with electric heater can be produced in high yield through simple processing not using any core of synthetic resin and avoiding molding operation. Depressed groove (4) is spirally provided on an external surface of inner part (1) of rubber, and multiple ribs (5) are provided on an internal surface thereof along the direction of length. Electric heater (7) of tape-shaped metal conductor is implanted in the depressed groove (4), and fixed. Electric wires (8a,8b) are connected to two ends of the electric heater (7) and drawn out. The inner part (1) is inserted in outer part (9) of rubber tube, and the outer part (9) is fixed to the inner part (1) with the use of an adhesive, etc.



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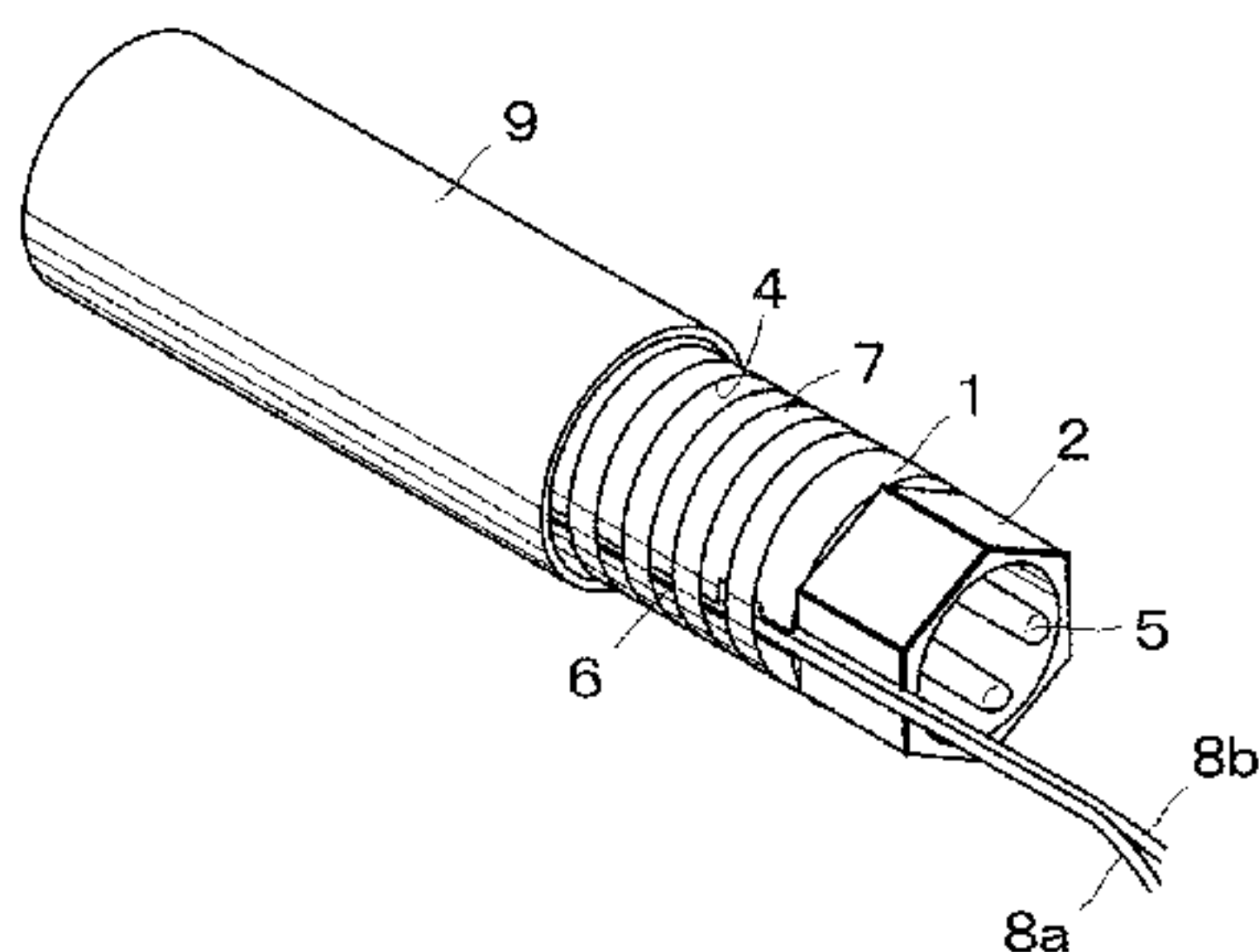
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(54) Title: HAND GRIP MEMBER WITH ELECTRIC HEATER

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(57) **Abstract:** A hand grip member with electric heater can be produced in high yield through simple processing not using any core of synthetic resin and avoiding molding operation. Depressed groove (4) is spirally provided on an external surface of inner part (1) of rubber, and multiple ribs (5) are provided on an internal surface thereof along the direction of length. Electric heater (7) of tape-shaped metal conductor is implanted in the depressed groove (4), and fixed. Electric wires (8a, 8b) are connected to two ends of the electric heater (7) and drawn out. The inner part (1) is inserted in outer part (9) of rubber tube, and the outer part (9) is fixed to the inner part (1) with the use of an adhesive, etc.

[続葉有]

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(57) 要約:

合成樹脂製のコアを使用することなく、またモールドを行うことなく、簡素な工程で歩留良く製造を可能とする。

ゴムから成るインナパーツ（１）の外表面に凹溝（４）が螺旋状に形成され、内表面には長手方向に沿って複数条のリブ（５）が形成されている。凹溝（４）内には金属導体をテープ状に形成した電熱ヒータ（７）が埋め込まれ固定され、電熱ヒータ（７）の両端にはそれぞれ電線（８ a、８ b）が接続され、引き出されている。

このインナパーツ（１）上に、ゴム筒製のアウトパーツ（９）を挿着し、インナパーツ（１）との間は接着剤などを用いて固着されている。

HANDLE GRIP MEMBER WITH ELECTRIC HEATER

Field of the Invention

[0001] The present invention relates to a handle grip
5 member with electric heater for use in motorcycles,
snowmobiles and so on.

Background of the invention

[0002] In handle grip members for motorcycles,
snowmobiles and so on, electric heating wires are installed
10 within handle grip members made of synthetic rubber for
warming hands of users as described in, for instance, the
following Patent Document 1. In this known handle grip
member with electric heater, after connecting electric
power supply wires to both ends of an electric heating body
15 of sheet type, the electric heating body sheet is wound
around a core body made of a synthetic resin, and then an
assembly of the core body and heating body is covered with
a synthetic rubber by molding to attain electric insulation
and an anti-slip surface.

20 [0003] The Patent Document 1: Japanese Patent Laid-
opened Publication Kokai Hei 10-67366

Disclosure of the Invention

Problems to be solved by the Invention

[0004] In the known handle grip member with electric
25 heater disclosed in the Patent Document 1, a process for
molding the synthetic rubber is cumbersome and a cycle
time is prolonged. Moreover, during the molding process,
synthetic resin core body and its outer appearance might
be deformed due to heat and pressure. Furthermore,
30 connection points between the electric heating body and

- 2 -

electric power supply wires might be broken to cause trouble. In this manner, manufacturing yield of the known handle grip member with electric heater could not be high.

[0005] The present invention has for its object to provide
5 a handle grip member with electric heater which can resolve the above mentioned problems and can be manufactured easily without molding.

Means for Solving the Problems

[0006] According to the invention, in order to achieve the
10 above mentioned object, a handle grip member with electric heater comprises an inner part formed by a cylindrical rubber body, an electric heating body provided on an outer surface of the inner part, and an outer part formed by a cylindrical rubber body, an assembly of the inner part and
15 electric heating body being inserted into the outer part.

Merit of the Invention

[0007] In the handle grip member with electric heater according to the invention, since use is not made of a synthetic resin core body and molding process, the handle
20 grip member with electric heater can be manufactured by simple processes with a high yield.

Brief Description of the Drawings

[0008] Fig. 1 is a perspective view showing an inner part of a first embodiment of the handle grip member with
25 electric heater according to the invention;

Fig. 2 is a perspective view illustrating an outer part;

Fig. 3 is a perspective view depicting a process for inserting the outer part onto the inner part;

30 Fig. 4 is a perspective view showing a condition in

- 3 -

which a grip member is inserted into a grip flange body;

Fig. 5 is a perspective view illustrating a condition in which the grip member has been inserted into the grip flange body;

5 Fig. 6 is a perspective view denoting a condition in which a metal part is applied on an outer part of a second embodiment of the handle grip member according to the invention;

Fig. 7 is a perspective view showing the outer
10 part;

Fig. 8 is a perspective view depicting the metal part;

Fig. 9 is a perspective view illustrating a condition in which the grip member and grip flange body are
15 assembled; and

Fig. 10 is a perspective view showing a condition in which the grip member has been assembled with the grip flange body.

Explanation of the Reference Numerals

20 [0009] 1 inner part
2 rectangular tube portion
3 ring-shaped portion
4 recess
5 rib
25 6 groove for electric power supply wire
7 electric heater
8a, 8b electric power supply wire
9, 21 outer part
10 grip flange portion
30 22 metal part

- 4 -

23 projection

24 opening

25 projected portion

Best Modes of the Invention

5 [0010] Now the present invention will be explained in detail with reference to the embodiments shown in the drawings.

Embodiment 1

[0011] Fig. 1 is a perspective view showing a
10 condition in which an electric heating body is wound around an inner part in a first embodiment of the handle grip member with electric heater according to the invention. The inner part 1 constituting a major structural body of the handle grip member is made of a hard synthetic rubber
15 and is formed into a cylindrical shape. At a root end of the inner part 1, is formed a rectangular tube portion 2 having a hexagonal outer configuration. At a free end of the inner part 1 is formed a ring-shaped portion 3. The inner part 1 is preferably made of synthetic rubber such as
20 NBR and EPDM in view of mechanical strength.

[0012] In an outer surface of the inner part 1 there is formed a recess 4 helically. On an inner surface of the inner part 1, there are formed three to eight ribs 5
25 extending in a longitudinal direction. The ribs 5 are preferably formed to have a square or semicircular cross sectional configuration. In the outer surface of the inner part 1 there is further formed a power supply wire groove 6 such that the groove crosses respective turns of the recess 4 and extends deeper than the recess 4. An electric heater
30 7 formed by a metal conductor tape is provided within the

- 5 -

recess 4 and is secured thereto.

[0013] The electric heater 7 is preferably formed by SUS or copper and has a width of 2-7 mm and a thickness of 0.02-0.1 mm. A depth of the recess 4 may be set to a value
5 substantially equal to a thickness of the electric heater 7, and is preferably set to a value slightly larger than a thickness of the electric heater 7 in view of succeeding processes.

[0014] A pitch of the recess 4 may be preferably set
10 to 7-15 mm, particularly 8-12 mm considering uniform heating, heat rising property, heat descending property and a width of the electric heater 7. A longitudinal length of the heating portion is determined by a length of the handle grip, and is preferably set to 80-150 mm, particularly 90-
15 120 mm for warming user's hand.

[0015] To both ends of the electric heater 7 are connected electric power supply wires 8a and 8b, these wires being covered with insulating sheaths. The electric power supply wire 8a is provided within the groove 6 such
20 that the wire extends under the electric heater 7 and is extended besides the ring-shaped portion 3 of the inner part 1. The other electric power supply wire 8b is connected to the electric heater 7 at a site near the rectangular tube portion 2. It should be noted that the
25 electric power supply wire 8a should be inserted into the groove 6 before winding the electric heater 7.

[0016] Fig. 2 is a perspective view showing an outer part 9. The outer part 9 is formed by molding a synthetic rubber into a tubular body. The outer part 9 is slipped
30 onto the inner part 1 having the electric heater 7 wound

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thereon. Fig. 3 denotes a condition while the outer part 9 is slipped onto the inner part 1. At first, an adhesive tape having a heat resistant adhesive applied on both sides thereof is wound on the electric heater 7, and a
5 volatile organic solvent is applied on the outer surface of the adhesive tape to increase a slippage. Then, the outer part 9 is applied onto the inner part 1. After evaporating the solvent by drying, adhesive force of the adhesive is recovered and the outer part 9 is fixed to the
10 inner part 1.

[0017] After assembling the inner part 1 and outer part 9 to form a grip portion, the rectangular tube portion 2 of the inner part 1 is inserted into a grip flange portion 10 made of synthetic resin as illustrated in Fig. 4
15 to form the handle grip member with electric heater shown in Fig. 5. In this case, the rectangular tube portion 2 is inserted into a hole having a corresponding rectangular shape of the grip flange portion 10. Although the grip portion is subjected to a rotational force during the
20 driving, the grip portion could not be freely rotated with respect to the grip flange portion 10. Before inserting the grip portion into the grip flange portion 10, free ends of the electric power supply wires 8a and 8b are connected to terminals provided in the grip flange portion 10, said
25 terminals being not shown in the drawings.

[0018] The electric power supply wires 8a and 8b are connected to an electric power source, i.e. battery via the terminals provided in the grip flange portion 10 and a cable not shown. Switches 11 and 12 provided on the grip
30 flanged portion 10 may be used as a controller switch for

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the electric heater 7 and as a direction indicator switch. Furthermore, an end part 13 is provided at a free end of the grip portion.

[0019] By fitting the thus completed handle grip member to a rod-like handlebar of a motor bicycle, the handle grip member can be used as a handle grip with electric heater. Since the ribs 5 are formed on the inner surface of the inner part 1, the handle grip member could not be freely rotated with respect to the handlebar.

10 Embodiment 2

[0020] Fig. 6 is a perspective view showing a condition in which a metal part is applied on an outer part in a second embodiment of the handle grip member with electric heater according to the invention. A tubular metal part 22 shown in Fig. 7 is applied on an outer part 21 made of rubber illustrated in Fig. 8.

[0021] On the outer surface of the outer part 21 there are formed a plurality of projections 23 each having a substantially diamond-shaped configuration and a flat surface. The metal part 22 may be formed by SUS or plated steel sheet and has formed therein a plurality of openings 24 into which the projections 23 of the outer part 21 are to be inserted. Therefore, the opening 24 has a corresponding shape to the projection 23. At front and rear ends of the metal part 22, there are formed projected portions 25.

[0022] Upon assembling the outer part and metal part, the outer part 21 made of rubber is inserted into the metal part 22 such that the projections 23 are clamped into the openings 24. Then, the outer part 21 and metal part 22

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form a unit body and the mechanical strength of the outer part 21 is reinforced.

[0023] In this case, it is preferable that a height of the projections 23 is slightly larger than a thickness of the metal part 22. Then, the projections 23 extend beyond the openings 24 and a surface resistance of the handle grip member becomes large to attain safety. The two projected portions 25 extended from the metal part 22 cover the electric power supply wires 8a and 8b and also serve to prevent any undesired rotation in combination of the grip flange portion 10.

[0024] Fig. 9 is a perspective view showing a condition in which the inner part 1 shown in Fig. 1 is inserted into the outer part 21 having the metal part 22 applied thereon, but before fitting the grip flange portion 10. Fig. 10 is perspective view showing a condition in which the grip member has been assembled with the grip flange body.

[0025] In the second embodiment 2, the handle grip member is reinforced by the metal part 22 and ornamentation of the handle grip member is also enhanced by the metal part 22.

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Claims in the Amendment

[International Office received on February 24, 2007 (24. 02. 2007)]

5 1(Amended) A handle grip member with electric heater comprising an inner part formed by a cylindrical body made of rubber, an electric heating body provided on an outer surface of the inner part, and an outer part formed by a tubular body made of rubber characterized in that an outer
10 configuration of an end portion of said inner part is formed into a polygonal shape, and said end portion of the inner part is inserted into a grip flange portion, said grip flange portion having therein connecting portions for connecting end portions of the electric heating body to
15 electric power supply wires.

2. The handle grip member with electric heater according to claim 1, characterized in that said electric heating body is formed by a metal tape and is
20 wound on the inner part helically.

3(Amended). The handle grip member with electric heater according to claim 2, characterized in that a recess is helically formed on the outer surface of the
25 inner part and a groove is formed in a longitudinal direction such that a depth of the groove is large than a depth of the recess, said electric heating body is provided within the recess to form a helical winding, one end of the electric heater is connected to one of the electric power
30 supply wires which is extended within the groove under the

- 11 -

electric heater up to said grip flange portion.

4. The handle grip member with electric heater according to claim 1, characterized in that anti-slipping
5 ribs are formed on an inner surface of the inner part.

5. The handle grip with heater according to claim 1, characterized in that said outer part is secured to the inner part with an adhesive.

10

6. The handle grip with heater according to claim 1, characterized in that said a tubular metal part having openings formed therein is applied on the outer part such that parts of outer part are projected into said openings.

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Explanatory Document under Article 19(1)

Claim 1 has been amended to make clear the subject matter of the invention that the grip flange portion is secured to an end portion of the inner part.

5 The cited references do not teach the grip flange portion.

 In the present invention, by securing the grip flange portion to the end portion of the inner part, the electric power supply wires can be easily connected to the ends of
10 the electric heating body.

 Claim 3 has been amended to make clear the subject matter of the present invention that one of the electric power supply wires is provided within the groove and is connected to one end of the electric heating body.

Fig.1

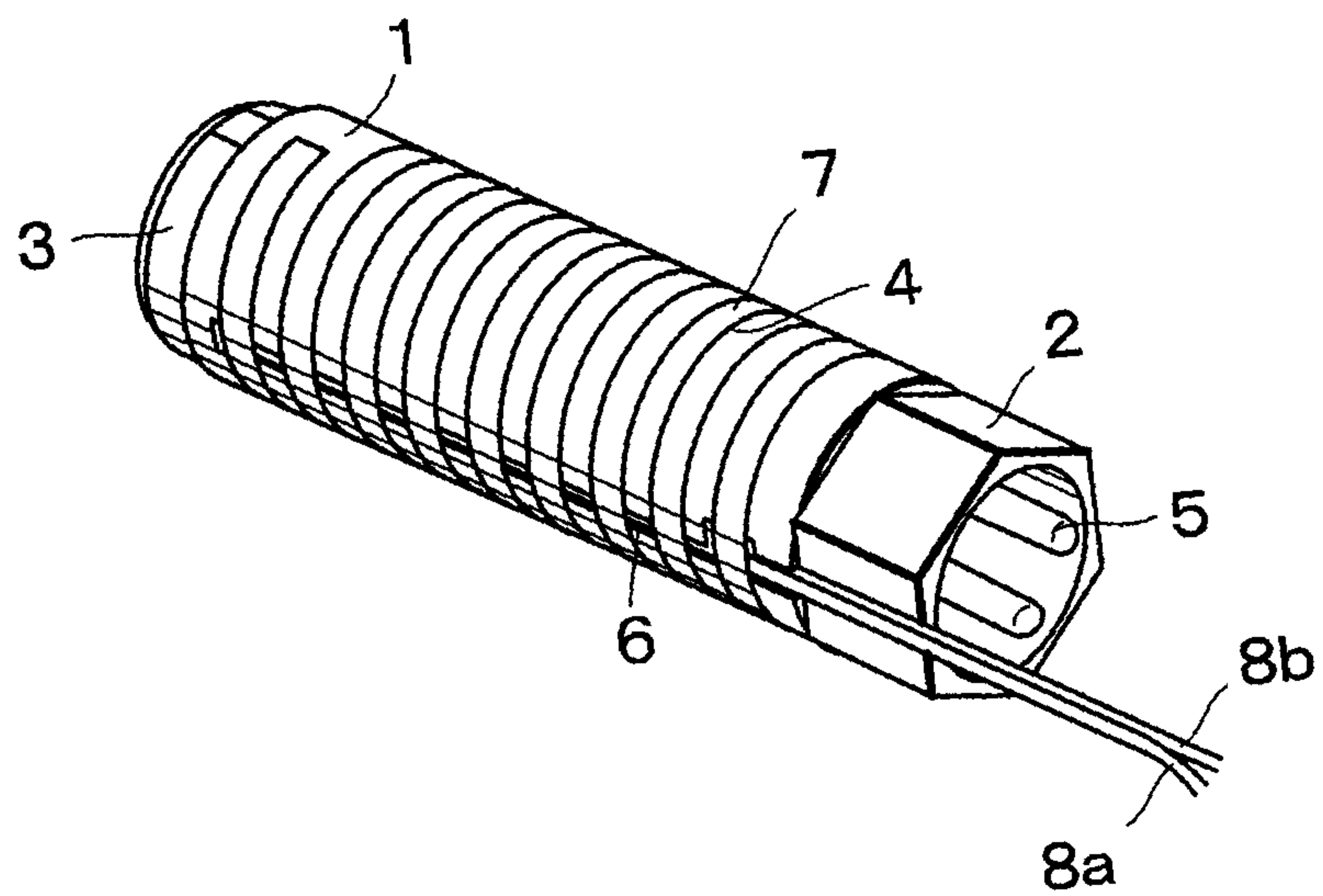


Fig.2

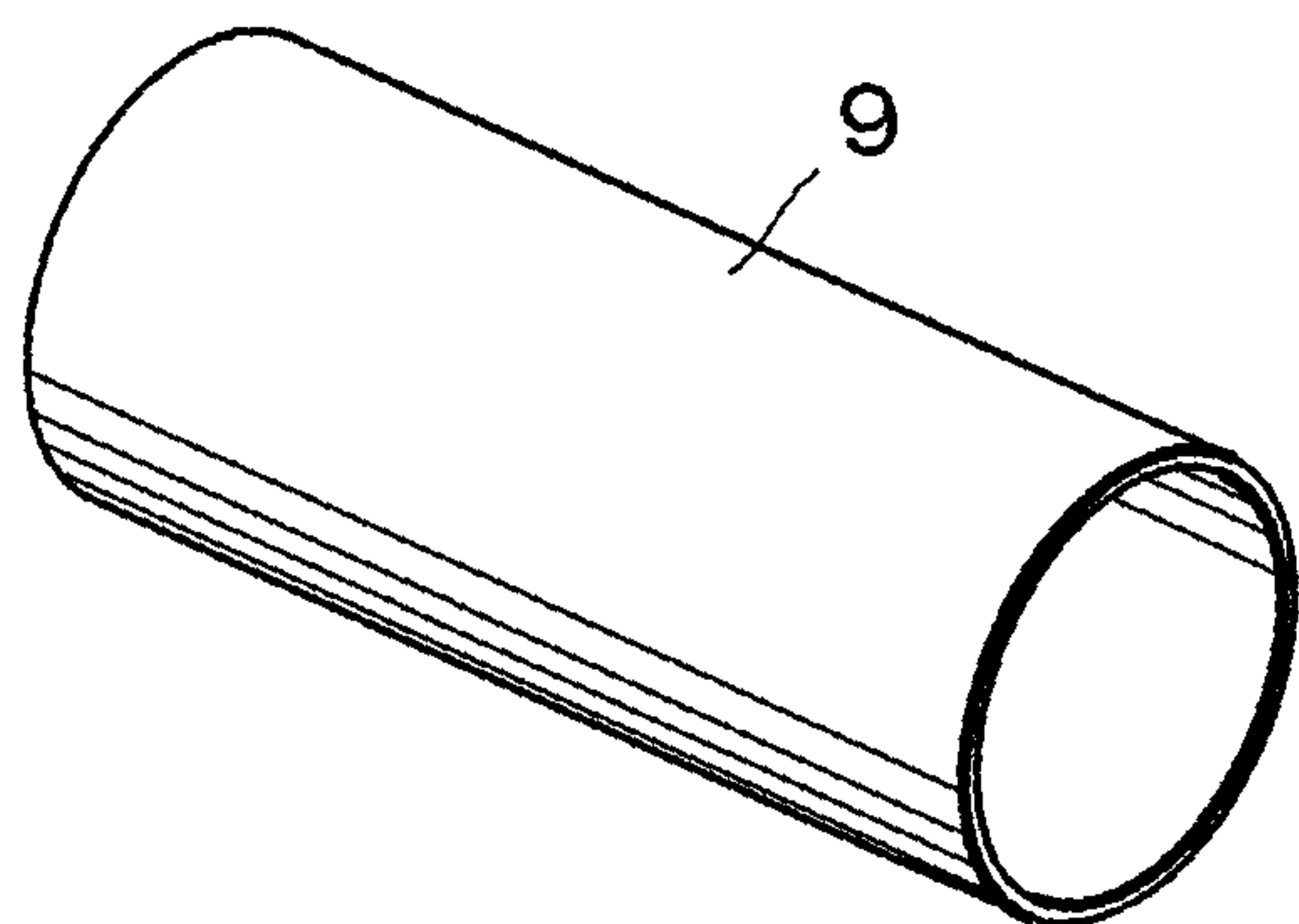


Fig.3

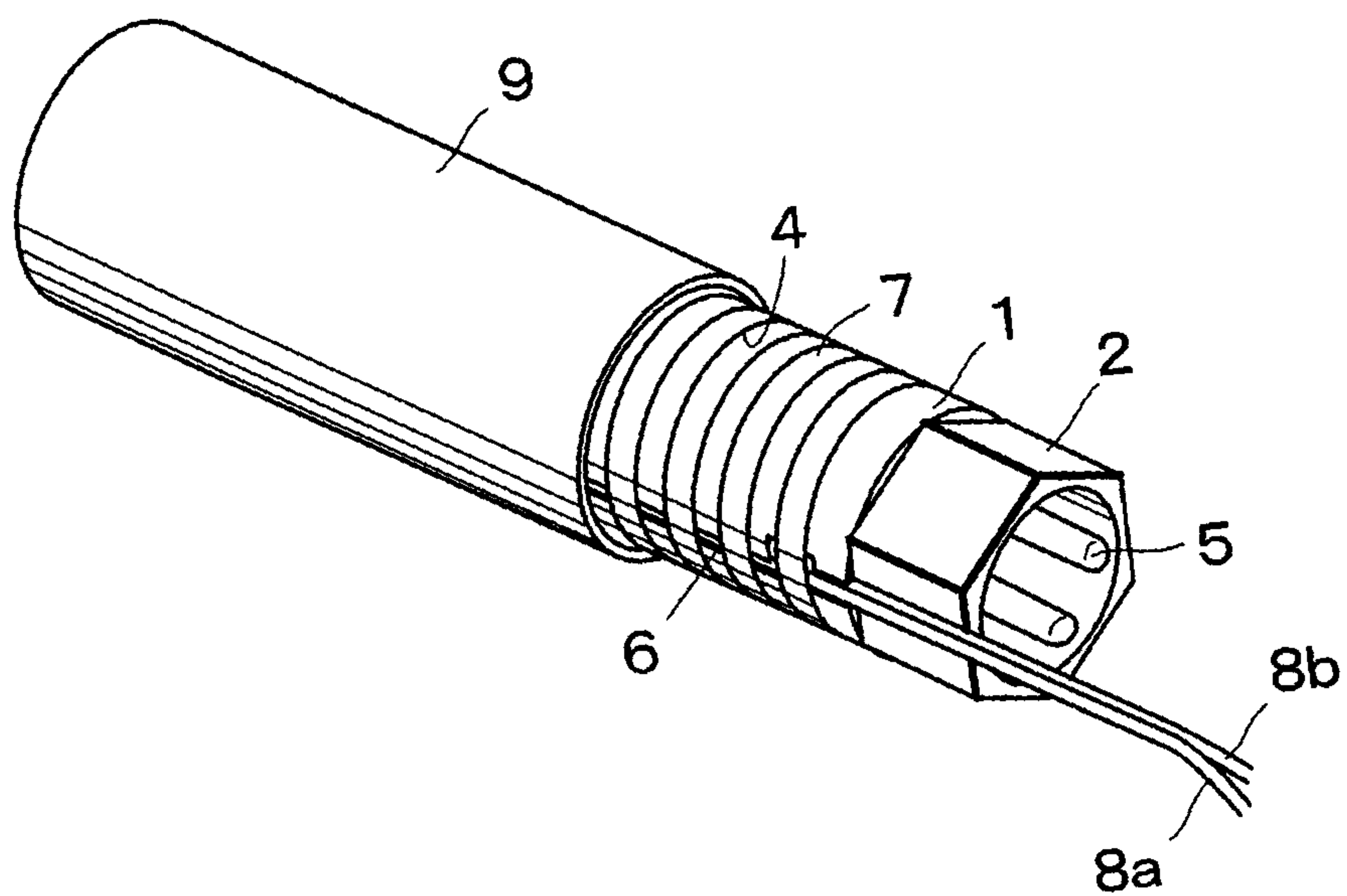


Fig.4

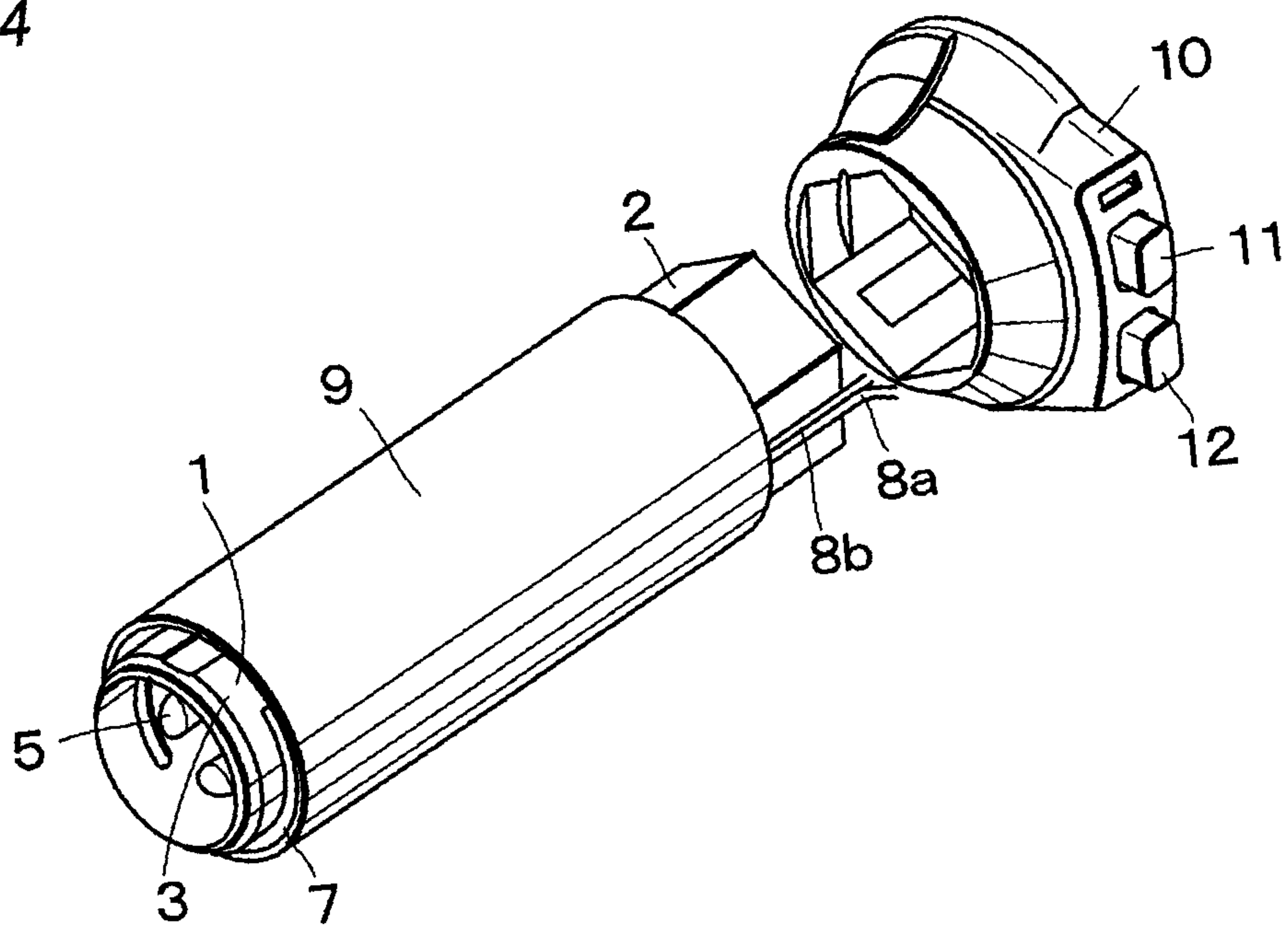


Fig.5

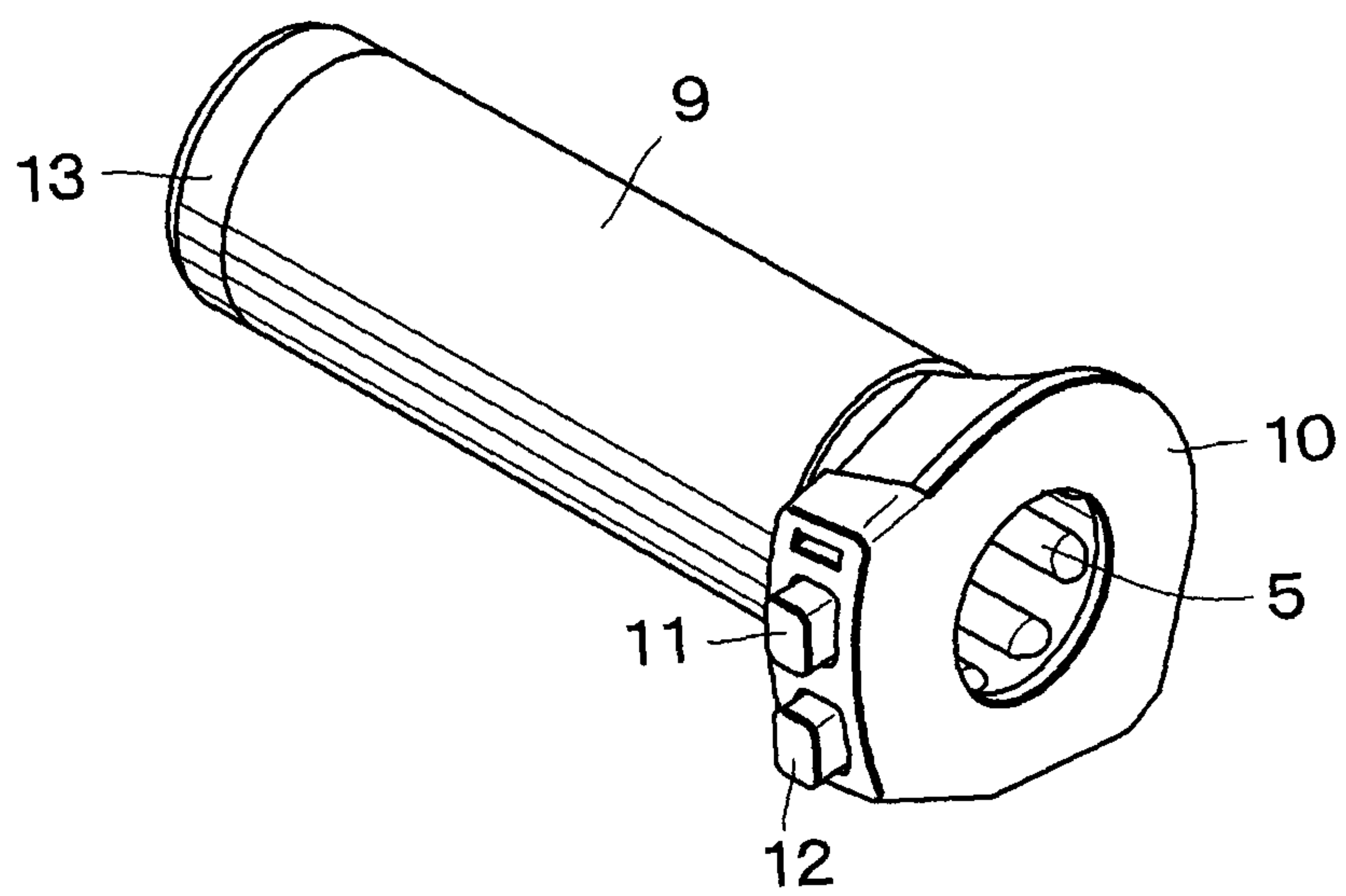


Fig.6

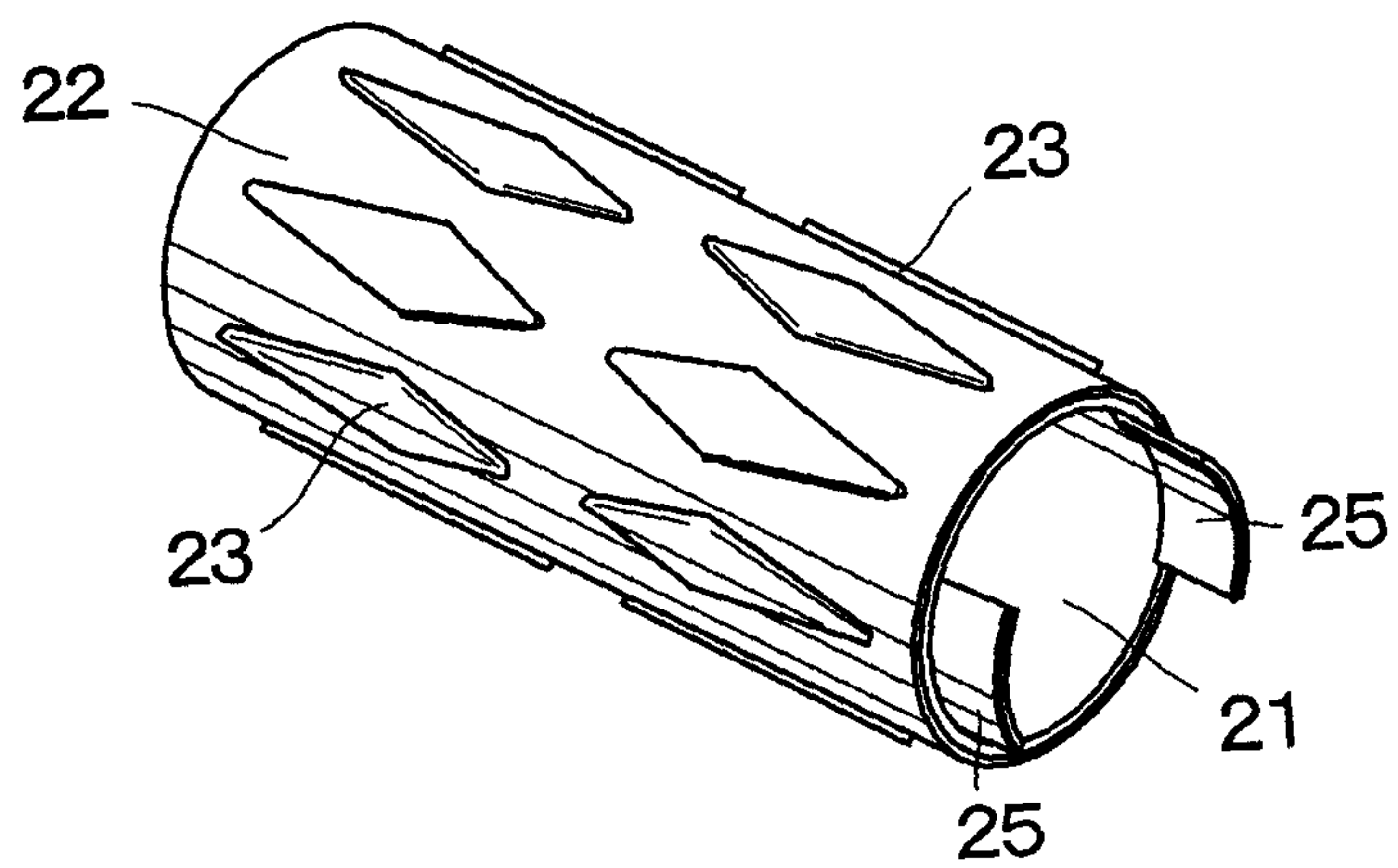


Fig.7

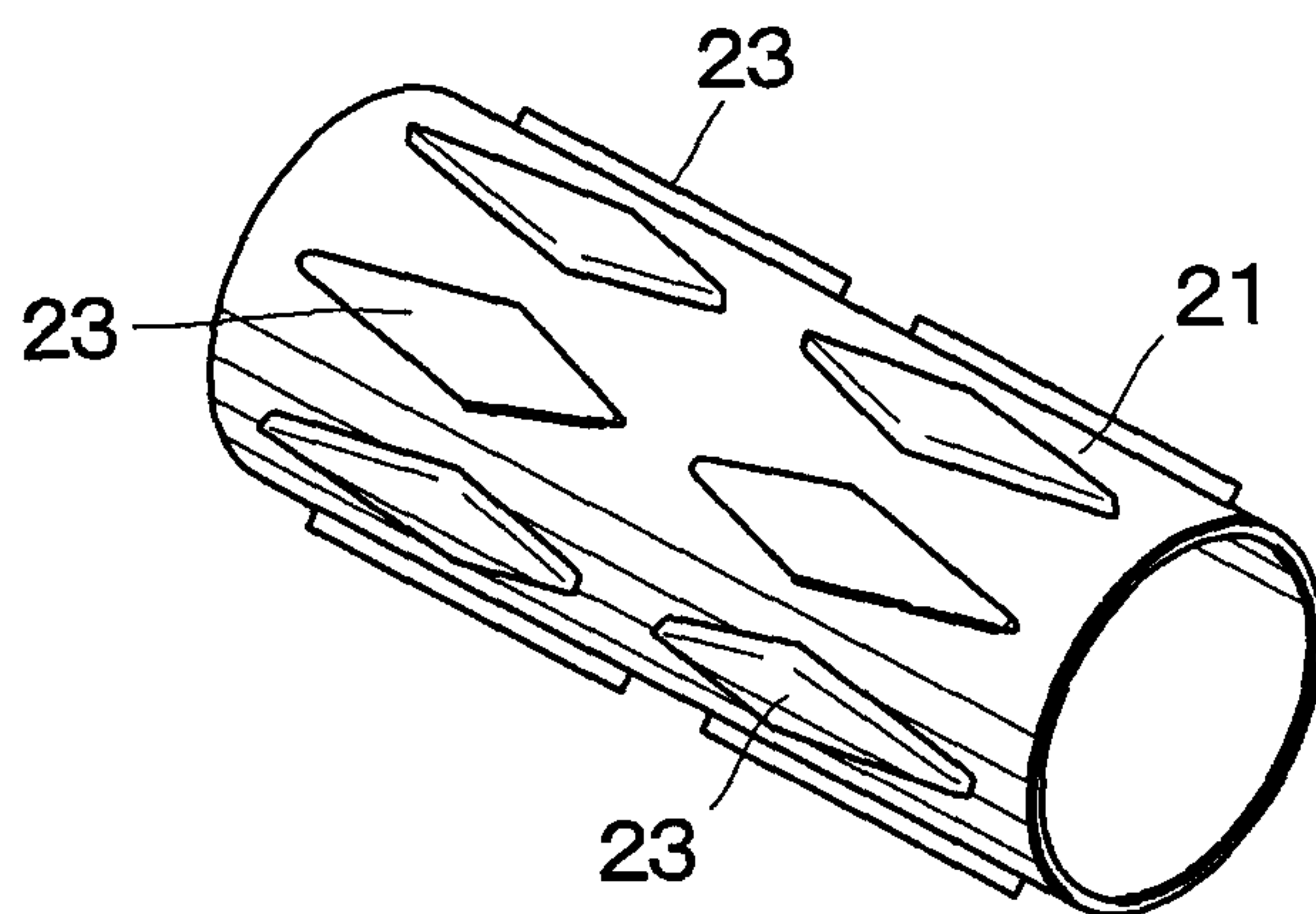


Fig.8

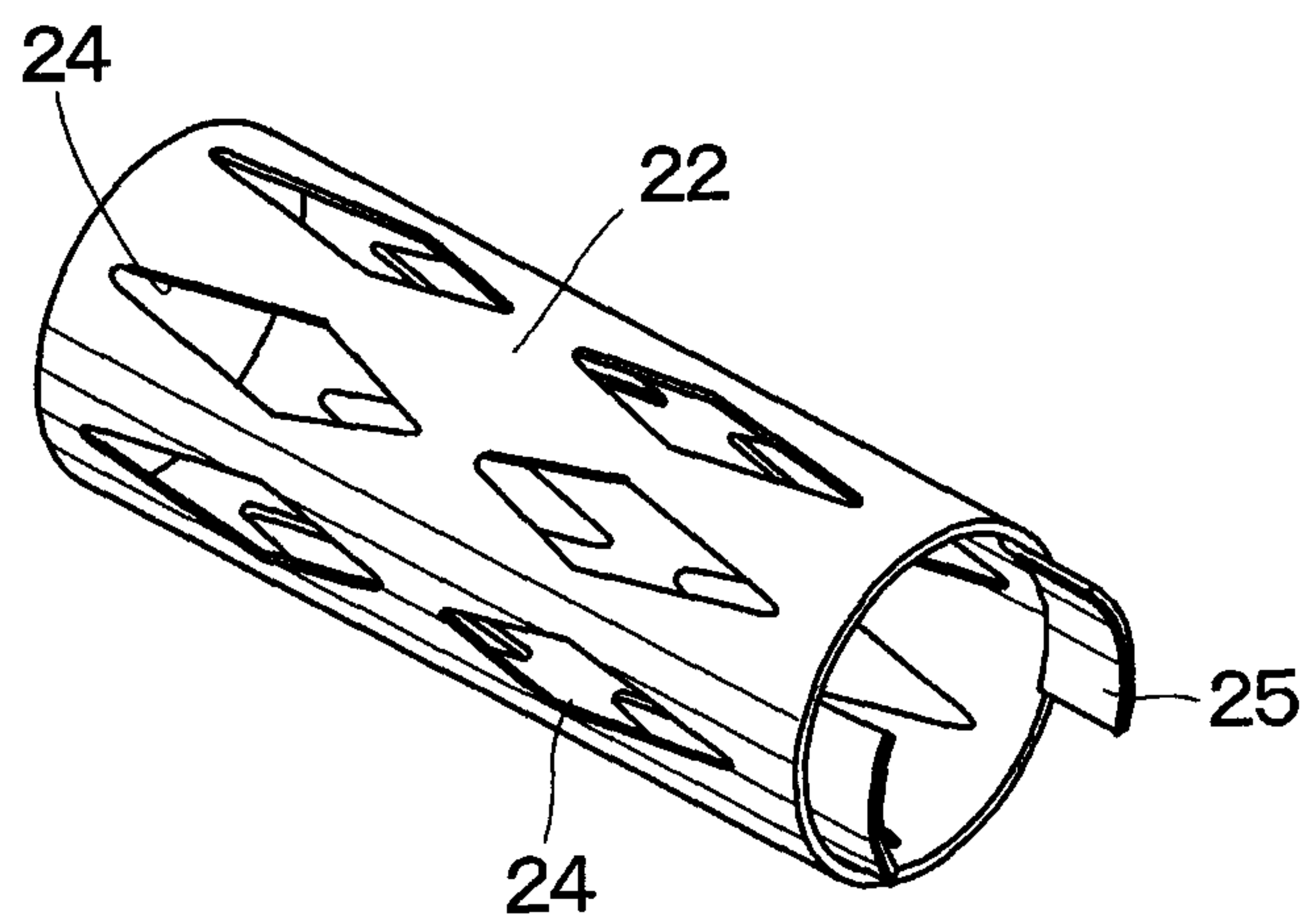


Fig.9

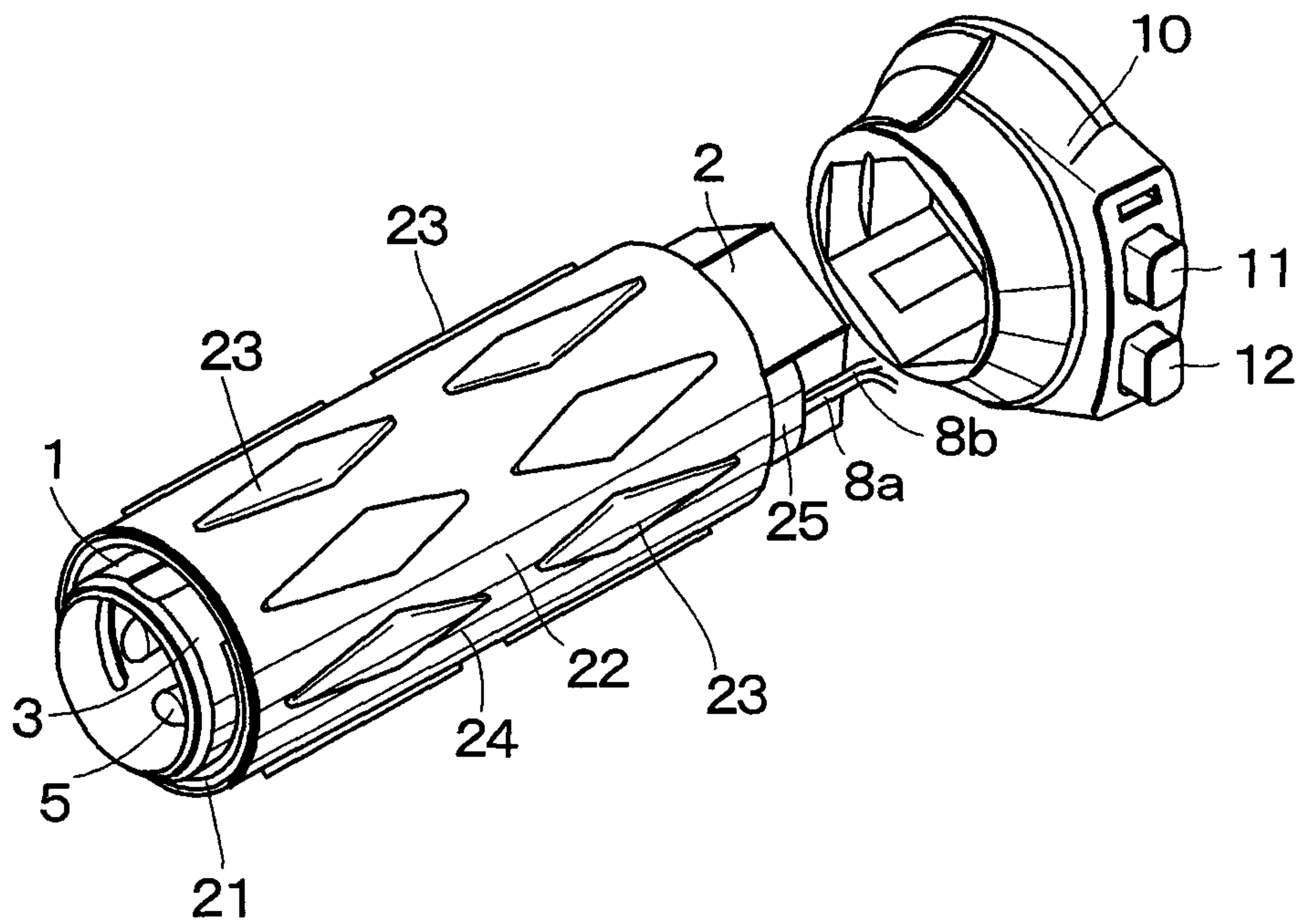


Fig.10

