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(71) Applicant and
(72) Inventor: **X-INNOVATIONS AB** [SE/SE]; Sädesvägen 5, S-737 44 Fagersta (SE).

(74) Agents: **MELIN, Linda** et al.; Groth & Co KB, Box 6107, S-SE-102 32 Stockholm (SE).

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(54) **Title:** WINDING DEVICE

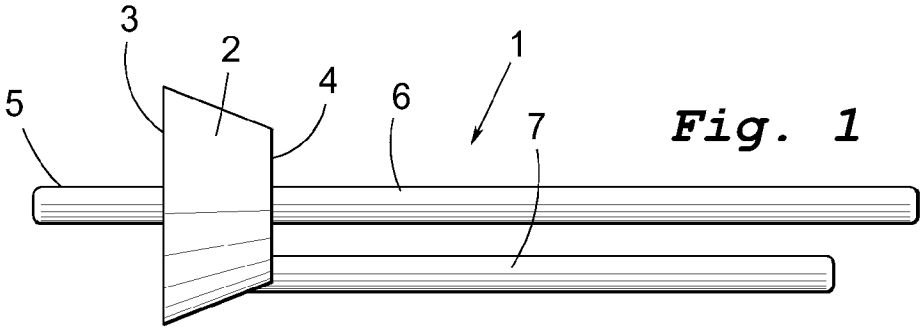


Fig. 1

(57) **Abstract:** The invention relates to a winding device (1) to wind up belts, straps, puttees, hoses, strops etc. According to the invention, the winding device (1) comprises a main part (2) having a first end (3) and a second end (4), which first end (3) is provided with a coupling member (5) for co-operation with a rotation tool and which second end (4) is provided with a first elongate leg (6) and at least one second elongate leg (7) principally parallel to said first elongate leg (6).

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WINDING DEVICE

Technical Field

The present invention relates to a winding device to wind up belts, straps, hoses, puttees, strops etc. In particular, the invention relates to an improved winding device for a firehose/strap, which is inexpensive and easy to bring along and which enables that a user easily and fast can wind up a hose/strap on the location where the hose/strap previously has been rolled out.

Background of the Invention

The work of winding up miscellaneous hoses, puttees for, for instance, horses, belts, straps and the like is usually occurring within the majority of trades, above all within the transportation trade where it is important to secure the load, as well as during extinction of fires where firemen on one hand have to roll out great quantities of firehose before the proper fire-extinction operations and on the other hand have to empty and wind up the same quantity of firehose after the fire-extinction operations. Today, straps and hoses are mostly wound up by hand or on some type of winch, which is mounted on a lorry or truck/fire-fighting vehicle. When a plurality of lorries are involved at, for instance, a fire or at a transportation/delivery, an extensive work is required with winding up all the hose/all straps, which have been used for the work task in question. This means on one hand that the work takes a long time and thereby also becomes expensive, and on the other hand that a heavy work is required for the driver or the persons who should carry out the winding of the straps or the hoses. A problem with the mode of operation used today is that the hose/strap, because the winch is fastened at the lorry/fire-fighting vehicle, has to be brought/drawn to the winch to be possible to be wound up thereon, which additionally makes the work more difficult and that the work takes more time.

Therefore, it is desirable with a winding device, which is easy to bring along, which is easy to mount and which in addition is inexpensive and simple to manufacture. It is also desirable with a winding device, which easily can be coupled to different tools, such as, for instance, a portable electrical, air-driven,

hydraulic or battery operated hand drilling machine, or a manual brace, but also to fixed engine montage if desired. It is also desirable with a winding device, which enables winding on the location where a hose/strap is lying and which minimizes the time for winding straps, hoses etc, both against a plane substratum and upon free rolling-up in the air.

US 6 467 755 discloses an electrically driven tool to wind up a strap or other flexible components on a winch. The tool comprises an elongate body, which is intended to by means of an electrically driven apparatus rotate a shaft/winch on which the strap or the flexible component should be wound.

Just like has been mentioned above, a user of the tool according to US 6 467 755 is forced to first collect the extended strap or hose and then draw this strap or hose to a free lorry and winch, which entails a heavy and time-consuming work. An additional disadvantage of said tool is that it has an expensive and complicated construction with on one hand an elongate body that should transfer the force from the tool and on the other hand a shaft/winch for winding the strap/hose.

US 5 188 307 discloses a portable tool to wind up a firehose. The tool comprises an elongate part, in the form of a telescopic shank, having a handle in one end and member to hold a hose in the other end. The member to hold the hose comprises a first leg, which has an extension along the rotation axis of the tool as well as a second leg angled to the elongate part. The handle is foremost intended to manually wind a hose but may also be coupled to an electrical motor.

A disadvantage of the tool according to US 5 188 307 is that it comprises many different parts, which makes it relatively complicated to manufacture. Another disadvantage of the tool is that the winding becomes relatively unstable if the tool is coupled to an electrical motor, since, among other things, the shank is relatively long and consists of a plurality of parts.

The Object of the Invention

The object of the present invention is to provide a winding device having a simple construction, which is extremely light, which entails that it is easy to bring along and enables winding of, for instance, a strap or hose, both against a plane substratum but also freely in the air, on the location where a strap or hose is rolled out. The object is in addition to provide a winding device, which has a lower

manufacturing cost than traditional winding systems and which makes the winding operation going fast and easy.

Summary of the Invention

The above object is attained by the present invention such as it is defined in the independent claim 1. Suitable embodiments of the invention are defined in the dependent claims.

Thus, according to the present invention, a winding device is defined to wind up belts, straps, puttees, hoses, strops etc., which device comprises a main part rotationally symmetrical around a rotation axis having a first end and a second end, which first end is provided with a coupling member for co-operation with a rotation tool and which second end is provided with a first elongate leg and at least one second elongate leg principally parallel to said first elongate leg. Said first elongate leg is principally centred on the second end of said main part in such a way that it has an extension in a direction along the rotation axis of the main part.

The second end of the main part has an end surface, which suitably is perpendicularly or principally perpendicularly arranged to the rotation axis of the main part. Said second elongate leg is connected perpendicularly to the end surface of the second end of the main part. Thus, the second elongate leg has an extension parallel to or principally parallel to the rotation axis of the main part.

In accordance with the invention, the advantage is obtained that, for instance, a strap or hose can be wound up on the location where the strap or the hose has been rolled out, for instance by means of free rolling-up, where the rolling-up takes place in the air. This entails that new work tasks can be commenced fast, which in turn entails environmental advantages because, for instance, lorries/fire-fighting vehicles do not need to stand idling for a longer time. Furthermore, the advantage is obtained that the winding device because of the simple construction thereof has economical advantages from material and manufacturing point of view. Said winding device neither requires any interference with the trucks/fire-fighting vehicles for the fastening of, for instance, winches. Because the winding device is controlled by a rotation tool, a good control of the course of winding is in addition obtained because the user can control the number of revolutions of the rotation tool so that a good course of winding is obtained. Furthermore, the winding device is stable and gets a smoother run during rotation foremost as a conse-

quence of the first elongate leg being centred and having an extension along the rotation axis of the main part.

According to an advantageous embodiment, said first elongate leg may be longer than said at least second elongate leg. By the fact that one of the elongate legs is longer than the second elongate leg/legs, the friction from the second elongate leg/legs is eliminated, which enables winding against a plane substratum, as well as it becoming easy to run, for instance, the strap or hose that should be wound up between the elongate legs.

According to an advantageous embodiment, the distance between said first elongate leg and said at least second elongate leg may be arranged so that a finger cannot be inserted therebetween. When a user should wind up a strap or hose, one of the ends of said strap or hose is brought in between two of the elongate legs of the device and, upon the start of the winding, there is thereby risk of a user's fingers getting stuck therebetween. By arranging the distance between the at least two elongate legs so that a finger cannot be inserted between the legs, the risk is eliminated of fingers getting stuck between said elongate legs during the winding operation. The distance between the two elongate legs may be within the interval of 3–15 mm, preferably 5–10 mm for protection against the fact that an adult's finger should be possible to be inserted between said elongate legs, but may also be in the interval of 3–5 mm to give protection against the fact that a child's finger should be possible to be inserted between said elongate legs. Of course, it is possible to choose other measures if a user intends to wind up very thick belts, straps, hoses, puttees, strops etc.

According to an advantageous embodiment, said main part may be in the shape of a cylinder, preferably having a diameter that is greater than the length of the cylinder.

According to another advantageous embodiment, said main part may be in the shape of a truncated cone. In this way, the risk is decreased of a user hurting himself/herself on projecting parts of the rotating winding device.

According to an advantageous embodiment, said rotation tool may be an electrical machine, such as an electrical drilling screwdriver, a drilling machine or a fixed engine montage. In this way, a quick and easy winding is obtained, which requires a small effort by the user. Of course, said rotation tool may be a manually manoeuvrable hand tool, such as, for instance, a manual brace. Hereby, a good

control is also obtained of the number of revolutions during the course of winding, which entails a faster and safer course of winding.

According to an advantageous embodiment, the device may furthermore comprise a carpet, formed as a separate unit, which is provided with a control member for said first elongate leg. The advantage is that the rotating winding device gets a more stable running and thereby a user's hand is affected by less force during the winding operation.

According to an additional advantageous embodiment, said first elongate leg may be fixed at the second end of said main part and that said second elongate leg may be selectively positionable for adjustment of the distance between said first and second elongate legs. The advantage is that the winding device can be set to be adapted to different types of straps or hoses having different thicknesses. This can be provided by the fact that said second end of said main part comprises threaded holes and that said second elongate leg is threaded at one of the ends to be able to co-operate with optional of said threaded holes. Of course, this may be provided in a plurality of ways, for instance by arranging a groove in the second end of the main part and that said second elongate leg comprises a pin having a locking means, for instance a nut. Said pin may then run in said groove and detachably be locked at desired distance from said first elongate leg.

According to an additional advantageous embodiment, said elongate leg of the winding device may be provided with detachably fastened lengthening elements. The advantage is that a user may vary the length of the elongate legs and in such a way be able to wind up very wide objects such as fence of different types, for instance sheep fence.

Brief Description of the Drawings

The invention will now be described in more detail by means of embodiment examples and reference being made to the accompanying drawings, where

Figure 1 shows a side view of an embodiment of a winding device according to the present invention,

Figure 2 shows a perspective view of an embodiment of the winding device according to the present invention, where winding of a strap is carried out against a tabletop.

Figure 3 shows a perspective view of an embodiment of the winding device according to the present invention, where the winding device comprises a carpet, which is provided with a control member for said first leg, and where the winding of a firehose is to be initiated,

Figure 4 shows a perspective view of the winding device in figure 3, where the winding of the firehose has been initiated, and

Figure 5 shows an embodiment of the winding device according to the present invention, where the winding device comprises lengthening elements.

Detailed Description of the Invention

In figures 1–5, an embodiment of the present invention is shown, applied to a winding device intended for winding belts, straps, hoses, puttees, strops etc. However, it should directly be emphasized that the invention not in any way is limited to this type of winding device, but may be applied to various winding devices.

Figure 1 shows a perspective view of the winding device 1 according to the present embodiment example. The winding device 1 according to figure 1 comprises a rotationally symmetrical main part 2 having a first end 3 and a second end 4. Said first end 3 of the main part 2 of the winding device 1 is provided with a coupling member 5, which is intended to co-operate with a rotation tool, for instance an electrical drilling screwdriver. In figure 1, said coupling member 5 has a round shape, but of course other types of designs are feasible, for instance hexagonal design when drilling screwdriver without chuck is used as rotation tool. Of course it is possible with other types of machines, such as, for instance, a fixed engine montage, but also manually manoeuvrable hand tools, such as a manual brace, are feasible. Said second end 4 of the main part 2 of the winding device 1 is provided with a first elongate leg 6 and a second elongate leg 7. The first elongate leg 6 as well as the second elongate leg 7 are perpendicularly connected to the end surface of said second end 4. In the embodiment in figure 1, said first elongate leg 6 is longer than said second elongate leg 7. In such a way, winding of straps, hoses etc., is enabled against plane substratums. The longer leg is centred at said second end 4 of said main part 2 to in such a way obtain a stable and smooth running of the winding device 1 in operation. If a user intends to wind up, for instance, a strap, a hose or the like freely in the air without support against a substratum, the two elongate legs 6, 7 may of course be principally equally long.

Said main part 2 of the winding device 1 has in the embodiment example of figure 1 the shape of a truncated cone. Thanks to there being, by this design, no projecting edges or corners, the risk decreases considerably that a user could hurt himself/herself on the winding device rotating in operation. However, the main part 2 may also be in the shape of a cylinder.

Figure 2 shows a perspective view of an embodiment of the winding device 1 according to the present invention. The winding device 1 is in this figure placed against a plane substratum, in this case a table 8. In the figure 2 in question, the user intends to wind up a strap 9 and has therefore to start with placed the strap 9 between the first elongate leg 6 and second elongate leg 7 of the winding device 1. To be able to wind up said strap 9, the coupling member (not visible) of the winding device 1 has been mounted in the chuck of a battery operated or electrical drilling screwdriver 15. In operation, only the longer leg, i.e., the first elongate leg 6, should be placed against the surface of the table 8 and consequently the free end of the second elongate leg 7 of the winding device 1 will be arranged a bit above the table top 8. In this way, said second elongate leg 7 will in operation be able to rotate freely around the longitudinal axis of said first elongate leg 6 and thereby the strap 9 is wound up successively around the elongate first and second legs 6, 7 of the winding device 1.

Figure 3 shows a perspective view of the winding device 1 according to the present invention, which winding device 1 comprises a carpet 10. The carpet 10 is provided with a control member 11 for the first elongate leg 6 of the winding device 1. In figure 3, said first elongate leg 6 is placed in said control member 11 so that the winding device 1 should get a more stable running in operation, which results in a user being loaded by a smaller force on the hand. Said carpet 10 has the advantage that the winding of, for instance, a strap or a hose, in the figure a firehose 12, is carried out on an even and clean substratum, which entails less wear of the firehose 12. In this embodiment example, the user places the hose 12 between the first and second elongate legs 6, 7 of the winding device 1. Then, said first elongate leg 6 is placed in the control member 11 of the carpet, wherein the winding of the hose 12 can be commenced.

Figure 4 shows a perspective view of the winding device in figure 3. In figure 4, the winding has been commenced and a part of the firehose 12 has been wound up around the elongate legs 6, 7 of the winding device 1.

The two elongate legs 6, 7 of the winding device 1 may be extended by detachably fasten lengthening elements 13, 14 on said legs 6, 7. The lengthening elements in figure 5 comprise a locking device in the form of a screw (not shown), which screw when the lengthening elements 13, 14 have been fastened on the respective leg 6, 7 is tightened so that it locks the lengthening elements 13, 14 at the respective leg 6, 7. In this way, winding is enabled of very wide belts/straps and of fence, such as, for instance, sheep fence. Of course, it is possible to fasten the lengthening elements 13, 14 in other ways at the elongate legs 6, 7, for instance, by wedging.

CLAIMS

1. A winding device to wind up belts, straps, puttees, hoses, strops etc., **characterized in** that the winding device (1) comprises a main part (2) rotationally symmetrical around a rotation axis having a first end (3) and a second end (4), which first end (3) is provided with a coupling member (5) for co-operation with a rotation tool (15) and which second end (4) is provided with a first elongate leg (6) and at least one second elongate leg (7) principally parallel to said first elongate leg (6), said second end (4) has an end surface to which said first and second elongate legs (6, 7) are principally perpendicularly connected, said first elongate leg (6) is principally centred on the second end (4) of said main part (2) and has an extension along the rotation axis of the main part (2).

2. Winding device according to claim 1, **characterized in** that said first elongate leg (6) is longer than said at least second elongate leg (7).

3. Winding device according to any one of claims 1 and 2, **characterized in** that the distance between said first elongate leg (6) and said at least second elongate leg (7) is arranged so that a finger cannot be inserted therebetween.

4. Winding device according to any one of claims 1–3, **characterized in** that said main part (2) is in the shape of a cylinder.

5. Winding device according to any one of claims 1–3, **characterized in** that said main part (2) is in the shape of a truncated cone.

6. Winding device according to any one of the preceding claims, **characterized in** that said rotation tool (15) is an electrical machine, such as an electrical drilling screwdriver, a drilling machine or a fixed engine montage.

7. Winding device according to any one of claims 1–5, **characterized in** that said rotation tool (15) is a manually manoeuvrable hand tool.

8. Winding device according to any one of the preceding claims, **characterized in** that the device furthermore comprises a carpet (10) formed as a separate unit, which is provided with a control member (11) for said first elongate leg (6).

9. Winding device according to any one of the preceding claims, **characterized in** that said first elongate leg (6) is fixed at the second end (4) of said main part (2) and that said second elongate leg (7) is selectively positionable for adjustment of the distance between said first and second elongate legs (6, 7).

10. Winding device according to claim 8, **characterized in** that said second end (4) of said main part (2) comprises threaded holes and that one of the ends of said second elongate leg (7) is threaded to be able to co-operate with optional of said threaded holes.

11. Winding device according to any one of the preceding claims, **characterized in** that said elongate legs (6, 7) of the winding device (1) are provided with detachably fastened lengthening elements (13, 14).

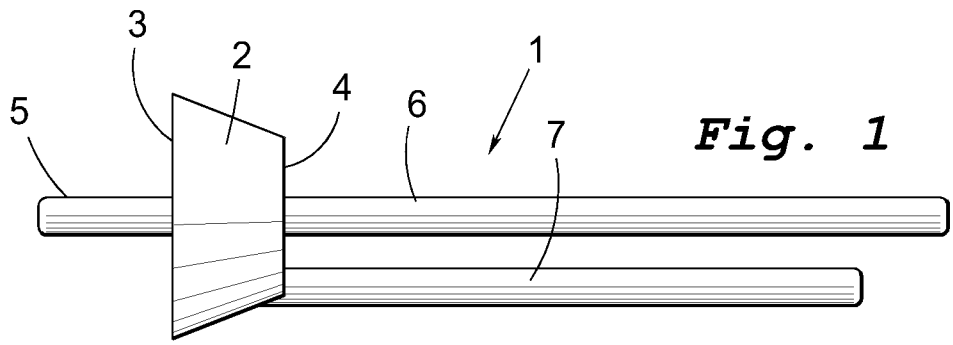


Fig. 1

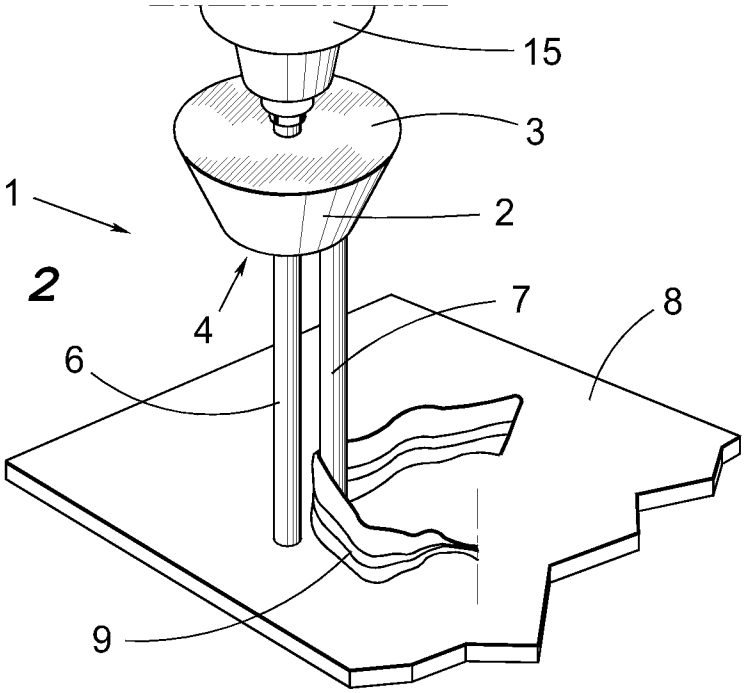


Fig. 2

Fig. 3

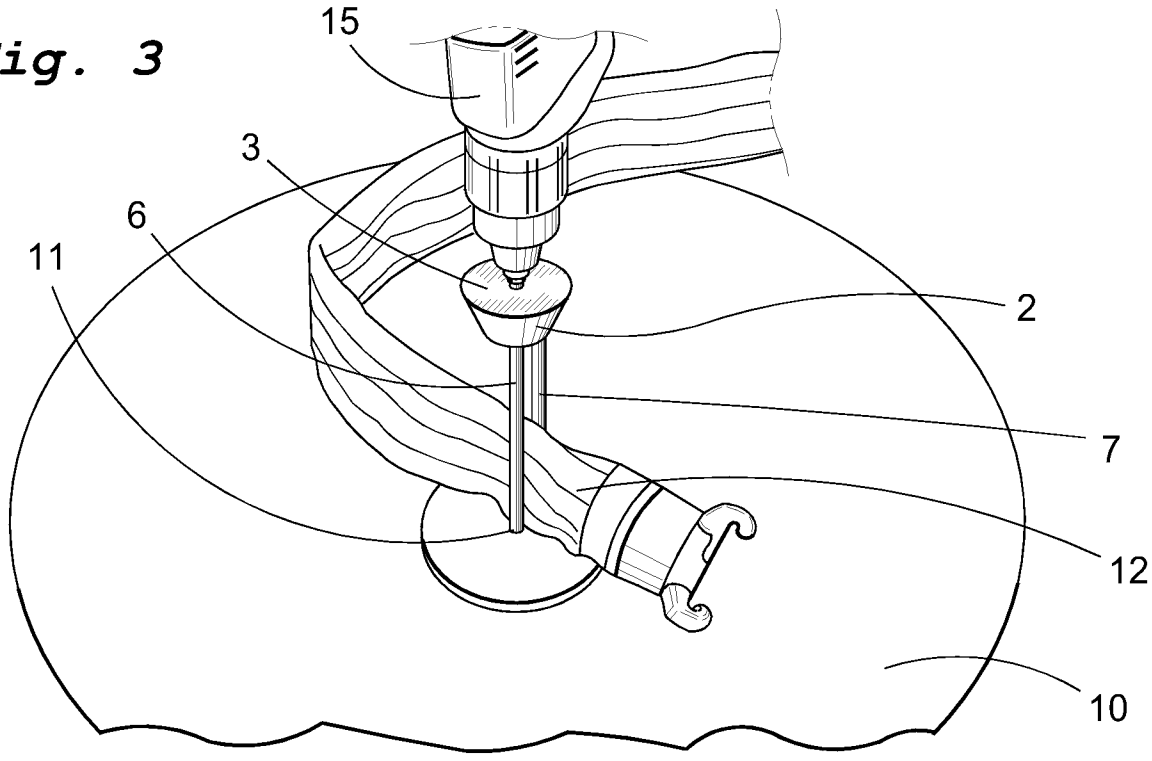


Fig. 4

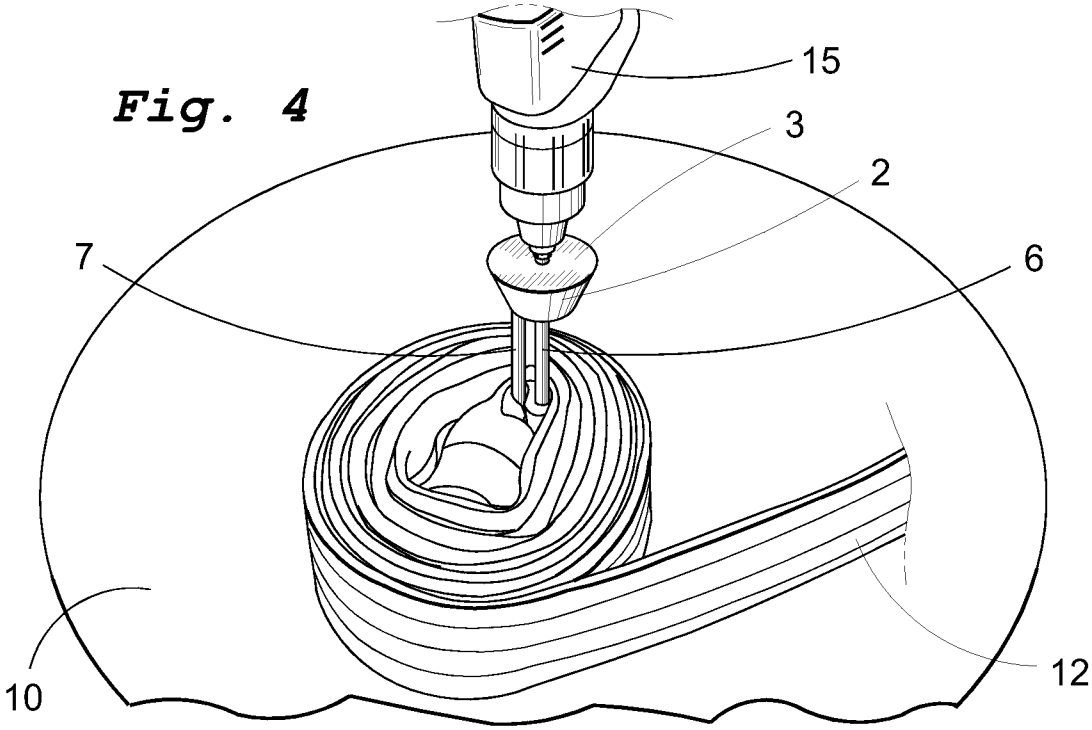
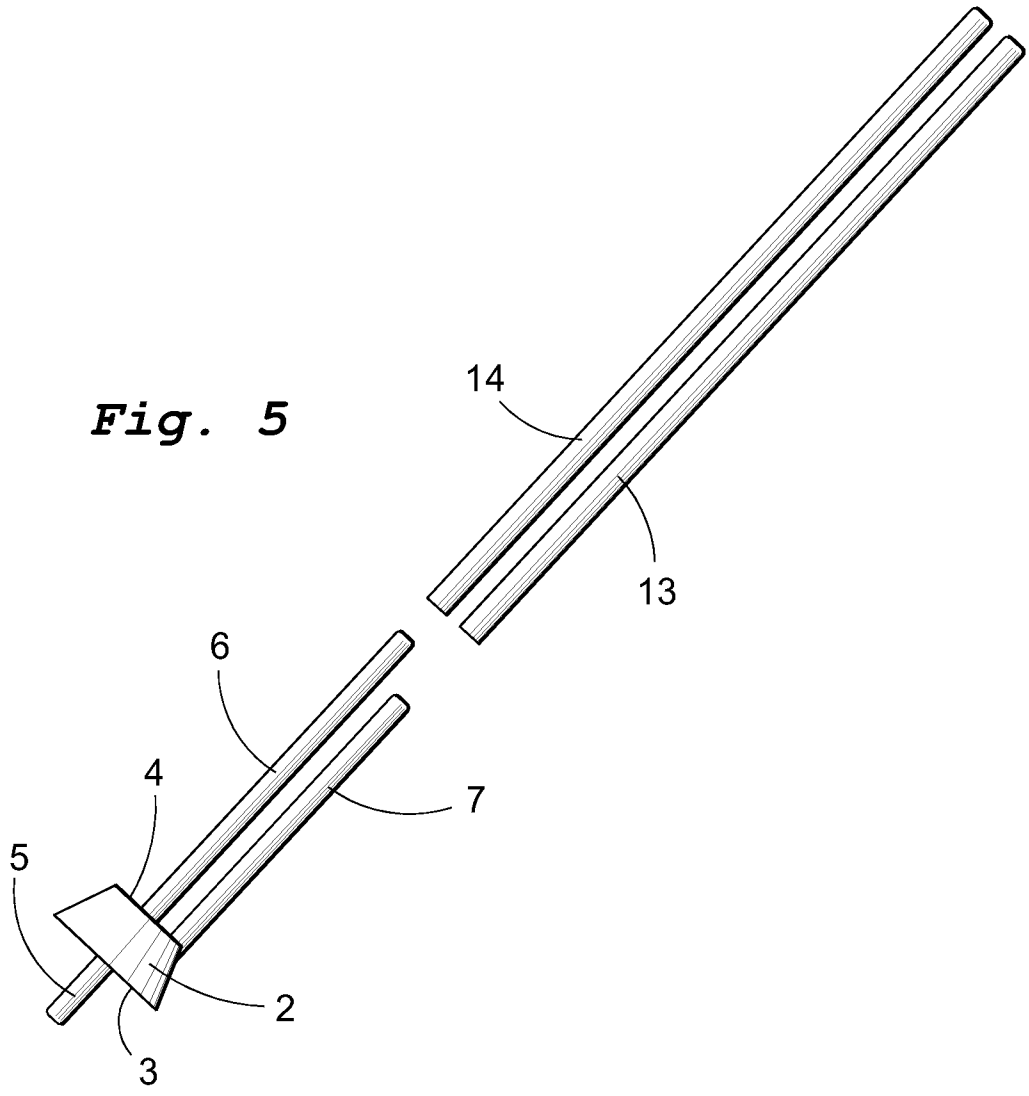


Fig. 5



INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2008/050763

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: A62C, B65H

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, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6561450 B1 (T.E. WALSH), 13 May 2003 (13.05.2003), figure 5	1-11
Y	US 5188307 A (B.D. MILLER), 23 February 1993 (23.02.1993), whole document	1-11
A	GB 2286580 A (R. MUNN ET AL), 23 August 1995 (23.08.1995), figure 1, abstract	1-11
A	US 2197767 A (H.G. NEALE), 23 April 1940 (23.04.1940), whole document	1-11

☐ 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
3 November 2008	05 -11- 2008
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Björn Lindkvist / MRo Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

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B65H 54/58 (2006.01)
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Cited literature, if any, will be enclosed in paper form.

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				GB	9503254 D	00/00/0000
US	2197767	A	23/04/1940	NONE		