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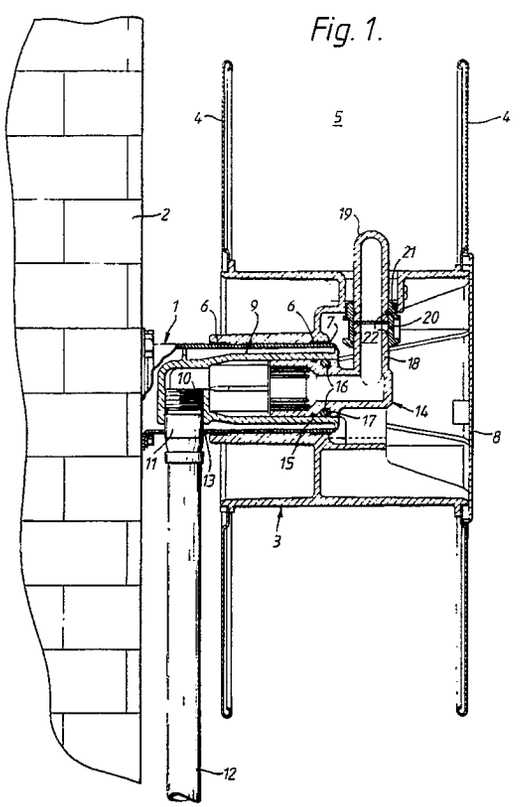
(54) Hose reel assembly.

(57) A hose reel assembly comprises a drum (3/4) borne on a cantilevered support tube (1). A rotary joint assembly to direct water from a feed pipe (12) to the hose connector (19) of the drum comprises a fixed conduit member (9) mounted within the support tube and a rotatable conduit member (14) sealingly journalled to the fixed member. An inlet port (10) of the fixed conduit member receives the feed pipe (12) and an outlet spigot (18) of the rotatable conduit member is connected to the hose connector (19) by an external sleeve (20). If it is required to have access to the joint assembly (9/14) for maintenance purposes it can be removed from the reel as a complete unit by disconnecting the feed pipe (1), removing an access cover (8) at the accessible end of the drum hub, disconnecting the outlet spigot (18) from the hose connector (19) and withdrawing the joint assembly through the open end of the hub.

Fig. 1.



EP 0 397 461 A1

Hose Reel Assembly

The present invention relates to hose reel assemblies especially, though not exclusively, of the kind which are installed in buildings for fire-fighting purposes. An aim of the invention is to provide an assembly which is constructed for ease of maintenance e.g. in case of need for attention to, or replacement of, a seal or seals between the stationary and rotating parts of the assembly.

In one aspect the invention accordingly resides in a hose reel assembly comprising: a rotatable drum to carry a hose wound thereon; a generally tubular, cantilevered support member extending axially within the hub of the drum and bearing the latter for rotation; a rotary joint assembly comprising a fixed conduit member mounted coaxially within said support member and having an inlet port at one end, and a rotatable conduit member sealingly journalled to the fixed conduit member and terminating in an outlet port; first conduit means detachably connected to said inlet port for leading liquid into the joint assembly; and second conduit means borne by the drum and detachably connected to said outlet port for leading said liquid from the joint assembly into the hose; the drum having an access opening through that end of its hub remote from said inlet port; all constructed and arranged such that with the first and second conduit means detached from said inlet and outlet port respectively the rotary joint assembly can be withdrawn as a unit from the support member through laid access opening without removal of the drum from said support member.

The rotatable conduit member of the rotary joint assembly is preferably demountably retained to the fixed conduit member by releasable fastening means which are accessible for release when the rotary joint assembly is removed from the support member as aforesaid.

In a preferred class of embodiments the hose reel assembly also comprises a rotation-responsive valve which is adapted to turn on a supply of liquid to the hose automatically as hose is drawn off the drum and the latter consequently rotates. Such valve may comprise a valve member mounted coaxially within the rotary joint assembly and normally engaging a seat in said rotatable conduit member to shut off flow through the latter; and means responsive to rotation of the rotatable conduit member relative to the fixed conduit member for withdrawing said valve member from said seat.

The invention will now be more particularly described, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 is a vertical section through one embodiment of a fire-fighting hose reel assembly constructed in accordance with the invention;

Figure 2 is a part sectional end view of the assembly of Figure 1;

Figure 3 is a vertical section, to an enlarged scale, through the rotary joint assembly of the reel when equipped also with a rotation-responsive valve; and

Figures 4 and 5 are respective horizontal sections through two further embodiments of hose reel assembly in accordance with the invention.

Referring to Figure 1, the illustrated hose reel assembly is mounted on a steel support tube 1 bolted at one end to a building wall 2. The drum comprises a moulded plastics (e.g. polypropylene) hub structure 3 and two steel side plates 4 defining between them an annular space 5 within which the hose (not shown) will be wound. The hub moulding 3 has two brass bearing inserts 6 by which it is journalled on the support tube 1, and is retained on its support by a profiled circlip 7 (see also Figure 2). The end of the hub remote from the wall 2 is normally closed by a snap-on cover plate 8.

Mounted non-rotatably within the support tube 1 is a generally tubular conduit member 9 of moulded plastics (e.g. polyacetal). At its inner end this member has a radially-directed inlet port 10 into which is threaded the union 11 of a flexible water feed pipe 12. The union 11 passes through a hole 13 in the wall of the support tube 1 and thus serves also to locate the member 9 in relation to the tube 1. At its opposite end the member 9 receives a rotatable conduit member or elbow 14 of similar material, the members 9 and 14 forming a rotary joint assembly through which water is led from the feed pipe 12 to the hose. The elbow 14 is rotatably sealed to the conduit member 9 by an O-ring 15 and is retained therein by a pair of pins 16 driven through cross-bores in the conduit member and engaging in an annular groove 17 formed in the outside surface of the elbow. At its opposite end the elbow 14 terminates in a radial outlet spigot 18 which is connected to an elbowed hose connector 19 fixed to the hub (see also Figure 2). This connection is secured by a sleeve 20 which can slide up and down on the spigot 18 and over the end of the connector 19 and is coupled into a radial socket 21 moulded in the hub e.g. by a bayonet or screw action; O-rings 22 are provided around the adjacent ends of the spigot 18 and connector 19 to seal against the inside of the sleeve 20.

The O-ring 15 is the sole sealing element between the stationary (9) and rotating (14) parts of the waterway between the inlet pipe 12 and hose connector 19. In the event that access is required

to that seal for maintenance or replacement the rotary joint assembly 9/14 can be extracted from the reel by the following simple procedure. Having disconnected the water supply to the feed pipe 12 the latter is twisted to disconnect it from the inlet port 10. The cover plate 8 is removed allowing manual access to the sleeve 20 which is then disconnected from the socket 21 and slid down on the spigot 18. The joint assembly 9/14 can then simply be pulled as a single unit from the support pipe 1, through the open end of the hub 3. Once out of the reel, the two parts 9 and 14 of this unit can if desired be separated by removal of the pins 16, to povide access to the seal 15. Re-assembly, with the same or a replacement joint assembly 9/14, is the reverse of the above procedure.

In another embodiment, the rotary joint assembly 9/14 also includes an automatic valve to turn on the water supply from pipe 12 to the hose as the latter is drawn off the drum, the components of which are shown to an enlarged scale in Figure 3.

With reference to Figure 3, a tubular valve member 23 is mounted in the upstream end of elbow 14, being borne slidably but non-rotatably relative thereto by a series of webs 24 on the valve member engaging in axial grooves 25 in the wall of the member 14. At its downstream end the valve member carries an annular sealing washer 26 retained by a screw 27, which normally engages a seat 28 formed in the elbow 14 to shut off water flow to its outlet spigot 18, under the combined action of upstream water pressure and a spring 29. The valve member can, however, be unseated to permit water flow to the spigot 18, and thence to the hose, by the following rotation-responsive mechanism.

At its upstream end the member 23 has a portion formed with an external screw thread 30. Behind this member is a control member in the form of a thrust nut 31 which is borne slidably but non-rotatably in the fixed conduit member 9 by a series of webs 32 on the nut engaging in axial grooves 33 in the wall of the member 9. The central portion of the nut 31 is formed with an internal screw thread 34 complementary to the thread 30 of the valve member 23 and in the illustrated shut-off condition of the valve this nut is biased axially by the spring 29, via a washer 35, to the position in which its thread will run onto the thread of the valve member as soon as relative rotation between the components in the correct sense occurs.

In use, as hose is drawn off the drum the elbow 14 together with valve member 23 is of course caused to rotate relative to the stationary conduit member 9, (clockwise as viewed in Figure 2). This rotation is in the sense which causes engagement of the the thread 34 of the nut 31 with the thread 30 of the valve member 23. The nut 31 is therefore caused to slide axially within the conduit member 9 in the downstream direction as the rotating thread 30 of the valve member draws the thread 34 of the nut over it. These threads are preferably multistart and of relatively coarse pitch so that after approximately one complete turn of the drum the nut 31 has moved to the position in which it comes up against the upstream end face 36 of the rotating elbow 14. As the drum and elbow continue to rotate the valve member 23 is now pulled through the nut 31, upstream away from its seat 28, thus permitting water flow around the washer 29 (frcm slots 37 in its tubular wall), and into the hose. After approximately three more turns of the drum the valve is fully open and the thread 30 of the valve member runs off the thread 34 of the thrust nut, at this stage the upstream end face 38 of the valve member having come into abutment with the spring-biased washer 35. Further rotation of the drum and elbow 14 as more hose is drawn off is, of course, permitted, but will cause no further axial movement of the valve member as the ends of the threads will simply continue to run idly over each other.

As noted above, in this condition of the mechanism the valve member 23 is now in abutment with the washer 35 to which the axial bias of spring 29 is applied, so that its thread 30 can re-engage the thread 34 of the nut 31 as soon as relative rotation in the reverse sense occurs. After use, therefore, as the hose is rewound the reverse rotation of the valve member causes its thread 30 to be drawn back through the thread 34 of the nut 31 to re-seat the valve member and shut off water flow to the hose once more, and after a total of approximately four turns of the drum the mechanism is returned to the condition shown in Figure 3, with the thread 30 run off and idling over the opposite end of the thread 34.

If access for servicing of the valve components is required, this is easily accomplished by removing the unit 9/14 and separating the elbow from the stationary conduit member as previously described in relation to the valveless embodiment.

Figures 4 and 5 show two further embodiments in which the construction of the reel assembly is the same as described above but in which it is mounted differently. Thus in Figure 4 the support tube 1 is bolted to an arm 39 carried on a vertical-axis pivot 40 by a bracket 41 fixed to the wall 2, so that the reel can be swung away from the wall to permit hose to be drawn off at any desired angle thereto. In Figure 5 the support tube 1 is bolted to an arm 42 carried on a vertical-axis pivot 43 by a bracket 44 fixed within a recess 45 in the wall 2, so that the reel can be swung out of the recess 45 and permit hose to be drawn off at virtually any

angle.

Claims

1. A hose reel assembly comprising: a rotatable drum (3/4) to carry a hose wound thereon; a generally tubular, cantilevered support member (1) extending axially within the hub (3) of the drum and bearing the latter for rotation; a rotary joint assembly comprising a fixed conduit member (9) mounted coaxially within said support member (1) and having an inlet port (10) at one end, and a rotatable conduit member (14) sealingly journalled to the fixed conduit member (9) and terminating in an outlet port (18); first conduit means (12) detachably connected to said inlet port (10) for leading liquid into the joint assembly; and second conduit means (19) borne by the drum (3/4) and detachably connected to said outlet port (18) for leading said liquid from the joint assembly into the hose; the drum (3/4) having an access opening (8) through that end of its hub (3) remote from said inlet port (10); Characterised in that with the first (12) and second (19) conduit means detached from said inlet (10) and outlet (18) port respectively the rotary joint assembly (9/14) can be withdrawn as a unit from the support member (1) through said access opening (8) without removal of the drum (3/4) from said support member (1).

2. A hose reel assembly according to claim 1 characterised in that said rotatable conduit member (14) is in the form of an elbow member with said outlet port (18) directed generally radially to the axis of rotation.

3. A hose reel assembly according to claim 1 or claim 2 characterised in that said rotatable conduit member (14) is demountably retained to the fixed conduit member (9) by releasable fastening means (16) which are accessible for release when the rotary joint assembly (9/14) is removed from the support member (1) as aforesaid.

4. A hose reel assembly according to any preceding claim characterised by a rotation-responsive valve (23-38) which is adapted to turn on a supply of liquid to the hose automatically as hose is drawn off the drum (3/4) and the latter consequently rotates.

5. A hose reel assembly according to claim 4 characterised in that said valve comprises a valve member (23) mounted coaxially within the rotary joint assembly (9/14) and normally engaging a seat (28) in said rotatable conduit member (14) to shut off flow through the latter; and means (31) responsive to rotation of the rotatable conduit member (14) relative to the fixed conduit member (9) for withdrawing said valve member (23) from said seat (28).

6. A hose reel assembly according to claim 5 characterised in that said valve member (23) is borne slidably but non-rotatably with respect to said rotatable conduit member (14) and has a screw threaded portion (30) at its end remote from said seat (28); the valve further comprising a control member (31) borne slidably but non-rotatably with respect to said fixed conduit member (9) and having a screwthreaded portion (34) complementary to the screwthreaded portion (30) of the valve member (23); whereby initial rotation of the rotatable conduit member (14) relative to the fixed conduit (9) member causes said control member (31) to be drawn axially towards the valve member (23) by the interengagement of said screw threaded portions (30/34) until the control member (31) engages an abutment (36) whereafter further said rotation of the rotatable conduit member (14) causes the valve member (23) to be drawn axially away from said seat (28) towards the control member (31).

Fig. 1.

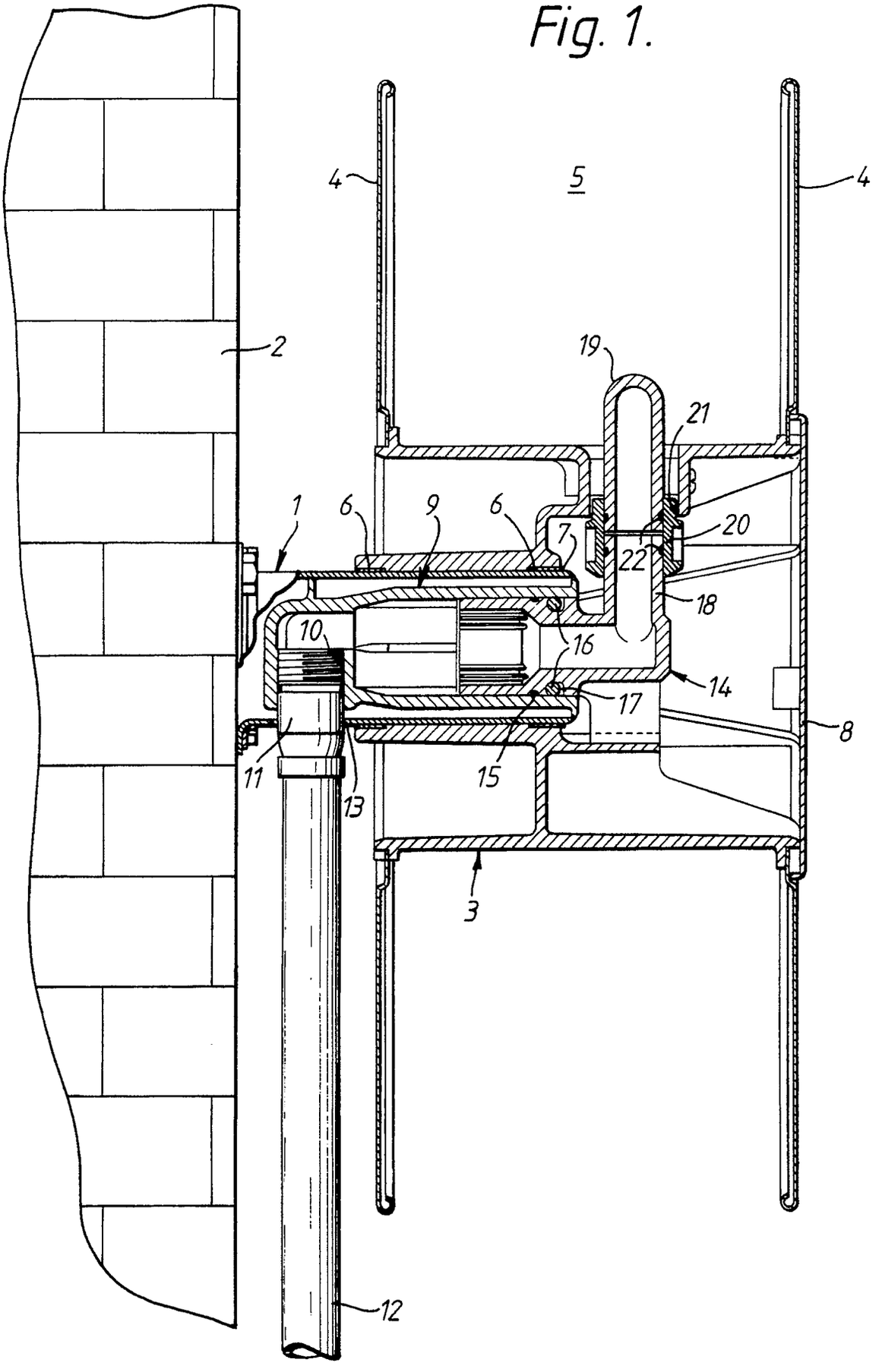
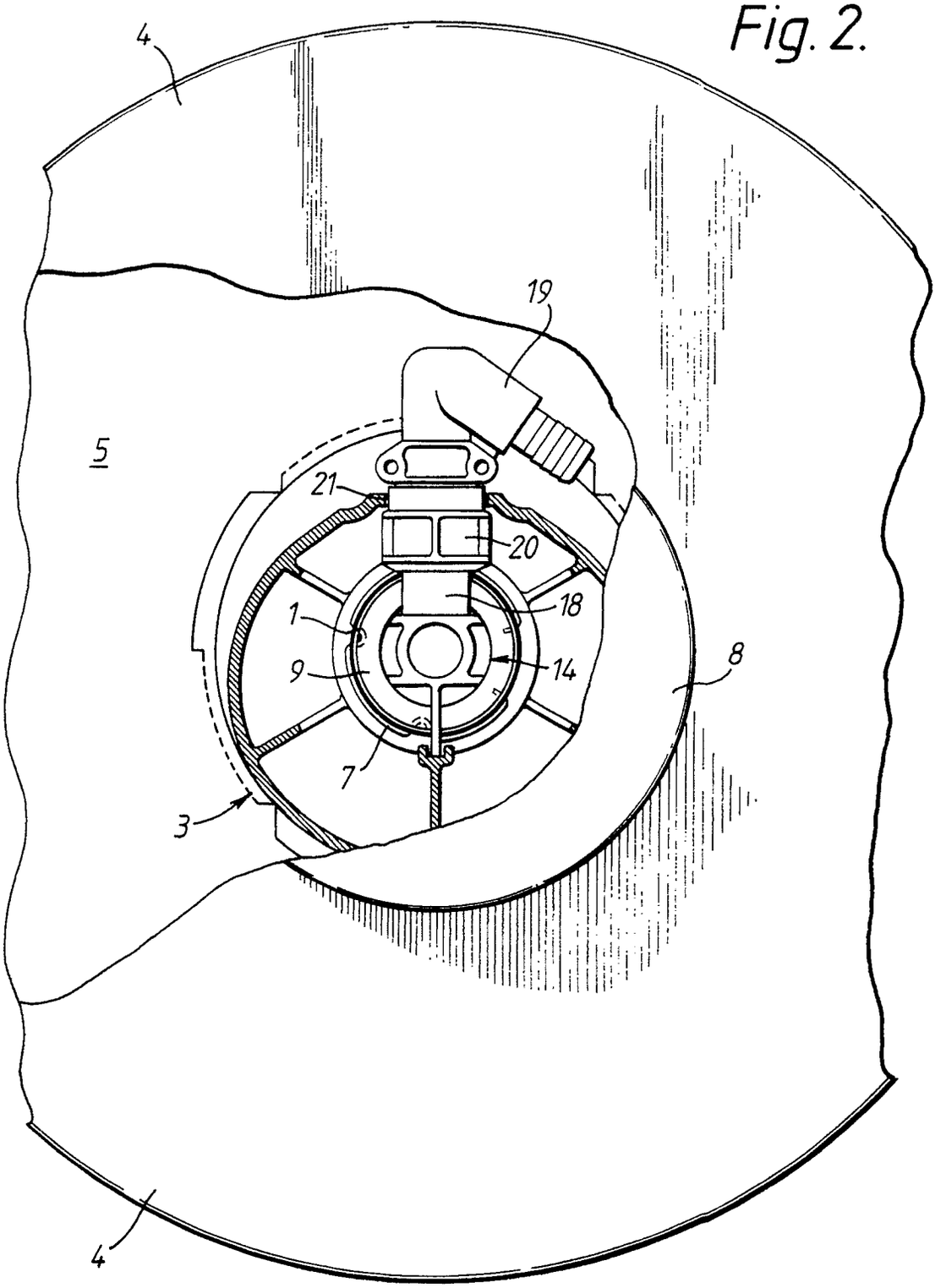


Fig. 2.



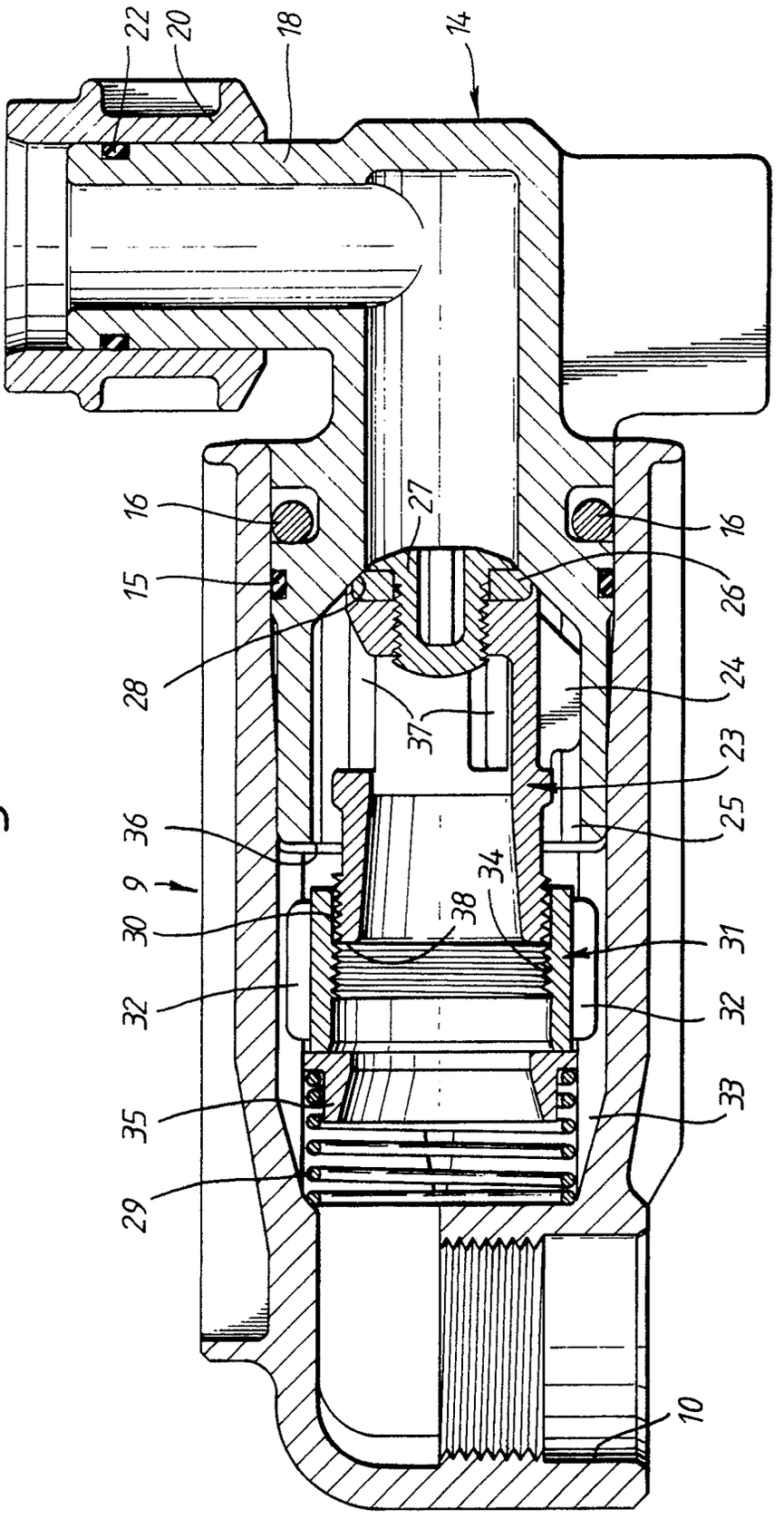

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Fig. 3.

Fig. 4.

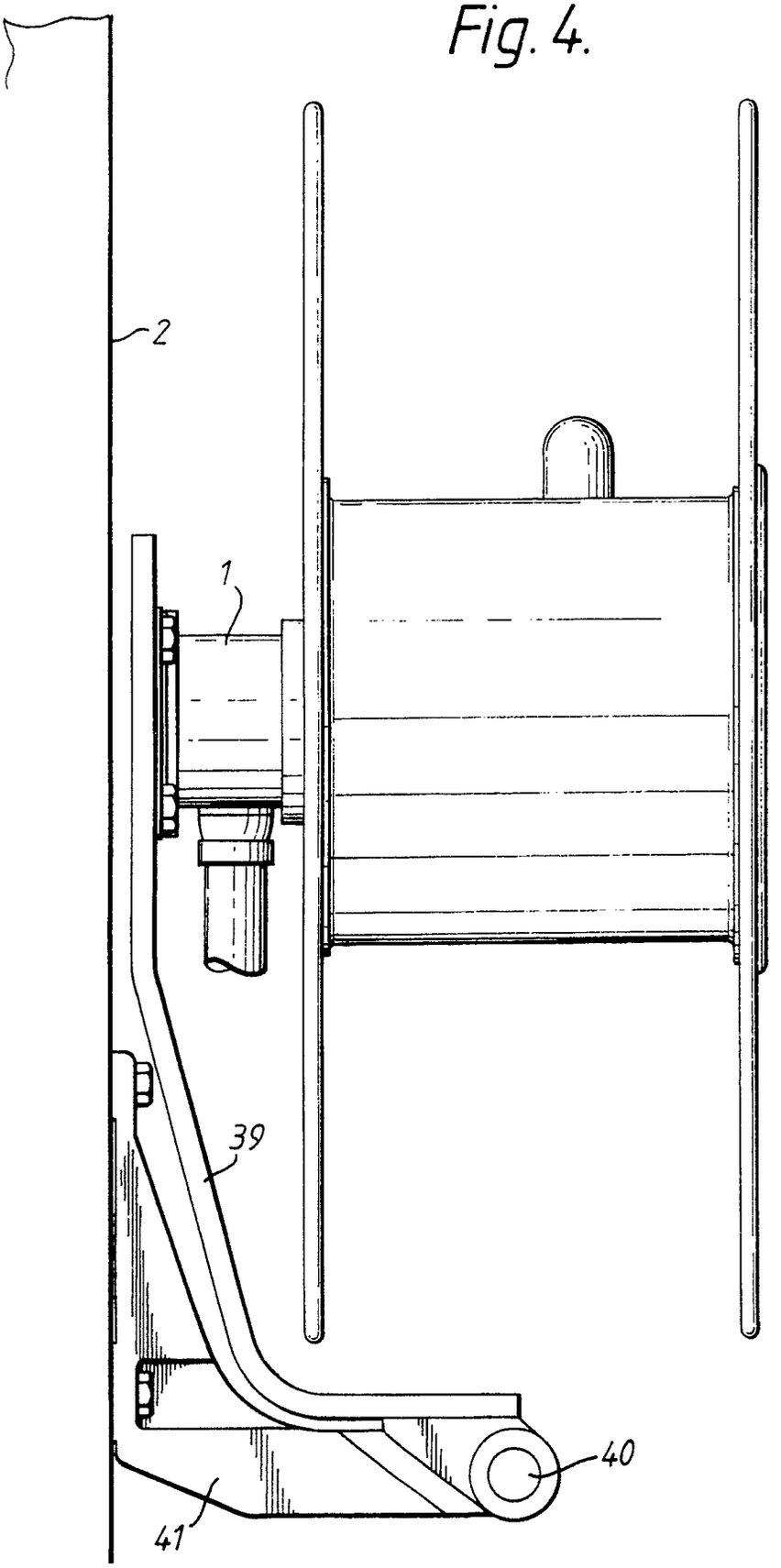
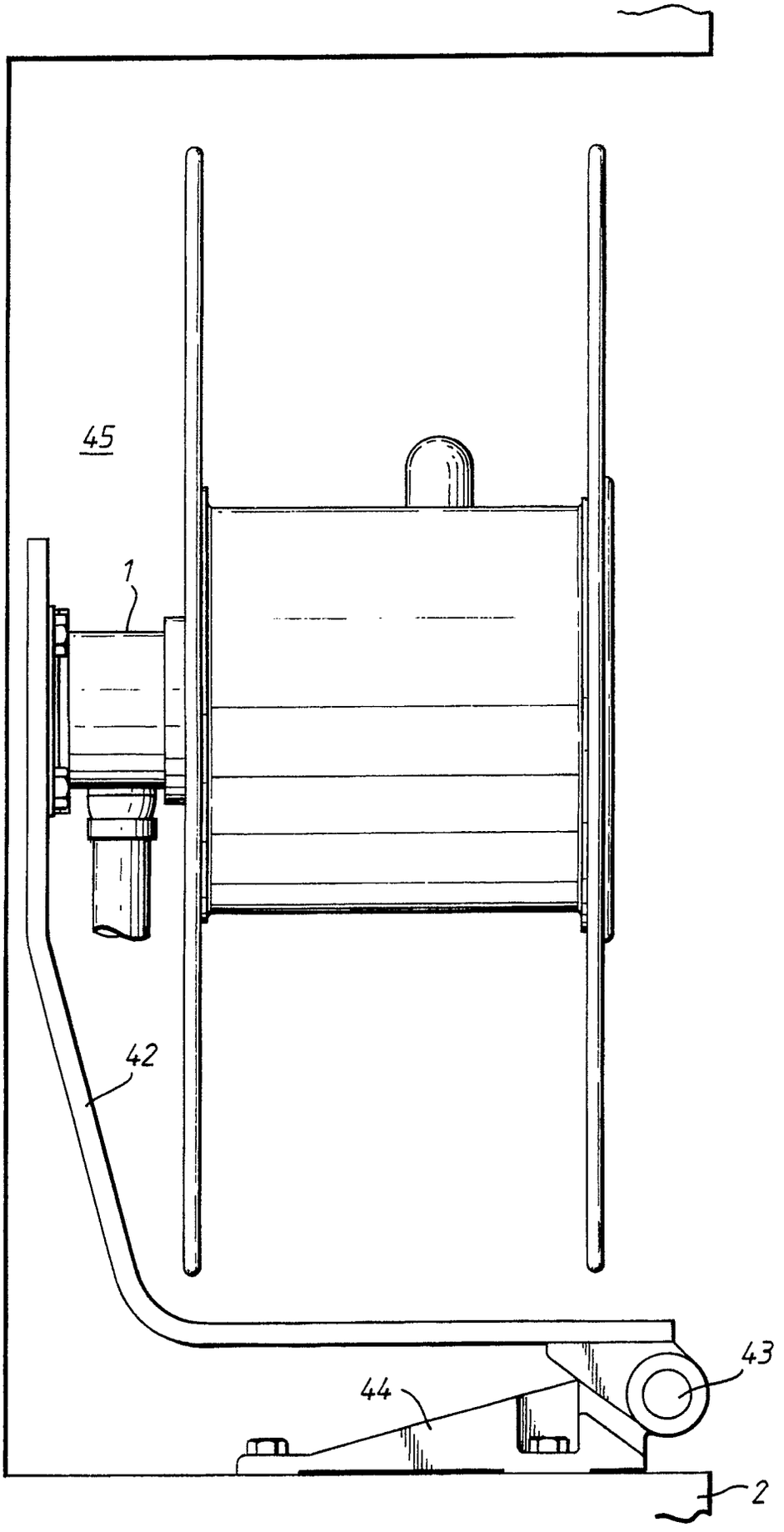


Fig. 5.



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EUROPEAN SEARCH REPORT

Application Number

EP 90 30 4974

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	DE-U-8800529 (HEINEN F.) * the whole document *	1, 2	A62C33/04
A	FR-A-2121049 (JANSEN) * page 6, lines 12 - 17; claim 1; figure 1 *	1-3	
A	FR-A-1187234 (ETABLISSEMENTS R. PONS ET CIE) * the whole document *	1	
A	US-A-3050078 (HOOPER) * claim 1; figure 1 *	4-6	
A	GB-A-1136411 (SAMUEL JONES & CO.) * the whole document *	4-6	
A	FR-A-2274539 (SCHIFFERS) * claim 1; figures 1-3 *	4-6	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

A62C
B65H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	27 JULY 1990	DIMITROULAS P.

CATEGORY OF CITED DOCUMENTS

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