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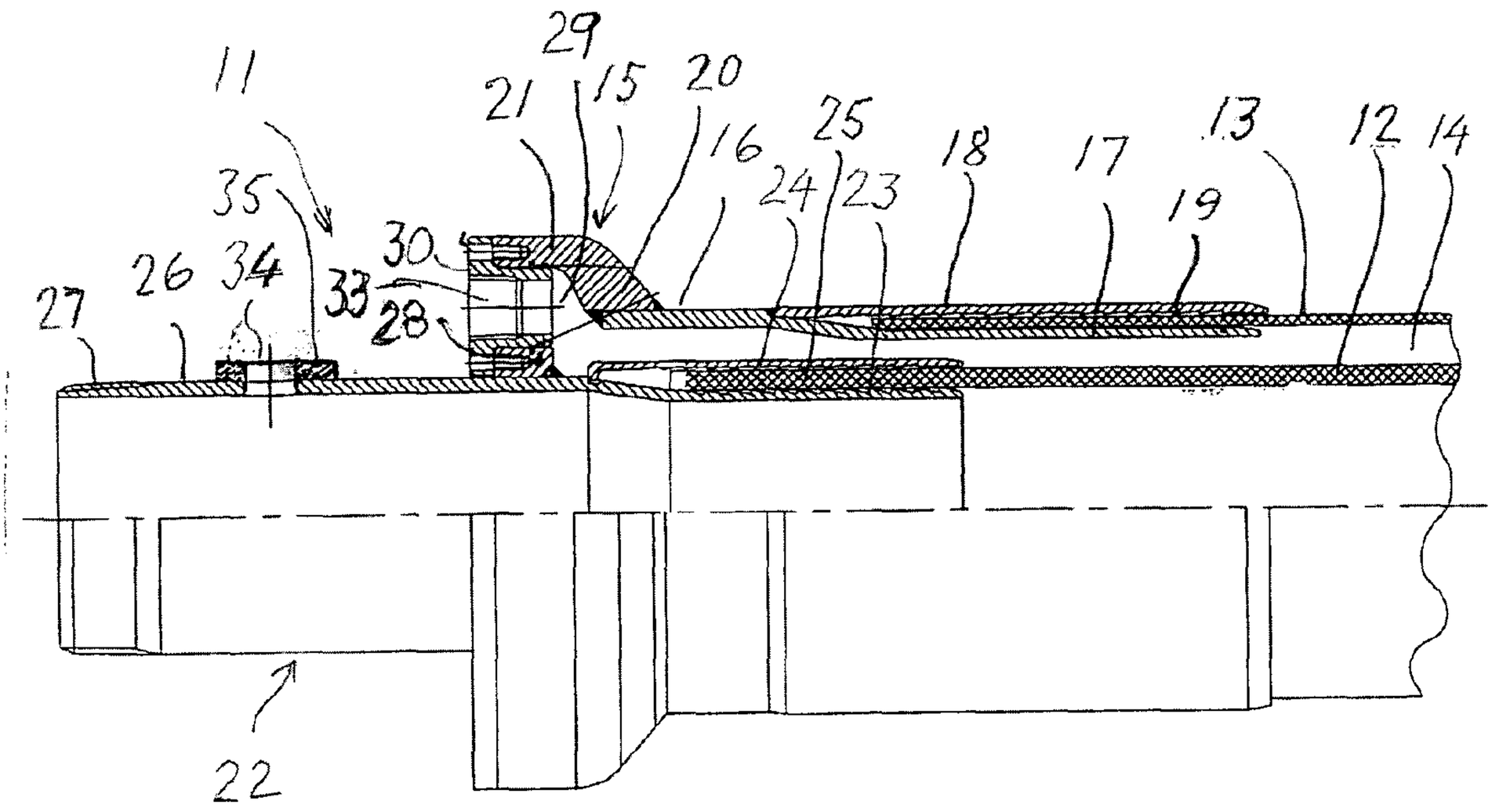
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(54) **Titre : RACCORD DE TUYAU**
(54) **Title: HOSE CONNECTOR**



(57) **Abrégé/Abstract:**
Arrangement for a hose system (11) comprising an inner main hose (12) and an outer cover hose (13) delimiting a ring shaped air filled volume (14) designed to make the hose bouyant in water. At least at one end there is a connector (15) attached to the main hose as well as the cover hose, and which at its free end is attached to, or integrated with, connector part (16) for connection of the hose system (11) to an external system. The connector (15) comprises: - an inner sleeve (22), to which the end of the main hose (12) is attached to, as the inner sleeve (22) by its free end (26) is equipped with an element, in particular threads, for connection to a pipe system - an outer sleeve (16) with to which the end of the cover hose is attached - a connector element (30) for connecting the inner sleeve (22) detachably to the outer sleeve (16), and a connection between the two hose parts (12, 14) comprising a one way valve which allows draining the outer hose (14) to the main hose (12).

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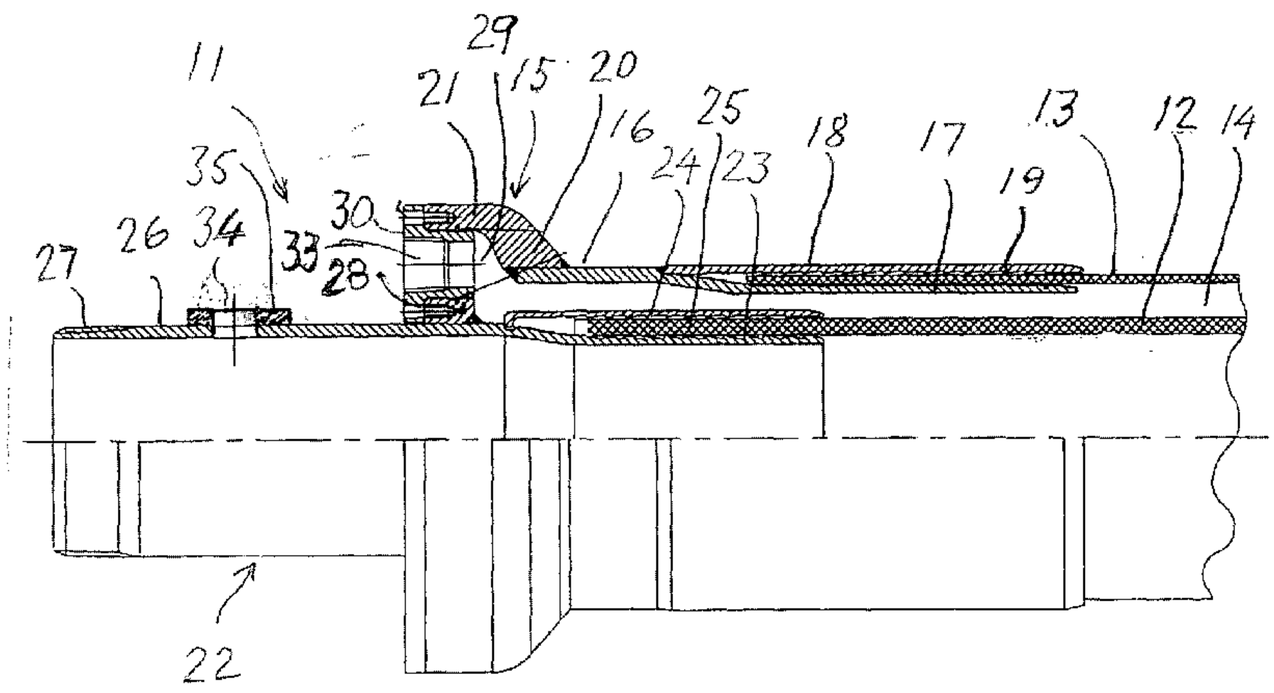


Fig 1

(57) Abstract: Arrangement for a hose system (11) comprising an inner main hose (12) and an outer cover hose (13) delimiting a ring shaped air filled volume (14) designed to make the hose bouyant in water. At least at one end there is a connector (15) attached to the main hose as well as the cover hose, and which at its free end is attached to, or integrated with, connector part (16) for connection of the hose system (11) to an external system. The connector (15) comprises: - an inner sleeve (22), to which the end of the main hose (12) is attached to, as the inner sleeve (22) by its free end (26) is equipped with an element, in particular threads, for connection to a pipe system - an outer sleeve (16) with to which the end of the cover hose is attached - a connector element (30) for connecting the inner sleeve (22) detachably to the outer sleeve (16), and a connection between the two hose parts (12, 14) comprising a one way valve which allows draining the outer hose (14) to the main hose (12).

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Hose connector

The invention concerns a hose connector for making a floating hose that can be used in numerous offshore applications having better total properties with regard to safety and use than known hoses for a similar purpose.

Background

Hoses that are able to float in the water are being used in transfer of pumpable fluids offshore, such as refuelling of platforms from supply boats or transfer of mud from a platform to a supply boat. In this purpose it is known to attach floating devices to ordinary hoses or to attach tubular mantles of foam material to the hoses. Both of these hose constructions provide buoyancy but do not increase the safety. Moreover, this is not a suitable way to provide a wear resistant hose.

In connection with increased focus upon the pollution problems from spill, a need for safety measures beyond hose upsizing has arisen.

Hoses have been proposed wherein the object of the outer hose has been to accommodate leakage from the internal main hose. Safety hoses of this type have enabled production of hoses that are able to float in water. But the main objective of establishing safety has prevented development of a satisfactory floating hose. For example US Patent 6,085,796 (Riga, 2000) describes a composite safety hose having an internal and external hose, which has been provided for hydraulic systems, having a low transport capacity. The design of the end connectors has not been satisfactory.

There is also known a double pipe having a foam material in the outer annulus in order to establish thermal insulation among other things. A structure of this type is known from US Patent 6,349,976 (Mentor Subsea, 2002), but neither this one has been suitable as a floating hose.

Objective

The main objective of the invention is to provide a floating hose which is adapted to rational production and having good utilization potential. Moreover, it should enable surveillance of leakage of hose content and enable collection of the content from an initiating leakage.

Another objective is to provide such a composite hose which makes replacement of hose parts at leakage easier and less expensive.

It is also an objective to provide a hose which enables a simple coiling with flattening of the external hose.

Other objectives will appear from the following example description.

Summary

In accordance with an aspect of an embodiment, there is provided a hose device comprising: an internal main hose having a unitary hose body; an external cover hose, wherein the internal main hose and the external cover hose define a tubular interstice configured to provide buoyancy to the hose device in water; and a connector configured to be connected to the internal main hose and the external cover hose, wherein a free end of the connector is connected to, or integrated with, a tubular end for connecting the hose device to an external connection, the connector comprising: an internal end connector in which an end of the internal main hose is inserted and attached, wherein a free end of the internal end connector comprises connecting means for connection to a pipe system, an external end connector to which an end of the external cover hose is attached, an intermediate connector directly and releasably connectable to both the internal end connector and the external end connector, and a connection between the interstice and the internal main hose, the connection having a check valve configured to allow emptying of the interstice to the internal main hose.

Example

The invention is illustrated in the drawings, wherein

Figure 1 shows an axial side view in a partial cross section of a device formed in accordance with the invention, whereas

Figure 2 illustrates an end view of the connector device of Figure 1.

Figure 1 shows the end of a composite or "compound" hose 11 formed in accordance with the invention. The main element is an internal main hose 12 which may be designed to transfer bunker fuel, mud or other pumpable fluids between two units which are separated by water, which requires the hose to be placed on the water surface.

The main hose 12 is surrounded by a cover hose 13, which may have a diameter that establishes a tubular interstice 14 between the two hoses. The interstice 14 will be filled with air in order to reduce the weight of the composite hose, so that the hose can stay afloat on water. But it may also be filled with another gas or partially or completely filled with a foam material. In an alternative embodiment, in order to maintain a distance between the main hose 11 and the cover hose 12, spacers such as tubular wave profiles can be arranged within the interstice 14.

A connector 15 is arranged at each end or at any joints in order to connect the main hose 11 and the cover hose 12, made up as described in the following.

In the example in the figures, the connector element 15 comprises an external end connector 16 for the cover hose 13. The external end connector 16 comprises two coaxial end sleeves 17, 18

which there between define an annular slit 19 for the end of the cover hose. The end connector 16 has at its free end an annular extension 20 having a pipe fitting 21 at the end.

Moreover, the connector 15 comprises an internal end connector 22 for the main hose 12. The internal end connector 22 comprises in a manner similar to the external end connector 16, two coaxial sleeves 23, 24 which define an annular slit 25 for the end of the main hose 12. The two hoses 12 and 13 may be fastened within the respective annular slits 25 and 19 in a manner known *per se* with hydraulic press equipment.

The internal end connector 22 is extended out to a tubular end 26 having threads 27 at the free end. In the area of the tubular end 26 which in a connected situation is supposed to lie within the extension 20, a ring or grommet 28 which axially external is level with the pipe fitting 21. An annular slit 29 is formed between these two parts.

This annular slit is in the example closed by a ring 30 which is threaded in a sealing manner to the pipe fitting 21 and the ring 28 by two screw rows 31 and 32. At the same time the ring 30 will lock the two parts of the end connection 15 to each other. The ring 30 exhibits a threaded aperture 33 for pipe connection. Moreover, the tubular end 26 has a radial aperture 34 having a connector flange 35. During use of the composite hose, a pipe or hose connection with a check valve (not illustrated) is connected between the aperture 33 and the aperture 34. The purpose of this connection is to empty the interstice 14 with regard to air and any liquid leakage during coiling. In this way pollution is prevented at the same time as hose handling is made more convenient.

The invention is primarily suitable for making a floating hose that can be used in numerous offshore applications having better total properties with regard to safety and use than known hoses for a similar purpose. It is of particular importance that the composite hose can be used in a safety regard, both to register leakage in a main hose and to collect such a leakage.

Claims

1. A hose device comprising:

an internal main hose having a unitary hose body;

an external cover hose, wherein the internal main hose and the external cover hose define a tubular interstice configured to provide buoyancy to the hose device in water; and

a connector configured to be connected to the internal main hose and the external cover hose, wherein a free end of the connector is connected to, or integrated with, a tubular end for connecting the hose device to an external connection, the connector comprising:

an internal end connector in which an end of the internal main hose is inserted and attached, wherein a free end of the internal end connector comprises connecting means for connection to a pipe system,

an external end connector to which an end of the external cover hose is attached,

an intermediate connector directly and releasably connectable to both the internal end connector and the external end connector, and

a connection between the interstice and the internal main hose, the connection having a check valve configured to allow emptying of the interstice to the internal main hose.

2. The hose device of claim 1, wherein the intermediate connector is tubular and releasably connected to one or both of the internal end connector and the external end connector.

3. The hose device of claim 2, wherein one or both of the internal end connector and the external end connector comprises a flange formed connector ring of the connecting element.

4. The hose device of any one of claims 1 to 3, wherein the intermediate connector comprises one or more holes for connecting a pipe connection to the interstice between the internal main hose and the external cover hose.

5. The hose device of any one of claims 1 to 4, wherein the intermediate connector comprises an external and internal bevel in order to fit within an annulus between the internal end connector and the external end connector.

6. The hose device of any one of claims 1 to 5, wherein the connecting means are threads.

7. The hose device of any one of claims 1 to 6, wherein the interstice is filled with air.

8. The hose device of any one of claims 1 to 6, wherein the interstice is at least partially filled with a foam material.

9. The hose device of any one of claims 1 to 8, wherein

the intermediate connector is a separate, ring shaped connecting element directly and releasably connecting the internal end connector with the external end connector.

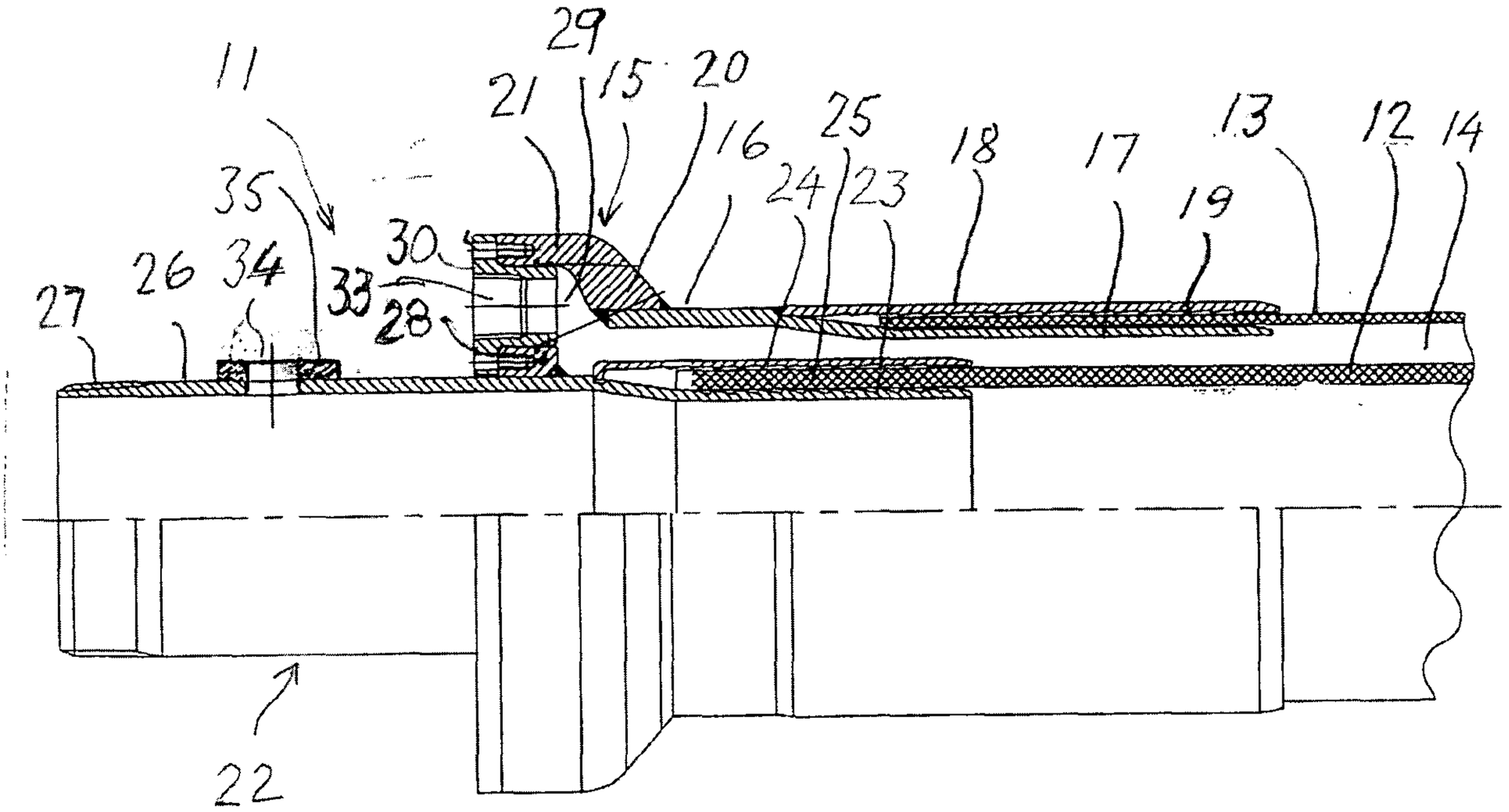

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Fig 1

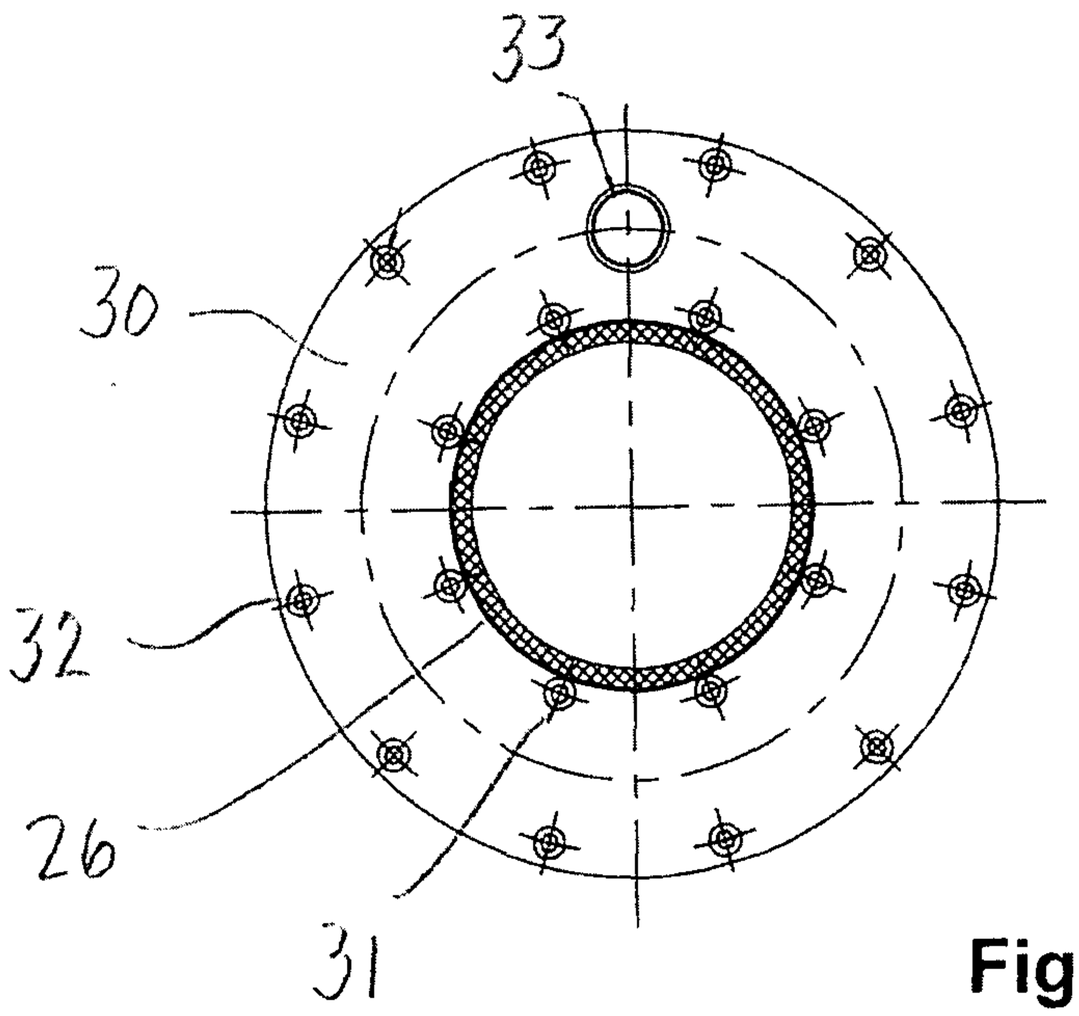
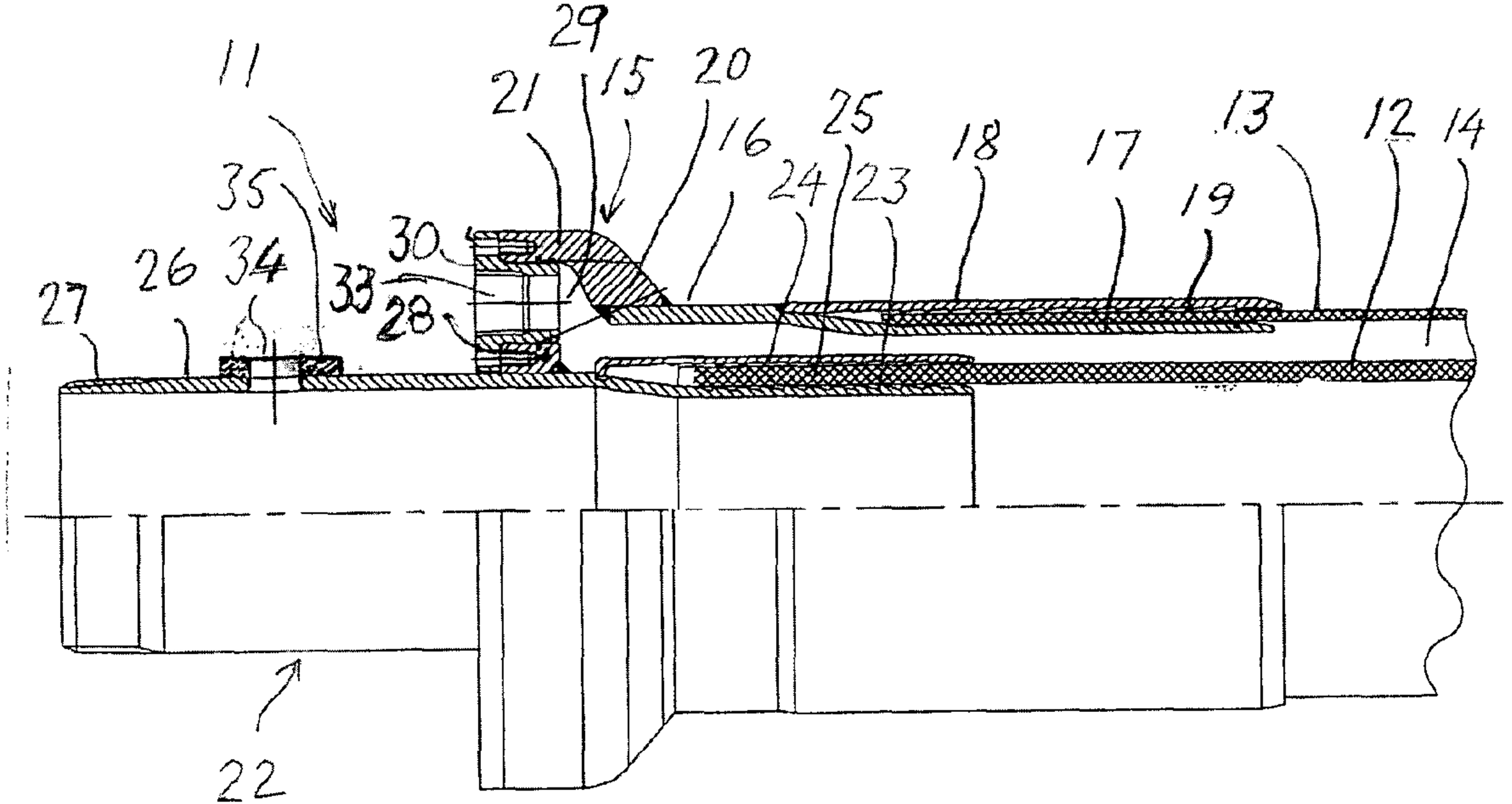

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Fig 2


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