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(54) **Device for connecting a dosage pump to a hydraulic system**

(57) A device for connecting a dosage pump to a hydraulic system; the pump (11) comprises a hollow body (12) whose head (13) accommodates a vaned element (14) which rotates due to the fluid which arrives from the hydraulic system; the fluid enters the head (13) through an intake port (15) and exits through a discharge port (16); the intake port (15) and the discharge port (16) are connected to appropriately provided corresponding connectors of the hydraulic system by interposition of a coupling (17) inside which an intake channel (18) and a discharge channel (19) for the fluid of the pump (11) are provided. On the head (13), the intake port (15) and the discharge port (16) are formed on a same side and are mutually laterally adjacent. On the coupling (17), which is provided by a substantially T-shaped body, the intake channel (18) and the discharge channel (19) each lie, for a first substantially straight portion (18a, 19a), between a port (20, 21) for connection to the hydraulic system and a curved portion (18b, 19b) in the central part (22) of the coupling (17) and, for a second portion (18c, 19c), with an axis (23, 24) which is transverse with respect to the axis (25, 26) of the respective first portion (18a, 19a), between the curved portion (18b, 19b) and an opening (18d, 19d) designed to face one of the two corresponding ports, the intake port (15) or the discharge port (16), of the head (13). The first portions (18a, 19a) of the two channels (18, 19) are mutually opposite with respect to the central part (22) inside the lateral arms (17a, 17b) of the T-shaped body that forms the coupling (17) and the two second portions (18c, 19c) lie within the central part (22) of the coupling (17).

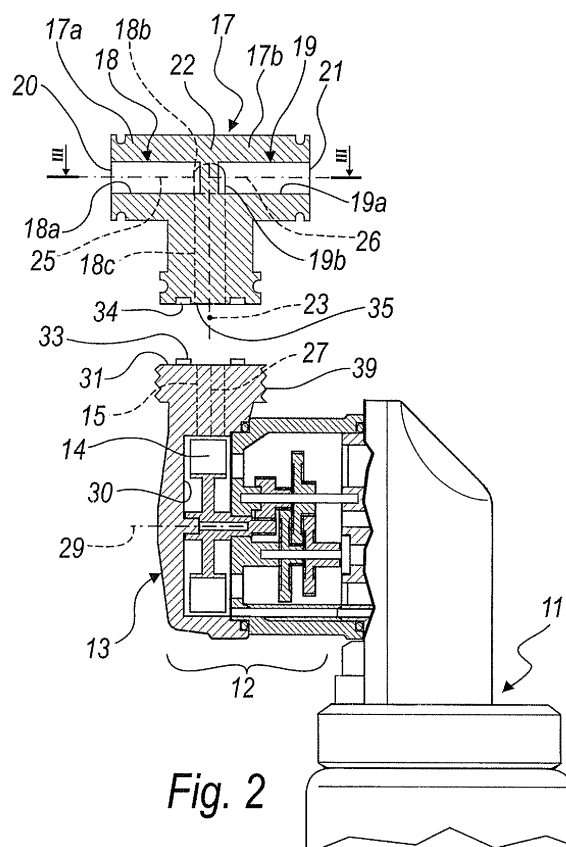


Fig. 2

Description

[0001] The present invention relates to a device for connecting a dosage pump to a hydraulic system.

[0002] Currently known dosage pumps, such as for example the one disclosed and claimed in Italian patent No. 1336867 in the name of this same Applicant, comprise a hollow body which accommodates internally a vaned element, which rotates due to the water that arrives from the hydraulic system, and means for mechanical reduction and transmission of the rotary motion; these last means are further functionally connected to means for converting rotary motion into reciprocating rectilinear motion, which in turn act on dosage and pumping means arranged inside the container, associated with the hollow body, of the liquid to be dosed.

[0003] Currently known devices for connecting such a dosage pump to a hydraulic system are constituted by the head of the hollow body, inside which the vaned element is accommodated, and by an appropriately provided coupling.

[0004] The water of the hydraulic system reaches the vaned element through an intake port on the head and exits from said head through a discharge port.

[0005] In known dosage pumps, the ports for the intake and discharge of the water from the head are mutually opposite and substantially coaxial, their axes being arranged on a plane which is substantially perpendicular to the axis of the vaned element.

[0006] Particular couplings are currently used to connect said mutually opposite intake and discharge ports to the corresponding appropriately provided connectors of the pipes of the hydraulic system with which the pump is to be associated; said couplings are fork-shaped so as to convey the water, by means of a first channel, to the intake port of the head and draw it, by means of a second opposite channel, from the discharge port.

[0007] Centrally, the two channels run close to each other and substantially parallel to each other, within a neck which ends in an upper region with two mutually opposite ports for connection to the connectors of the hydraulic system.

[0008] These known devices are awkward to connect, since they require two operations for connecting, generally by screwing a ring, the coupling to the head of the pump, and two operations for connecting the coupling to the connectors of the hydraulic system.

[0009] Further, the couplings described above and currently in use have a relatively complex shape which is therefore relatively expensive to obtain.

[0010] Moreover, such couplings entail a particularly large bulk with respect to the spaces in which the dosage pumps are to be installed, such as for example in the vicinity of a boiler; further, said connecting devices force a position of the pump which makes it protrude away from the wall proximate to which there lie the pipes of the hydraulic system for which the pump is intended.

[0011] The aim of the present invention is to provide a

device for connecting a dosage pump to a hydraulic system which is capable of obviating the drawbacks shown by known types of device.

[0012] Within this aim, an object of the present invention is to provide a connection device which can be applied easily also to known types of dosage pump.

[0013] Another object of the present invention is to provide a connection device which is more compact than known devices.

[0014] Another object of the present invention is to provide a connection device which is quicker to install in the hydraulic system with respect to known types.

[0015] Another object of the present invention is to provide a connection device which is more compact and allows to fit the associated dosage pump in a position which entails less space occupation.

[0016] Another object of the present invention is to provide a device for connecting a dosage pump to a hydraulic system which can be manufactured cheaply with known systems and technologies.

[0017] This aim and these and other objects, which will become better apparent hereinafter, are achieved by a device for connecting a dosage pump to a hydraulic system, said pump comprising a hollow body whose head accommodates a vaned element which rotates due to the fluid which arrives from the hydraulic system, said fluid entering said head and reaching said vaned element through an intake port and exiting from said head through a discharge port, said intake and discharge ports being connected to appropriately provided corresponding connectors of the hydraulic system by interposition of a coupling inside which an intake channel and a discharge channel for the fluid of the pump are provided, said device being characterized in that

- on said head, said intake and discharge ports are formed on a same side and are mutually laterally adjacent,
- on said coupling, which is provided by a substantially T-shaped body, the intake channel and the discharge channel each lie, for a first substantially straight portion, between a port for connection to the hydraulic system and a curved portion in the central part of the coupling and, for a second portion, with an axis which is transverse with respect to the axis of the first portion, between said curved portion and an opening which is adapted to face one of the two corresponding intake or discharge ports of the head,

the first portions of the two channels being substantially mutually opposite with respect to the inside of the lateral arms of the T-shaped body that forms the coupling, the two second portions being arranged within the central part of said coupling.

[0018] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment thereof, illustrated by way of non-limiting ex-

ample in the accompanying drawings, wherein:

Figure 1 is a perspective view of a dosage pump with a connection device according to the invention fitted thereto;

Figure 2 is a partially sectional and partially exploded side view of a pump with a device according to the invention;

Figure 3 is a sectional view, taken along the line III-III of Figure 2;

Figure 4 is a sectional view of the head and the coupling of the device according to the invention;

Figure 5 is a bottom view of a coupling of a connection device according to the invention;

Figure 6 is a top view of a head of a connection device according to the invention.

[0019] With reference to the figures, a device for connecting a dosage pump to a hydraulic system according to the invention is generally designated by the reference numeral 10.

[0020] A generic dosage pump 11 comprises a hollow body 12, the head 13 of which accommodates a vaned element 14 which rotates due to the fluid that arrives from the hydraulic system.

[0021] The fluid, generally water, enters the head 13 and reaches the vaned element 14 through an intake port 15 and exits from the head 13 by means of a discharge port 16.

[0022] The intake port 15 and discharge port 16 are connected to appropriately provided corresponding connectors of the hydraulic system, of a per se known type, which accordingly are not shown for the sake of simplicity, by way of the interposition of a coupling 17.

[0023] An intake channel 18 and a discharge channel 19 for the fluid from the pump 11 are formed within the coupling 17.

[0024] On the head 13, the intake port 15 and the discharge port 16 are formed on a same side and are mutually laterally adjacent, as shown clearly in Figures 4 and 6.

[0025] The coupling 17, as can be seen from Figures 1 and 2, is provided by a substantially T-shaped body.

[0026] The intake channel 18 and the discharge channel 19 each form two portions on the coupling 17.

[0027] A first portion, 18a and 19a respectively, is substantially rectilinear between a port, 20 and 21 respectively, for connection to the hydraulic system, and a curved portion 18b and 19b in the central part 22 of the coupling 17.

[0028] Respective second portions, 18c and 19c respectively, lie along axes, 23 and 24 respectively, which are transverse with respect to the axis 25 and 26 of the first respective portions 18a and 19a.

[0029] The second portions 18c and 19c lie between the curved portion 18b and 19b and an opening 18d, 19d which is adapted to face one of the two corresponding ports, the intake port 15 or the discharge port 16, of the

head 13.

[0030] The first portions 18a and 19a of the two channels 18 and 19 are substantially mutually opposite, with respect to the central part 22 of the coupling 17, and are formed within the lateral arms 17a and 17b of the T-shaped body which forms the coupling 17.

[0031] The two second portions 18c and 19c lie within the central part 22 of the coupling 17.

[0032] The axes 27 and 28 respectively of the intake port 15 and of the discharge port 16 of the head 13 are substantially coplanar, on a plane which is substantially perpendicular to the rotation axis 29 of the vaned element 14.

[0033] In particular, in the embodiment of the device according to the invention 10 described here by way of non-limiting example of the invention, the axes 27 and 28 of the ports 15 and 16 of the head 13 converge from the internal space 30 of the head 13 which accommodates the vaned element 14 toward the portion of the outer surface 31 for supporting the coupling 17.

[0034] In this embodiment, which is a non-limiting example of the invention, the second portions 18c and 19c of the intake channel 18 and discharge channel 19 of the coupling 17 are substantially parallel and lie with axes 23 and 24 which are perpendicular to the axes 25 and 26 of the respective first portions 18a and 19a.

[0035] In particular, the first portions 18a and 19a of the channels 18 and 19 lie along axes 25 and 26 which are mutually substantially parallel and coplanar.

[0036] The axes 25 and 26 lie transversely to the direction, shown in Figure 3 by the axis 32, for the intake and discharge of the fluid with respect to the hydraulic system.

[0037] The portion of the outer surface 31 of the head 13 for supporting the coupling 17 has two centering protrusions 33, each adapted to enter a complementarily shaped seat 34 formed in the bottom 35 of the coupling 17.

[0038] The coupling 17 is fixed to the corresponding connectors of the hydraulic system by means of rings 36 and 37 which have a hexagonal profile and is fixed to the head 13 by means of a ring 38 which is adapted to be screwed onto a corresponding thread 39 provided on the head 13.

[0039] At least one annular gasket, not shown for the sake of simplicity, is fitted between the head 13 and the coupling 17 and is arranged in a corresponding slot 40 on the bottom of the coupling 17.

[0040] In practice it has been found that the invention thus described solves the problems noted in known types of connecting device for dosage pumps.

[0041] In particular, the present invention provides a device for connecting a dosage pump to a hydraulic system which can be applied easily also to known types of dosage pump; it is in fact sufficient to replace the hollow body or just to the head with a hollow body or a head 13 according to the invention to be then able to apply to the head 13 the coupling 17 according to the invention.

[0042] Moreover, the present invention provides a connecting device which is more compact than known devices.

[0043] The proximity of the intake port 15 and discharge port 16 of the head 13 in fact allows to use a coupling 17 according to the invention which is particularly compact and has a small bulk, thanks to the particular shape and particular arrangement inside it of the intake channel 18 and discharge channel 19 for the water.

[0044] Further, the present invention provides a connecting device which is faster to install in the hydraulic system with respect to known types by way of the three rings 36, 37 and 38 (as opposed to four of known types of device), by turning which it is possible to connect the coupling 17 to the connectors of the hydraulic system and to the head 13 of the pump 11.

[0045] Moreover, the present invention provides a connecting device which is more compact and allows to fit the associated dosage pump in at less bulky position; the coupling 17 in fact allows to arrange the pump 11 also in a position which is substantially adjacent to the wall on which there lie the pipes of the hydraulic system with which the pump 11 is associated; this is allowed by the position of the ports 15 and 16 on the head 13, which by being close to each other avoid the use of a known type of fork-shaped coupling.

[0046] Moreover, the present invention provides a device for connecting a dosage pump to a hydraulic system which can be manufactured cheaply with known systems and technologies.

[0047] In practice, the materials employed, so long as they are compatible with the specific use, as well as the dimensions, may be any according to requirements and to the state of the art.

[0048] The disclosures in Italian Utility Model Application No. PD2006U000027 from which this application claims priority are incorporated herein by reference.

[0049] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A device for connecting a dosage pump to a hydraulic system, said pump (11) comprising a hollow body (12) whose head (13) accommodates a vaned element (14) which rotates due to the fluid which arrives from the hydraulic system, said fluid entering said head (13) and reaching said vaned element (14) through an intake port (15) and exiting from said head (13) through a discharge port (16), said intake port (15) and said discharge port (16) being connected to appropriately provided corresponding connectors

of the hydraulic system by interposition of a coupling (17) inside which an intake channel (18) and a discharge channel (19) for the fluid of the pump (11) are provided, said device being **characterized in that**

- on said head (13), said intake port (15) and said discharge port (16) are formed on a same side and are mutually laterally adjacent,
- on said coupling (17), which is provided by a substantially T-shaped body, the intake channel (18) and the discharge channel (19) each lie, for a first substantially straight portion (18a, 19a), between a port (20, 21) for connection to the hydraulic system and a curved portion (18b, 19b) in the central part (22) of the coupling (17) and, for a second portion (18c, 19c), with an axis (23, 24) which is transverse with respect to the axis (25, 26) of the respective first portion (18a, 19a), between said curved portion (18b, 19b) and an opening (18d, 19d) which is adapted to face one of the two corresponding ports, the intake port (15) or the discharge port (16), of the head (13),

the first portions (18a, 19a) of the two channels (18, 19) being substantially mutually opposite with respect to the central part (22) inside the lateral arms (17a, 17b) of the T-shaped body that forms the coupling (17), the two second portions (18c, 19c) being arranged within the central part (22) of said coupling (17).

2. The device according to claim 1, **characterized in that** the axes (27, 28) of said intake port (15) and said discharge port (16) of the head (13) are substantially coplanar, on a plane which is substantially perpendicular to the rotation axis (29) of the vaned element (14).
3. The device according to one or more of the preceding claims, **characterized in that** said axes (27, 28) of the ports (15, 16) of the head (13) converge from the internal space (30) of the head (13) in which said vaned element (14) is accommodated toward the portion of the outer surface (31) for the support of said coupling (17).
4. The device according to one or more of the preceding claims, **characterized in that** said second portions (18c, 19c) of the intake channel (18) and discharge channel (19) of the coupling (17) have axes (23, 24) which are substantially parallel and lie at right angles to the axes (25, 26) of the respective first portions (18a, 19a).
5. The device according to one or more of the preceding claims, **characterized in that** said first portions

(18a, 19a) of the channels (18, 19) lie along axes (25, 26) which are substantially mutually parallel and coplanar.

6. The device according to one or more of the preceding claims, **characterized in that** said axes (25, 26) of the first portions (18a, 19a) of the channels (18, 19) lie transversely to the direction (32) of the intake and discharge of the fluid that arrives from the hydraulic system. 5 10
7. The device according to one or more of the preceding claims, **characterized in that** said portion of the outer surface (31) of the head (13) for supporting said coupling (17) has at least one centering protrusion (33), which is adapted to enter a complementarily shaped seat (34) formed in the bottom (35) of said coupling (17). 15
8. The device according to one or more of the preceding claims, **characterized in that** said coupling (17) is fixed to the corresponding connectors of the hydraulic system by means of rings (36, 37) which have a hexagonal profile. 20 25
9. The device according to one or more of the preceding claims, **characterized in that** said coupling (17) is fixed to said head (13) by means of a ring (38) which is adapted to be screwed to a corresponding thread (39) provided on said head (13), at least one annular gasket being arranged between said head (13) and said coupling (17) and being arranged in a corresponding slot (40) on the bottom (35) of said coupling (17). 30 35

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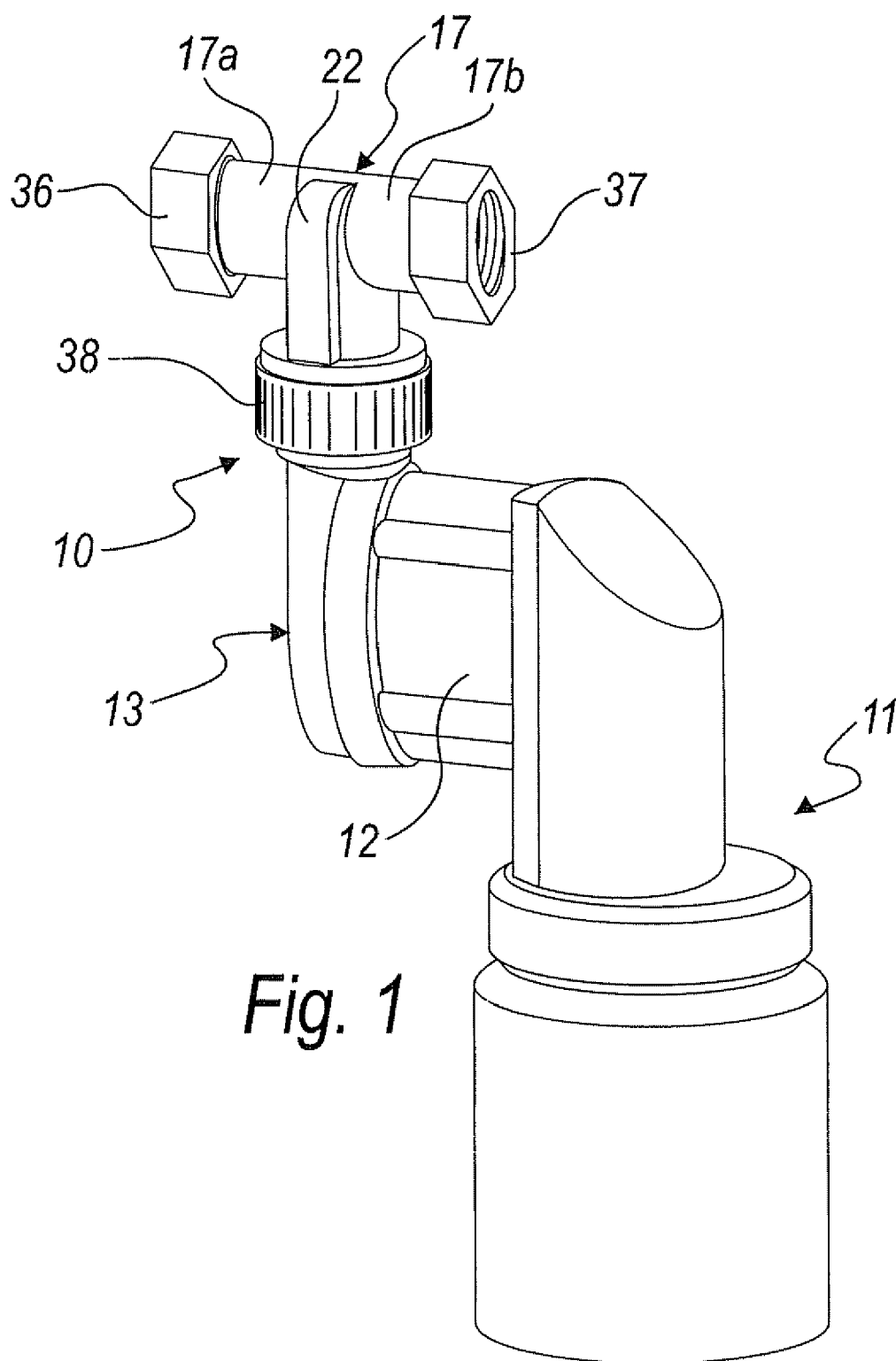
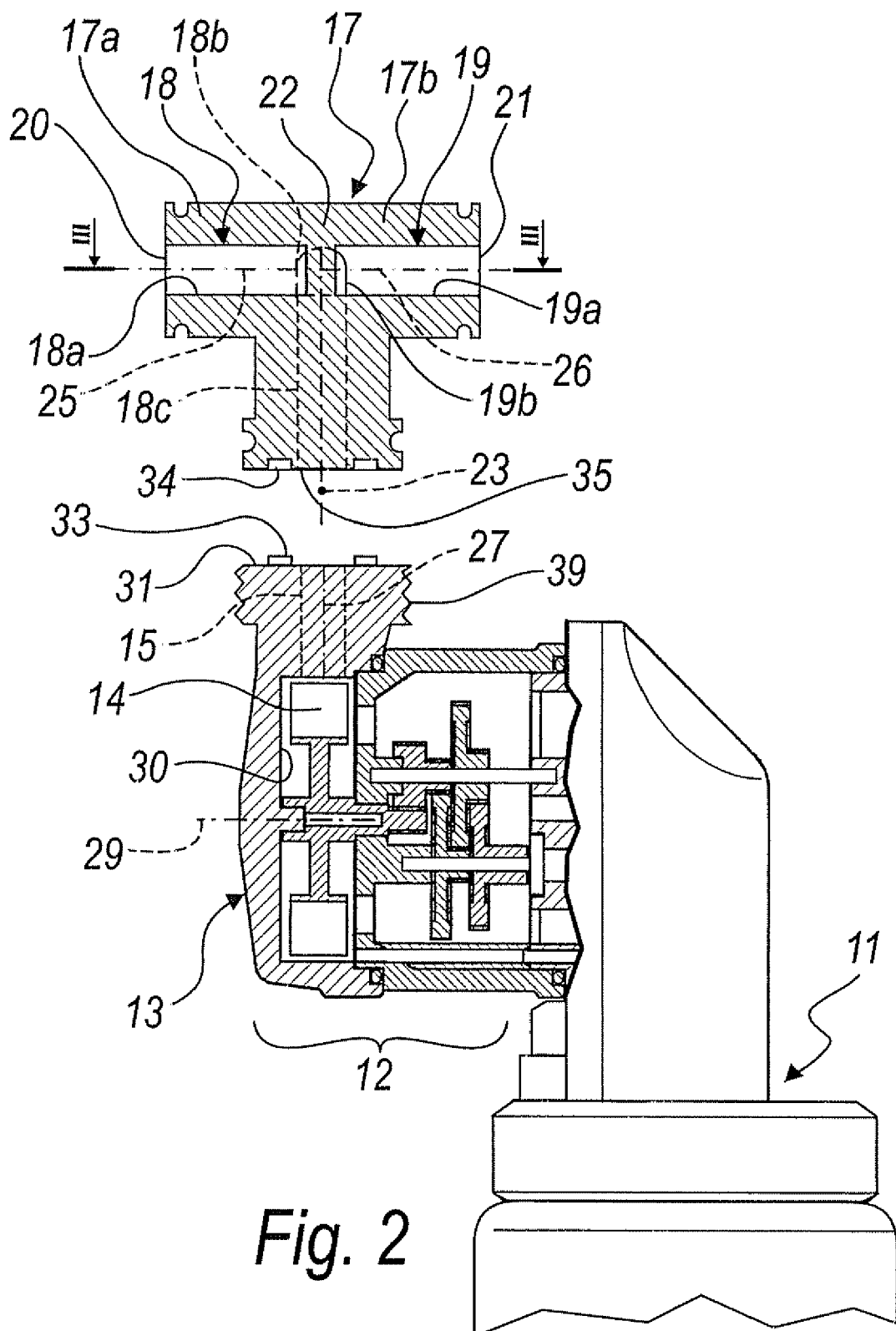
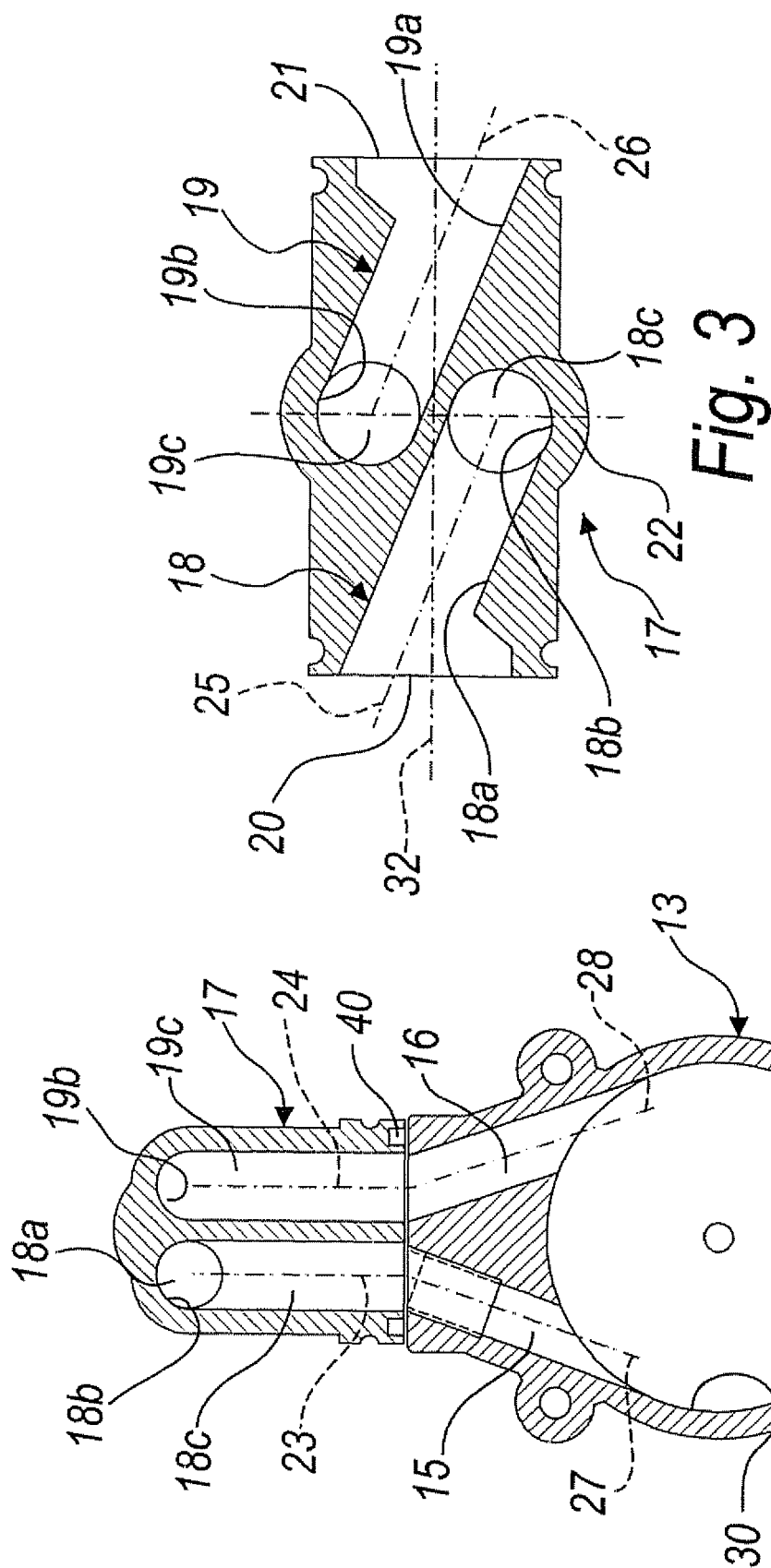
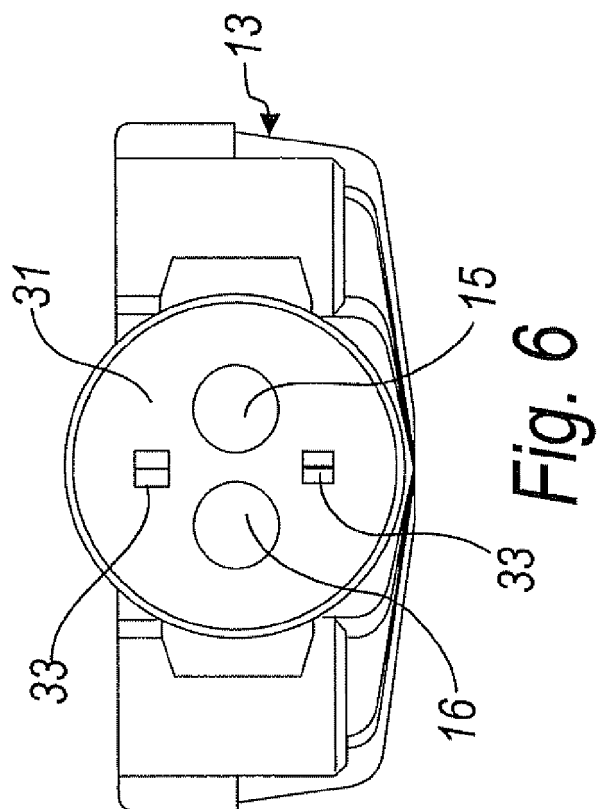
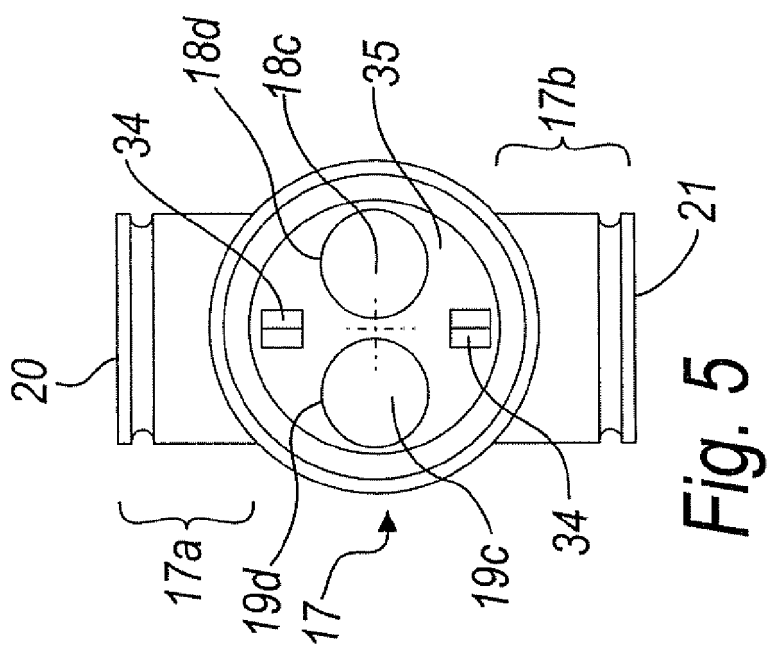


Fig. 1









European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 10 2405

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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 27 June 2007	Examiner Avramidis, Pavlos
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (F04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 07 10 2405

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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