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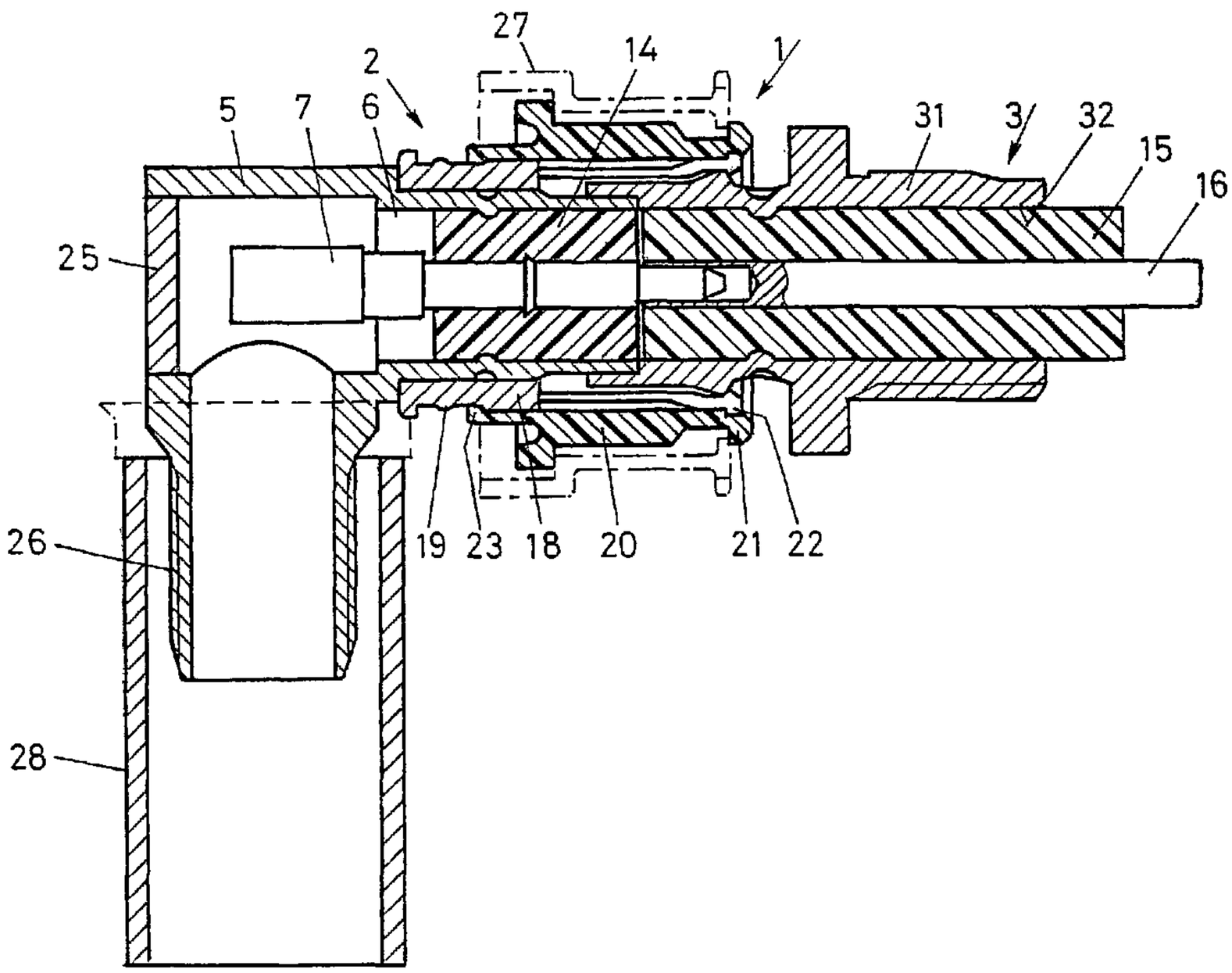
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(54) Titre : CONNECTEUR ENFICHABLE COAXIAL
(54) Title: COAXIAL PLUG CONNECTOR



(57) Abrégé/Abstract:
The invention relates to a plug connector having a housing (5), which is open at a front side to enable the plugging in of a mating connector (3) and has channel (6) extending therethrough. An inner conduct contact (7) is isolated and arranged therein Connecting means (11, 20) are used to mechanically connect the plug connector housing (5) to the mating counter (3). The mating connector (3) locks when it is plugged into the connecting means (11, 20). The connecting means (11, 20) are shaped in such a manner that said agents subject the mating connector (3) to an axial tension tensioning external conductor contact surface (10) of said mating connector (3) against an external conductor against an external conductor contact surface of the housing (5). The plug connector (2) can be coupled with a mating connector (3) very rapidly and securely and a reliable electrical contact is guaranteed between the external conductors (5, 31).

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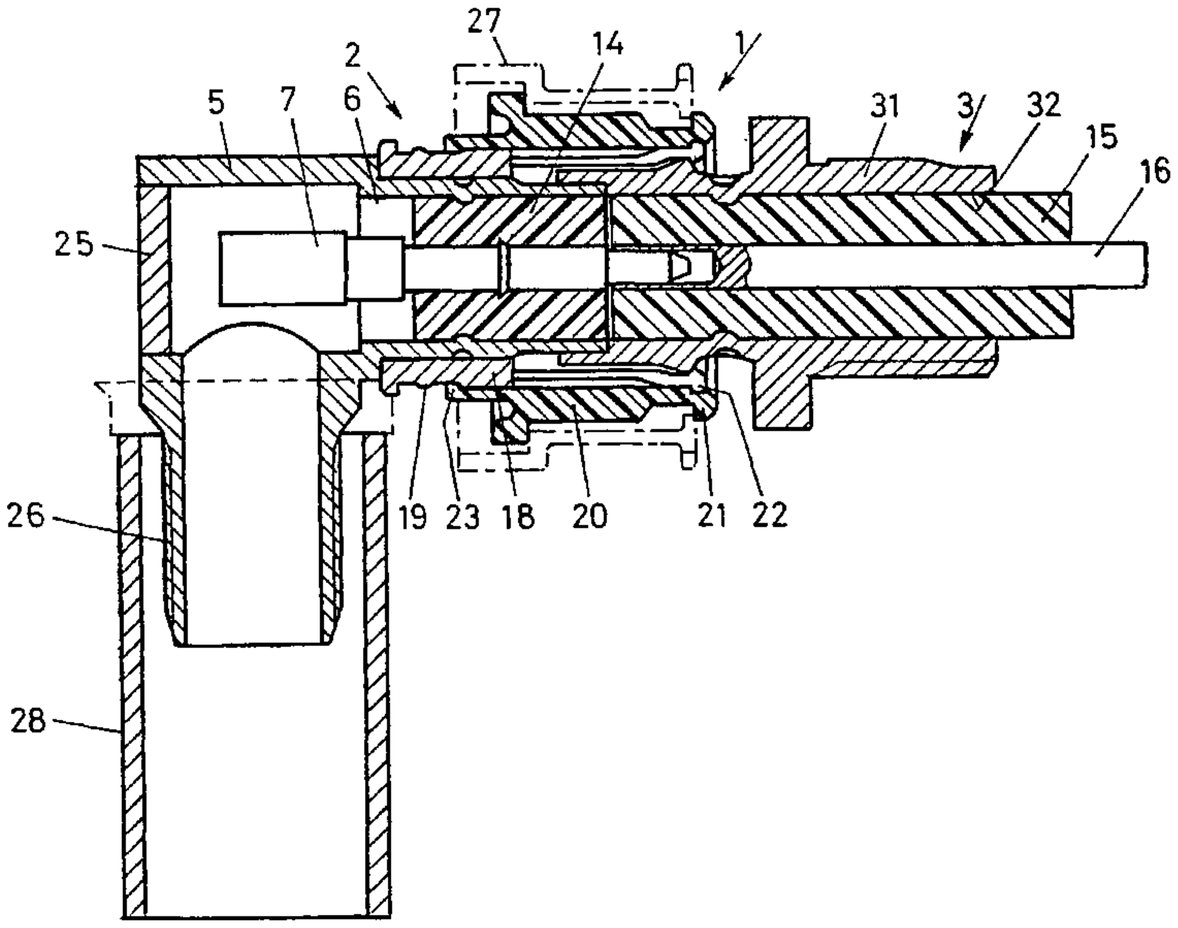
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(54) Title: COAXIAL PLUG CONNECTOR

(54) Bezeichnung: KOAXIALER STECKVERBINDER



(57) Abstract: The invention relates to a plug connector having a housing (5), which is open at a front side to enable the plugging in of a mating connector (3) and has channel (6) extending therethrough. An inner conduct contact (7) is isolated and arranged therein Connecting means (11, 20) are used to mechanically connect the plug connector housing (5) to the mating counter (3). The mating connector (3) locks when it is plugged into the connecting means (11, 20). The connecting means (11, 20) are shaped in such a manner that said agents subject the mating connector (3) to an axial tension tensioning external conductor contact surface (10) of said mating connector (3) against an external conductor against an external conductor contact surface of the housing (5). The plug connector (2) can be coupled with a mating connector (3) very rapidly and securely and a reliable electrical contact is guaranteed between the external conductors (5, 31).

(57) Zusammenfassung: Der Steckverbinder weist ein Steckergehäuse (5) auf, das an einer Stirnseite zum Aufstecken eines Gegensteckers (3) offen ist und das von einem Kanal (6) durchsetzt ist, in dem ein Innenleiterkontakt (7) isoliert angeordnet ist. Verbindungsmitteln (11, 20) dienen

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— *Mit internationalem Recherchenbericht.*

Zur Erklärung der Zweibuchstaben-Codes, und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

zum mechanischen Verbinden des Steckergehäuses (5) mit dem Gegenstecker (3). Der Gegenstecker (3) wird beim Aufstecken mit den Verbindungsmitteln (11, 20) verrastet. Die Verbindungsmittel (11, 20) sind so ausgebildet, dass sie auf den Gegenstecker (3) eine aiale Spannung ausüben, welche eine Aussenleiterkontaktfläche (10) des gegensteckers (3) gegen eine Aussenleiterkontaktfläche (9)des Steckverbinders (5) spannt. Der Steckverbinder (2) lässt sich mit dem Gegenstecker (3) sehr schnell und sicher kuppeln und dennoch ist ein zuverlässiger elektrischer Kontakt zwischen den Aussenleitern (5, 31) gewährleistet.

Coaxial plug connector

This invention relates to coaxial plug connector with a plug housing which is open on a front side to make it possible to plug in a mating connector and has a channel running through it, in which an inner conductor contact is located and isolated, with connecting means to mechanically connect the plug connector housing to the mating connector.

Examples of such plug connectors of the prior art are disclosed in US 5,088,937, DE 3 117 320 and in EP 0 867 978 A2. These plug connectors each have a male thread onto which the mating connector is screwed. By means of this threaded fastening, the two outer conductor contact surfaces are placed in contact with each other under a clamping force. This clamping force must achieve a minimum axial force to guarantee the electrical contact of the outer contact between the plug connector and the mating connector. One disadvantage of these plug connectors is that the assembly process is relatively time-consuming, and that there must be a minimum distance between the plugs in a row of plugs for the use of a tool.

The object of the invention is to create a plug connector of the type described above which can be assembled more easily and quickly and is also more reliable.

The invention teaches that this object can be achieved with a coaxial plug connector which is characterized by the fact that the mating connector locks with the connecting

means when it is attached, and the connecting means are realized so that they exert an axial clamping force on the mating connector, which clamps an outer conductor contact surface of the mating connector against an outer conductor contact surface of the plug connector. The necessary axial clamping force which clamps the two outer conductor contact surfaces against each other is guaranteed by the connecting means. The connecting means make possible on one hand a very quick and easy coupling of the plug connector with the mating connector and simultaneously guarantee a minimum contact force, which can be 300 N for example. After the mating connector has been connected, the two parts are thus mechanically connected to each other and the above mentioned contact is guaranteed without the requirement for additional measures.

In one development of the invention, the connecting means have a radially flexible and elastically expandable outer conductor sleeve which can be locked with the mating connector. The mating connector can be inserted with its forward end into this outer conductor sleeve, whereby this outer conductor sleeve locks onto the mating connector. Preferably the mating connector has, on the outside, an encircling rib onto which the outer conductor sleeve can be locked. To generate the above mentioned axial clamping force, the above mentioned rib preferably has an inclined clamping surface on the back. On this clamping surface, a radial clamping force of the outer conductor sleeve can be diverted into an axial application force. This arrangement has the special advantage that the axial force is essentially independent of dimensional tolerances, because it is essentially independent of the location in which the radial force is exerted on the clamping surface.

A continuous clamping force can be guaranteed in particular if, as in one development of the invention, the outer conductor sleeve is surrounded by a locking sleeve. This locking sleeve can preferably move axially and in a working position surrounds the

outer conductor sleeve. The locking sleeve preferably exerts an inwardly directed force on the outer conductor sleeve. The outer conductor sleeve diverts at least part of this radial force into the above mentioned axial clamping force.

The plug connector is preferably an SMA connector. A connector of this type has a passage running through it that has a diameter of approximately 4.1 millimeters. On such relatively small connectors, the necessary axial clamping force can be achieved with the above mentioned rib on the outside of the mating connector. The plug connector claimed by the invention can be used as an angle plug connector or as a straight-line plug connector. When it is used as an angle plug connector, it has the special advantage that the mating connector and the plug connector can be twisted continuously and at any desired angle around their common longitudinal axis in relation to each other. The bent connecting part of the plug connector can therefore be oriented accurately and at any desired angle without adversely affecting the connection.

Additional advantageous features of the invention are disclosed in the dependent claims, the following detailed description and in the accompanying drawing.

One exemplary embodiment of the invention is described in greater detail below and is illustrated in the accompanying drawings, in which:

Figure 1 is a sectional drawing through a plug connector of the type claimed by the invention,

Figure 2 is a sectional drawing through a mating connector, and

Figure 3 is a sectional drawing through the plug connector with the attached mating connector.

The plug connector 2 has a plug housing 5 on which a connector part 26 that is bent at a right angle is shaped, and which projects into a support 28. The housing 5 is open on a front side and has a channel 6 running through it. An inner conductor contact 7 is located in the channel 6 and is isolated from the plug housing 5 by means of a sleeve-shaped insulator 14. The channel 6 is closed on the rear end by a cover 25. The plug housing 5 forms the outer conductor and on the front side has a ring-shaped encircling contact surface 9. The isolating sleeve 14 is flush with this contact surface 9, as shown.

Attached to the housing 5 is a holder 18 which can be connected to the connector housing 5 by radial compression, for example. On the holder 18 there is a clamping sleeve 11 which is provided with axial slots 24 and forms a plurality of flexible elastic snap-in pins 29. On the front side of these snap-in pins 29 there are locking lugs 8 that point radially inward. On the outside, a stop is formed by a shoulder 22. As shown, a front end 4 of the sleeve 11 projects beyond the contact surface 9 of the outer contactor sleeve 30.

A locking sleeve 20 is guided on the holder 18 so that it can move axially to a limited extent. Figure 1 shows the locking sleeve 20 in a retracted stand-by position, in which an edge 23 that points radially inward is locked on a locking rib 10 (Figure 3). Figure 3 shows the locking sleeve 20 in the working position. In this position, the locking sleeve 20 is in contact with the shoulder 22 and with its forward edge 21 exerts a radial force on the clamping sleeve 11. In Figure 3, the locking sleeve 20 is therefore pushed onto the clamping sleeve 11.

The mating connector 3 has an outer conductor in the form of an essentially cylindrical housing 31. In a channel 32 that runs all the way through this housing 31 there is a

conductor 15, in which an inner conductor contact 16 is located. On the front end, the housing 31 has a cylindrical recess 17 in which there is a ring-shaped contact surface 10. This contact surface 10, as shown, is also flush with the insulator 15. At some distance from the contact surface 10, on the outside of the housing 31, there is a rib 12 that projects radially. On the back side of this rib 12 there is an encircling clamping surface 13 which, as shown in Figure 2, is inclined at an acute angle with respect to the longitudinal axis A of the mating connector 3.

The mating connector 3 is pushed onto the plug connector 5 by axially inserting the plug connector with a forward end 33 into the clamping sleeve 11, until the two contact surfaces 9 and 10 come in contact with each other. The clamping sleeve 11 is thereby elastically expanded on the front end, and shortly before contact is made between the two contact surfaces 9 and 10, the locking lugs 8 snap in behind the rib *[Translator's Note: sic - The German text says "Rille" (groove), an obvious typo for "Rippe" - rib]* and lie against the clamping surface 13. The locking sleeve 20 is then pushed into the position shown in Figure 3, in which position it exerts, with its edge 21, a radial force on the outer conductor sleeve 11. This force is transmitted via the locking lugs 8 and the clamping surface 13 into the mating connector 3. On account of the inclination of the clamping surface 13, there is a force component in the direction of the axis A. The axial contact force can be 300 N, for example. Because the contact surfaces 9 and 10 are relatively small, there is a relatively large surface pressure on them. That is particularly true in an SMA connector, in which the inside diameter d of the channel 6 is approximately 4.1 millimeters. A reliable electrical contact is therefore guaranteed. The plug connector 2 and the mating connector 3 are reliably connected to each other not only electrically but also mechanically. As shown in Figure 3, the locking sleeve 20 can be located in a connecting part 27 which is drawn here in broken lines.

The connection 1 can be realized so that it is detachable or non-detachable. In a non-detachable variant, for example, the locking sleeve 20 can be secured by radial compression or in any other suitable manner to prevent displacement.

Claims

1. Coaxial plug connector with a plug housing (5) which is open on a front side (4) to make it possible to plug in a mating connector (3) and has a channel (6) running through it, in which an inner conductor contact (7) is located and isolated, with connecting means (11, 20) to mechanically connect the plug connector housing (5) to the mating connector (3), characterized by the fact that the mating connector (3) is locked in position when it is plugged into the connecting means (11, 20) and the connecting means (11, 20) are realized so that they exert an axial clamping force on the mating connector (3) which clamps an outer conductor contact surface (10) of the mating connector (3) against an outer conductor contact surface (9) of the mating connector (5), whereby the connecting means (11, 20) have a radially expandable clamping sleeve (11) which can be locked with the mating connector (3) during the above mentioned connection on a clamping surface (13) and diverts a radial force on the clamping surface (13) into an axial force component which clamps the outer conductor contact surfaces (9, 10) against each other.

2. Plug connector as claimed in Claim 1, characterized by the fact that the mating connector (3) has locking means in the form of a rib (12) that projects radially outward.

3. Plug connector as claimed in Claim 2, characterized by the fact that the rib (12) has an encircling clamping surface (13) that is inclined with respect to the longitudinal axis (A) of the mating connector (3).

4. Plug connector as claimed in Claims 2 or 3, characterized by the fact that the clamping sleeve (11) has gripping or locking means (8) on the front end which grip the rib (12) of the mating connector (3) from behind.

5. Plug connector as claimed in one of the Claims 1 to 4, characterized by the fact that the clamping sleeve (11) is provided with radial slots (24).

6. Plug connector as claimed in one of the Claims 1 to 5, characterized by the fact that the clamping sleeve (11) is surrounded by a locking sleeve (20).

7. Plug connector as claimed in Claim 6, characterized by the fact that the locking sleeve (20) is axially movable and in a working position surrounds the clamping sleeve (11) and exerts a force that is directed radially inward on the clamping sleeve.

8. Plug connector as claimed in Claim 1 to 7, characterized by the fact that the locking sleeve (20) is made of plastic.

9. Plug connector as claimed in one of the Claims 6 to 8, characterized by the fact that the locking sleeve (20) is axially secured in a retracted stand-by position.

10. Plug connector as claimed in Claim 10, characterized by the fact that the locking sleeve (20) is detachably locked in the retracted position.

11. Plug connector as claimed in Claim 10, characterized by the fact that the locking sleeve (20) in the working position is frictionally engaged with the clamping sleeve (11).

AMENDED SHEET

Fig. 1

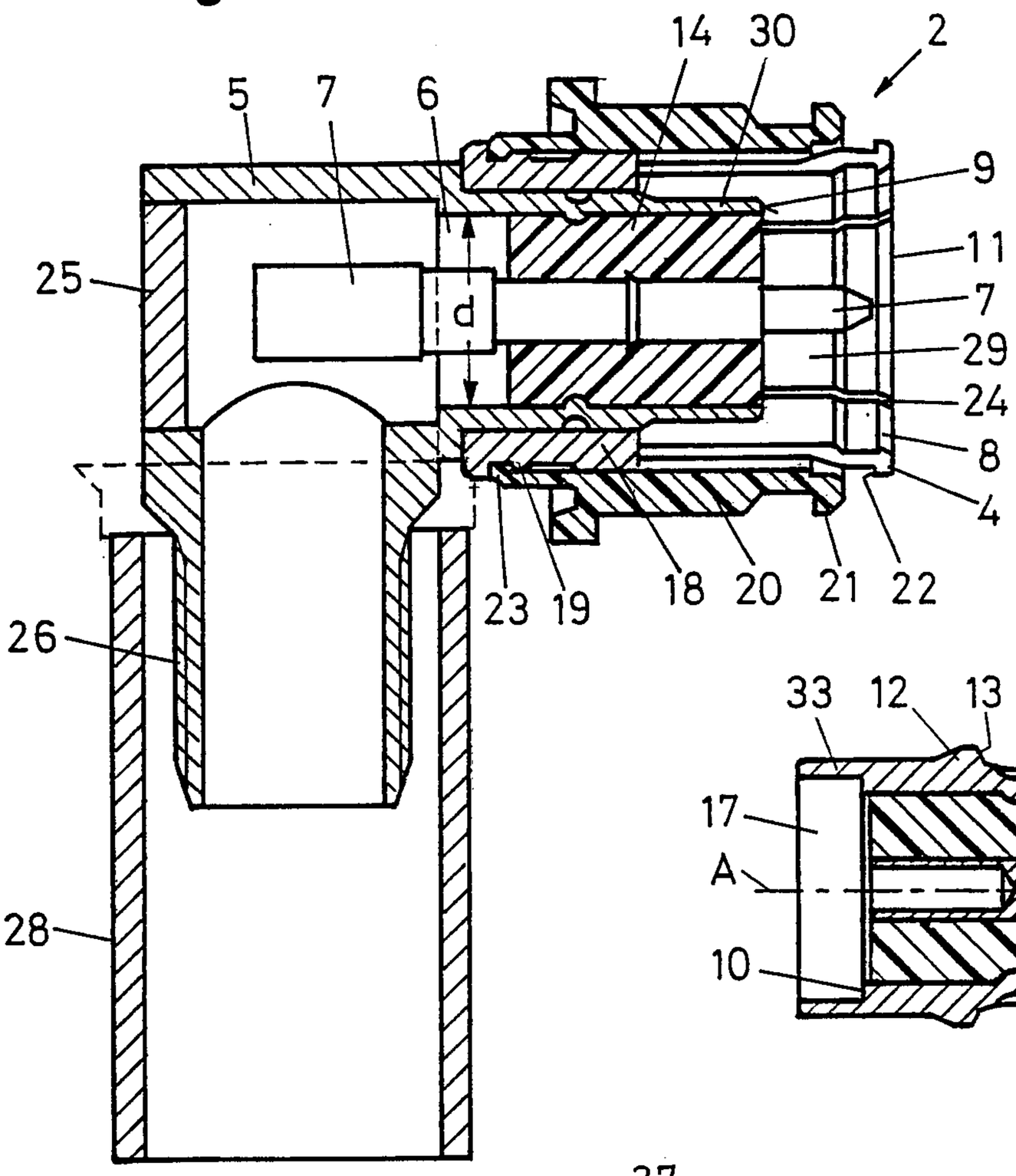
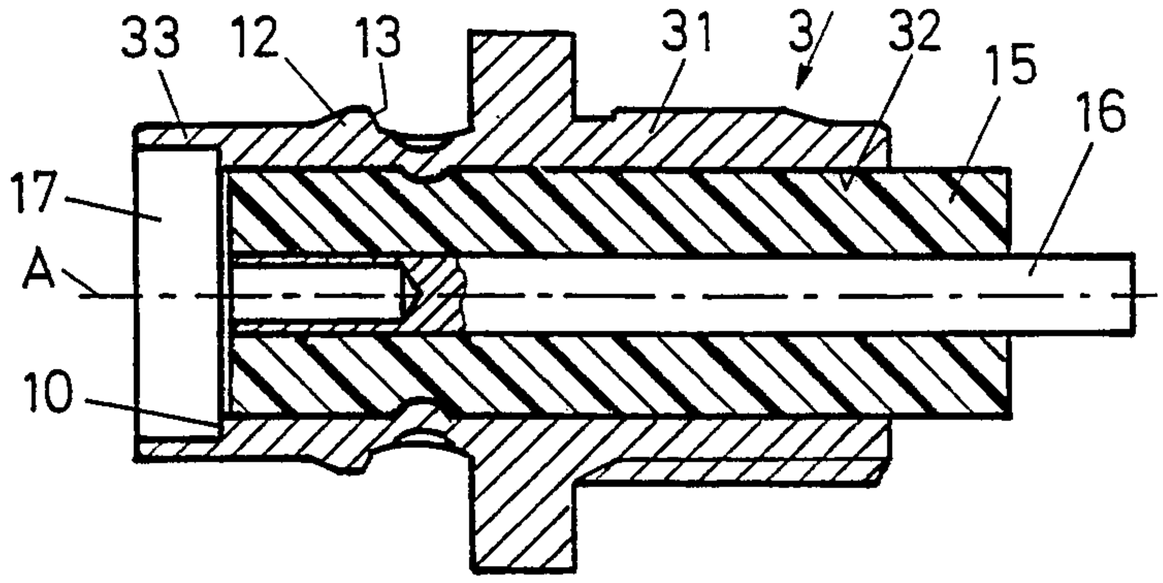


Fig. 2



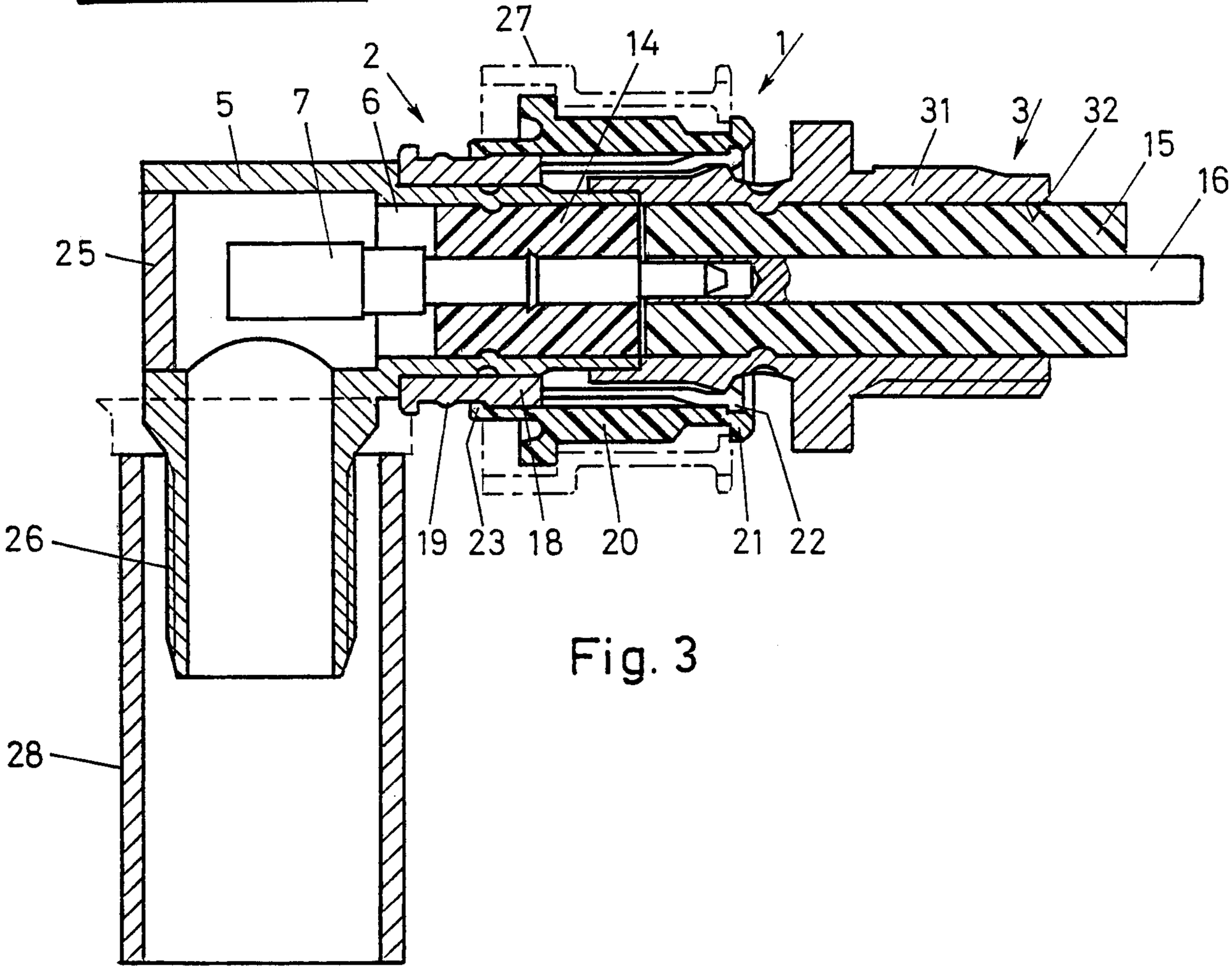
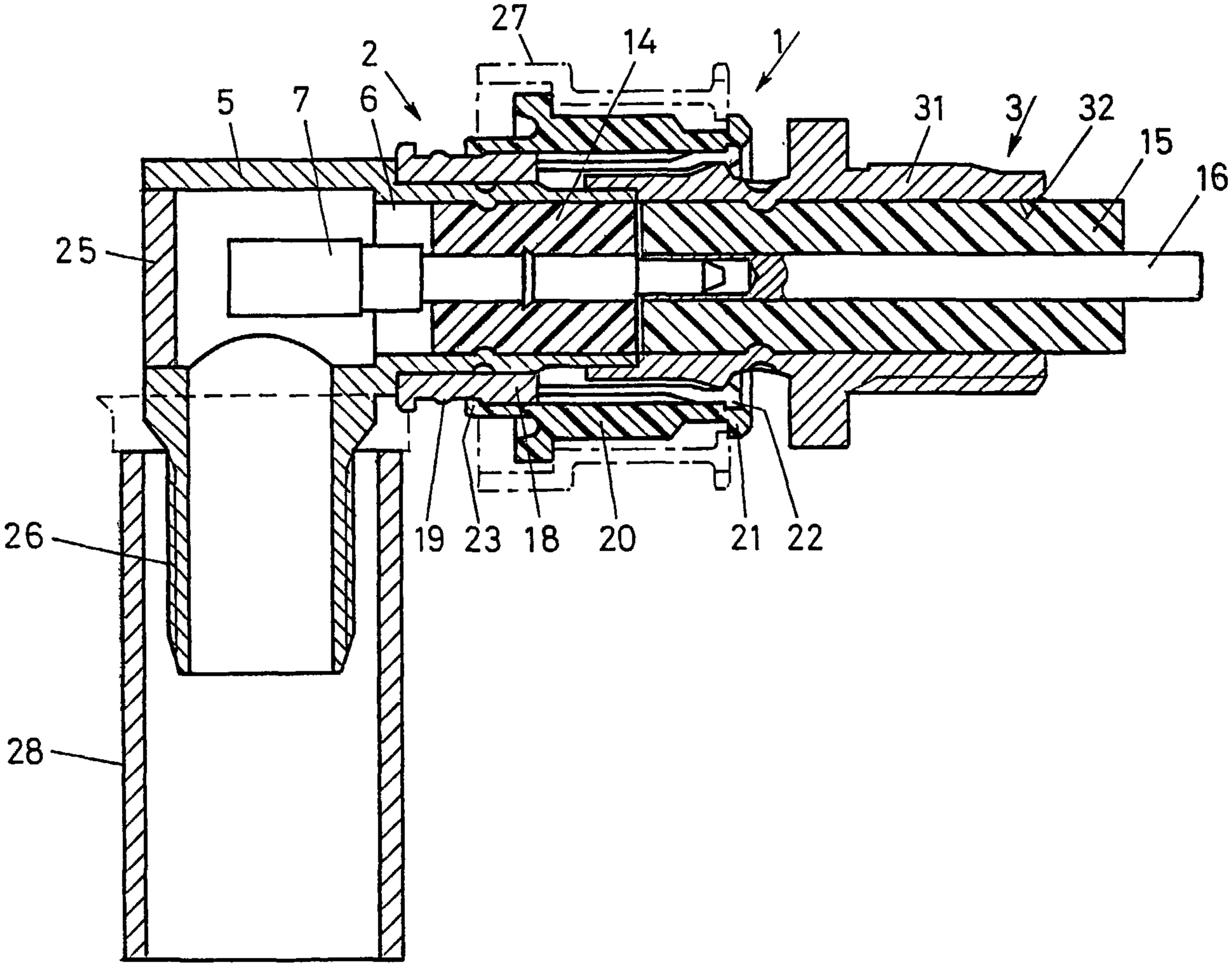


Fig. 3


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