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(54) Title: CONNECTOR FOR TUBULAR ELEMENTS FOR THE CONVEYING OF FLUIDS

(57) Abstract: Connector for tubular elements for the conveying of fluids comprising a ring nut (2) and a ring (3), fitted with a notch (4), said ring nut (2) comprising a superior annular sector (21) and an external thread (22) by which the connector connects to a complementary internal thread (222) of a hydraulic device (223) and said ring (3) is inserted into the lower end portion of the ring nut (2) and is able to clutch on to the tubular element, wherein said ring (3) is fitted with an external annular rim (31) which is restrained in a corresponding internal annular rim (24) provided inside the ring nut (2), in this way the ring and the ring nut always remain bound to one other.

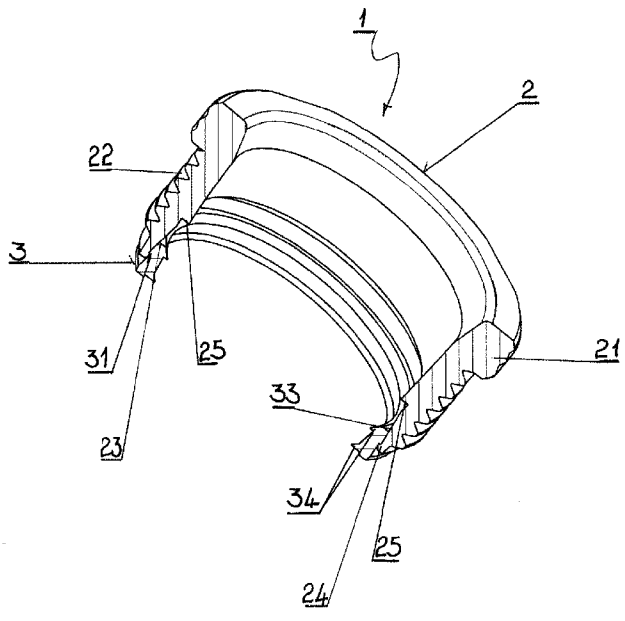


Fig. 9

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TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

Connector for tubular elements for the conveying of fluids

This invention concerns a connector for tubular elements for the conveying of fluids. In particular, this invention is a fitting of the type comprising at least one ring nut and a ring which are coupled to a terminal portion of a hydraulic device.

Various types of fittings are known for tubular elements for the conveying of fluids. It is well known that, in hydraulic distribution systems, the critical points are constituted by the connection points between the tubular elements of the plant, in particular, between the various pipes, between them and the valves, fittings or junction devices in general. The connections usually occur by means of ring nuts that fit into the end portions of these tubular elements.

These well-known fittings mainly have the drawbacks of being made up of two pieces: a ring nut and a ring. This may involve, in the mounting and disassembly phases, the detachment of the two pieces for which the ring often falls to the ground. There is also the risk of mounting the ring in an inverted position, with the consequent slipping from the pipe and/or a leak of liquid.

Furthermore, it may happen that the two ring nut-ring tapers do not fit together with the consequent jamming of the ring that causes the impossibility of the clutching of the same to the tubular element for which it is necessary to provide for the unlocking with considerable difficulties and lengthening of processing times. Finally, it may occur that the ring nut, during assembly, is tightened excessively for which the terminal part of the tubular element may be damaged against the edges of the ring notch.

This invention obviates the above mentioned drawbacks by providing a ring nut and ring assembly, bonded to each other in a stable and safe way.

CONFIRMATION COPY

The subject of this invention is a connector for tubular elements for the conveying of fluids with the features of the attached claim 1.

The invention will be described in detail in a form in which it may be made, exemplifying but not limitative, made with reference to the accompanying figures in which:

- Figure 1 shows a side view of the connector according to this invention;
- Figure 2 is a top view of the connector according to this invention;
- Figure 3 shows a section of the connector taken along the line A-A of Figure 2;
- Figure 4 shows a detail of the connector indicated in the circle of Figure 3;
- Figure 5 shows an exploded side view of the connector according to this invention;
- Figure 6 shows a top view of the connector according to this invention;
- Figure 7 shows an exploded section of the connector taken along the line B-B of Figure 6;
- Figure 8 shows a detail of the connector indicated in the circle in Figure 7;
- Figure 9 shows a perspective view of the connector according to this invention;
- Figure 10 shows a perspective exploded view of the connector according to this invention in the assembly phase.

With reference to the above figures, connector 1, according to this invention, comprises a ring nut 2 and a ring 3 provided with a notch 4. The ring nut 2

comprises an upper annular sector 21 and an external thread 22 via which the connector connects to a complementary inner thread 222 of a hydraulic device 223 (for example, a junction, a cap, a solenoid valve, etc.) possibly provided with an identification ring 7. Said ring 3 is inserted in the lower end part of the ring nut 2 and is able to clutch on to the tubular element.

Preferably, the lower end portion 23 of the ring nut 2 is internally shaped as a truncated cone that widens towards the lower edge. The ring 3 is, preferably, in its external part, of frusto-conical shape substantially complementary to that of the ring nut.

Said ring 3 is also provided with an external annular rim 31 that goes to seat tightly into a corresponding internal annular rim 24 provided inside the ring nut 2 and, in particular, in its frusto-conical portion 23. In this way, the ring 3 and the ring nut 2 always remain bonded to one another.

The ring 3 is also provided with an upper edge 33 that rests against the terminal edge 25 of the lower part of the ring nut and is provided with internal teeth 34 which clutch on to the tubular element to lock it inside the connector.

When the tubular element is inserted into the ring nut 2 and this is screwed to the end part of the connector, the ring 3 abuts on the inner edge 224 of the hydraulic device 223, fitted with a gasket 6. The ring 3, once the ring nut 2 has been manually tightened, securely tightens against said tubular element by the action of the pressure exerted by the liquid flowing in its interior, thus avoiding leaks.

The width of the notch 4 of the ring is determined according to the actual need of the tube clamping and is determined according to the circumference of the pipe and its thickness; the penetration of the teeth 34 in the pipe varies

between 0.5 and 1 mm. The predetermined notch width allows you not to change, in a permanent way, the circumference of the ring. In this configuration, to mount the assembly in a safe way, it is not necessary to exert excessive force on the ring nut because, as already said, it is the very same liquid pressure on the walls which brings about a strong and secure clamping. The assembly of this invention is able to withstand a pressure up to 700 bars, without the pipe slipping off.

CLAIMS

1. Connector for tubular elements for the conveying of fluids comprising a ring nut (2) and a ring (3), fitted with a notch (4),

said ring nut (2) comprising a superior annular sector (21) and an external thread (22) by which the connector connects to a complementary internal thread (222) of a hydraulic device (223) and said ring (3) is inserted into the lower end portion of the ring nut (2) and is able to clutch on to the tubular element,

characterized by the fact that said ring (3) is fitted with an external annular rim (31) which is restrained in a corresponding internal annular rim (24) provided inside the ring nut (2), in this way the ring and the ring nut always remain bound to one other.

2. Connector as per claim 1, wherein the lower end portion (23) of the ring nut (2) is internally shaped as a truncated cone that widens towards the lower edge and the ring (3), in its external portion, is of frusto-conical shape, substantially complementary to that of the ring nut (2).

3. Connector as per claim 2, wherein the internal annular rim (24) of the ring nut (2) is provided in the frusto-conical portion (23) thereof.

4. Connector as per claim 1, wherein the ring (3) is fitted with an upper edge (33) that abuts on the terminal edge (25) of the lower portion of the ring nut (2).

5. Connector as per claim 1, wherein the ring (3) is fitted with internal teeth (34) that clutch on to the tubular element to lock it inside the connector.

6. Connector as per claim 1, wherein the width of the notch (4) of the ring (3) is determined on the basis of the circumference of the tubular element and of its thickness.

7. Connector as per claim 6, wherein the penetration of the teeth (34) into the tubular element (223) varies between 0.5 and 1 mm.

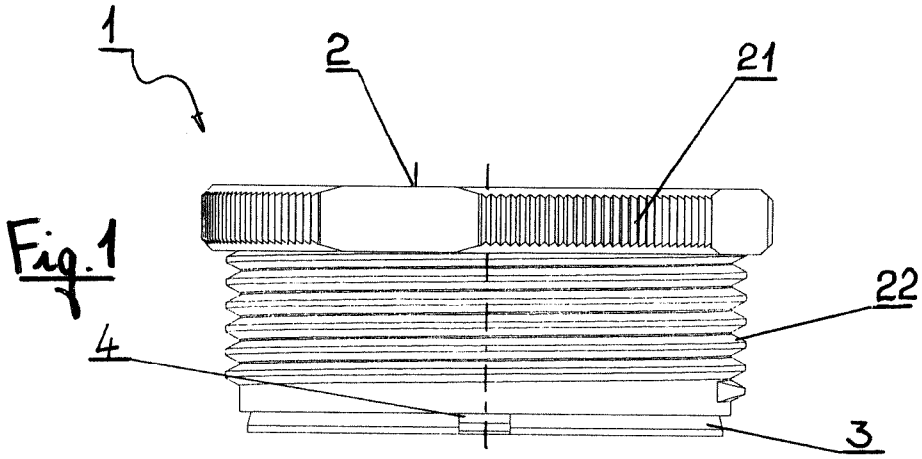


Fig.1

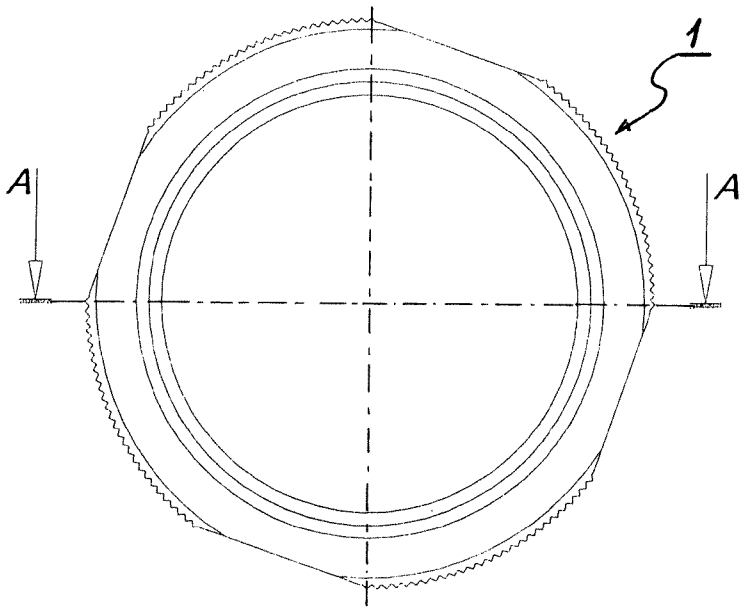


Fig.2

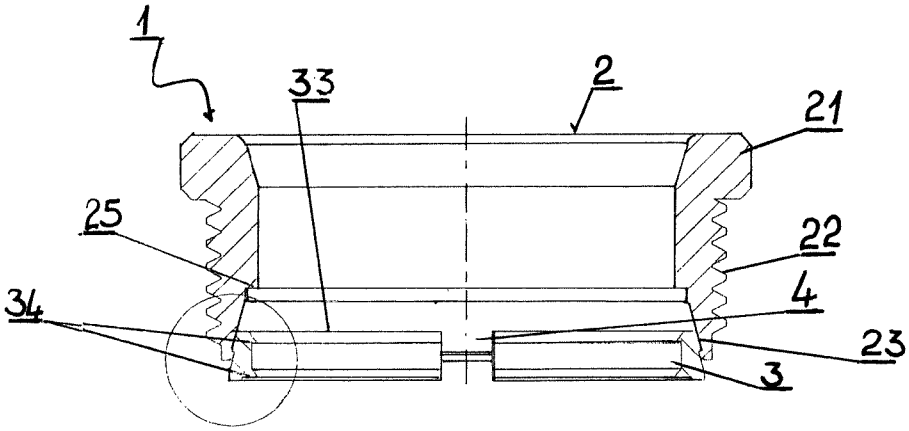


Fig.3

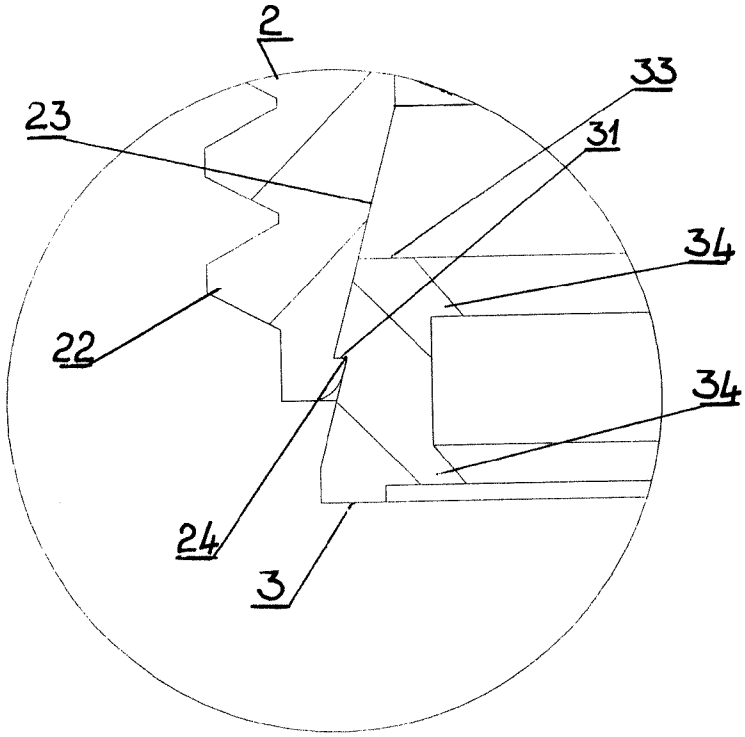


Fig.4

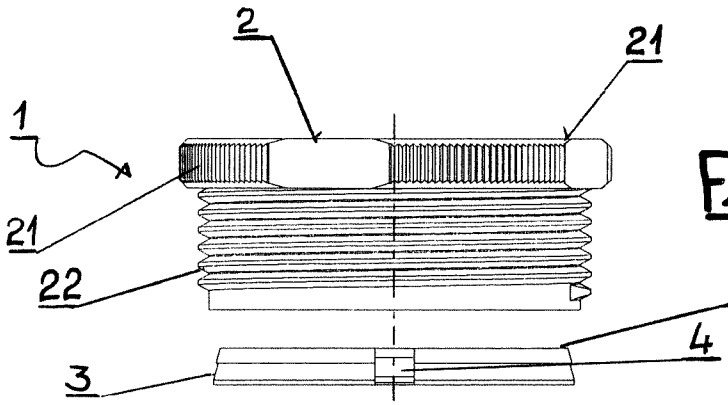


Fig.5

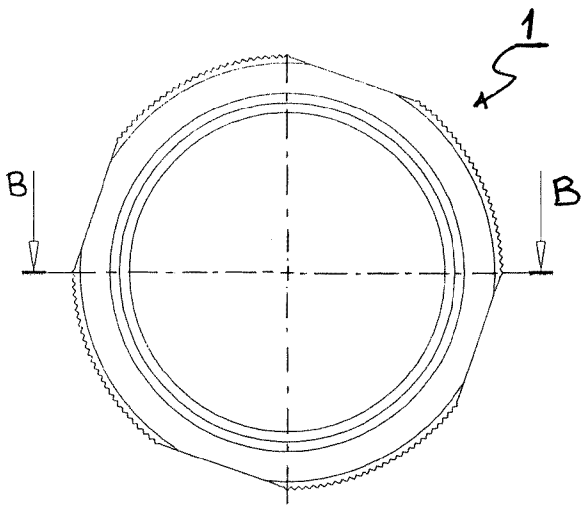


Fig.6

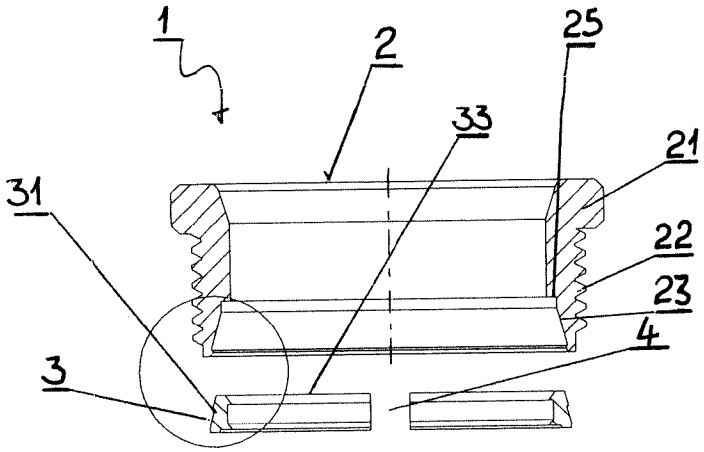


Fig. 7

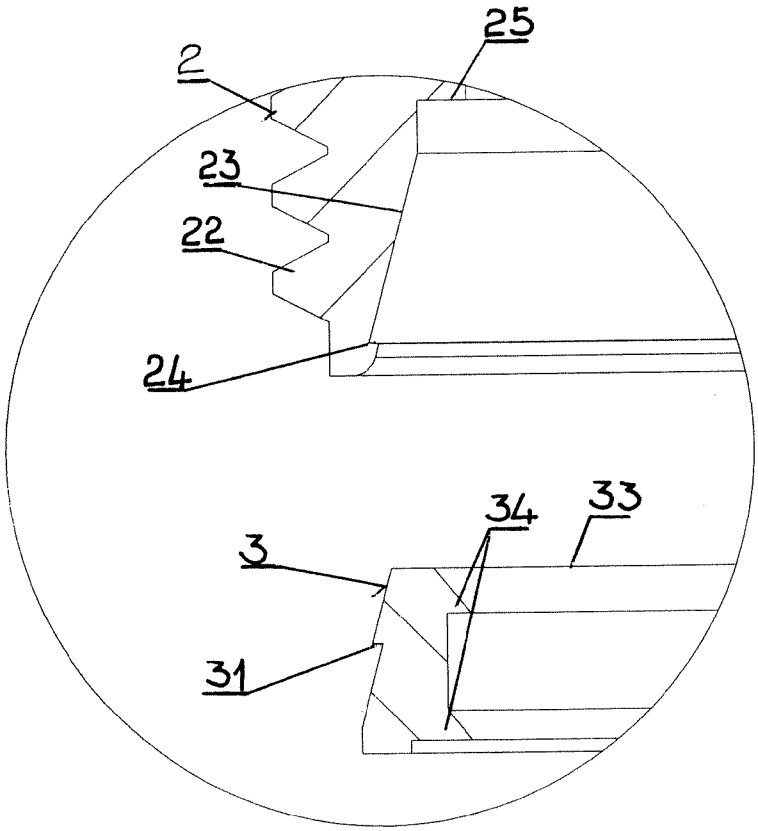


Fig. 8

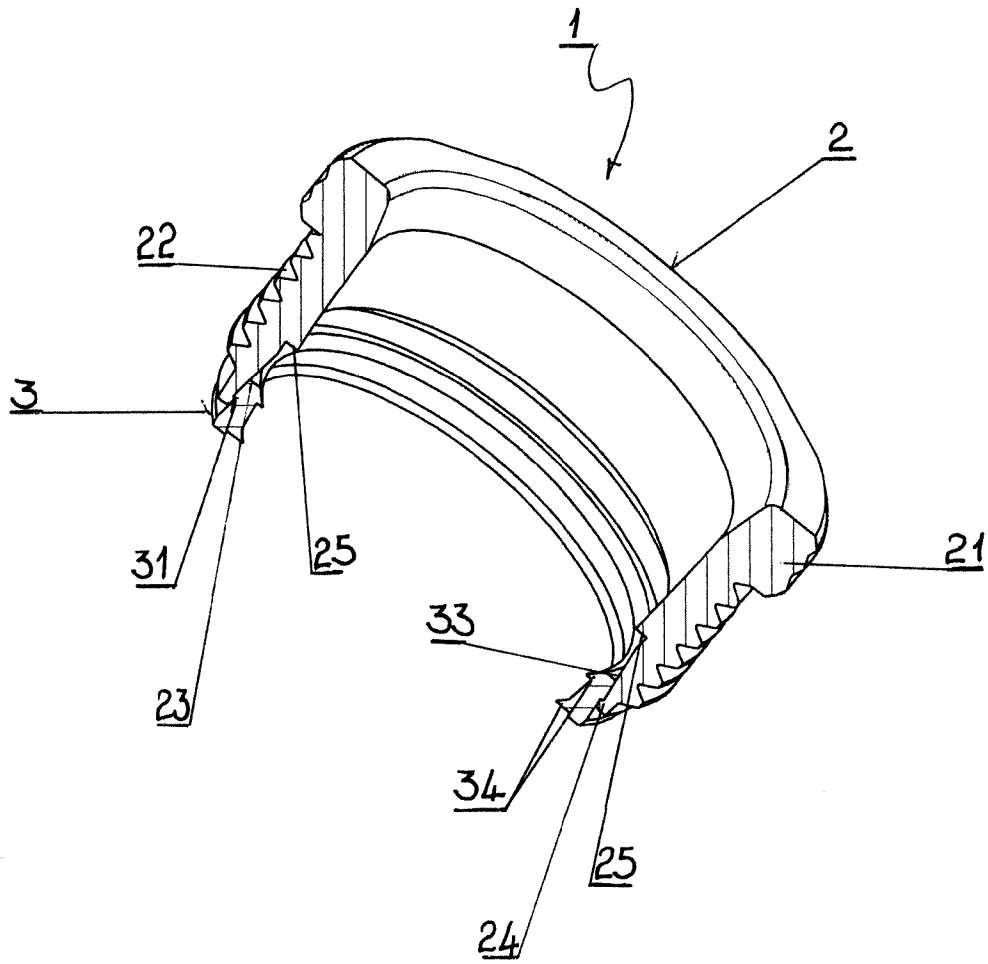


Fig. 9

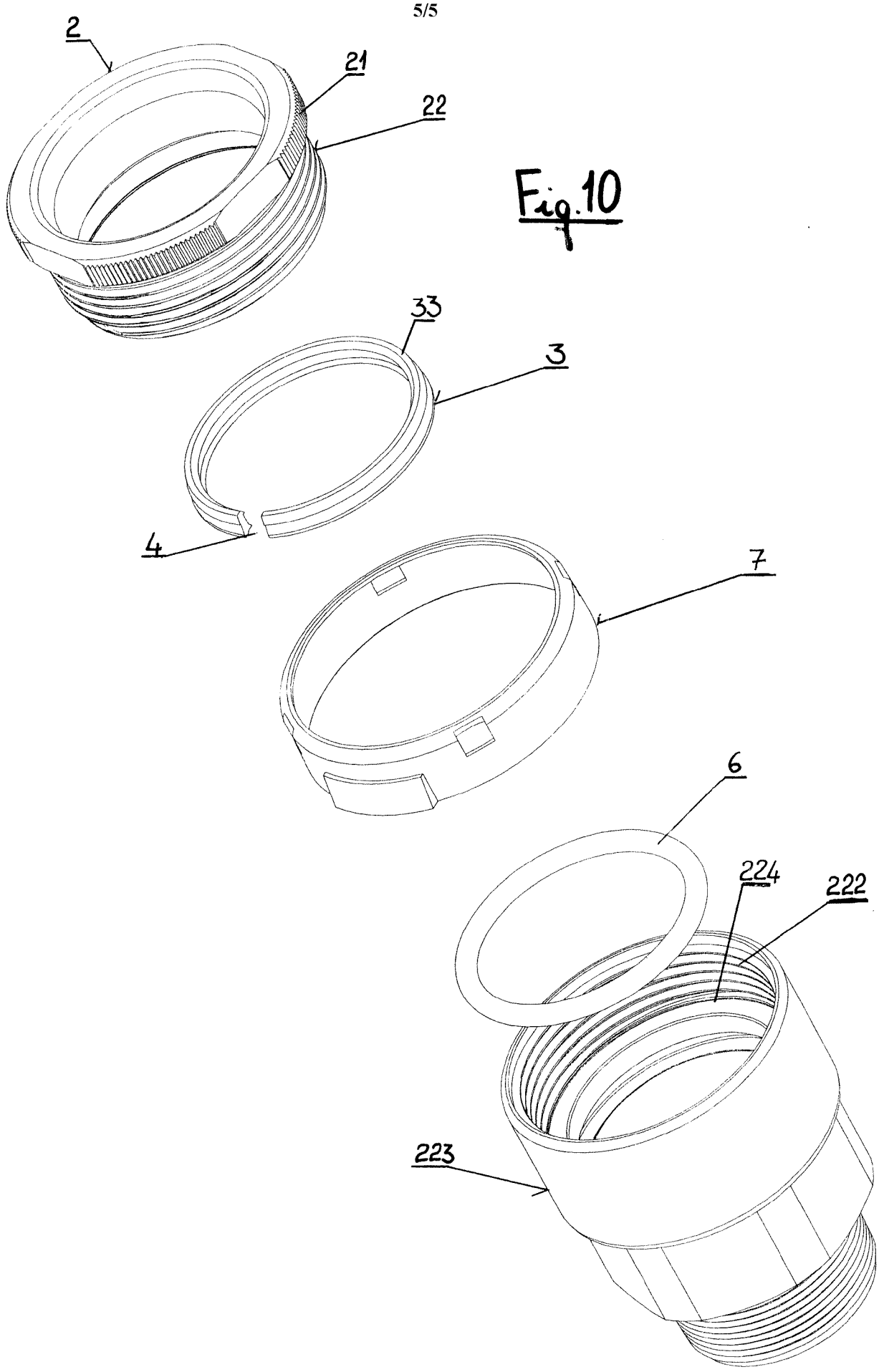


Fig.10

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2016/000562

A. CLASSIFICATION OF SUBJECT MATTER
INV. F16L19/065 F16L19/10
ADD.

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)
F16L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 597 569 A1 (PONT A MOUSSON [FR]) 23 October 1987 (1987-10-23) page 2, line 32 - page 8, last line figures	1-7
X	DE 22 59 850 A1 (REISHOLZ STAHL & ROEHRENWERK) 12 June 1974 (1974-06-12) page 2, last line - page 6, last line figures	1-7
A	GB 2 072 780 A (VOSS ARMATUREN) 7 October 1981 (1981-10-07) the whole document	1
A	DE 93 07 361 U1 (VOSS) 15 July 1993 (1993-07-15) the whole document	1

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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Date of the actual completion of the international search	Date of mailing of the international search report
10 June 2016	21/06/2016

Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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