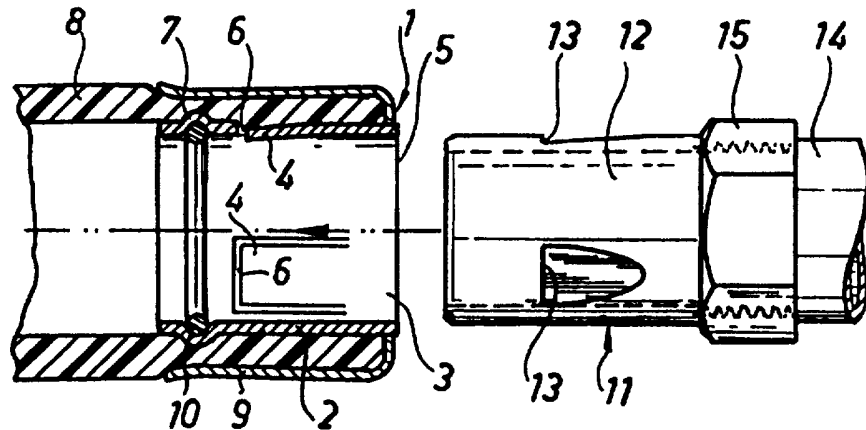




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/SE96/01752 (22) International Filing Date: 27 December 1996 (27.12.96) (30) Priority Data: 9600008-8 2 January 1996 (02.01.96) SE (71) Applicant (for all designated States except US): ABA OF SWEDEN AB [SE/SE]; P.O. Box 100, S-334 00 Anderstorp (SE). (72) Inventor; and (75) Inventor/Applicant (for US only): RYHMAN, Morgan [SE/SE]; Dikesgatan 14, S-334 32 Anderstorp (SE). (74) Agent: AWAPATENT AB; P.O. Box 11394, S-404 28 Göteborg (SE).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>With amended claims.</i> <i>In English translation (filed in Swedish).</i>
(54) Title: A HOSE COUPLING DEVICE (57) Abstract The invention relates to a hose coupling device, which comprises a male part (11, 16, 21, 26, 30) connectable to a female part (1, 18). The female part (1, 18) consists of a sleeve (2), which is provided with a number of resilient tongues (4) extending in equally spaced relationship along the inner wall (3) of the sleeve (2) and protruding inwards from the inner wall (3) and directed away from the mouth (5) of the sleeve (2). The male part (11, 16, 21, 26, 30) consists of a tube portion with transverse edges (13, 29) in its outer wall (12). At the insertion of the male part (11, 16, 21, 26, 30) into the female part (1, 18) the resilient tongues (4) are arranged to resiliently snap into place behind the transverse edges (13, 29) of the male part (11, 16, 21, 26, 30) and hence connect the female part (1, 18) to the male part (11, 16, 21, 26, 30). The parts can be separated by turning them relative to one another to a position where the resilient tongues (4) assume a position laterally of the transverse edges (13, 29).		



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A HOSE COUPLING DEVICE

The invention relates to a hose coupling device,
5 comprising a male part and a female part, which are
interconnectable.

Many different types of couplings are known, which
are intended to interconnect two hose-pipes or a hose and
a tube. However, all the known embodiments have that in
10 common, that one coupling part, which for example is
attached to the end of a hose by a hose clamp, forms a
protruding part at the end of the hose. This protruding
part is provided with means for connecting the end of the
hose to another coupling part which is mounted on a tube
15 or another hose. Known hose coupling types can therefore
be seen as unnecessarily complicated and hence expensive
constructions.

According to the invention, a hose coupling has been
provided, in which the female part is insertable into the
20 end portion of a hose and said female part is provided
with means for holding the male part after the insertion
thereof into the female part. Hence, a very compact hose
coupling is provided, which is reliable and at the same
time cheap to manufacture. The characteristics of the
25 device according to the invention are described in the
appended claims.

In the following, the invention will be described in
more detail with reference to the accompanying drawings,
in which

Fig. 1 is a longitudinal sectional view of a female part according to the invention and a lateral view of a male part according to one embodiment of the invention,

Fig. 2 is a longitudinal sectional view of the same female part as in Fig. 1 and a lateral view of a male part according to a second embodiment of the invention,

Fig. 3 is a longitudinal sectional view of a female part according to a second embodiment of the invention and a lateral view of a male part according to a third embodiment of the invention,

Fig. 4 is a lateral view of a female part and a male part according to the same embodiment as in Fig. 3,

Fig. 5 illustrates one embodiment comprising two male parts which have been joined together as seen in a lateral view and a first female part as seen in a lateral view for connection from the left as seen in the figure and a longitudinal sectional view of a second female part for connection from the right as seen in the figure,

Fig. 6 is a lateral view of a male part according to a fourth embodiment,

Fig. 7 is an end view of the same embodiment and

Fig. 8 illustrates on a larger scale and schematically a part of the male part in order to illustrate its possibilities of turning within the female part and

Fig. 9 is a lateral view of an alternative embodiment of the male part and

Fig. 10 is an end view of this embodiment.

According to the invention, the device comprises a female part 1, the main component of which is a sleeve 2, which may be made for example of a tube of sheet metal or of extruded plastics. This sleeve 2 is provided with several resilient tongues 4 uniformly spaced around the inner wall of the sleeve 3, which in the embodiment illustrated are equally spaced from the mouth 5 of the

sleeve 2 and directed away therefrom and protruding inwards somewhat from the inner wall 3. Preferably, the resilient tongues 4 are made by punching of slits 6 in the wall of the sleeve 3. At its inner portion, as seen
5 from the mouth 5, the sleeve 2 is provided with a bead 7. When applying a hose 8 over the sleeve 2, the bead 7 forms a ring-shaped external stopping edge, which penetrates into the hose material. An outer sleeve 9 is applied over the end of the hose and is pressed to
10 holding around the end portion of the hose. The material of the hose 8 will then on the one hand be lockingly compressed around the bead 7, and on the other hand, resiliently press the tongues 4 somewhat into the sleeve 2 and increase the spring force thereof. Inside the
15 sleeve 2 the bead 7 forms a ring-shaped track, into which a sealing ring 10 is applied. Hence, the female part 1 will mainly be built into the end portion of the hose 8.

The male part 11 in Fig. 1 is a tube part, which is provided with a number of transverse edges 13,
20 corresponding to the number of resilient tongues 4, in its outer wall 12. These transverse edges 13 may for example be formed by the cutting off of material in the outer wall 12. They could also be formed by press moulding the material or - if the male part 11 is made
25 from plastics - be formed through injection moulding of the male part 11. In the embodiment of the male part 11 shown in Fig. 1, the male part is attached to an externally threaded tube 14 by means of a flange nut 15.

When inserting the male part 11 into the female part
30 1 in the correct angular position so far, that the front section of the male part presses past the sealing ring 10, the resilient tongues 4 will snap into place behind the transverse edges 13 of the male part 11, locking the male part to the female part. Hence, this coupling of the

female part 1 to the male part 11 forms a bayonet coupling.

Because the outer sleeve 9 pressingly abuts against the end portion of the hose, the resilient tongues 4 will
5 be pressed between the male part 11 and the resilient hose material. Consequently, the resilient tongues 4 can be made longer than if they had been lying free, and a relatively small mounting force is then required when connecting the male part 11 to the female part 1.
10 Simultaneously, the coupling can be exposed to a relatively large pulling force without the risk of the resilient tongues 4 bending and the coupling coming apart.

When separating the male part 11 from the female part
15 1, the parts 1 and 11 are turned relative to one another so far, that the resilient tongues 4 will assume a position laterally of the transverse edges 13, and the male part 11 can then be pulled out of the female part 1.

In Fig. 2 an embodiment is illustrated where the
20 female part 1 is identical to that of the embodiment in Fig. 1 but the male part 16 is provided with a threaded portion 17 which is intended to be screwed into a machine of some kind, for example a pump.

In Figs 3 and 4 an embodiment is illustrated, where
25 the female part 18 is formed at its mouth 5 with a transverse flange 19, said flange having a nose 20. In this embodiment the male part 21 is provided with a corresponding transverse flange 22, by means of which the male part 21 is attached to a wall 23 of a machine of
30 some kind. When connecting the female part 18 to the male part 21 and turning the female part 18 into a position, in which each resilient tongue 4 snaps into place behind a transverse edge 13, the nose 20 is simultaneously arranged to engage in a notch 24 in the transverse flange
35 22 of the male part 21. In this manner one gets a clear

visual indication of the two parts 18 and 21 being coupled together without having to listen particularly for the snapping sound, when the resilient tongues 4 engage the rear faces of the transverse edges 13, or
5 having to check the coupling by trying to pull the parts apart.

In Fig. 5 an embodiment is shown in which two male parts 21 are directed away from each other, separated by a middle flange 25 with one notch 24 pointing in each
10 direction. According to this embodiment the coupling is effected in the same way as according to the embodiment last described, that is, a female part 18 is applied onto the male part 21 from each side and is turned, until the nose 20 on each female part 18 engage in its associated
15 notch 24 in the middle flange 25. This embodiment is an example of how joining two hose-pipes 8 can be carried out rapidly.

In Figs 6 and 7 an embodiment is illustrated, where the male part 26 has been designed with such large
20 depressed areas 27 that the remaining sections, having full width, form bars 28 that are equally spaced around the male part 26. The transverse edge portions 29 which extend between the bars 28 thus become considerably larger than according to the above described embodiments
25 of the male part, that is, they extend over a longer part of the circumference of the male part 26, as seen in Figs 7 and 8. As is desirable in certain situations, this makes it possible to rotate the male and female parts relative to one another over a longer section, before the
30 resilient tongues 4 of the female part are transferred up onto the bars 28 and the parts can be separated.

In Figs 9 and 10 an embodiment is shown where the male part 30 has a depressed circumferential portion 31 and hence also one single transverse edge 32 extending
35 around the male part 30. This embodiment has been devised

with a view to allowing an unlimited relative turning of the parts after having connected the male part 30 to the female part 1,18 but preventing the possibility of pulling the parts apart, which is desirable in certain
5 circumstances.

The invention is not limited to the embodiments illustrated and described but can be varied in many ways within the scope of the appended claims. The directions for the correct relative turning position of female part
10 and male part for connecting the parts can of course be carried out differently than by way of the nose 20 and the notch 24, for example with scribed lines or colour markings in the material.

CLAIMS

1. A hose coupling device, comprising a male part (11, 16, 21, 26) and a female part (1, 18) which are interconnectable, characterised in
5 that the female part (1, 18) consists of a sleeve (2), said sleeve being provided with a number of resilient tongues (4) extending in equally spaced relationship along the inner wall (3) of the sleeve (2) and directed away from the mouth (5) of the sleeve (2)
10 and protruding inwards from the inner wall (3), and said sleeve being insertable into the end portion of a hose (8), in that means (9) are arranged to hold the hose (8) and the sleeve (2) together by compressing the end portion of the hose around the sleeve (2), so that the
15 material of the end portion of the hose is pressed resiliently against the resilient tongues (4) to increase the spring force thereof, and in that the male part (11, 12, 21, 26) consists of a tube portion, which is connectable to for example a tube (14) or to a hose (8), said
20 tube portion being provided in its outer wall (12) with a number of transverse edges (13, 29) corresponding to the number of resilient tongues (4) in the sleeve (2) of the female part, said resilient tongues (4) being arranged to resiliently snap into place behind the transverse edges
25 (13, 29) of the male part (11, 16, 21, 26) when the male part (11, 16, 21, 26) is being inserted into the female part (1, 18) and not to allow the pulling apart of the female part (1, 18) and the male part (11, 16, 21, 26), until said parts have been turned relative to one another
30 to a position wherein the resilient tongues (4) assume a position at the side of the transverse edges (13, 29).

2. A device according to claim 1, characterised in that the female part (18) is formed at its mouth (5) with a transverse flange (19), which has a
35 nose (20), said nose arranged, when the female part (18)

is being connected to the male part (21), to engage in a notch (24) in a corresponding transverse flange (22) in the male part (21), as soon as each resilient tongue (4) snaps into place behind a transverse edge (13).

5 3. A device according to any of the preceding claims, characterised in that the transverse edges (13, 29, 32) of the male part (11, 16, 21, 26) are made by the grinding off or cutting off of material in the outer wall (12) of the male part (11, 16, 21, 26,
10 30).

4. A device according to any of the preceding claims, characterised in that the transverse edges (13, 29, 32) of the male part (11, 16, 21, 26, 30) are made by the pressing of material down or into the
15 outer wall (12) of the male part (11, 16, 21, 26, 30).

5. A device according to any of the preceding claims, characterised in that the transverse edges (13, 29, 32) of the male part (11, 16, 21, 26, 30) are made when manufacturing the male part (11, 16, 21,
20 26, 30) through injection moulding.

6. An alternative embodiment of hose couplings, comprising a male part (30) and a female part (1, 18), which are interconnectable, characterised in that the female part (1, 18) consists of a
25 sleeve (2), said sleeve being provided with a number of resilient tongues (4) extending in equally spaced relationship along the inner wall (3) of the sleeve (2) and directed away from the mouth (5) of the sleeve (2) and protruding inwards from the inner wall (3), and said
30 sleeve being insertable into the end portion of a hose (8), in that means (9) are arranged to hold the hose (8) and the sleeve (2) together by compressing the end portion of the hose around the sleeve (2), so that the material of the end portion of the hose is pressed
35 resiliently against the resilient tongues (4) to increase

the spring force thereof, and in that the male part (30) consists of a tube portion, which is connectable to for example a tube (14) or to a hose (8), said tube portion being provided in its outer wall (12) with one single
5 transverse edge (32) extending circumferentially around the male part (30), and in that the resilient tongues (4) are arranged to resiliently snap into place behind the transverse edge (32) of the male part (30) when the male part (30) is being inserted into the female part (1,18),
10 allowing unlimited turning of the male part (30) relative to the female part (1, 18) but preventing the parts from being pulled apart.

AMENDED CLAIMS

[received by the International Bureau on 9 June 1997 (09.06.97);
original claim 6 cancelled; remaining claims unchanged (2 pages)]

1. A hose coupling device, comprising a male part
(11, 16, 21, 26) and a female part (1, 18) which are
interconnectable, c h a r a c t e r i s e d i n
5 t h a t the female part (1, 18) consists of a sleeve
(2), said sleeve being provided with a number of
resilient tongues (4) extending in equally spaced
relationship along the inner wall (3) of the sleeve (2)
and directed away from the mouth (5) of the sleeve (2)
10 and protruding inwards from the inner wall (3), and said
sleeve being insertable into the end portion of a hose
(8), in that means (9) are arranged to hold the hose (8)
and the sleeve (2) together by compressing the end
portion of the hose around the sleeve (2), so that the
15 material of the end portion of the hose is pressed
resiliently against the resilient tongues (4) to increase
the spring force thereof, and in that the male part (11,
12, 21, 26) consists of a tube portion, which is connec-
table to for example a tube (14) or to a hose (8), said
20 tube portion being provided in its outer wall (12) with a
number of transverse edges (13, 29) corresponding to the
number of resilient tongues (4) in the sleeve (2) of the
female part, said resilient tongues (4) being arranged to
resiliently snap into place behind the transverse edges
25 (13, 29) of the male part (11, 16, 21, 26) when the male
part (11, 16, 21, 26) is being inserted into the female
part (1, 18) and not to allow the pulling apart of the
female part (1, 18) and the male part (11, 16, 21, 26),
until said parts have been turned relative to one another
30 to a position wherein the resilient tongues (4) assume a
position at the side of the transverse edges (13, 29).

2. A device according to claim 1, c h a r a c t e r i
s e d i n t h a t the female part (18) is formed at
its mouth (5) with a transverse flange (19), which has a
35 nose (20), said nose arranged, when the female part (18)

is being connected to the male part (21), to engage in a notch (24) in a corresponding transverse flange (22) in the male part (21), as soon as each resilient tongue (4) snaps into place behind a transverse edge (13).

5 3. A device according to any of the preceding claims, characterised in that the transverse edges (13, 29, 32) of the male part (11, 16, 21, 26) are made by the grinding off or cutting off of material in the outer wall (12) of the male part (11, 16, 21, 26,
10 30).

4. A device according to any of the preceding claims, characterised in that the transverse edges (13, 29, 32) of the male part (11, 16, 21, 26, 30) are made by the pressing of material down or into the
15 outer wall (12) of the male part (11, 16, 21, 26, 30).

5. A device according to any of the preceding claims, characterised in that the transverse edges (13, 29, 32) of the male part (11, 16, 21, 26, 30) are made when manufacturing the male part (11, 16, 21,
20 26, 30) through injection moulding.

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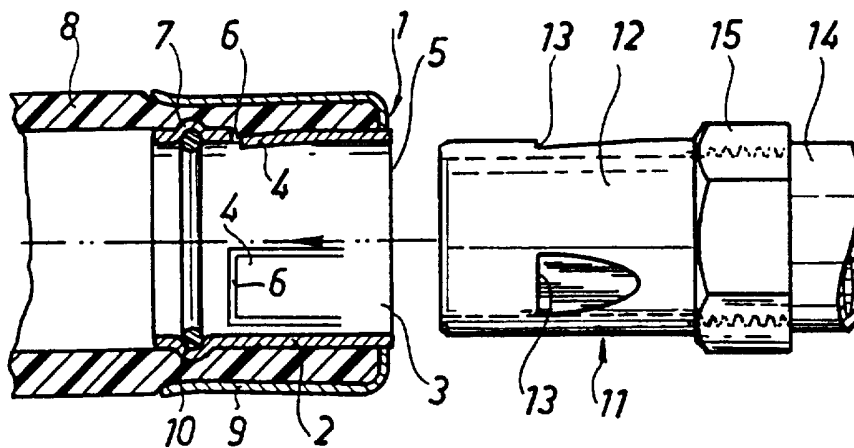


Fig. 1

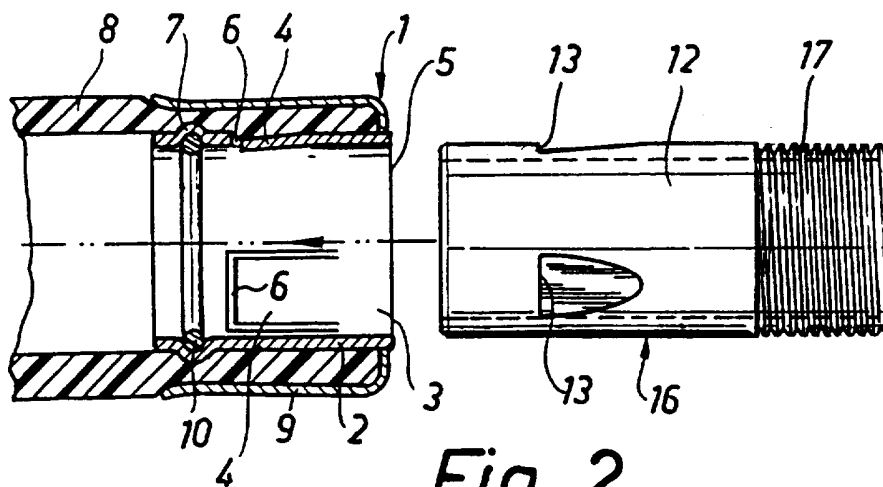
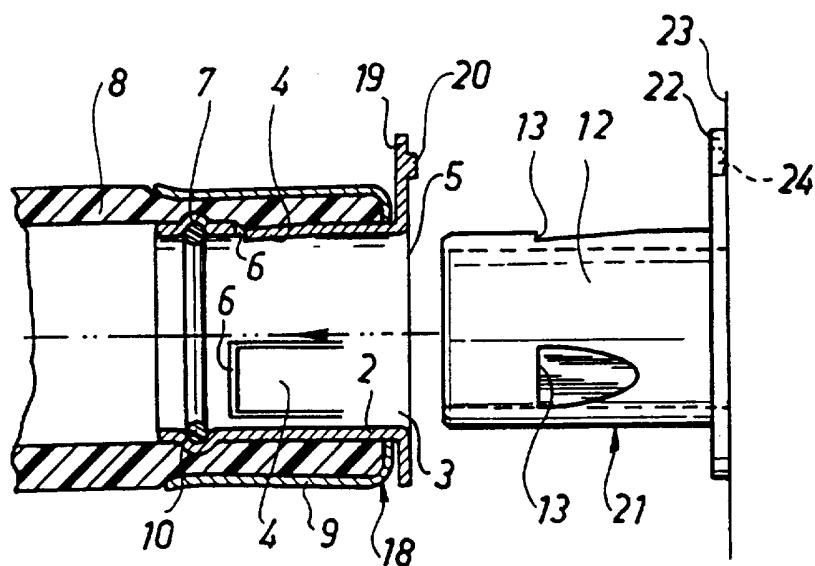
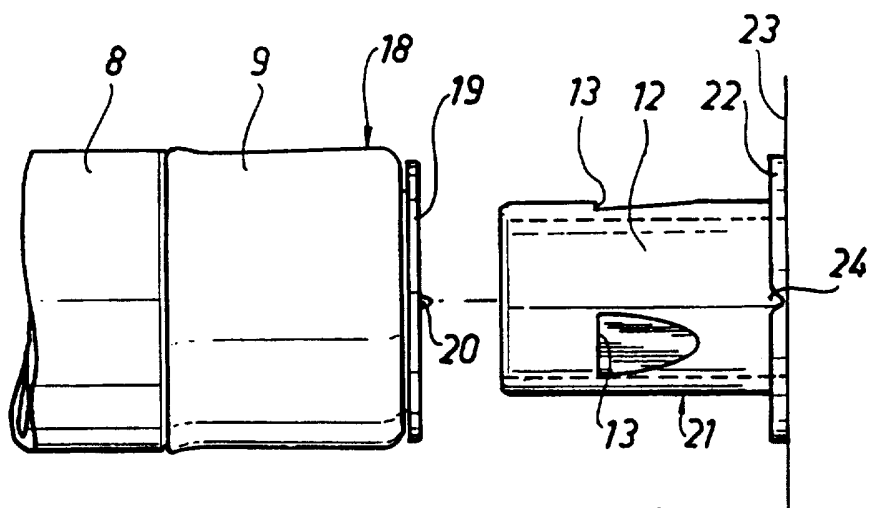


Fig. 2

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*Fig. 3**Fig. 4*

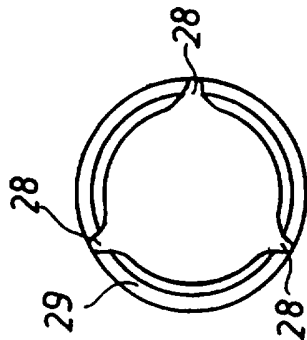


Fig. 7

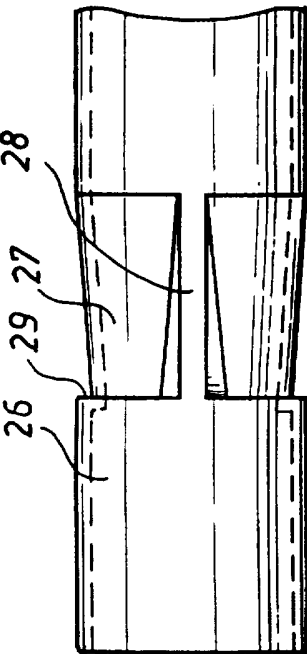


Fig. 6

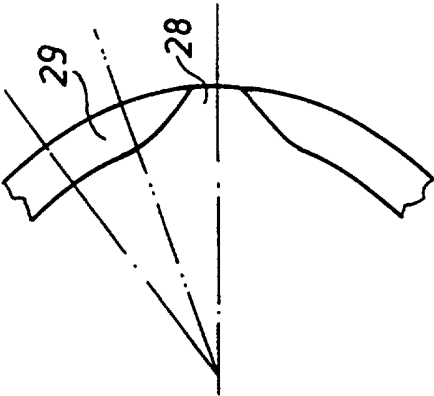


Fig. 8

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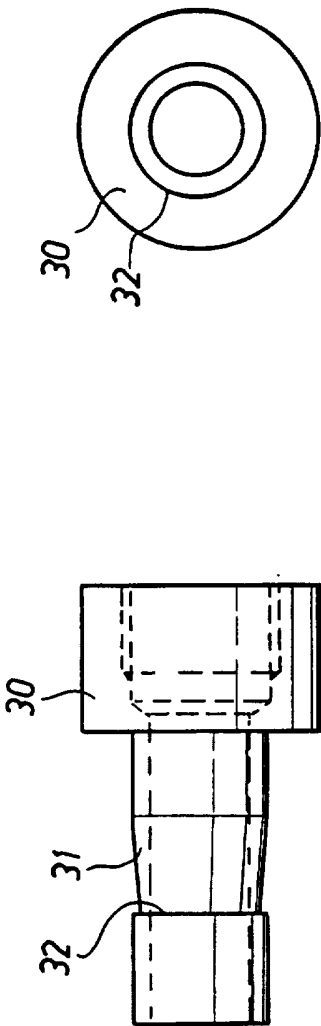


Fig. 10

Fig. 9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 96/01752

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: F16L 33/22, F16L 37/12, F16L 37/24
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)

IPC6: F16L

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

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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 3815167 C1 (RASMUSSEN GMBH), 14 Sept 1989 (14.09.89), figures 1-12 --	6
X	DE 3914645 A1 (RASMUSSEN GMBH), 9 November 1989 (09.11.89), figures 1-5 --	6
A	US 1661674 A (MILTON OSBORN), 6 March 1928 (06.03.28), figures 1-3 -- -----	

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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Date of the actual completion of the international search

9 April 1997

Date of mailing of the international search report

14 -04- 1997

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INTERNATIONAL SEARCH REPORT
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International application No.
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Patent document cited in search report			Publication date	Patent family member(s)	Publication date
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