

# 593650

COMMONWEALTH of AUSTRALIA

PATENTS ACT 1952

## APPLICATION FOR A STANDARD PATENT

I  
-We

Karl WEINHOLD of  
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4040 Neuss 1,  
FEDERAL REPUBLIC OF GERMANY

APPLICATION ACCEPTED AND AMENDMENTS

ALLOWED ..... 5.12.87 .....

hereby apply for the grant of a Standard Patent for an invention entitled:

"PIPE SCREWED CONNECTION"

which is described in the accompanying ~~provisional~~ complete specification.

Details of basic application(s):—

<u>Number</u>	<u>Convention Country</u>	<u>Date</u>
P 36 17 014.3	FEDERAL REPUBLIC OF GERMANY	21st May, 1986
P 37 09 819.5	FEDERAL REPUBLIC OF GERMANY	25 March, 1987

LODGED AT SUB-OFFICE  
18 MAY 1987  
Melbourne

LODGED AT SUB-OFFICE  
18 MAY 1987  
[REDACTED]

The address for service is care of DAVIES & COLLISON, Patent Attorneys, of 1 Little Collins Street, Melbourne, in the State of Victoria, Commonwealth of Australia.

Dated this 18th day of May, 19 87

*H. M. Rimington*

To: THE COMMISSIONER OF PATENTS

.....  
(a member of the firm of DAVIES & COLLISON for and on behalf of the Applicant).

Davies & Collison, Melbourne and Canberra.

# COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

## DECLARATION IN SUPPORT OF CONVENTION OR NON-CONVENTION APPLICATION FOR A PATENT

Insert title of invention,

In support of the Application made for a patent for an invention  
entitled :

PIPE SCREWED CONNECTION

Insert full name(s) and address(es)  
of Declarant(s) being the appli-  
cant(s) or person(s) authorized to  
sign on behalf of an applicant  
company.

~~I~~  
~~We~~

Karl Weinhold  
Im Jagdfeld 43  
4040 Neuss 1 - BRD -  
Federal Republic of Germany

Cross out whichever of paragraphs  
1(a) or 1(b) does not apply.

1(a) relates to application made  
by individual(s).

1(b) relates to application made  
by company; insert name of  
applicant company.

do solemnly and sincerely declare as follows :-

1. (a) ~~We are~~ I am the applicant..... for the patent

~~or (b) I am authorized by~~

~~the applicant..... for the patent to make this declaration on its behalf.~~

2. (a) ~~We are~~ I am the actual inventor..... of the invention

or (b)

Cross out whichever of paragraphs  
2(a) or 2(b) does not apply.

2(a) relates to application made  
by inventor(s)

2(b) relates to application made  
by company(s) or person(s) who  
are not inventor(s); insert full  
name(s) and address(es) of inven-  
tors.

~~is~~  
~~are~~ the actual inventor..... of the invention and the facts upon which the applicant.....  
and ~~is~~  
~~are~~ entitled to make the application as follows :-

The applicant has the consent of Waluga Armaturen GmbH to  
claim priority from the two basic applications.

State manner in which appli-  
cant(s) derive title from inven-  
tor(s)

Cross out paragraphs 3 and 4  
for non-convention applications.  
For convention applications  
insert basic country(s) followed  
by date(s) and basic applicant(s).

3. The basic application..... as defined by Section 141 of the Act ~~was~~  
were made  
in West-Germany..... on the March 25, 1987.....  
by Waluga Armaturen GmbH.....  
in West-Germany..... on the ~~MAY~~  
May 21, 1986.....  
by Waluga Armaturen GmbH.....  
in ..... on the .....  
by .....

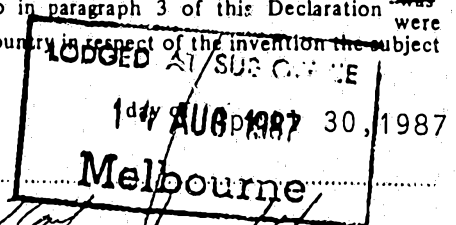
4. The basic application..... referred to in paragraph 3 of this Declaration ~~was~~  
were  
the first application..... made in a Convention country in respect of the invention the subject  
of the application.

Insert place and date of signature.

Declared at Neuss this

Signature of Declarant(s) (no  
attestation required).

Note: Initial all alterations.



(Karl Weinhold)

DAVIES & COLLISON, MELBOURNE and CANBERRA.

(12) PATENT ABRIDGMENT (11) Document No. AU-B-73129/87  
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 593650

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SCREWED PIPE CONNECTION

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(56) Prior Art Documents  
AU 552893 85135/82 F16L 19/10 21/088  
AU 22391/67 74.5  
AU 225537 22576/56 74.5

(57) Claim

1. A liquid-tight, hydraulic, pipe screwed connection having a socket member attachable to one pipe end, a plug-in member at the opposite pipe end which can be partly inserted into the socket member, and a union nut for which the plug-in member as a bearing surface in the form of an annular shoulder and which engages over the plug-in member and is screwed on to the socket member, wherein meshing screwthreaded surfaces disposed on the union nut and on the socket member each have matchingly conical threads and cylindrical threads, said cylindrical threads intersecting said conical threads at the largest diameter of said conical threads, and said cylindrical threads being substantially fewer in number than said conical threads, whereby the angle of conicity of said conical threads is such that rotating the union nut disengages the threads of each threaded member readily by virtue of a gap which is produced between the

(11) AU-B-73129/87  
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conical threads when the threaded members are shifted longitudinally in relation to each other, and wherein opposite coaxial sealing surfaces of each of the plug-in member and the socket member are cylindrical, and a sealing ring is inserted in an annular groove in at least one of said plug-in member and said socket member sealing surfaces and wherein a split locking pin is inserted transversely through the union nut and engages a locking pin shoulder surface in said socket member.

COMMONWEALTH OF AUSTRALIA

PATENT ACT 1952

COMPLETE SPECIFICATION

(Original)

FOR OFFICE USE

593650

Class

Int. Class

Application Number:  
Lodged:

73129/81

Complete Specification Lodged:  
Accepted:  
Published:

Priority:

Related Art:

This document is the  
amendments made under  
Section 49 and is correct for  
printing

Name of Applicant: Karl WEINHOLD

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1 Little Collins Street, Melbourne, 3000.

Complete Specification for the invention entitled:

"PIPE SCREWED CONNECTION"

The following statement is a full description of this invention,  
including the best method of performing it known to me :-

### "PIPE SCREWED CONNECTION"

The invention relates to a screwed connection, more particularly for pipes used under high pressure or accouterments inserted in piping, having a socket member attachable to one pipe end, a plug-in member at the opposite pipe end which can be partly  
5 inserted into the socket member, and a union nut for which the plug-in member has a bearing surface in the form of an annular shoulder and which engages over the plug-in member and is screwed on to the socket member.

Following prolonged use and/or as a result of a dirt-charged  
10 or aggressive atmosphere, such commercially available pipe screwed connection become so clogged by corrosion and/or dirt that some of the screwthreaded connection can be released only with permanent damage, if at all. This applies more particularly to pipe screwed connections underground, which are normally  
15 constructed with a cylindrical, round screwthreading. Such a screwthreaded connection should be readily releasable due to the partially merely linear contact at the flanks of the round screwthreading, but under severe conditions of use even cylindrical, round screwthreaded connections can no longer be  
20 released.

It is an object of the invention to obviate this disadvantage and provide a pipe screwed connection, more particularly a high pressure screwed connection which will withstand even sever operational loadings, such as a heavy  
25 accumulation of dirt and an aggressive atmosphere, in unfavourable conditions of use, for example, under ground and can be readily released at any time.

According to one aspect of the present invention there is



1 provided a liquid-tight, hydraulic, pipe screwed connection  
2 having a socket member attachable to one pipe end, a plug-in  
3 member at the opposite pipe end which can be partly inserted  
4 into the socket member, and a union nut for which the plug-  
5 in member as a bearing surface in the form of an annular  
6 shoulder and which engages over the plug-in member and is  
7 screwed on to the socket member, wherein meshing  
8 screwthreaded surfaces disposed on the union nut and on the  
9 socket member each have matchingly conical threads and  
10 cylindrical threads, said cylindrical threads intersecting  
11 said conical threads at the largest diameter of said conical  
12 threads, and said cylindrical threads being substantially  
13 fewer in number than said conical threads, whereby the angle  
14 of conicity of said conical threads is such that rotating  
15 the union nut disengages the threads of each threaded member  
16 readily by virtue of a gap which is produced between the  
17 conical threads when the threaded members are shifted  
18 longitudinally in relation to each other, and wherein  
19 opposite coaxial sealing surfaces of each of the plug-in  
20 member and the socket member are cylindrical, and a sealing  
21 ring is inserted in an annular groove in at least one of  
22 said plug-in member and said socket member sealing surfaces  
23 and wherein a split locking pin is inserted transversely  
24 through the union nut and engages a locking pin shoulder  
25 surface in said socket member.

26 According to another aspect of the present invention  
27 there is provided a liquid-tight, hydraulic pipe screwed  
28 connection having a socket member attachable to one pipe  
29 end, a plug-in member at the opposite pipe end which can be  
30 ~~said plug-in member and said socket member each having a sealing surface,~~  
31 ~~partly inserted into the socket member,~~ and a union nut for  
32 which the plug-in member has a bearing surface in the form  
33 of an annular shoulder and which engages over the plug-in  
34 member and is screwed on to the socket member, wherein  
35 meshing screwthreaded surfaces disposed on the union nut and  
36 on the socket member each have matchingly conical threads  
37 and cylindrical threads, said cylindrical threads  
38 intersecting said conical threads at the largest diameter of  
said conical threads and said cylindrical threads being

1 substantially fewer in number than said conical threads,  
2 whereby the angle of conicity of said conical threads is  
3 such that rotating the union nut disengages the threads of  
4 each threaded member readily by virtue of a gap which is  
5 produced between the conical threads when the threaded  
6 members are shifted longitudinally in relation to each  
7 other, and wherein the surface of the plug-in member and the  
8 sealing surface of the socket member are matchingly conical  
9 in construction and a sealing ring is inserted in an annular  
10 groove in at least one of the two sealing surfaces and  
11 wherein a split locking pin is inserted transversely through  
12 the union nut and engages a locking pin shoulder surface in  
13 said socket member.

14 According to yet another aspect of the present  
15 invention there is provided a liquid-tight, quick release  
16 connection for connecting two pipe ends comprising:

17 a) a first pipe end on a first pipe having a socket member  
18 attached to said first pipe end, said socket member having a  
19 sealing surface and a meshing screwthreaded surface with a  
20 cylindrical portion and a conical portion;

21 b) a second pipe end on a second pipe having a plug-in  
22 member partially insertable into said socket member, said  
23 plug-in member having a sealing surface and an annular  
24 shoulder with a bearing surface; and

25 c) a union nut substantially surrounding said second pipe  
26 end and engaging said plug-in member bearing surface so as  
27 to retain said union nut disposed around said second pipe,  
28 said union nut having a meshing screwthreaded surface with a  
29 cylindrical portion and a conical portion screwable onto  
30 said socket member, said meshing, screwthreaded surfaces of  
31 said socket member and said union nut being complementary,  
32 said conical portion being substantially greater in length  
33 than said cylindrical portion, said screw threaded  
34 cylindrical portion intersecting said screw threaded conical  
35 portion at the largest diameter of said screw threaded  
36 conical portion, whereby said meshing, screwthreaded  
37 surfaces mesh together and cause said sealing surfaces to  
38 abut each other and to form a liquid-tight seal when said





1 union is screwed fully onto said socket member, and whereby  
2 the angle of conicity of the conical portion is large enough  
3 so that turning the union nut disengages the threads of each  
4 threaded member readily by virtue of a gap which is produced  
5 between the respective conical portions of the union nut and  
6 of the socket member when they are shifted longitudinally in  
7 relation to each other.

8     The advantage of the pipe screwed connection having conical  
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screwthreaded surfaces according to the invention in comparison with the prior art cylindrical screwthreaded connections used is that the engagement of the screwthreading can be released after even less than one rotation. As a result it is very easy to release even pipe screwed connections with a heavily corroded or dirtied screwthreading.

To improve guidance, in a preferred embodiment of the pipe screwed connection according to the invention the union nut and the socket member each have adjoining their conical screwthreaded surfaces a short cylindrical screwthreaded portion having few turns. When the union nut is slid on to the socket member, the screwthreaded connection is first made via the short cylindrical screwthreaded portion, whereafter the conical screwthreaded portions are pulled into one another as the union nut continues to be turned.

The connection between the plug-in member and the socket member via the union nut is self-centering. To this end preferably the sealing surfaces of the plug-in member and the socket member are cylindrical or matchingly conical in constructions. Preferably a sealing ring is inserted to an annular groove in at least one of the two sealing surfaces, to seal off the pipe screwed connection.

Since the pipe screwed connection according to the invention can be readily released, buttress or trapezoidal screwthreadings can now be conveniently used, in which the supporting surfaces under tensile stressing are appreciably larger than in the case of a round screwthreading with which, as already stated, there is partially only linear contact.

Preferred embodiments of the invention illustrated in the drawings will now be explained in greater detail. In the drawings:

Fig. 1 is a longitudinal section through the pipe screwed connection with the union nut firmly screwed on;

Fig. 2 is the same section as Fig. 1, but with the screwed connection loosened;

Fig. 3 is a section to an enlarged scale of the engagement of buttress screwthreading in the tightened condition;

Fig. 4 is the same section as Fig. 3, with the buttress

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screwthreading loosened;

Fig. 5 is a section to an enlarged scale of the engagement between the union nut and the socket member with trapezoidal screwthreading in the tightened condition;

5 Fig. 6 is the same section as Fig. 5, but with the screwthreading loosened;

Fig. 7 is a longitudinal section through a variant embodiment of the pipe screwed connection; and

Fig. 8 is an elevation of the pipe screwed connection shown 10 in Fig. 7.

In the drawings like elements have like references. Referring to Figs. 1 and 2, a plug-in member 2 is welded to the end of one pipe 1, an associated socket member 4 being welded to the end of an opposite pipe 3. A union nut 5 is applied over the 15 plug-in member 2. An annular collar 6 on the plug-in member 2 forms a bearing surface in the form of an annular shoulder 7 for the union nut 5, which engages over the plug-in member 2 and is screwed on to the socket member 4.

The meshing screwthreaded surfaces 8 on the union nut 5 and 20 9 on the socket member 4 are conical in construction. The screwthreaded surface 8 of the union nut 5 widens conically outwards, while the screwthreaded surface 9 of the socket member 4 tapers conically in the direction of its free end. This means that the conicities of the meshing surfaces 8,9 of the union nut 25 5 and socket member 4 match one another.

For centering at the start of tightening the union nut 5 on to the socket member 4, the screwthreaded surface 8 of the nut 5 and also the screwthreaded surface 9 of the socket member 4 each have short cylindrical screwthreading portion 10; 11. The union 30 nut 5 first meshes fully with the socket member 4 over these screwthreading portions. As the union nut 5 is turned further, the threads on the conical surfaces 8, 9 then also mesh, until finally the union nut 5 can be no longer turned and the final position shown in Fig. 1 is reached.

35 When the union nut 5 is screwed onto the socket member 4 the nut entrains the plug-in member 2 and draws it into the socket member 4 (Fig. 2), until the conical sealing surface 13' at the end of the plug-in member 2 contacts the matching conical sealing

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surface 12' of the socket member 4. In the embodiment shown in Fig. 7 the sealing surfaces 12,13 are cylindrical.

Inserted into an annular groove 15 in the plug-in member 2 is a sealing ring 14 which seals the gap between the plug-in member 2 and the socket member 4 when the sealing surfaces 12,13; 12',13' are in engagement.

Preferably the socket member 4 and the union nut 5 have a buttress (Figs. 3 and 4) or trapezoidal screwthreading (Figs. 5 and 6). Figs. 3 and 5 show the relative position of the screwthreading teeth with the union nut 5 fully screwed on to the socket member 4, while Figs. 4 and 6 show the relative position of the screwthreadings with the screwed connection somewhat more released.

For permanent connection (Figs. 7 and 8) a split locking pin 16 can be inserted through a transverse bore 17 in the union nut, the bore being so situated that the pin 16 engages behind the socket member 14, as shown most clearly in Fig. 7.

The reference numerals in the following claims so not in any way limit the scope of the respective claims.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A liquid-tight, hydraulic, pipe screwed connection having a socket member attachable to one pipe end, a plug-in member at the opposite pipe end which can be partly inserted into the socket member, and a union nut for which the plug-in member has a bearing surface in the form of an annular shoulder and which engages over the plug-in member and is screwed on to the socket member, wherein meshing screwthreaded surfaces disposed on the union nut and on the socket member each have matchingly conical threads and cylindrical threads, said cylindrical threads intersecting said conical threads at the largest diameter of said conical threads, and said cylindrical threads being substantially fewer in number than said conical threads, whereby the angle of conicity of said conical threads is such that rotating the union nut disengages the threads of each threaded member readily by virtue of a gap which is produced between the conical threads when the threaded members are shifted longitudinally in relation to each other, and wherein opposite coaxial sealing surfaces of each of the plug-in member and the socket member are cylindrical, and a sealing ring is inserted in an annular groove in at least one of said plug-in member and said socket member sealing surfaces and wherein a split locking pin is inserted transversely through the union nut and engages a locking pin shoulder surface in said socket member.

2. The liquid-tight, hydraulic, pipe screwed connection according to claim 1, wherein the union nut and the socket member have a buttress screwthreading or a trapezoidal screwthreading.

3. A liquid-tight, hydraulic pipe screwed connection having a socket member attachable to one pipe end, a plug-in member at the opposite pipe end which can be partly inserted into the socket member, and a union nut for which the plug-in member has a bearing surface in the form of an annular shoulder and which engages over the plug-in member and is screwed on to the socket member, wherein meshing



screwthreaded surfaces disposed on the union nut and on the socket member each have matchingly conical threads and cylindrical threads, said cylindrical threads intersecting said conical threads at the largest diameter of said conical threads and said cylindrical threads being substantially fewer in number than said conical threads, whereby the angle of conicity of said conical threads is such that rotating the union nut disengages the threads of each threaded member readily by virtue of a gap which is produced between the conical threads when the threaded members are shifted longitudinally in relation to each other, and wherein the <sup>sealing</sup> surface of the plug-in member and the sealing surface of the socket member are matchingly conical in construction and a sealing ring is inserted in an annular groove in at least one of the two sealing surfaces and wherein a split locking pin is inserted transversely through the union nut and engages a locking pin shoulder surface in said socket member.

4. A liquid-tight, quick release connection for connecting two pipe ends comprising:

- a) a first pipe end on a first pipe having a socket member attached to said first pipe end, said socket member having a sealing surface and a meshing screwthreaded surface with a cylindrical portion and a conical portion;
- b) a second pipe end on a second pipe having a plug-in member partially insertable into said socket member, said plug-in member having a sealing surface and an annular shoulder with a bearing surface; and
- c) a union nut substantially surrounding said second pipe end and engaging said plug-in member bearing surface so as to retain said union nut disposed around said second pipe, said union nut having a meshing screwthreaded surface with a cylindrical portion and a conical portion screwable onto said socket member, said meshing, screwthreaded surfaces of said socket member and said union nut being complementary, said conical portion being substantially greater in length than said cylindrical portion, said screw threaded cylindrical portion intersecting said screw threaded conical



portion at the largest diameter of said screw threaded conical portion, whereby said meshing, screwthreaded surfaces mesh together and cause said sealing surfaces to abut each other and to form a liquid-tight seal when said union is screwed fully onto said socket member, and whereby the angle of conicity of the conical portion is large enough so that turning the union nut disengages the threads of each threaded member readily by virtue of a gap which is produced between the respective conical portions of the union nut and of the socket member when they are shifted longitudinally in relation to each other.

5. The liquid-tight, quick release connection according to claim 4 wherein said socket member sealing surface is frusto-conical about an axis substantially parallel to the longitudinal dimension of said first pipe and said plug-in member sealing surface is frusto-conical about an axis substantially parallel to the longitudinal dimension of said second pipe, whereby said socket member sealing surface and said socket member screwthreaded surface define an annular shaped portion that is compressed toward said plug-in member as said union nut is fully screwed onto said socket member.

6. The liquid-tight, quick release connection according to claim 4 wherein said plug-in member includes an annular depression accommodating a sealing ring whereby said sealing ring ensures the sealing of the liquid-tight seal when said union nut is screwed fully onto said socket member by pressing against said socket plug-in member sealing surface.

7. The liquid-tight, quick release connection according to claim 6 wherein said union nut further includes a transverse bore for accommodating a locking pin whereby said locking pin engages a locking pin shoulder surface in said socket member so as to prevent loosening of said union nut.

8. The liquid-tight, quick release connection according to claim 4 wherein the meshed, screwthreaded surface of each of the socket member and the union nut include screwthreads having a buttressed shape.

9. The liquid-tight, quick release connection according to claim 4 wherein the meshed, screwthreaded surface of each of



the socket member and the union nut include screwthreads having a trapezoidal shape.

10. A liquid-tight, hydraulic pipe screwed connection substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 27th day of October, 1989.

DAVIES & COLLISON  
Patent Attorneys for  
KARL WEINHOLD





Fig. 1

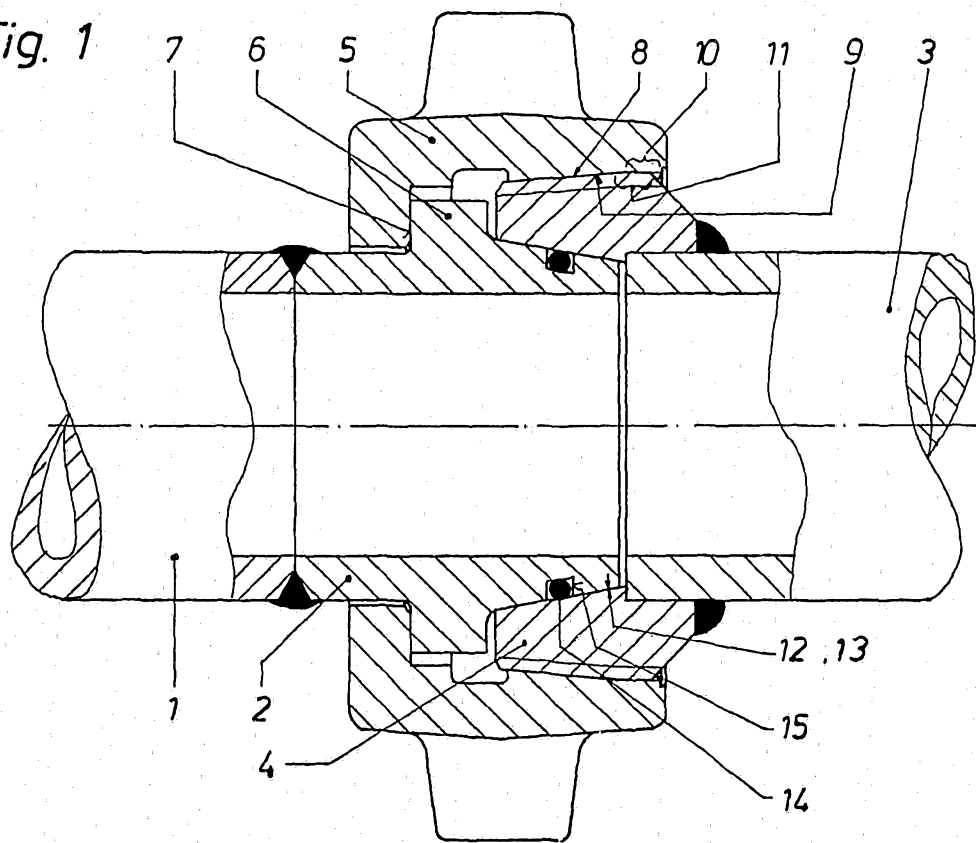


Fig. 2

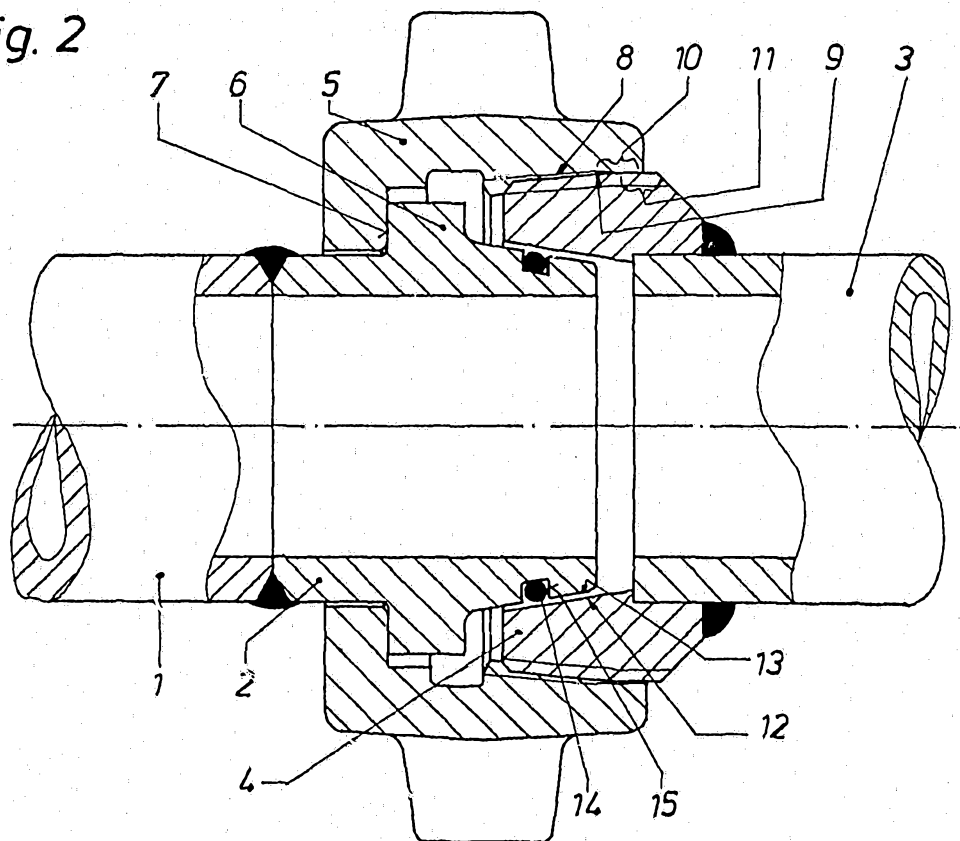


Fig. 3

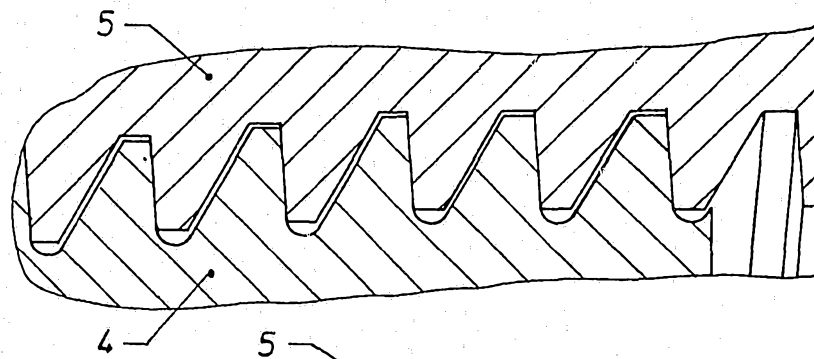


Fig. 4

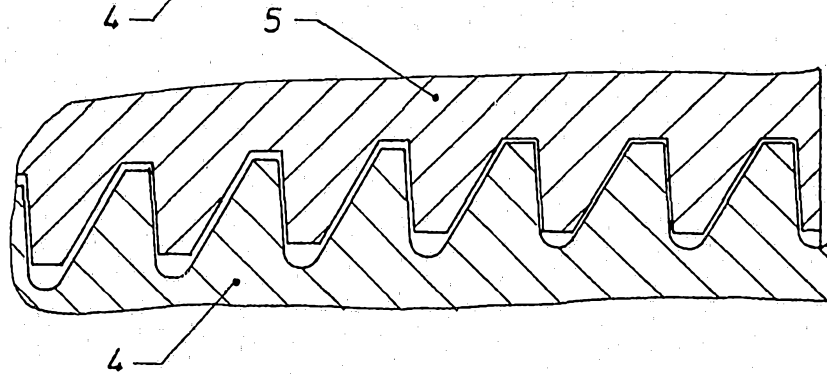


Fig. 5

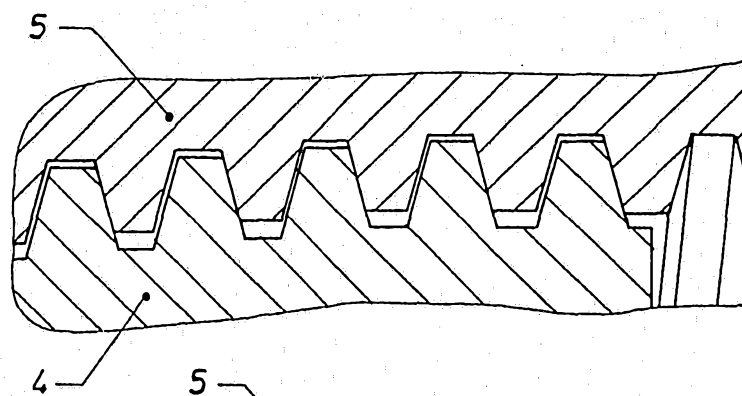


Fig. 6

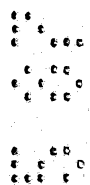
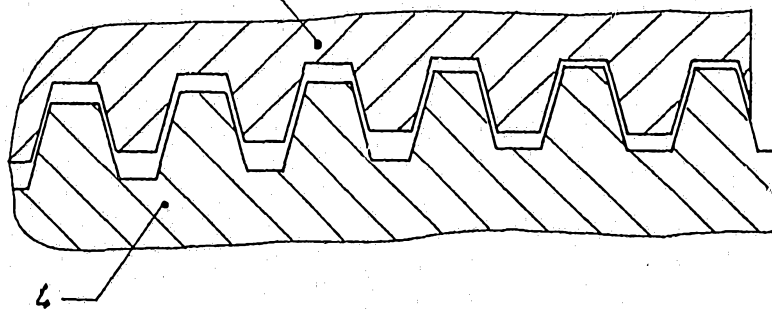


Fig.8

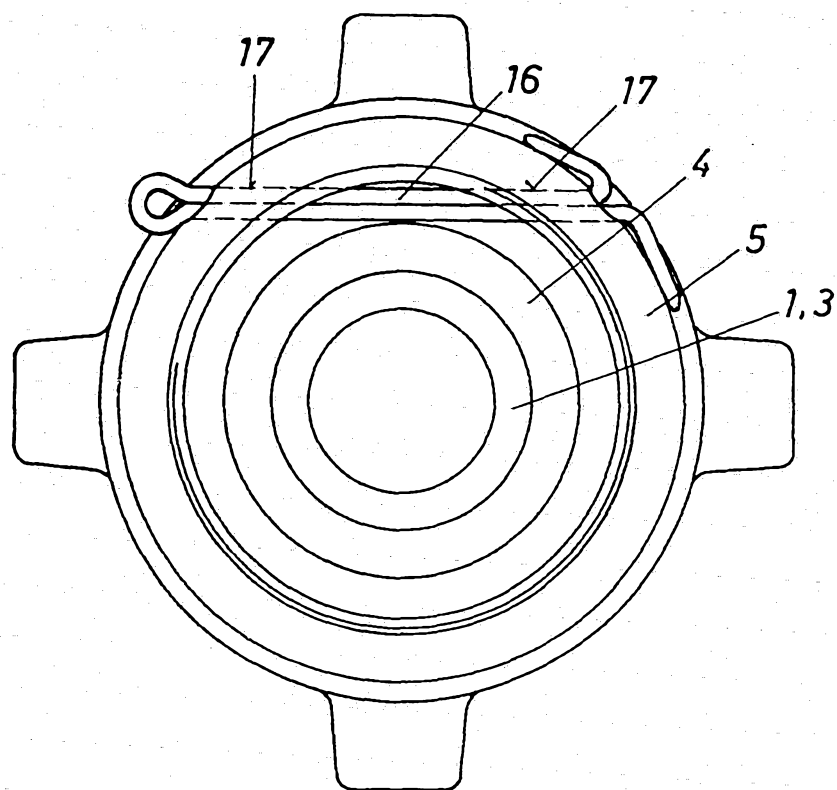


Fig.7

