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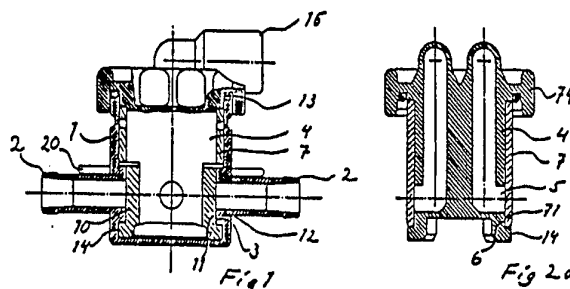
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54 Virsraksts: **Medicīnā izmantojama ierīce šķidrums cauruļu savienošanai**

57 Kopsavilkums: Medicīnā izmantojamas šķidrums cauruļvadu savienošanas ierīces korpusam (1) un savienotājam (4), kas pievienojams korpusam, ir blīvējošas virsmas (3,6). Savienotāja (4) blīvējošo virsmu aizsardzībai tās ir pārklātas ar aizsarga (7) aizsargvirsmām (71) pirms savienotāja saistīšanas ar korpusu (1). Aizsargs (7) ir izveidots tā, lai neatsegtu blīvēšanas virsmas (6) saistīšanās laikā korpusā. Ierīce ir konkrēti piemērota pacienta asinsrites pievienošanai ārējai sistēmai, un tā atļauj nepārtraukt arteriovenoza hemofiltrāciju.



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**MEDICĪNĀ IZMANTOJAMA IERĪCE ŠĶIDRUMA CAURUĻU
SAVIEÑOŠANAI**

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PATENTA FORMULA

1. Medicīnā izmantojama ierīce šķidruma cauruļu savienošanai, konkrēti, pacienta asinsrites sistēmas savienošanai ar ārēju sistēmu, kurā ir asins apstrādes ierīce, kas satur korpusu (1) ar divām ārējām īscaurulēm (2) un savienotāju (4), kas satur pirmo un otro caurumus (5) savienošanai caur kanāliem ar ārējo sistēmu vai šķidruma avotu, minētais savienotājs ir ievietojams korpusā un minētam savienotājam (4) ir aizsargs (7), kas ir
15 pārvietojams attiecībā pret savienotāju (4),
atšķirīga ar to, ka

-korpuss (1) satur iekšējas blīvēšanas virsmas (3) ap ārējo īscauruļu (2) atverēm korpusa iekšienē;
20 -savienotājs (4) satur ārējas blīvēšanas virsmas (6) rajonā ap minētajiem caurumiem (5);
- pārvietojamais aizsargs (7) satur aizsargvirsmas (71), kas pārklāj ārējās blīvēšanas virsmas (6), tādējādi aizsargājot tās no ārējām iedarbībām, kad savienotājs ir korpusa ārpusē; un
25 - ierīce ir piemērota aizsarga (7) izņemšanai no ārējām blīvēšanas virsmām (6) un savienošanai ar korpusa iekšējām blīvēšanas virsmām (3), ievietotā stāvoklī saistot savienotāju ar korpusu, lai iegūtu pamatā pret sūci drošu savienojumu starp minētajiem caurumiem (5) un ārējām īscaurulēm (2).

30

2. Ierīce, saskaņā ar 1. punktu,
atšķirīga ar to, ka korpusā (1) ievietoti ventiļi, kas ir regulējami starp stāvokļiem, kad īscaurules (2) ir slēgtas un kad tās ir atvērtas.

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3. Ierīce, saskaņā ar 2. punktu,
atšķirīga ar to, ka minētie ventiļi satur vārstuļus (10) ar
vārstuļu virsmām (11), kas slēgtā stāvoklī ir kontaktā ar
korpusa iekšējām blīvēšanas virsmām.

5

4. Ierīce, saskaņā ar 1.-3. punktiem,
atšķirīga ar to, ka blīvēšanas virsmas (3,6), tāpat kā
aizsargvirsmas (71) un vārstuļu virsmas, ir cilindru apvalka
virsmu daļas.

10

5. Ierīce, saskaņā ar 4. punktu,
atšķirīga ar to, ka aizsargs ir izveidots kā aizsargčaula (7), kas
novietota uz savienotāja, var pagriezties un ir aksiāli fiksēta
attiecībā pret savienotāju.

15

6. Ierīce, saskaņā ar 5. punktu,
atšķirīga ar to, ka pamatā cilindriskais korpus (1) satur
vismaz vienu uz iekšpusi biezāku daļu (12, 42), kura iekšpusē ir
minētās iekšējās blīvēšanas virsmas, un kuras novērš
20 aizsargčaulas griešanos, kad savienotāju, kad tas ievietots
korpusā, griež līdz savienojošam stāvoklim.

7. Ierīce, saskaņā ar jebkuru no 4.-6. punktiem,
atšķirīga ar to, ka attiecīgās blīvēšanas virsmas (3,6) un
25 aizsargvirsmas (71) ir pamatā diametrāli novietotas un katra
stiepjas līdz 90^0 pa aploci.

8. Ierīce, saskaņā ar jebkuru no 1., 4., 5. un 6. punktiem,
atšķirīga ar to, ka korpusā (1) ir vārsts (36), minētais vārsts
30 aktīvā stāvoklī tieši savieno ārējās īscaurules (2) savā starpā, un
ka savienotājs (4) apgādāts ar līdzekļiem vārsta (36)
pārvietošanai neaktīvā stāvoklī, kad savienotājs (4) ir pievienots
korpusam, lai iegūtu, kā minēts iepriekš, pret sūci drošu
savienojumu.

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- 5 9. Ierīce, saskaņā ar jebkuru no 1., 3. un 4. punktiem,
atšķirīga ar to, ka aizsargs ir izvietots tā, lai pie aksiālas
pārvietošanas attiecībā pret savienotāju tas neatsegtu ārējās
blīvēšanas virsmas.
- 10 10. Ierīce, saskaņā ar jebkuru iepriekšējo punktu,
atšķirīga ar to, ka korpuss ādas tuvumā ir apgādāts ar
implantējamiem atlokiem (20), uz kuriem uzaugt pacienta ādai.
- 15 11. Ierīce, saskaņā ar 3. punktu,
atšķirīga ar to, ka vārsts satur vismaz vienu elastīgu atdures
izcilni (63), kam atbilst vismaz viens atdures robs (65) sienas
biezākā daļā rotācijas ierobežošanai slēgtā stāvoklī.
- 20 12. Ierīce, saskaņā ar jebkuru no 1.-11. punktiem,
atšķirīga ar to, ka tā satur atsevišķu savienotāju (30), kas ir
piemērots ievietošanai korpusā savienotāja (4) vietā, minētais
savienotājs (30) satur kanālu (31), kas ievietotā stāvoklī tieši
savieno ārējās īscaurules (2) savā starpā, un pārvietojamu
aizsargu (7), kas atbilst savienotāja aizsargam (7).
- 25 13. Ierīce, saskaņā ar 12. punktu,
atšķirīga ar to, ka savienotājs (30) satur caurlaidošu
šķērssienu (60) starp kanālu (31) un ārieni.

FLUID CONDUIT CONNECTING DEVICE FOR MEDICAL PURPOSES

The invention concerns a fluid conduit connecting device for medical purposes, particularly for the connection of the blood circuit of a patient to an external circuit for blood filtering or other blood treatment according to the preamble of claim 1.

A great number of patients today depend on blood filtering appliances. A common cause for this is acute renal failure, i.e. a non functional kidney system. Patients with this diagnosis may either receive a transplanted kidney or be treated with dialysis. Before transplantation comes into the question, the patient is however obliged to use dialysis. This is also the only solution for many patients due to the fact that transplantation is not feasible for one reason or the other and due to the shortage of kidneys available for transplantation. Thus, in Sweden today approximately 1600 patients are regularly treated with dialysis. This means a great strain, not only to the patients themselves, as it brings about frequent appearance at the hospital and stay at the premises during a period of at least three to four hours. It also brings about great costs for the society, the annual costs for one patient in dialysis may today be estimated to SEK 500 000. A very large part of the costs relate to personel, equipment and premises and it is therefore desired to be able to conduct the treatment in the homes, which would lead to great economic gain.

Of the different systems available today for conducting blood filtering one equipment may be mentioned which leads the blood from a blood vessel of the patient, transports it by means of an external pump through a blood treatment equipment and thereafter reinjects it into the patient.

Another solution is continuous ambulatory peritoneal dialysis, where an existing membrane in the body, which could be the abdominal membrane, is used. In this case blood is present on one side of the membrane, at the same time as a solution of

salt and glucose, acting as a purifying liquid, is introduced to the other side of the membrane.

5 For the treatment of acute renal failure, continuous arterio-venous hemofiltration (CAVH) has recently been used. The principle of this method is continuous filtration of the blood, with the heart of the patient being used as the pump for pressing the blood through an external so called shunt circuit, wherein the blood is continuously filtered. After
10 filtering the blood is reintroduced to the patient in a purified state.

All known systems to be connected to the blood circuit of the patient are associated with drawbacks of different kinds.
15 The problem of sterility is particularly serious, since all kinds of external equipment being connected to a patient brings about a risk of introducing infections into the blood circuit. As an example of a device for the connection of an external circuit to a blood circuit of a patient
20 EP-A2-0 087 189 could be mentioned, wherein an external member comprising two needles is inserted into a housing, through a self-sealing septum, the housing being transplanted into the body of the patient. The insertable needles of this device involve a substantial risk of introducing infections into the
25 blood stream of the patient. In known types of shunt devices, conventional tube joints are used, being connected to inserted or transplanted connections for artery and vein respectively in the patient.

30 US-A-4 496 350 describes a connecting device, where the needles are protected by a displaceable protective member for preventing the openings of the outer portions of the needles from exerting cutting action on the blood leakage preventing septum. Also this device brings about a great risk of intro-
35 ducing infections into the blood stream.

A different kind of connecting device is described in

SE-B-453 801 wherein a connecting half with artery or vein connections is implanted into the patient, and from the outside connectable to an external circuit by means of an external connecting half, which is designed as a naked male portion, insertable into the implanted connecting half so as to allow CAVH-treatment.

In all these known devices the connections are unfortunately sources of infections that could be introduced into the patient despite the latter device comprising arrangements for sterilisation.

There are also problems of sterility in connections of the external circuit and when connecting different sources of fluidum to a patient.

It is an object of the invention to provide a solution to the above mentioned problems and particularly to provide a connecting device allowing frequent CAVH-treatment of patients under maintained requiered hygienic standard. Further objects are to provide a connecting device which is easy to handle, economic in manufacture, tolerable by the patient and biocompatibel.

These objects are accomplished by a device according to the present invention, being characterized by the features of the characterizing part of claim 1. The device is particularly suitable for implantation into a patient with a portion of the housing extending outside the skin and allows the patient's own blood pressure to be used as propellant to circulate the blood through an outer blood treatment circuit, e.g. a dialyser, and in a purified state, still using the patients own blood pressure, reintroduce the blood to the blood stream of the patient under maintained sterility in the outer connecting member coming into contact with the housing. By thus protecting the connecting surfaces of the outer connecting member from coming into contact with the air or external objects before they are brought into cooperation with corresponding

surfaces inside of the housing, there will be a radical reduction of the risk of infections.

5 Other objects are accomplished by further features according to the depended claims:

By the embodiment according to claims 2 and 3, the outward coupling means may be closed in a simple manner at the same time as the connecting member is withdrawn from the housing.

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Claims 4 - 7 specify different details in connection with the device being entirely or in part rotational symmetric and that the connection is achieved by rotation of the connecting member relative to the housing when it has been axially inserted into the housing.

15

The construction according to claim 8 accomplishes that the housing is permanently carrying a valve member which may be displaced from an active position, where it directly connects the outward coupling means with each other to an inactive position, and where these are instead connected to the outer circuit via the connecting member. Through this embodiment no separate joining member is needed, since the joining function is obtained by the valve member being permanently seated within the housing. In this embodiment, the housing is preferably covered with a simple protective lid between treatments of the patient. This embodiment is however less suitable in connection with longer treatment periods due to the risk of coagulation within the connecting channel of the valve member in the inactive position.

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The feature according to claim 10 facilitates the patient's skin to grow onto the implanted device.

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The feature of claims 12 and 13 allows the outward coupling means to be directly connected to each other between treatment

periods as well as the possibility of allowing immediate access to the blood stream e.g. for medication purposes.

The invention will now be explained in greater detail with reference to the appended drawings:

Figs. 1 - 6 show an embodiment of the invention with the connecting members in different mutual positions in central sections, fig. 1. 2b. 3 and 5, however, only partly sectioned;

Figs. 7a - e show perspective views of the different members being part of an embodiment of the invention, and

Fig. 8 shows an alternative embodiment of the valve portion of the device.

Fig. 1 shows an essentially circular cylindric housing 1, with nipple-shaped outward coupling means, comprising artery and vein joints 2 when the housing is implanted into a human body. At the mouths of these coupling means within the housing, there are inward sealing surfaces 3 formed on inward thickened wall portions 12 in the housing, in the area of the artery and vein joints. A partly cylindric replaceable valve member 10 is inserted within the housing and cooperates by means of valve surfaces 11 with the inward sealing surfaces 3 of the housing in the position shown in fig. 1. The artery and vein joints are thus closed. The valve member 10 is at its lower end (at the bottom in fig. 1) provided with guide ribs 14, by which it is held in the shown axial position by the thickened wall portions 12. Further a connecting member 4 is inserted into the housing 1. This connecting member 4 which is shown separately in figs. 2a och b, carries a protective sleeve 7 on its cylindrical mid portion, between a protective cover 74 and guide ribs 14 (fig. 2a). The protective sleeve 7 will thus be rotatable around the connecting member 4 but axially fixed to the latter. The protective sleeve 7 is provided with protective surfaces 71, protecting and covering outward sealing

surfaces 6 of the connecting member 4. First and second openings 5 of the connecting member 4, communicating with the outer circuit through channels in the connecting member 4, are thus closed in the position shown in fig. 2a. The protective sleeve 7 is cut in its lower portion (at the bottom in the figures, c.f. fig. 2b) so as to occupy at the most 90° in the rotational direction in the area of each of the outward sealing surfaces 6 of the connecting member.

Thus, the protective sleeve 7 is in the position shown in fig. 2a with respect to the connecting member 4 when this member is inserted into the position according to fig. 1. From this position the connecting member is rotated 90° to reach the position shown in fig. 3, whereby the first and second openings 5 of the connecting member 4 will communicate with the artery and vein coupling means 2 so that the latter will be connected to the external circuit via conduit joints 15 or the like (at the top in fig. 3). During rotation of the connecting member 4 from the position according to fig. 1 to the position according to fig. 3, the protective sleeve 7 is prevented from rotating by the inward thickened wall portions 12. The outward sealing surfaces 6 of the connecting member 4 thus will instead lie close to the corresponding sealing surfaces 3 of the housing 1. When the connecting member 4 is in the position according to fig. 3 it is, besides being axially fixed to the housing through cooperation between the guide ribs 14 and the lower surfaces of the thickened wall portions, also sealed by the sealing ring 13.

In fig. 4 the device is shown in a section perpendicular to the section according to fig. 3 with the connecting member in a connected position with respect to the housing. The protective sleeve 7 is in the same position as in fig. 1. The valve member 10 is coupled to rotational cooperation with the connecting member when the latter is inserted into the housing. Finally fig. 4 shows a so called implanting flange 20, surrounding the cylindrical wall of the housing and being adapted

to be located directly below the skin of the patient. The implanting flange 20 will facilitate the growth of the skin of the patient on to the device. The implanting flange allows a certain movement of the housing with respect to the skin of the patient without the appearance of "gaps" at the implanted housing.

Fig. 5 shows the cooperation of a separate joining member 30 with the housing 1 in a normal position (without inserted connecting member), i.e. when the patient is not subject to blood treatment. This joining member 30 comprises a preferably straight channel 31, which directly connects the artery and vein coupling means with each other. Further the joining member 30 also carries a protective sleeve to protect the outward sealing surfaces from external influences. The joining member is inserted into the housing in the same way as the connecting member as described above.

Fig. 6 shows the housing with inserted joining member 30 in a section corresponding to fig. 4. The joining member 30 here carries a penetrable septum, which is comprised of a silicon rubber element 60, between the channel 31 and the outside. Hereby an immediate introduction to the blood stream of substances, as e.g. medical compounds, is possible by penetrating the septum, with a needle of the like. The member 60 is fixed by means of a fixing plate 61, which cooperates with a slot in the joining member with its rib 62.

Fig. 7a thus shows a perspective partly sectional view of the housing 1. The figure shows the thickened wall portions 12 with inward sealing surfaces 3 in the areas of the mouths of the artery and vein coupling means within the essentially cylindrical housing. Further the implanting flanges 20 are shown.

Fig. 7b shows the valve member 10 with valve surfaces 11 and guide ribs 14. To enable the valve member 10 to be locked

in rotational direction in the closing position within the housing 1, it is provided with one or more arresting projections 63, which cooperate(s) with arresting recesses 65 in the thickened wall portions of the housing 1 (see fig. 7a). Each
 5 arresting projection 63 is linked to a pressure pin 64 which may be actuated by surfaces 66 of the joining member or the connecting member respectively (see fig. 4). This actuation is accomplished when inserting, by the surfaces 66, via the
 10 pressure pin 64 pressing the arresting projection 63 downwards thereby freeing it from cooperation with the arresting recess 65, and thus freeing the valve body for rotational movement.

Fig. 7c shows the connecting member 4 without protective sleeve. The arrows A and V respectively indicate the direction
 15 of the blood flow from the artery coupling means to the vein coupling means. The connecting member 4 is provided with a protective cover 74 for sealing the upper part of housing 1. Further dashed lines indicate how the first and second openings 5 communicate with the joints 15 of the external circuit. The outward sealing surfaces 6 are located in the area
 20 around the first and second openings 5. Finally the connecting member 4 comprises guide ribs 14 at its lower portion for cooperation with the housing in a previously described manner.

Fig. 7d shows the protective sleeve 7 with one of the protective surfaces 71. At its upper part, the protective sleeve 7 is provided with projections 72 on resilient portions 73, said
 25 projections cooperating with recesses in protrusions 77 of the connecting member and the joining member, respectively (see fig. 2b). Said projections and recesses allow snap-in arrestment in a distinct rotational position to be obtained between the protective sleeve 7 and the connecting member 4 and the
 30 joining member 30, respectively. Further the protective sleeve 7 on its upper part is provided with portions 75, the side surfaces 76 of which cooperate with surfaces 78 of said protrusions 77 for limiting the mutual rotation between the
 35 connecting member/joining member and the protective sleeve.

Due to this limitation and snap-in arrestment, safe control of the connection of the connecting member/joining member into the housing is achieved.

5 Fig. 7e shows the joining member 30 with a channel 31 and the protective cover 74.

To be able to place a protective sleeve 7 e.g. on a connecting member 4 the protective cover 74 (or possibly the guiding
10 ribs) constitutes a separate fastenable part of the connecting member 4. After having placed the protective sleeve 7 onto the lower part of the connecting member 4, the protective cover 74 may be fastened to said lower part in any suitable manner e.g. by glueing.

15 Fig. 8 shows an alternative embodiment with a specially shaped valve member. A housing 1 is thus shown with artery and vein coupling means 32. The housing 1 is in this case provided with one single thickened inward wall portion 42, on the inside of
20 which the inward sealing surfaces are located. A connecting member 34 is inserted into the housing and comprises first and second openings 35, which communicate with the outer circuit. Further the connecting member 34 carries a protective sleeve 37, which protects the one and only outward sealing surface of
25 the connecting member 34 in the position shown in the figure. A valve member 36 with a channel 33 provides the desired connection of the artery and vein coupling means 32 (in the position shown in the figure) when the patient is not subject to treatment. For the connection of the artery and vein coupling means to the outer circuit, the connecting member 34 is
30 rotated 180°, whereby the first and second openings 35 will be placed right in front of the mouths of the artery and vein coupling means 32 within the housing 1. The protecting sleeve 37 is stopped in the shown position by its cooperation with
35 the thickened inward wall portion 42.

Further modifications are of course possible within the scope of the invention. E.g. the protective surfaces may be arranged to free the sealing surfaces in any other way than by rotation of a connecting member with respect to a protective sleeve.

5 The protective member thus does not have to be rotational symmetric and may alternatively free the surfaces through axial displacement. The sealing surfaces may also take up relatively smaller dimensions than as has been shown in the embodiments. The channels of the connecting member and (where
10 appropriate) in the valve member may have another line up than the shown. The housing may also be of any other shape than cylindrical, e.g. box-shaped. If the device is rotational symmetric the locking of the connecting member/joining member within the housing may be accomplished in any other suitable
15 manner than the shown, e.g. by a conventional bayonet-mount in the area of the protective lid. Hereby exact positioning in rotational direction will be easily achieved.

The housing is produced from a material suitable for implanting, particularly titanium, which is well documented in
20 similar applications and has been found tissue compatible. The artery and vein coupling means may consist of PTFE or any other suitable material. The other details, as connecting members etc. are to be regarded as disposable equipment and is
25 thrown away after use. This generally also applies to all the other equipment of the external circuit, including the artificial kidney.

The device may also be adapted for other kinds of blood treatment. Alternative uses which may be mentioned, are infusion
30 e.g. total parenteral nutrition (TPN), blood stream sampling, heart failure treatment, gas exchange as oxygenizing, cytostatic treatment as well as the connection of artificial organs, e.g. pancreas. Further a number of other kinds of blood filtering or blood treatments as e.g. plasmatransfusion, plasmolysis,
35 immunoadsorption, cell separation and cell treatment.

Finally, the connecting device according to the invention is also very suitable for use as an advanced conduit coupling for a number of medical purposes where a high hygienic standard is demanded. In these cases the housing is thus not implanted
5 into a patient but is part of an external circuit, e.g. in connection with catheters to gain access to the blood stream or different cavities in the organism, as well as to introduce different substances into the external circuit. The housing may hereby be modified in such a way that it does not comprise
10 details concerning its use as an implant. Another possible modification consists in that only one outward coupling means extends from the housing.

C L A I M S

1. Fluid conduit connecting device for medical purposes,
particularly for connecting the blood circuit of a patient to
5 an external circuit, wherein an equipment for blood treatment
is arranged, comprising a housing (1) with two outward
coupling means (2), and a connecting member (4), which compri-
ses first and second openings (5) communicating with the
external circuit or a fluidum source via channels, said
10 connecting member (4) being insertable into the housing and
said connecting member (4) carrying a protective member (7)
being moveable with respect to the connecting member (4),
c h a r a c t e r i z e d in
- 15 - that the housing (1) comprises inward sealing surfa-
ces(3) in the areas around the mouths of the outward
coupling means (2) within the housing;
 - that the connecting member (4) comprises outward sea-
20 ling surfaces (6) in the areas around said openings
(5);
 - that the moveable protective member (7) comprises
protective surfaces (71), covering the outward sea-
ling surfaces (6), thereby protecting these from ex-
25 ternal influences when the connecting member is out-
side of the housing; and
 - that the device is adapted to remove the protective
member (7) from the outward sealing surfaces (6) and
bring these into cooperation with the inward sealing
30 surfaces (3) of the housing when connecting the con-
necting member in the inserted position within the
housing, to obtain an essentially leakproof connec-
tion between said openings (5) and the outward
coupling means (2).
- 35 2. Device according to claim 1, c h a r a c t e r i z e d
in a valve means being located within the housing (1) and

being adjustable between a position where the coupling means (2) are closed and a position where they are opened.

5 3. Device according to claim 2, c h a r a c t e r i z e d in that said valve means comprises a valve member (10) with valve surfaces (11), in the closing position cooperating with the inward sealing surfaces of the housing.

10 4. Device according to any of the claims 1-3, c h a r a c t e r i z e d in that the sealing surfaces (3,6) as well as the protective surfaces (71) and the valve surfaces (11) are parts of envelope surfaces of cylinders.

15 5. Device according to claim 4, c h a r a c t e r i z e d in that the protective member is comprised of a protective sleeve (7) being arranged on the connecting member and being rotatable and axially fixed with respect to the connecting member.

20 6. Device according to claim 5, c h a r a c t e r i z e d in that the essentially cylindrical housing (1) comprises at least one inward thickened portion (12,42), which on the inside is provided with said inward sealing surfaces, and which prevents the rotation of the protective sleeve when the
25 connecting member is rotated to a connecting position in its inserted position within the housing.

30 7. Device according to any of the claims 4-6, c h a r a c t e r i z e d in that the respective sealing surfaces (3,6) and protective surfaces (71) are comprised of essentially diametrically located surfaces, each one extending at the most 90° in rotational direction .

35 8. Device according to any of the claims, 1, 4, 5 and 6, c h a r a c t e r i z e d in that a valve body (36) is arranged within the housing (1), said valve body in an active position directly connecting the outward coupling means (2)

with each other, and that the connecting member (4) is provided with means for displacing the valve body (36) to an inactive position when the connecting member (4) is connected to the housing, in order to obtain said essentially leakproof connection.

9. Device according to any of the claims 1, 3 and 4, characterized in that the protective member is arranged to uncover the outward sealing surfaces by an axial displacement with respect to the connecting member.

10. Device according to any of the previous claims, characterized in that the housing is provided with implanting flanges (20), in the area of the skin level, for the skin of the patient to grow on to.

11. Device according to claim 3, characterized in that the valve body comprises at least one resilient arresting projection (63), cooperating with at least one arresting recess (65) in a thickened wall portion, for rotational locking in a closing position.

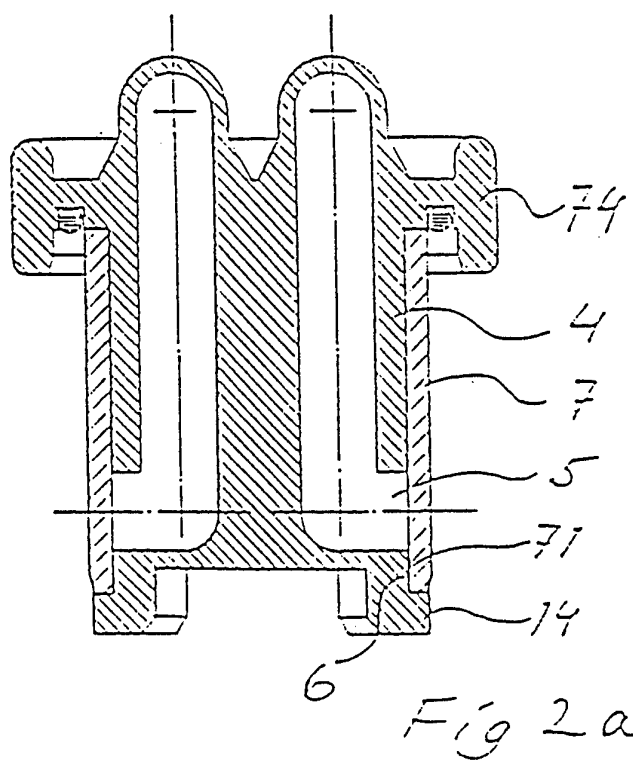
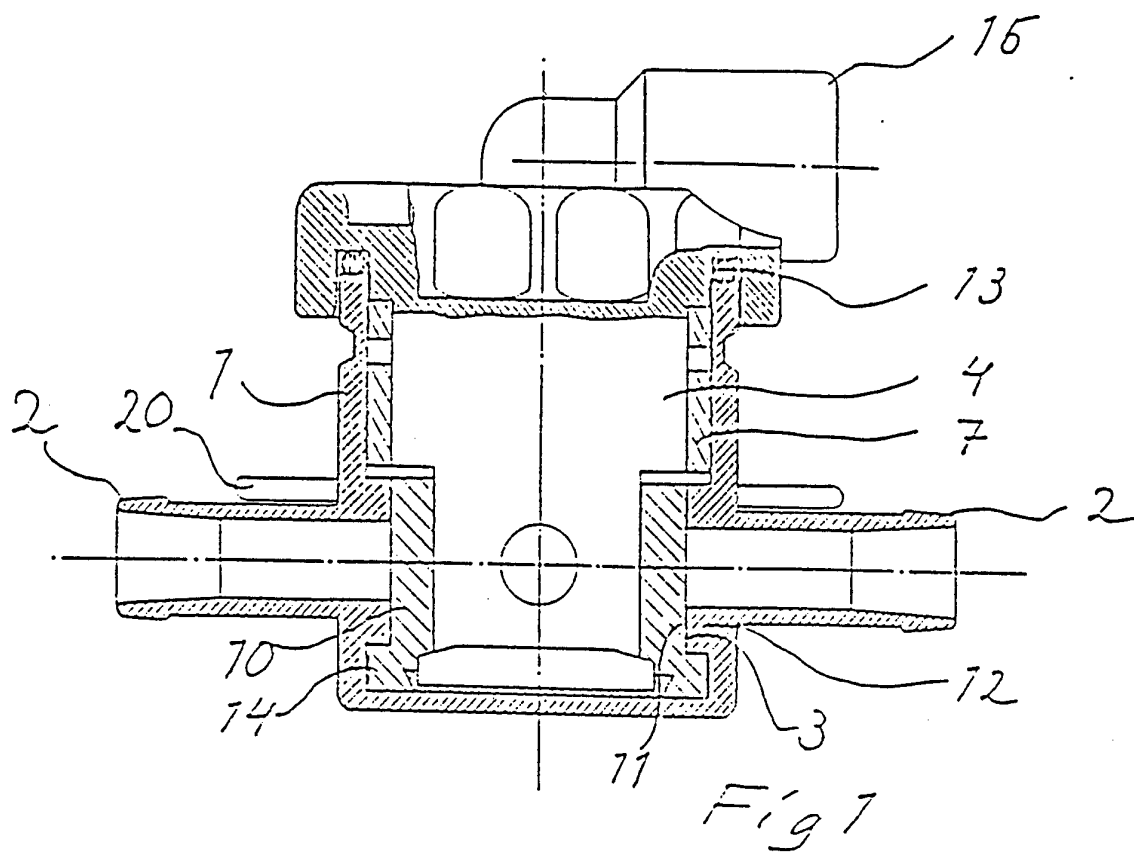
12. Device according to any of the claims 1-11, characterized in that it also comprises a separate joining member (30), which is adapted to be inserted within the housing instead of the connecting member (4), said joining member (30) comprising a channel (31), which in an inserted position directly connects the outward coupling means (2) with each other, and a moveable protective member (7) corresponding to the protective member (7) of the connecting member.

13. Device according to claim 12, characterized in that the joining member (30) comprises a penetrable septum (60) between the channel (31) and the outside.

A B S T R A C T

In a fluid conduit connecting device for medical purposes a housing (1) and a connecting member (4), being connectable to the housing, carry cooperating sealing surfaces (3,6). For the purpose of protecting the sealing surfaces of the connecting member (4), these surfaces are covered by protective surfaces (71) of a protective member (7) prior to the connection of the connecting member (4) to the housing (1). Protective member (7) is arranged to uncover the sealing surfaces (6) when the connection into the housing takes place.

The device is suitable particularly for connecting the blood stream of a patient to an external circuit and allows continuous arteriovenous hemofiltration (CAVH).



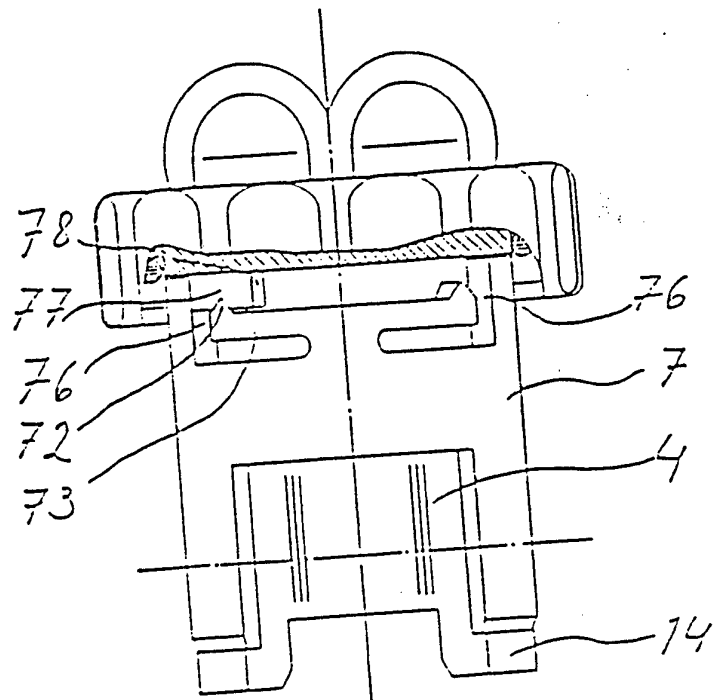


Fig 2 b

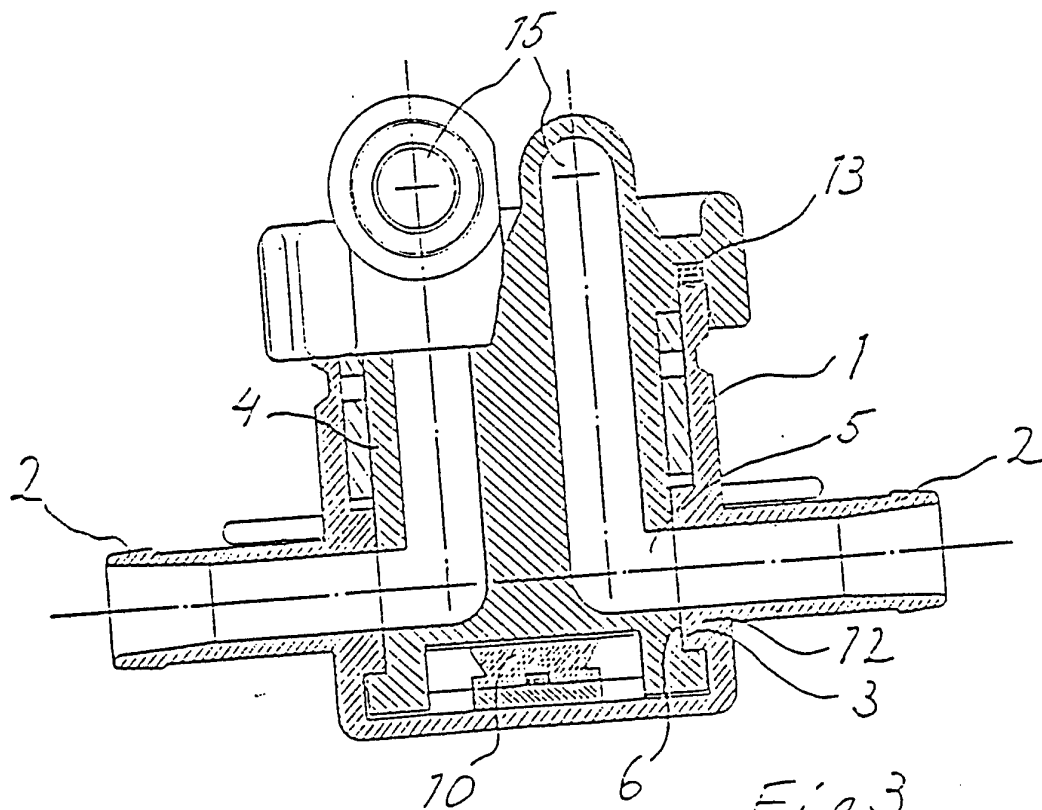


Fig 3

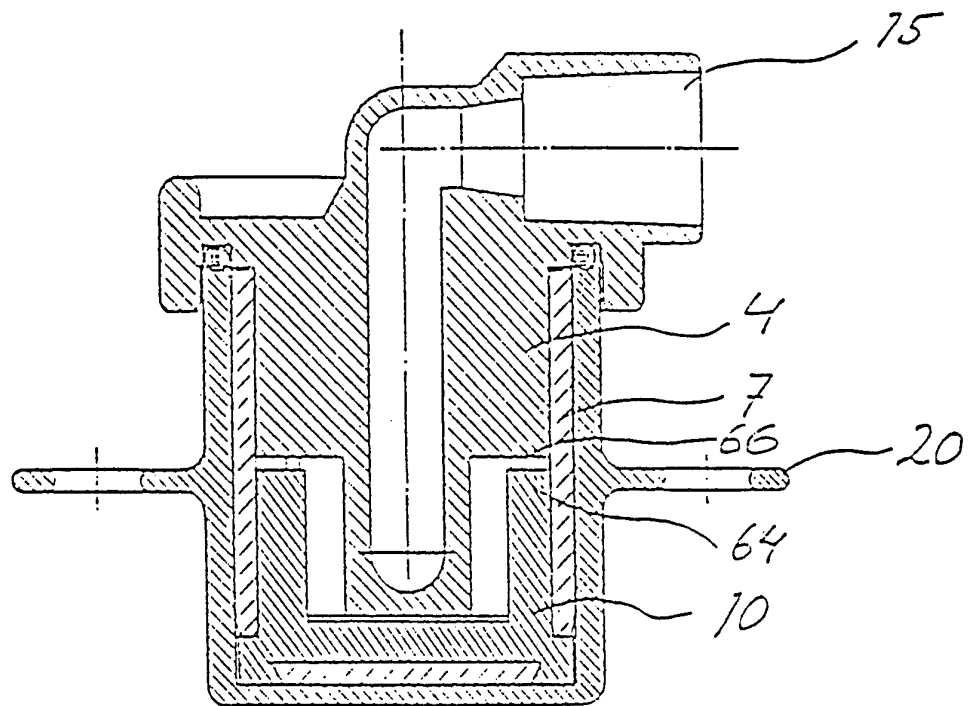


Fig 4

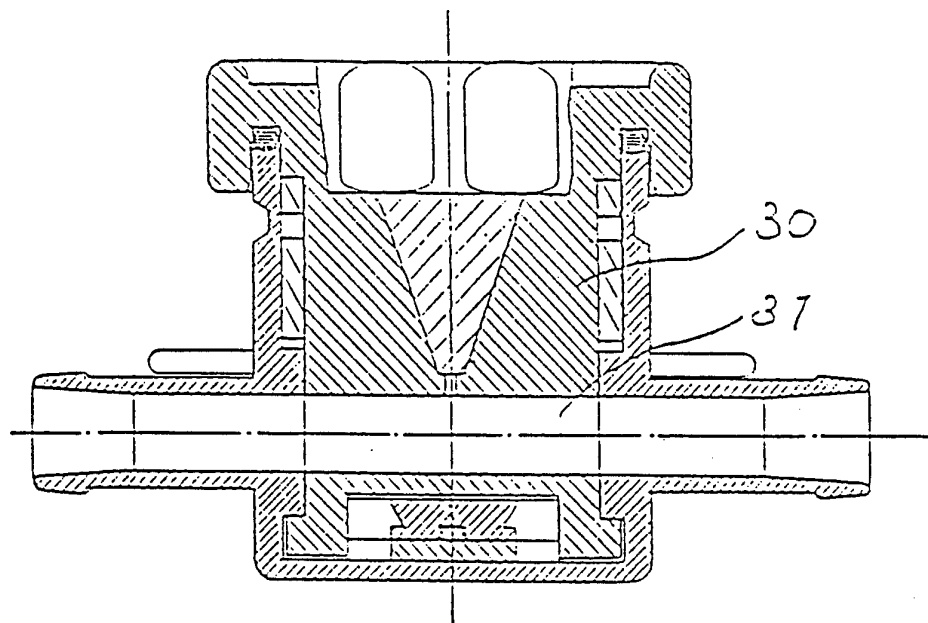
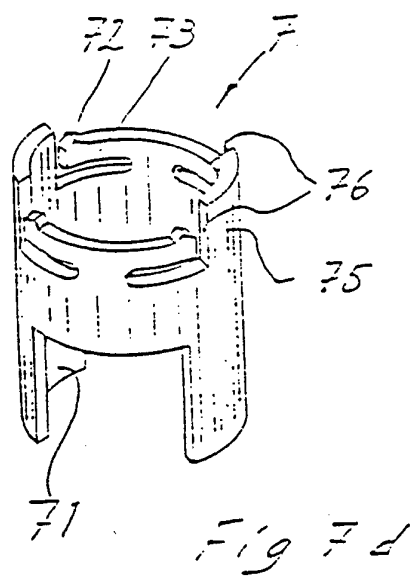
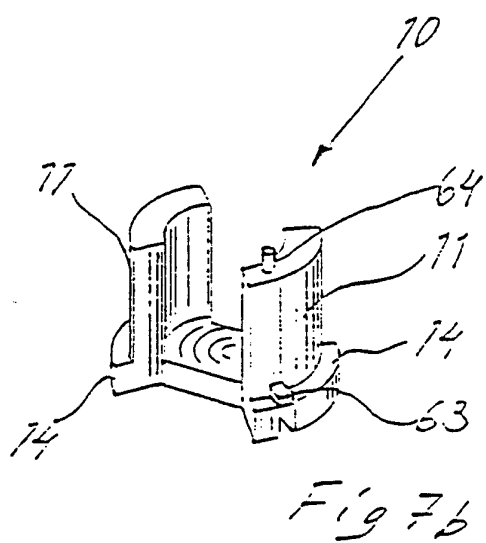
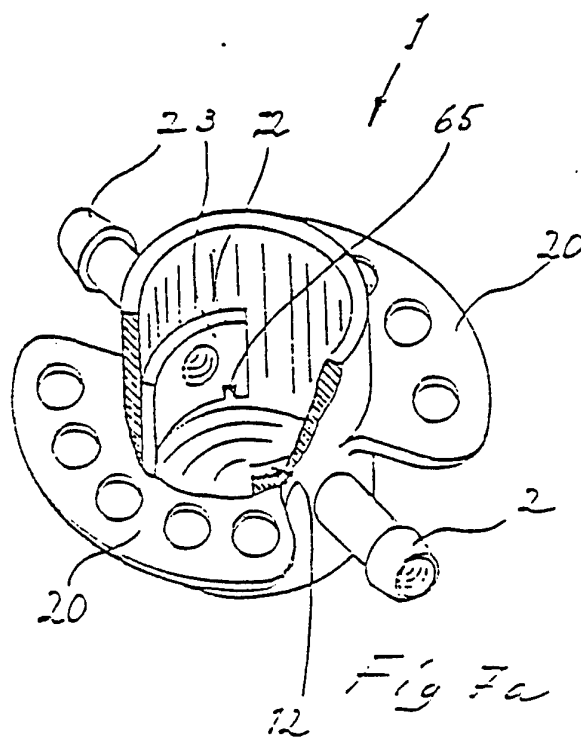
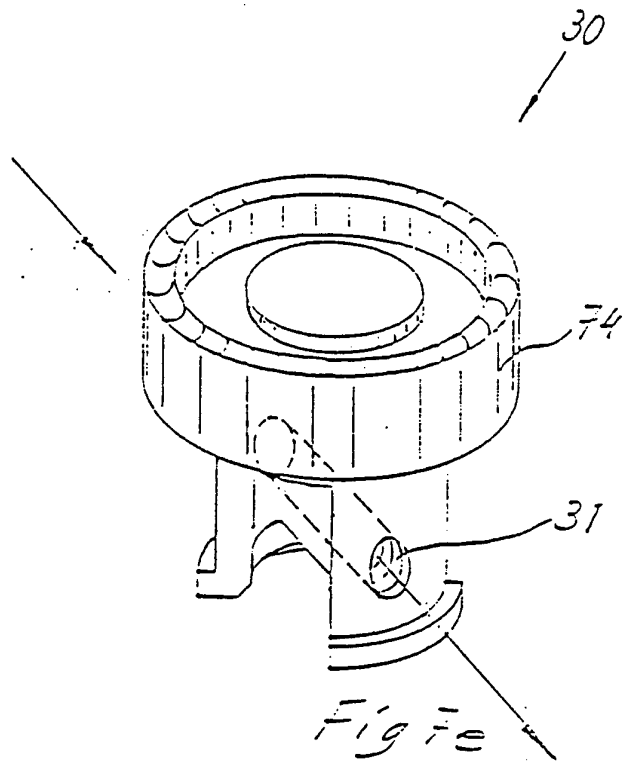
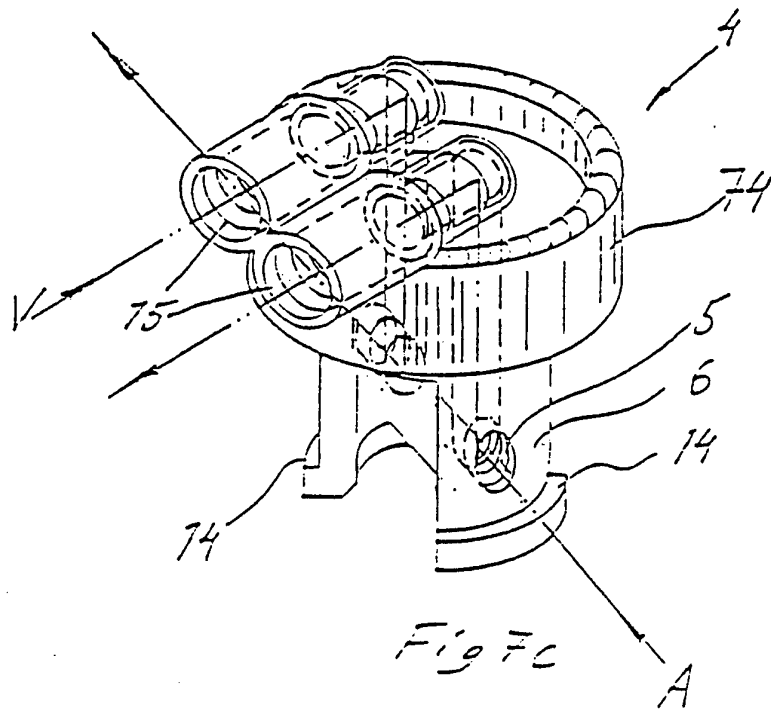


Fig 5





6/6

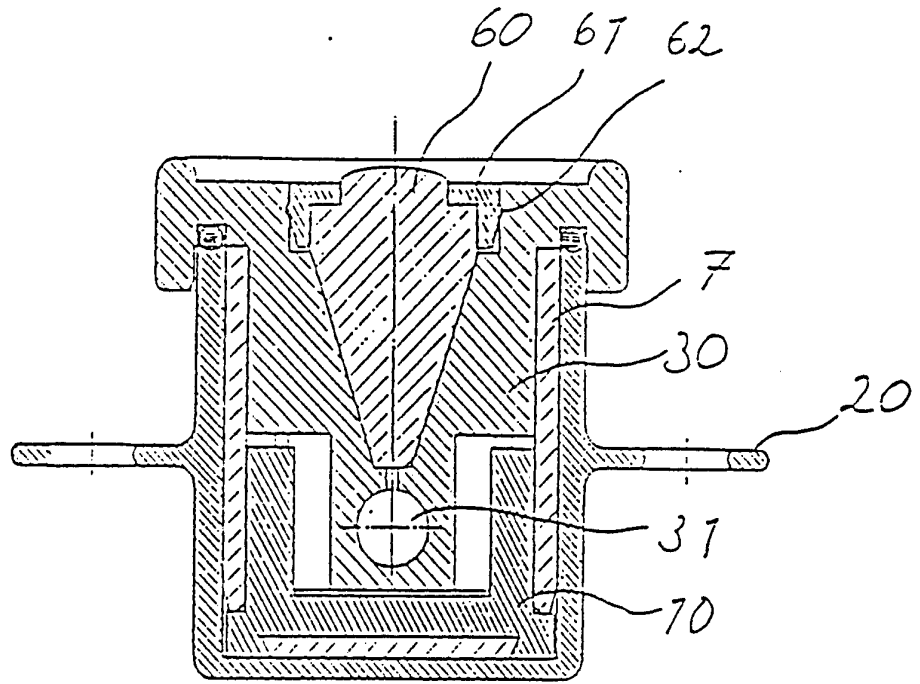


Fig 6

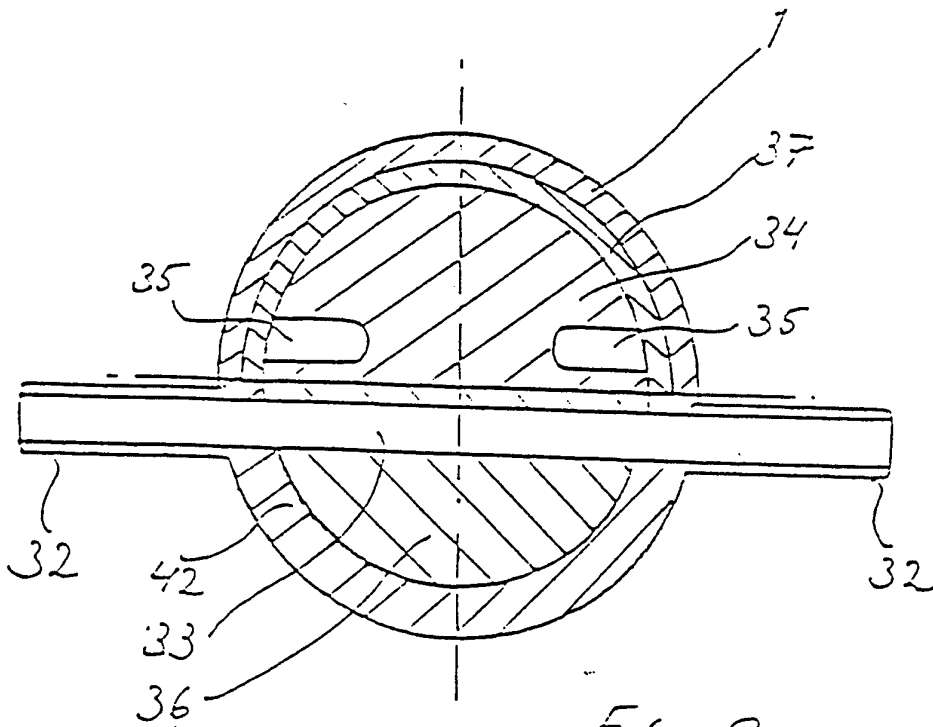


Fig 8