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73 Proprietor: **IB-Produktor HB**
Tunavägen 7
S-616 00 Aby(SE)

72 Inventor: **Dahlin, Ake Bertil Ingemar**
Storgatan 131
S-384 00 Blomstermala(SE)

74 Representative: **Onn, Thorsten et al**
AB STOCKHOLMS PATENTBYRA
Zacco & Bruhn
P.O. Box 23101
S-104 35 Stockholm (SE)

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Description

This invention concerns a thread joint particularly in connection with adjustable legs or jacks for platforms for instance in the shape of floors in tents used together with caravans in order to increase the available protected area. A main problem in establishing a floor supported in many points which is to be adjustable to any surface is that the adjusting possibility preferably shall be great as compared to the thickness of the floor. Of course jacks of known type can be used but they have in common, firstly, that they are relatively complicated and, secondly, it is difficult to obtain sufficient adjustment in comparison with the floor thickness or, in other words, it is difficult to obtain a great relationship between the maximum and the minimum length of the jack or the leg. This is in practice particularly the case with floors under tents arranged in connection with caravans. The ground under the floor is mostly not prepared for the floor and the floor is necessary to enable the use of the tent in bad weather since the ground might become muddy and slippery. Today this need of a floor under caravan tents has been solved by using used wood in different shapes, for instance from loading pallets. Of course such a construction can be satisfactory for permanent arrangements but the construction is definitely not easy to move. Furthermore, the different legs of the floor may sink differently with time, resulting in an uneven surface of the floor and a corresponding time consuming work to regain the even surface. An uneven floor is not only aesthetically unpleasant but may be uncomfortable and dangerous.

One attempt to overcome the above mentioned problems is shown in FR-A-2 178 736 describing a jack or support leg that is extendable by means of extension pieces that can be inserted between the head of the jack and its adjusting or lifting threaded member. The parts are aligned to each other by means of holes and pins extending into these holes. In this way the adjustable height is increased but the jack will be very cumbersome to use, since lateral access is necessary.

In view of the above it is the object of the invention to solve these problems and to provide a device for this. This is achieved by means of a thread joint comprising at least two threaded bodies with identical outer threads, which bodies are provided with interlocking means capable of transferring a turning force between the bodies in at least one direction, and abutment means capable of transferring forces in at least one axial direction between the threaded bodies and that in the abutting and force transferring position the threads of the bodies coincide and form a single continuous thread that can be threaded into and through a nut.

The tread joint in accordance with the invention makes it possible to continuously lengthen for instance the screw part of a jack that can be inserted from above in the case with the floor until the sufficient length of a leg is obtained.

Further characteristics and advantages of the invention as well as its appliances are apparent from the following description of an embodiment of the invention shown in the drawings. In the drawings Fig 1 shows a lateral projection of a floor in accordance with the invention, Fig 2 the same floor as seen from above, Fig 3 a support leg of a tent floor in accordance with the invention, Fig 4 the same support leg as in Fig 3 but with means for the operation, Fig 5 details of Figs 4, 6 and 7 of alternative embodiments of the support leg as far as its locking is concerned, Figs 8 and 9 a section of a reciprocal locking of the support leg parts and Fig 10 the thread profile.

As is apparent from Figs 1 and 2 the tent floor according to the invention comprises a plurality of square modules 1 which are connected at their corner points by means of jacks or support legs 2 which will be described in greater detail below. The length of the support legs 2 is adjustable, which allows of adaptation to the ground. Moreover, as the lateral beams 3 framing the modules are restrictedly elastically attached to the support legs 2 the risk of no ground contact of a support leg, if this is carelessly adjusted with following great breaking risks is eliminated. In this way the adjustment of the support legs is also simplified so that the floor becomes even and all the support legs absorb the pressure. If the structure should be non-elastic it would be difficult to decide if the force absorption at each support leg functions. By using the above-mentioned support leg it will, moreover, always be easy to adapt the level of the tent floor from the upper side to possible ground changes.

In Fig 3 a support leg in the form of a support leg housing 31 is shown, in the bottom of which a nut 32 is arranged nonrotatably. The threaded support leg 33 extends through this nut 32. The support leg consists of a lower portion 34 and an upper joint portion 35. Moreover, such a joint portion is shown freely above the very support leg. The support leg is terminated at its bottom portion by a foot member 36. Each support leg portion 34, 35 includes a cylindrical, lightly tapered hole into which a corresponding projecting pin 37 on the portions 35 of the support leg portions 35 can be pushed. When the tapered pins 37 are pushed into the tapered holes 38 the shoulder portion 39 between pins and thread will abut against the upper end 40 of the support leg portion located below. Moreover, a key grip is arranged in the bottom of each tapered recess 38 at the very front or down on the pin, respectively, which key grip is quite

simply semi-circular in this case. In the position defined by this key grip 41 the threads agree for the consecutive support leg portions. In this way it will be possible to fill up with support leg portions 35 as desired when the support leg 33 is threaded downwards until it gets into contact with the ground and has lifted the support leg housing 31 to the desired height. For screwing down the support leg the key or the crank 42 shown in Fig 11 is used. This crank is also provided with a key grip corresponding to the key grip 41 furthest below. However, as distinguished from the key grip between the different portions the lower end of the key or crank is bevelled, see Fig 33, which bevelling has been designated 43. The crank 42 is further provided with a stop means 44 which will abut the upper end of the support leg housing 31 because there is a need of a new support leg portion when the support leg has been screwed down enough. Therefore the key grip of the crank 42 and the support leg portion 43 will slide apart until the bevelling 43 presses the key 42 upwards. As the crank is bevelled the driving ability is only lost in one direction while it is maintained in the other direction, and therefore the support leg can always be screwed up again if desired.

In order to reduce the risk of vibrations or the like the support leg 33 is slowly turning the nut 32, this has outer conical surfaces with the cone tip upwards in the bottom 45 of the support leg housing 31. The nut 32 is held on its place axially by a washer 46 which is held fast in turn by means of nuts 47 which also holds the bottom 45 of the support leg housing 31 to the support leg housing 31. As the nut 32 has a slight axial play and is for instance provided with a slot or is lightly elastic a compression of the nut 32 against the parts 34 or 35 of the support leg is obtained, as soon as there is a load on the support leg, which prevents thread wandering.

The support legs can also be locked in the way shown in Fig 6 where the support leg 50 is directly threaded in the bottom 49 of a support leg housing 48. However, a threaded washer 51 is arranged beneath the bottom 49 with a slight axial play, which washer is also threaded onto the support leg 50. The axial play of the washer and its turning stop, respectively, are so arranged that the thread in the bottom and the washer 51, respectively, agree at downward turning while at upward threading the washer must in a way not shown be retained in this position (e.g. by pushing down a rod or the like through a hole arranged in the housing) in order to prevent the washer from accompanying the turning of the support leg so much that the threads are wedged reciprocally.

Fig 7 shows a further way of locking the support leg in a definite position. In this case the

bottom 53 of the support leg housing 52 is provided with a horizontal slot 54. In the portion 55 beneath the slot a screw 50 is threaded which can be actuated from above and clamps the slot 54 together and locks the threading in this way.

In order to prevent the support leg portions from falling apart when no axial compressive load is present a device such as is exemplified in Figs 3, 8 and 9 can be used. Two recesses 57 and 58, respectively, are arranged straight in front of each other in the cylindrical upper portion of each support leg section. The recess 58 is relatively small while the recess 57 is relatively broad and a circlip 59 is arranged in these. The circlip has axially a height corresponding to abut the pitch as apparent from Fig 3. In unactuated state the spring ring 59 is in the position shown in Fig 9, i.e. it extends to the thread tops. However, when the circlip and the recesses, respectively, are screwed into the thread of the nut 32 the circlip 59 is pressed by the nut inwards in radial direction. The circlip will then expand in the portions being within the tapered recess of the support leg portion where, moreover, a recess is arranged to be able to absorb at least the width of the circlip so that it comes on a level with the cone surface at its lower edge. The circlip will then enter the position shown in Fig 8. In the position shown in Fig 8 the circlip 59 will release the groove 60 running all around on the support leg portion 35 and this can be removed out of the lower support leg portion. In other words, support leg portions can always be inserted and taken out of support leg portions located below when the circlip section 53 is in the nut 32. The internal groove running all around in the cylindrical portion of the support leg section 35 need not be undercut as the lower edge of the circlip 59 need only be pressed in to the level of the conical surface therein and consequently it is possible to manufacture the support leg pieces by die casting in e.g. aluminum. By the relatively great overlapping between the support leg portions obtained in that the tapered pin extends almost up to the next tapered pin a joint very resistant to buckling is obtained.

In order to ensure that the different portions are not wedged reciprocally, when the very joint passes through the thread in the nut 32, the axial play of the thread in the nut 32 are preferably a little greater than the turning play of the reciprocal key grips. After adjustment of the support leg this is upwardly sealed by a cover.

It is not only apparent from Fig 10 that the reciprocal axial play of the threads but also the thread stops 61 of the screw thread 60 are lower than those 62 of the nut 63. Moreover, the edges 64 of the tops 61 of the screw thread are bevelled. This has the advantage that even if the portions are handled so carelessly that damages arise the risk

of these influencing the function is inconsiderable.

Claims

1. Thread joint comprising at least two threaded bodies (34, 35) with identical outer threads, which bodies are provided with interlocking means (41) capable of transferring a turning force between the bodies in at least one direction, and abutment means (40) capable of transferring forces in at least one axial direction between the threaded bodies and that in the abutting and force transferring position the threads of the bodies (34, 35) coincide and form a single continuous outer thread that can be threaded into and through a nut (32). 5
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2. Thread joint as claimed in claim 1, **characterized in** that the abutment means (40) and the interlocking means include an axial pin (37) on one body extending into a corresponding recess (38) in the other. 20
3. Thread joint as claimed in claim 2, **characterized in** that a key grip (41) is arranged in the bottom of the recess (38) and the top of the pin (37) respectively, and that the threads form a continuous common thread when the key grip is in position. 25
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4. Thread joint as claimed in any one of claims 1-3, **characterized in** that the thread play in the nut is greater than the angular play between the treaded bodies. 35
5. Thread joint as claimed in any one of the foregoing claims, **characterized in** that the axial positions of the threaded bodies are lockable reciprocally in two directions. 40
6. Thread joint as claimed in any one of claims 2-4, **characterized in** that the included bodies are locked in a lengthwise relation to each other axially by means of an oval circlip (59) arranged in a milled-out section (57) in the wall of the recess (38) extending to the ridges of the thread so that when the thread is screwed home the oval circlip is compressed to release the recess. 45
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7. Thread joint as claimed in any one of the foregoing claims, **characterized in** that the nut comprises locking means for fixing the position. 55
8. Thread joint as claimed in any one of the foregoing claims, **characterized in** that the ridges of the screw thread has a side clear-

ance in the nut thread.

9. In combination a tool and a thread joint according to any of the previous claims, **characterized in** that the tool is provided with a key grip corresponding to the key grip (41) in the bottom of the recess but with a lower end of the key grip bevelled or chamfered, the tool (42) further being provided with a stop means (44) which will abut against the upper end of a nut part or housing (31) when there is a need of a new threaded body causing the bevelled part of the key grip to slide over the key grip in the bottom of the recess of the threaded body pressing the tool upwards, so that the driving ability is lost in this direction while it is still possible to retract the threaded body by rotation in the opposite direction.

Patentansprüche

1. Gewindeverbindung, umfassend wenigstens zwei mit gewinde versehene Körper (34, 35) mit identischen Außengewinden, wobei die Körper zum Übertragen einer Drehkraft zwischen den Körpern in wenigstens einer Richtung geeignete Kuppelungsmittel (41) aufweisen sowie zum Übertragen von Kräften in wenigstens einer Axialrichtung zwischen den mit Gewinde versehenen Körpern geeignete Anliegemittel (40), wobei in der anliegenden und kraftübertragenden Stellung die Gewinde der Körper (34, 35) koinzidieren und ein einziges, kontinuierliches Außengewinde bilden, welches in eine und durch eine Mutter (32) schraubbar ist.
2. Gewindeverbindung nach Anspruch 1, dadurch gekennzeichnet, daß die Anliegemittel (40) und die Kuppelungsmittel einen Axialstift (37) an einem Körper umfassen, welcher sich in eine entsprechende Ausnehmung (38) in dem anderen erstreckt.
3. Gewindeverbindung nach Anspruch 2, dadurch gekennzeichnet, daß eine schlüsselartige Eingriffsanordnung (41) in dem Boden der Ausnehmung (38) bzw. der Spitze des Stifts (37) vorgesehen ist und daß die Gewinde im Eingriffszustand der schlüsselartigen Eingriffsanordnung ein kontinuierliches, gemeinsames Gewinde bilden.
4. Gewindeverbindung nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß das Gewindenspiel in der Mutter größer ist als das Winkelspiel zwischen den mit Gewinde versehenen Körpern.

5. Gewindeverbindung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Axialstellungen der mit Gewinde versehenen Körper gegenseitig in zwei Richtungen festlegbar sind. 5
6. Gewindeverbindung nach einem der Ansprüche 2 bis 4, dadurch gekennzeichnet, daß die umfaßten Körper aneinander axial in einer Längsbeziehung mittels eines ovalen Sicherungsrings (59) festgelegt sind, welcher in einem herausgearbeiteten Abschnitt (57) in der Wandung der Ausnehmung (38) angeordnet ist und sich zu den Scheiteln des Gewindes derart erstreckt, daß dann, wenn das Gewinde zurückgeschraubt wird, der ovale Sicherungsring zum Freigeben der Ausnehmung zusammengedrückt wird. 10 15
7. Gewindeverbindung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Mutter Verriegelungsmittel zum Festlegen der Stellung umfaßt. 20
8. Gewindeverbindung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Scheitel des Schraubgewindes in dem Muttergewinde ein Seitenspiel aufweisen. 25
9. Kombination eines Werkzeugs und einer Gewindeverbindung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das Werkzeug eine schlüsselartige Eingriffsanordnung aufweist, welche der schlüsselartigen Eingriffsanordnung (41) in dem Boden der Ausnehmung entspricht, wobei jedoch ein unteres Ende der schlüsselartigen Eingriffsanordnung abgeschrägt oder abgefast ist, wobei ferner das Werkzeug (42) ein Stoppmittel (44) aufweist, welches dann, wenn ein neuer mit Gewinde versehener Körper erforderlich ist, gegen das obere Ende eines Mutterteils oder Gehäuses (31) anliegt und bewirkt, daß der abgeschrägte Teil der schlüsselartigen Eingriffsanordnung über die schlüsselartige Eingriffsanordnung in dem Boden der Ausnehmung des mit Gewinde versehenen Körpers rutscht und das Werkzeug nach oben drückt, derart, daß das Antriebsvermögen in diese Richtung verloren ist, während es immer noch möglich ist, den mit Gewinde versehenen Körper durch Drehung in der entgegengesetzten Richtung zurückzubewegen. 30 35 40 45 50
- identiques, lesquels corps sont dotés de moyens de blocage réciproque (41) aptes à transmettre une force de rotation entre les corps dans au moins une direction, et des moyens de butée (40) capables de transmettre des forces dans au moins une direction axiale entre les corps filetés et en ce que dans la position de butée et de transmission de forces, les filets des corps (34, 35) coïncident et forment un filetage extérieur continu unique pouvant être vissé dans et à travers un écrou (32).
2. Raccord fileté selon la revendication 1, caractérisé en ce que les moyens de butée (40) et les moyens de blocage réciproque comprennent un axe axial (37) sur un corps s'étendant jusque dans un évidement correspondant (38) dans l'autre corps.
3. Raccord fileté selon la revendication 2, caractérisé en ce qu'une préhension à clavette (41) est disposée respectivement dans le fond de l'évidement (38) et au sommet de l'axe (37) et en ce que les filets forment un filetage commun continu lorsque la préhension à clavette est en position.
4. Raccord fileté selon l'une quelconque des revendications 1-3, caractérisé en ce que le jeu de filetage dans l'écrou est supérieur au jeu angulaire entre les corps filetés.
5. Raccord fileté selon l'une quelconque des revendications précédentes, caractérisé en ce que les positions axiales des corps filetés peuvent être réciproquement bloquées dans les deux directions.
6. Raccord fileté selon l'une quelconque des revendications 2-4, caractérisé en ce que les corps incorporés sont bloqués dans une relation longitudinale l'un par rapport à l'autre axialement au moyen d'un jonc d'arrêt (59) disposé dans une section fraisée (57) dans la paroi de l'évidement (38) s'étendant jusqu'aux crêtes du filetage de sorte que lorsque le filetage est vissé à fond, le jonc oval est comprimé pour libérer l'évidement.
7. Raccord fileté selon l'une quelconque des revendications précédentes, caractérisé en ce que l'écrou comprend des moyens de blocage pour la fixation de la position.
8. Raccord fileté selon l'une quelconque des revendications précédentes, caractérisé en ce que les crêtes du filetage de la vis présentent une tolérance latérale dans le filetage de

Revendications

1. Raccord fileté comprenant au moins deux corps filetés (34, 35) avec des filets extérieurs

l'écrou.

9. En combinaison un outil et un raccord fileté selon l'une quelconque des revendications précédentes, caractérisé en ce que l'outil est muni d'une préhension à clavette correspondant à la préhension à clavette (41) dans le fond de l'évidement mais avec une extrémité inférieure de la préhension à clavette biseautée ou chanfreinée, l'outil (42) étant de plus doté d'une butée (44) qui vient en appui contre l'extrémité supérieure d'une partie d'écrou ou logement (31) où un nouveau corps fileté est nécessaire pour faire coulisser la partie biseautée de la préhension à clavette sur la préhension à clavette du fond de l'évidement du corps fileté comprimant l'outil vers le haut de sorte que l'aptitude à l'enfoncement dans cette direction est perdue tandis qu'il est toujours possible de faire rentrer le corps fileté par rotation dans la direction opposée.

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FIG.1

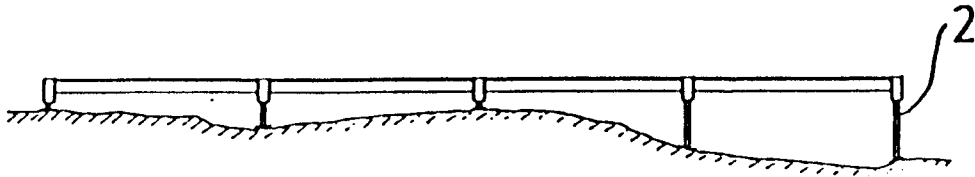


FIG.2

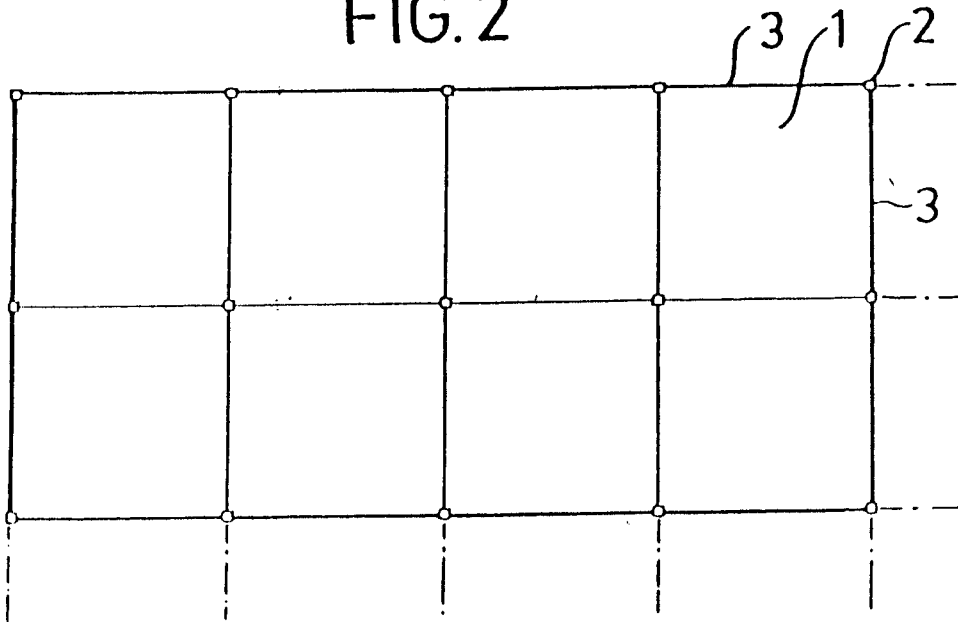


FIG.3

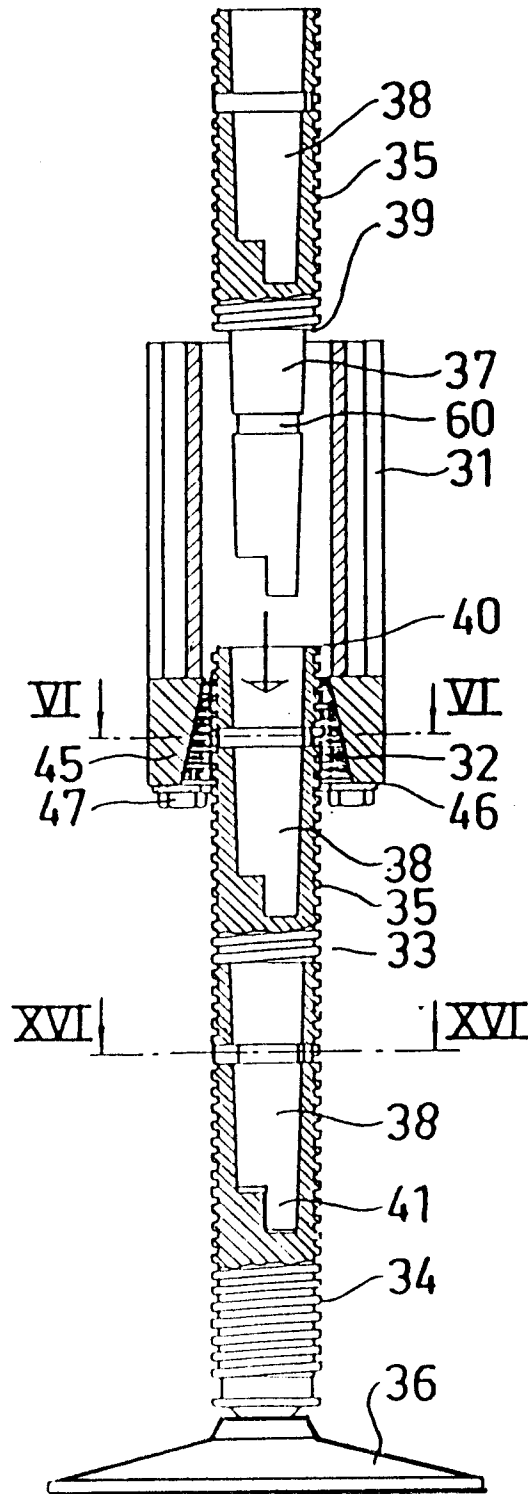


FIG.4

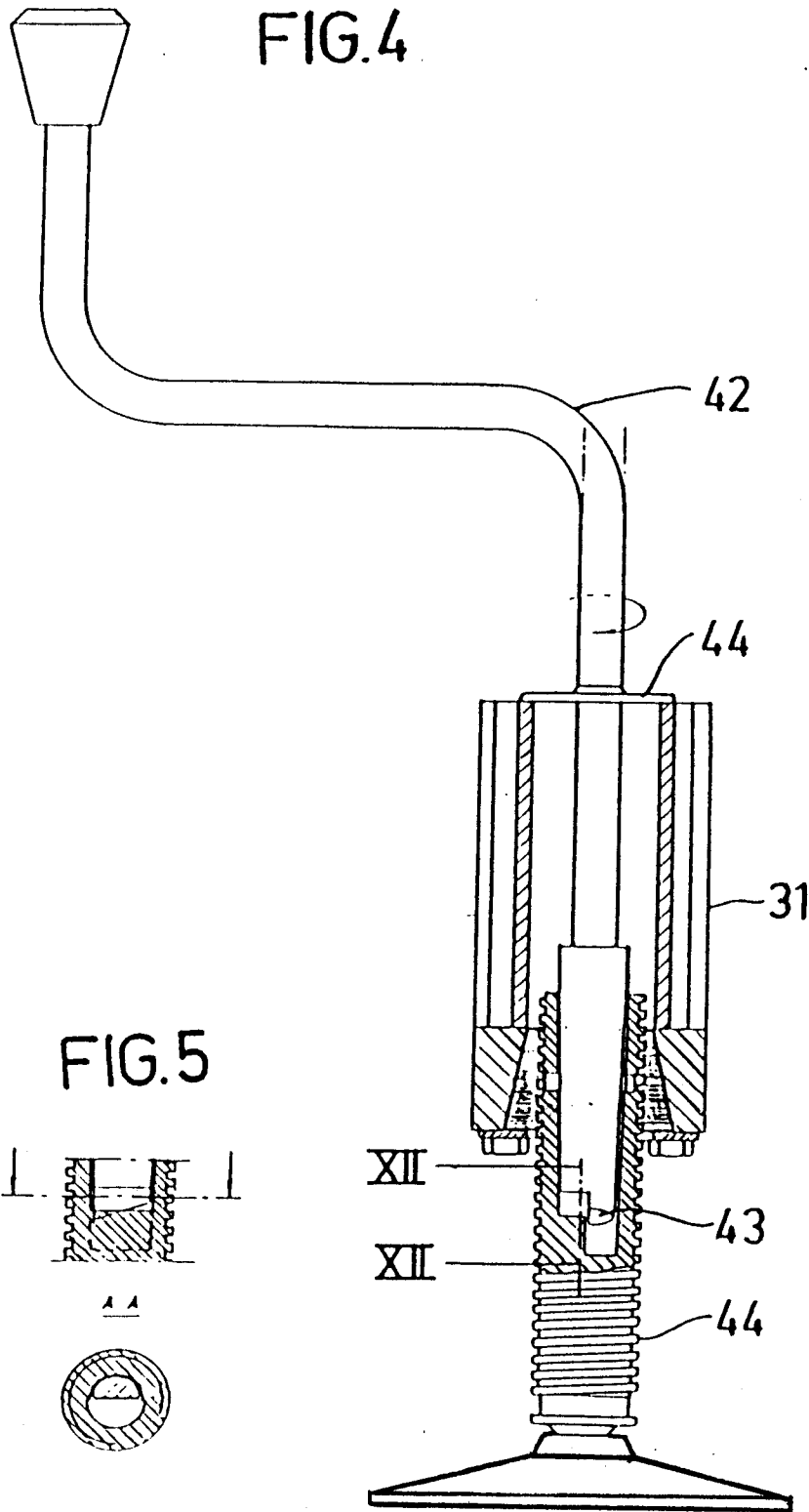


FIG.5

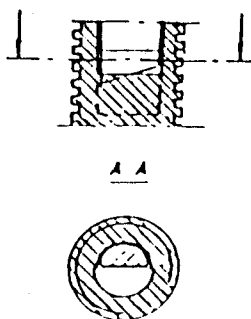


FIG.6

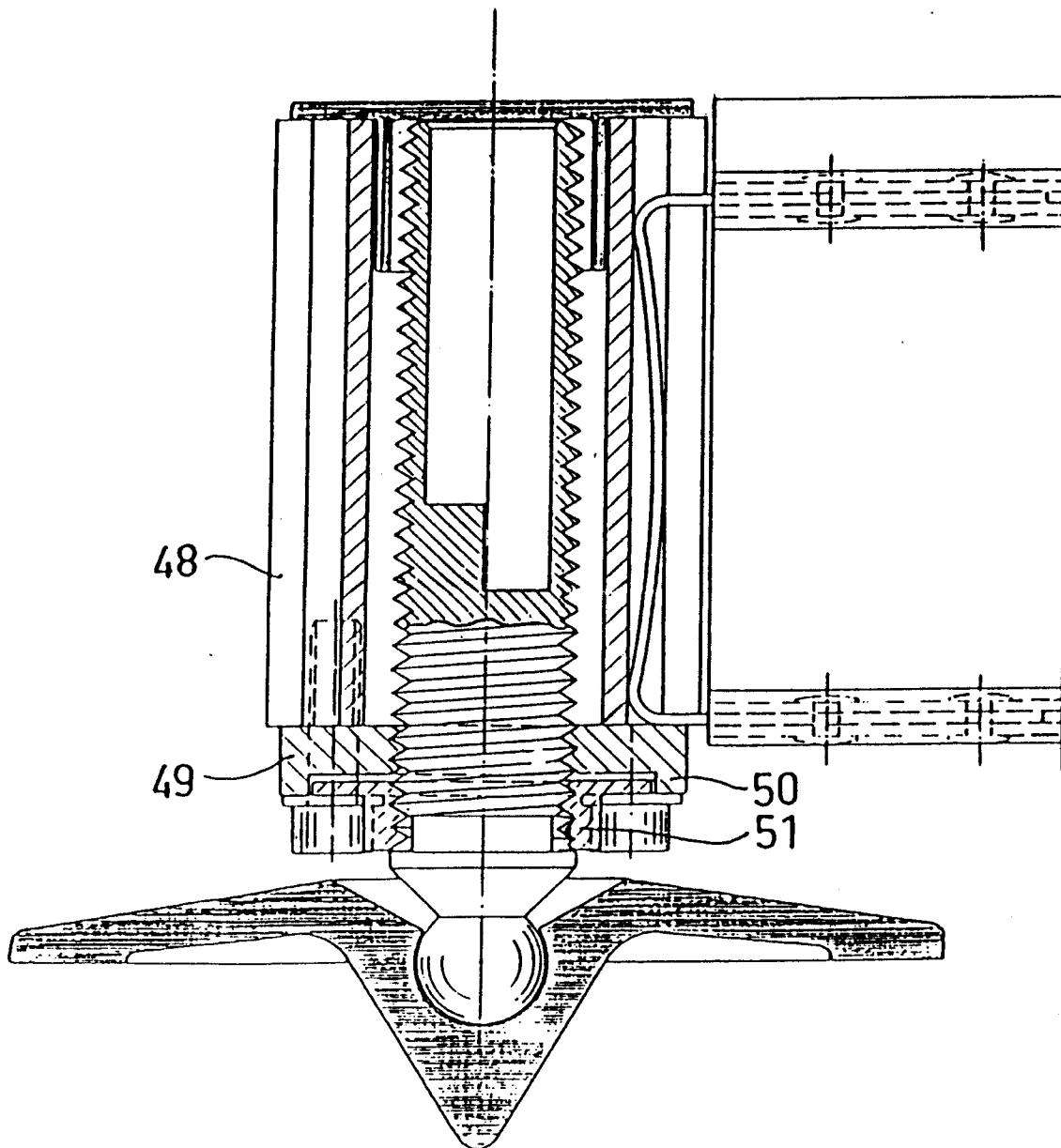


FIG.7

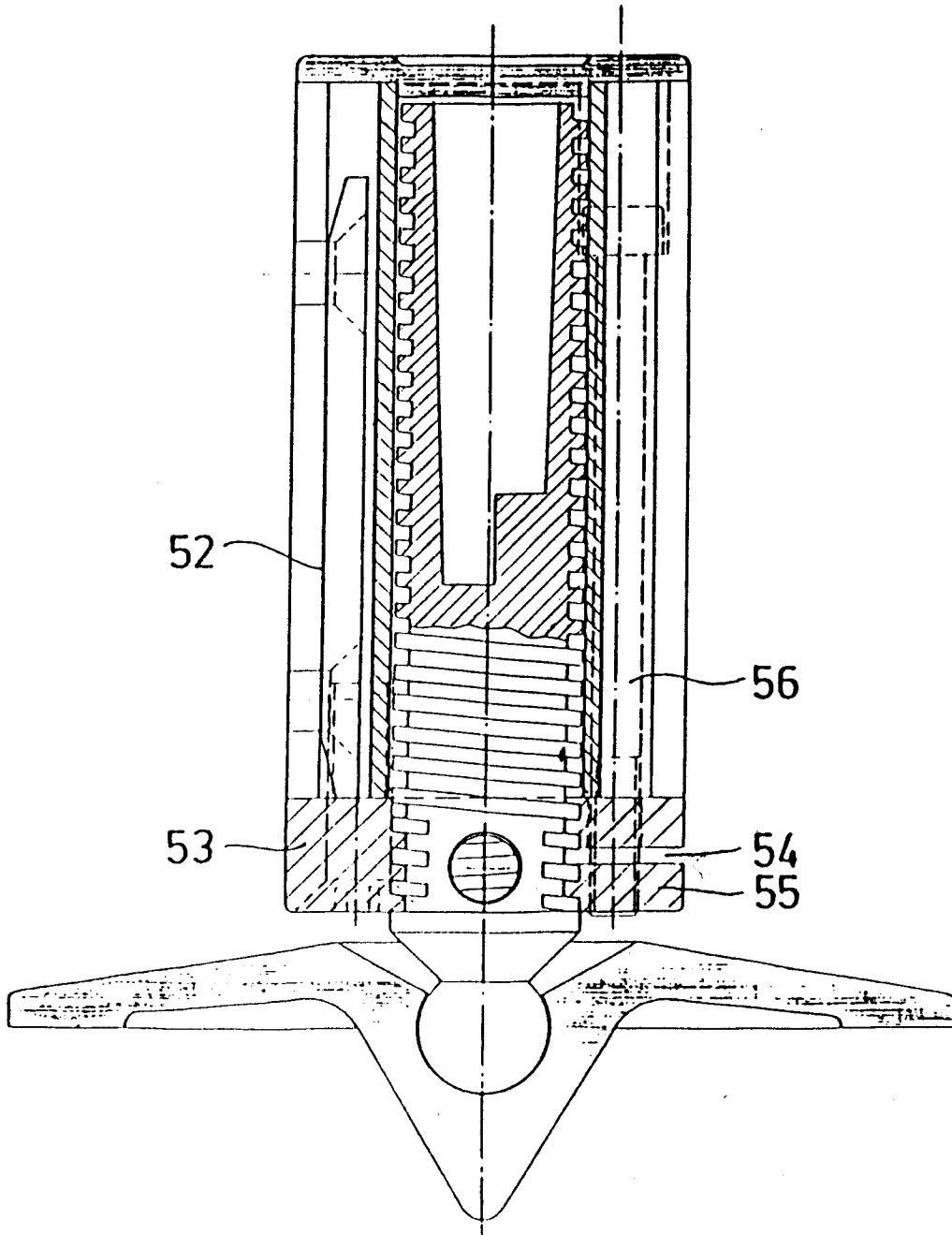


FIG.8

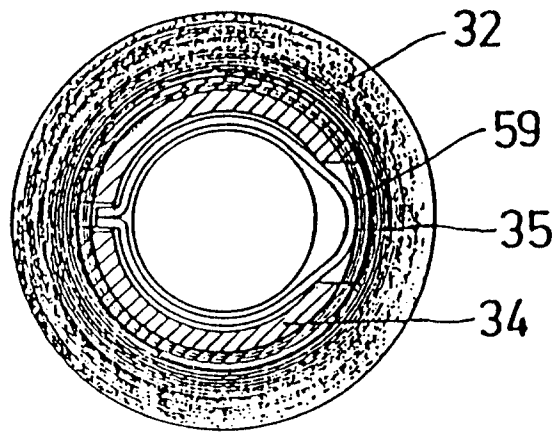


FIG.9

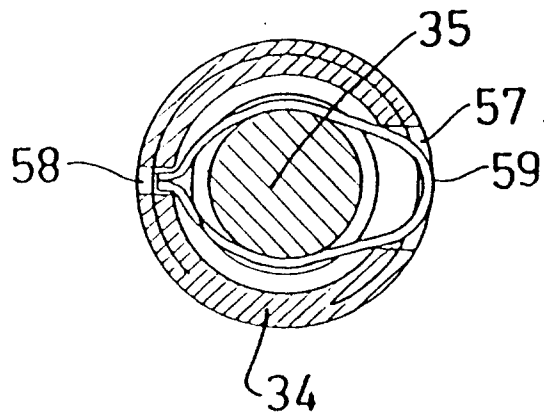


FIG.10

