

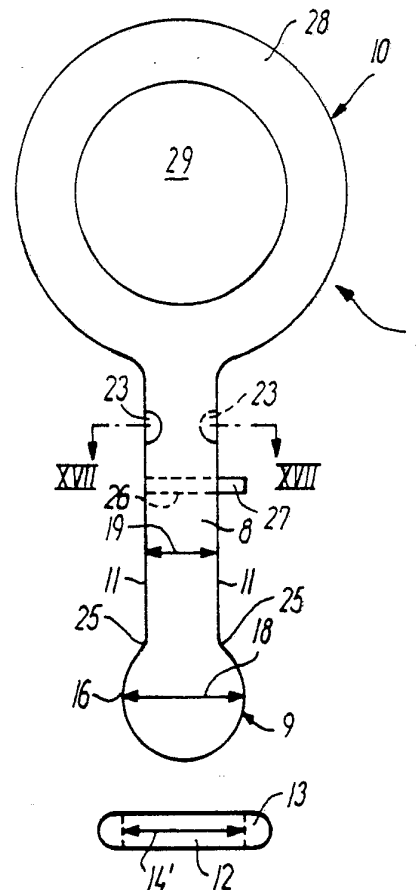


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁵ : F16G 15/04	A1	(11) International Publication Number: WO 92/18789 (43) International Publication Date: 29 October 1992 (29.10.92)
(21) International Application Number: PCT/DK92/00129 (22) International Filing Date: 15 April 1992 (15.04.92) (30) Priority data: 3695 18 April 1991 (18.04.91) IS (71) Applicant: BROEDRENE MARKUSSENS METALVAR- EFABRIK A/S [DK/DK]; Sverigesvej 5-11, DK-7480 Vildbjerg (DK). (71)(72) Applicant and Inventor: RAGNARSSON, Kjartan [IS/ IS]; Marargötu 7, IS-240 Grindavik (IS). (74) Agent: LEHMANN & REE A/S; Grundtvigsvej 37, DK- 1864 Frederiksberg C (DK).		(81) Designated States: AT (European patent), AU, BE (Euro- pean patent), CA, CH (European patent), DE (Euro- pean patent), DK (European patent), ES (European pa- tent), FI, FR (European patent), GB (European patent), GR (European patent), IT (European patent), LU (Euro- pean patent), MC (European patent), NL (European pa- tent), NO, SE (European patent). Published <i>With international search report.</i> <i>In English translation (filed in Danish).</i>

(54) Title: AN INTERCONNECTOR**(57) Abstract**

An interconnector (1) which simply and quickly may be releasably connected in any elongated opening (12), comprises a rod-shaped central part (8) and an enlarged end part (9, 10) at each end. The rod-shaped central part (8) has such cross-section that it may not be rotated in the elongated opening (12). The enlarged end parts (9, 10) have such an extension that they only can pass through the elongated opening (12) when a longer dimension (18) for an enlarged end part (9) is oriented along a long side edge (14) of the opening (12). At two opposite corners of the rod-shaped central part (8), an incision (23) is provided, which allows a rotation of the interconnector (1) when the incisions (23) register with the opening (12). This is achieved as the distance (24) between the incisions (23) is less than the shortest distance (15') between the side edges (14) of the associated opening (12). The interconnector is especially suitable for use together with chains, e.g. in the fishing industry.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	FI	Finland	MI	Mali
AU	Australia	FR	France	MN	Mongolia
BB	Barbados	GA	Gabon	MR	Mauritania
BE	Belgium	GB	United Kingdom	MW	Malawi
BF	Burkina Faso	GN	Guinea	NL	Netherlands
BG	Bulgaria	GR	Greece	NO	Norway
BJ	Benin	HU	Hungary	PL	Poland
BR	Brazil	IE	Ireland	RO	Romania
CA	Canada	IT	Italy	RU	Russian Federation
CF	Central African Republic	JP	Japan	SD	Sudan
CG	Congo	KP	Democratic People's Republic of Korea	SE	Sweden
CH	Switzerland	KR	Republic of Korea	SN	Senegal
CI	Côte d'Ivoire	LI	Liechtenstein	SU	Soviet Union
CM	Cameroon	LK	Sri Lanka	TD	Chad
CS	Czechoslovakia	LU	Luxembourg	TG	Togo
DE	Germany	MC	Monaco	US	United States of America
DK	Denmark	MG	Madagascar		
ES	Spain				

AN INTERCONNECTOR

BACKGROUND OF THE INVENTION

5 The present invention relates to an interconnector intended for releasable connection with at least one elongated opening, preferably in an elongated chain link, and which has a rod-shaped central part which at least at one end has an enlarged T-shaped part.

10 The invention relates to an interconnector which, among other things, is intended for replacing shackles and the like. An interconnector is primarily believed to be used as a chain interconnector. Because of its special form, an interconnector according to the present invention will, however, be used in connection with any element that is supplied with an elongated or oblong opening, e.g. a free inner opening in an
15 elongated chain link, and in which the side edges of the opening are limited by an edge area having a limited wall thickness. In the present description, the invention will, however, be explained with reference to an elongated opening provided in a chain link.

20 An interconnector of the type mentioned by way of introduction is known, among others, from German Publication No. 2,744,736. In this publication a chain interconnector is described, in which the rod-shaped central part is connected with two end parts, provided that a substantially C-shaped interconnector is formed. This interconnector
25 has a limited use, namely for mutual connection of two chain ends. Furthermore, the described chain interconnector is relatively difficult to work with, as a rather considerable amount of mutual twisting and turning is demanded through spacious angles of a chain interconnector and the chain(s) with which it is connected. With strong loads,
30 e.g. a large tension, the interconnector may be deformed in such a way that it would be difficult to separate from a chain without use of auxilliary tools.

35 An important area of use for an interconnector, according to the invention, is production of fishing equipment. Particularly with trawl and large drag nets, funnel-shaped net bags are connected with trailing equipment via chains and wires. The opening of the fishing equipment should be as large as possible in order to accomplish the best possible catch. After the catch has gone into the trawl or the net, the

opening will be strongly loaded and is therefore provided with a special carrier cable or fishing line. The fishing line is totally or partially made of a chain which is fastened to the bottom sides of a trailing equipment which drags the fishing equipment over the bottom.

5 The fishing line is fastened to the long sides of the trailing equipment by means of chains which are fastened by locking shackles or by special connectors. Such connectors are normally provided by two halves. Due to the strong loads occurring, the two halves will often be deformed in such a way, that they only with difficulties may be separated.

10 At replacement, the use of special explosive tools, anvil, hammers and any cutting pipes is demanded.

In larger trawls, up to 40-50 connectors will often be used, which makes it time consuming to replace a trawl, which is fastened to the trailing equipment. Under normal circumstances it can necessitate the

15 work of 5-6 men from 45-60 minutes.

It is the object of the present invention to provide an interconnector that simply and quickly may be releasably connected in any elongated opening, and which gives a high degree of security against an unintentional disconnection of the established connection.

20

According to the invention, this is obtained with an interconnector of the type mentioned by way of introduction being characterized in that

25 the rod-shaped central part has a quadrilateral cross section, the side length of which is shorter than the distance between the side edges of the associated opening and in which the diagonals between opposite corners are longer than said distance between the side edges of the associated opening, that the two end parts of the interconnector have a cross section being larger than that of the rod-shaped central part, and of which end parts said, at least one enlarged T-shaped end part has a rectangular cross section in which the short side length is shorter than said distance between the side edges of the associated opening, and in which the longest side length is longer

30 than this distance, but still shorter than the distance between the end edges of the opening, and that the rod-shaped central part, on at least one and preferably two opposite corners, is provided with an incision having such a depth, that a diagonal between the incision and the opposite corner, or the opposite incision is shorter than said

35

distance between the side edges of the associated opening.

The rod-shaped central part of the interconnector has side lengths which are adapted to dimensions on an actual oblong opening, e.g. a
5 free inner opening in an elongated chain link, with which the interconnector cooperates.

If both end parts are made with an identical, enlarged T-shaped end part, both of these will be able to pass through the oblong opening
10 when a T-shaped end part is orientated with the largest side length directed along the longitudinal direction of the opening. This introduction of the interconnector can be effected quickly and safely. When the incision of the interconnector is positioned opposite the side
15 edges of the opening, the interconnector is rotated 90° and is pulled back. Hereby, the underside of the T-shaped end part will abut the side edges of the opening.

By placing the incisions as far from the T-shaped end part as possible, it is possible to obtain the best possible security against
20 unintentional disconnection. For additional security, an interconnector can be provided with a locking split which is inserted after an interconnector is placed with the enlarged part abutting the side edges of the opening.

25 Establishment of the mutual connection simply requires a translative motion followed by a rotational motion through 90° which may be done very quickly and simply. Even if the interconnector is exposed to strong loads and possibly is deformed, its simple form will still
30 cause it to be functionable and easy to disconnect and reconnect without use of auxilliary tools.

Due to the simple form, the interconnector according to the invention may either be produced by cutting out a plate or by forging. In combination with the oblong form, this will cause the interconnector to be
35 able to withstand strong loads without risk of breakage.

The invention is primarily developed to meet problems with fishing equipment. Accordingly, the interconnector comprises at least one T-shaped end part for connection with an associated connection ope-

ning, e.g. formed by a quadrilateral, oblong or a semicircular opening in a chain link. The other end of the interconnector may have any form, however, said other end part shall also present such a cross section that the interconnector may not unintentionally pass through the opening. Thus, the other end of the interconnector may be produced with varying forms, depending on whether the equipment to be fastened is permanently connected to the interconnector or releasable connected to the interconnector. An interconnector can also be pliable in order to provide for a flexible connection.

10 An interconnector of the type mentioned above is very simple to use and may be combined as a single-acting or a poly-acting interconnector. Thus, according to a special embodiment, it may be possible to place several interconnectors with a circle-shaped end part in a sling or a ring and then fasten a great number of chains or other elements to the T-shaped end part of the interconnector.

Often, interconnectors in fishing equipment shall withstand great forces and wear, and accordingly, they will be produced from hard-wearing metals or alloys, e.g. by cutting out plates. As an alternative, an interconnector may be produced by welding several elements together. In other cases, in which the interconnector has to withstand minor loads, it may also be possible to produce the interconnector from other materials, e.g. plastic materials. For example, this can be the case for suspending service installations in houses.

The interconnector has been described as having a rod-shaped central part which connects two end parts. It is noted that the rod-shaped central part does not necessarily need to be rectilinear. Depending on the intended use, the rod-shaped central part may be provided with any bending or double-bending. Thus, the rod-shaped part may be V-shaped, S-shaped or U-shaped.

BRIEF DESCRIPTION OF THE DRAWING

35 The invention will now be further explained with reference to the accompanying drawing, in which

Figs. 1-3 show three side views of a first embodiment for an intercon-

- necter according to the invention,
Figs. 4-5 show two side views of a second embodiment for an interconnector according to the invention,
Fig. 6 shows a side view of a variant of the second embodiment of
5 the interconnector, shown in Figs. 4 and 5,
Figs. 7-8 show two side views of a third embodiment for an interconnector according to the invention,
Figs. 9-11 show three side views of a fourth embodiment for an interconnector according to the invention,
10 Figs. 12-14 show three side views of a fifth embodiment for an interconnector according to the invention,
Fig. 15 shows a side view of a sixth embodiment for an interconnector according to the invention,
Fig. 16 shows a side view of a seventh embodiment for an interconnector according to the invention,
15 Fig. 17 shows a sectional view according to line XVII-XVII in Fig. 1,
Fig. 18 shows a side view of an eighth embodiment for an interconnector according to the invention, and
20 Fig. 19 shows a side view of a ninth embodiment for an interconnector according to the invention.

The drawing illustrates different embodiments for an interconnector according to the invention. The different embodiments are denoted by
25 reference numerals 1-7 and 47-48.

In the different figures, the same or similar elements are denoted by the same reference numerals, and thus each separate part will not be explained specifically in connection with each separate figure.
30

The interconnector 1 has a rod-shaped central part 8 which at each end is provided with an enlarged part 9, respectively 10. Thus, as seen in Fig. 1, the enlarged part 9 at the one end shows a substantially T-shaped cross section.
35

In the present application, the expression "T-shaped" means any form which has a cross section, which presents edges 25 projecting from two opposite side faces 11 on the rod-shaped central part 8. Thus, the T-shaped part can be circular, as illustrated in Fig. 1, ellipse-

shaped, rod-shaped or formed by any other form.

5 The T-shaped end part 9 is intended for cooperating with an opening 12 which may be provided in any way, e.g. as a free opening in a chain link. An edge area 13 of the opening 12 is illustrated in Figs. 1-3. It is noted that an outer boundary of the edge area 13 can be placed in any arbitrary distance from the opening 12. In the case of a chain link, the opening 12 will be defined as a free opening which is provided in a link, which at the one end or at each end is connected with another chain link.

10 The opening 12 is elongated and has a long side edge 14 and a short side edge 15. At least in a central area 16, the T-shaped end part 9 has a rectangular cross section with a short side length 17 that is shorter than the distance 15' between the side edges 14 of the associated opening 12. The long side length 18 of the rectangular cross section is longer than the distance 15' between the side edges 14, but shorter than the distance 14' between the side edges 15 of the opening.

15 The rod-shaped central part 8 has a cross section, in which the lengths 19 and 20 of the side edges may be identical or different, but the lengths 19,20 of both side edges will always be a little shorter than the distance 15' between the side edges 14 of the associated opening.

20 As appears from the cross section of Fig. 17, a diagonal 21 between opposite corners 22 is longer than the distance 15' between the side edges 14 of the opening. The rod-shaped central part 8 is provided with two incisions 23 at opposite corners 22. The incisions 23 have such a depth, that a diagonal 24 between the incisions 23 is less than the distance 15' between the side edges 14 of the associated opening 12.

25 With correct orientation, the T-shaped end part 9 may be moved through the opening 12 and then the rod-shaped central part 8 is displaced through the opening 12 until the incisions 23 are positioned opposite the side edges 14. Subsequently, the interconnector may be rotated 90° and then be pulled back until the edges 25 on the underside of the

T-shaped end part 9 abut the side edges 14. Hereby, the interconnector is secured in the opening 12.

5 To avoid unintentional disconnection of the interconnector 1 from the opening 12, which could only happen when the incisions 23 again are positioned opposite the side edges 14, the interconnector is optional-ly provided with a bore 26, in which a lock split 27 may be inserted, which is projecting from the side face 11 of the interconnector. For illustrative purposes, the lock split 27 is shown inserted in Figs. 1 and 2. The lock split 27 can be of any known type, however, it will preferably be a resilient lock split. As an alternative to the lock split 27, a simple elastic rubber ring (not shown) may be used, which after the mounting of the interconnector in the opening 12 is displaced to a position between the incisions 23 and the opening 12.

15

The T-shaped end part 9 appears in all embodiments. The other end part 10 shown in Figs. 1-3 consists of a ring 28 having a central opening 29 which makes passage of chains, wires and the like possible, which by means of the interconnector 1 is desired to connect with another element, e.g. an additional chain.

20

Like all other subsequent embodiments, the end part 10 has a cross section, which at least has the same size as the cross section of the T-shaped end part 9. Thus, the end part 10 or the corresponding end part in subsequent embodiments will never be able to pass through the opening 12 when the interconnector is rotated to its connected position.

25

The interconnector 2, illustrated in Figs. 4 and 5, is rectilinear. Fig. 6 shows an alternative form 2' for the embodiment shown in Figs. 4 and 5. In the interconnector 2' the end parts are angled in relation to the rod-shaped central part 8 so that the interconnector appears S-shaped.

30

35 The embodiment for the interconnector 2 and 2', illustrated in Figs. 4-6, is also called an intermediate interconnector. The intermediate interconnector is produced with two identical T-shaped end parts 9 both being intended for connection with a connection opening 12. For instance, the intermediate interconnector may be used for mutual con-

nection of two chain ends, in which chain links consist of elongated chain links, which comprise a connection opening 12.

5 The third embodiment for an interconnector 3, shown in Figs. 7 and 8, comprises a T-shaped end part 9. At the other end of the rod-shaped central part 8, an eye 30 is formed in the form of a cut up chain link or a length of round steel bar 31 which is welded to the rod-shaped central part 8. In the embodiment shown, the eye 30 is connected to a length of chain 32 which at the other end is connected with an enlarged chain link 33, in which a pipe 34 is arranged. At each end of the pipe 34, a stop flange 35 is provided, which prevents the pipe 34 from sliding out of the enlarged chain link 33. Thus, this embodiment provides a flexible interconnector.

15 Instead of a chain 32, an eye 30 can be used for fastening a snap hook which can assure a quick disconnection of an element which otherwise would pass through the interior 36 of the pipe 34. For example, such an element could be a wire, a pipe, a cable, a chain or another elongated element.

20 In Figs. 9-11, the fourth embodiment for the interconnector 4 is shown, in which the end part 37 opposite the T-shaped end part 9 is cranked compared to the rod-shaped central part 8. As shown in Figs. 10 and 11, the end part 37 is constituted by an enlarged part 38 which substantially has same cross section as the T-shaped part 9. The enlarged part 38 is connected with the rod-shaped part 8 via an intermediate part 39 having a cross section substantially equivalent to the cross section of the rod-shaped central part 8, which means that the opening 12 can be arranged around the intermediate part 39. The interconnector 4 is especially suitable for connecting a chain being suspended perpendicular to another chain.

35 The fifth embodiment for the interconnector 5, illustrated in Figs. 12-14, differs only from the embodiment shown in Figs. 4 and 5 in that the two identical T-shaped end parts 9 are orientated perpendicular to each other. The interconnector 5 may be used to connect two chains crossing each other.

In Fig. 15, the sixth embodiment for the interconnector 6 is shown.

The interconnector 6 has two identical T-shaped end parts 9 which are connected to each respective half 40 by the rod-shaped central part. Each half 40 is provided with incisions 23 for mounting in the connection opening 12. The two halves 40 are mutually connected by means of a hinged joint 41. In the embodiment shown, the hinged joint 41 is formed by two welded pieces of round steel bar which form eyes 43, through which a chain link 44 is placed. Thus, the interconnector will be flexible, as it was the case with the interconnector illustrated in Figs. 7 and 8.

10

The interconnector 7 illustrated in Fig. 16 comprises a T-shaped end part 9. At the side of the rod-shaped central part 8 facing away from the T-shaped end part 9, a cross bar 45 is fastened. Two additional interconnectors 46 are connected to the cross bar. In the embodiment illustrated, the additional interconnectors 46 are shown as being identical and comprising a T-shaped end part 9. However, the additional interconnectors 46 can be formed by any desired elements and in any desired number. Thus, they may consist of rings, chain links, snap hooks or the like. With this embodiment, it will be possible to connect several elements to one element which is connected with an upwardly orientated T-shaped end part 9. Thus, the interconnector 7 may be used by a Y-shaped connection between a main chain and two side chains.

15

The interconnector 47 illustrated in Fig. 18 comprises a T-shaped end part 9. At the opposite end of the rod-shaped central part 8, a ring 28 is fastened, corresponding to the ring illustrated in Fig. 1. In this embodiment, a spring 49 is arranged around the rod-shaped central part 8. At one end, the spring 49 abuts the ring 28, and at the other end, the spring abuts a cup-shaped flange 50. The flange 50 consists of a circular disc 51 and an annular part 52 mounted thereon, and which supports the outside of the spring 49. The circular disc 51 is provided with a central quadrilateral hole corresponding to the cross section of the rod-shaped central part 8.

20

25

When using the embodiment shown in Fig. 18, a great security is obtained against unintentional release of a chain link. A chain link should overcome the power exerted by the spring 49 in order to be aligned with the incisions 23. In the embodiment shown, the incisions

are arranged relatively near the enlarged part 9. This position will relieve the mounting of the interconnector 47 in a chain link or another opening, seeing that the spring 49 does not necessarily need to be completely compressed.

5

The ninth embodiment for the interconnector 48 shown in Fig. 19, differs from the embodiment illustrated in Fig. 18 only by comprising a cup-shaped flange 50 at each end of the spring 49. Hereby, a better abutment is obtained against the other enlarged end part 10 which does not necessarily need to be provided as a ring 28. Thus, the use of two cup-shaped flanges 50 will be suitable for use in an interconnector comprising two identical end parts 9.

10

It is noted that a spring 49 may be used in any of the embodiments shown in order to reduce the risk of an unintentional alignment of the incisions 23 at the side edges of an associated opening.

15

The interconnectors 1-7 and 47-48 shown and described have a wide area of use. However, they have an important use in fishing equipment, especially when manufacturing fishing trawl and larger drag nets. With fishing equipment it is often necessary to establish a mutual connection between several chains or chains and wires. In certain situations it is desirable that two chains are mutually displaceable, which for example is possible when using the interconnectors 1 and 3 in which chains may be displaced through the openings 29 and 36.

20

25

However, the invention is not limited to fishing equipment and use in connection with chains. Interconnectors according to the invention will also be suitable for use in installations where service cables and pipes are suspended in houses, on ships and other places. The interconnector has a simple form and may easily be produced in many varying sizes and of varying materials, adapted to the intended use.

30

35

C L A I M S

1. An interconnector intended for releasable connection with at least one elongated opening, preferably in an elongated chain link, and
5 which has a rod-shaped central part which at least at one end has an enlarged T-shaped part, characterized in that the rod-shaped central part has a quadrilateral cross section, the side length of which is shorter than the distance between the side edges of the associated opening and in which the diagonals between opposite corners
10 are longer than said distance between the side edges of the associated opening, that the two end parts of the interconnector have a cross section being larger than that of the rod-shaped central part, and of which end parts said, at least one enlarged T-shaped end part has a rectangular cross section in which the short side length is shorter
15 than said distance between the side edges of the associated opening, and in which the longest side length is longer than this distance, but still shorter than the distance between the end edges of the opening, and that the rod-shaped central part, on at least one and preferably two opposite corners, is provided with an incision having such a
20 depth, that a diagonal between the incision and the opposite corner, or the opposite incision is shorter than said distance between the side edges of the associated opening.

2. An interconnector according to claim 1, characterized
25 in that it comprises two identical, enlarged T-shaped end parts which are mutually connected by the rod-shaped central part which, apart from the incisions, has the same cross section all over its length.

3. An interconnector according to claim 1, characterized
30 in that one of the end parts is a ring-shaped end part which is made integrally with the interconnector by cutting out a plate, by forging or by a corresponding method.

4. An interconnector according to any of the preceding claims,
35 characterized in that at least one of the end parts is cranked in relation to the rod-shaped central part.

5. An interconnector according to claim 1, characterized
in that one of the end parts consists of a welded, round steel bar

which forms an eye intended for cooperation with a snap hook, a chain link or the like.

5 6. An interconnector according to any of the preceding claims, characterized in that the rod-shaped central part consists of two halves which are mutually connected by a hinged joint, and at least one of the two halves is provided with said incision.

10 7. An interconnector according to any of the preceding claims, characterized in that the largest dimension of both end parts is oriented in the same direction and that the interconnector, as seen perpendicular to said direction, has the same thickness all along its extension.

15 8. An interconnector according to any of the claims 1-6, characterized in that the largest dimension of both end parts is oriented substantially perpendicular to each other.

20 9. An interconnector according to claim 1, characterized in that one of the end parts consists of a cross bar which is connected to several interconnectors by its side that faces away from the rod-shaped central part.

25 10. An interconnector according to any of the preceding claims, characterized in that a bore for a locking split is provided in the rod-shaped central part, at least at one side of the incision(s) said locking split is oriented in the same direction as the largest side length of the end part, and which is projecting from the side wall of the rod-shaped central part.

30

35

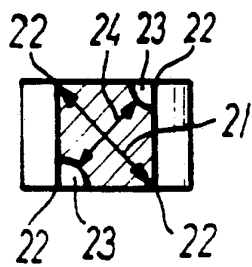
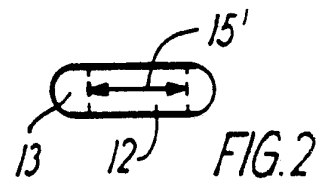
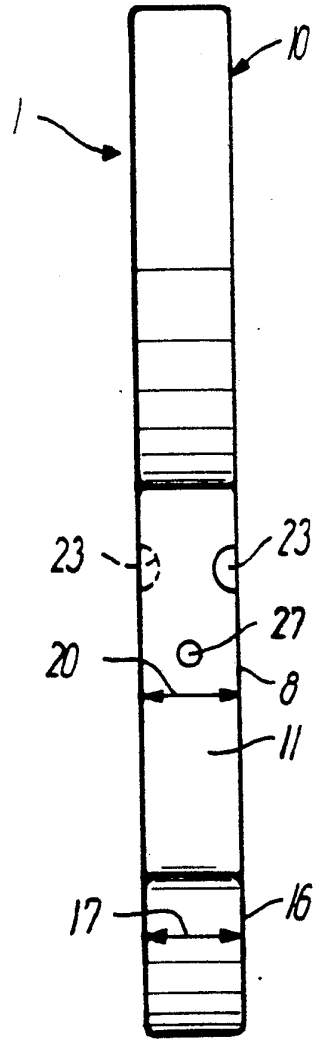
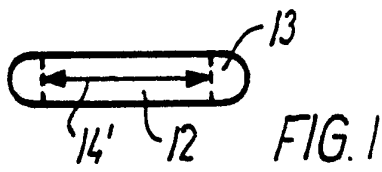
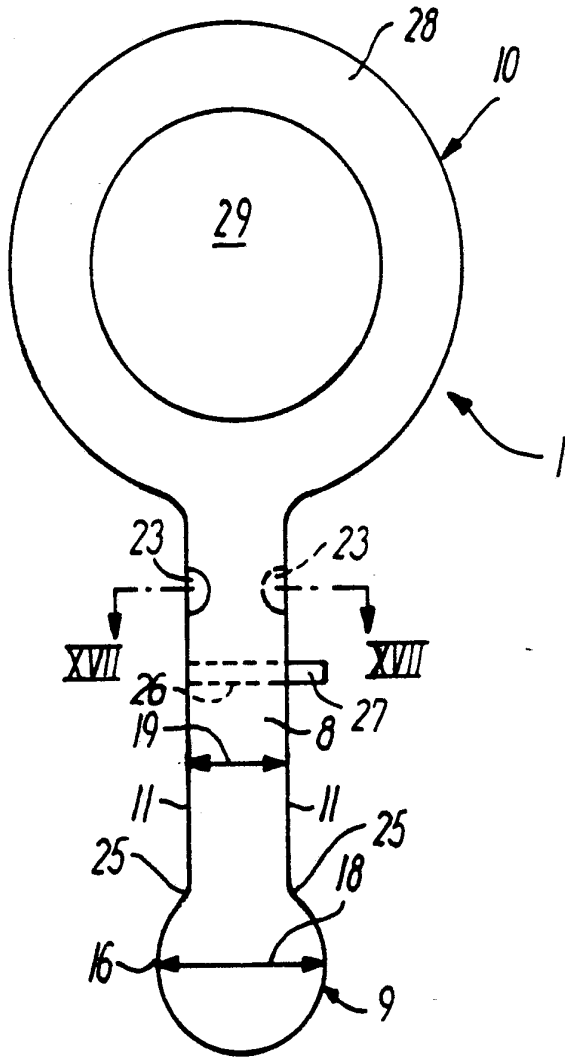


FIG.17

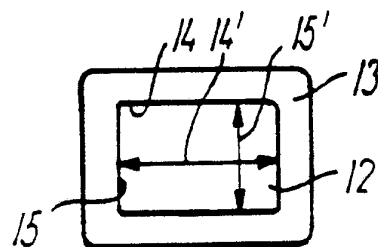
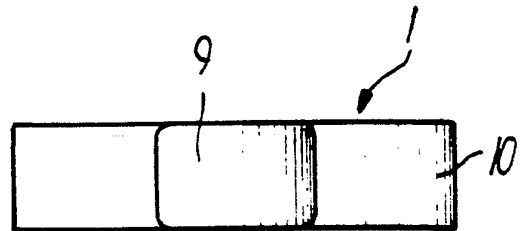


FIG.3

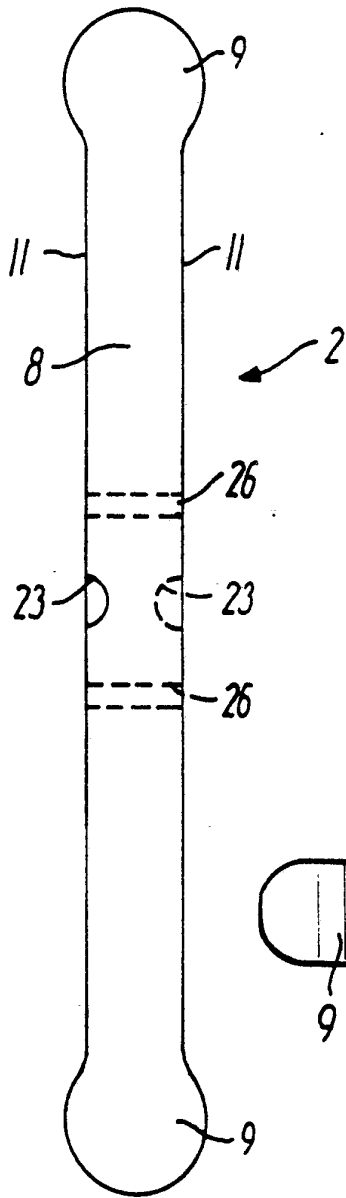


FIG. 4

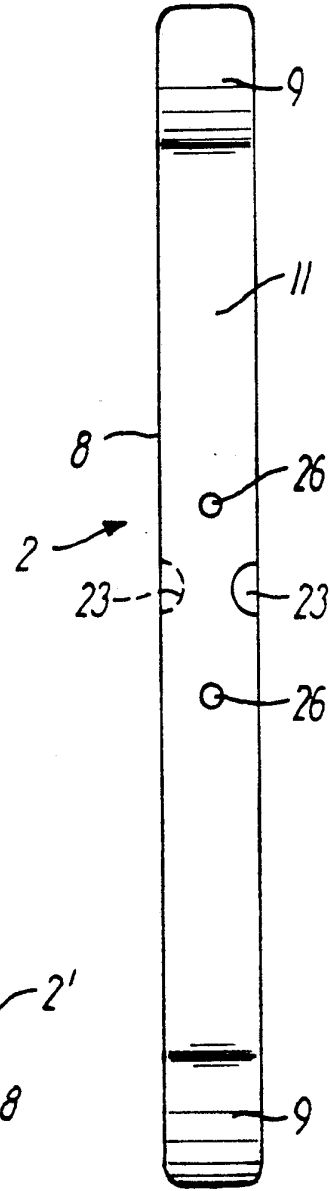


FIG. 5

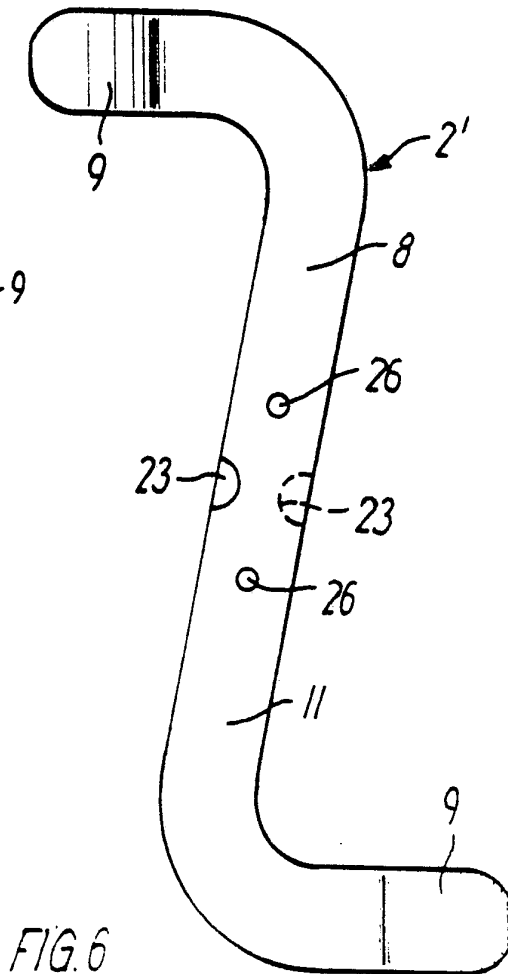


FIG. 6

3/7

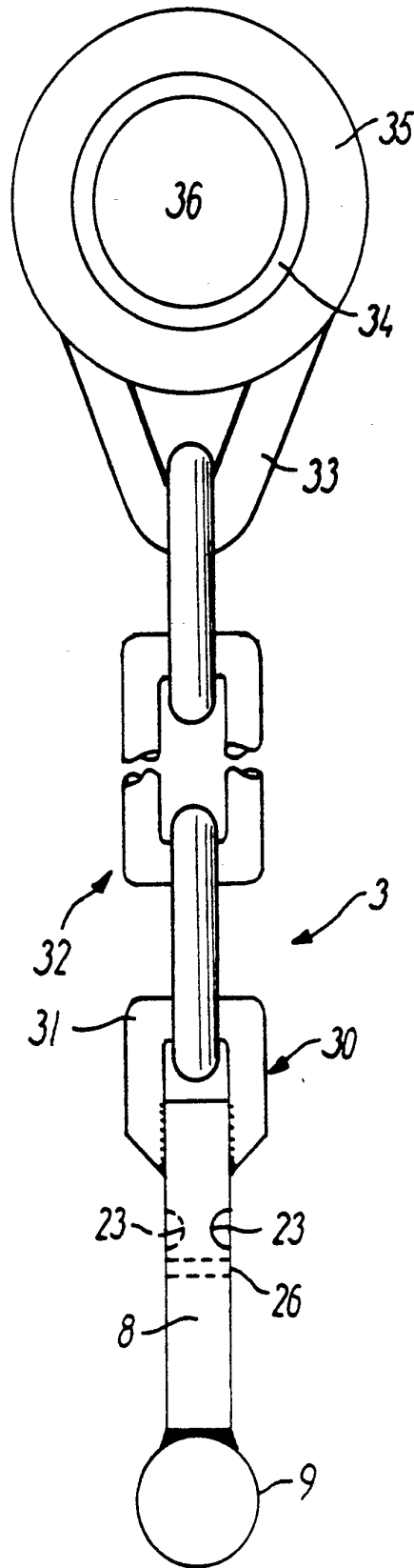


FIG. 7

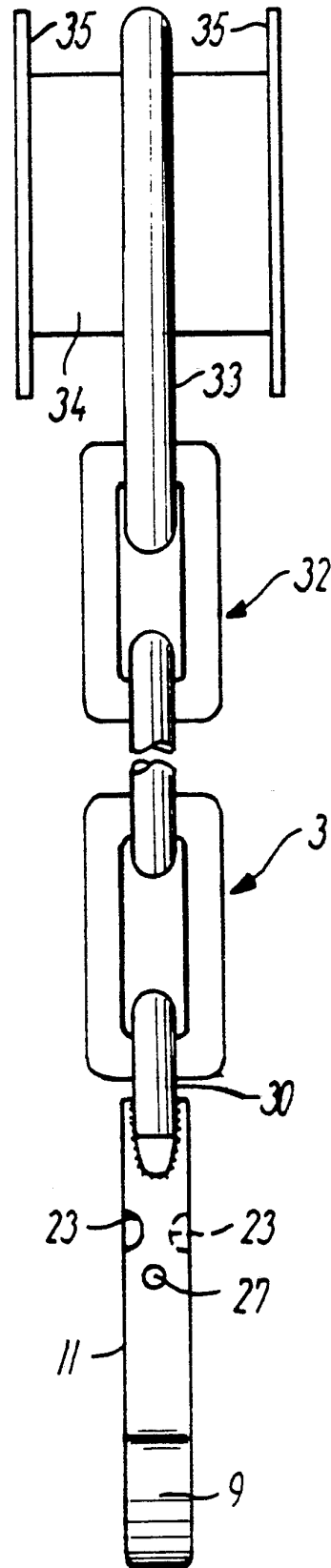


FIG. 8

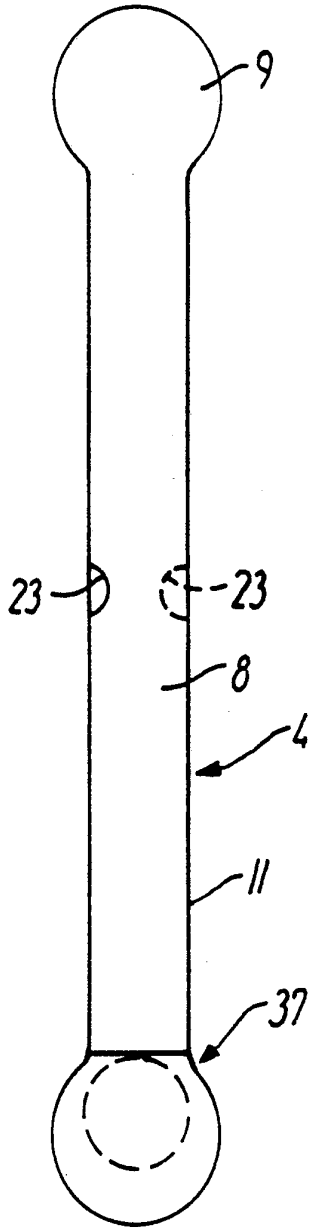


FIG. 9

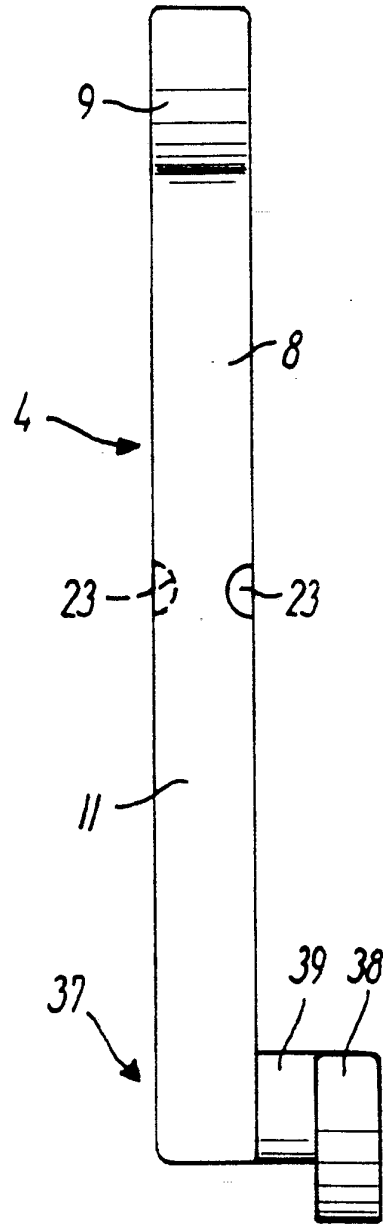


FIG. 10

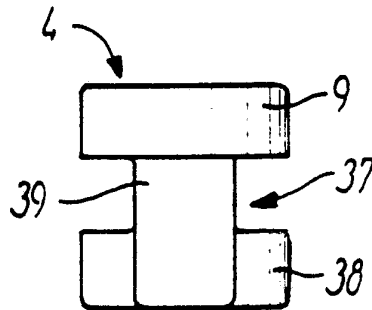


FIG. 11

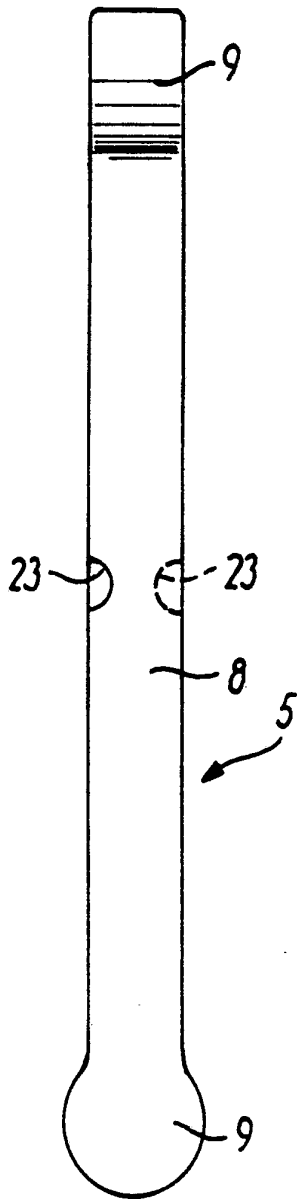


FIG. 12

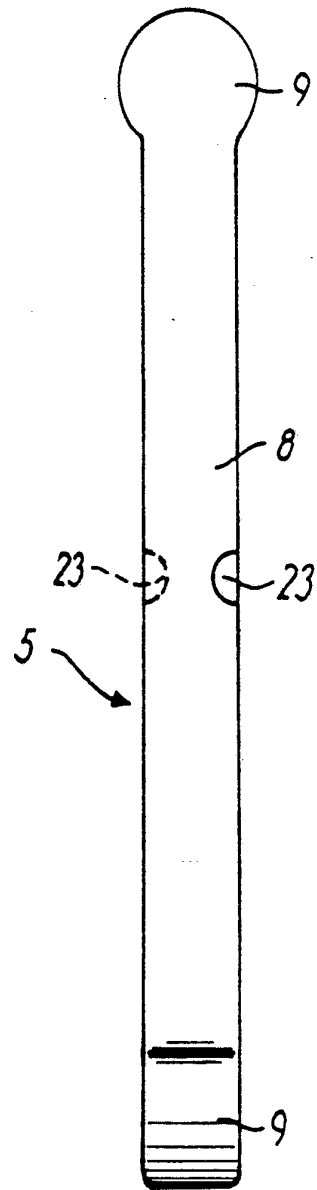


FIG. 13

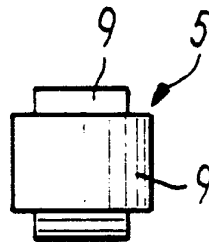


FIG. 14

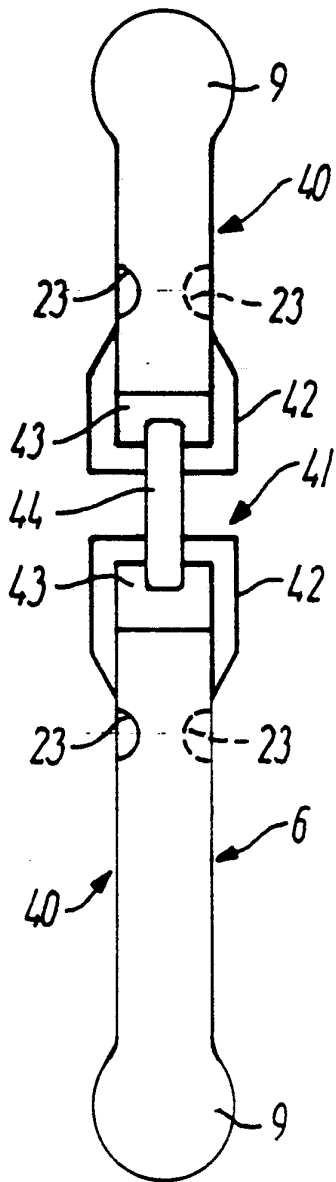


FIG. 15.

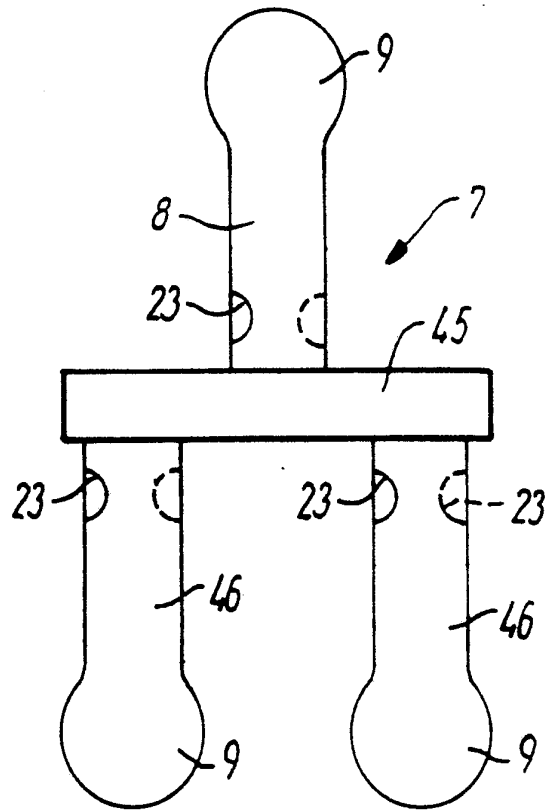


FIG. 16

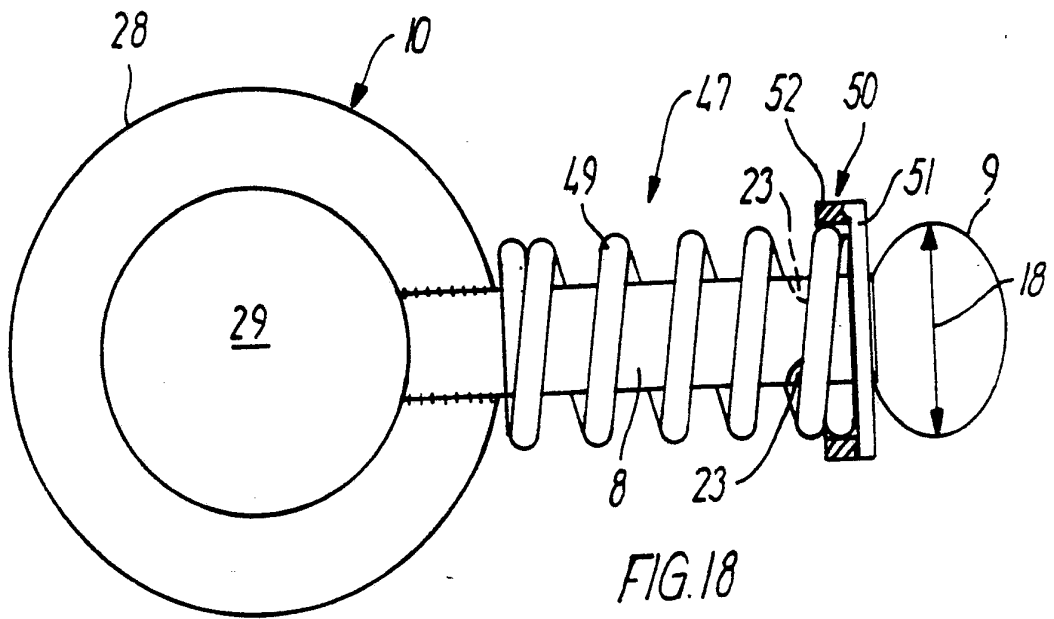


FIG. 18

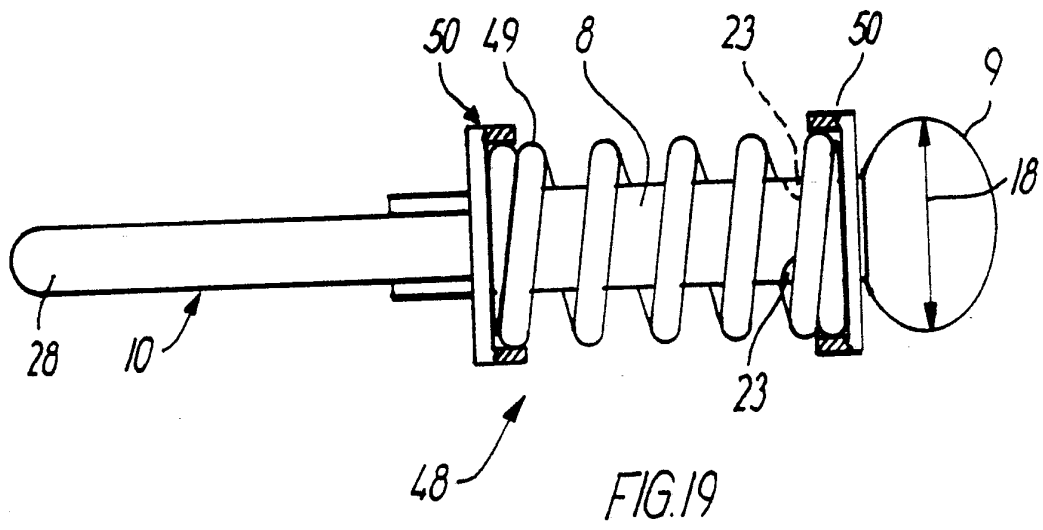
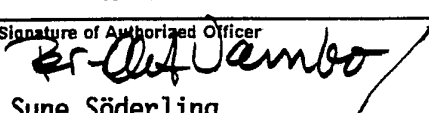


FIG. 19

INTERNATIONAL SEARCH REPORT

International Application No PCT/DK 92/00129

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC5: F 16 G 15/04		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
IPC5	F 16 G	
Documentation Searched other than Minimum Documentation to the extent that such Documents are included in Fields Searched ⁸		
SE,DK,FI,NO classes as above		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	US, A, 2995889 (G. JOHNSON) 15 August 1961, see the whole document --	1
A	US, A, 3374620 (R.L. GOWER) 26 March 1968, see the whole document -- -----	1
<p>* Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
15th July 1992	1992 -07- 22	
International Searching Authority	Signature of Authorized Officer	
SWEDISH PATENT OFFICE	 Sune Söderling	

ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO. PCT/DK 92/00129

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the Swedish Patent Office EDP file on 29/05/92
The Swedish Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 2995889	61-08-15	NONE	
US-A- 3374620	68-03-26	NONE	