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(54) **Prop for construction work**

(57) The prop has a) an external sleeve, handle and upper flange assembly moulded from a single piece of metal, b) the internal spring (11) is constructed from a flat spring strip bent to form two terminal limbs (12,13) bent to provide zones in friction with the internal surface of the external tube, and c) the external tube has straight diametrically opposite transverse grooves (9,10) through which the bent ends of the spring (11) project.

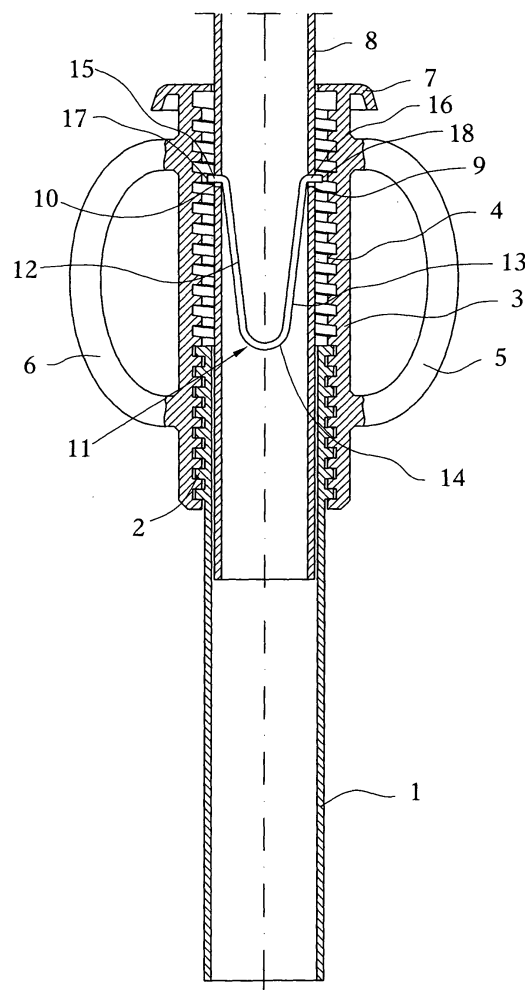


FIG. 1

EP 1 602 791 A2

Description

[0001] This invention relates to a prop for construction work of the type used for the temporary support of concrete structures and which has telescopic members which can be moved at will for the purposes of adjusting to a desired height.

[0002] In these props for construction work there arises the problem that they may come apart unintentionally once they have been removed from their working position, because one telescopic member can slip with respect to the other, and come out completely.

[0003] To avoid the problem indicated, the present applicant is the proprietor of Spanish Patent of Invention 9700061 which discloses a prop for construction work with an internal spring which by producing an arresting force against an upper flange attached to the adjustment sleeve is intended to prevent one tubular member from unintentionally coming out from the other with consequent dismantling of the prop.

[0004] However this known solution suffers from a significant complication in that it requires three separate elements joined together to form the arresting rotating sleeve and washer at the extremity, and the spring has a very complex laminar shape requiring longitudinal cuts in the internal tube so that the retaining tabs can project, which causes appreciable difficulties in manufacture as there is some difficulty in making the said longitudinal grooves in the surface of the tubular member. Likewise, in practice it is frequently necessary to fit a number of laminar springs simultaneously in order to achieve the arresting surface area necessary.

[0005] This invention is based on forming an internal spring in the internal tube of the prop from a flat strip of steel bent into a substantially "V" shape, the ends of which have bent lips in the form of approximately circular segments projecting through transverse grooves in the tube, which is very easy to manufacture. The new prop is further combined with a unitary sleeve body having a handle and a top flange, eliminating any welding and added pieces. The bent lips in the shape of circular segments of the internal V-shaped spring abut against the top flange of the unitary sleeve body.

[0006] The new unitary sleeve will be made by casting materials providing sufficient strength and mouldability to achieve the relatively complex shape of this sleeve and handle member.

[0007] The new unitary sleeve is also characterised in that it has means to permit easy cleaning of the internal thread, comprising one or more longitudinal channels which interrupt the threads and which because of their width do not impede proper fine adjustment by means of the said thread, while on the other hand permitting the easy removal of dust, waste materials, etc., which habitually accumulate in such members on site.

[0008] Also the prop to which this invention relates has original features in the upper and lower plates which are attached to the extremities of the tubular body of the

prop merely through cold deformation by cramping and swaging.

[0009] To provide a better understanding, drawings of a preferred embodiment of this invention are appended by way of an explanatory but not restrictive example.

Figure 1 is a longitudinal cross-section of a prop for construction work according to this invention.

Figure 2 shows a cross-section similar to Figure 1 illustrating a working position.

Figure 3 shows a representative perspective view of the arrangement of the lateral projections of the spring with respect to the internal tube.

Figure 4 shows a transverse cross-section through the section plane indicated in Figure 3.

Figure 5 shows a perspective view of the internal spring in the prop.

Figure 6 shows a perspective view of a prop constructed according to this invention.

Figure 7 shows a detailed cross-section of the base of the prop.

Figure 8 shows a cross-section of the prop revealing the arrangement of the pin.

Figure 9 shows a plan view of the pin.

Figure 10 shows a representative cross-sectional view of the internal spring in the arresting position.

Figure 11 shows a perspective view with elements of the sleeve and upper cap with the pin removed to provide a better understanding.

[0010] As will be seen in the figures, the prop to which this invention relates has an internal tubular member -1- with its threaded upper end -2- embedded in a combined sleeve member formed by tubular member -3- which through its thread -4- engages the thread -2- of tubular member -1- and from whose outer surface there extend handle members -5- and -6-, constructed as a single piece, having at the top a flange or top -7- which is also integral with the whole.

[0011] Internal tubular member -8- has diametrically opposite transverse grooves -9- and -10- designed for passage of the lips of internal spring -11-.

[0012] Internal spring -11- comprises a steel spring in the shape of a strip or band of material which has two limbs -12- and -13- joined below by curved portion -14- arranged in a substantially "V" shape, terminating at the top in outwardly bent lips -15- and -16-, whose outer edges -17- and -18- are preferably of a curved shape. Spring -11- is fitted within internal tubular member -8- in such a way that lips -15- and -16- project through grooves -9- and -10- in such a way that edges -17- and -18- offer a large contact surface area when they abut against the upper flange of the sleeve, to dissipate impact energy without damaging the prop.

[0013] Through this invention manufacture of the prop assembly is very much simplified with respect to the spring, which is merely a flat strip of material, that is a cut and bent steel spring, and likewise transverse

grooves -9- and -10- in the external tube, which are very easy to manufacture. Similarly construction of the sleeve, handle and upper flange assembly as a single casting provides appreciable advantages in manufacture and assembly, resulting in more effective functioning of the prop, a longer service life and substantial savings in manufacture.

[0014] The prop to which this invention relates provides for formation of the foot -19- and the top part -20- of the same in a new and rational way which makes it possible to avoid welding, through plates pressed directly onto the tubular member, as may be seen in the detail in Figure 7 which shows the bottom part of tubular member -1- comprising a base plate -21- having a central opening in which the bottom end of tubular member -1- is fitted by cold cramping deformation and pressing forming a cramped zone -22- of substantially doughnut structure cramped at the edge -23- of the central opening and plate -21-, supplemented with an outwardly transversely bent zone in the form of a flange -24- which bears against the upper edge of the said edge -23-, making it possible to apply loads between the plate and the tube. Through this arrangement the base plates can be formed without any need for welding and with great strength and durability.

[0015] In upper part -20- construction of the top end is similar to that described, merely in an inverse arrangement as regards the positioning of top tube -8- and upper plate -25-.

[0016] As will be seen in Figures 8 and 9, the pin of the prop has a special structure which essentially comprises two successive U-shaped half loops -27- and -28- arranged, as seen in plan, opposite each other and in such a way that the inner arm -29- of loop -27- passes through tubular member -8- to set the desired height, while as seen in side view loop -28- is at an obtuse angle with respect to loop -27-. The extremity of external arm -30- of loop -28- ends in an extremity -31- bent into a right-angle which partly encloses the outside of loop -27-. Damage to and/or breakage of the pin and the opening, and loss of the pin, especially as a result of being dropped, is avoided in this way.

[0017] This invention also provides for improvements in sleeve member -3-, the inner thread -4- of which has longitudinally one or more longitudinal grooves -26- which make it possible for particles of dirt which may enter the thread from the site, and which frequently give rise to problems for the versions of prop sleeves of the type currently known, can be automatically discharged.

[0018] In Figure 11, which illustrates sleeve -3-, there will likewise be seen the retaining head formed by a base member -32- and a cap -33- in such a way that base member -32- has a projecting collar -34- of a generally cylindrical shape with openings -35- and -36- designed to receive the bottom projections -37- and -38- of cap -33- in the working position of the prop, and it will be seen that the bottoms of these notches -35- and -36- each have small projections -39- and -40- to prevent in-

correct assembly. Wings -41- and -42- of base member -32- have an asymmetrical shape with a straight side -43- and an extensively curved side -44-, preventing incorrect mating with that base member.

[0019] As indicated, cap -33- has bottom projections -37- and -38-, the bottom edges of which have a pointed shape, for example edge 45.

[0020] Likewise upper edges -46- and -47- of cylindrical collar -34- have an inclined structure to assist the retaining movement.

Claims

1. A prop for construction work, of the type having two tubular members in a telescopic arrangement with flat top and bottom supporting base members, a transverse pin coinciding with the selected openings in the telescopic assembly and a formwork retaining head arrangement in the tubular elements of which the external tube has an upper threaded zone which receives an outer sleeve with a handle, **characterised in that:**
 - a) the external sleeve, handle and upper flange assembly are moulded from a single piece of metal,
 - b) the internal spring is constructed as a flat strip spring bent to form two outer limbs bent to match the top parts of the flange, and the internal surface of the external tube, and,
 - c) the external tube has straight diametrically opposite transverse grooves through which the bent ends of the spring project.
2. A prop for construction work according to claim 1, **characterised in that** the ends of the lips of the spring have curved external edges.
3. A prop for construction work according to claim 1, **characterised in that** the external sleeve has internal grooves in an axial direction which cut the thread and permit the easy removal of impurities entering the sleeve.
4. A prop for construction work according to claim 1, **characterised in that** both the top and bottom base members are each constructed of plates attached to the extremities of the corresponding tubes by cold cramping and deformation.
5. A prop for construction work according to claim 4, **characterised in that** the plate has a central opening onto which the lower extremity of the tubular member is lipped into a partly doughnut shape, a flange formed by transverse deformation of the tubular member by transverse bending coinciding with the upper part of the flange of the said central

opening in order to permit axial pressure between the tubular member and the plate.

6. A prop for construction work according to claim 1, **characterised in that** the base member of the device for retention of the formwork has: 5
- upper edges in the central cylindrical collar having an inclined structure,
 - projections at the bottoms of the vertical discharge grooves, and 10
 - asymmetrical lateral wings with a straight edge and an extensively curved opposite edge to direct the mating operation. 15
7. A prop for construction work according to claim 1, **characterised in that** the cap of the discharge device has inclined zones in each of the lower edges of its vertical projections. 20
8. A prop for construction work according to claim 1, **characterised in that** the fixing pin for the telescopic position of the two tubular members of the prop has a structure formed by two opposing U-shaped half loops in an arrangement almost enclosing each other in such a way that the outer loop is largely bent into an obtuse angle with respect to the inner loop and the remainder of the outer arm of the said outer loop which ends in a part which is substantially bent through 90°, giving rise to a structure which is protected against damage and/or breakage through being dropped. 25 30

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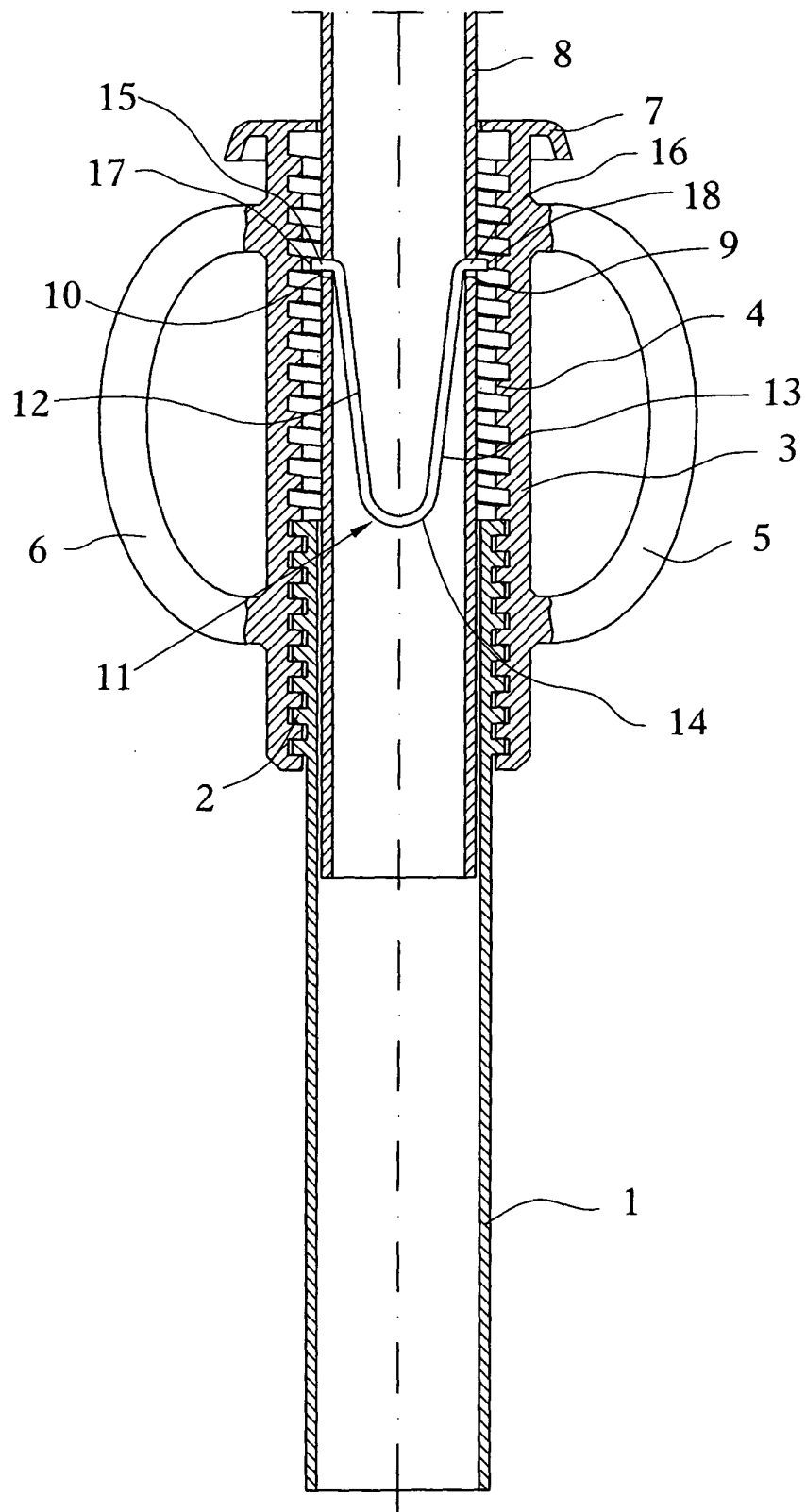


FIG. 1

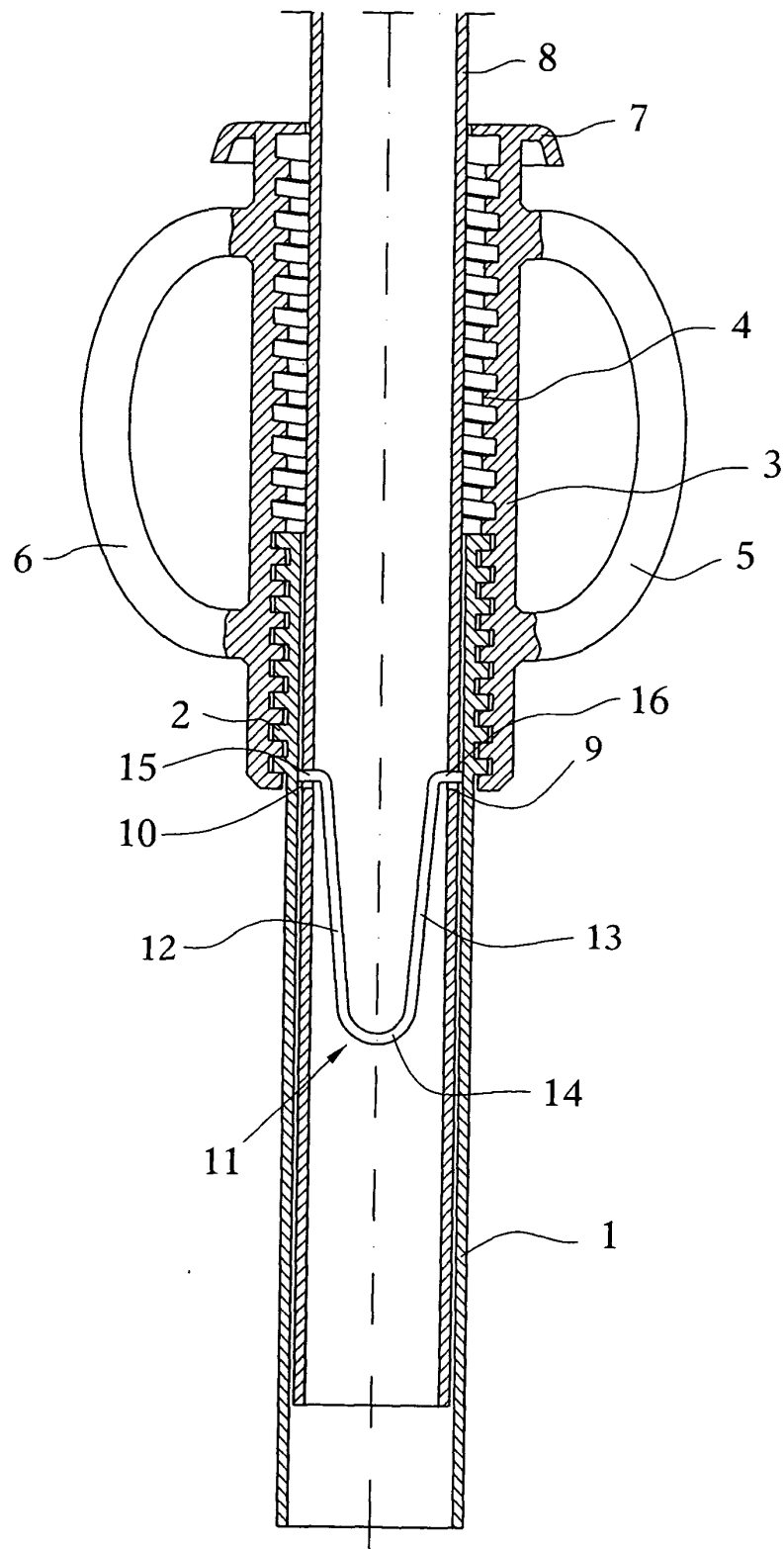


FIG. 2

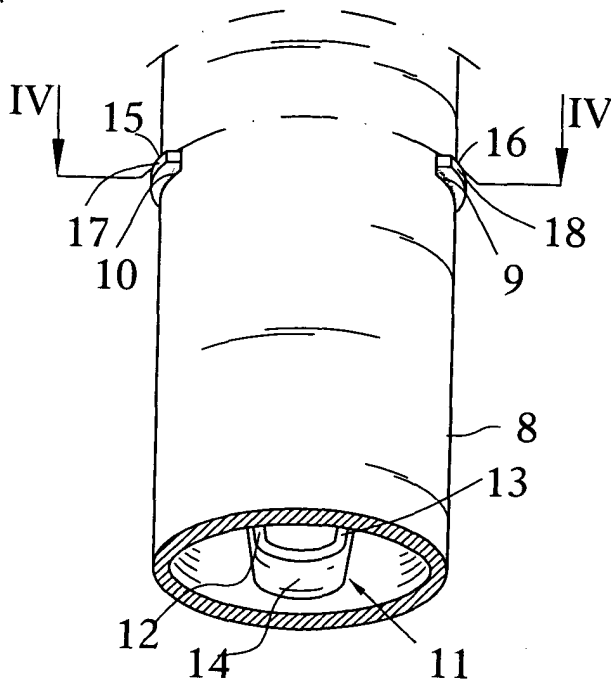


FIG. 3

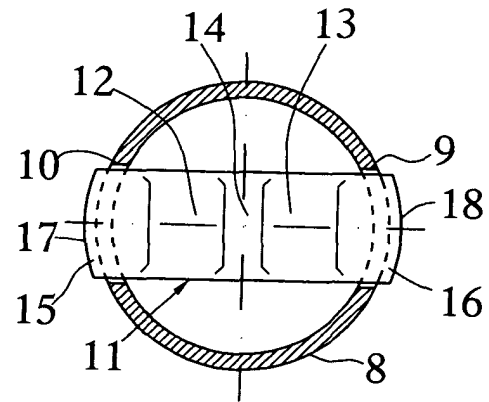


FIG. 4

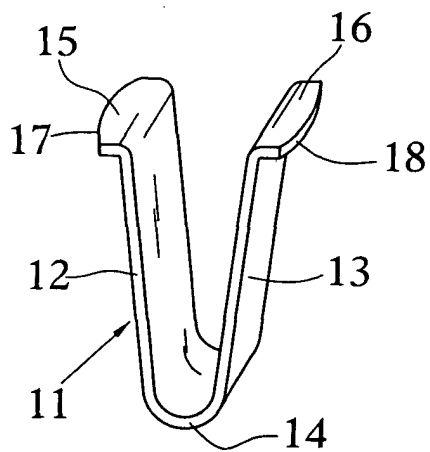


FIG. 5

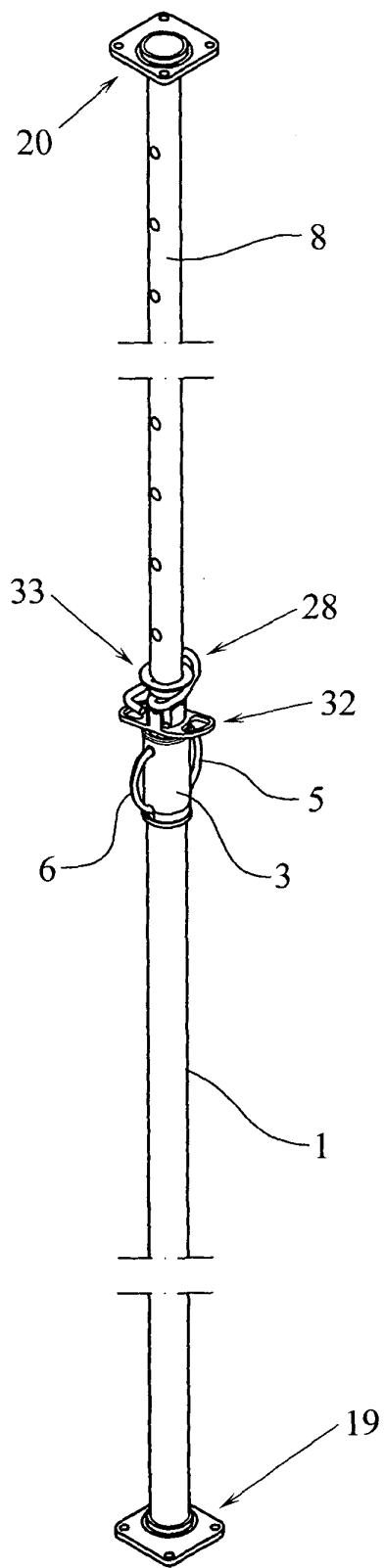


FIG. 6

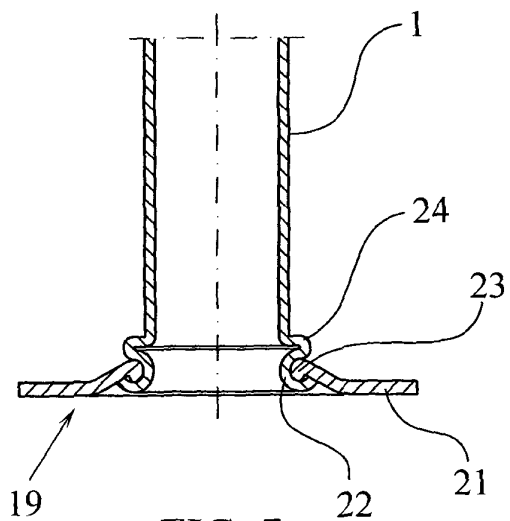


FIG. 7

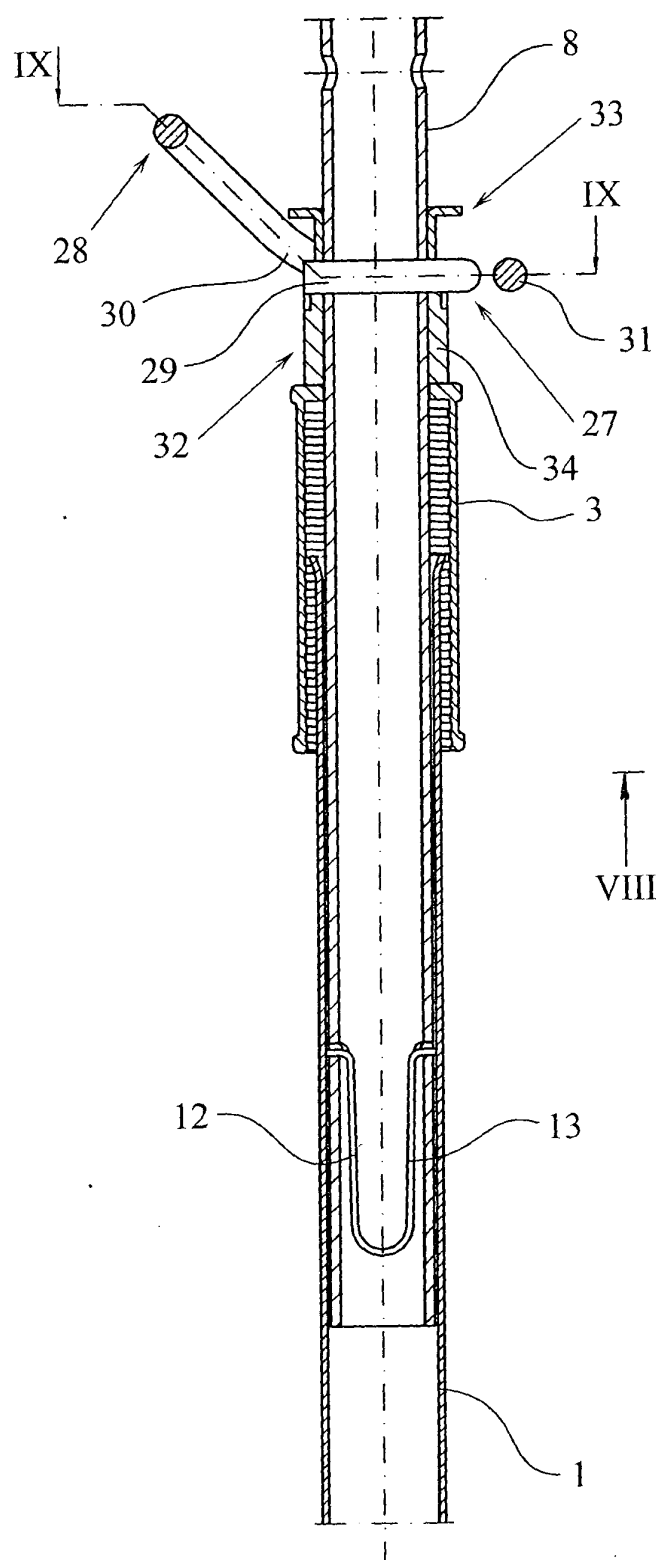


FIG. 8

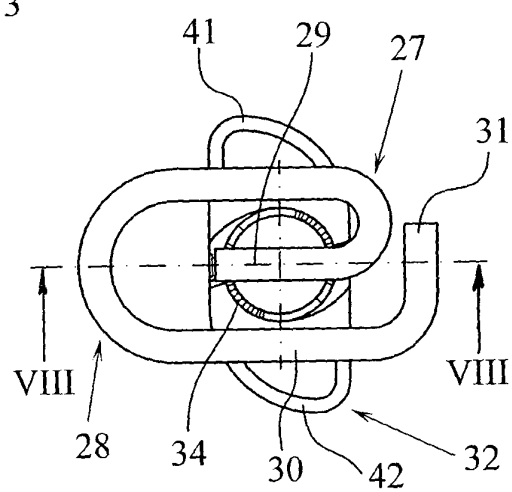


FIG. 9

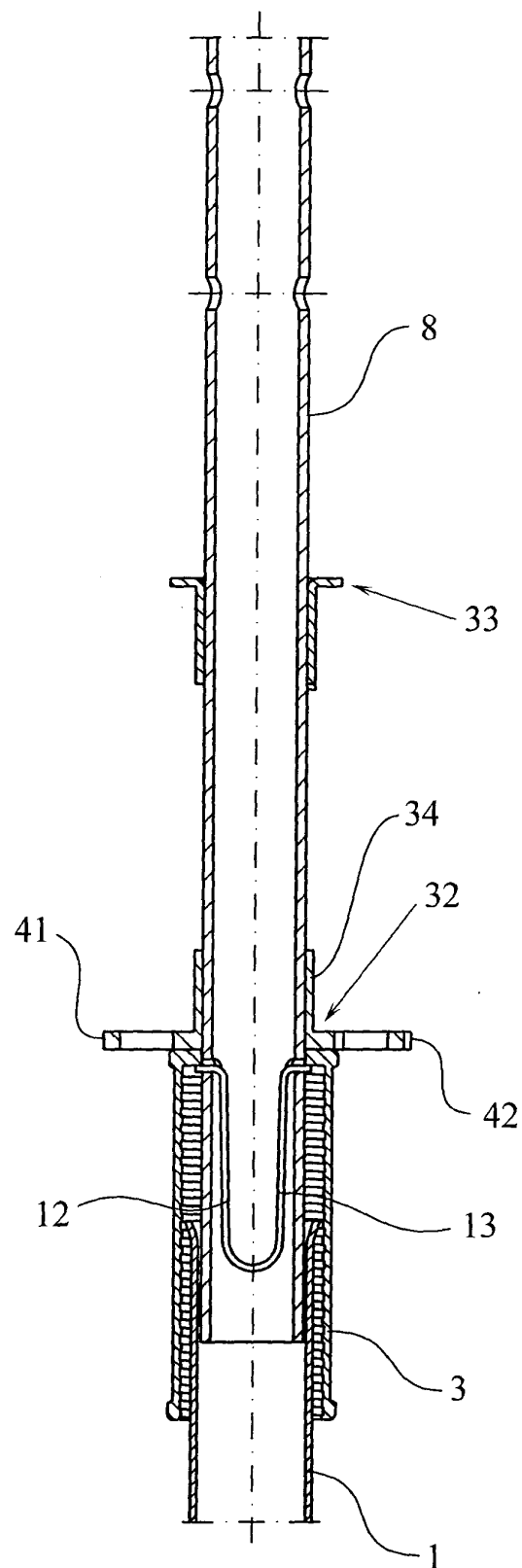


FIG. 10

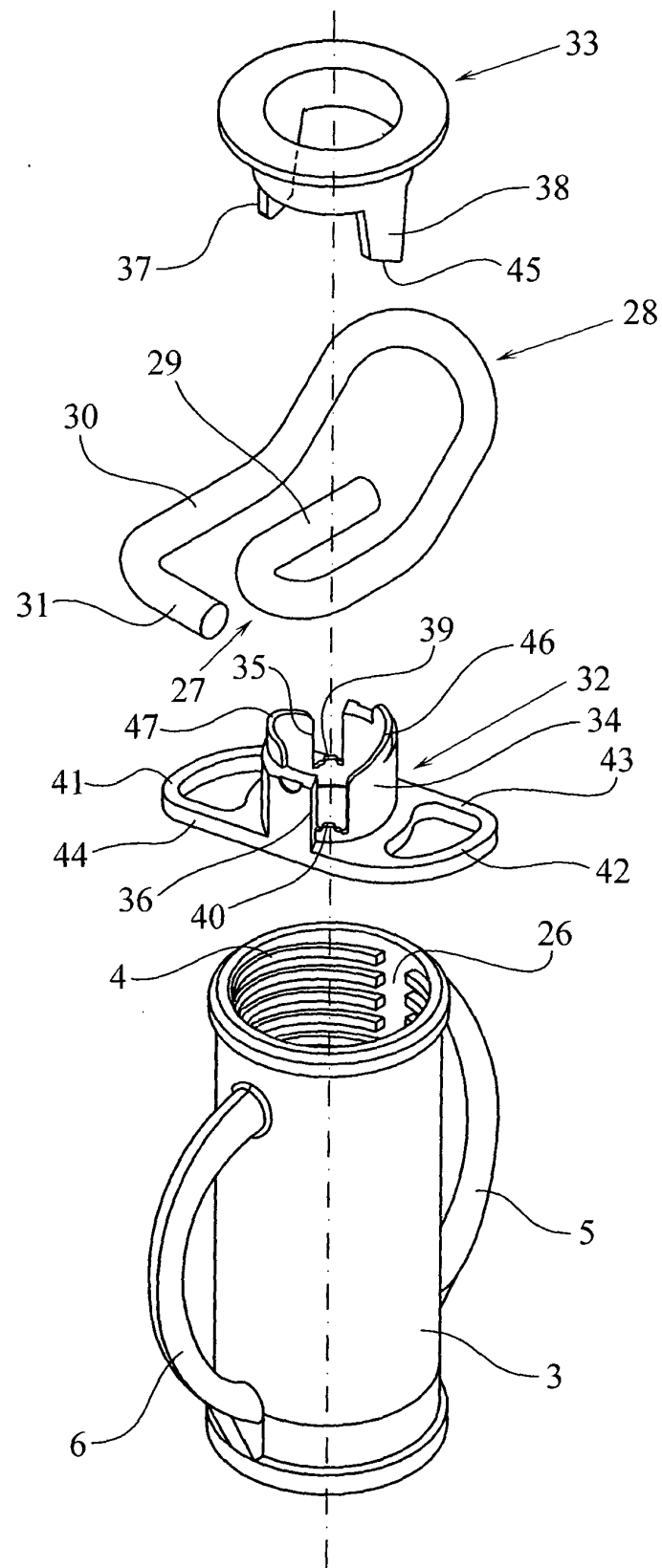


FIG. 11