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(54) **Prop for construction work**

Stütze für Bauarbeiten

Etai pour travaux de construction

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(73) Proprietor: **Sistemas Técnicos de Encofrados, S.A.**
08150 Parets del Vallés, Barcelona (ES)

(72) Inventor: **Ubinana Felix, José Luis**
08150 Parets del Valles (Barcelona) (ES)

(74) Representative: **Durán Moya, Carlos et al**
DURAN-CORRETJER
Còrsega, 329
08037 Barcelona (ES)

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- **PATENT ABSTRACTS OF JAPAN vol. 1998, no. 12, 31 October 1998 (1998-10-31) -& JP 10 183990 A (SANKYO:KK), 14 July 1998 (1998-07-14)**
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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] Another example of an invention to prevent unintentional decoupling of props can be found in FR-A-2 188 648, which discloses an internal element comprising two cylindrical parts that are pushed against two holes of the internal tube by means of a helical spring. The cylindrical parts project through said holes and abut against the upper flange to prevent decoupling.

[0006] FR-A-2 188 648 discloses all the features of the preamble of claim 1.

[0007] It is also known in the art the use of other elements to avoid decoupling of the prop. DE 42 28 195 A1 discloses a ring made of rubber that surrounds the internal tube of the prop and it is fixed it. Said ring is located between two surfaces which abut against the top flange. The rubber produces also a braking effect due to the friction with the tube during movement.

[0008] On the other hand, JP 10 183990 A discloses a coupling element between two tubes. In this case in order to achieve coupling both inner and outer tubes need to have holes. The coupling element is an "V"-shaped spring which edges are bent inwards and its triangular profile allows easy decoupling of the tubes without exerting an excessive force.

[0009] This invention is defined by a prop as claimed in claim 1 and 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 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.

[0010] The new unitary sleeve may be made by casting materials providing sufficient strength and mouldability to achieve the relatively complex shape of this sleeve and handle member.

[0011] In a preferred embodiment, 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 grooves 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.

[0012] 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 cross-section of the prop revealing the arrangement of the pin.

Figure 7 shows a plan view of the pin.

Figure 8 shows a representative cross-sectional view of the internal spring in the arresting position.

Figure 9 shows a perspective view with elements of the sleeve and upper cap with the pin removed to provide a better understanding.

[0013] As will be seen in the figures, the prop to which this invention relates has an external 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.

[0014] Internal tubular member -8- has diametrically opposite transverse grooves -9- and -10- designed for passage of the lips of internal spring -11-.

[0015] 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 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.

[0016] 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.

[0017] As will be seen in Figures 6 and 7, 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.

[0018] A preferred embodiment of 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 side, and which frequently give rise to problems for the versions of prop sleeves of the type currently known, can be automatically discharged.

[0019] In Figure 9, 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 incorrect 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.

[0020] As indicated, cap -33- has bottom projections

-37- and -38-, the bottom edges of which have a pointed shape, for example edge 45.

[0021] 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 (1,8) in a telescopic arrangement with flat top and bottom supporting base members, a transverse pin (27,28) coinciding with selected openings in the telescopic arrangement and a formwork retaining head arrangement in the tubular members (1,8) of which the external tube (1) has an upper threaded zone which receives an outer sleeve (3) with a handle and an upper flange, **characterised in that:**
 - a) the outer sleeve (3), handle (5,6) and upper flange (7) are moulded in a single piece of metal,
 - b) the prop includes an internal spring (11) which is constructed as a flat strip spring bent to form two outer limbs (12,13) bent to match top parts of the flange, and an internal surface of the external tube (1), and,
 - c) the internal tube (8) has straight diametrically opposite transverse grooves (9,10) through which bent ends (15,16) of the outer limbs (12,13) of the spring project,
 - d) the bent ends (15,16) of the two outer limbs (12,13) of the spring (11) have curved external edges having lips (17,18) with the shape of circular segments.
2. A prop for construction work according to claim 1, **characterised in that** the outer sleeve (3) comprises a thread (4) and has internal grooves (26) in an axial direction which cut the thread (4) and permit the easy removal of impurities entering the sleeve.
3. A prop for construction work according to claim 1, **characterised in that** a base member (32) of the device for retention of the formwork has:
 - upper edges (46,47) in a central cylindrical collar (34) having an inclined structure,
 - projections (39,40) at the bottoms of vertical discharge grooves (35,36), and
 - asymmetrical lateral wings (41,42) with a straight edge (43) and an extensively curved opposite edge (44) to direct the mating operation.
4. A prop for construction work according to claim 1, **characterised in that** a cap (33) of the discharge device has inclined zones (45) in each of the lower edges of vertical projections (38).

5. A prop for construction work according to claim 1, **characterised in that** the transverse pin for the telescopic position of the two tubular members of the prop has a structure formed by two opposing U-shaped half loops (27,28) in an arrangement almost enclosing each other in such a way that the outer U-shaped half loop (28) is largely bent into an obtuse angle with respect to the inner U-shaped half loop (27) and the remainder of an outer arm (30) of the said outer U-shaped half loop which ends in a part (31) which is substantially bent through 90°, giving rise to a structure which is protected against damage and/or breakage through being dropped.

Patentansprüche

1. Stütze für Bauarbeiten des Typs, der in einer teleskopischen Anordnung zwei röhrenförmige Elemente (1, 8) mit einem oberen und unteren flachen tragenden Basiselement, einen Querstift (27, 28), der mit ausgewählten Öffnungen in der teleskopischen Anordnung übereinstimmt, und in den röhrenförmigen Elementen (1, 8) eine schalungszurückhaltende Kopfanordnung aufweist, wobei das äußere Rohr (1) einen oberen, mit einem Gewinde versehenen Bereich aufweist, der eine äußere Hülse (3), die einen Griff und einem oberen Flansch hat, aufnimmt, **dadurch gekennzeichnet, dass:**

a) die äußere Hülse (3), der Griff (5, 6) und der obere Flansch (7) aus einem einzigen Metallstück geformt sind,

(b) die Stütze eine Innenfeder (11), die als eine Flachbandfeder ausgestaltet ist, die gebogen ist, um zwei äußere Schenkel (12, 13) zu bilden, die so gebogen sind, dass sie mit den oberen Teilen des Flanschs übereinstimmen, und eine Innenoberfläche des äußeren Rohrs (1) umfasst, und

(c) das innere Rohr (8) gerade diametral gegenüberliegende Aussparungen (9, 10) hat, durch die die gebogenen Enden (15, 16) der äußeren Schenkel (12, 13) der Feder hervorstehen,

(d) die gebogenen Enden (15, 16) der zwei äußeren Schenkel (12, 13) der Feder (11) gekrümmte Außenränder aufweisen, die Lippen (17, 18) mit der Form von Kreissegmenten haben.

2. Stütze für Bauarbeiten nach Anspruch 1, **dadurch gekennzeichnet, dass** die äußere Hülse (3) ein Gewinde (4) und Innenaussparungen (26) in Axialrichtung umfasst, die das Gewinde (4) durchschneiden und das leichte Entfernen von Verunreinigungen erlauben, die durch die Hülse eindringen.

3. Stütze für Bauarbeiten nach Anspruch 1, **dadurch**

gekennzeichnet, dass ein Basiselement (32) der Vorrichtung für das Zurückhalten der Schalung folgendes aufweist:

- obere Ränder (46, 47) in einem zentralen zylindrischen Kragen (34), der eine schräge Struktur hat,

- Projektionen (39, 40) an den unteren Enden der vertikalen Entlassungsaussparungen (35, 36), und

- asymmetrische laterale Flügel (41, 42) mit einem geraden Rand (43) und einem stark gekrümmten gegenüberliegenden Rand (44), um die Verbindungsposition steuern.

4. Stütze für Bauarbeiten nach Anspruch 1, **dadurch gekennzeichnet, dass** eine Kappe (33) der Entlassungsvorrichtung schräge Bereiche (45) in jedem der unteren Ränder der vertikalen Projektionen (38) aufweist.

5. Stütze für Bauarbeiten nach Anspruch 1, **dadurch gekennzeichnet, dass** der Querstift für die teleskopische Position der zwei röhrenförmigen Elemente der Stütze eine Struktur hat, die durch zwei gegenüberliegende U-förmige Halbschleifen (27, 28) gebildet wird, die eine derartige Anordnung haben, dass sie sich beinahe gegenseitig auf eine Weise umschließen, dass die äußere U-förmige Halbschleife (28) weitgehend in einem stumpfen Winkel in Bezug auf die innere U-förmige Halbschleife (27) gebogen ist und der Rest eines äußeren Arms (30) der äußeren U-förmigen Halbschleife, die in einem Teil (31) endet, das im wesentlichen um 90° gebogen ist, eine Struktur ergibt, die gegen Beschädigung und/oder Bruch durch Herunterfallen geschützt ist.

Revendications

1. Etais pour travail de construction, du type ayant deux éléments tubulaires (1, 8) dans un ensemble télescopique avec un sommet plat et des éléments de base supportant le fond, une goupille transversale (27, 28) coïncidant avec des ouvertures choisies dans l'ensemble télescopique et un ensemble de tête de soutien de coffrage dans les éléments tubulaires (1, 8) parmi lesquels le tube externe (1) a une zone supérieure filetée qui reçoit un manchon externe (3) ayant un manche et un flasque supérieur, **caractérisé en ce que :**

a) le manchon externe (3), le manche (5, 6) et le flasque supérieur (7) sont moulés en une seule pièce de métal,

b) l'étais comprend un ressort interne (11) qui est construit sous forme d'un ressort en bande plate incurvée pour former deux branches externes

- (12, 13) pliées pour s'adapter à deux parties supérieures du flasque, et une surface interne du tube externe (1), et
- c) le tube interne (8) a des fentes transversales (9, 10) rectilignes et diamétralement opposées que traversent les extrémités pliées (15, 16) des branches externes (12, 13) du ressort, 5
- d) les extrémités pliées (15, 16) des deux branches externes (12, 13) du ressort (11) ont des bords externes incurvés ayant des lèvres (17, 18) ayant la forme de segments circulaires. 10
2. Etai pour travail de construction selon la revendication 1, **caractérisé en ce que** le manchon externe (3) comprend un filetage (4) et a des rainures internes (26) dans une direction axiale qui coupent le filetage (4) et permettent l'enlèvement aisé d'imputrés pénétrant dans le manchon. 15
3. Etai pour travail de construction selon la revendication 1, **caractérisé en ce qu'**un élément de base (32) du dispositif pour le soutien du coffrage comprend : 20
- des bords supérieurs (46, 47) d'une bague cylindrique centrale (34) ayant une structure inclinée, 25
 - des saillies (39, 40) dans les fonds de fentes de décharge verticales (35, 36), et
 - des ailes latérales asymétriques (41, 42) avec un bord droit (43) et un bord opposé (44) fortement incurvé pour diriger l'opération d'ajustement. 30
4. Etai pour travail de construction selon la revendication 1, **caractérisé en ce qu'**un bouchon (33) du dispositif de décharge a des zones inclinées (45) dans chacun des bords inférieurs d'excroissances verticales (38). 35
- 40
5. Etai pour travail de construction selon la revendication 1, **caractérisé en ce que** la goupille transversale pour la position télescopique des deux éléments tubulaires de l'étai a une structure formée de deux demie boucles (27, 28) opposées conformées en U 45
- dans une disposition où elles s'enferment presque l'une dans l'autre de telle sorte que la demie boucle en U externe (28) est en grande partie repliée selon un angle obtu par rapport à la demie boucle en U interne (27) et au reste d'un bras externe (30) de ladite demie boucle en U externe qui se termine en une partie (31) qui est sensiblement pliée à 90°, réalisant une structure qui est protégée contre les dégradations et/ou les ruptures en cas de chute. 50
- 55

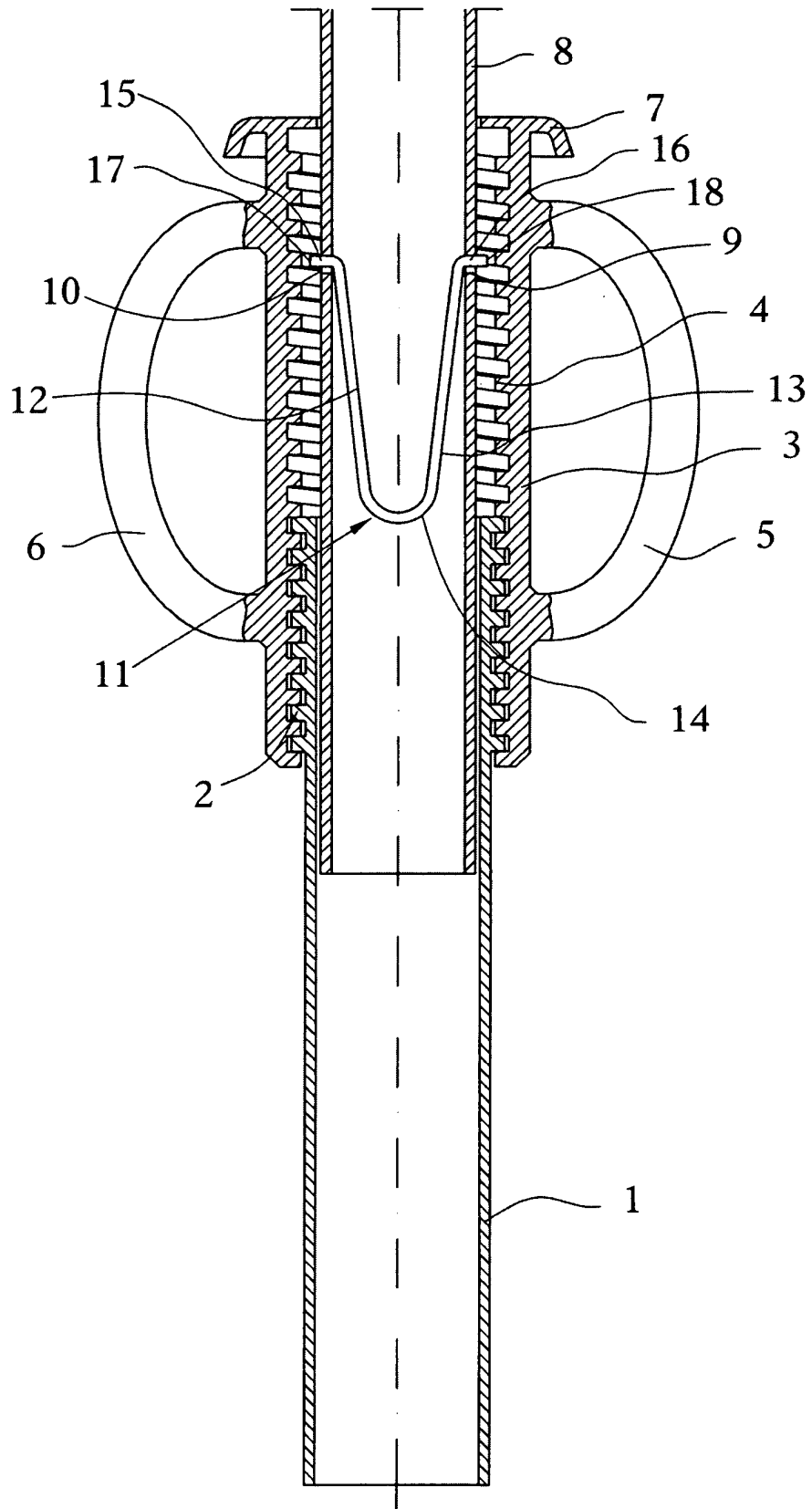


FIG. 1

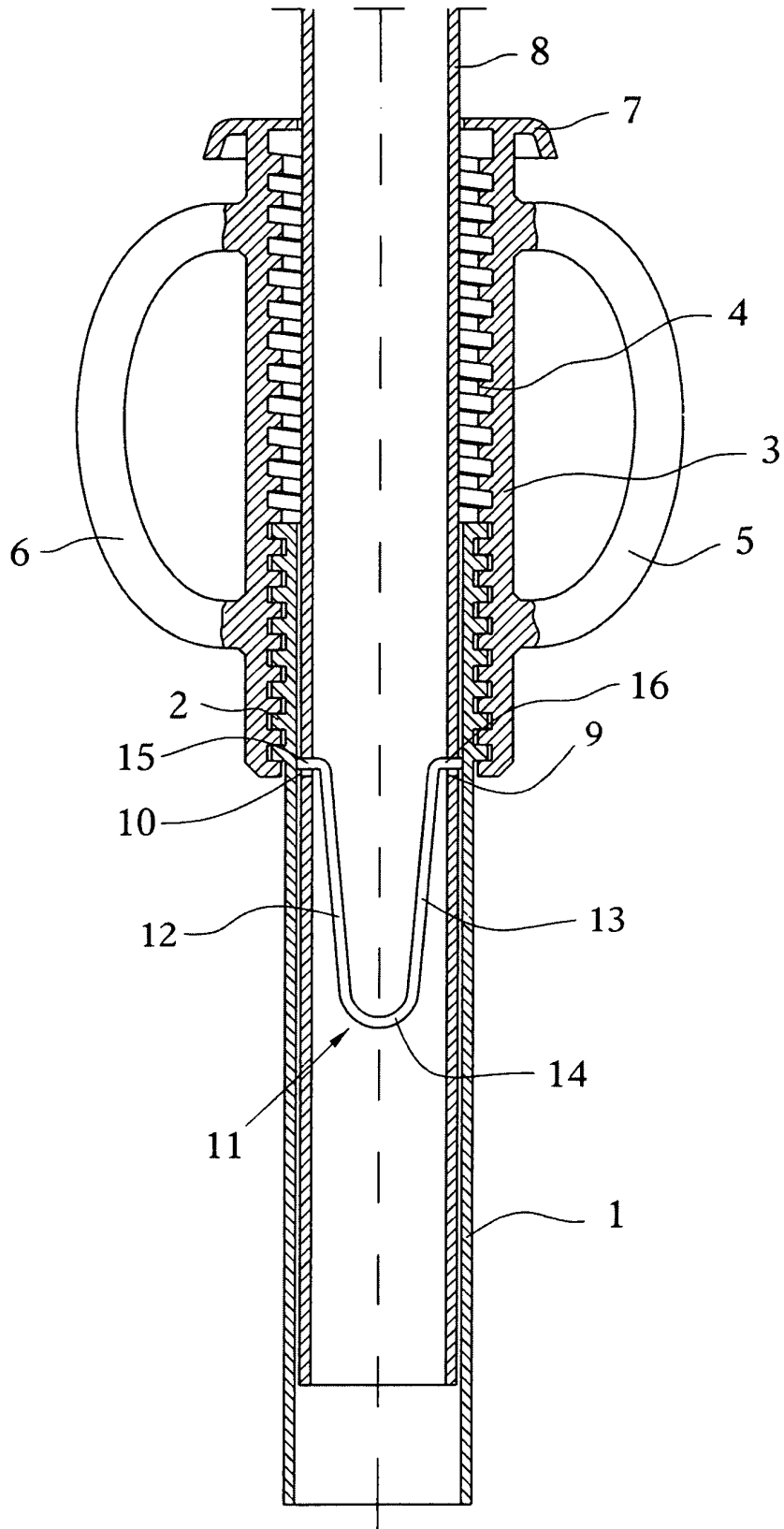


FIG. 2

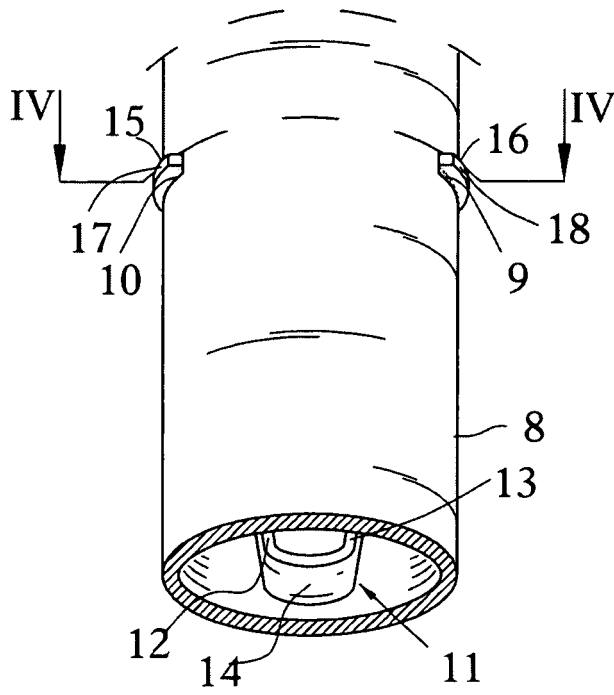


FIG. 3

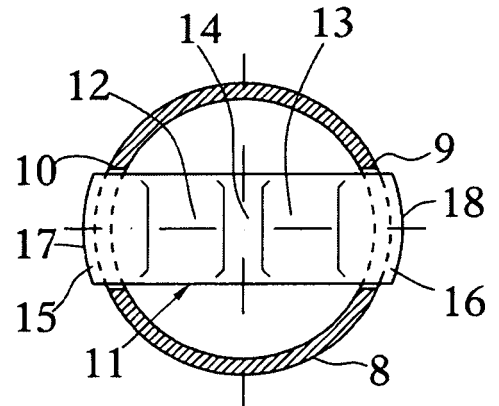


FIG. 4

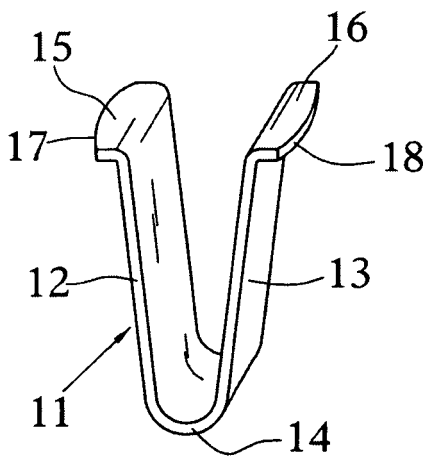


FIG. 5

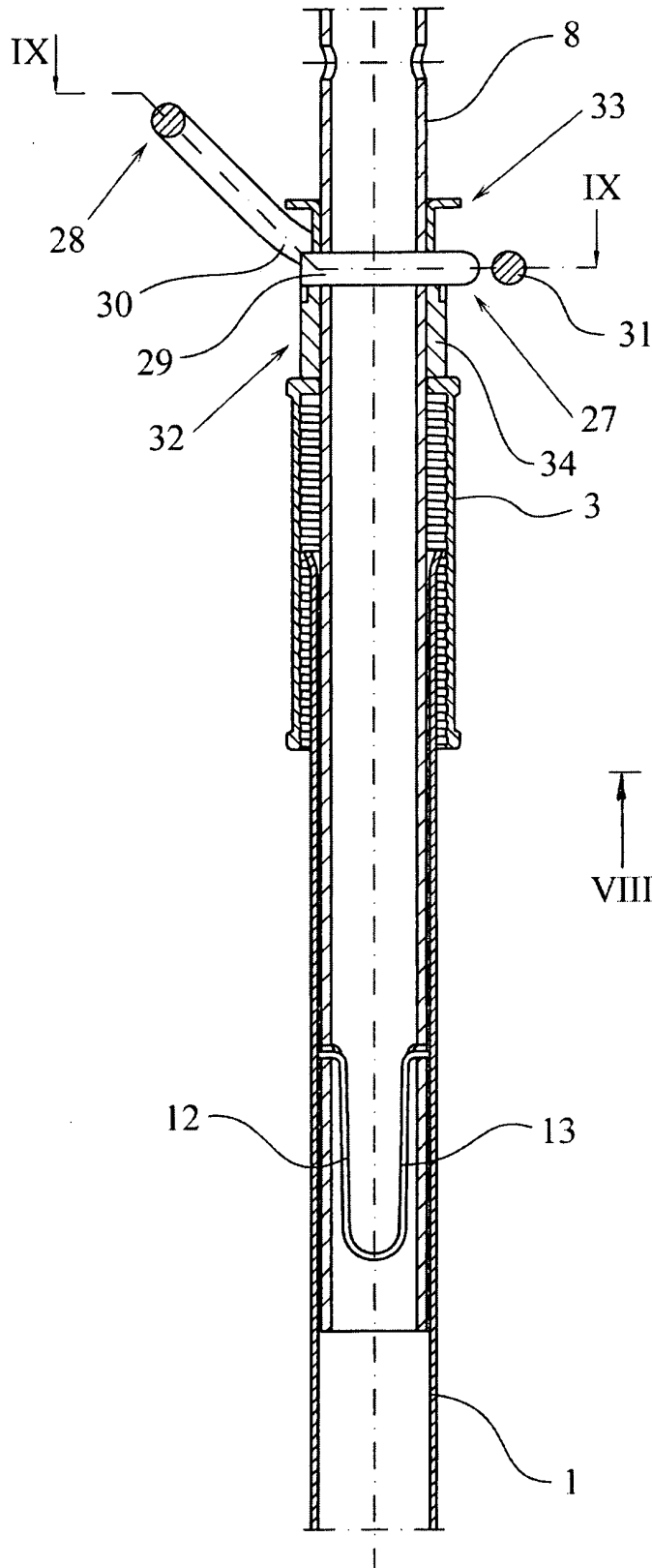


FIG. 6

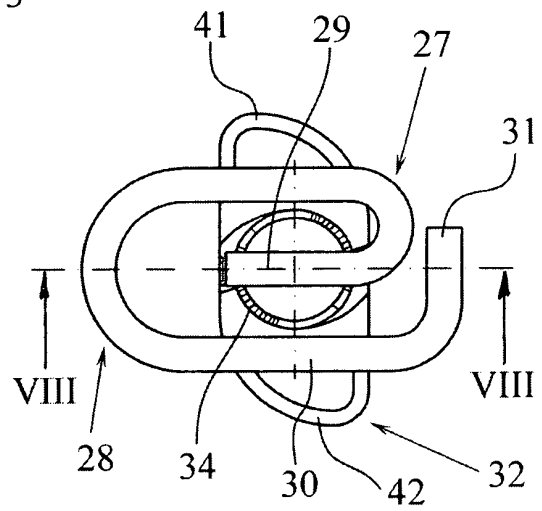


FIG. 7

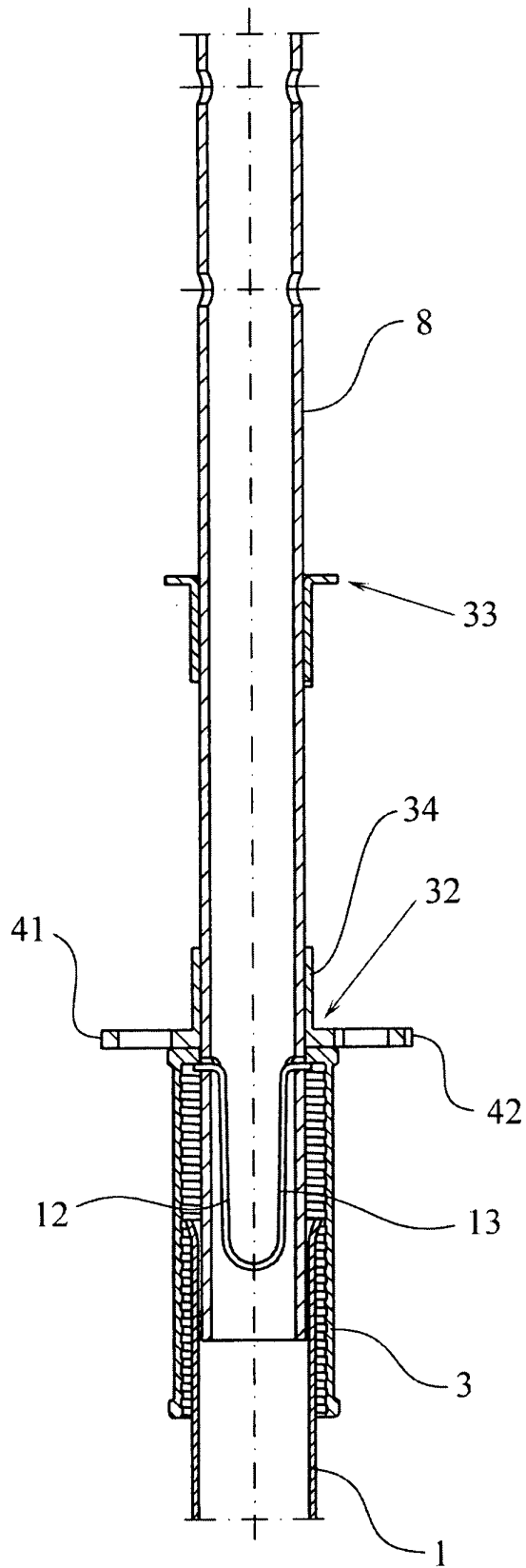


FIG. 8

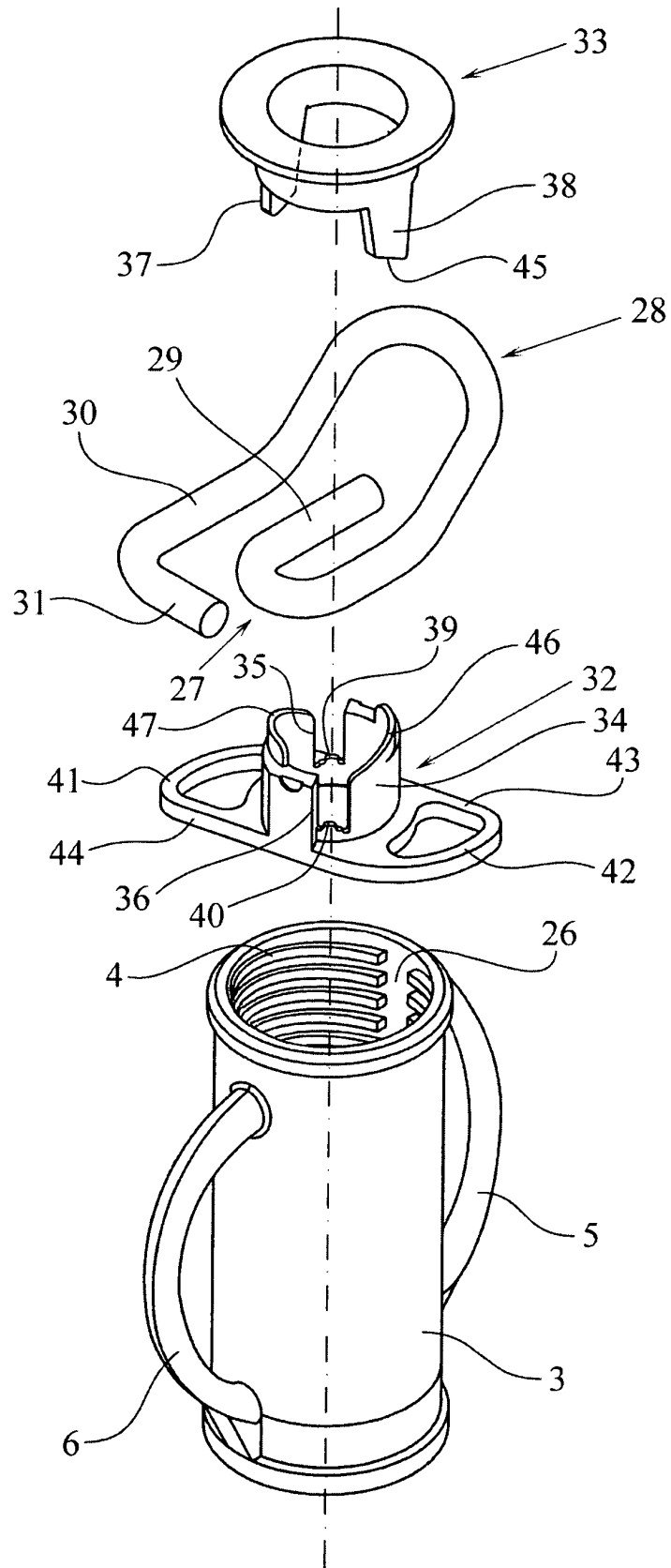


FIG. 9

REFERENCES CITED IN THE DESCRIPTION

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