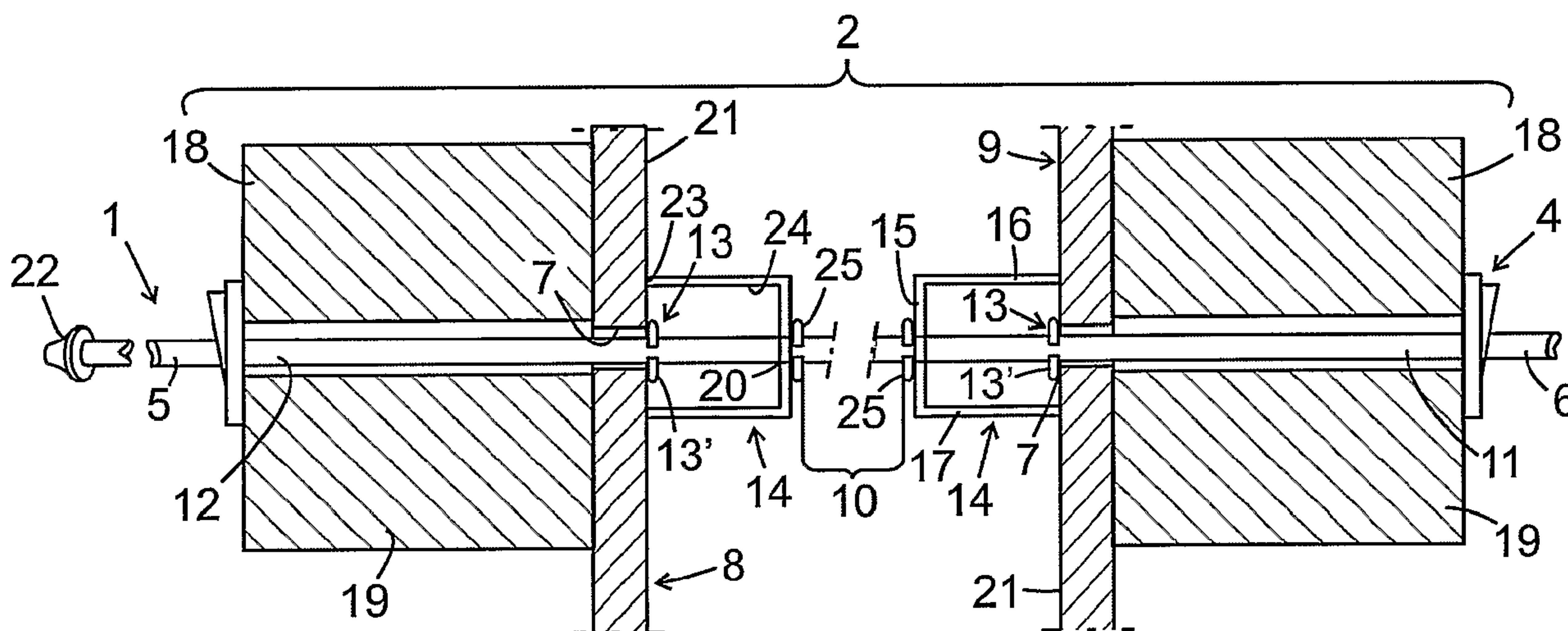




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(54) Titre : PROCÉDE ET ATTACHE DE COFFRAGE DESTINES A PRODUIRE UNE PAROI
 (54) Title: A METHOD AND A FORM TIE FOR PRODUCING A WALL



(57) Abrégé/Abstract:

The present invention concerns a method for producing a wall or partition construction with essentially smooth surfaces. The method comprises the arrangement of opposite former sheets 8, 9 or equivalent surfaces at a distance from each other in order to form a former space with the aid of form ties 1, parts of which are caused to extend through holes 7 in the former sheets 8, 9 and provided with stop means 13, which are caused to come into contact with those surfaces of the former sheets 8, 9 that face the former space, and which form ties 1 are provided with retainers 4 on the surfaces of the former sheets 8, 9 that face away from the former space in order to maintain the former sheets 8, 9 or equivalent at a distance from each other, after which mortar or concrete in liquid form is added to the former space and caused to solidify. The form ties 1 are constituted by non-rusting material and are provided before application in the former space with breakage guides 13', which are located essentially in the plane of the inner surfaces of the former sheets 8, 9. The form ties 1 are caused to interact with supports and spacers 14 of non-rusting material, which are arranged to be in contact with the inner surfaces of the former sheets 8, 9. The supports and spacers 14 are designed such that they allow the mortar or concrete in liquid form to be caused to surround them except for those parts that are in contact with the inner surfaces of the former sheets 8, 9, the surfaces that face the former space. Following the solidification of the wall or partition construction, the retainers 4 and the former sheets 8, 9 are removed and the form ties 1 are broken at the breakage guides 13'. The invention also concerns a form tie 1 to be used when producing a wall or partition construction by the method described above.

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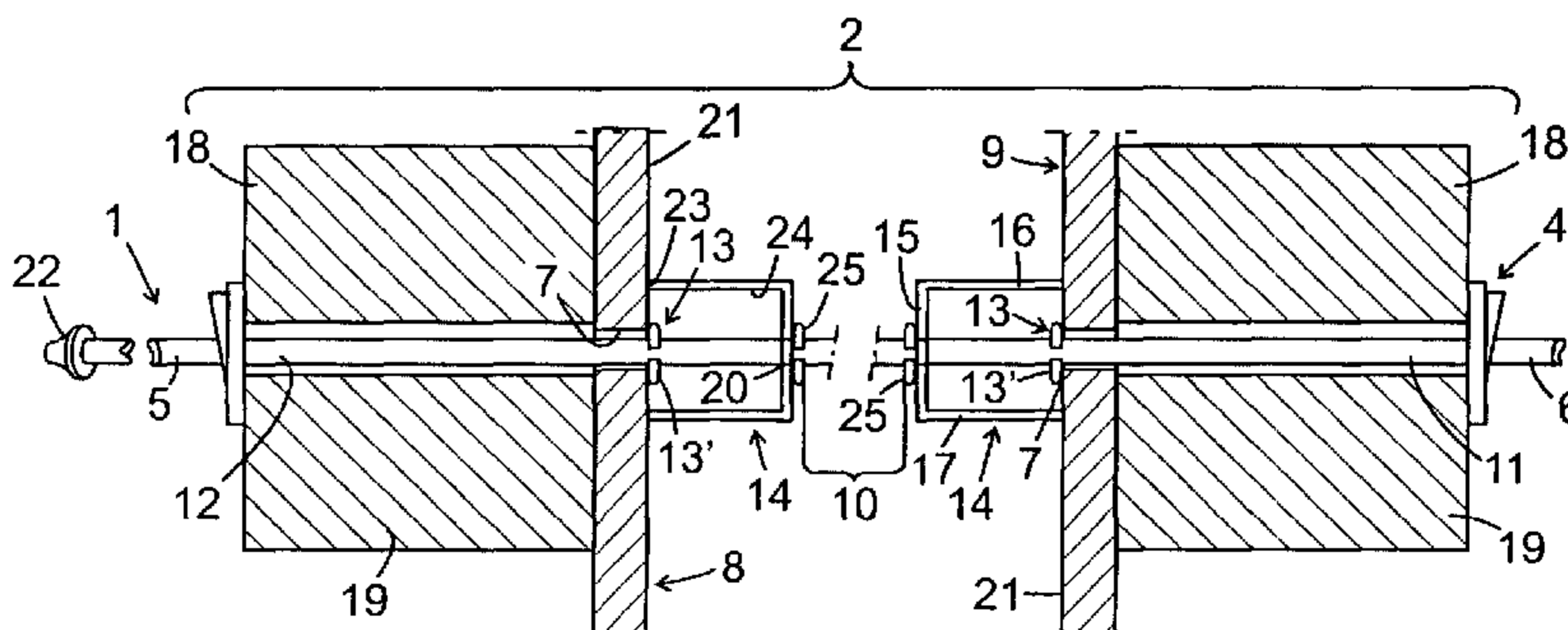
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(54) Title: A METHOD AND A FORM TIE FOR PRODUCING A WALL



(57) Abstract: The present invention concerns a method for producing a wall or partition construction with essentially smooth surfaces. The method comprises the arrangement of opposite former sheets 8, 9 or equivalent surfaces at a distance from each other in order to form a former space with the aid of form ties 1, parts of which are caused to extend through holes 7 in the former sheets 8, 9 and provided with stop means 13, which are caused to come into contact with those surfaces of the former sheets 8, 9 that face the former space, and which form ties 1 are provided with retainers 4 on the surfaces of the former sheets 8, 9 that face away from the former space in order to maintain the former sheets 8, 9 or equivalent at a distance from each other, after which mortar or concrete in liquid form is added to the former space and caused to solidify. The form ties 1 are constituted by non-rusting material and are provided before application in the former space with breakage guides 13', which are located essentially in the plane of the inner surfaces of the former sheets 8, 9. The form ties 1 are caused to interact with supports and spacers 14 of non-rusting material, which are arranged to be in contact with the inner surfaces of the former sheets 8, 9. The supports and spacers 14 are designed such that they allow the mortar or concrete in liquid form to be caused to surround them except for those parts that are in contact with the inner surfaces of the former sheets 8, 9, the surfaces that face the former space. Following the solidification of the wall or partition construction, the retainers 4 and the former sheets 8, 9 are removed and the form ties 1 are broken at the breakage guides 13'. The invention also concerns a form tie 1 to be used when producing a wall or partition construction by the method described above.



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A METHOD AND A FORM TIE FOR PRODUCING A WALL

TECHNICAL AREA

The present invention relates to a method for producing a wall or partition with essentially
5 smooth surfaces, which method comprises opposite former sheets or equivalent surfaces
being arranged at a distance from each other in order to form a former space with the aid of
form ties, parts of which protrude through holes in the said former sheets and are provided
with stop means, which stop means are caused to come into contact with those surfaces of
the former sheets that face the former space, and which form ties are provided on the sides
10 of the former sheets that face away from the former space with retainers in order to maintain
the former sheets at the correct distance, after which mortar or concrete in liquid form is
added to the former space and caused to solidify. The invention also concerns a form tie to
be used when producing a wall or partition with the method described above. The form tie
comprises a rod with a breakage guide and at least one support and spacer that interacts
15 with the rod.

INTRODUCTION

Form ties are used primarily when moulding concrete walls *in situ*. In this case, the form ties
are used in order to position the moulds, that is, in order to keep together the former sheets
20 that are used, and to fix them relative to each other, in order to form an inner space, which is
filled with moulding compound in order to form, for example, a wall, partition, column or
similar. The former sheets of the mould are normally built up from battens for the support of
loads that arise and stiff wooden sheets for example, the sheets known as plywood sheets,
of planking or of both in order to define the space. Former sheets of materials other than
25 wood, for example, of metal or stiff paperboard, can also be used, as can, in counter-
moulding, one or more of the former sheets be constituted by an existing object.

The form ties, which are significantly longer than the width of the former space, essentially
consist of thin iron or steel rods, although normal reinforcing iron is also found, which are cut
30 to suitable lengths. In order to position the former sheets at the correct distance from each
other, supports and spacers are arranged at predetermined locations along the rods. The
supports and spacers normally consist of thin washers, for example, circular washers of
plastic or metal, which may be domed; solid or hollow plastic, concrete or metal bodies
having a certain volume and geometry, such as cones, cubes or similar. The length of the
35 body in the direction of the rod determines the width of the mortar, that is, it determines the
void that is formed in the moulding compound from the surface of the moulded element and

inwards, which width of mortar can amount to greater than 50 mm using known supports and spacers. Since such a support and spacer may have a comparable ratio between its diameter and its width, it is easy to realise that a wall, for example, that has been moulded using the said support and spacer requires considerable subsequent cleaning, once the
5 removal of the supports and spacers, which is necessary for aesthetic reasons, has been carried out.

The supports and spacers are prevented from displacement inwards along the rod by means of stop means, for example, embossed impressions, increased thickness or tracks in the rod
10 itself, arranged on the rod such that an irregularity in cross-section is achieved, with which the support and spacer subsequently makes contact. Furthermore, there is often a moisture barrier washer or a gas barrier washer arranged between these supports and spacers that is to prevent the passage of moisture or gas along the rod and thus through the wall. Once the former sheets have also been secured against relative displacement in a direction away from
15 each other by means of some form of retainer, moulding compound, principally and naturally a concrete mixture or some other cement-based mixture, is poured between the former sheets in order to form the actual element, for example a wall or column.

The retainers are removed once the moulding is complete, and the element in question is
20 freed wholly or partially (depending on whether the said element is a free-standing element or has been moulded against an existing object such as, for example, an existing wall, which in this case replaces one of the former sheets) by removing the unattached former sheets from each other.

The end sections of each rod, which now protrude from the surface of the element, are now removed by, for example, being cut or broken at the said irregularity in cross-section. These irregularities in cross-section are currently often positioned at, or at a certain distance inside of, the actual surface of the moulded element, normally at the inner side of each support and spacer, and they are arranged in such a manner that the supports and spacers are freed
30 from the rest of the rod during the removal of the protruding end sections. In order for it to be possible to apply a sealing and levelling layer of mortar or smoothing compound on top of the end of the remaining central part of the form tie, the support and spacer is normally removed from the surface using a suitable tool such as a screwdriver.

35 This means either that time-consuming and manpower-consuming extra work in the form of removal of each such support and spacer followed by the said repair of the surface must be

carried out, or that the very ugly holes left by the supports and spacers are left in the wall without any measures being taken. Furthermore, a rod of iron or steel, which is positioned underneath what is only a very thin surface layer, will rust in the presence of moisture, giving disturbing rust patches and the risk of rust-caused destruction of the surface layer of the element, while at the same time, the sealing properties of the element are, naturally, considerably reduced. If the end of the rod is left completely without a protective layer, the situation is, naturally, considerably worsened. In the long run, the supporting power, functionality and length of life of the construction can be seriously affected, particularly in the event of rust-caused splitting of the surface layer of the element.

10

Repair of damaged building constructions caused by the attack of rust costs society considerable amounts each year, both in the case of constructions, such as bridges and harbour constructions, paid for from public funds, and in the case of privately owned constructions.

15

In order to at least reduce the risk of damage from moisture, the above-mentioned moisture-barrier washer is often mounted at the centre of the rod of the form tie, which moisture barrier can, for example, be comprised by a circular metal washer with a diameter of between 5 cm and 10 cm. Furthermore, the building element can be protected from attack by moisture by means of various methods and surface layers, which it is subsequently appropriate to apply following the removal of the formers. This involves, naturally, additional expense, and it is not always the case that such extra protective layers can be applied.

20

THE PRIOR ART

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Form ties for moulded forms of the type specified above are known in many different designs, although all of them have in common the failure to deal with the problems described above.

30

The patent document US 1293391 A describes form ties in which the rod 3 of the form tie has breakage guides 4. Bowl-shaped washers are arranged in those breakage guides that are intended to limit the thickness of the moulded wall as supports and spacers for the former sheets, which in this way cause similar bowl-shaped depressions in the mould. Naturally, this is a disadvantage when moulding a wall that is intended to be smooth.

35

The patent document CA 2034584 A describes a form tie that, following moulding and the breaking off of the protruding ends of the rods, leaves behind such supports and spacers

that, when removing the same, cause exactly the undesired holes in the moulded surface of the wall that are described above. It is also specified that the rods are manufactured from steel, making it probable that problems with rust will eventually arise.

5 A further example of a form tie is known from SE 451 079 B, which demonstrates different designs of supports and spacers and a rod in which the stop means comprises tracks in the rod, together with special lock-washers. However, this form tie has the disadvantages that have been described above.

THE INTENTION OF THE INVENTION AND ITS CHARACTERISTICS

10 The purpose of the present invention is to achieve a form tie for moulded forms, which form tie completely eliminates, or at least considerably reduces, the problems described above.

The invention is thus characterised by the form tie being manufactured from a non-rusting material and provided before being applied in the former space with breakage guides, which
15 breakage guides are essentially located in the same plane as the inner surfaces of the former sheets. The form ties are caused to interact with supports and spacers of a non-rusting material, which supports and spacers are arranged to make contact with the inner surfaces of the former sheets. The supports and spacers are designed such that they allow the mortar or concrete in liquid form to be caused to surround them except for those parts
20 that lie in contact with the inner surfaces of the former sheets, the surfaces that face towards the former space. Following solidification of the wall or partition construction, the retainers and the former sheets are removed, and the form ties are broken at the breakage guides. According to further aspects of a form tie according to the invention, the support and spacer is provided with at least a first surface, positioned essentially perpendicular to the rod.

25 Furthermore, the support and spacer is designed to be available for interaction with the moulding compound with the exception of the said first surface, and that, once the form tie has been applied as it is to be used, the breakage guide in the rod is positioned in essentially the same plane as the first surface, and that not only the supports and spacers but also the rod are manufactured from a non-rusting material.

30 Further characteristics of one preferred embodiment of the invention are that the form tie has at least two breakage guides and two supports and spacers. The two breakage guides are separated from each other by a distance that essentially corresponds to the desired thickness of the completed wall or partition. At least the first surface of each support and
35 spacer is located at a distance from the rod that is essentially in the same plane as the associated breakage guide.

Further characteristics of one preferred embodiment of the invention are that the form tie comprises a first stop means that prevents an associated support and spacer from being displaced relative to the form tie in towards its centre, and a second stop means that prevents the associated support and spacer from being displaced relative to a form tie outwards away from its centre. There is a distance arranged relative to the form tie between the said first and second stop means such that each support and spacer can be displaced, within certain limits, and that the associated breakage guide is located along the form tie at a position that, when viewed from its centre, lies behind the associated second stop means.

Each support and spacer is provided with two legs, the extents of which in the direction of the width of the form tie are essentially equal and each one of which essentially agrees with the distance of the breakage guide from the first stop means, and the ends of which form the said first surfaces.

Further characteristics of one preferred embodiment of the invention are that the supports and spacers are arranged to be fixed relative to the form tie by, for example, welding.

Further characteristics of one preferred embodiment of the invention are that the supports and spacers are bent from the material of the rod, in the form of, for example, loops arranged in a plane that is perpendicular to the longitudinal direction of the rod.

ADVANTAGES OF THE INVENTION

By using only non-rusting materials and by locating the breakage guides of the form tie in the same plane as the inner surfaces of the former sheets, or similar, it is achieved that the parts of the form tie left behind following removal of the end sections that protrude beyond the surface of the relevant element can often be left completely without any further measures, at least with respect to the function of the construction and, in many cases, also with respect to its appearance. By making the support surface of the supports and spacers that is in contact with the inner surface of the former sheets as small as possible, further aesthetically advantageous characteristics are achieved since the supports and spacers in this way become less noticeable.

According to further aspects of the invention, a construction is achieved that, for example, completely eliminates, or at least considerably reduces, the need for an internal moisture barrier, including the need of a special moisture barrier washer arranged on the form tie

inside the moulded element, and in nearly all cases the need for subsequent cleaning is also eliminated.

DESCRIPTION OF DRAWINGS

5 The invention will be described in more detail with reference to the drawings.

Figure 1 is a schematic side view of one preferred embodiment of a form tie according to the present invention, which form tie comprises one rod and two supports and spacers.

10 Figure 2 is a schematic side view of an alternative embodiment of a form tie according to the invention intended for counter-moulding, which form tie comprises an alternative end section.

Figure 3 is a schematic perspective view of a form tie with an alternative embodiment of the breakage guides/stop means according to the invention.

15

Figures 4 and 5 are schematic perspective views of form ties with alternative embodiments of supports and spacers according to the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

20 A schematic side view of a form tie 1 for moulds 2 according to a first preferred embodiment of the invention is shown in Figure 1, which form tie 1 comprises an extended rod, which is manufactured from a non-rusting material, preferably a metallic material such as stainless steel or aluminium. The rod, in the embodiment shown, is essentially straight and cut at a length that is suitable for the particular mould, while being considerably longer than the width
25 of the mould such that all types of retainer 4, including tensioners (not shown), can be applied as necessary to the ends 5, 6 of the rod. It is intended that the rod is to be arranged to be inserted through or fixed into holes 7, which are appropriately placed opposite each other, in essentially opposite former sheets 8, 9 in order to achieve, together with the said retainers 4, a connection of the former sheets 8, 9 that resists tensile forces at a
30 predetermined distance from each other during moulding in the said mould 2 until the former sheets 8, 9 are removed from each other. The rod comprises a central section 10 and two external end sections 11, 12, which three sections 10, 11, 12 have predetermined rod cross-sections that in the embodiments shown are common and are evenly distributed along the lengths of the said sections 10, 11, 12.

35

A number of stop means 13, 25 are arranged at certain predetermined positions along each rod for the positioning of one or several supports and spacers 14, each at a predetermined position along the rod. In the special embodiment shown in Figure 1, two supports and spacers 14 are attached to prevent displacement inwards along the rod by means of one stop means 25 each, which supports and spacers 14 are thus also arranged at a predetermined distance from each other. However, the supports and spacers 14 are arranged such that they can still be displaced in a direction outwards from the relevant stop means 25. Each support and spacer 14 has, furthermore, a through-opening 20 for the said rod, either in the form of a hole at the centre of the support and spacer 14 in order to thread the support and spacer 14 from one end section 11, 12 of the rod, or in the form of an oblong hole from the edge of the support and spacer 14 towards its centre in order to thread the support and spacer 14 across the rod. In the embodiment shown, the support and spacer 14 is constituted by pieces cut from a longer rail of non-rusting material with a U-shaped profile, which support and spacer 14 has been hollowed in the central part 15 of the U-profile in order to thread it onto the rod from its ends 5, 6 in such a way that the two legs 16, 17 of the U-profile face outwards from the central section 10 of the rod in order for each to come into contact with one end surface 23 against the inner surface 21 of the closer of the former sheets 8 and 9. A further stop means 13 is arranged on the rod at the same distance as the free end surfaces 23 of the two legs 16, 17 of the support and spacer 14, which stop means 13 prevents the support and spacer from falling off during assembly of the mould 2, and which also constitutes a breakage guide 13' for cutting the rod on completion of the moulding. It is also intended that the former sheets 8, 9 should rest on these stop means 13 when the mould is assembled. The opening 20 can be punched out from the central part 15 in such a manner that a cone that protrudes from the central part 15 is formed during the punching, which cone makes it more difficult for moisture to penetrate along the rod.

Each stop means 13, 25 in the embodiment shown in Figure 1 is constituted by two stamped embossings arranged essentially opposite to each other and on each side of the rod such that the latter obtains an irregularity in its cross-section that prevents the said displacement inwards. The stop means 13, 25 can, naturally, also be comprised by other irregularities in cross-section in the form of, for example, one or more notches, threaded sections or protrusions, which are arranged along the rod, in which or against which the said support and spacer 14 rests. The stop means 13 also function, as has been previously mentioned, as breakage guides 13' in this case.

Several clear advantages are achieved by giving the supports and spacers 14 the form of a thin U-shaped profile, which is mounted on the rod in such a manner that a three-pointed star is formed. Firstly, the moulding compound achieves free flow around the sides of the support and spacer 14 and through the passage 24 through it, which is why undesirable air pockets located against the inner surfaces 21 of the former sheets 8, 9 are prevented. Secondly, the total area of contact of the support and spacer 14 with the former sheets 8, 9, that is, the sum of the above-mentioned end surfaces 23, will be considerably reduced compared to what it is when using conventional washers or cones, which must have a certain diameter that is greater than the relevant hole 7 in the former sheet 8, 9 in order to guarantee that the conventional support and spacer 14 is not able to pass out through the said hole 7 when the form tie 1 is placed under tension. In this way, it is achieved that the support and spacer 14 that remains after demounting the mould is as good as invisible, while at the same time the rust stains that are otherwise problematical are totally prevented due to the selection of a non-rusting material for the complete form tie 1.

If either of the former sheets 9 is constituted by an existing object, as shown in Figure 2, as in the process known as counter-moulding, each rod 3 is normally screwed, by means of a thread 29 that is arranged along one of the end sections 11 of the rod 3, into a hole 7 drilled into the object for the purpose. The form tie 1 in such an embodiment preferably comprises only one support and spacer 14 arranged at the end section 12 that is opposite to the thread 29. The threaded end section 11 constitutes in this way not only a support and spacer but also a stop means, since the rod 3 is attached to the existing object 9 such that the predetermined distance to the opposite support and spacer 14 is obtained, and in this way the desired thickness of the element is also obtained. It is intended that such counter-moulding ties are to be used together with duplex sheaths or expanders and jointing nuts.

Figure 3 shows an alternative design for the design of the rod 3 of the form tie 1 in which the stop means 13 and the breakage guides 13' have been achieved by the rod 3 having two different diameters. The central part of the rod 3, which is intended to be located inside the moulded wall, has a larger diameter, while the parts on each side of this part have a smaller diameter. The shoulders that are formed in this way are thus in this case stop means 13 for the forming sheets 8, 9 and breakage points 13'.

Figure 4 shows an alternative design for the support and spacer 14, which in this case is constituted by sections 26 of the rod 3. These sections 26 are constituted by a bent loop 27 intended to support the former sheets 8, 9 on the surface of these that faces the former

space. The rod 3 has breakage guides 13' arranged in the same plane as the surface of the former sheets 8, 9 that face the former space.

Figure 5 shows an alternative design for the support and spacer 14, which in this case is constituted by sections 26 of the rod 3. These sections 26 are constituted by two bent loops 28 intended to support the former sheets 8, 9 on the surface of these that faces the former space. In this case, the rod 3 has breakage guides 13' in a manner equivalent to that shown in Figure 4. The sections 26 in Figures 4 and 5 can be constituted by incomplete rings that support the former sheets, instead of loops 27, 28. The supports and spacers 14 can be mutually arranged along the longitudinal length of the form tie to display an angle, for example, 90 degrees.

In the particular embodiments that are illustrated, the form tie 1 comprises a round rod 3 that normally has a standard diameter of 6.5 mm or 8 mm with free end sections 11, 12 at approximately 400 mm (that is, a free end of 400 mm from the respective stop means 13 for the supports and spacers 14). The tensile resistance of a 6.5 mm form tie is approximately 14 kN, and that for an 8 mm form tie is approximately 18 kN. However, highly resistant form ties with a tensile resistance of approximately 25 kN are also manufactured. The 8 mm form ties are delivered as standard with 400 mm free ends, but they can also be obtained with an end knob 22. Form ties having an end knob 22 are intended for use in moulds comprising plywood and double battens 18, 19 (45 x 95 mm) or planks.

The supports and spacers 14 are manufactured from a U-profile, 40 x 40 x 3 mm, which is cut into pieces of width 15 mm, these pieces being drilled with holes of the diameter of the rod. It is appropriate if the form tie 1 is manufactured from non-rusting material SIS 2333 or SIS 2343. The thickness of the covering layer can, naturally, vary, which is why it is appropriate to manufacture the legs 16, 17 of the supports and spacers 14 with several lengths, for example within an interval from approximately 5 mm to approximately 60 mm, preferably 7 mm, 15 mm, 35 mm, 45 mm and 55 mm, from which a selection can be made.

The invention is not limited to the embodiments and examples of the design shown or described above: it can be varied in various ways within the framework of the patent claims. It should, for example, be realised that the said non-rusting material is not limited to metallic materials, such as stainless steel and aluminium, but all other materials, alloys and composite material having the properties required for use as a form tie 1 for moulds 2, for example plastic, paperboard, etc. (although preferably of an inorganic, water-repellent

material), lie within the innovative concept. It should further be realised that the rod 3, which is preferably relatively straight, can also comprise one or several bends. The cross-section of the rod 3 can be rectangular, square, circular, or it can have any other suitable form.

- 5 The term "moulds 2" is taken to denote primarily wall moulds, but all other possible moulds 2 comprising former sheets 8, 9 that essentially face each other held together by one or several of the said form ties 1 are included by the term, for example moulds 2 for staircases, columns, supporting walls, etc., and including counter-moulded walls or elements in which at least one of the former sheets 8, 9 is constituted by an existing construction, for example, an
10 existing building element, or an existing object, such as rock, ground excavation, etc.

The moulding compound is primarily constituted by concrete, but other compounds such as sealing compound, bentonite compound, etc., also fall within the framework of the term.

- 15 The retainers 4 can comprise, for example, wedges or tension wedges, with or without GeKu ties.

DESCRIPTION OF FUNCTION

- The function and use of the form tie 1 according to the invention will now be described. At
20 least one of the former sheets 8, 9 is mounted and prepared for the relevant type of mould 2 in a conventional manner prior to the mounting of the form ties 1. For example, if holes 7 for the ends 5, 6 of the form ties 1 are not present, holes must be made through the former sheets 8, 9. One of the outer end sections 11, 12 of each form tie 1 is extended through the said holes 7 through the former sheets 8, 9 such that the support and spacer 14 of the
25 relevant end section 12 is brought into contact with the inner surface 21 of the said former sheet 8, 9. If counter-moulding against, for example, an existing wall 9, is to take place, see Figure 2, the wall 9 is prepared for this by drilling holes, plugging threads, insulation, etc. The threaded end-section 11 is then screwed as far as the central part 10 into the existing object 9. The irregularities 13' in the cross-section of the thread thus function both as
30 support and spacer and as stop means in this special case. The armouring that is part of the element that is to be moulded is mounted in the conventional manner before, during or after the arrangement of the form ties 1. The remainder of the former sheets 8, 9 are mounted in the conventional manner for the relevant mould 2, such that the inner surface 21 of each former sheet 8, 9 rests against the end surfaces 23 of the supports and spacers 14, that is,
35 the surface at the ends of the legs 16, 17 in the embodiment that is shown in Figure 1.

The former sheets 8, 9 are thus positioned at a predetermined distance from each other such that the thickness of the element that is to be moulded in the particular mould 2 is determined, since each support and spacer 14 is arranged at a stop means 25 in such a manner that the support and spacer 14 is prevented by the said stop means 25 from being displaced inwards towards the central section 10. According to one preferred embodiment of the invention, not shown here, the support and spacer is also welded onto the rod such that a tight connection between them is obtained, whereby an integrated sealing function is at the same time obtained.

10 When the form ties 1 have also been fixed to prevent relative displacement of the form sheets 8, 9 in a direction away from each other with the aid of a conventional method, for example, by means of retainers 4 placed against the outer surface of the former sheets 8, 9, concrete can be added. Since the supports and spacers 14 that are included have open through-passages 24 (in contrast with the normal conical, closed supports and spacers), the concrete can flow in and reach the mould surface 21 even within the support and spacer 14.

15 Once the moulded element has solidified, the mould 2 is dismantled and the outer sections 11, 12 of the form ties 1 that protrude from the surface of the element are removed at the stop means closest to the freed surface of the element, that is, it is appropriate if they are broken at the stop means 13 that forms a breakage guide 13' exactly at the surface of the wall. In this way, a wall, for example, is created that does not normally require any subsequent cleaning.

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CLAIMS :

1. A method for producing a wall or partition construction with essentially smooth surfaces, comprising the arrangement of opposite form sheets at a distance from each other in order to form a form space with the aid of form ties, parts of which are caused to extend through holes in the form sheets and provided with stop means, which are caused to come into contact with those surfaces of the form sheets that face the form space, and which form ties are provided with retainers on the surfaces of the form sheets that face away from the form space in order to maintain the form sheets at the distance from each other, after which mortar or concrete in liquid form is added to the form space and caused to solidify, wherein the form ties are manufactured from non-rusting material and provided before application in the form space with breakage guides, which are essentially located in the plane of the inner surfaces of the form sheets, each form tie is caused to interact with supports and spacers of non-rusting material, which have been arranged to be in contact with the inner surfaces of the form sheets, the supports and spacers are designed such that they allow the mortar or concrete in liquid form to surround them, except for those parts that are in contact with the inner surfaces of the form sheets, the surfaces that face the form space, and following the solidification of the wall or partition construction, the retainers and the form sheets are removed and the form ties are broken at the breakage guides.
2. A form tie to be used when producing an essentially smooth wall or partition construction, said form tie comprising a rod with at least one breakage guide and at least one support and spacer that interacts with the rod, the support and spacer being provided with at least one first surface located essentially perpendicular to the rod and the support and spacer being designed to be accessible for interaction with the molding compound except for the first

- surface wherein, when the form tie has been mounted ready for use, the breakage guide in the rod is located essentially in the same plane as the first surface, and the support and spacer and the rod are manufactured from non-rusting material.
3. The form tie according to claim 2 wherein said rod has at least two breakage guides and two supports and spacers, the two breakage guides are separated from each other at a distance that essentially corresponds to the desired thickness of the final wall or partition construction, and at least the first surface of each support and spacer is positioned at a distance from the rod essentially in the plane of the respective breakage guide.
 4. The form tie according to claim 2 or 3 including a first stop means that prevents an associated support and spacer from being displaced relative to the form tie in a direction towards its centre and a second stop means that prevents the associated support and spacer from being displaced relative to the form tie in a direction out from its centre, the distance between the first and the second stop means being such that each support and spacer can be displaced within certain limits relative to the form tie, and the associated breakage guide being located on the form tie at a position relative to its centre that lies behind the associated second stop means wherein the or each support and spacer is equipped with two legs the lengths of which in the lengthwise direction of the form tie being essentially equal and each of their lengths corresponding to the distance of the breakage guide from the first stop means and wherein the ends of the legs form two of said at least one first surface.
 5. The form tie according to claim 2 or 3 wherein at least one support and spacer is fixedly attached to the form tie.
 6. The form tie according to any one of claims 2, 3 and 5 wherein at least one support and spacer is bent from the material of the rod.

7. The form tie according to claim 6, wherein at least one support and spacer is constituted by loops or rings arranged in a plane perpendicular to the longitudinal axis of the rod.
8. The form tie according to claims 6 or 7 wherein the at least one support and spacer is arranged at an angle relative to the longitudinal axis of the form tie.
9. The form tie according to any one of claims 2 to 4, wherein the at least one support and spacer is designed as a U-shaped profile with a hole that accepts the rod and outer ends of outer parts of the U-profile make contact during the molding process with the inner surfaces of the form sheets.
10. The form tie according to claim 5 wherein the at least one support and spacer is fixedly attached to the form tie by welding.

FIG.1

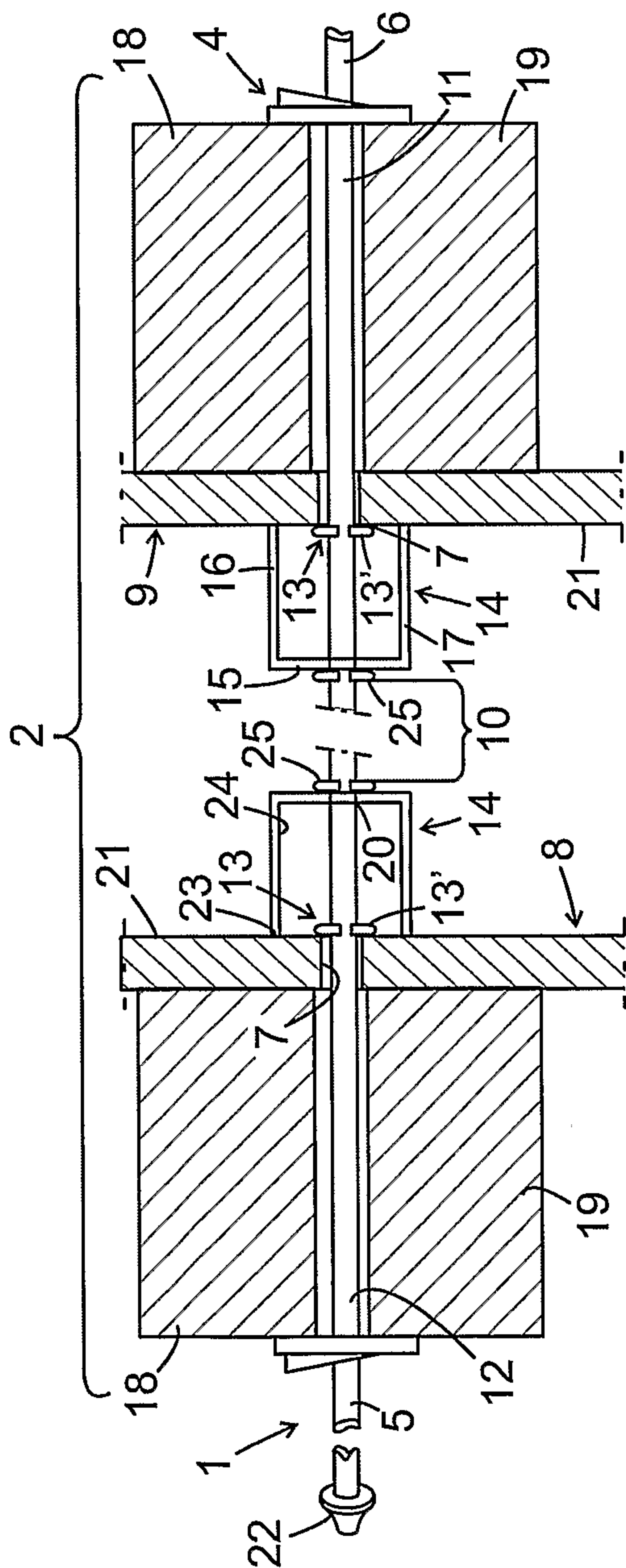
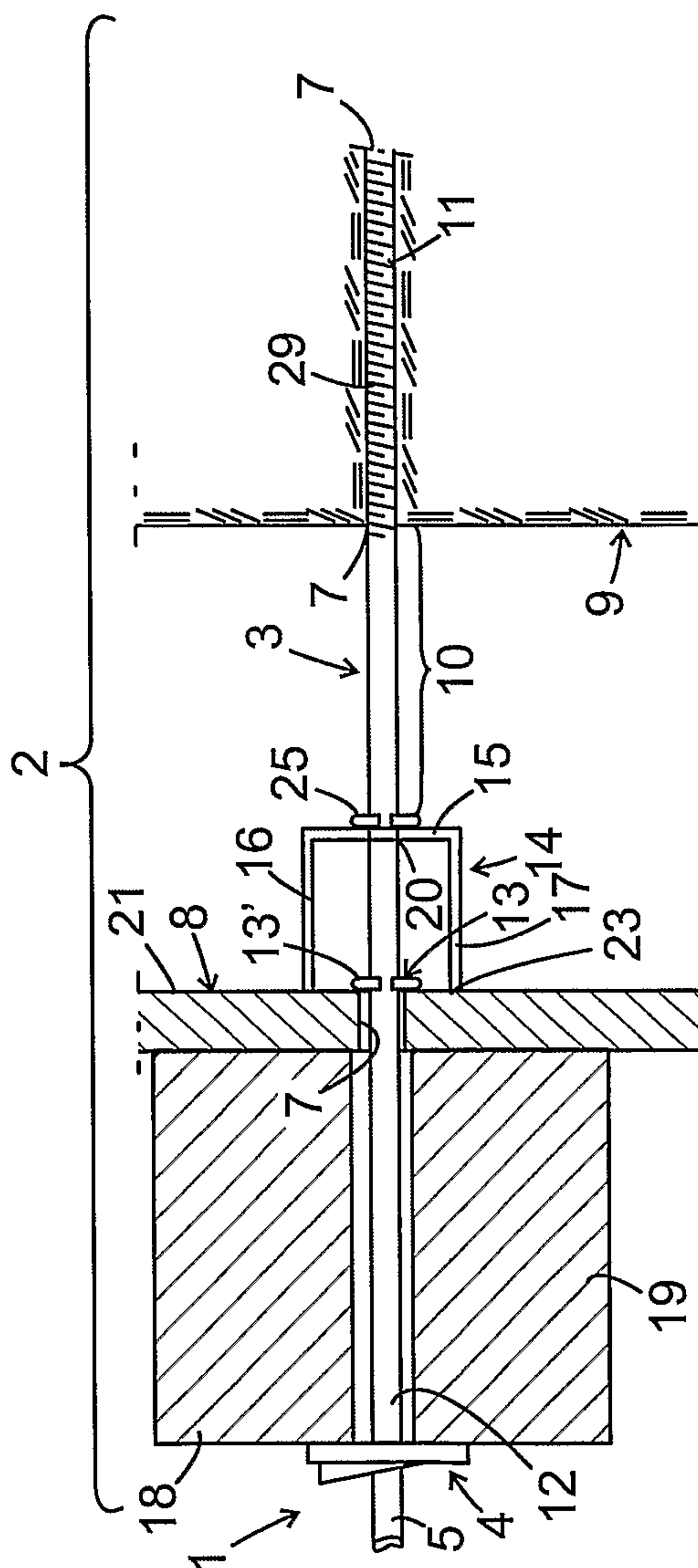


FIG.2



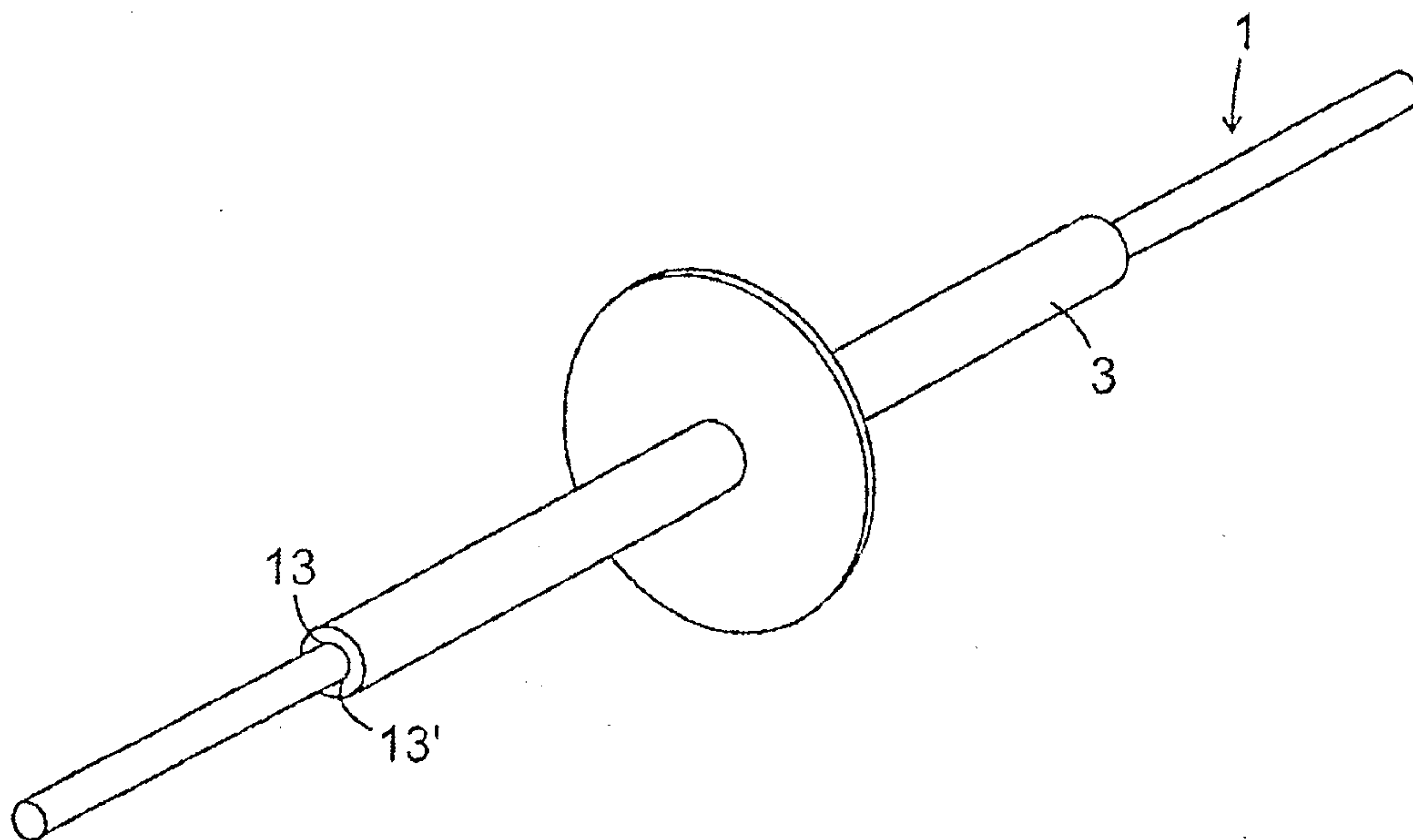


Figure 3

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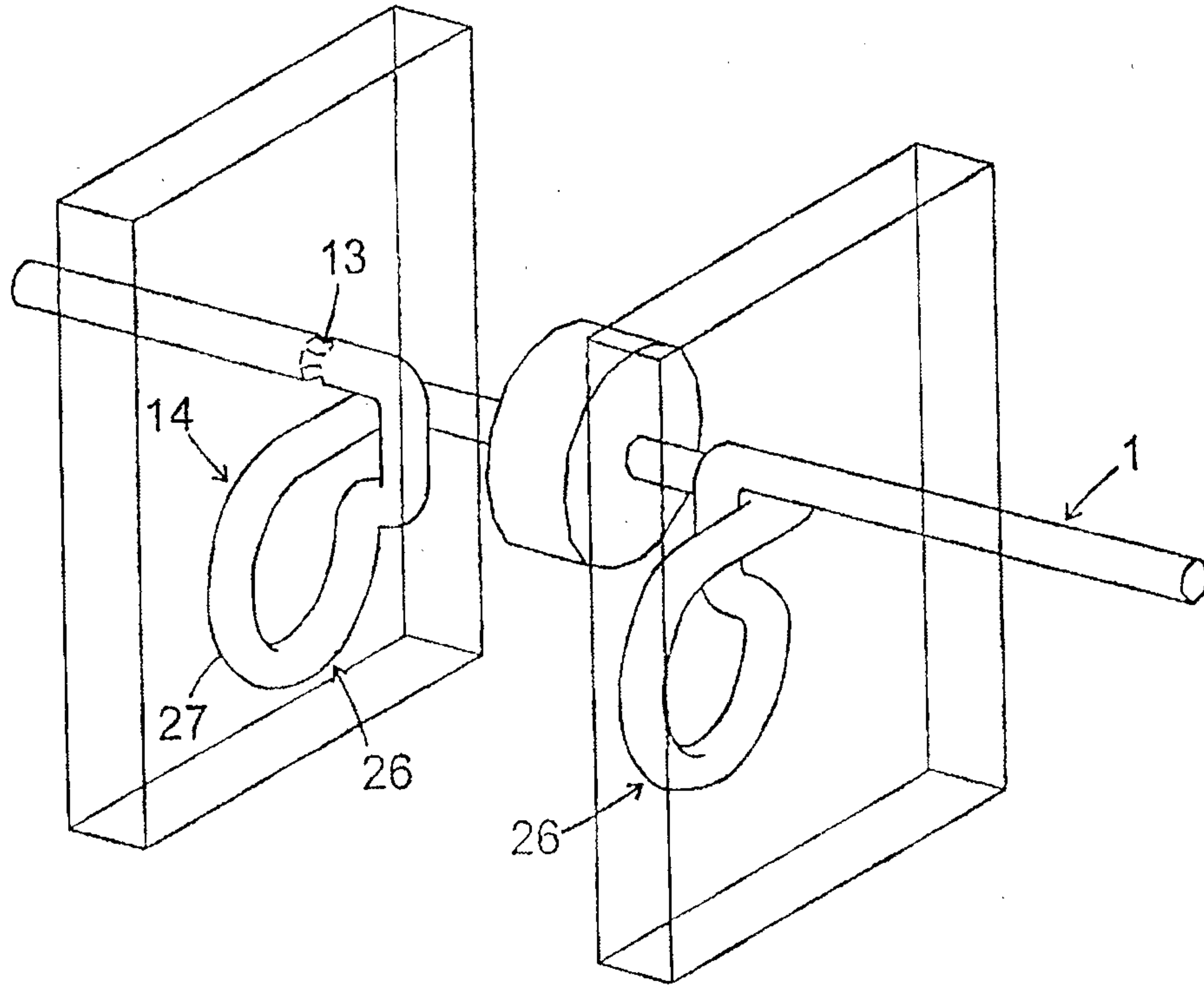


Figure 4

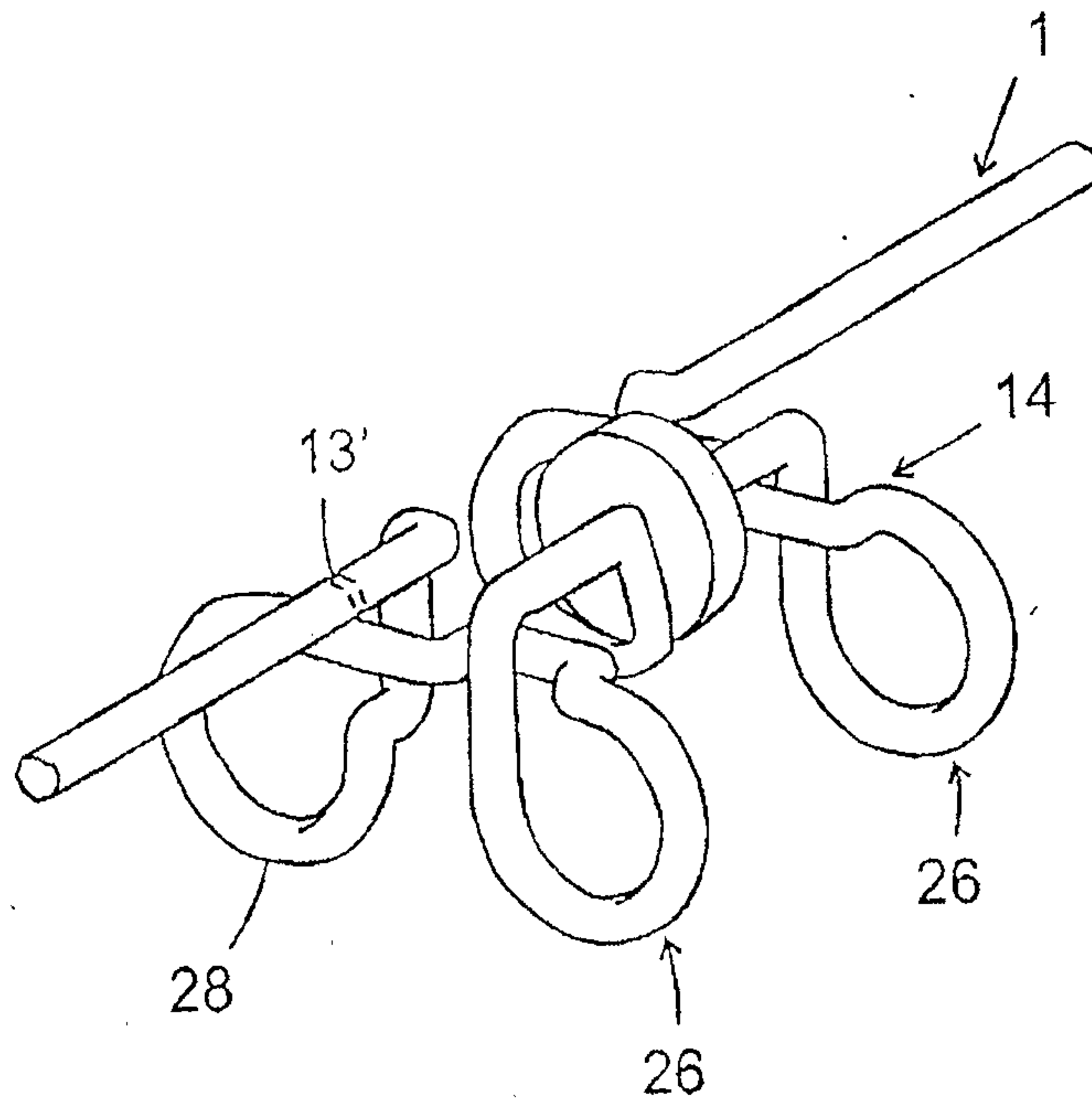


Figure 5

