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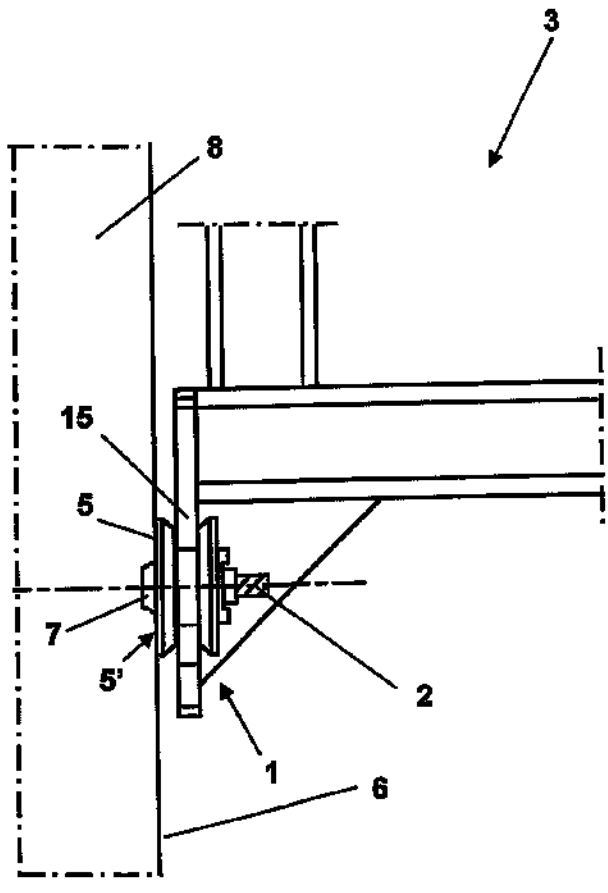
(54) **Title:** SUPPORT PART FOR RESTING CONSOLES OR CLIMBING SCAFFOLDING IN A VERTICAL CONCRETE STRUCTURE



(57) **Abstract:** The support part is used so that consoles or climbing scaffolding, for fixing to a protruding element fixed to the outer surface of a vertical structure, can rest on it, so that the support part being fixed to the vertical structure, a flat portion of one of its sides is in contact with said surface. It is characterized in that it comprises a through-hole, whose axis is essentially perpendicular to said flat portion, which enables the protruding element to be inserted and because the side facing the outer surface comprises an extension, concentric with the hole and adapted in such a way that, the protruding element having to be inserted in the support part and said flat portion being in contact with the outer surface thereof, said extension remains embedded in the vertical structure, absorbing the sharp force that the protruding element must bear when the platform is resting on the support part.

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DESCRIPTION

"Support part for resting consoles or climbing scaffolding in a vertical concrecte structure"

Technical field of the invention

The invention relates to a support part of the type upon which platforms used to help in the construction of vertical concrete structures rest, such as consoles or climbing scaffolding, for fixing to an element protruding from an outer surface of the vertical concrete structure to which said protruding element is fixed, in such a way that once the support part is fixed to the vertical structure, a flat portion of one of the sides of the support part is in contact with the outer surface of the vertical structure.

Background of the invention

In the course of carrying out construction work of buildings or civil works, it is usual to use platforms that rest on outer support parts which are fixed to the construction itself. An example of this type of platform are consoles or climbing scaffolding, which are of assistance during the construction of vertical concrete structures and which move further up to the top as the concrete structure grows.

The consoles or climbing scaffolding rest on the outer support parts by means of a forked-type support, in other words, the scaffolding or console itself comprises at least two inverted U-shaped vertical elements, which are designed to fit onto at least two support parts. The support parts, which serve as a rest for the said platforms, are fixed to the vertical concrete structures (concrete walls) and protrude out of said surfaces to allow the platforms to rest on them.

While the building or civil work is being constructed, some anchors are inserted inside the vertical concrete structure to subsequently fix the support parts to these anchors. The anchors are usually nailed to the shuttering and partition wall of the vertical structure (before pouring the concrete) in such a way that once the mass has set, they are ready to receive the outer support parts on which the platform is mounted.

These anchors are currently fixed by screwing them onto the ends of support bars buried in the concrete, which is why, in reality, intermediate parts act between said buried bars and the support parts whereon the platforms rest. In this way, the anchors and the support parts can be retrieved once the platform is moved to another location, with the support bars buried in the concrete remaining in place.

Among the different types of known anchors, the one most used consists of an element which is truncated conical in shape, the smaller base of which is screwed to one end of said support bar, buried in the concrete, while in its larger base, which protrudes out from the outer surface of the concrete, the support part is fixed using a screw or any dismountable joining element.

An example of embodiment is disclosed in document ES 1042982 U, which relates to an anchor for climbing scaffolding, of the type which are inserted in conjunction with a support bar in the concrete of a vertical structure and into which can be fixed an element which acts as a support for the scaffolding console, the anchors and support parts later being retrieved, while the bars remain buried in the concrete. The anchor disclosed in said document is characterized in that it is comprised of a metal truncated conical part which has in its smaller base a threaded hole through which the anchor is screwed to the bar which will be inside the concrete, while in its larger base is a second threaded hole, larger in diameter than the former, in which an clamp screw is initially inserted, while it is held perpendicular to the vertical shuttering, and once the scaffolding is concreted and removed, a support part of the scaffolding console which has, for this purpose, a threaded ending and in the opposite end an ending which is polygonal in shape, which makes it easier to handle, for screwing onto the anchor. Said in another way, the support part has an ending with outer threading on one of its surfaces which is introduced into the threaded hole of the metal truncated conical part inserted in the concrete, while in the opposite side is an ending which is polygonal in shape like a screw which allows it to be attached.

According to another form of use, when the panels for shuttering around the vertical structure are mounted, some special threaded bars are used to join the panels, known as dywidag bars, inserted in a plastic tube with an outer diameter larger than that of the dywidag bar, like a cover, between the two panels, so that once the concrete has set, the dywidag bar is removed and replaced by a bar with the correct metrics for fixing the support part via a female part with the same metrics.

In the anchoring systems described earlier, the use of anchorings by way of additional intermediate elements is specified for fixing the support part such as metal truncated conical parts positioned between the support bar buried in the concrete and the support part, or bars that have to support highly concentrated sharp forces when the platform is resting on the support part.

The absence of any support part bar whose characteristics simplify the

mounting and fixing process of the concrete structure is thus to be noted.

Explanation of the invention

The support part object of the invention is of the type upon which platforms used to help in the construction of vertical concrete structures rest, such as consoles or climbing scaffolding, for fixing to an element protruding from an outer surface of the vertical concrete structure whereto said protruding element is fixed, in such a way that once the support part is fixed to the vertical structure, a flat portion of one of the sides of the support part is in contact with the outer surface of the vertical structure.

In essence, the support part is characterized in that it comprises a through-hole whose axis is essentially perpendicular to the aforementioned flat portion of one of the sides of the support part, which enables the element protruding from the outer surface of the vertical structure to be inserted in the support part, and in that on the side facing said outer surface the support part has an extension, concentric with the hole and adapted in such a way that the element protruding from the outer surface of the vertical structure being duly inserted in the support part and the flat portion of one of its sides being in contact with the outer surface thereof, said extension remains embedded in the vertical structure, absorbing the sharp force that the protruding element must bear when the platform is resting on the support part.

According to another characteristic of the support part, object of the invention, said through-hole is threaded, enabling the support part to be screwed onto the protruding element of the outer surface of the vertical structure.

According to another aspect of the invention, said extension has a truncated conical, cylindrical, prismatic or truncated pyramid configuration.

Brief description of the drawings

The attached drawings illustrate a non-restrictive example of a preferred embodiment of the support part, object of the invention. In said drawings:

Fig. 1 is an elevational view of a platform which is resting on two support parts object of the invention;

Fig. 2 is a close-up of a support part according to Fig. 1;

Fig. 3 is a perspective view of the platform in Fig. 1 and includes a board;

Fig. 4 is a vertical section view of a support part screwed to the bar protruding from the vertical concrete structure;

Fig. 5 is an elevational view of the support part in Fig. 4;

Fig. 6 is an elevational view of the same support part with its corresponding section view according to the cut section A-A;

Fig. 7 is a perspective view of the same support part, showing the side of said part which faces the platform;

Figs. 8 to 11 are perspective views of four support parts according to the invention, with different configurations of extensions on the side which is to face the vertical concrete structure;

Fig. 12 is an elevational view of the shuttering assembly for a vertical concrete structure;

Fig. 13 is a section view of the shuttering assembly in Fig. 12; and

Fig. 14 is a section view of an anchoring system using a metal truncated conical part according to the state of the art.

Detailed description of the drawings

Figs. 1 and 2 are elevational views of a platform 3 which rests on at least two protruding support parts 1 fixed to the outer surface 6 of a vertical structure 8, which may be a concrete wall. These platforms 3, such as consoles or climbing scaffolding, are used to help in the construction of the vertical concrete structures 8 themselves.

A platform 3 of this type generally comprises two metal corbels, each one formed by an array of horizontal and vertical profiles joined by diagonal profiles in the form of a support bracket. Each corbel comprises a horizontal profile finished off in one of its ends by a forked element 15 which extends downwards, used to receive a support part 1 which fits into it and in this way make the platform 3 rest on the latter. Fig. 2 shows how the forked element 15 fits into the support part 1 which has previously been fixed to a protruding element 2 of the outer surface 6 of the vertical concrete structure 8 under construction. In the drawings, the protruding element 2 of the outer surface 6 of the vertical structure 8 is represented as a bar.

In addition to the metal corbels, a platform 3 also comprises a horizontal working surface built from beams whose ends rest on the upper horizontal profiles of the metal corbels and upon which a board is placed whereon the workers will carry out their work. The horizontal working surface is only represented on the platform 3 in Fig. 3.

The support part 1, object of the invention, is designed to be fixed to a protruding element 2 of the surface 6 of the vertical concrete structure 8, a structure which is represented in the drawings as part of a wall. When the support part 1 is

fixed to receive the forked element 15 of the platform 3 which fits into it, the part is positioned in such a way that a flat portion 5 of one of its sides 5' remains in contact with the outer surface 6 of the vertical structure 8. This situation is represented in the vertical section of Fig. 4 and in the corresponding elevation in Fig. 5. In these figures, it can be seen in greater detail how the support part 1 has a groove 14, to receive the forked element 15 which fits into it represented in Fig. 2.

The object of the invention is characterized, among other things, in that the support part 1 also comprises a through-hole 4, either threaded or not, whose axis is essentially perpendicular to said flat portion 5 of the side 5'. This characteristic is reflected in the cut section A-A of Fig. 6, wherein the hole 4 passes through the support part 1 from the side 5' to the opposite flat side. The through-hole 4 enables the element 2 protruding from the outer surface 6 to be inserted directly into the support part 1, the situation represented in Figs. 4 and 5. The through-hole 4 is preferably threaded, in this way allowing the support part 1 to be screwed onto the protruding element 2, providing greater security in fixing said element.

Said protruding element 2 is a bar, threaded externally, of the type that pass through panels 9 used to shutter the vertical structure 8. These bars, known in the trade as "dywidag" bars, are used to adjust and maintain the distance of separation between the two aforementioned panels 9, which determines the thickness of the vertical structure 8.

In addition to the through-hole 4, represented in the drawings with a constant diameter for better adaptation to the diameter of the inserted "dywidag" bar, another characteristic of the support part 1 is the extension 7 that it has in its side 5' facing the outer concrete surface 6. Said extension 7, concentric with the hole 4, is adapted in such a way that, the protruding element 2 being duly inserted or screwed to the support part 1 and the flat portion 5 of the side 5' being in contact with the outer surface 6, said extension 7 remains embedded in the vertical structure 8.

Fig. 7 shows a perspective view of the support part 1 wherein the side opposite to the side 5' which is flat and round can be seen, and with the hole 4 in its centre. The embodiments represented in Figs. 8 to 11 show perspectives of support parts 1 with different configurations of the extension 7 in their sides 5'. More specifically, in Fig. 8, the extension is represented with a truncated conical configuration, in Fig. 9 with a cylindrical configuration, in Fig. 10 with a truncated pyramid configuration and in Fig. 11 with a prismatic configuration.

Figs. 12 and 13 represent the shuttering process of the vertical structure 8 before concreting. First, the shuttering panels 9 are mounted, between which a

plastic tubular cover 10 is positioned, finished off at both ends with cones 11, also generally made of plastic. Subsequently, an externally threaded bar, a "dywidag" bar, is introduced in the plastic tubular cover 10, in such a way that the ends of the bar introduced protrude outside passing through the shuttering panels 9. At each end of the threaded bar introduced, a bracket plate 13 is attached followed by a bracket 12. The bracket 12 comprises a bolt with a threaded screw adapted to the threading of the "dywidag" bar. In order to determine and maintain the distance of separation between the panels 9, which will constitute the thickness of the vertical structure 8, the brackets 12 are turned around the "dywidag" bar until the bracket plates 13 hit the outer surfaces of the panels 9. When the poured concrete filling the space between the two shuttering panels 9 has set, the end cones 11 of the plastic tubular cover 10 will leave a truncated conical hole visible in the outer surface 6 of the vertical structure 8, once the panels 9 are removed.

In order to withdraw the panels, the brackets 12 and the bracket plates 13 are unscrewed, and the "dywidag" bar is removed. The "dywidag" bar is then reintroduced in the hole made, which remains protruding from the outer surface 6, and the support part 1 is then fixed to the vertical structure 8. The protruding end of the "dywidag" bar is inserted into, or screwed onto, the support part 1 through the through-hole 4, depending on whether the latter is threaded or not, until the flat portion 5 of the side 5' of the support part 1 is in contact with the outer surface 6 of the vertical concrete structure. In this position, the extension 7 of the support part remains embedded in the vertical structure 8 and, to finish fixing the position of the support part 1 to the vertical structure 8, a bracket 12 of the support part 1 is then screwed on, which prevents it from unscrewing or being removed from the "dywidag" bar. If the hole 4 is threaded, fixing of the support part 1 to the "dywidag" bar is reinforced by screwing both of them together.

In the case described earlier, it was mentioned that the plastic tubular cover 10 comprises end cones 11 at its ends which is why the hole made in the outer surface 6 has a truncated conical form. In this case, the most suitable embodiment of the support part 1 is the one whose extension 7 has a complementary truncated conical configuration, as shown in Fig. 8.

Although this is not usual, the situation may arise wherein the plastic tubular cover were finished off in tubular parts configured in such a way as to leave, on the outer surface 6, cylindrical, prismatic or truncated pyramid holes, in which case, the support parts 1 represented in Figs 9, 10 and 11 respectively, would have to be used. In Fig. 10, the configuration of the extension 7 is a truncated pyramid with a

rectangular base and, in Fig. 11, it is cuboid. In the case where the holes have different geometric configurations, the extension 7 of the support part 1 will have the most suitable corresponding geometric configuration so that the space between the hole and the extension 7 (the support part already being embedded in the concrete) is the smallest possible.

For support parts 1 with extensions 7 that have a truncated conical configuration or cylindrical extensions, the process of screwing the support bar 1 to the "dywidag" bar is the one described earlier. However, for support parts 1 with an extension with a truncated pyramid configuration or a prismatic configuration, the process differs in that, once the shuttering has been removed from the vertical structure 8 (the panels 9 removed), the "dywidag" bar must be removed and the support part 1 positioned in such a way that the extension 7 is embedded in the hole of the outer surface 6 and the flat portion 5 of the side 5' is in contact with the outer surface 6. Subsequently, the "dywidag" bar is reintroduced by screwing it until it has fastened to the threaded through-hole 4 of the support part 1 in such a way that the ends of the "dywidag" bar protrude from the outer surfaces 6 of the vertical structure 8. To finish fixing the support part 1 to the vertical structure 8, all that needs to be done is to then screw on a bracket 12 after the support part 1 which will prevent the latter from becoming unscrewed.

In the state of the art, systems are known for fixing support parts by means of metal truncated conical parts 25 as represented in Fig. 14. In said figure, the known support part 20 has an ending with outer threading 22 and at the opposite end a polygonal-shaped ending 21 like a bolt. The process for this type of anchoring consists in fixing, to one of the shuttering panels, a metal truncated conical part 25, whereto a metal bar has been attached which has, on the innermost end (the end furthest from the shuttering panel), a welded or threaded buffer. This metal bar, not represented in Fig. 14, will remain buried in the vertical concrete structure 8. The metal truncated conical part 25 has on its smaller base a first threaded hole 24 wherein the metal to be buried in the concrete will be attached, while the opposite larger side, situated level with the concreted surface, is a second threaded hole 23 wherein an clamp screw is initially placed, not represented in Fig. 14, to enable the metal bar to be held in a horizontal position until the concrete is poured. After the concrete has set, the clamp screw is then removed and the ending with outer threading 22 of the known support part 20 is positioned in the second threaded hole 23. In this type of anchoring, the metal bar that is buried in the concrete, together with its welded or threaded buffer, does not correspond to the "dywidag" bars used

to join the shuttered panels and to adjust the distance between them. In this way, in addition to having to position the "dywidag" bars to shutter the vertical structure 8, the metal bar that is buried in the concrete also has to be positioned. Another drawback of this system is the forced use of the metal truncated conical part 25, without which the known support part 20 cannot be fixed so that a console or climbing scaffolding can rest on it.

However, the support part 1 object of the invention allows it to be fixed to the outer surface 6, since additional intermediate parts, such as the metal truncated conical part 25 described earlier, are not required, thus simplifying the assembly process and itself taking advantage of the bars with outer threading used to shutter the vertical structure 8 ("dywidag" bars) due to the through-hole 4, which is preferably threaded. The importance of the extension 7 included in the side 5' of the support part 1 should also be highlighted. With the extension 7 remaining embedded in the vertical structure when the support part 1 has been screwed (or the "dywidag" bar has been inserted in it, for holes 4 that are not threaded) until its flat portion 5 is in contact with the outer surface 6, the situation represented in Fig. 4, the extension 7 absorbs the sharp force that the "dywidag" bar must bear when the platform is resting on the support part.

CLAIMS

1.- Support part (1) of the type upon which platforms (3) used to help in the construction of vertical concrete structures (8) rest, such as consoles or climbing scaffolding, for fixing to an element (2) protruding from an outer surface (6) of the vertical concrete structure to which said protruding element is fixed, in such a way that once the support part is fixed to the vertical structure, a flat portion (5) of one of the sides (5') of the support part is in contact with the outer surface of the vertical structure, characterized in that the support part comprises a through-hole (4), whose axis is essentially perpendicular to said flat portion of one of the sides of the support part, which enables the element protruding from the outer surface of the vertical structure to be inserted in the support part, and in that,on the side facing said outer surface, the support part has an extension (7), concentric with the hole and adapted in such a way that, the element protruding from the outer surface of the vertical structure being duly inserted in the support part and the flat portion of one of its sides being in contact with the outer surface thereof, said extension remains embedded in the vertical structure, absorbing the sharp force that the protruding element must bear when the platform is resting on the support part

2.- Support part (1) according to claim 1, characterized in that said through-hole (4) is threaded, enabling the support part (1) to be screwed onto the protruding element (2) of the outer surface (6) of the vertical structure (8).

3.- Support part (1) according to at least one of the previous claims, characterized in that said extension (7) has a truncated conical, cylindrical, prismatic or truncated pyramid configuration.

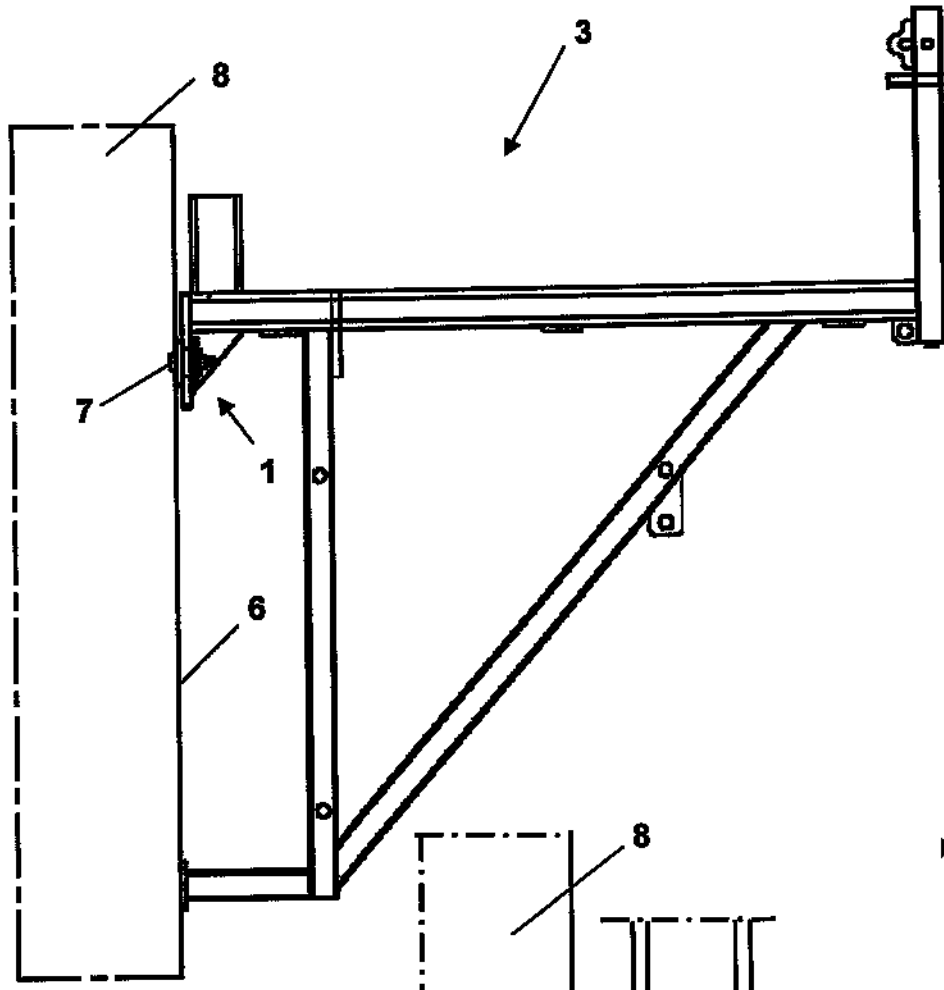

Fig. 1

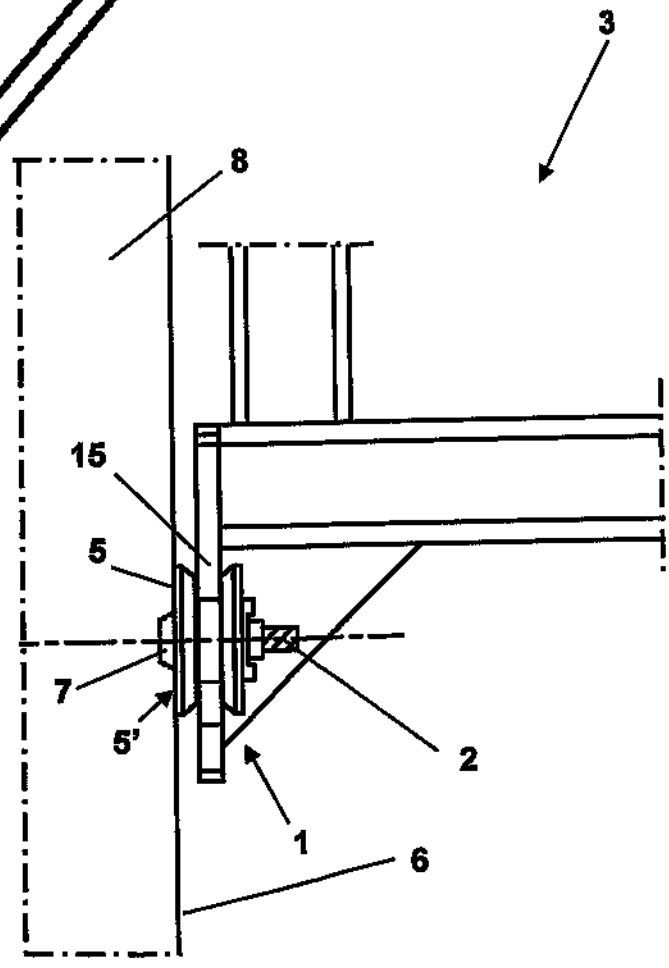

Fig. 2

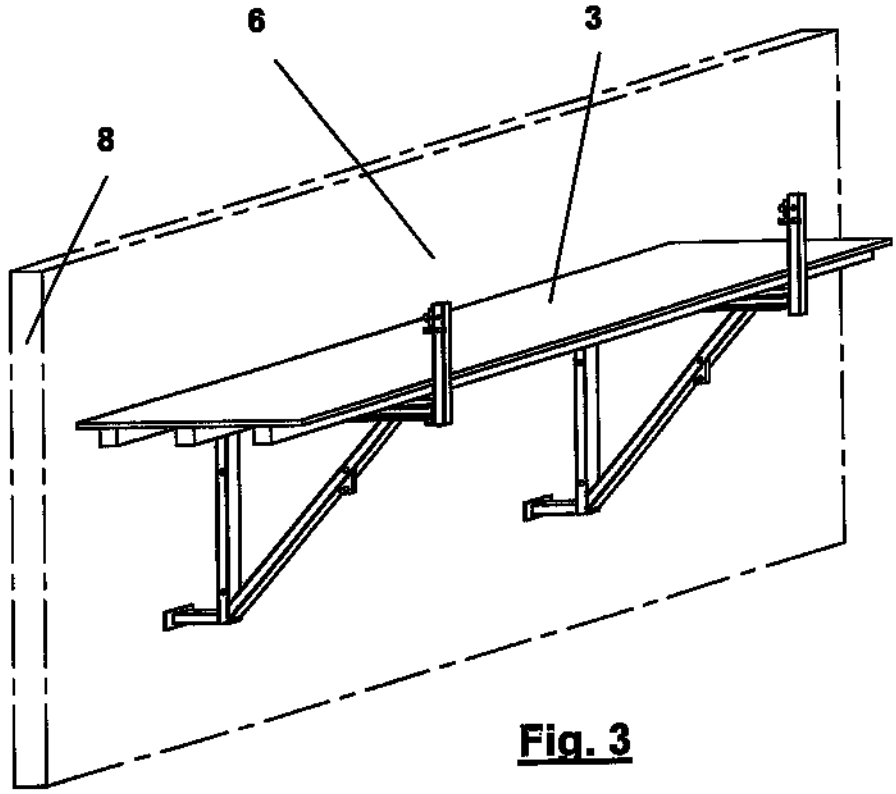

Fig. 3

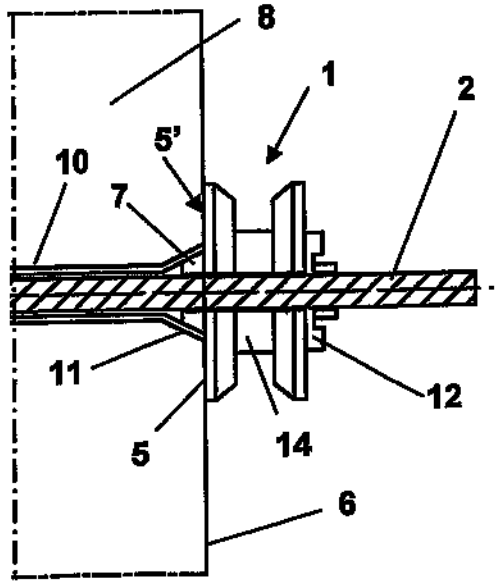

Fig. 4

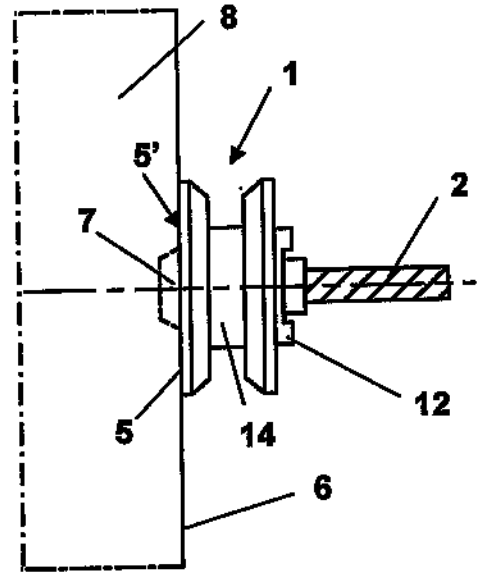

Fig. 5

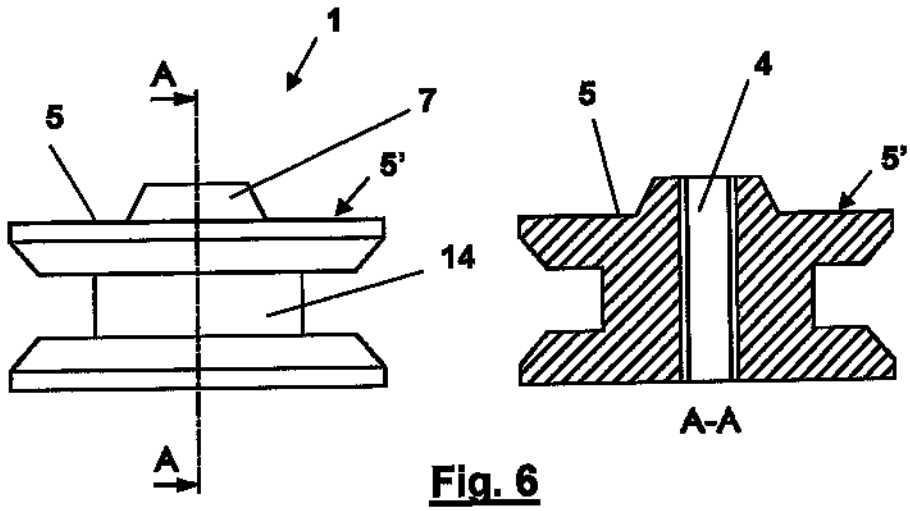

Fig. 6

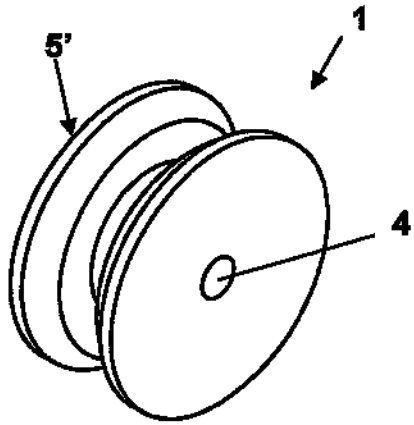

Fig. 7

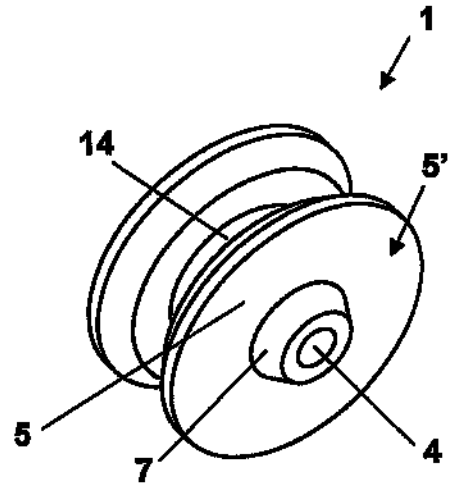

Fig. 8

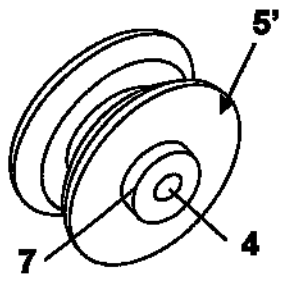

Fig. 9

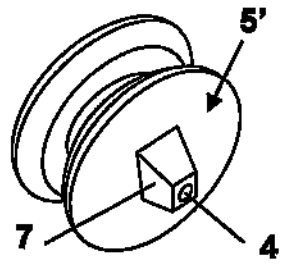

Fig. 10

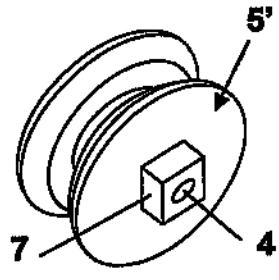

Fig. 11

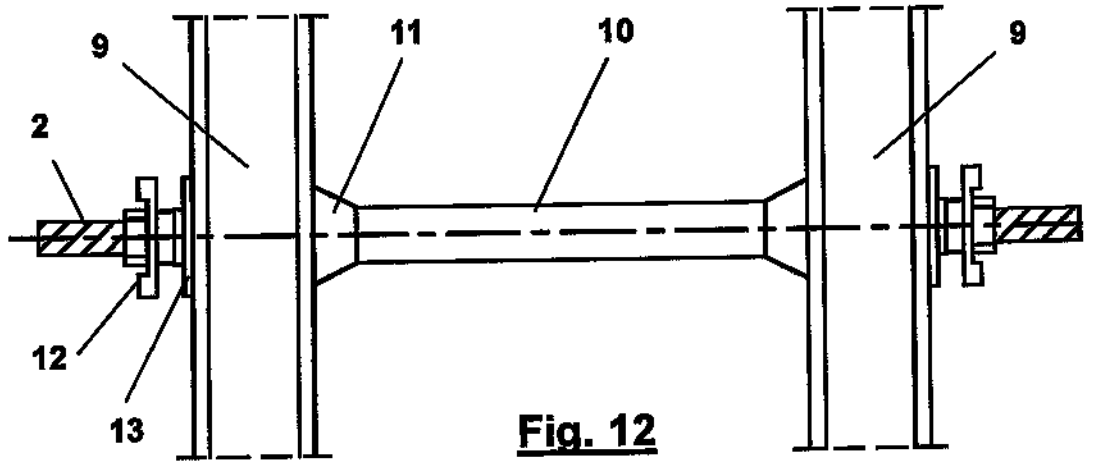

Fig. 12

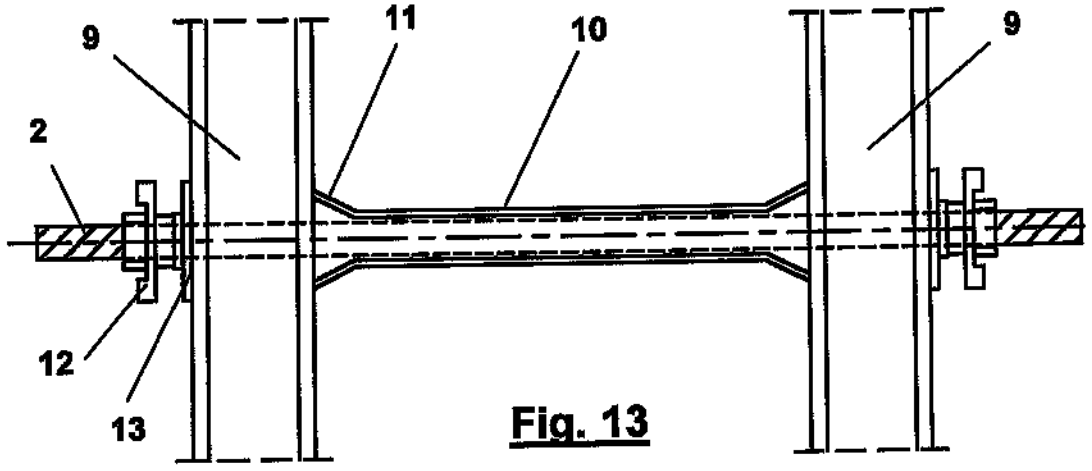

Fig. 13

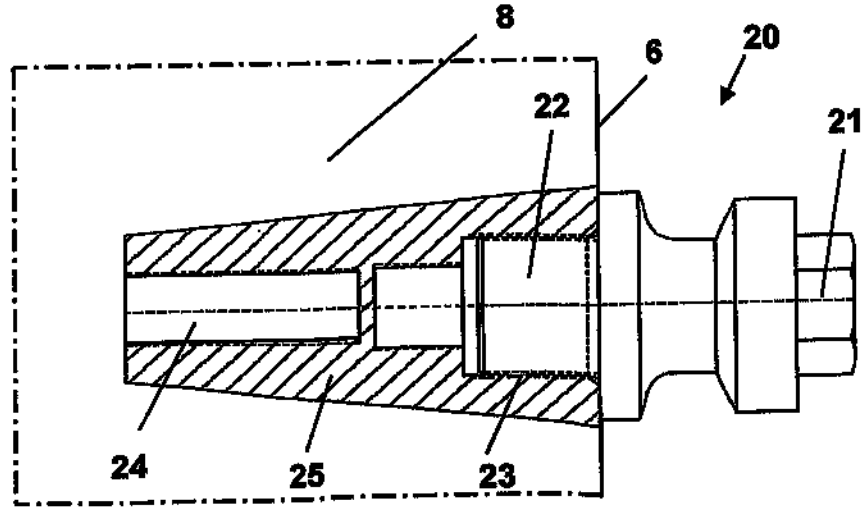

Fig. 14

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2005/012481

A. CLASSIFICATION OF SUBJECT MATTER
INV. E04G5/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E04G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 27 44 665 A1 (HOFF,WALTER) 12 April 1979 (1979-04-12) page 12; figure 3	1-3
X	DE 33 12 294 C1 (PERI-WERK ARTUR SCHWOERER GMBH & CO KG, 7912 WEISSENHORN, DE) 25 October 1984 (1984-10-25) column 3, line 59 - column 4, line 19	1,3
X	DE 297 00 648 U1 (TKALEC, KRUNO S., 83064 RAUBLING, DE) 26 June 1997 (1997-06-26) page 3, lines 1-9; figure 1	1,2
A	FR 2 470 219 A (LAROCHE JEAN PIERRE) 29 May 1981 (1981-05-29) page 3	1-3

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[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents :

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23 March 2006	05/04/2006

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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