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(54) HEIGHT-REGULATING MECHANISM OF AN ELBOW OF A FOLDED ARM OF AN AWNING

(57) A height-regulating mechanism of an elbow of a folded arm of an awning, usually arranged on a support of the arm of the awning, relates to a mechanism which allows the arm of an awning to be inclined, that is to say, allows the height of the elbows of the articulated arms, when they are folded, of a roller awning, to be regulated by means of adjusting the inclination of the joining point of the arm (2') with the support (3) thereof which is situated between the arm and the box, or between the arm (2') and other systems or sets of supports, which may incorporate the winding drum of the awning and be fixed to the wall or roof.

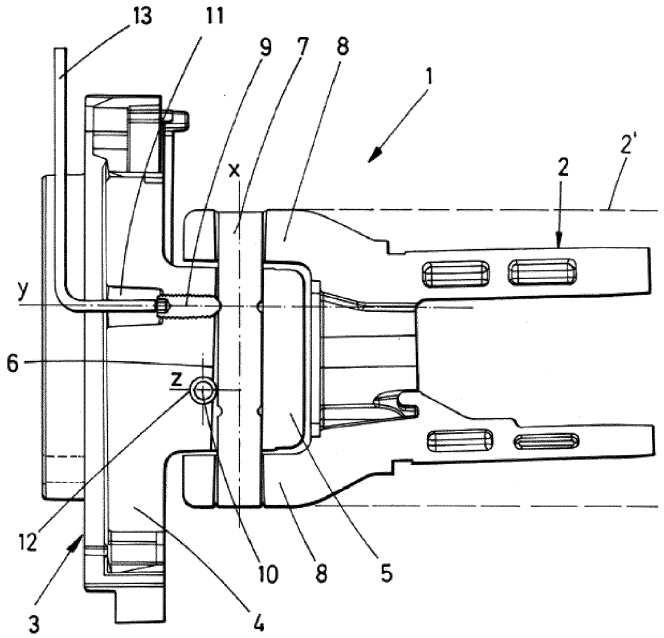

FIG.1

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Description

OBJECT OF THE INVENTION

[0001] The invention, a height-regulating mechanism of an elbox of a folded arm of an awning, usually arranged on a support of the arm of the awning, relates to a mechanism which allows the arm of an awning to be inclined, that is to say, it allows the height of the elbows of the articulated arms, when they are folded, of a roller awning to be regulated by means of adjusting the inclination of the joining point of the arm with the support thereof which is situated between the arm and the box or between the arm and other systems or sets of supports which may incorporate the winding drum of the awning and be fixed to the wall or roof.

[0002] The field of application of the present invention is framed within the industrial sector dedicated to the manufacture of roller awnings, in particular those with articulated foldable arms for supporting and extending the canvas, being centered in particular in the area of supporting and regulating accessories of said arms.

BACKGROUND OF THE INVENTION

[0003] As is known, the roller awnings are generally composed of a canvas associated with a rotary shaft or winding drum which is horizontally fixed on a box or to another type of support and which is coupled to the wall, said rotation being capable of being actuated manually or motorized. Furthermore, the opposing end of said canvas is provided with a loading bar to which are coupled at least two arms formed by two sections articulated in an elbow, the opposing end of which is joined to the mentioned box or part of a support by means of the respective arm supports provided for such purpose, these arms being provided with elastic means which bend to maintain them extended in order to force the tension of the canvas.

[0004] The joinings of the arms to the supports of the shaft of the box or winding shaft of the canvas are formed by articulated assemblies which provide for a regulating mechanism, the aim of which is to be able to slightly vary the inclination of said joining and consequently the height of the elbows of the articulated arms when they are folded with respect to the winding shaft.

[0005] There are in principle three types of awning arm supports of the types known as invisible arms.

- an integrated assembly in which the main support with the winding shaft of the awning is fixed to the wall or roof and in order to incline the canvas when the arm is open, the support of the arm can be rotated with respect to the main support. In addition, this support of the arm may incorporate a mechanism for regulating the height of the elbow of the arm when it is folded like the object of the present invention.
- an assembly formed by three independent pieces, a main support to the wall or roof, a support of the shaft of the winding canvas and a support of the arm. The support of the arm can rotate with respect to the support of the shaft and at the same time said support of the arm can incorporate the mechanism for regulating the height of the elbow of the arm when it is folded like the object of the present invention.
- an assembly formed by a box in which the roller awning is housed and which comprises the support of the arm or movable support which rotates with respect to the winding shaft of the awning integrated in the box. This system allows the arm to be inclined with respect to the box and it can also incorporate the mechanism for regulating the height of the elbow of the arm in the support of the arm when it is folded like the object of the present invention.

[0006] Specifically, the utility model ES1048736U, relating to a "Device for adjusting the inclination of an arm of an awning", proceeds from a through hole through a protuberance of the support with an inserted shaft, the protruding ends of which are joined to the branches of a fork formed on the end of the arm, it being envisaged that said hole defines a suitable interior shape or slotted hole to guide an angular oscillation of the cited shaft within an oscillation plane substantially parallel to the winding shaft, which allows a variation of the inclination of the folded arm in the mentioned oscillation plane, maintaining the parallels even though the canvas is inclined. And as a way to control and fix said oscillation, it envisages two pushing elements opposing each other, specifically, a first pushing element that is accessible from a surface of the protuberance arranged for pushing the shaft in a first direction substantially parallel to said oscillation plane; and a second pushing element that is accessible from a surface of the support opposite the protuberance arranged for pushing the bolt in a second direction, opposed to the first, substantially contained in the oscillation plane.

[0007] At the same time, the document ES2342779A1, relating to an "Awning arm support with inclination adjustment", describes a solution similar to the previous one in which, in order to avoid any drawbacks due to difficulties in terms of access from the exterior surface of the support, it envisages incorporating the two pushing elements at the exterior side of the protuberance, which is articulated, of said support, that is to say, arranging the access entrances to the pushing elements on at least one surface of the protuberance, it also being envisaged that said surface of the protuberance is covered by an angle coinciding with the angle swept by the arm when rotated, or slightly greater than the same. However, this second solution also presents certain drawbacks such as if the two access holes are implemented on the part of the protuberance, they constitute a double weakening of the most susceptible break section of the support piece, thus causing it to lose robustness. The fact that said protuberance of the support is articulated makes the manufacture, installation, and maintenance difficult as it

requires a larger number of components which primarily makes the adjustment or regulation of the height of the elbows difficult.

[0008] The objective of the present invention is therefore to present an alternative solutions to the previous systems for optimally regulating the height of the elbows of the folded articulated arms in winding awnings.

DESCRIPTION OF THE INVENTION

[0009] The height-regulating mechanism of an elbow of a folded arm of an awning which the invention proposes can be incorporated into the different awning arm supports present in the state of the art and specifically into the articulated joining between the awning arms and the box or in the support system of the awning where the winding drum is incorporated in order to thus regulate the height of the elbows when the arm is folded by means adjusting the inclination thereof.

[0010] A first object of the invention is therefore a height-regulating mechanism of an elbow of an arm of an awning incorporated in a support for an awning arm like those present in the state of the art according to claim 1. Specifically, the mechanism, which allows the inclination of the folded awning arm to be modified, comprises a through hole in the support of the arm of the awning, with an end with a circular base with a first axis (x) coinciding with the center of the base, said first axis (x) extending through the hole perpendicular to the base to a second end of the through hole which has the shape of a slotted hole or elongated hole. This hole therefore has a circular hole at one end and an elongated hole at the opposite end such that it allows the oscillation of the bolt with respect to the circular hole. The cited bolt is housed in said hole, the protruding ends of which are coupled, once installed, to the branches of a fork arranged on the end of the arm of the awning. The support of the mechanism has two openings which connect the through hole to the exterior of the support in the interior of which two pushing elements are situated which act on the bolt and regulate the oscillation of said bolt in the cited hole such that:

- a first opening, in accordance with a second axis (y) perpendicular to the first axis (x), passes through the support to the through hole, consequently a first pushing element which is introduced into said first opening acts on the cited bolt in one direction and
- a second opening, in accordance with a third axis (z) perpendicular to the first (x) and to the second axis (y) which, in its course, is connected laterally to the through hole, consequently a second pushing element which is introduced into said second opening acts laterally on the bolt in the same direction as the first pushing element.

[0011] In this way, the mechanism has a through hole preferably in a protuberance of the base and houses a bolt which passes through said protuberance, along a first axis (x) and with respect to which the arm rotates which is joined to the bolt by the protruding ends thereof by means of the branches of the fork situated on the end of the arm. The branches of the fork which are coupled to the projections of the bolt can form part of the arm or be independent of the same and be coupled to the end of the arm. As has been mentioned, the hole preferably has a cavity with increasing amplitude, from a circular hole, the axis of which defines the first axis (x) of the mechanism which can guide an oscillation of the bolt which, in turn, causes a variation of the inclination of the arm in a plane substantially parallel to the winding drum.

[0012] The mechanism is designed to house both pushing elements in order to fix the bolt in the hole and regulate the oscillation of said bolt in the desired position. Said pushing elements are accessible from the exterior of the mechanism and instead of being incorporated and arranged facing each other in order to push the bolt from opposing directions, they are introduced into the openings described, one through the rear or external part of the mechanism, displaceable along the second axis (y) and the other through a side of the protuberance of the support along the third axis (z) to act on the bolt in the same direction.

[0013] In particular, the axis of the first opening, second axis (y), is perpendicular to the first axis (x) of the through hole such that the pushing element situated in the first opening can act on the bolt in one direction, when both axes, the axis (y) of the first opening and the axis (x) of the through hole, are perpendicular to each other. This first pushing element fixes the bolt in a position in the mechanism and is preferably situated in the upper part of the mechanism and above the second opening, being accessible in order to regulate the displacement thereof in the opening by way of a first access in the rear or external part of the support of the mechanism. Said displacement of the pushing element is preferably achieved due to a thread arranged in the access and in the pushing element which has at least one section with threading since it is preferably a set screw. Said first pushing element is preferably concealed in the interior of the access without protruding from the support. In order to allow the passage of a tool through the rear part of the base of the support of the mechanism in a comfortable and easy manner and thus act on the first pushing element, said opening comprises an access entrance to the first access that is oversized on said rear part of the base.

[0014] In addition, the second opening follows a path that is secant to the through hole in order to allow the connection of the lateral interior of the opening to the interior of the hole by way of a side of said opening. In fact, the axis of said second opening is perpendicular both to the axis of the first opening and to the axis of the through hole, that is to say, the third axis (z) is perpendicular to the second axis (y) and to the first axis (x). Like the first pushing element, this second element also comprises a section with a threading in order to be threaded

to the interior of the second opening and the subsequent displacement through the opening. However, this second pushing element is formed by a revolving body which has a section with concentric diameters of different lengths and a second with the cited threading and with concentric diameters of the same length. This second pushing element, once the position of the bolt is fixed in the hole by means of the first pushing element, allows the position of the arm to be regulated with respect to the mechanism when the side of the pushing element acts on the bolt. When action is carried out on the second pushing element by means of a tool, said second pushing element displaces along the second opening and due to the variable diameter thereof, it will displace the bolt to a greater or lesser extent laterally in the interior of the through hole, in the shape of a slotted hole.

[0015] In light of the above, the advantages provided by the mechanism proposed compared to the current systems are essentially:

- improved accessibility since it is not necessary to open the arms of the awning, it is sufficient to open them slightly in order to be able to regulate and fix the position (stop the bolt) since the access is through the exterior of the box and
- a support of the arm, where the bolt is housed, that is more robust since the openings for the pushing elements are distanced from the more fragile sections of the support where it could be broken with subsequent danger.

DESCRIPTION OF THE DRAWINGS

[0016] In order to complement the description of the invention and to facilitate the understanding of the characteristics of the invention, as an integral part of the same, said description is accompanied by the following figures with an illustrative and non-limiting nature.

Figure 1 shows a sectional view of the side elevation of an exemplary support with the mechanism for regulating folded arms of an awning, object of the invention, the parts and elements which it comprises and the configuration and arrangement of said parts and elements being discernible.

Figures 2 and 3 show two perspective views, front and rear respectively, of the support shown in Figure 1, in this case illustrated without sectioning and without the arm coupled to the through shaft.

Figure 4 shows a perspective view of the second pushing element.

Figure 5 shows a section of the support which contains the mechanism object of the invention through a vertical plane which sections the second opening through the middle.

Figure 6 shows a section of the support which contains the mechanism object of the invention through a horizontal plane which sections the second opening through the middle.

PREFERRED EMBODIMENT OF THE INVENTION

[0017] In view of the mentioned figures, an example of the mechanism object of the invention is described below integrated into the support of an arm of an awning in order to regulate the height of the elbow when said awning is folded.

[0018] As is observed in said figures, the support (3) with the mechanism object of the invention can be applied to the articulated joint (1) between each one of the folded arms (2') and specifically between a forked piece (2) arranged on the end of the arm (2') and which may or may not form part of the same (2, 2'), with the support (3) which is fixed to the box of the awning or to another support system of an awning (not shown), with the aim of being able to modify the inclination thereof in a plane parallel to the winding drum of the awning which is coupled in said box in order to regulate the height of the elbows at which the two sections forming each arm (2') are articulated.

[0019] As can be discerned in the figures, said support (3) of the mechanism is formed, in this embodiment, by a piece which has a flat base (4) perpendicular to the joint thereof with the box or support of the awning in which a protuberance (5) emerges on the front face thereof with a through hole (6), where a bolt (7) is inserted, the ends of which protrude above and below the through hole (6) in order to be coupled to the branches (8) of the fork (2) arranged on the end of the arm (2'), thus allowing the opening and closing movement of the arm (2') when pivoted on said bolt (7). Said through hole (6) comprises a first hole with a circular section, preferably at the top, and a second hole with an elongated section, in the manner of a slotted hole, such that the bolt (7) has an oscillation movement in the interior of the through hole (6). As Figure 1 shows, the through hole has a cavity with variable amplitude, increasing from one end to the other end of the hole (6) which allows, as has been mentioned, the oscillation of the bolt (7), allowing the arm (2') to be positioned by way of the forked piece (2) arranged on the end of said arm at one inclination or another. Said forked piece (20 may form part of the arm (2') or be an independent piece. The axis which passes through the center of the circular hole of the through hole (6) and is perpendicular to said hole constitutes the first axis (x) of the mechanism.

[0020] In order to regulate with precision and fix said inclination of the arm (2') and therefore the position of the bolt (7) in the cavity which forms the through hole (6), it is envisaged that there are two pushing elements (9, 10) which complete the mechanism for regulating the inclination of the arms (2') of the awning since they act as pushing elements for fixing and regulating said oscillation of the bolt (7) in the desired position. Said pushing elements (9, 10) are accessible by way of respective openings (11, 12) which allow the displacement thereof in the interior of the openings (11, 12) and the subsequent tight-

ening by means of threading. The threading and displacement of the pushing elements is carried out by means of the corresponding tool (13). Said pushing elements (9, 10) preferably do not protrude from the openings (11, 12) thereof, although they could do so.

[0021] Specifically, said pushing elements (9, 10) consist of a first pushing element, preferably a set screw (9) situated in an upper position, and the aim of which is to fix the bolt (7), upon being threaded towards the through hole (6), in the tightening direction towards the right in the figures, when it is displaced along the first opening (11) against the bolt (7), thus fixing the position of the same. Said bolt (7) comprises notches which allow the correct position of the bolt to be ensured. Said first opening (11) is situated in the rear part of the base (4) of the support (3) and passes through the base (4) and the protuberance (5) to the hole (6) such that the first pushing element (9) introduced in said first opening (11) acts on the bolt (7) in one direction. The axis of the first opening (11) defines the second axis (y) of the mechanism which is perpendicular to the first axis (x). Said first opening (11) which provides access when tightening the first pushing element (9) is oversized in order to easily allow the passage of the key which constitutes the tool (13) by means of which action is carried out on said element (9) at the same time as minimizing the use of aluminum, which would not be required since there is sufficient thickness below the first opening (11).

[0022] The second pushing element (10) is preferably a revolving body with various sections with concentric diameters of different lengths (102, 103, 104) and one section with threading (101) with concentric diameters of the same length in order to be able to be threaded on a section with threading (121) of the second opening (12) as is observed in Figure 4. Specifically, the pushing element (10) comprises a first section (101) formed by a first cylindrical body with threading, followed by a second body (102) in which the diameter of the first cylindrical body is reduced in a continuous manner until arriving at a third section (103) in which the diameter again increases until reaching a fourth section (104) where the diameter is constant. This pushing element thus has two supports, one on the first section (101) and one on the fourth section (104) which ensures that it is always well guided and withstands the side forces exerted by the bolt (7). Other forms which allow the bolt (7) to be displaced in a phased manner could also be used. In Figure 6, it is observed how said second opening (12) follows a path secant to the through hole (6), being situated on a side of the protuberance (5) of the front part of the support (3), between the hole (6) and the base (4) and passing through the protuberance (5). Due to the secant path thereof, said opening (12), on its course, is connected laterally with the hole (6) such that the second pushing element (10) introduced into said second opening (12) acts laterally on the bolt (7) in the same direction as the first pushing element (9). This second pushing element (10) is displaced along the second opening (12) which defines a third displacement axis (z) and which is perpendicular to the first axis (x) and to the second axis (y) mentioned. By means of this second opening (12) and this second pushing element (10), it is possible to regulate the position of the bolt (7) with the desired inclination since the lower part of the bolt (7) fixed at the upper part thereof will be displaced laterally, transferring said inclination to the branches of the end of the arm (2') and therefore to the entire length of the arm (2').

[0023] The first (101) and fourth section (104) of the second pushing element (10) can have the same or different diameters which would mean in this second case that the second opening (12) is divided into two parts with different diameters, the connection to the through hole (6) being situated between the two parts with different diameter.

Claims

1. A height-regulating mechanism of an elbow of a folded arm of an awning, arranged on an awning arm support, in order to allow the inclination of the arm (2') to be modified, the support (3) having a through hole (6) with an end with a circular base with a first axis (x) coinciding with the center of the base, said first axis (x) extending through the hole (6) perpendicular to the base to a second end of the through hole (6) which has the shape of a slotted hole or elongated hole in order to house a bolt (7), the protruding ends of which are coupled, once installed, to the branches (8) of a fork (2) arranged on the end of the arm (2') of the awning, said support (3) having two openings (11, 12) which connect the through hole (6) to the exterior of the support (3) in order to introduce two pushing elements (9, 10) into said openings (11, 12) which act on the bolt (7), regulating the oscillation of said bolt (7) in the hole (6), **characterized in that** it comprises:

   - a first opening (11), in accordance with a second axis (y) perpendicular to the first axis (x), that passes through the support (3) to the hole (6), such that a first pushing element (9) introduced into said first opening (11) acts on the bolt (7) in one direction, and
   - a second opening (12), in accordance with a third axis (z) perpendicular to the first (x) and to the second axis (y), and said opening (12), in its course, being connected laterally to the hole (6), such that a second pushing element (10) introduced into said second opening (12) acts laterally on the bolt (7) in the same direction as the first pushing element (9).

2. The mechanism according to claim 1, **characterized in that** the first opening (11) is situated on the support (3) above the second opening (12).

3. The mechanism according to claim 1, **characterized in that** the support of the awning arm comprises a base (4) and a protuberance (5) on the front face thereof in which the through hole (6) is situated in order to house the bolt (7), the first opening (11) being situated on the rear part of the base (4) of the support (3) and passing through the base (4) and the protuberance (5) to the hole (6), and the second opening (12) being situated on a side of the protuberance (5) of the front part of the support (3), between the hole (6) and the base (4), passing through the protuberance (5).

4. The mechanism according to claim 1, **characterized in that** the first axis (x) of the hole (6) and the second axis (y) of the first opening (11) are contained in the same first plane which is intersected perpendicularly by the third axis (z) of the second opening (12).

5. The mechanism according to claim 1, **characterized in that** the second opening (12) follows a path secant to the through hole (6), the third axis (z) of the second opening (12) being contained in a second plane that is parallel to a third plane which contains the first axis (x) of the hole (6) and which is intersected perpendicularly by the second axis (y) of the first opening (11).

6. The mechanism according to claim 1, **characterized in that** the second opening (12) comprises a section with threading (121) via which the second pushing element (10) is displaced.

7. The mechanism according to claim 1, **characterized in that** the first opening (11) comprises a section with threading via which the first pushing element (9) is displaced.

8. The mechanism according to claim 1, **characterized in that** the second pushing element (10) has a revolving body with sections with concentric diameters of different lengths (102, 103, 104) and a section with threading (101) with concentric diameters of the same length which are threaded on the second opening (12).

9. The mechanism according to claim 1, **characterized in that** it comprises a first pushing element (9) which has at least one section with a thread which is threaded on the first opening (11).

10. The mechanism according to claim 1, **characterized in that** the access entrance to the opening (11) situated on the rear part of the base (4) of the support (3) is oversized in order to easily allow the passage of a tool (13) by means of which action is carried out on said first element (9).

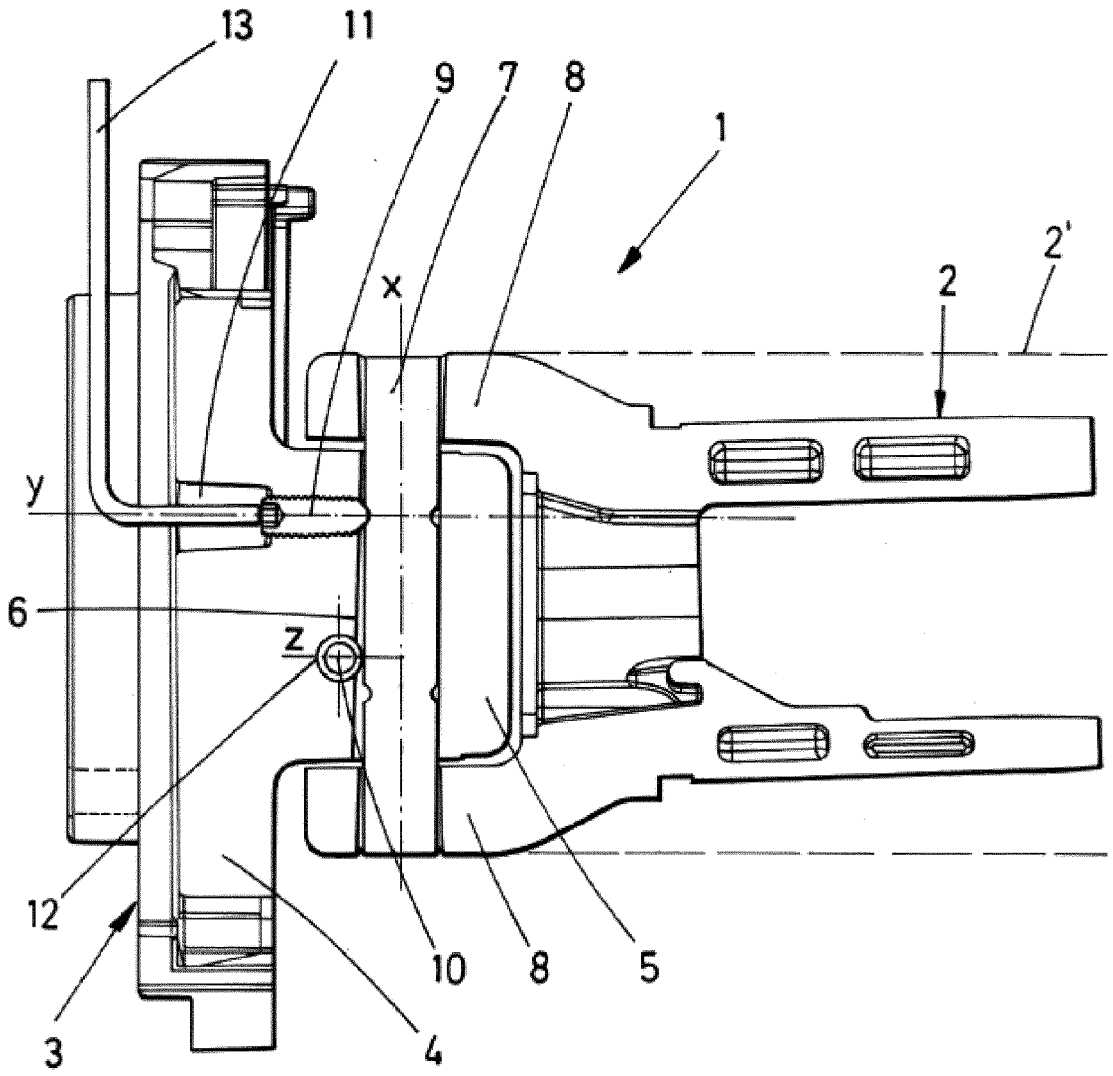

FIG.1

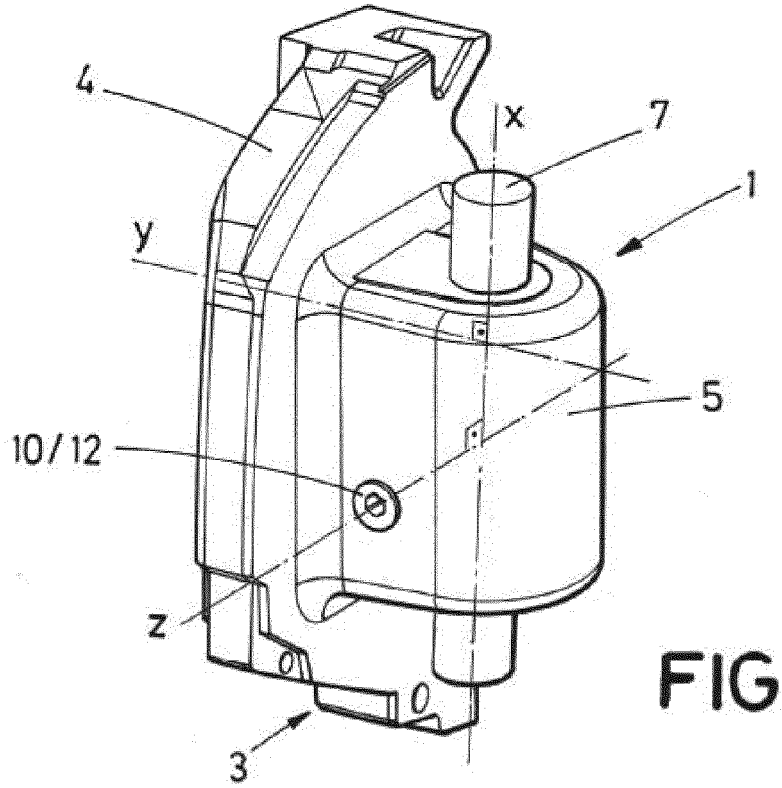

FIG.2

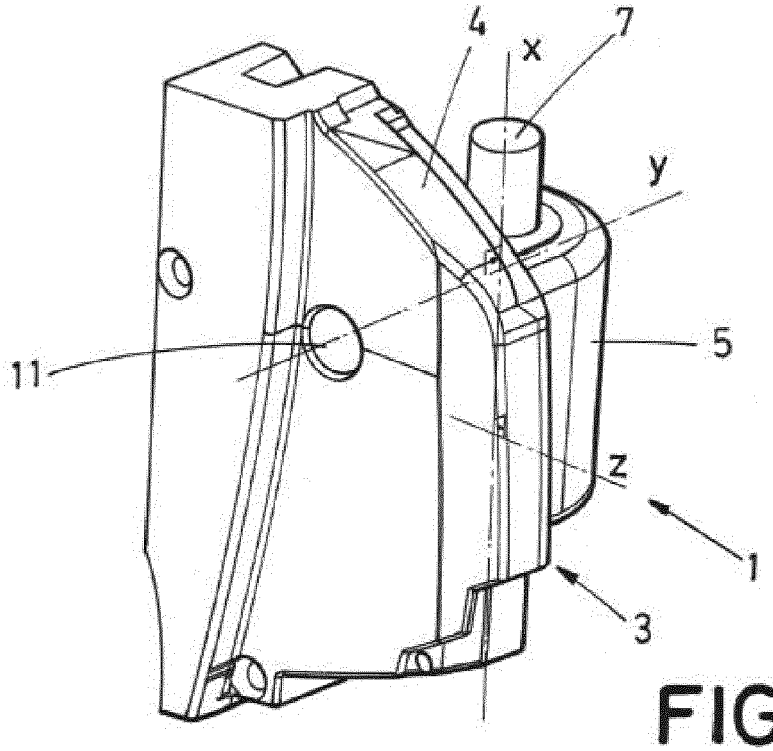

FIG.3

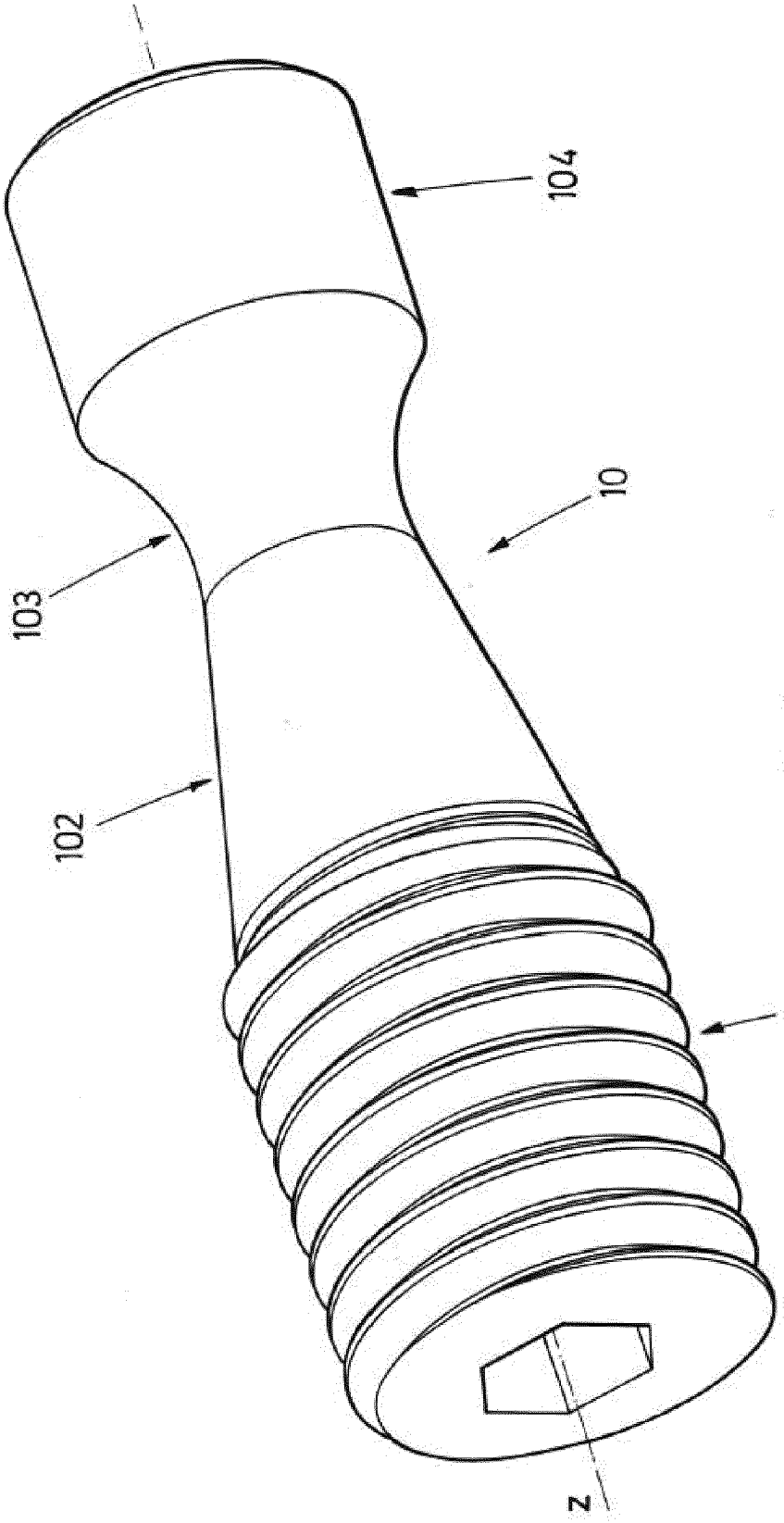

FIG.4

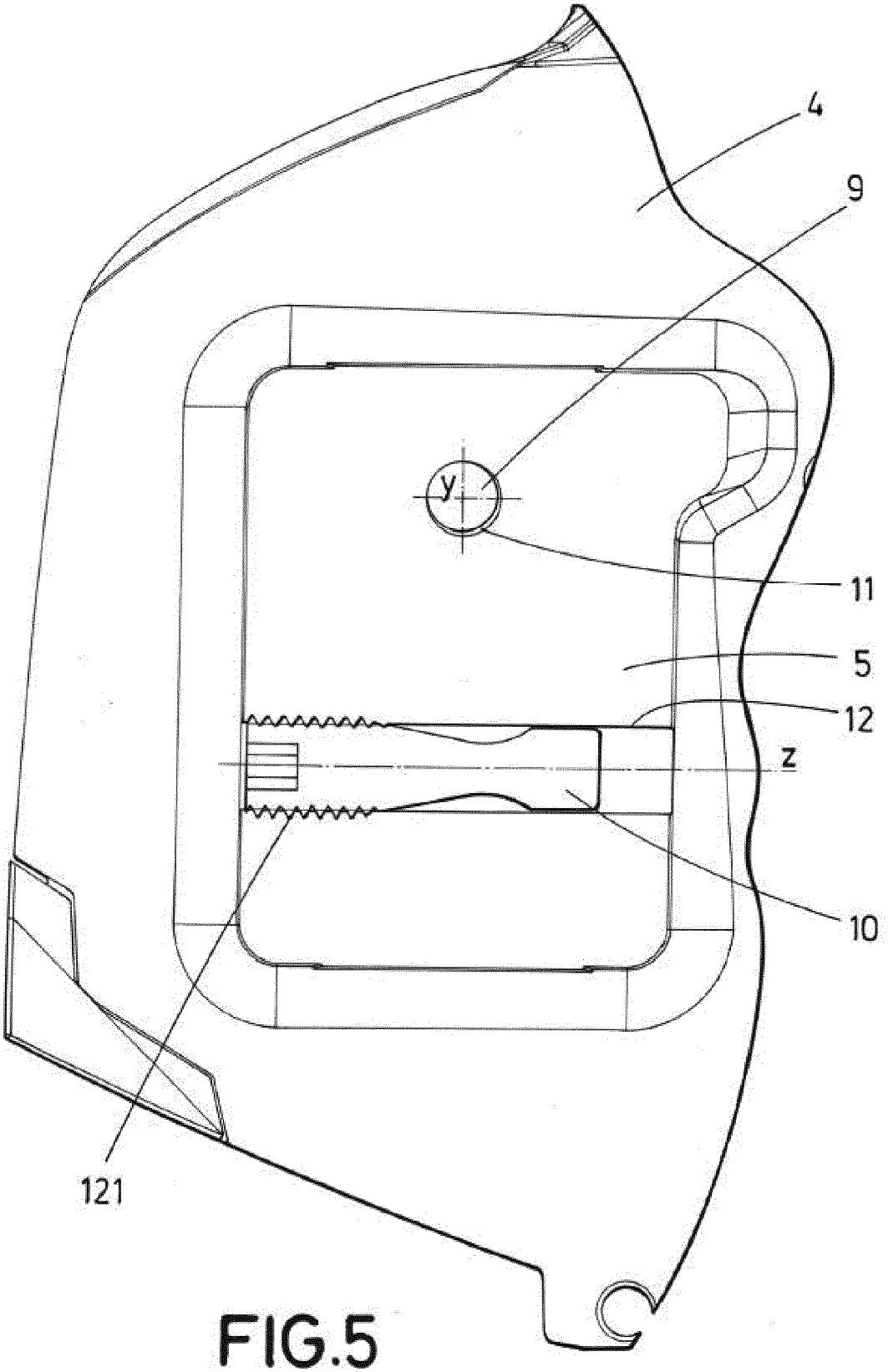

FIG.5

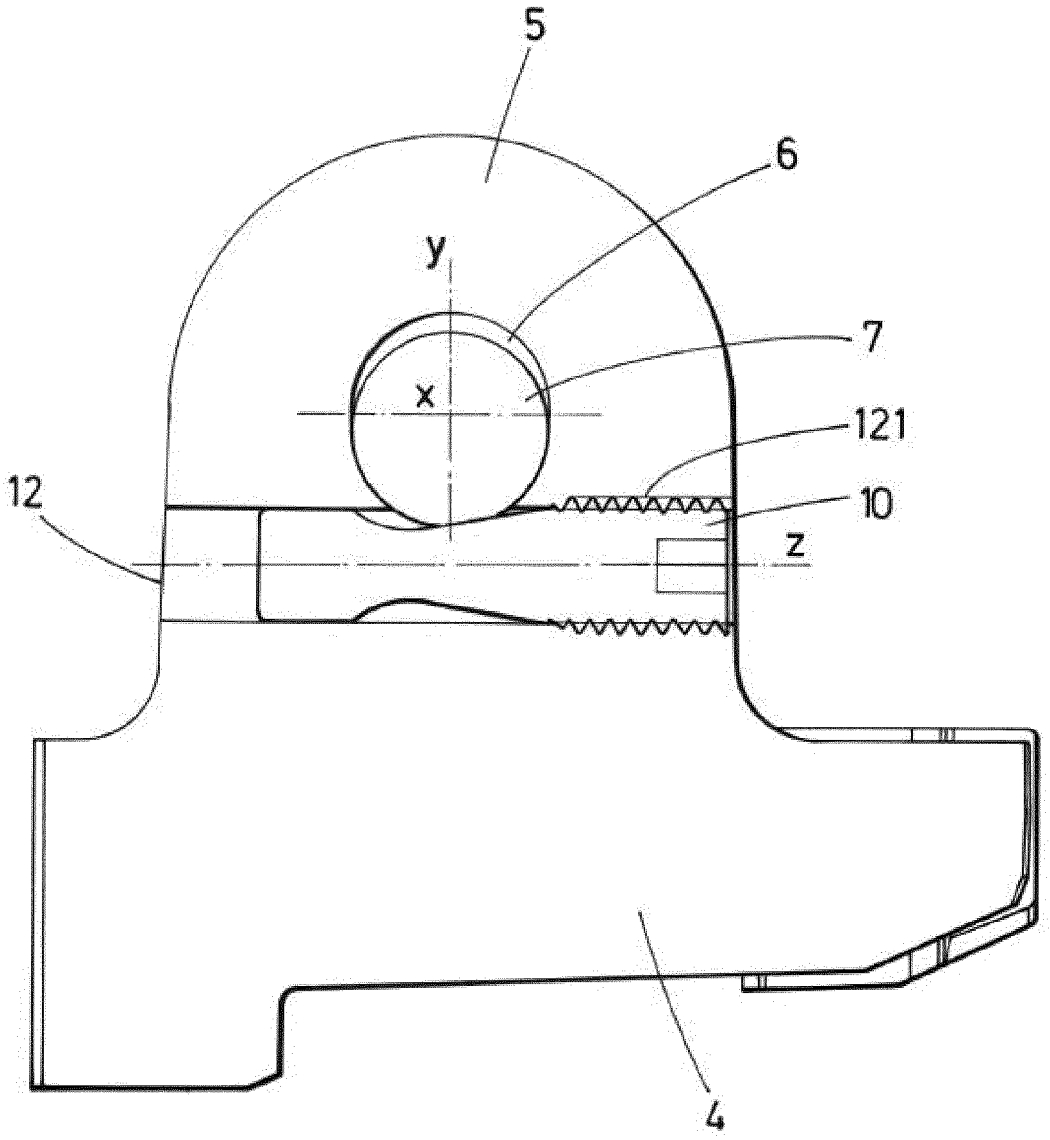

FIG.6

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EUROPEAN SEARCH REPORT

Application Number
EP 16 38 2396

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 1 767 721 A1 (LLAZA SA [ES]) 28 March 2007 (2007-03-28) * figures 2,4 * * paragraphs [0001], [0010], [0014], [0022], [0023] *	1-10	INV. E04F10/06
A,D	ES 1 048 736 U (LLAZA, S.A.) 16 September 2001 (2001-09-16) * figure 4 *	1-10	
A	DE 94 03 086 U1 (VOSS PAUL GMBH & CO [DE]) 22 June 1995 (1995-06-22) * the whole document *	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	13 January 2017	Cornu, Olivier

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