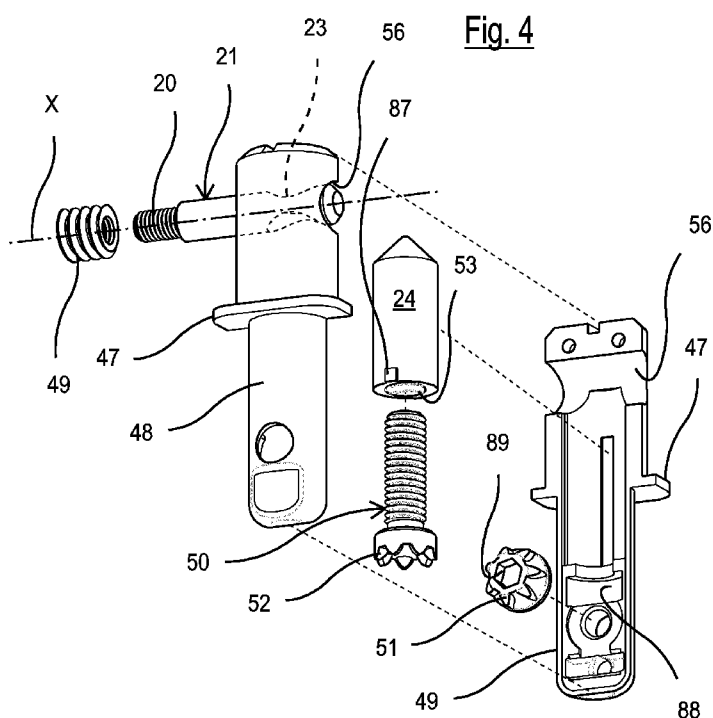




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(54) Title: A COMPACT JOINT FOR CONNECTING A FIRST PANEL AND A SECOND PANEL OF FURNITURE AND OTHER FURNISHING ITEMS



(57) Abstract: A compact joint for connecting a first panel (12) and a second panel (11) of furniture and other furnishing items, positioned perpendicular to each other, wherein said joint comprises a plurality of interconnection and blocking components for joining and firmly blocking said two panels (11,12) together, wherein said plurality of components lies on the same plane (B) which is perpendicular to said first panel (12) and said second panel (11) and which contains a coupling axis (X) between said panels (12,11), said coupling axis (X) being inside said first panel (12), said joint also providing an actuation axis (Z). According to the invention, the actuation axis of the joint (Z) is perpendicular to the axis (X) and lies on a plane (P) which is parallel and interspaced with respect to the first panel (12) and perpendicular with respect to the second panel (11).



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MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
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A COMPACT JOINT FOR CONNECTING A FIRST PANEL AND A
SECOND PANEL OF FURNITURE AND OTHER FURNISHING ITEMS

The present invention relates to a compact joint
for connecting a first panel and a second panel of
5 furniture and other furnishing items.

Various types of joints are known, such as that
object of European patent application EP 930436 A1
which provides a cam element for actuating expandable
gripping means or in any case, a mechanism for
10 actuating the joint, which require holings in the
panels, having a certain complexity.

Other systems are also known for joining a panel or
shelf or base or bottom of a piece of furniture and a
shoulder or other panel of a piece of furniture in the
15 furnishing industry in general. In these further
examples, the joining is effected by positioning a plug
screwed into a hole of the shoulder and, for example, a
butt or similar constraining element inserted in a hole
formed in the shelf or bottom or base of the furniture.

20 In order to produce this type of joint, a hole must
be made in the shelf, bottom or base of the furniture,
which receives the butt or similar constraining element
which, in turn, houses a grub screw in a threaded
portion of the same. This hole is not very pleasing to
25 the user, even if covered by a special cap in an

attempt to restore the aesthetics of the parts involved in the junction.

Furthermore, the presence of caps causes hindrances and obstacles for the positioning of objects on the bottom or base of the furniture, in any case being a source of disturbance for the user.

It should also be taken into account that an actuation from above, in particular for lower joints, is not always easy, in the presence of limited spaces between shelves or minimum distances from the bottom of the furniture or rear wall of the furniture, and, as already indicated, visible holes are required which are greatly criticized by users.

The general objective of the present invention is therefore to provide a relatively hidden joint that provides front actuation between a panel or shelf or base or bottom of a piece of furniture and a shoulder or other panel of a piece of furniture capable of solving the drawbacks of the known art mentioned above, in a simple, economical and functional manner.

A further objective of the present invention is to provide a joint between two panels which, in addition to having a minimum visibility on the part of an observer, and therefore a high aesthetical value, can be easily accessible, even from a free area between the

bottom and floor where the furniture is positioned.

Another objective of the present invention is to provide a joint between portions of vertical walls and the bottom and shelves of a piece of furniture or
5 furnishing item, which does not create a significant encumbrance and is adjacent between a panel or shelf or base or bottom of a piece of furniture and a shoulder or other panel of a piece of furniture, even between the bottom or base and the floor.

10 The above objectives are achieved by a joint produced according to the independent claim 1 and following subclaims.

The structural and functional characteristics of the present invention and its advantages with respect
15 to the known art will appear even more evident from the following description, referring to the enclosed schematic drawings, which show embodiment examples of the invention itself, all having the same innovative concept. In the drawings:

20 - figures 1 and 2 are perspective views, exploded and assembled, respectively, of a first embodiment of a compact joint for connecting a first panel and a second panel of furniture and furnishing items according to the present invention;

25 - figure 3 is a raised exploded section of the joint

shown in figures 1 and 2;

- figures 4, 5 and 6 are perspective views in various dimensions, one exploded and the other two of parts of what is shown in figure 4, of the mechanism of the joint of figures 1 to 3;

- figures 7 and 8 are perspective views, exploded and assembled, respectively, of a second embodiment of a compact joint for connecting a first panel and a second panel of furniture and furnishing items according to the present invention;

- figure 9 is a raised exploded section of the joint shown in figures 7 and 8;

- figures 10, 11 and 12 are perspective views in various dimensions, one exploded and the other two assembled of parts of what is shown in figure 10, of the mechanism of the joint of figures 7 to 9.

With reference in general to the figures, these show embodiments of a compact joint for connecting a first panel and a second panel of furniture and furnishing items according to the present invention.

In the various figures, in fact, a first panel 12 is provided, which must be firmly interconnected to a second panel 11. The first panel 12, for example, can be a shelf or a base or a bottom or other panel of a piece of furniture and the second panel 11, a shoulder

of a piece of furniture. In this way, the first panel 12 and the second panel 11 are positioned perpendicular to each other.

The joint also provides, either at least partially contained in the two panels 12, 11, or at least partially associated with the two panels 12, 11, a plurality of interconnection and blocking components for joining and firmly blocking the two panels 12 and 11 together.

The examples proposed also show how, according to the present invention, this plurality of components lie on the same plane B which is perpendicular to the first panel 12 and the second panel 11.

The plane B also contains a coupling axis X between the two panels 12 and 11, wherein said coupling axis X is inside the first panel 12 on a plane A also inside the first panel 12. In figure 3, for example, the plane B is the plane of the sheet containing the same figure, whereas the plane A is the plane perpendicular to the sheet containing the coupling axis X between the panels 12, 11 which must be joined with the joint of the present invention.

More specifically, with respect to figures 1 to 6, these show a first embodiment of a joint for connecting a first panel and a second panel of furniture and other

furnishing items produced according to the present invention.

Figure 1 shows an exploded perspective view of a joint according to the invention wherein a blind hole 22 is formed in the first panel 12, according to the axis X and suitable for receiving a pin 21. The pin 21, at one of its ends, has a threaded end 20 which is screwed into an internally threaded bushing 49 positioned in a blind hole 19, horizontal in the example, of the second panel 11, for example a shoulder of a piece of furniture.

The blind hole 19 of the second panel 11 is aligned with the hole 22 of the first panel 12 and both are arranged according to the axis X indicated above. The pin 21, when positioned with respect to the second panel 11, provides a housing 23 in its protruding part.

A second hole 28 is formed in the first panel 12 and intersects with the first hole 22. The hole 28 is directed according to an axis Y, vertical in the figures of this example, which is perpendicular to the axis X and which also lies on the plane B.

A pair of half-shells 48, 49 are housed in this blind hole 28, which form a cylindrical casing inside part of which a threaded drive screw 50 of a grub screw 24, is caused to rotate. The two half-shells 48 and 49

are only partially housed in this hole 28 as they each have half of a flange 47, in their intermediate portion.

When the two half-shells 48, 49 are joined, said
5 flange 47 is arranged in abutment at the inlet of the hole 28 on the lower surface of the first panel 12.

The rotation of the threaded screw 50 is controlled by a pinion-toothed crown bevel. A pinion 51 is in fact rotatably positioned inside a hole formed in one of
10 the two half-shells 48, as shown in figures 5 and 6.

The pinion 51 engages with a toothed crown 52, formed as the head of the above-mentioned threaded screw 50. The toothed crown 52 is rotatable inside a seat 88 formed in the two coupled half-shells 48 and
15 49. The threaded screw 50 is in turn positioned in an axial threaded hole 53 inside the grub screw 24.

A shaped tool 26, for example provided with a hexagonal head 27, is suitable for being inserted inside a complementary seat 89 of the pinion 51 so as
20 to be coupled with it for causing its rotation.

The rotation of the pinion 51 in turn causes the rotation of the toothed crown 52 of the head of the threaded screw 50. The rotation of the threaded screw 50 forces the upward movement of the grub screw 24, as
25 teeth 87 are provided that prevent the rotation of the

grub screw 24.

When the joint is assembled as shown in figure 2, the rotation and actuation described above cause the tip of the grub screw 24 to become engaged in the housing 23 of the pin 21, as shown in figures 5 and 6, causing and stabilizing the blockage between the panels 12 and 11. The pin 21 passes through the shells 48, 49 thanks to the presence, in each of the same, of grooves 56 which, when coupled, define a passage hole of the pin 21.

An actuation axis Z of the threaded screw 50 is perpendicular to the plane B and the actuation is effected by inserting the hexagonal head 27 of the shaped tool 26 into the complementary seat of the pinion 51, as shown in figure 2.

In this way, a compact joint is produced according to the present invention.

Figures 7 to 12 show a second embodiment of a joint for connecting a first panel and a second panel of furniture and other furnishing items produced according to the present invention.

Figure 7 shows an exploded perspective view of a joint according to the invention, wherein the same reference numbers are used for the same elements as those shown in figures 1-6.

In this example, a different plurality of interconnection and blocking components are provided for joining and firmly blocking the two panels 12 and 11 together.

5 A cylindrical extension 70 of a casing or body 71 is in fact housed in the hole 28 of the first panel 12, in which a device with a worm screw and toothed drive wheel of a grub screw 24, is positioned. The cylindrical extension 70 is provided with pass-through
10 holes 72 in which the pin 21 is inserted.

The body 71 has a seat 73 for a worm screw 74 arranged for collaborating with a toothed wheel 75, in turn housed in a seat 76. The worm screw 74 is kept rotating in the seat 73, thanks to a plug 77.

15 The toothed wheel 75 integrally carries a threaded portion 78 which is screwed into an internal threading (not shown) formed in the cylindrical extension 70 positioned above the body 71. The threaded portion 78 containing the grub screw 24 is therefore forced to
20 move in the seat 76 when rotated, thus engaging the housing 23 of the pin 21, blocking it.

When this second embodiment of a joint is also assembled as shown in figure 8, the rotation and actuation described above cause the tip or grub screw
25 24 to become engaged in the housing 23 of the pin 21,

causing and stabilizing the blockage between the panels 12 and 11. The pin 21 passes through the cylindrical extension 70 passing through the pass-through holes 72.

An actuation axis Z of the worm screw 74 is perpendicular to the plane B and the actuation is effected by inserting the hexagonal head 27 of the shaped tool 26 into the complementary seat of the worm screw 74, as shown in figure 8.

In this way, a compact joint is produced according to the present invention.

The inventive idea at the basis of the present invention is consequently the provision of a compact joint for connecting a first panel 12 and a second panel 11 of furniture and other furnishing items, positioned perpendicular to each other, wherein said joint comprises a plurality of interconnection and blocking components for joining and firmly blocking said two panels 11, 12 together, and wherein said plurality of components lies on the same plane B which is perpendicular to said first panel 12 and said second panel 11 and which contains a coupling axis X between said panels 12, 11, said coupling axis X being inside said first panel 12. According to the invention, the actuation axis Z of the joint is perpendicular to the axis X and lies on a plane P which is parallel and

interspaced with respect to the first panel 12 and perpendicular with respect to the second panel 11.

It can thus be seen how a front actuation is effected by means of a joint according to the invention, providing a solution to the problems encountered in the known art indicated above.

Primarily, all visible holes have been eliminated from the furniture and an adjustable joint has been provided that can be actuated in the minimum space existing beneath the first panel or bottom or base and the floor P from a front position.

The elements of the system have been minimized and are extremely simple to construct and use. The holings in the two panels 11 and 12, such as shoulders and bottom or base have also been minimized.

The advantages and innovative characteristics of a compact joint for connecting a first panel and a second panel of furniture and other furnishing items according to the present invention are therefore evident.

The forms and structure for producing a joining system with front actuation in axis with a bottom according to the present invention, as also the materials and assembly modes, can naturally differ from those shown for purely illustrative and non-limiting purposes in the drawings.

The objectives mentioned in the preamble of the description have therefore been achieved.

The protection scope of the present invention is defined by the enclosed claims.

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CLAIMS

- 1) A compact joint suitable for being used in furniture and other furnishing items with a shelf (12) and at least one shoulder (11) positioned perpendicular to each other, wherein said joint comprises a plurality of interconnection and blocking components for joining and firmly blocking said shelf (12) and said at least one shoulder (11) together, wherein said plurality of components lies on the same plane (B) which is perpendicular to said shelf (12) and said at least one shoulder (11) and which contains a coupling axis (X) between said shelf (12) and said at least one shoulder (11), said coupling axis (X) being inside said shelf (12), said joint also providing an actuation axis (Z), characterized in that the actuation axis of the joint (Z) is perpendicular to the axis (X) and lies on a plane (P) which is parallel and interspaced with respect to the shelf (12) and perpendicular with respect to the at least one shoulder (11).
- 2) The joint according to claim 1, characterized in that said coupling axis (X) between said shelf (12) and said at least one shoulder (11) is also on a plane (A) perpendicular to said plane (B).
- 3) The joint according to claim 1 or 2, characterized in that said plurality of interconnection and blocking

components of said joint are either at least partially contained in said shelf (12) and said at least one shoulder (11) or at least partially associated with said shelf (12) and said at least one shoulder (11) for
5 joining and firmly blocking said shelf (12) and said at least one shoulder (11) together.

4) The joint according to claim 1, characterized in that said shelf (12) has at least one hole (22) for receiving a pin (21), which is provided with a housing
10 (23) for an engagement grub screw (24) and which is firmly positioned in a hole (19) formed in said at least one shoulder (11).

5) The joint according to claim 4, characterized in that said plurality of interconnection and blocking
15 components of said joint comprise a grub screw (24), movably positioned in a casing (48, 49), situated in a hole (28) of said shelf (12), and in operable engagement with said pin (21).

6) The joint according to claim 5, characterized in
20 that said grub screw (24) can be moved in said casing (48, 49) by means of a bevel (51, 52).

7) The joint according to claim 6, characterized in that said bevel comprises a pinion (51) rotatably positioned inside said casing (48, 49) that is engaged
25 with a toothed crown (52), produced as the head of a

threaded screw (50) in turn positioned in an axial threaded hole (53) inside said bead (24).

8) The joint according to one or more of the previous claims from 5 to 7, characterized in that said casing
5 (48, 49) is arranged and associated beneath said shelf (12) in a hole (28) of the same by means of an abutment flange (47).

9) The joint according to one or more of the previous claims from 1 to 4, characterized in that said
10 plurality of interconnection and blocking components of said joint comprise a body (71), associated beneath said shelf (12), which contains a worm screw-toothed wheel pair (74, 75) that causes a screw (78) to slide, which is engaged in a housing (23) of a pin (21)
15 connected to said at least one shoulder (11).

10) The joint according to claim 9, characterized in that said body (71) has a seat (73) for said worm screw (74) arranged for collaborating with said toothed wheel (75), in turn housed in a relative seat (76), wherein
20 said toothed wheel (75) integrally carries said screw (78), which is housed inside an internal threading formed in a cylindrical extension (70) positioned above said body (71).

Fig. 1

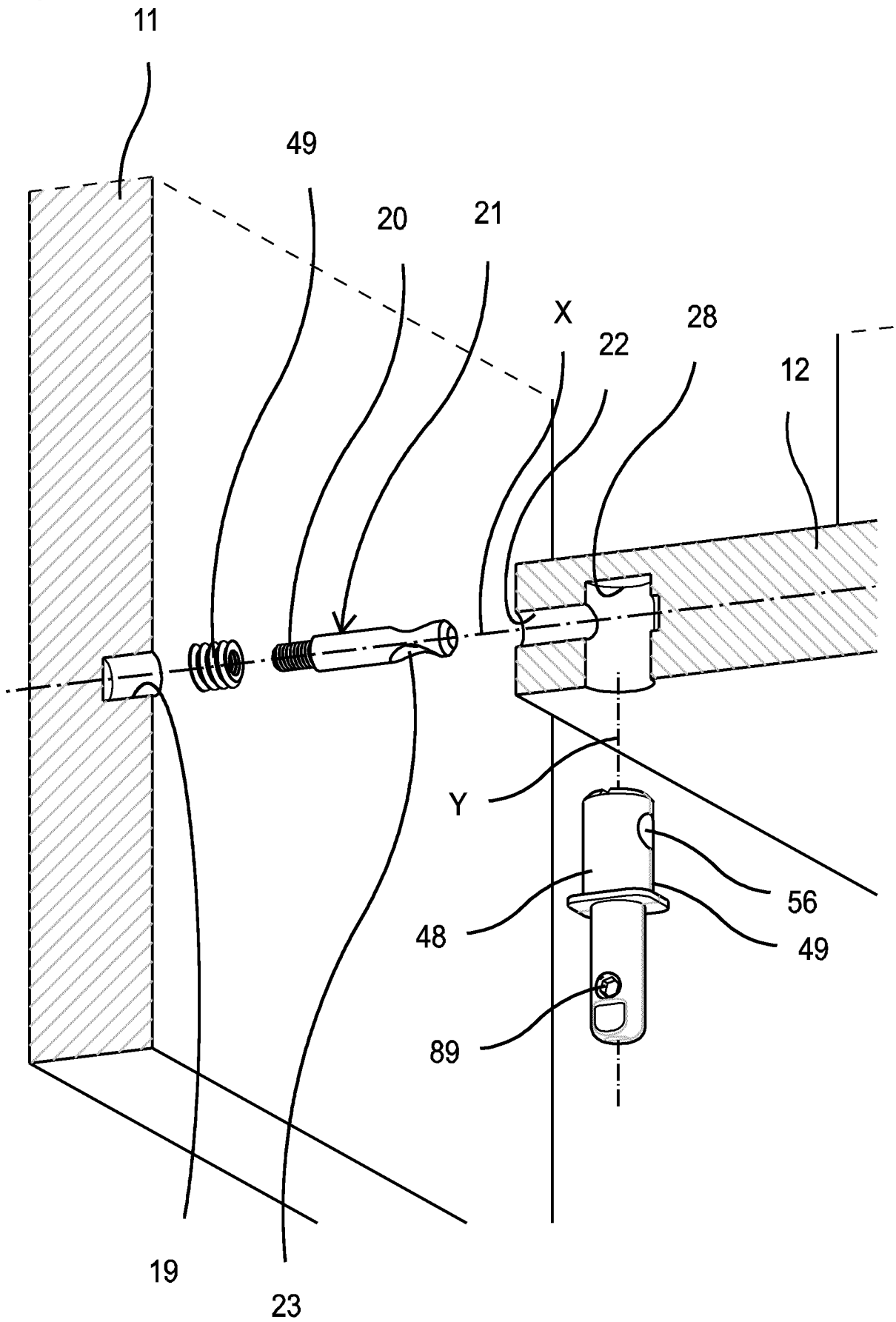


Fig. 2

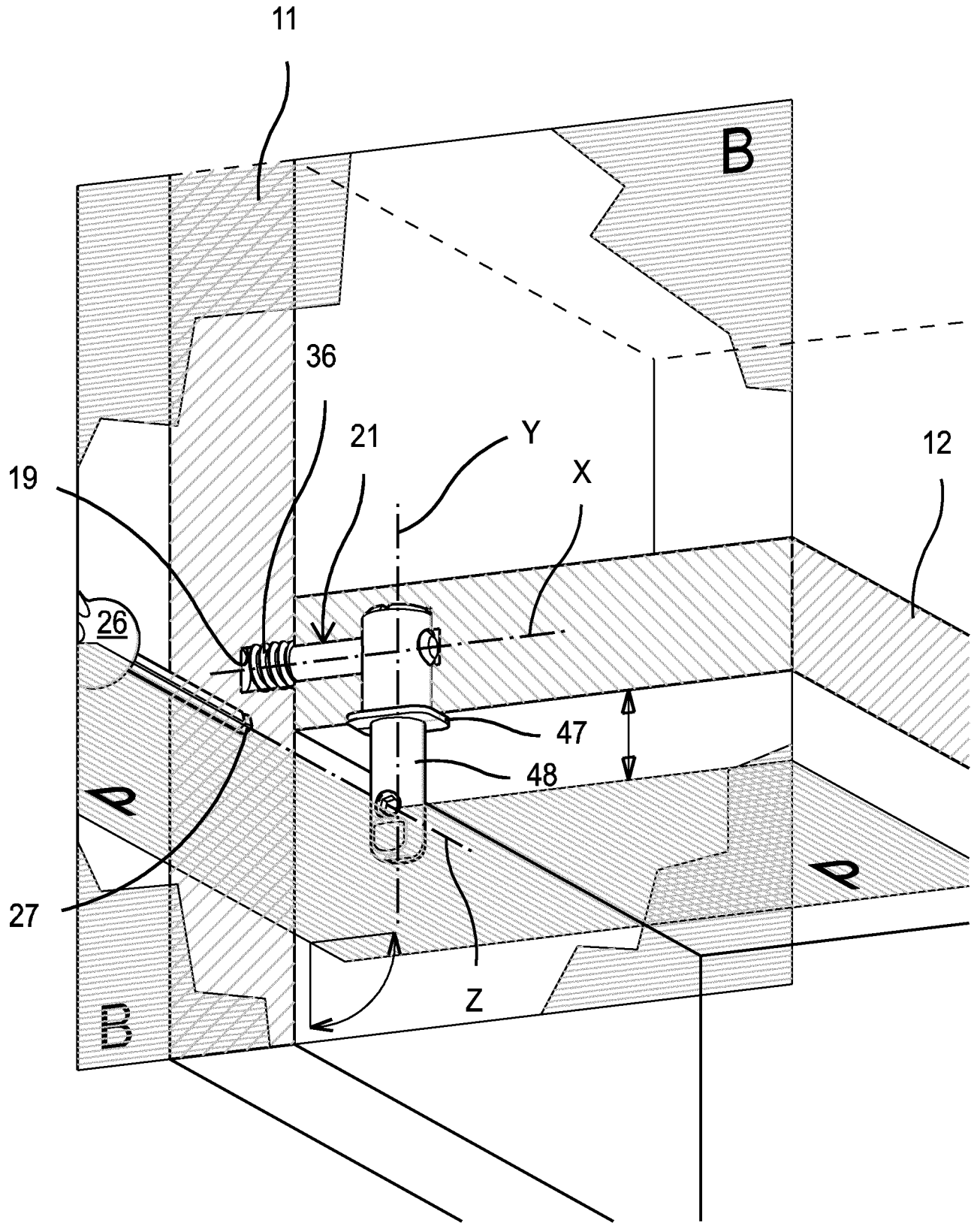
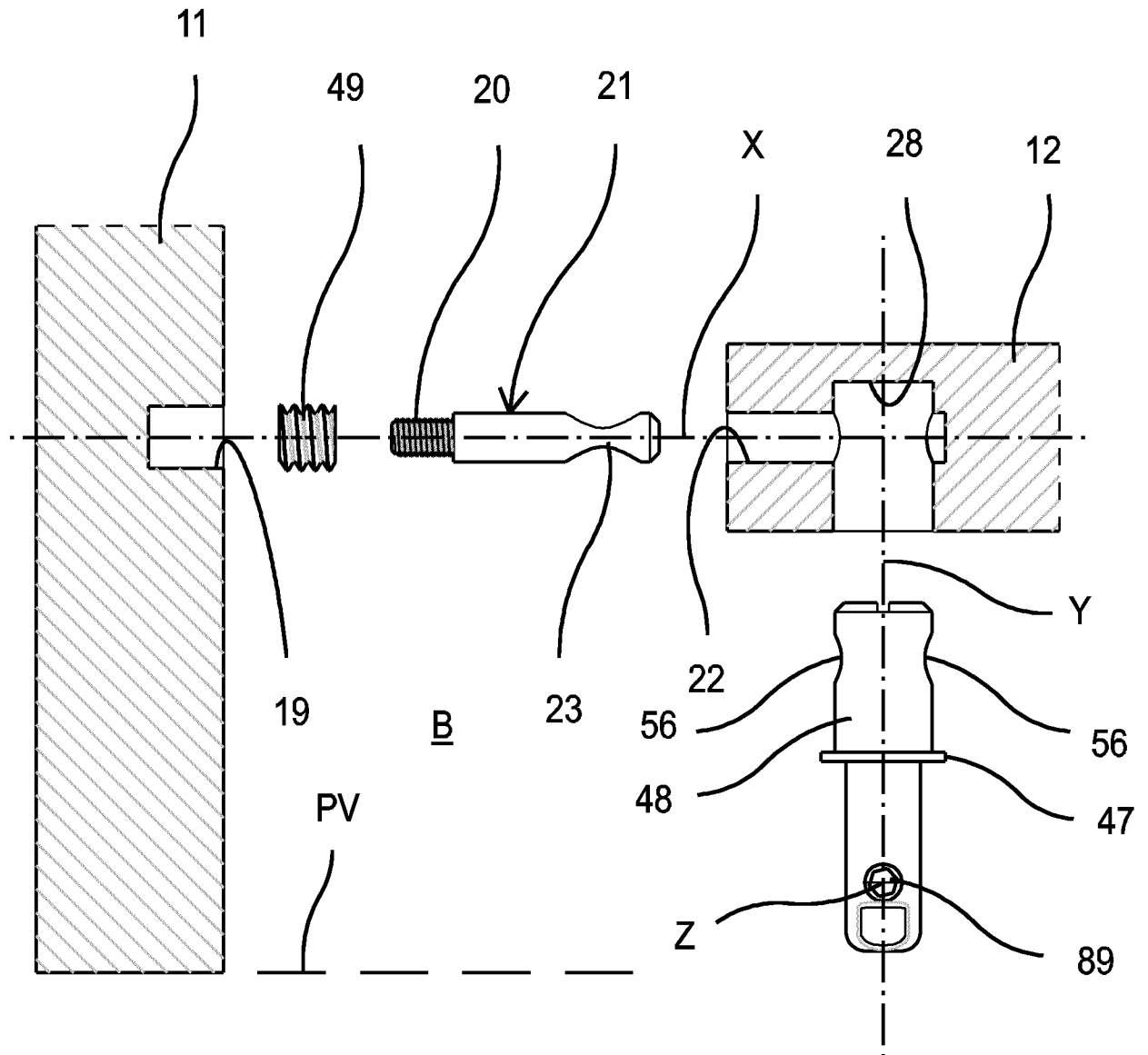


Fig. 3



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Fig. 4

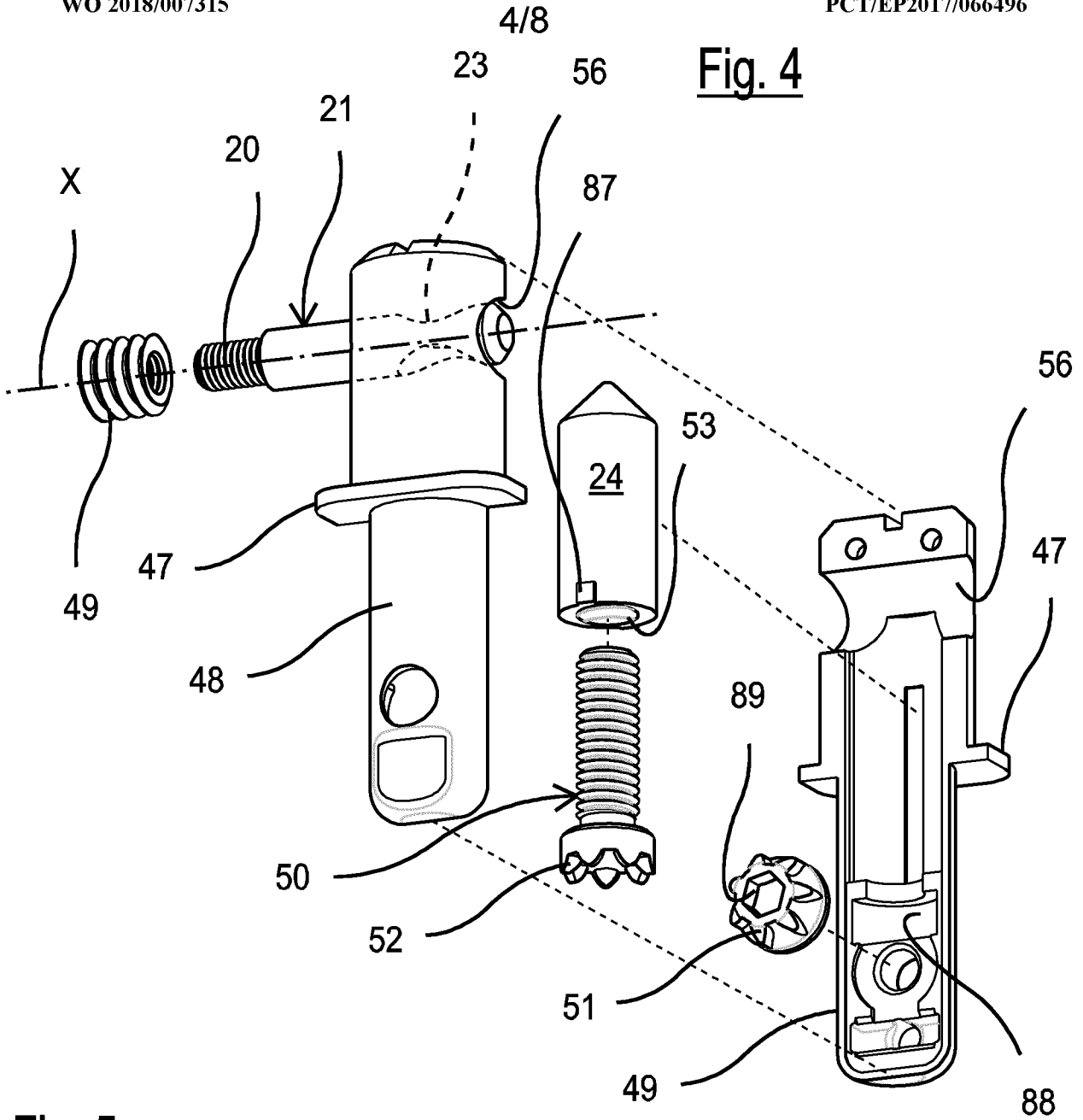


Fig. 5

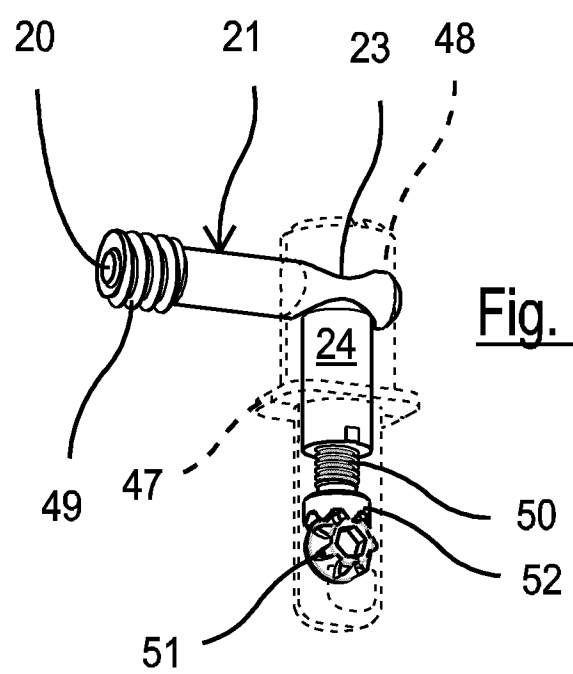
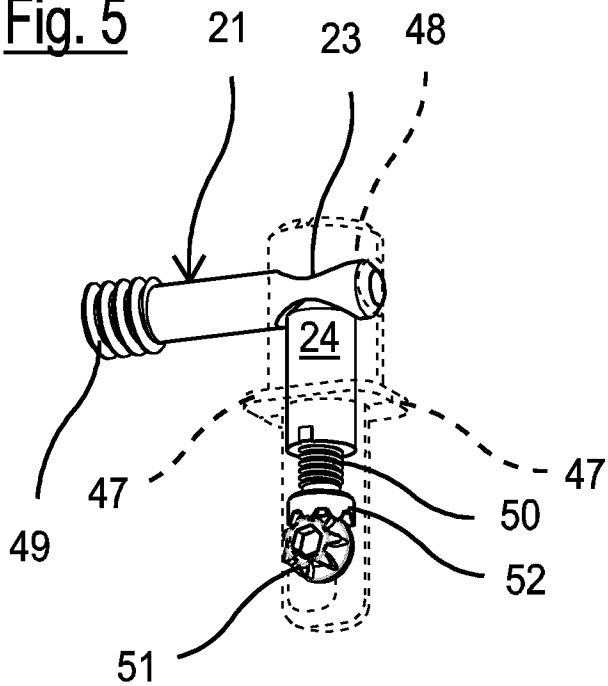


Fig. 6

Fig. 7

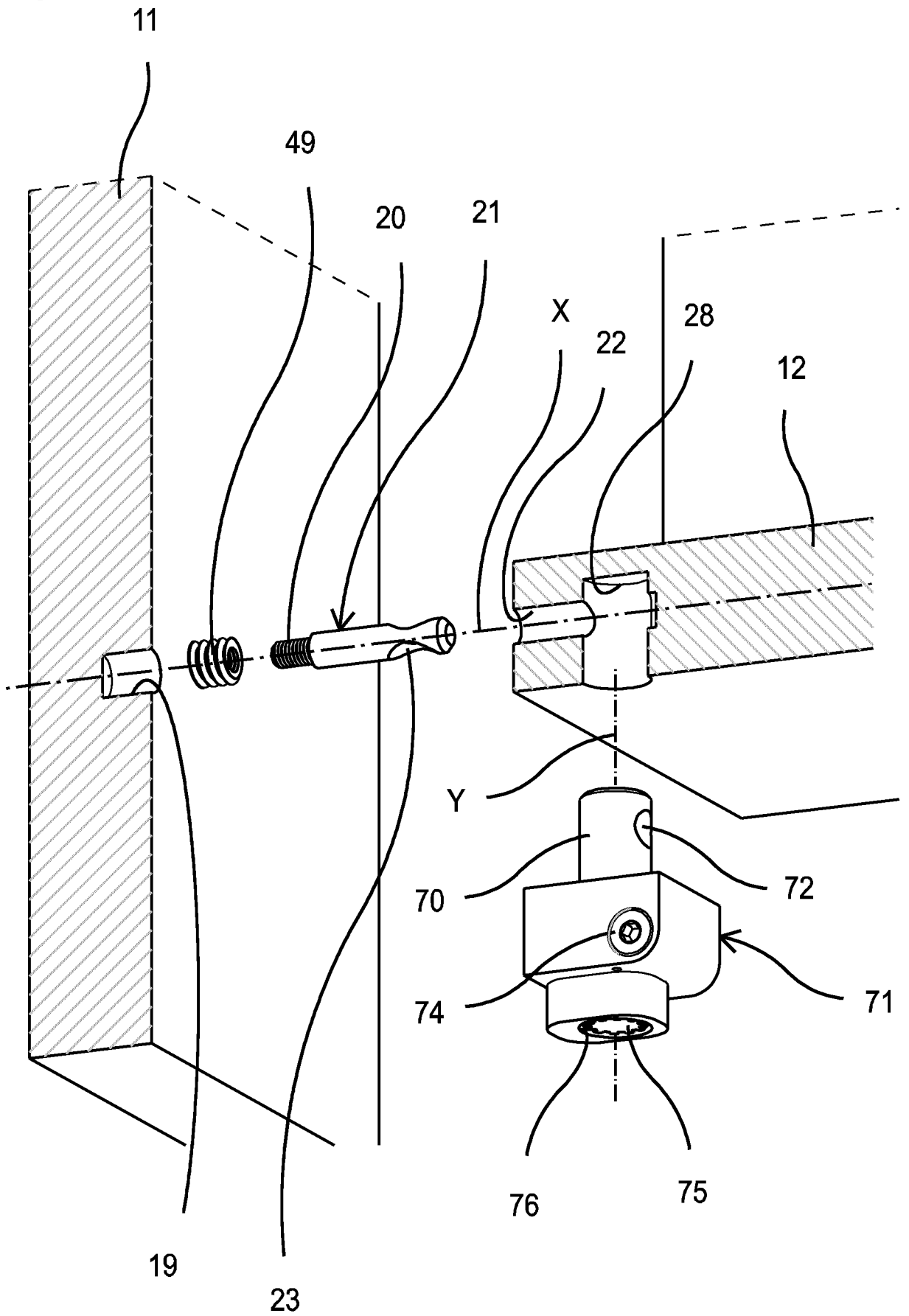


Fig. 8

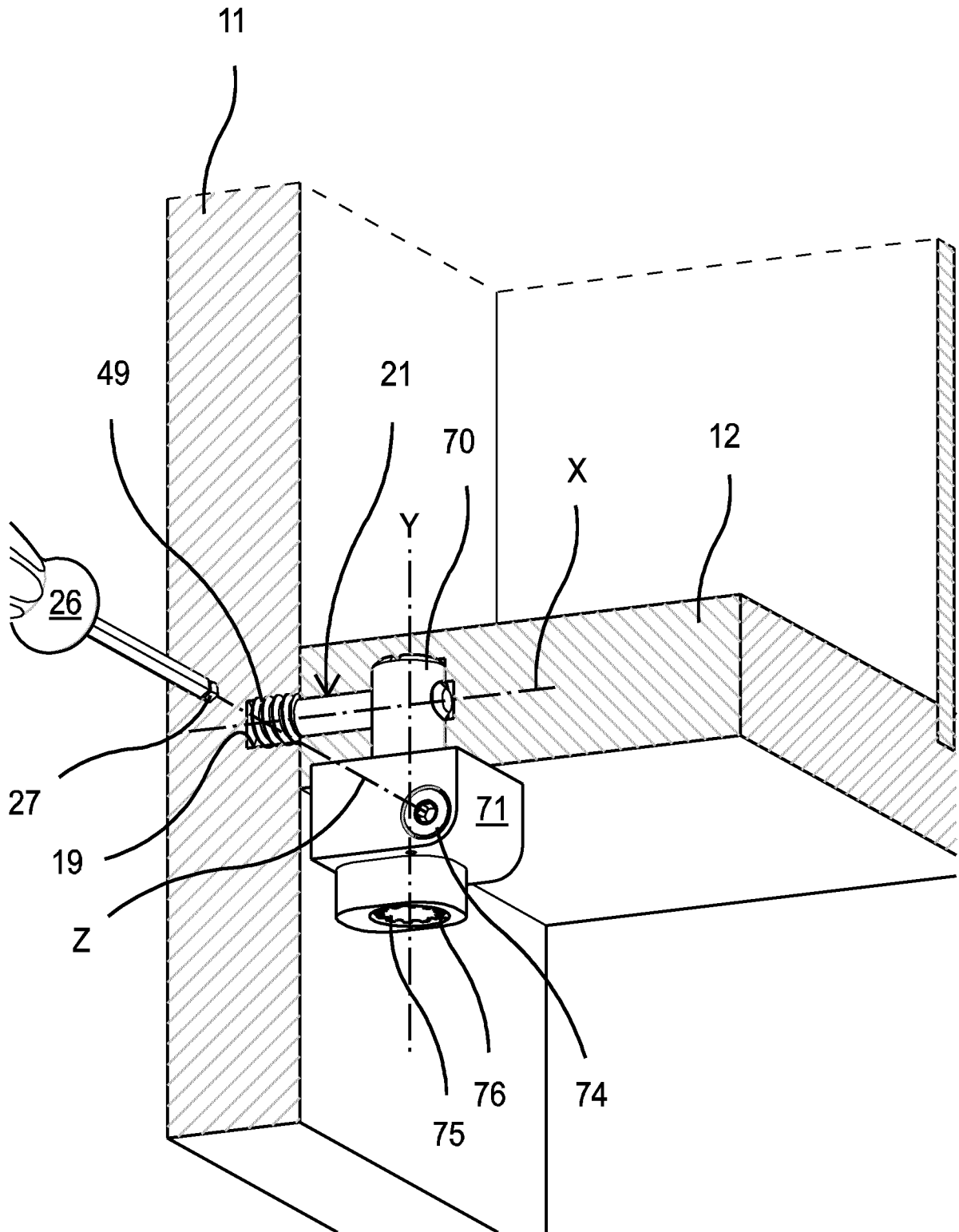


Fig. 9

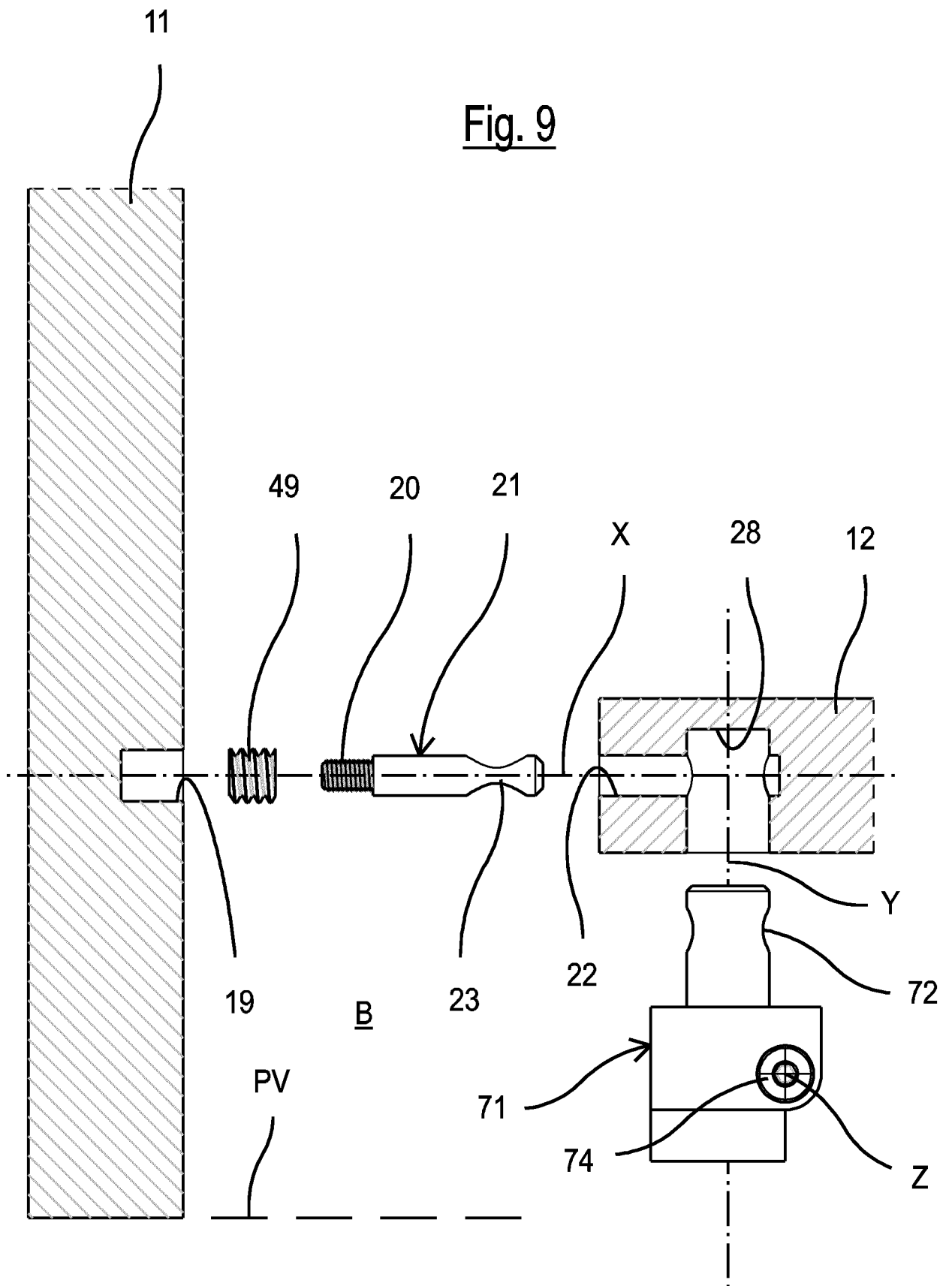


Fig. 10

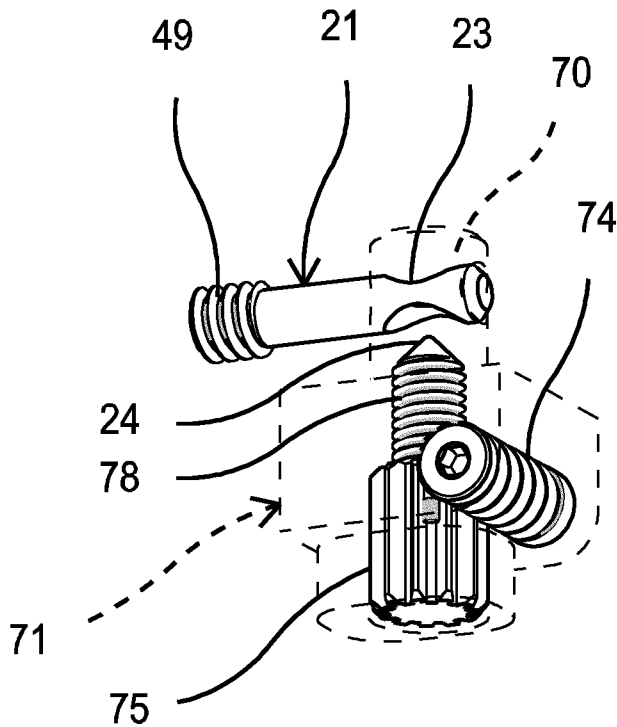
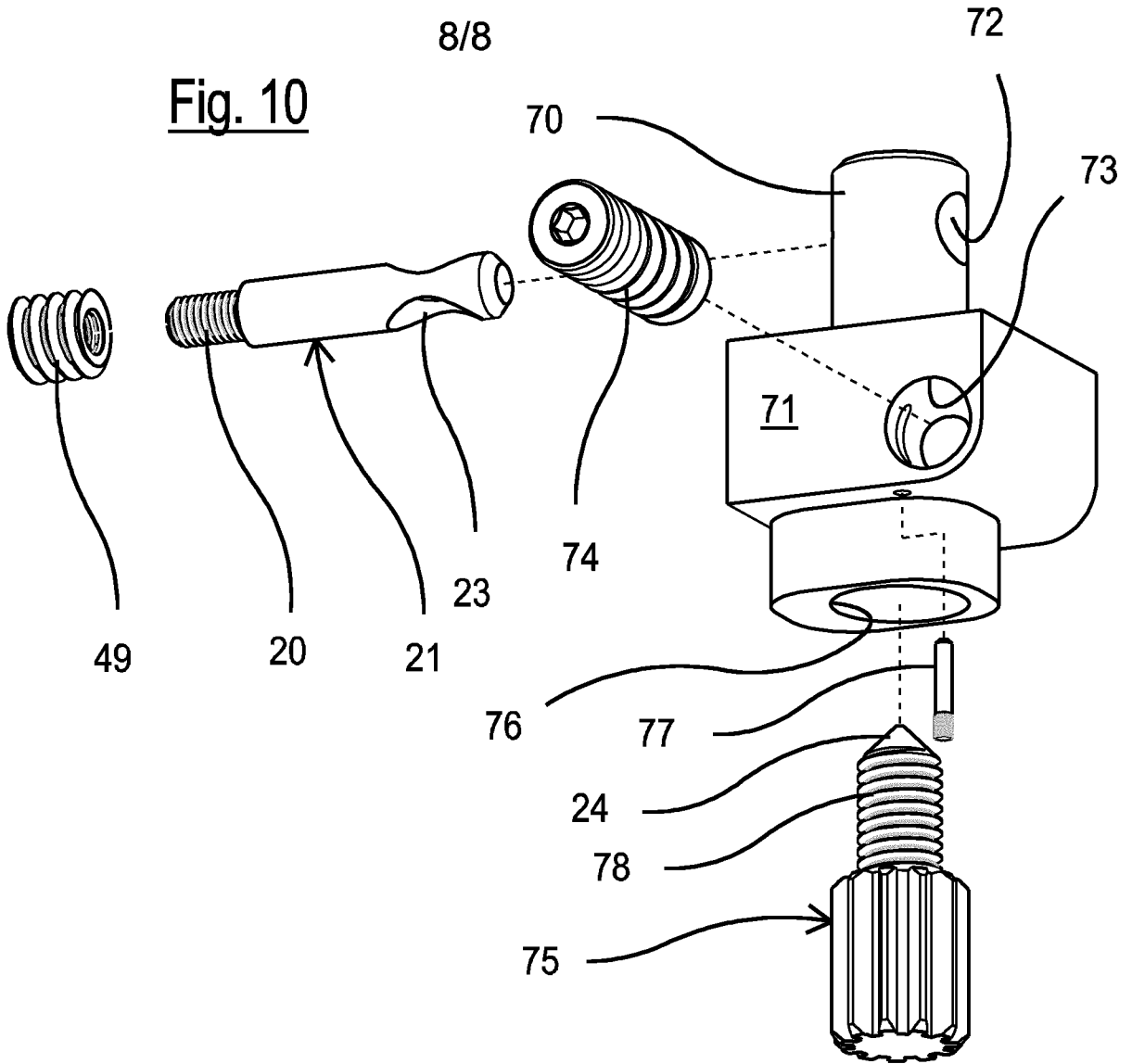


Fig. 11

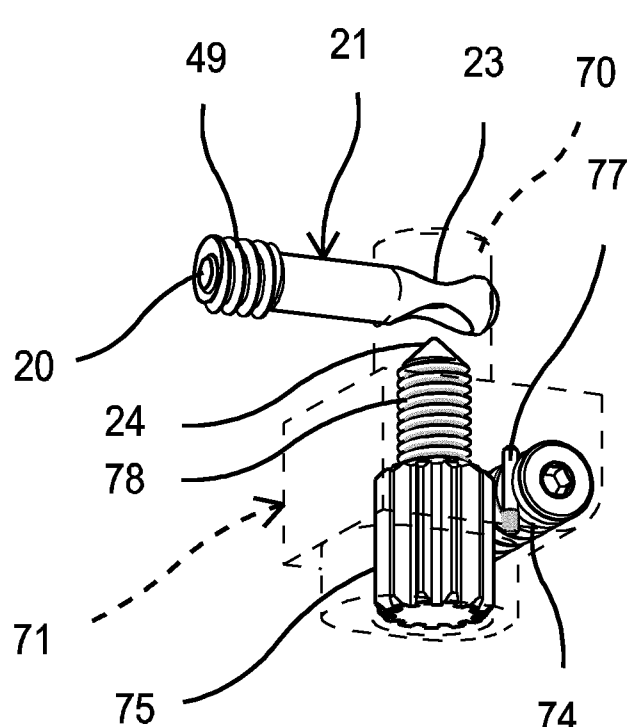


Fig. 12

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/066496

A. CLASSIFICATION OF SUBJECT MATTER
INV. F16B12/20
ADD.

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)
F16B

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 practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2008/076089 A2 (MARU MIMARLIK INSAAT) 26 June 2008 (2008-06-26)	1-8
A	figures 1,4,6	9,10
X	WO 2009/094720 A1 (AJANOVIC) 6 August 2009 (2009-08-06)	1-5
X	WO 2012/150490 A2 (DIEFFECI S R L) 8 November 2012 (2012-11-08)	1
X	GB 2 288 321 A (SZMIDLA ANDREW) 18 October 1995 (1995-10-18)	1

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

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de Cornulier, P

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2017/066496

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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