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(54) **LOCKING MEMBER FOR BUILDING
FORMWORKS**

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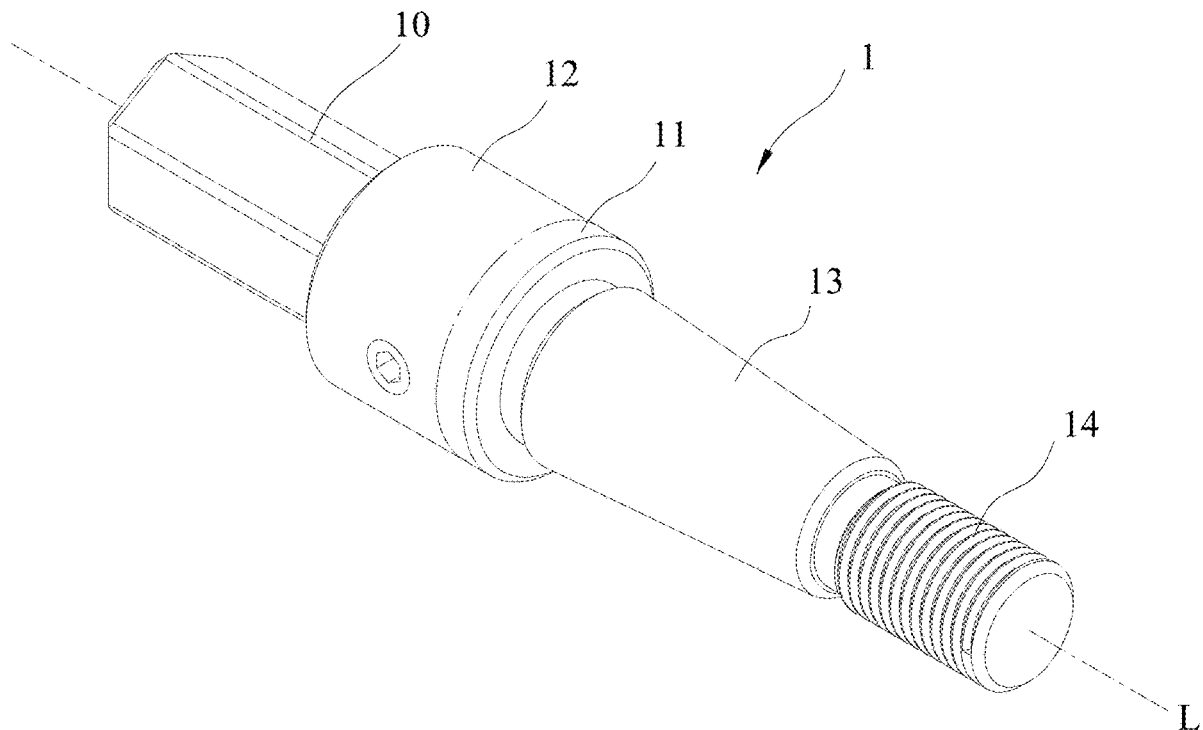
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(57) **ABSTRACT**

A locking member is suitable for assembling two building formworks each including a positioning hole and a locking hole, and includes a driven portion, a shoulder formed on one end of the driven portion, a first tapered section connected to the shoulder and configured to be inserted into the positioning hole of one building formwork, and a second tapered section connected to the first tapered section and configured to be inserted into the locking hole of the other building formwork, and a threaded portion connected to the second tapered section and configured to threadedly engage with the locking hole.



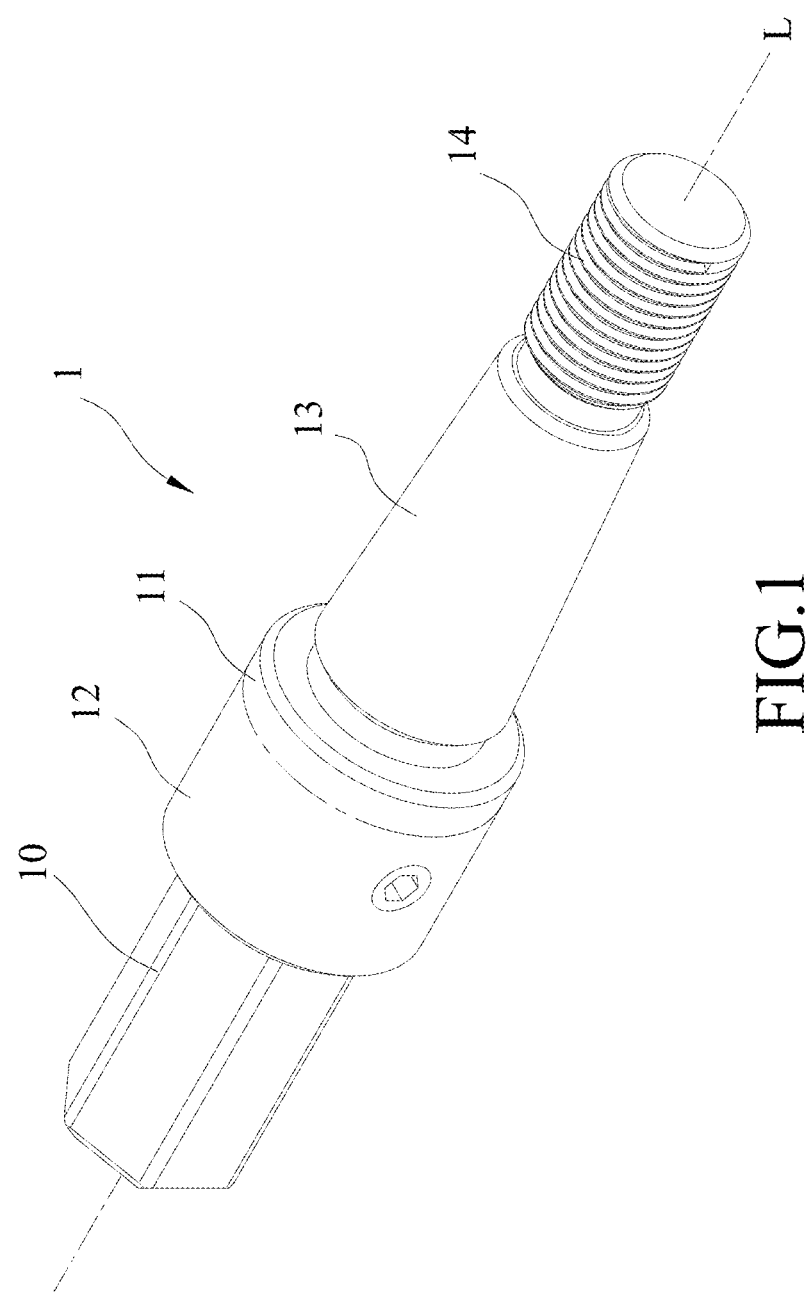


FIG.1

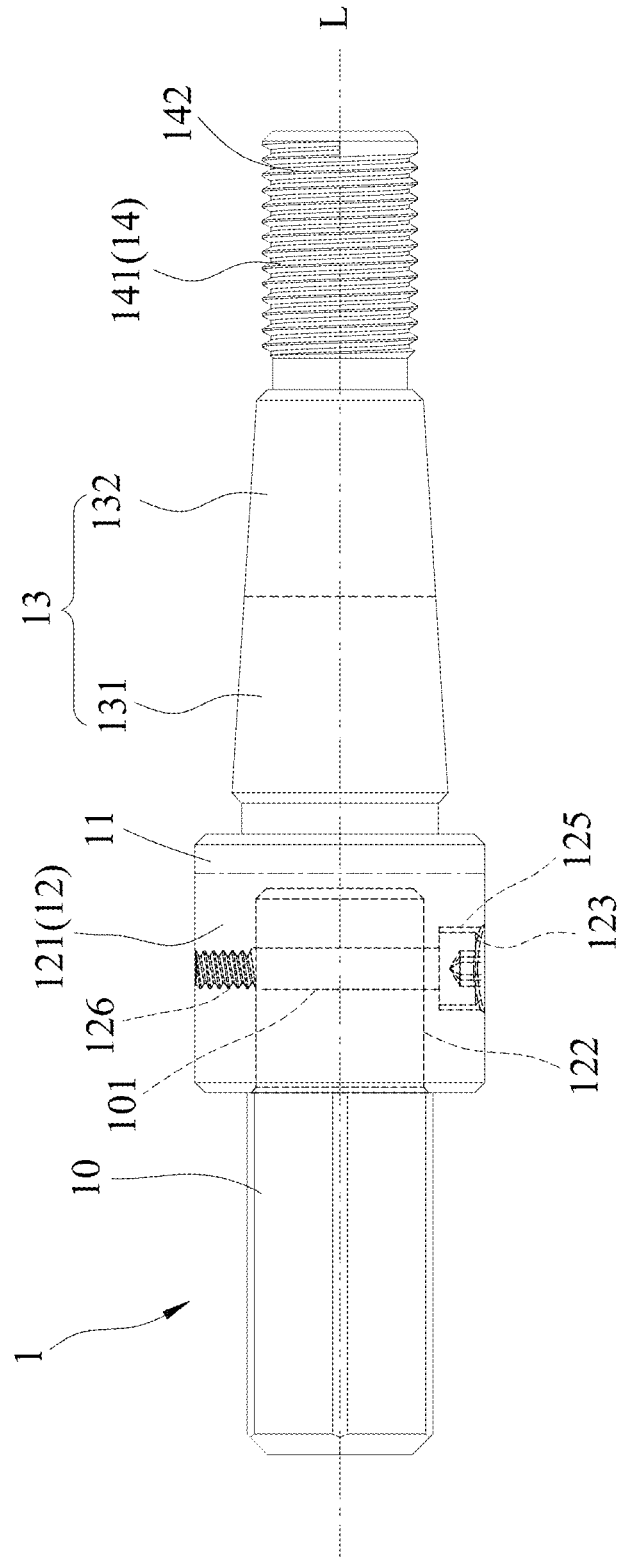


FIG.2

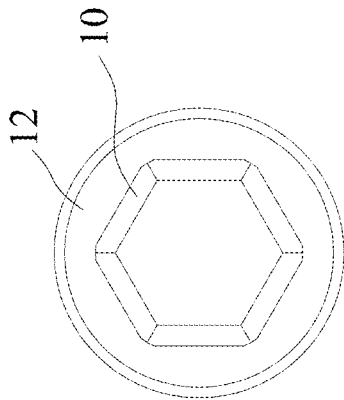


FIG.3

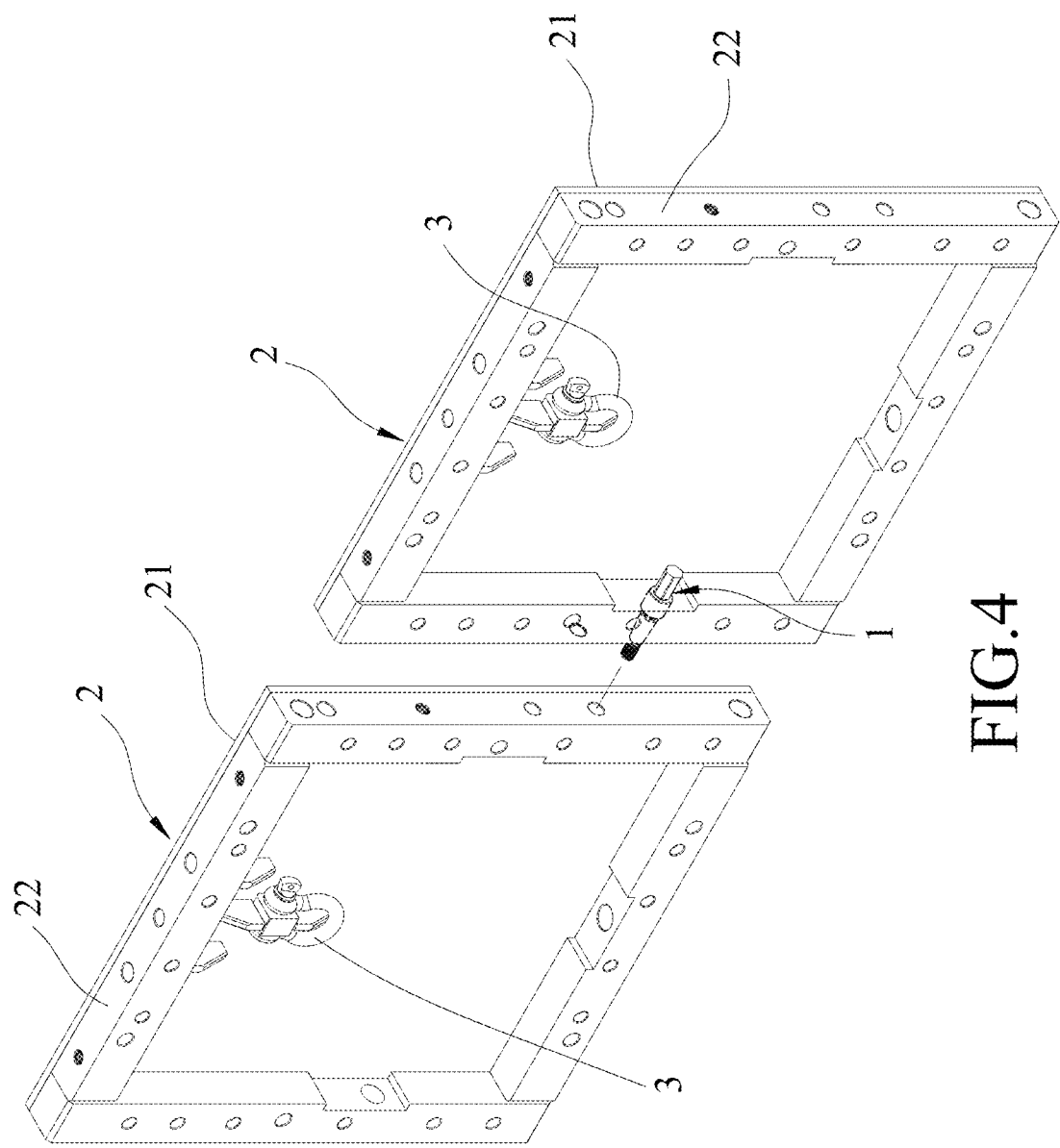


FIG.4

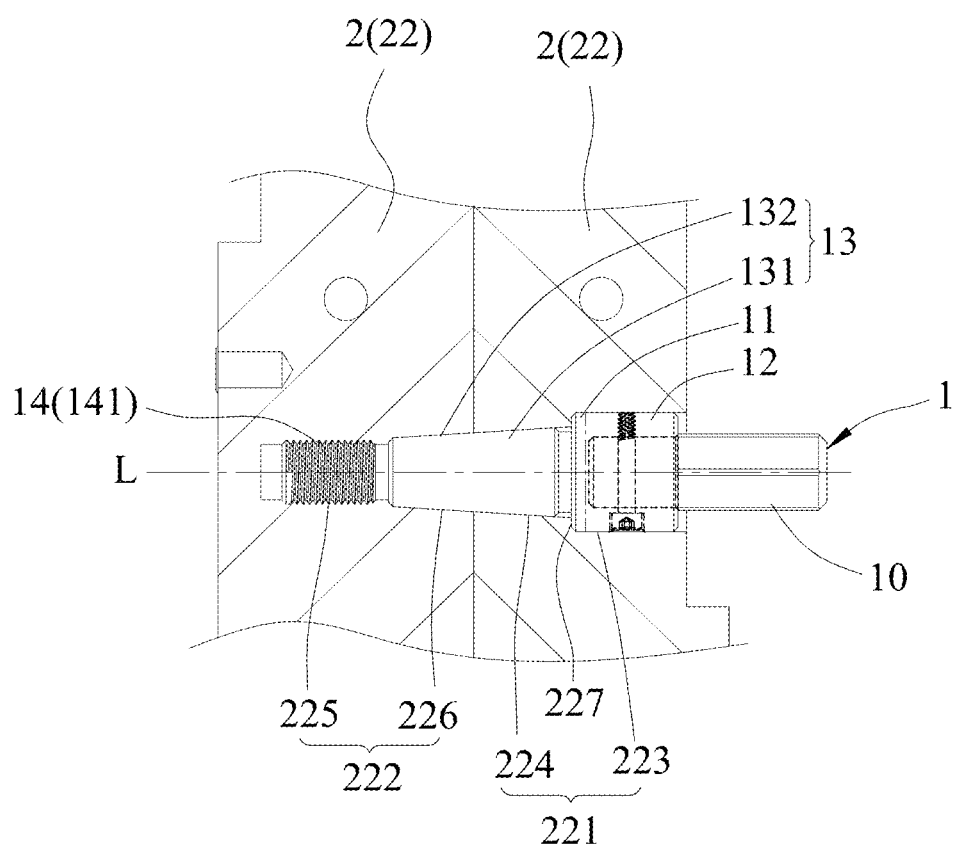


FIG.5

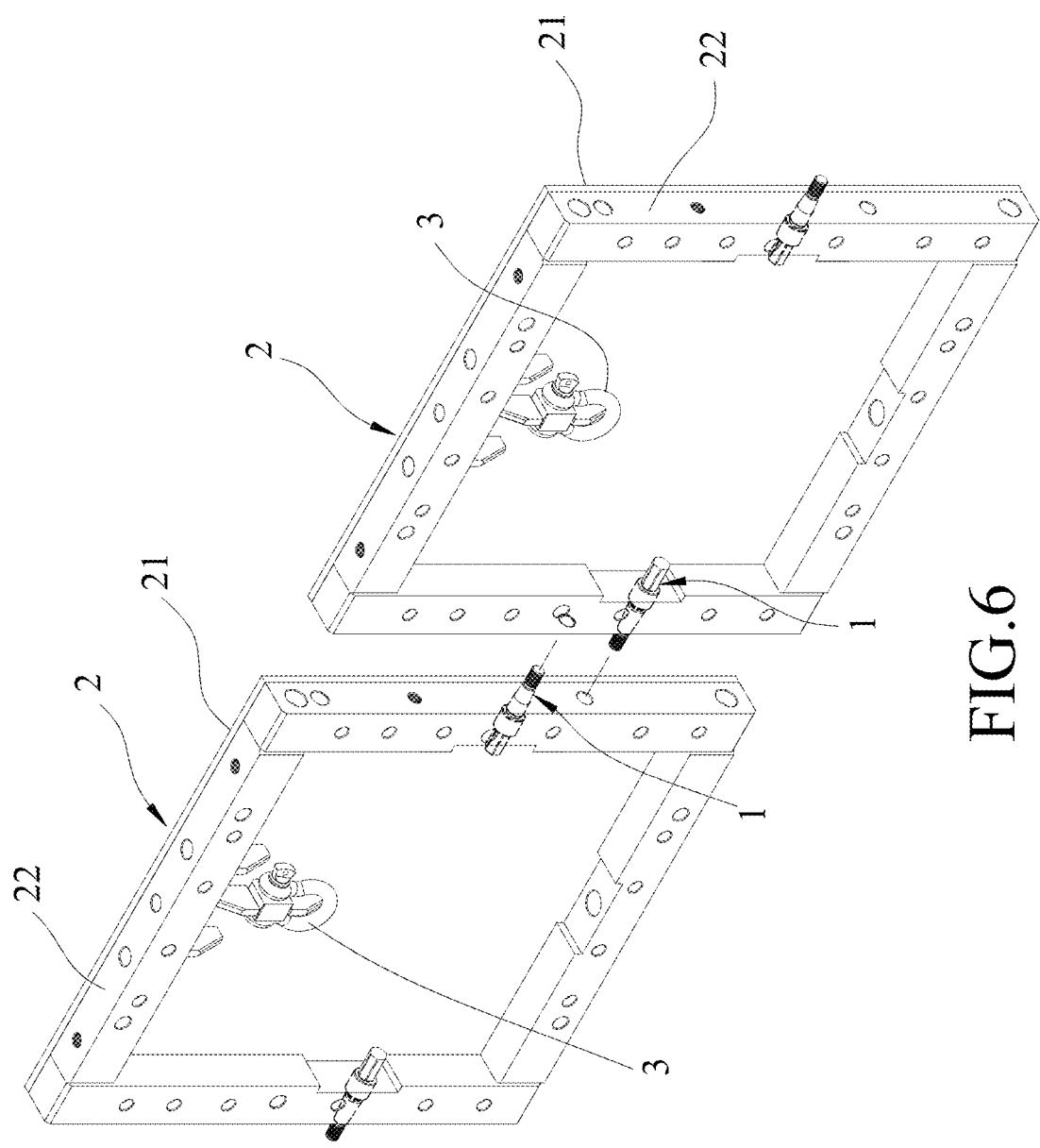


FIG.6

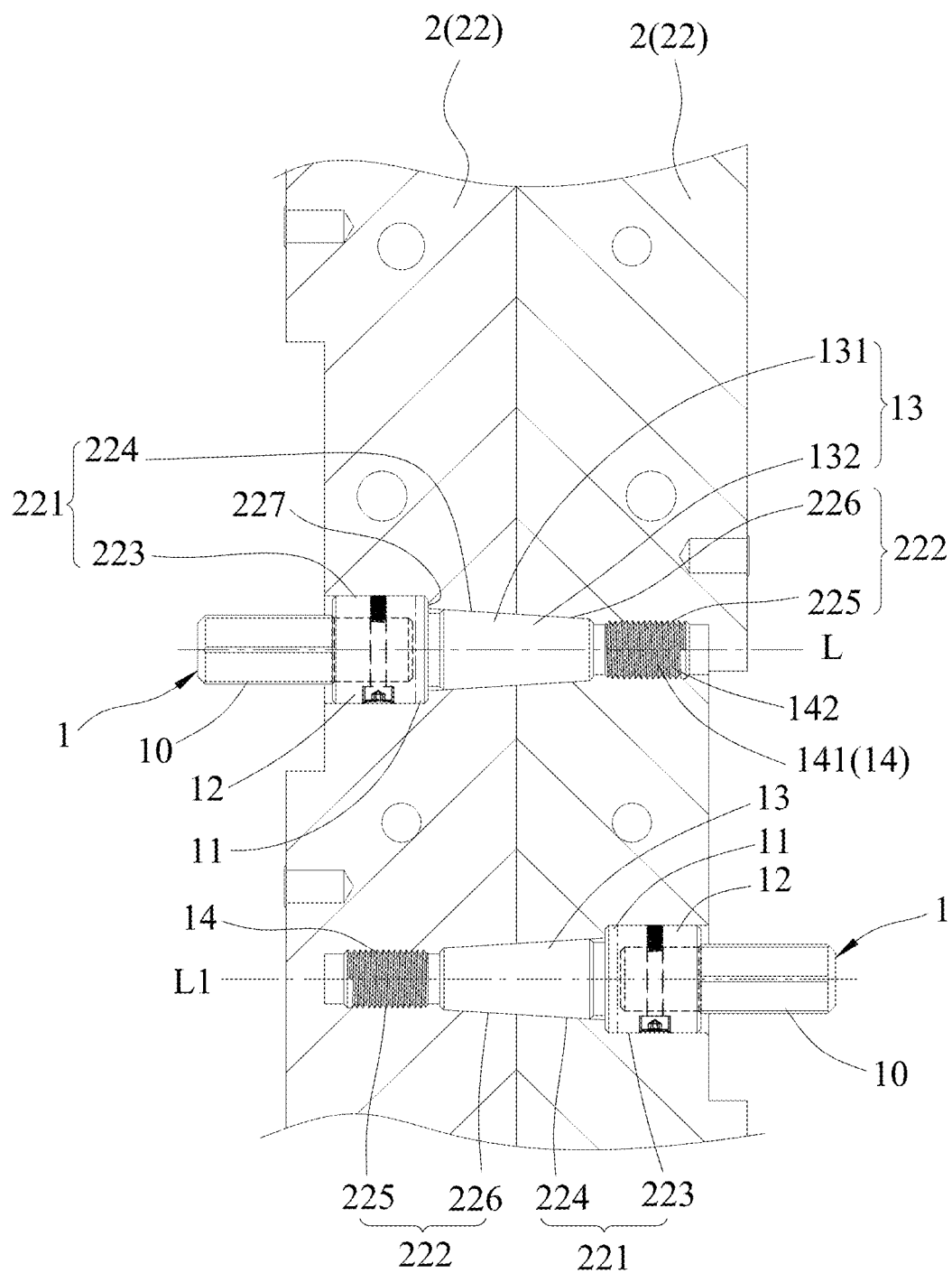


FIG.7

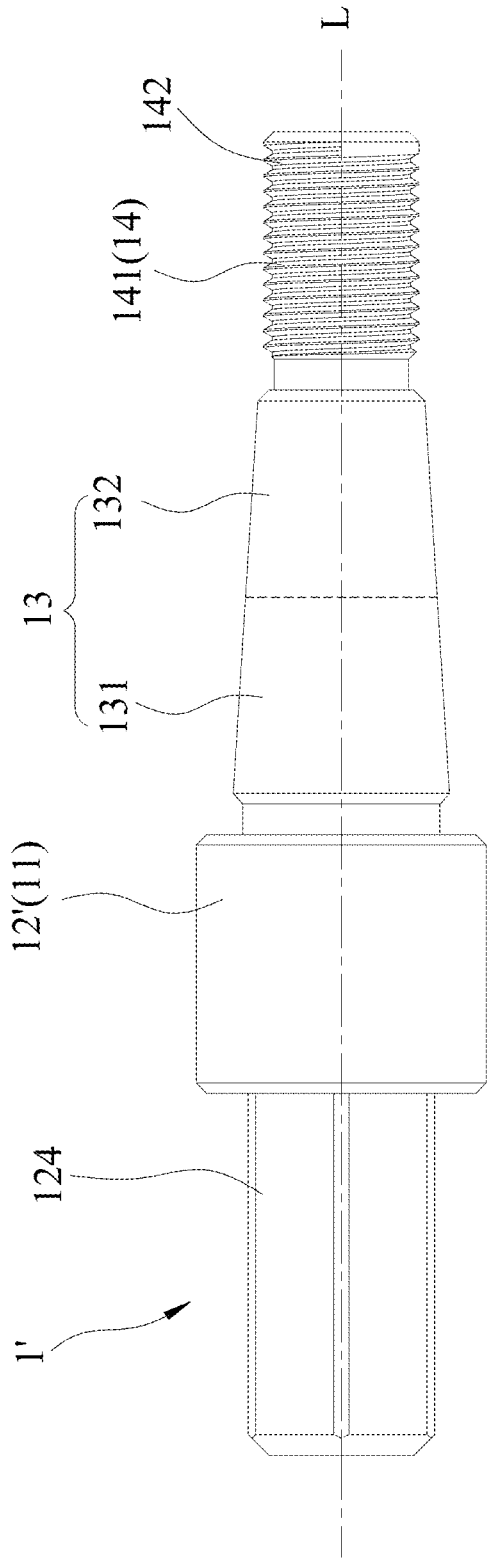


FIG.8

LOCKING MEMBER FOR BUILDING FORMWORKS

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority from Taiwanese Patent Application No. 110135147, filed on Sep. 22, 2021.

FIELD

[0002] The disclosure relates to a locking member for assembling building formworks.

BACKGROUND

[0003] An existing building formwork apparatus, as disclosed in Taiwanese Patent No. 1716319, includes at least four formworks and at least one connecting hornbeam block. Each formwork has a mold surface at one side thereof, a mounting surface at the other side thereof, and two connecting posts disposed on upper and lower ends of the mounting surface. Each connecting post has a plurality of through holes. The connecting hornbeam block has a plurality of connecting holes.

[0004] After the formworks are brought to align with and abut against each other, the connecting hornbeam block is then disposed on the connecting posts of the formworks, after which a plurality of fasteners are extended through the through holes and the connecting holes to fix the formworks and the connecting hornbeam block, thereby cooperatively forming the existing building formwork apparatus. However, the positioning of the formworks relies only on the connecting hornbeam block, so that, after assembly, the mold surfaces of the formworks are prone to misalign and become uneven. There is still room for improvement of the existing building formwork apparatus.

SUMMARY

[0005] Therefore, an object of the present disclosure is to provide a locking member that can alleviate at least one of the drawbacks of the prior art.

[0006] Accordingly, a locking member of this disclosure extends along and is rotatable about an axis, and is suitable for assembling two building formworks. Each building formwork includes a wall plate, and a frame disposed on one side surface of the wall plate. The frame of each building formwork has at least one positioning hole having a shoulder, and at least one locking hole having an internally threaded section. The locking member comprises a driven portion, a shoulder formed on one end of the driven portion, a positioning portion, and a threaded portion.

[0007] The positioning portion has a conical shape, and includes a first tapered section connected to the shoulder, and a second tapered section connected to the first tapered section at a side opposite to the shoulder. The positioning portion gradually tapers from the first tapered section to the second tapered section in a direction away from the shoulder. Each of the first and second tapered sections has a cross section smaller than that of the shoulder. The first tapered section is configured to be inserted into the at least one positioning hole of one of the building formworks to restrict the locking member to rotate about the axis. The second tapered section is configured to be inserted into the at least one locking hole of the other building formwork.

[0008] The threaded portion is connected to the second tapered section at a side opposite to the first tapered section, and is configured to threadedly engage with the internally threaded section of the at least one locking hole of the other building formwork until the shoulder of the locking member abuts against the shoulder of the at least one positioning hole of the one of the building formworks.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Other features and advantages of the disclosure will become apparent in the following detailed description of the embodiments with reference to the accompanying drawings, in which:

[0010] FIG. 1 is a perspective view of a locking member according to the first embodiment of the present disclosure;

[0011] FIG. 2 is a front view of the first embodiment;

[0012] FIG. 3 is a left side view of FIG. 1;

[0013] FIG. 4 illustrates how the locking member of the first embodiment can be used for assembling two building formworks;

[0014] FIG. 5 is an enlarged fragmentary partly sectional view, illustrating the two building formworks being assembled using the locking member of the first embodiment;

[0015] FIG. 6 illustrates how two locking members of the first embodiment can be used for assembling two building formworks;

[0016] FIG. 7 is an enlarged fragmentary partly sectional view, illustrating the two building formworks being assembled using the two locking members of the first embodiment; and

[0017] FIG. 8 is a front view of a locking member according to the second embodiment of the present disclosure.

DETAILED DESCRIPTION

[0018] Before the present disclosure is described in greater detail, it should be noted herein that like elements are denoted by the same reference numerals throughout the disclosure.

[0019] Referring to FIGS. 1 to 5, a locking member 1 according to the first embodiment of the present disclosure is shown to comprise a connecting rod portion 10, a driven portion 12, a shoulder 11, a positioning portion 13, and a threaded portion 14. The locking member 1 extends along and is rotatable about an axis (L).

[0020] The connecting rod portion 10 has a through hole 101 extending transversely through one end thereof.

[0021] The driven portion 12 includes a surrounding wall 121, a groove 122 defined by the surrounding wall 121, a through hole 125 extending transversely through the surrounding wall 121 and communicating with the groove 122, and a threaded hole 126 diametrically opposed to the through hole 125.

[0022] The shoulder 11 is formed on one end of the driven portion 12, and is cylindrical, but is not limited thereto.

[0023] The connecting rod portion 10 has a shape corresponding to the groove 122 of the driven portion 12, and is hexagonal, as shown in FIG. 3. In this embodiment, the connecting rod portion 10 has the one end inserted into the groove 122 along the axis (L), and through a fixing bolt 123 that extends through the through holes 125 and 101 and threadedly engages the threaded hole 126, the one end of the connecting rod portion 10 is fixed inside the groove 122,

thereby preventing separation of the connecting rod portion 10 from the driven portion 12. When the connecting rod portion 10 is rotated, the driven portion 12 is driven by the connecting rod portion 10 to rotate therewith.

[0024] In a modification of the first embodiment, the connecting rod portion 10 may be replaced by a hand tool (such as a drive rod, not shown) to drive the driven portion 12 to rotate therewith. Since the modification of the first embodiment does not need the connecting rod portion 10, a protruding portion thereof may be reduced.

[0025] The positioning portion 13 has a conical shape, and includes a first tapered section 131 connected to the shoulder 11, and a second tapered section 132 connected to the first tapered section 131 at a side opposite to the shoulder 11. The positioning portion 13 gradually tapers from the first tapered section 131 to the second tapered section 132 in a direction away from the shoulder 11 along the axis (L). Each of the first and second tapered sections 131, 132 has a cross section smaller than that of the shoulder 11. In this embodiment, the first and second tapered sections 131, 132 are integrally formed as a single piece, and each of the first and second tapered sections 131, 132 has a taper ratio of 1:8. The shoulder 11 and the positioning portion 13 are also integrally formed as a single piece.

[0026] The threaded portion 14 is connected to the second tapered section 132 at a side opposite to the first tapered section 131, and has an outer peripheral surface 142 formed with an external thread 141.

[0027] As shown in FIGS. 4 and 5, the locking member 1 is suitable for assembling two building formworks 2. Each building formwork 2 includes a wall plate 21, and a frame 22 having a rectangular shape and disposed on one side surface of the wall plate 21. The wall plate 21 of each building formwork 2 is provided with a hoist ring assembly 3 for facilitating lifting and moving of the building formwork 2. The frame 22 of each building formwork 2 has a positioning hole 221 and a locking hole 222 on each side thereof and adjacent to each other. The positioning hole 221 of each building formwork 2 is configured to align with the locking hole 222 of the other building formwork 2 during assembly. The positioning hole 221 has a large-diameter section 223 corresponding to the driven portion 12, a first tapered hole section 224 corresponding to the first tapered section 131, and a shoulder 227 between the large-diameter section 223 and the first tapered hole section 224. The locking hole 222 has an internally threaded section 225 corresponding to the external thread 141, and a second tapered hole section 226 corresponding to the second tapered section 132.

[0028] Referring again to FIGS. 4 and 5, to assemble the two building formworks 2, the locking member 1 is first inserted into the positioning hole 221 of one of the building formworks 2 with the driven portion 12, the shoulder 11 and the first tapered section 131 thereof positioned therein, and with the second tapered section 132 and the threaded portion 14 thereof extending out of the positioning hole 221 and inserted into an aligned locking hole 222 of the other building formwork 2 so as to engage the threaded portion 14 with the internally threaded section 225 until the shoulder 11 abuts against the shoulder 227. Hence, assembly of the two building formworks 2 is completed. It should be noted that the locking member 1 is rotated about the axis (L) using a hand tool, such as a wrench (not shown), that is inserted into or clamp a portion of the locking member 1 that protrudes

out of the driven portion 12 for rotation therewith so as to lock the building formworks 2 together. With the first tapered section 131 of the locking member 1 inserted into the first tapered hole section 224 of the positioning hole 221 of one of the building formworks 2 and with the second tapered section 132 thereof inserted into the second tapered hole section 226 of the locking hole 222 of the other building formwork 2, the locking member 1 is restricted to rotate about the axis (L) and is prevented from deviating.

[0029] Referring to FIGS. 6 and 7, two locking members 1 of the first embodiment may also be used for assembling the two building formworks 2. As shown, one of the locking members 1 is inserted into the positioning hole 221 of a left one of the building formworks 2 with the second tapered section 132 and the threaded portion 14 thereof extending out of the positioning hole 221 and inserted into an aligned locking hole 222 of a right one of the building formworks 2 so as to engage the threaded portion 14 with the internally threaded section 225 until the shoulder 11 abuts against the shoulder 227. On the other hand, the other locking member 1 is inserted into the positioning hole 221 of the right building formwork 2 with the second tapered section 132 and the threaded portion 14 thereof extending out of the positioning hole 221 and inserted into an aligned locking hole 222 of the left building formwork 2 so as to engage the threaded portion 14 with the internally threaded section 225 until the shoulder 11 abuts against the shoulder 227. Hence, assembly of the two building formworks 2 is completed.

[0030] It should be noted herein that after the assembly of the building formworks 2 is completed, the locking member 1 has the driven portion 12 received in the large-diameter section 223, the shoulder 11 abutting against the shoulder 227, the first tapered section 131 received in the first tapered hole section 224, the second tapered section 132 received in the second tapered hole section 226, and the threaded portion 14 engaged to the internally threaded section 225. Further, with the first tapered section 131 of the locking member 1 inserted into the first tapered hole section 224 of the positioning hole 221 in the frame 22 of one of the building formworks 2, with the second tapered section 132 thereof inserted into the second tapered hole section 226 of the aligned locking hole 222 in the frame 22 of the other building formwork 2, apart from the locking member 1 being restricted to rotate about the axis (L), the frames 22 of the building formworks 2 can be flush with each other, and the other side surfaces (i.e., mold surfaces) of the wall plates 21 of the building formworks 2 can also be flush with each other to facilitate subsequent process.

[0031] Referring to FIG. 8, the second embodiment of the locking member 1' of this disclosure is substantially identical to the first embodiment. However, the locking member 1' of the second embodiment does not include the connecting rod portion 10 (see FIGS. 1 and 2), and the driven portion 12' thereof has a protruding post 124 that is polygonal and that protrudes in a direction opposite to the shoulder 11. The shoulder 11 and the driven portion 12' are integrally formed as a single piece, so that the fixing bolt 123 (see FIG. 2) can be omitted. A hand tool (such as a wrench, not shown) can be inserted into or can clamp the protruding post 124 for rotation therewith.

[0032] In the description above, for the purposes of explanation, numerous specific details have been set forth in order to provide a thorough understanding of the embodiment(s). It will be apparent, however, to one skilled in the art, that one

or more other embodiments may be practiced without some of these specific details. It should also be appreciated that reference throughout this specification to “one embodiment,” “an embodiment,” an embodiment with an indication of an ordinal number and so forth means that a particular feature, structure, or characteristic may be included in the practice of the disclosure. It should be further appreciated that in the description, various features are sometimes grouped together in a single embodiment, figure, or description thereof for the purpose of streamlining the disclosure and aiding in the understanding of various inventive aspects, and that one or more features or specific details from one embodiment may be practiced together with one or more features or specific details from another embodiment, where appropriate, in the practice of the disclosure.

[0033] While the disclosure has been described in connection with what are considered the exemplary embodiments, it is understood that this disclosure is not limited to the disclosed embodiments but is intended to cover various arrangements included within the spirit and scope of the broadest interpretation so as to encompass all such modifications and equivalent arrangements.

What is claimed is:

1. A locking member extending along and rotatable about an axis and suitable for assembling two building formworks, each building formwork including a wall plate, and a frame disposed on one side surface of the wall plate, the frame of each building formwork having at least one positioning hole and at least one locking hole, the positioning hole having a shoulder, the locking hole having an internally threaded section, said locking member comprising:

- a driven portion;
- a shoulder formed on one end of said driven portion;
- a positioning portion having a conical shape and including a first tapered section connected to said shoulder, and a second tapered section connected to said first tapered section at a side opposite to said shoulder, said posi-

tioning portion gradually tapering from said first tapered section to said second tapered section in a direction away from said shoulder, each of said first tapered section and said second tapered section having a cross section smaller than that of said shoulder, said first tapered section being configured to be inserted into the at least one positioning hole of one of the building formworks to restrict said locking member to rotate about the axis, said second tapered section being configured to be inserted into the at least one locking hole of the other one of the building formworks; and

- a threaded portion connected to said second tapered section at a side opposite to said first tapered section, said threaded portion being configured to threadedly engage with the internally threaded section of the at least one locking hole of the other one of the building formworks until said shoulder of said locking member abuts against the shoulder of the at least one positioning hole of the one of the building formworks.
- 2. The locking member as claimed in claim 1, wherein said driven portion includes a surrounding wall, and a groove defined by said surrounding wall.
- 3. The locking member as claimed in claim 2, further comprising a connecting rod portion received in said groove and having a shape corresponding to that of said groove.
- 4. The locking member as claimed in claim 1, wherein said driven portion has a protruding post protruding in a direction opposite to said shoulder.
- 5. The locking member as claimed in claim 4, wherein said protruding post is polygonal.
- 6. The locking member as claimed in claim 1, wherein said first tapered section and said second tapered section are integrally formed as a single piece.
- 7. The locking member as claimed in claim 1, wherein each of said first tapered section and said second tapered section has a taper ratio of 1:8.

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