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(71) Applicant: **Oliveira & Irmao S.A.**
**3800 Aveiro (PT)**

(72) Inventor: **Moura de Oliveira, Antonio Manuel**
**3800-25, Aveiro (PT)**

(74) Representative: **Jorio, Paolo et al**
**Studio Torta S.r.l.**
**Via Viotti, 9**
**10121 Torino (IT)**

## (54) Adjustable device for fastening pipes to a sanitary fixture installation structure, in particular for a lavatory with a flush tank

(57) An adjustable device (25), for fastening pipes to a sanitary fixture installation structure (1), in particular for a lavatory with a flush tank, has a bar (4) carried by the structure; a supporting member (26) fixable to the bar; and two fastening assemblies (31, 32) for fastening a first and a second pipe (11, 12) to the supporting member by means of respective intermediate members (33, 34); the fastening assemblies (31, 32) are adjustable to adjust the positions of the pipes (11, 12), with respect to the supporting member (26) and along respective adjustment axes (A1, A2), independently of each other; for which purpose, the fastening assemblies (31, 32) have respective racks (47, 48) carried by the supporting member (26) and associated with respective guides (49, 50), and respective slides (53, 54) which slide inside the guides and have releasable stops (55, 56) cooperating with the racks (47, 48).

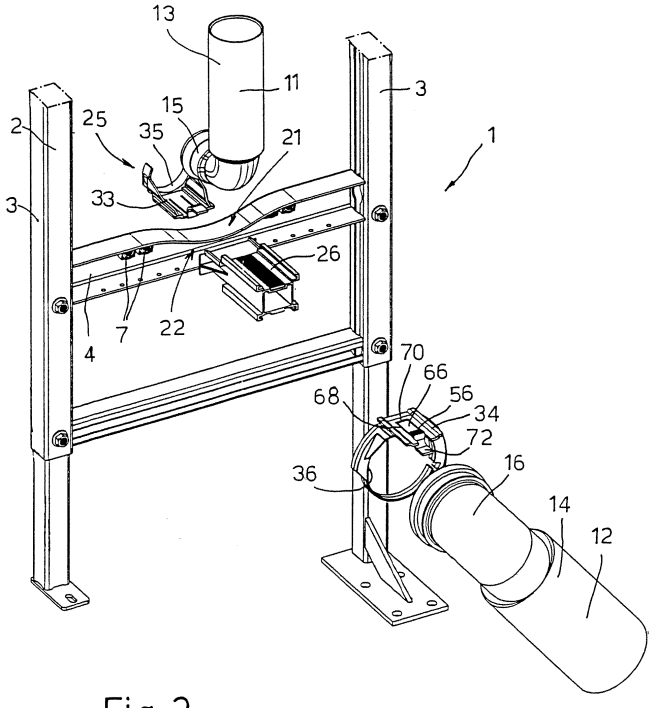



Fig. 2

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## Description

**[0001]** The present invention relates to an adjustable device for fastening pipes to a sanitary fixture installation structure, in particular for a lavatory with a flush tank.

**[0002]** Installation structures for recessing sanitary fixtures are known, which comprise a metal frame to which are fixed various structural and functional parts, as well as the anchors for securing the frame to a supporting wall.

**[0003]** In the case of a lavatory with a flush tank, in addition to the flush tank and the lavatory bowl supports, the structure is also fitted with a flush pipe (connecting the tank to the bowl) and a drain bend (connecting the bowl to an external drain).

**[0004]** In known structures, these two pipes are fixed to the frame (normally to a cross member of the frame) by separate supporting members and respective fastening members, which are normally unsatisfactory in terms of fast, easy installation, and do not permit adjustment of the position of the pipes with respect to the frame. Some known systems permit such adjustment, but it is complicated, painstaking, and relatively time-consuming.

**[0005]** It is an object of the present invention to provide an adjustable device for fastening pipes to a sanitary fixture installation structure, in particular for a lavatory with a flush tank, designed to eliminate the aforementioned drawbacks of the known art; more specifically, it is an object of the invention to provide an adjustable device which, besides being cheap and easy to produce and fast and easy to install, also enables precise, easy adjustment of the position of the pipes with respect to the structure.

**[0006]** According to the present invention, there is provided a device for fastening pipes to a sanitary fixture installation structure, in particular for a lavatory with a flush tank, as claimed in the accompanying Claim 1.

**[0007]** In addition to being cheap and easy to produce, the device according to the invention is also extremely fast and easy to install, and enables precise, easy adjustment of the position of the pipe with respect to the structure.

**[0008]** A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a front view in perspective of a sanitary fixture installation structure, in particular for a lavatory with a flush tank, featuring a pipe fastening device in accordance with the invention;

Figure 2 shows a partial rear view in perspective of the Figure 1 structure, and an exploded view of the fastening device;

Figure 3 shows a larger-scale detail of the Figure 1 structure;

Figure 4 shows an exploded view of the fastening device.

**[0009]** With reference to Figures 1 and 2, an installation structure 1 for recessing sanitary fixtures, in particular a lavatory with a flush tank, comprises a frame 2, e.g. made of metal, having two posts 3, and a crossbar 4 between posts 3; and a known flush tank 6 is fixed to posts 3 by known connecting members (not shown for the sake of simplicity).

**[0010]** Crossbar 4 has couplings 7 for attachment of a sanitary fixture - in the example shown, a known lavatory bowl (not shown) - and which are defined, for example, by openings or holes for insertion of known supports and relative locking members not shown.

**[0011]** Crossbar 4 supports two pipes 11, 12, which, in the example shown, are defined respectively by a flush pipe connecting tank 6 to the lavatory bowl, and by a drain bend connecting the lavatory bowl to an external drain.

**[0012]** Both pipes 11, 12 are substantially L-shaped, and comprise respective main portions 13, 14; and respective end portions 15, 16 bent 90° to main portions 13, 14, substantially parallel to each other, and substantially perpendicular to crossbar 4.

**[0013]** With reference also to Figures 3 and 4, crossbar 4 - made, for example, of a metal section - has a substantially U-shaped cross section; a front wall 17 with couplings 7; and two, respectively top and bottom, flanges 18, 19 substantially perpendicular to wall 17. Crossbar 4 comprises a central portion 20 having a dip 21 housing end portion 15 of pipe 11; and central portion 20 has a cavity 22 bounded by wall 17 and flanges 18, 19.

**[0014]** Structure 1 has a fastening device 25 for fastening pipes 11, 12 to structure 1, and in particular to crossbar 4.

**[0015]** Device 25 comprises a supporting member 26 fixable releasably to crossbar 4 by a click-on coupling 27; and two independent fastening assemblies 31, 32 located on opposite sides of supporting member 26 to fasten respective pipes 11, 12 to supporting member 26 by means of respective intermediate members 33, 34 fixable to supporting member 26 and having respective seats 35, 36 for pipes 11, 12.

**[0016]** Supporting member 26 has a prismatic, molded plastic body 40, and comprises two opposite, respectively top and bottom, faces 41, 42; and a connecting portion 43 for connection to crossbar 4 and which fits inside cavity 22. Click-on coupling 27 comprises a tooth 44 carried by a flexible tongue 45, formed on bottom face 42 of supporting member 26, and which clicks inside a seat 46, formed in flange 19 of crossbar 4, when connecting portion 43 is inserted inside cavity 22.

**[0017]** Faces 41, 42 support respective racks 47, 48 associated with respective guides 49, 50; racks 47, 48 and respective guides 49, 50 extend along respective adjustment axes A1, A2; racks 47, 48 are defined by respective successions of parallel teeth extending crosswise to adjustment axes A1, A2; guides 49, 50 comprise respective pairs of rails 51, 52 located on opposite sides of racks 47, 48; and guides 49, 50 are open at both re-

spective axially opposite ends.

**[0018]** Adjustment axes A1, A2 are parallel to each other and to end portions 15, 16 of pipes 11, 12, and substantially perpendicular to crossbar 4.

**[0019]** Intermediate members 33, 34 comprise respective slides 53, 54, which run inside guides 49, 50 along adjustment axes A1, A2, and have respective releasable stops 55, 56 cooperating with racks 47, 48.

**[0020]** Slides 53, 54 comprise respective base plates 57, 58; and respective pairs of longitudinal ribs 59, 60 extending laterally on opposite sides of base plates 57, 58 and inserted in sliding manner inside rails 51, 52.

**[0021]** Base plates 57, 58 have respective ends, from which respective collars 61, 62 project perpendicularly to define seats 35, 36. In the non-limiting example shown in the drawings, collar 61 is designed to flex radially and click onto end portion 15 of pipe 11, whereas collar 62 is fitted onto and tightened about end portion 16 of pipe 12 by means of a flexible strap 63 fitted with a fastening mechanism 64.

**[0022]** Stops 55, 56 are carried by respective flexible tabs 65, 66 defined by respective portions of base plates 57, 58, which are bounded by respective cuts 67, 68 through base plates 57, 58, and are attached to base plates 57, 58 by respective root edges 69, 70. Tabs 65, 66 also have respective user operating levers 71, 72; and stops 55, 56 and levers 71, 72 project from respective opposite faces of tabs 65, 66.

**[0023]** In actual use, to fasten pipes 11, 12 to structure 1, the fitter inserts connecting portion 43 of supporting member 26 inside cavity 22, so that tooth 44 engages seat 46.

**[0024]** Intermediate member 33 is then fitted to supporting member 26, by inserting slide 53 inside guide 49 (through one of the axially opposite ends of guide 49, which are both open) and by keeping tab 65 raised so that stop 55 does not engage rack 47. When slide 53 is set to the desired position along adjustment axis A1, tab 65 is released so that stop 55 engages rack 47, thus securing intermediate member 33 to supporting member 26. End portion 15 of pipe 11 is then inserted inside seat 35.

**[0025]** Similarly, intermediate member 34 is fitted to supporting member 26 by inserting slide 54 inside guide 50, with stop 56 raised to avoid engaging rack 48; slide 54 is set to the desired position along adjustment axis A2, and stop 56 is released to engage rack 48; and end portion 16 of pipe 12 is then inserted inside seat 36 and locked by collar 62.

**[0026]** Fastening assemblies 31, 32 thus provide for adjusting the positions of pipes 11, 12, with respect to supporting member 26 and along adjustment axes A1, A2, independently of each other.

**[0027]** Clearly, changes may be made to what is described and illustrated herein without, however, departing from the scope of the accompanying Claims.

## Claims

1. An adjustable device (25) for fastening pipes to a sanitary fixture installation structure (1), in particular for a lavatory with a flush tank, the device comprising a bar (4) carried by the structure (1); and a supporting member (26) fixable to the bar (4) and having fastening means (31; 32) for fastening at least one pipe (11; 12) to the supporting member (26); the device being **characterized in that** said fastening means (31; 32) are adjustable fastening means for adjusting the position of said pipe (11; 12), with respect to the supporting member (26), along an adjustment axis (A1; A2).

2. A device as claimed in Claim 1, **characterized in that** said fastening means (31; 32) comprise at least one rack (47; 48) associated with a guide (49; 50); and at least one slide (53; 54) which slides inside the guide (49; 50).

3. A device as claimed in Claim 2, **characterized in that** the rack (47; 48) and the guide (49; 50) extend along an adjustment axis (A1; A2); the slide (53; 54) sliding inside the guide (49, 50) along the adjustment axis (A1; A2), and having a releasable stop (55; 56) cooperating with the rack (47; 48).

4. A device as claimed in Claim 3, **characterized in that** the stop (55; 56) is carried by a flexible tab (65; 66) formed on the slide (53; 54) and having opposite faces respectively supporting said stop (55; 56) and a user operating lever (71; 72).

5. A device as claimed in Claim 3 or 4, **characterized in that** the slide (53; 54) comprises a base plate (57; 58) having two longitudinal ribs (59; 60) inserted inside respective rails (51; 52) of the guide (49; 50).

6. A device as claimed in Claim 5, **characterized in that** the tab (65; 66) is defined by a portion of the base plate (57; 58) bounded by a cut (67; 68) through the base plate (57; 58) and attached to the base plate (57; 58) by a root edge (69; 70).

7. A device as claimed in one of Claims 2 to 6, **characterized in that** the rack (47; 48) and the guide (49; 50) are carried by the supporting member (26).

8. A device as claimed in one of the foregoing Claims, **characterized in that** the supporting member (26) supports independent first and second adjustable fastening means (31, 32) for adjusting the positions of respective pipes (11, 12), with respect to the supporting member (26), along respective adjustment axes (A1, A2) and independently of each other.

9. A device as claimed in Claim 8, **characterized in**

**that** said adjustment axes (A1, A2) are parallel to each other.

**10.** A device as claimed in Claim 7 or 8, **characterized in that** said first and second adjustable fastening means (31, 32) comprise respective racks (47, 48) carried by the supporting member (26) and associated with respective guides (49, 50); and respective slides (53, 54) which slide inside said guides (49, 50); the racks (47, 48) and the respective guides (49, 50) extending along respective adjustment axes (A1, A2); and the slides (53, 54) sliding inside the guides (49, 50) along said adjustment axes (A1, A2), and having respective releasable stops (55, 56) cooperating with the racks (47, 48).

**11.** A device as claimed in one of the foregoing Claims, **characterized in that** the supporting member (26) is fixable releasably to the bar (4) by a click-on coupling (27).

**12.** A device as claimed in Claim 11, **characterized in that** the click-on coupling (27) comprises a tooth (44) carried by a flexible tongue (45), formed on the supporting member (26), and which clicks inside a seat (46) formed in the bar (4) .

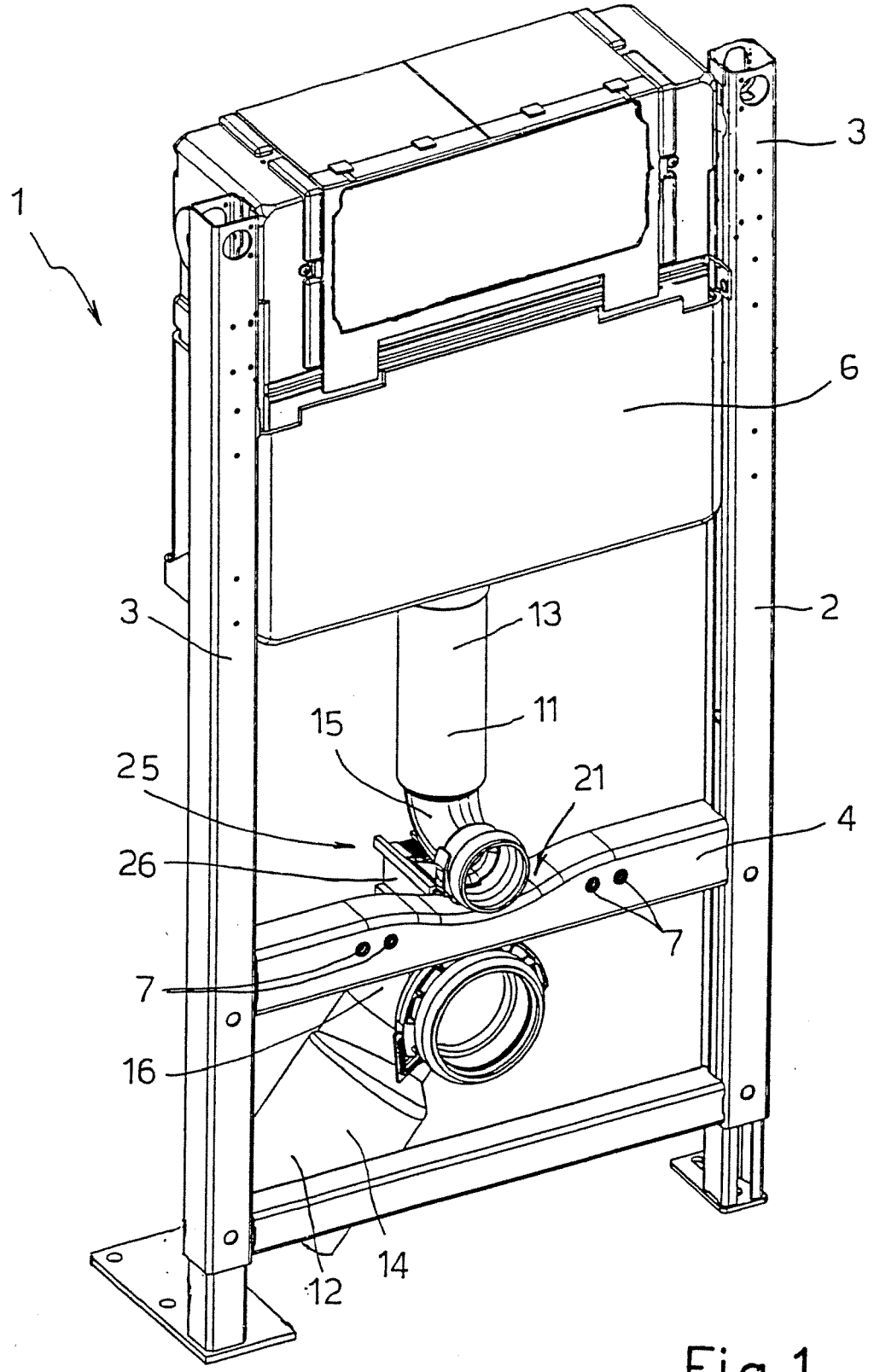



Fig. 1

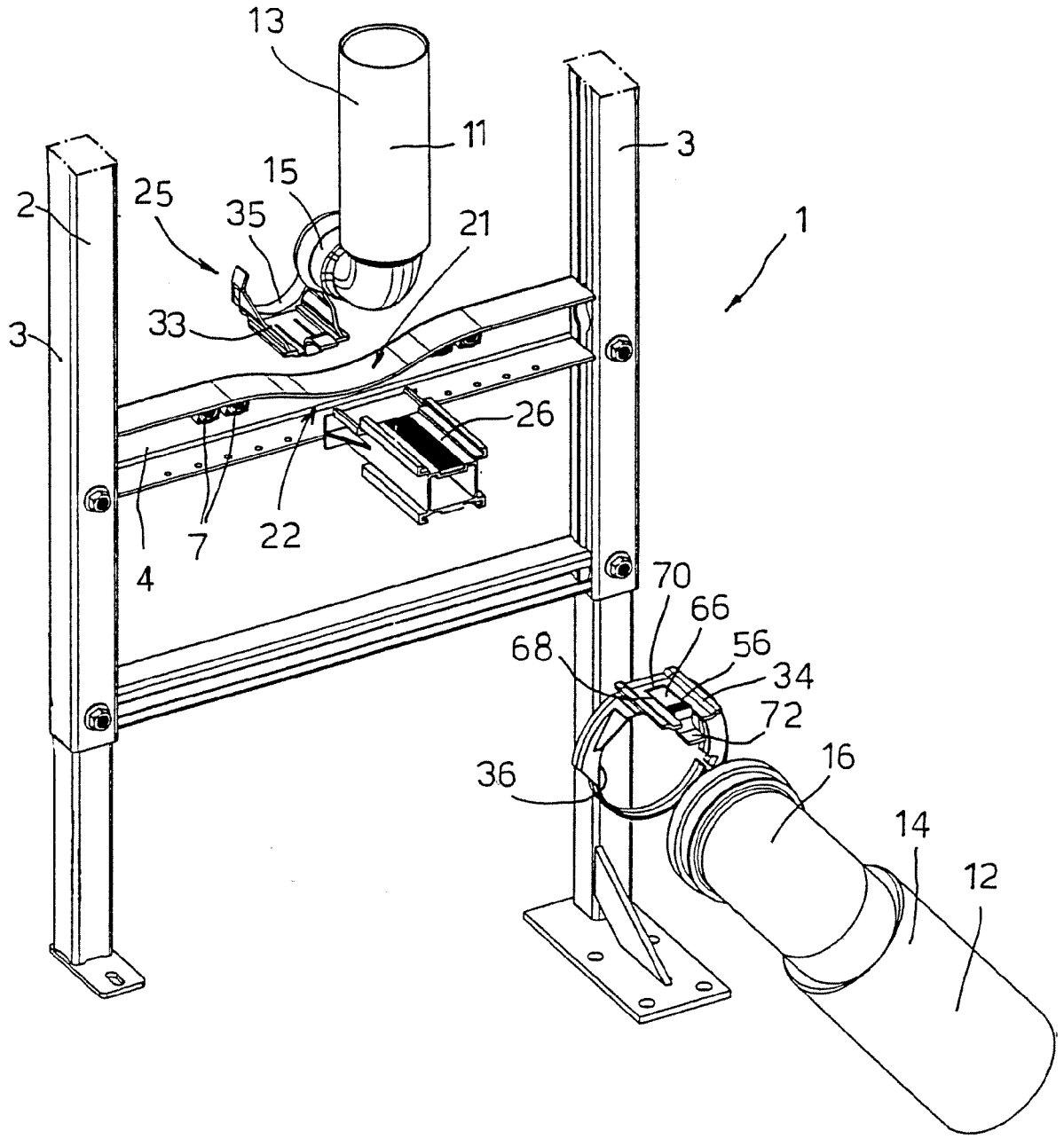



Fig. 2

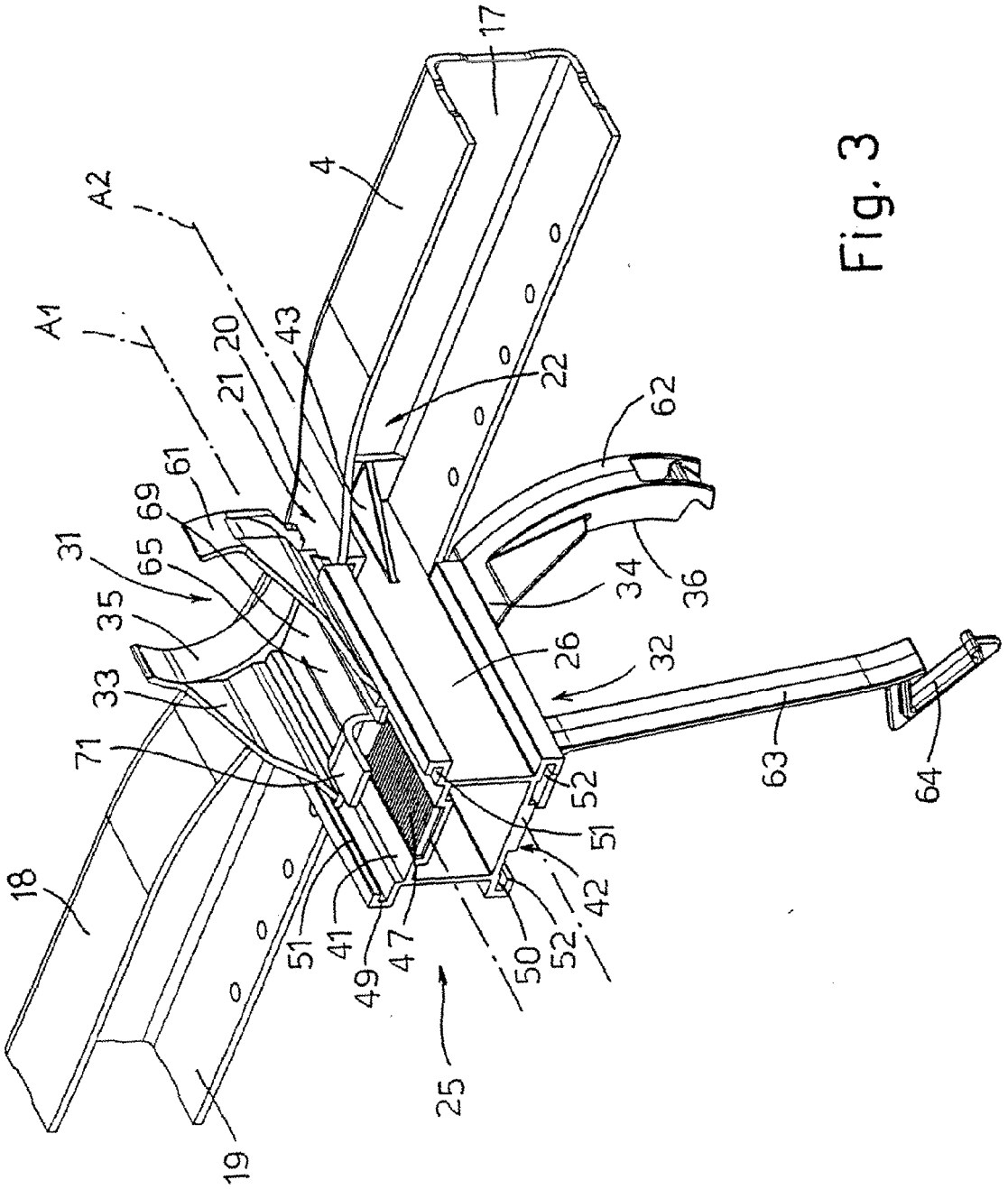

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Fig. 3

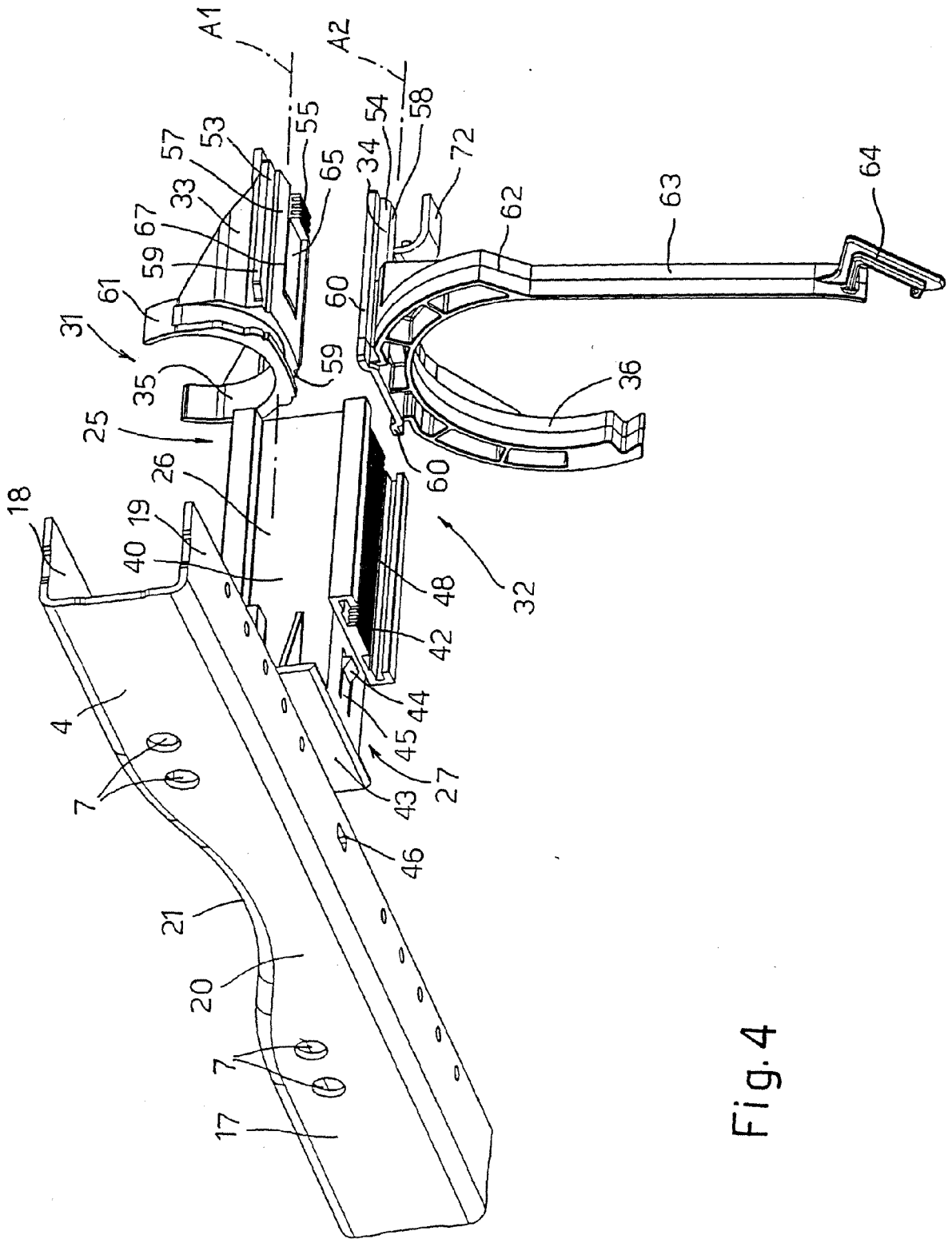

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Fig.4

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Application Number
EP 05 11 2725

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