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## EUROPEAN PATENT APPLICATION

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

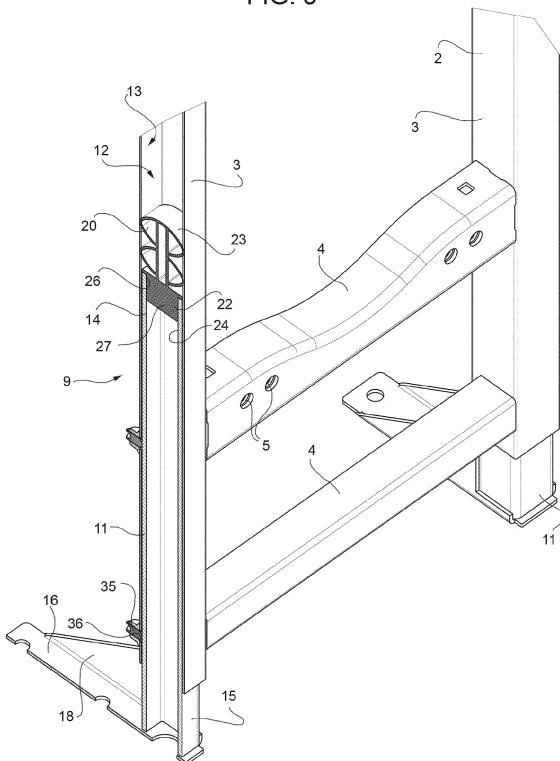
(72) Inventors:  
• Marques, Augusto  
Esgueira 3800 Aveiro (PT)  
• Lopes Dias de Figueiredo, Noé  
3800-716 Aveiro (PT)

(74) Representative: Cernuzzi, Daniele  
Studio Torta S.p.A.  
Via Viotti, 9  
10121 Torino (IT)

### (54) Installation structure for sanitary fixture

(57) A sanitary fixture recessed installation structure (1) has a frame (2), having two posts (3) and one or more cross members (4) between the posts (3); and a height adjusting system (9) for adjusting the height of the structure (1) and having two legs (11), which extend vertically from respective bottom ends (15) of the posts (3), and are inserted telescopically inside respective longitudinal guide seats (12) formed inside the posts (3) and bounded by respective inner lateral surfaces (13); the legs (11) have respective friction members (20) fixed to the legs (11), and which cooperate in sliding manner and with a given friction force with the inner lateral surfaces (13) of the guide seats (12) as the legs (11) slide inside the guide seats (12) to adjust the height of the structure (1).

FIG. 3



## Description

**[0001]** The present invention relates to a sanitary fixture recessed installation structure.

**[0002]** Sanitary fixture recessed installation structures normally comprise a metal frame fitted with various structural and functional parts, and fasteners for fixing the frame to a supporting wall.

**[0003]** The frame normally comprises two vertical posts with feet resting on the floor; and the structure often has a height adjusting system for adjusting the height of the structure by adjusting the length of the posts.

**[0004]** For this purpose, the feet of commonly used installation structures are fitted to legs inserted inside and slideable freely with respect to the posts; and, once the right height is set, the legs are locked in place by screws securing them to the posts.

**[0005]** Though simple in design, this structure height adjusting system has drawbacks in actual use, foremost of which is the need to support the frame when adjusting the height of the structure and tightening the leg screws, to prevent the legs from sliding back inside the posts under the weight of the frame, and so altering the set height.

**[0006]** It is an object of the present invention to eliminate the drawbacks of the known art by providing, in particular, a sanitary fixture recessed installation structure which is cheap and easy to produce, and practical to use, especially at the height adjusting stage.

**[0007]** According to the present invention, there is provided a sanitary fixture recessed installation structure substantially as defined in the attached Claim 1, and therefore comprising a frame, having two posts and one or more cross members between the posts; and a height adjusting system for adjusting the height of the structure; the system comprising two legs, which extend vertically from respective bottom ends of the posts, and are inserted telescopically inside respective longitudinal guide seats formed inside the posts and bounded by respective inner lateral surfaces; the structure being characterized by the legs having respective friction members fixed to the legs, and which cooperate in sliding manner and with a given friction force with the inner lateral surfaces of the guide seats as the legs slide inside the seats to adjust the height of the structure.

**[0008]** Further preferred characteristics of the installation structure according to the invention are as claimed in the dependent Claims.

**[0009]** The structure according to the invention eliminates the drawbacks referred to above, by being cheap and easy to produce, while at the same time allowing fast, easy height adjustment of the structure.

**[0010]** A number of non-limiting embodiments of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a partly exploded partial view in perspective of a sanitary fixture recessed installation

structure in accordance with the invention;

Figure 2 shows a view in perspective of a detail of the Figure 1 structure;

Figure 3 shows a view in perspective and partial longitudinal section of the Figure 1 structure assembled; Figure 4 shows a partly exploded partial view in perspective of a variation of the installation structure according to the invention;

Figure 5 shows a view in perspective of a detail of the Figure 4 structure;

Figure 6 shows a partly exploded partial view in perspective of a further variation of the installation structure according to the invention;

Figure 7 shows a view in perspective of a detail of the Figure 6 structure.

**[0011]** Number 1 in Figure 1 indicates as a whole a recessed installation structure for sanitary fixtures (toilets, urinals, sinks, bidets, etc.).

**[0012]** Structure 1 comprises a frame 2 made, for example, of metal sections, and having two posts 3, and one or more cross members 4 between posts 3.

**[0013]** Posts 3 and/or cross members 4 have openings or holes 5 for anchoring the structure to a wall, for assembling functional components parts, for inserting sanitary fixture supports and fasteners, etc.

**[0014]** With reference also to Figures 2 and 3, structure 1 comprises a height adjusting system 9 for adjusting the height of structure 1.

**[0015]** System 9 comprises two legs 11, which extend vertically from respective bottom ends of posts 3 and are inserted telescopically inside respective longitudinal guide seats 12 formed inside posts 3 and bounded by respective inner lateral surfaces 13.

**[0016]** Preferably, but not necessarily, each leg 11 is made of a hollow metal section, e.g. a square or rectangular box section; and posts 3 are also made of hollow metal sections, e.g. square or rectangular or other-shaped box sections.

**[0017]** Each leg 11 extends between a top connecting end 14 inserted inside a guide seat 12, and a free bottom end 15 projecting from guide seat 12.

**[0018]** Bottom ends 15 of legs 11 have respective feet 16 by which to support and fix structure 1 to a floor or other supporting surface.

**[0019]** Each foot 16 comprises, for example, a flat plate 17 projecting perpendicularly from end 15; and reinforcing members 18 projecting perpendicularly upwards from plate 17, on either side of leg 11.

**[0020]** Top ends 14 of legs 11 have respective friction members 20 fixed to legs 11, and which cooperate in sliding manner and with a given friction force with inner lateral surfaces 13 of guide seats 12 as legs 11 slide inside guide seats 12 to adjust the height of structure 1.

**[0021]** Each friction member 20 comprises a body 21, preferably a one-piece plastic (polymer material) body, having a connecting portion 22 for securing body 21 to leg 11, and a friction portion 23 projecting from connect-

ing portion 22 to contact lateral surface 13 of guide seat 12.

**[0022]** Connecting portion 22 is designed to fit tightly inside a mating seat 24 formed in top end 14 of leg 11, and to interferentially engage mating seat 24 to lock connecting portion 22 inside mating seat 24. In the non-limiting example shown, connecting portion 22 comprises a plate 25, which rests on a peripheral edge 26 of mating seat 24; and a number of fins 27 projecting from a bottom face 28 of plate 25 and designed to interferentially fit inside mating seat 24 to lock connecting portion 22 inside mating seat 24.

**[0023]** Fins 27 define fastening means to fix friction member 20 to leg 11 and, more specifically, to lock connecting portion 22 inside mating seat 24. It is understood that friction member 20 may be fixed to leg 11 by other types of fastening means.

**[0024]** Friction portion 23 projects from a top face 29, opposite bottom face 28, of plate 25, and is shaped and sized to fit tightly inside guide seat 12 with a given friction force.

**[0025]** More specifically, friction portion 23 comprises at least one lateral member 30 having a free end 31 contacting a portion of lateral surface 13 of guide seat 12; member 30 optionally, but not necessarily, tapers towards free end 31.

**[0026]** In the Figure 1-3 example, friction portion 23 has at least two opposite lateral members 30 tapering towards respective free ends 31 contacting respective opposite portions of lateral surface 13 of guide seat 12. More specifically, friction portion 23 comprises a central longitudinal rib 32 and lateral members 30 projecting from opposite sides of rib 32 to cooperate in sliding manner with lateral surface 13 of guide seat 12.

**[0027]** Members 30 taper towards respective free ends 31. For example, members 30 are curved, in particular substantially arc-shaped, and/or have free ends 31 with respective curved lips 33 which, in use, contact lateral surface 13 of guide seat 12.

**[0028]** In the example shown, each friction member 20 comprises two superimposed pairs of opposite members 30; and each pair comprises two opposite curved members 30.

**[0029]** Friction members 20, and more specifically friction portions 23, are designed to fit frictionally inside respective guide seats 12; and the friction produced by friction portions 23 on lateral surfaces 13 of respective guide seats 12 is sufficient to at least temporarily support the weight of frame 2 weighing on legs 11 (i.e. is greater than the weight force of frame 2).

**[0030]** Moreover, the friction produced by each friction portion 23 on lateral surface 13 of relative guide seat 12 is less than the force produced by interference-fitting connecting portion 22 inside mating seat 24.

**[0031]** In actual use, the position of legs 11 with respect to posts 3 (i.e. the off-floor height of structure 1) is adjusted by the fitter sliding legs 11 longitudinally with respect to frame 2 inside respective guide seats 12; as legs

11 slide inside posts 3, friction members 20 remain fixed to legs 11 (due to the interference fit of connecting portions 22 inside mating seats 24), and members 30 slide along lateral surfaces 13 of guide seats 12 with a given friction.

**[0032]** With feet 16, i.e. legs 11, fixed to the floor, the fitter can thus simply pull frame 2 upwards to the required height.

**[0033]** Once the structure is set to the required height, legs 11, even without the fitter supporting frame 2, remain temporarily in the set position, i.e. do not slide back down posts 3 under the weight of frame 2. That is, the friction produced by friction portions 23 on lateral surfaces 13 is sufficient to at least temporarily support frame 2.

**[0034]** At this point, the fitter secures legs 11 to posts 3, e.g. using screws or other fasteners 35 inserted inside respective holes 36 in the lateral walls of posts 3 and engaging legs 11, as shown in Figure 3.

**[0035]** Friction member 20, and in particular connecting portion 22 and/or friction portion 23, may obviously be designed differently from those described above by way of example.

**[0036]** For example, in the Figure 4 and 5 variation, in which any details similar or identical to those described above are indicated using the same reference numbers, connecting portion 22, which for example is substantially C-shaped, is inserted (tightly or not) inside mating seat 24, and is secured inside it by fastening means comprising at least one projection 38 projecting from connecting portion 22 and which engages, e.g. clicks inside, a hole 39 in a lateral wall of leg 11.

**[0037]** In this variation, too, friction portion 23 projects upwards from connecting portion 22, and is shaped and sized to fit tightly inside guide seat 12 with a given friction force by means of one or more lateral members 30 with respective free ends 31 which contact a portion of lateral surface 13 of guide seat 12. In the Figure 4 and 5 example, friction portion 23 comprises two or more superimposed members 30 projecting from the same side of a longitudinal rib 32.

**[0038]** Also in the further variation in Figures 6 and 7, in which any details similar or identical to those described above are indicated using the same reference numbers, friction members 20 are partly flexible to fit inside guide seat 12 and cooperate with inner lateral surface 13 of guide seat 12, but the action of each friction member 20 is aided by a spring 40; each friction member 20 therefore comprises a spring 40 which acts on and presses friction portion 23 against inner lateral surface 13 of guide seat 12.

**[0039]** More specifically, friction portion 23 comprises at least one pair of opposite lateral members 30 having respective free ends 31 contacting respective opposite portions of lateral surface 13 of guide seat 12; and spring 40 is interposed between lateral members 30 and exerts thrust to expand friction portion 23 and part members 30.

**[0040]** In this case, free ends 31 are substantially flat, having respective substantially flat, parallel contact sur-

faces 41 which, in use, contact lateral surface 13 of guide seat 12.

**[0041]** Members 30 are defined by respective arms 42, which project from connecting portion 22, specifically from top face 29 of plate 25, are positioned facing each other, and are separated by a cavity 43; and spring 40 - for example, but not necessarily, a coil spring - has two opposite ends 44, which cooperate with respective arms 42, and more specifically with respective appendixes 45 spaced apart and projecting towards each other inside cavity 43 from respective arms 42.

**[0042]** In the Figure 6 and 7 example, but not necessarily, arms 42 are joined by a curved connecting portion 46 also defining a hinge portion. Friction portion 23 thus has a closed profile, being substantially ring-shaped about cavity 43.

**[0043]** Connecting portion 22 is again designed for insertion inside mating seat 24, and is fixed inside it by fastening means which, in this case, comprise two flexible fins 27 projecting from a central supporting member 47 and having respective opposite projections 38; projections 38 project from respective fins 27, and engage - e.g. given the flexibility of fins 27, click inside - respective holes 39 in the lateral wall of leg 11.

**[0044]** Clearly, changes may be made to the installation structure as described and illustrated herein without, however, departing from the scope of the accompanying Claims.

## Claims

1. A sanitary fixture recessed installation structure (1) comprising a frame (2), having two posts (3) and one or more cross members (4) between the posts (3); and a height adjusting system (9) for adjusting the height of the structure (1); the system (9) comprising two legs (11), which extend vertically from respective bottom ends (15) of the posts (3), and are inserted telescopically inside respective longitudinal guide seats (12) formed inside the posts (3) and bounded by respective inner lateral surfaces (13); the structure (1) being **characterized by** the legs (11) having respective friction members (20) fixed to the legs (11), and which cooperate in sliding manner and with a given friction force with the inner lateral surfaces (13) of the guide seats (12) as the legs (11) slide inside the guide seats (12) to adjust the height of the structure (1).
2. A structure as claimed in Claim 1, wherein the friction members (20) are designed so that the friction produced by the friction members (20) on the inner lateral surfaces (13) of the respective guide seats (12) is sufficient to at least temporarily support the weight of the frame (2) weighing on the legs (11).
3. A structure as claimed in Claim 1 or 2, wherein each

friction member (20) comprises a body (21), preferably a one-piece and/or plastic body, having a connecting portion (22) for connecting the body (21) to a leg (11), and a friction portion (23) which projects from the connecting portion (22) and contacts an inner lateral surface (13) of a guide seat (12).

4. A structure as claimed in Claim 3, wherein the friction portion (23) has at least one lateral member (30) having a free end (31) which contacts a portion of the lateral surface (13) of the guide seat (12).
5. A structure as claimed in Claim 4, wherein the member (30) tapers towards the free end (31).
6. A structure as claimed in Claim 3 or 4, wherein the member (30) is substantially arc-shaped and/or has a free end (31) with a curved lip (33) which contacts the inner lateral surface (13) of the guide seat (12).
7. A structure as claimed in one of Claims 3 to 6, wherein the friction portion (23) has at least one pair of opposite lateral members (30).
8. A structure as claimed in Claim 7, wherein each friction member (20) has two superimposed pairs of opposite lateral members (30).
9. A structure as claimed in one of Claims 3 to 8, wherein the friction portion (23) comprises two or more superimposed lateral members (30) projecting from the same side of a longitudinal rib (32).
10. A structure as claimed in one of Claims 3 to 9, wherein the connecting portion (22) is designed to fit tightly inside a mating seat (24) formed at a top end (14) of the leg (11), and to interferentially engage the mating seat (24) to lock the connecting portion (22) inside the mating seat (24).
11. A structure as claimed in Claim 10, wherein the connecting portion (22) comprises a plate (25), which rests on a peripheral edge (26) of the mating seat (24); and a number of fins (27) projecting from a bottom face (28) of the plate (25) and designed to interferentially engage the mating seat (24) to lock the connecting portion (22) inside the mating seat (24).
12. A structure as claimed in one of Claims 3 to 11, wherein the friction portion (23) is designed so that the friction produced by the friction portion (23) on the inner lateral surface (13) of the guide seat (12) is less than the force produced by interference-fitting the connecting portion (22) inside the mating seat (24).
13. A structure as claimed in one of Claims 3 to 12, wherein the connecting portion (22) is fixed inside

the mating seat (24) by at least one projection (38), which projects from the connecting portion (22) and engages, e.g. clicks inside, a hole (39) in a lateral wall of the leg (11).

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14. A structure as claimed in one of the foregoing Claims, wherein the friction members (20) are partly flexible to fit inside the guide seat (12) and cooperate with the inner lateral surface (13) of the guide seat (12), and the action of each friction member (20) is aided by a spring (40) which acts on a friction portion (23) of the friction member (20) to press the friction portion (23) against the inner lateral surface (13) of the guide seat (12).

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15. A structure as claimed in Claim 14, wherein the friction portion (23) comprises at least one pair of opposite lateral members (30) having respective free ends (31) which contact respective opposite portions of the inner lateral surface (13) of the guide seat (12); and the spring (40) is interposed between the lateral members (30), and exerts thrust to expand the friction portion (23) and part the members (30).

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FIG. 1

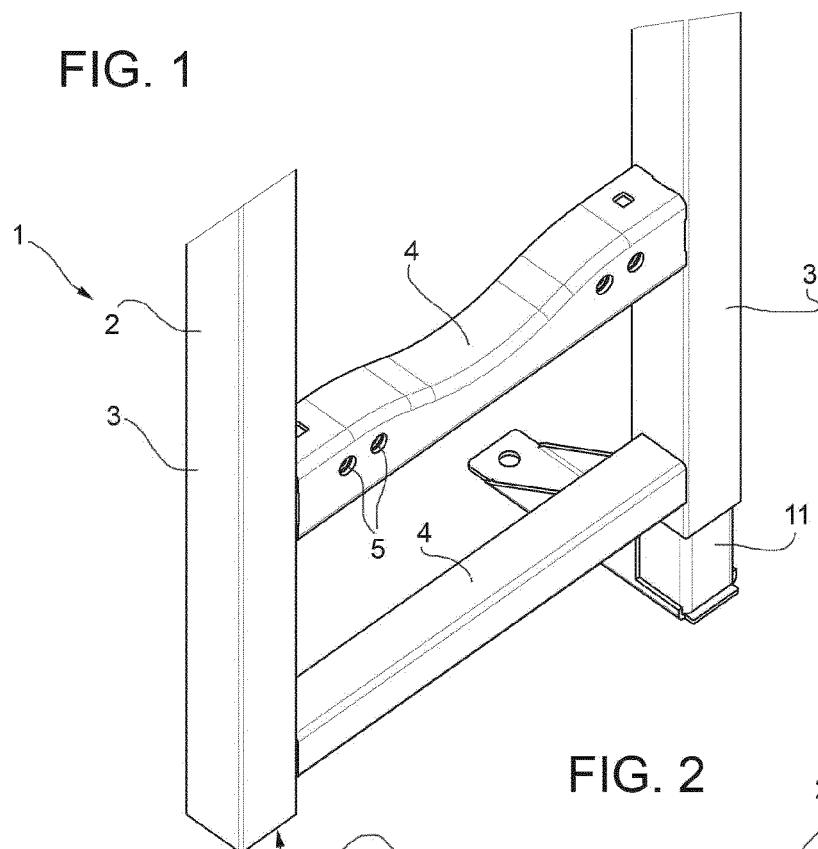


FIG. 2

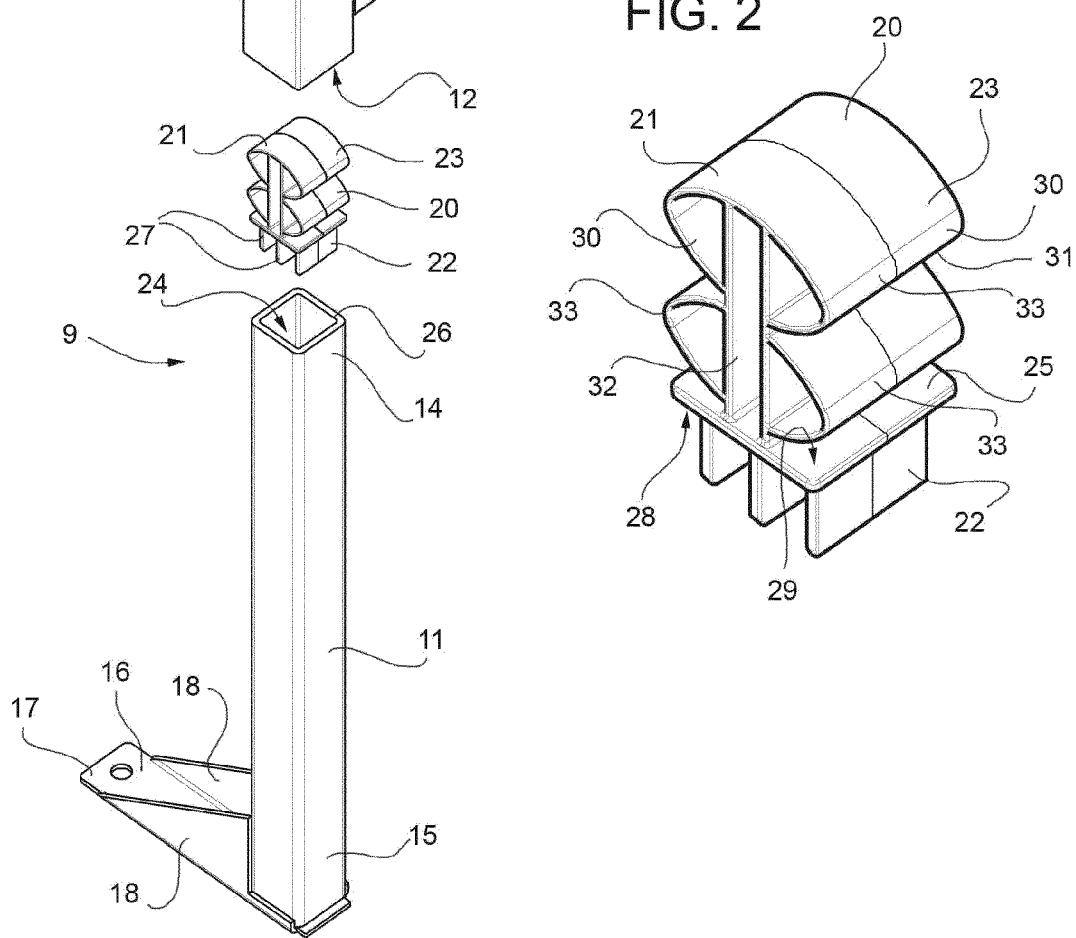


FIG. 3

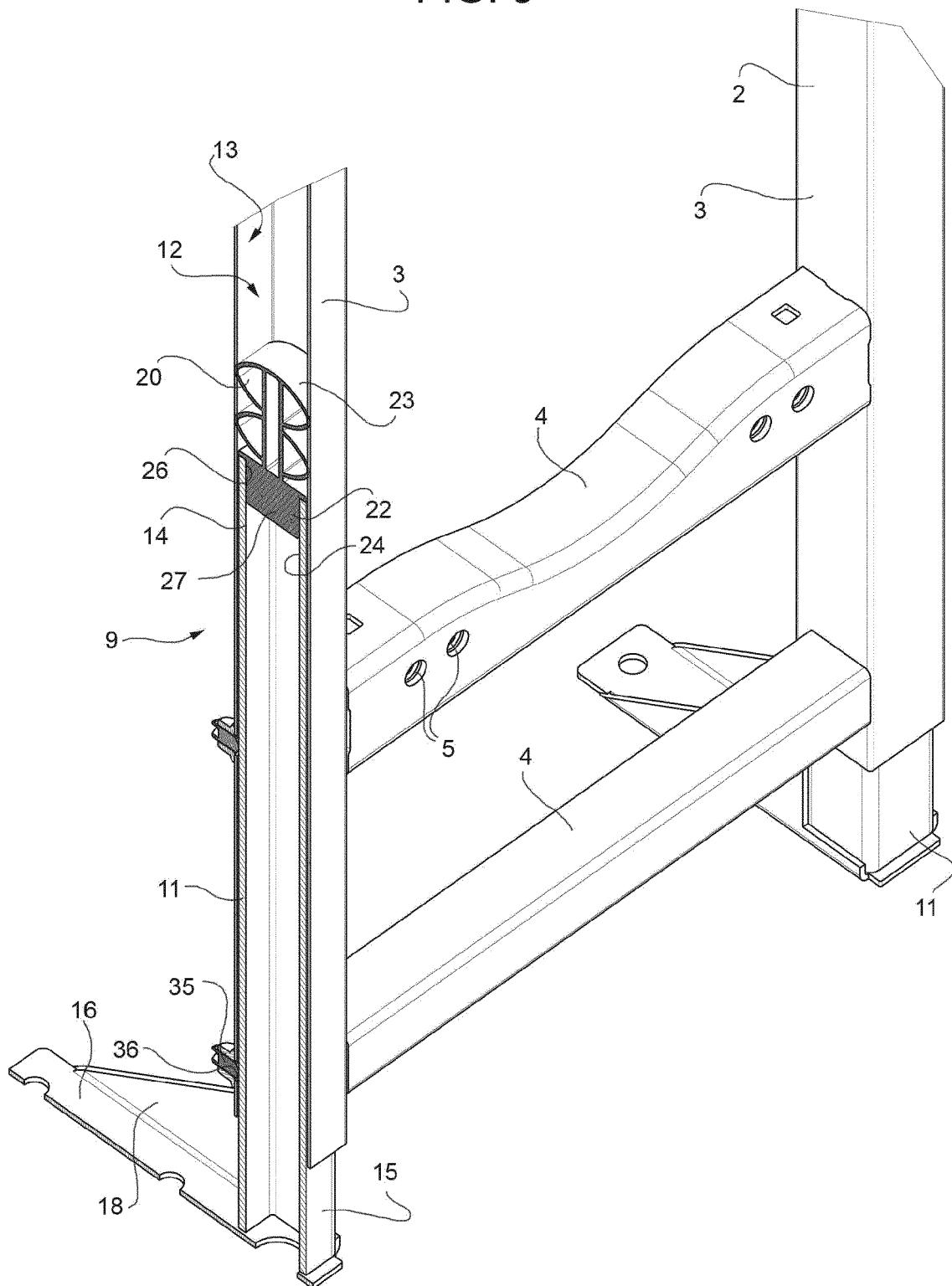


FIG. 4

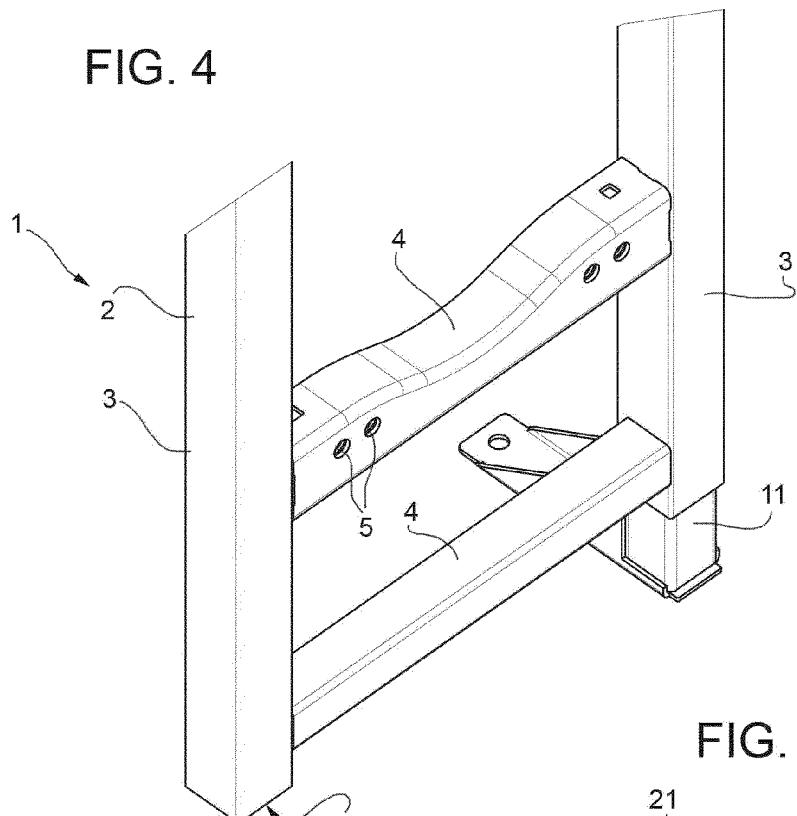


FIG. 5

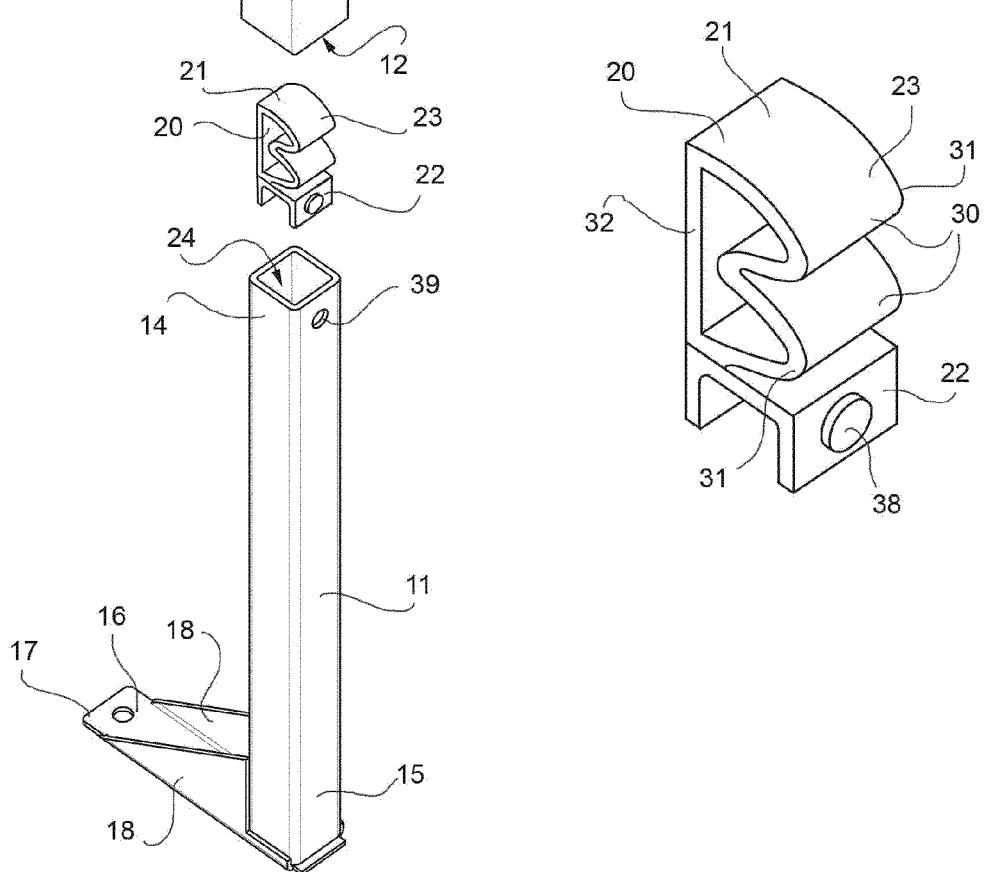


FIG. 6

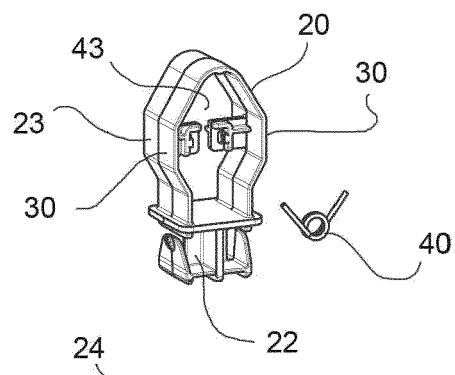
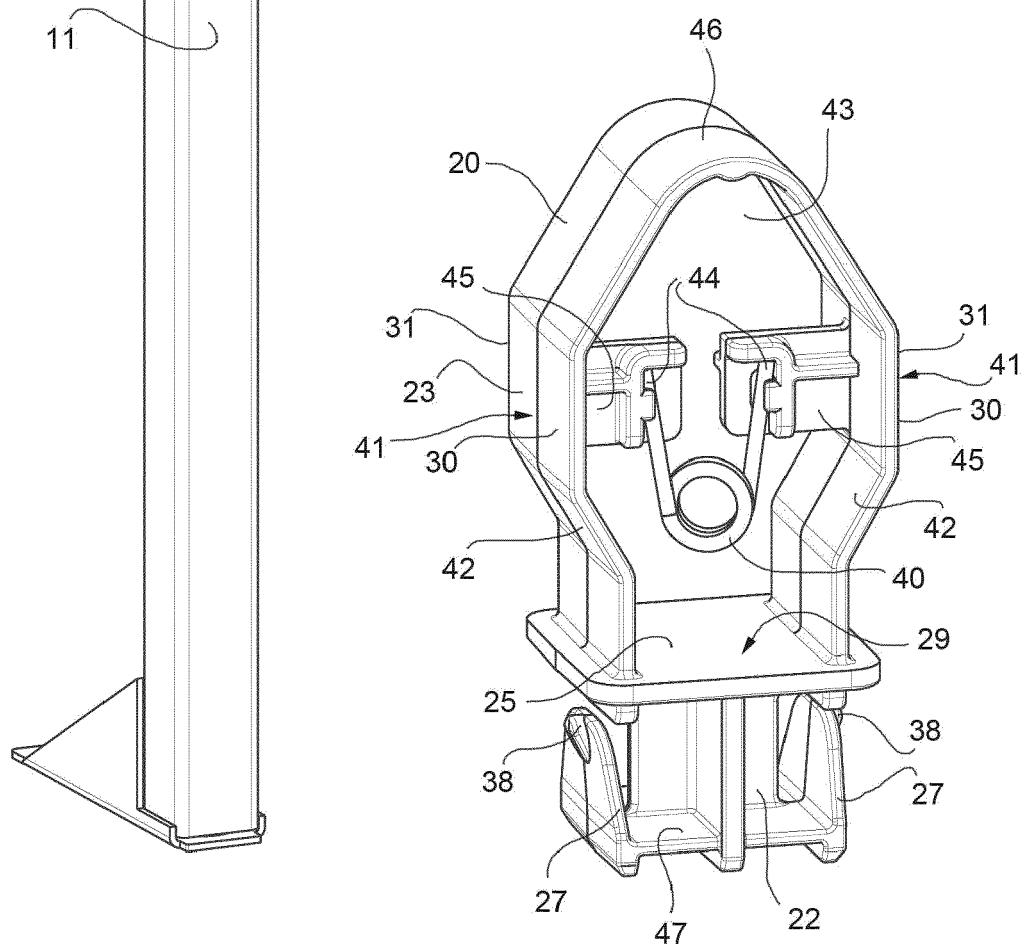


FIG. 7





## EUROPEAN SEARCH REPORT

Application Number

EP 12 39 8009

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)																							
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim																								
A	EP 1 813 733 A2 (OLIVEIRA & IRMAO SA [PT]) 1 August 2007 (2007-08-01) * abstract * * paragraph [0017] - paragraph [0021] * -----	1	INV. E03D11/14																							
A	EP 0 916 772 A1 (SIAMP CEDAP REUNIES [MC]) 19 May 1999 (1999-05-19) * paragraph [0023] * -----	1																								
1			TECHNICAL FIELDS SEARCHED (IPC)																							
1			E03D																							
The present search report has been drawn up for all claims																										
1 EPO FORM 1503 03.82 (P04C01)	Place of search	Date of completion of the search	Examiner																							
	Munich	23 April 2013	Flygare, Esa																							
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 12 39 8009

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23-04-2013

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