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(72) Inventor: **Bermejo Sotillo, Miguel Angel**
49003 Zamora (ES)

(74) Representative: **Manzano Cantos, Gregorio**
Cabinet Manzano
Embajadores, 55
28012 Madrid (ES)

(71) Applicant: **Trenzametal, S.L.**
49012 Zamora (ES)

(54) **Metal profiles and pre-mounted elements forming articulated fences and railings and the assembly thereof**

(57) The invention relates to metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof, formed by a main basic set of vertical and horizontal supporting members and an assembly of pre-assembled articulation elements and the assembly of the complete installation, comprising a set of basic tubular metallic profiles (1,71,72) indistinctly serving as vertical or horizontal supporting members and

completed with a joint sealer batten (2); a ball joint (7) - butt hinge (8) assembly for the attachment between tubular or solid struts and stringers; assembly members (24) with a receiving foot; a screwing foot for screwing to a bed plate and a fixing foot for fixing to a flooring edge; articulated foot (41); oval articulated base foot (80); anchorings to a wall and solid profile (93); articulated cramp and assembly for cable ducts.

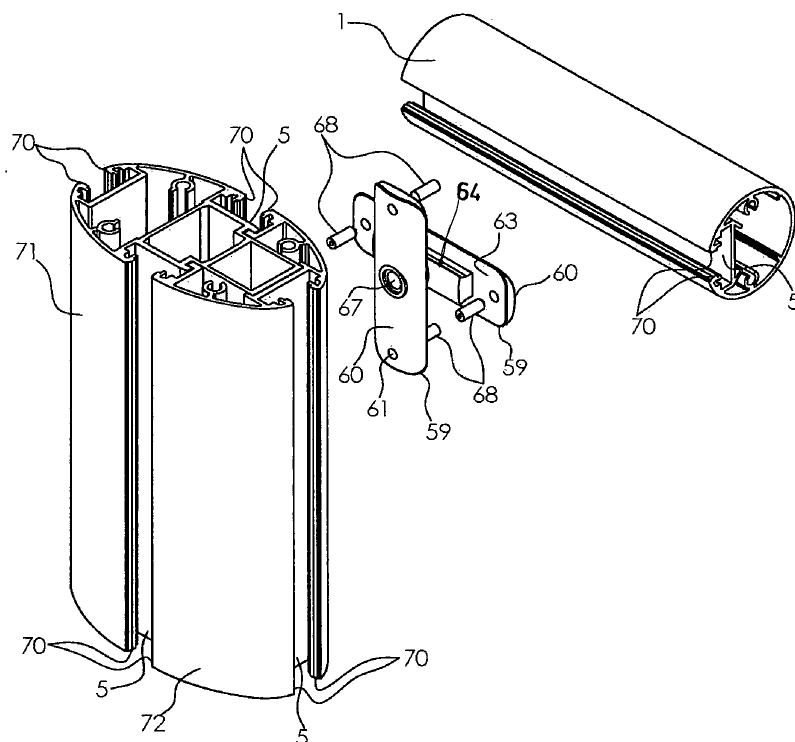


FIG. 10

Description

Object of the Invention

[0001] The invention relates to two tubular metallic profiles, one round profile and another oval profile, and to an assembly of pre-assembled elements for constructing articulated fences and railings which can be directly assembled to one another on-site without needing welds, or special machining as a result of the fact that the particular geometry of the elements and the different mechanisms form an articulated modular system of firm and long-lasting mechanical attachments. The articulated elements allow the assembled assembly to adapt to all types of planes and outlines without needing workshop operations. The versatility of the system allows numerous different compositions and the incorporation of different materials such as boards, glass, cables, tubes and solid wood bars. The invention consists of two metallic tubular profiles and their specific machining in the factory, assembly and fixing parts, anchorings to walls and to floors, and the assembly of all the elements to one another.

Background of the Invention

[0002] There is currently no system designed with these specifications which is modular, articulated, able to incorporate different materials such as boards, glass, cables, tubes and solid wood bars, and with so many different configurations and on-site installation ease. For said purposes, reference is made to the following patents belonging to the same inventor, M. A. Bermejo, E 1 614 826 B1 of Trenzametal, S.A. for: REMOVABLE MODULAR URBAN RAILINGS; E 0004 380114/1 of Natural Faber, S.A. for: DEMOUNTABLE ARTICULATED TUBULAR STRUCTURE FOR RAILINGS AND THE JOINTING AND FIXING COMPONENTS THEREOF and E 0006 380207/ 8 of Natural Faber, S.A. for: ENSEMBLE ARTICULÉ DE BARRIÈRES DE PROTECTION. Inventive Step

[0003] As can be summarized from the disclosure referred to the object of the invention in the preliminary paragraphs of this specification, the advantageous purpose of such invention is to provide preassembled and prefabricated modular elements for the installation of (indoor and outdoor) fences, latticework, partitions and railings, with a great variety of configurations and incorporation of materials (boards, glass, cables, tubes and solid wood bars) according to the functional needs, the final on-site assembly of which is carried out without welds or workshop machining, which only require being screwed in order to fix them to the ground or to the walls with a high capacity of adaptation to the latter due to their articulated anchoring and assembly elements, facilitating the installation and reducing the assembly time.

Description of the Invention

[0004] Consequently the invention is essentially based on two grooved tubular metallic profiles (one round profile and another oval profile) and pre-assembled articulated mechanical elements for making modular articulated gratings or railings.

[0005] Both the round and the oval tubular metallic profile are used for vertical elements (struts) and horizontal elements (handrail, body, stringers and the like), and have three types of rigid fixings for fixing to the ground for installations received, screwed in a bed plate and screwed to a flooring edge in addition to an articulated foot for adapting to slopes.

[0006] The attachment between horizontal and vertical elements is emphasized by the type of developments to be carried out and can be made either by means of an abutment which is inserted in the groove of the tubular metallic profile in which an articulated clamp is fixed allowing the incorporation of all types of panels for making the body, such as boards made of wood, phenolics, composites, glass, solar panels, etc..., or a support for a cable or with a crosshead formed by two abutments which are inserted in the groove of the metallic tubular profile or embedded in the solid profiles which, according to their configuration, allows the assembly between two tubular metallic profiles or between a metallic profile and another solid profile.

[0007] A butt hinge-ball joint assembly is used for assembling the upper horizontal element, which can be a solid or tubular profile, which assembly allows it to rotate on the axis of the strut in addition to adapting to the installation plane.

[0008] From the assembly idea it is deduced that all the members integrating it are planned and developed to adapt, with their particular designs, to the main members of the structure which is designed and calculated so that, without needing the intervention of means specially required for specific works, they can exceptionally be installed on-site on any type of surface, in which the means designed for this purpose and integrating the assembly comply with the linearity of the installation, maintaining the horizontalness of its stringers, crosspieces or others and the adaptation of its struts to the profiles of the terrain or surface on which they are assembled.

[0009] Emphasis is made on the fact that the absence of means that do not correspond to the assembly described in the patent makes the assembly of the installation especially agile and safe, whatever the demands thereof may be upon having solved all the mechanical application, adaptation and assembly situations with complementary members perfectly and efficiently adjusting to the basic main elements which are the vertical and horizontal tubular supporting profiles.

[0010] A broader idea of the features of the invention will be given below in reference to the sheet of drawings etc... In the drawings:

Figure 1 is a front perspective view of the round tubular metallic profile (1) and of the batten (2).

Figure 2 is a front perspective view of the oval tubular metallic profile formed by the male part (71) and the female part (72) and of the batten (2).

Figure 3 is a front perspective view of the butt hinge-ball joint assembly formed by the ball joint (7), the butt hinge (8), the base (9) of the butt hinge, the washer (10), the nut (11) and the screws (22) and its assembling on the metallic profile (1).

Figure 4a is a front perspective view of the assembly of the round tubular metallic profile (1) with the receiving foot formed by the anchoring tube (24), the pressure plate (29), the stud bolts (31) and the trim (25).

Figure 4b is a front perspective view of the assembly of the round tubular metallic profile (1) with the screwing foot for screwing to a bed plate formed by the anchoring tube (24), the pressure plate (29), the stud bolts (31), the bed plate base (32) and the fixing plugs (35).

Figure 4c is a front perspective view of the assembly of the round tubular metallic profile (1) with the foot at a flooring edge formed by the pressure plate (29), the stud bolts (31), the flooring edge base (36) and the fixing plugs (35).

Figure 5 is a front perspective view of the assembly of the round tubular metallic profile (1) with the articulated foot formed by the base (41), the special screw (40), the body (39), the centering element (38), the protector (37), the anchoring tube (24), the pressure plate (29), the stud bolts (31), the stud (42), the washer (43), the nut (44) and the screw (45).

Figure 6a is a front perspective view of the assembly of the oval tubular metallic profile (71) and (72) with the articulated foot formed by the oval base (80), the oval body (79), the screws (73), the stud (42), the washer (43) and the nut (44).

Figure 6b is a front perspective view of the assembly of the oval tubular metallic profile (71) and (72) with the fixed foot formed by the oval body (91), the screws (73), the stud (42), the washer (43) and the nut (44).

Figure 7a is a front and rear perspective view of the abutment (59).

Figure 7b is a perspective view of the assembly of the crosshead for attaching two tubular metallic profiles formed by two abutments (59), the rivet (67) and the stud bolts (68).

Figure 7c is a perspective view of the assembly of the crosshead for attaching a tubular metallic profile with a solid profile formed by two abutments (59), the rivet (67) and the stud bolts (68).

Figure 8 is a perspective view of the assembly of the solid profile (93) provided with the insert (95) with the assembly of Figure 3.

Figure 9 is a perspective view of the assembly of a solid profile (93) with a round tubular metallic profile

(1) by means of the assembly of Figure 7c.

Figure 10 is a perspective view of the assembly of two tubular metallic profiles, one round profile (1) and another oval profile (71) and (72) by means of the assembly of Figure 7b.

Figure 11 is a perspective view of the connection of two solid profiles (93) by means of the plates (102), the centering element (103) and the screws (106).

Figure 12 is a perspective view of the connection of two round tubular metallic profiles (1) with their battens (2) by means of the plates (109), the screws (112), the centering profile (113), the bridge plate (114) and the screws (115).

Figure 13a is a perspective view of the anchoring of a round tubular metallic profile (1) to a wall by means of the terminating part (117), the screws (120), the anchoring to a wall for a tubular profile (121), the stud bolts (123) and the plug (122).

Figure 13b is a perspective view of the anchoring of a solid profile (93) to a wall by means of the terminating part (102), the screws (106), the anchoring to a wall for a solid profile (128) and the plug (122).

Figure 14 is a perspective view of the assembly to the round tubular metallic profile (1) of the articulated cramp formed by the abutment (59), the screw (132), the stud bolts (68), the cramp support (138), the bolt (137), the support clamp (133), the joints (134) and (135), the tightening clamp (136) and the screws (141).

Figure 15 is a perspective view of the assembly to the round tubular metallic profile (1) of the cable duct formed by the abutment (59), the screw (132), the stud bolts (68), the core (145), the cable (144), the bushing (148) and the screw (151).

Description of a Preferred Embodiment of the Invention

[0011] This description is centered on the corresponding illustrations of the depictions of the invention, based on the following aspects:

[0012] The arrangement of the tubular metallic profiles, a round profile (1) (Figure 1) and an oval profile formed by the profiles (71) and (72) (Figure 2), are elements which by their structure and geometry are used both for vertical elements (hereinafter struts) and for horizontal elements (hereinafter crosspieces or handrails) for constructing gratings, fences or railings, and have one or four grooves (5) respectively and a batten (2) consisting of two longitudinal teeth (6) for their clipping in the grooves (5). The oval profile is assembled by fitting the projections (76) of the profile (72) in the grooves (77) of the profile (71) which in turn fits its face (74) in the groove (75) of the profile (72), and finally being attached by the screws (73). Each profile, (71) and (72), has one groove (5) and the tongue and groove joint of both creates two more grooves (5).

[0013] There is a butt hinge-ball joint assembly (Figure 3) for assembling the upper elements of the gratings,

fences or railings, which assembly is formed by a base (9) of the butt hinge with a central borehole (18) in which the butt hinge (8) is introduced and is kept fixed by assembling in its lower threading (17) the nut (11) with the washer (10) which is supported on the plane (20) of the cover (9), allowing the butt hinge (8) to freely rotate on its axis. The threading (16), finished with the tip (98), in which the ball joint (7) is screwed in, is at the upper part of the butt hinge (8). The butt hinge-ball joint assembly (Figure 3) is assembled on the strut, fitting the milled cylinder (21) of the base (9) of the butt hinge in the channel (3) of the strut (1), placing this milling (21) against the face (23) of the channel (3) and screwing in the screws (22) in the open tubular channels (4) of the strut (1) (Figure 1), which screws are introduced in the boreholes (19) of the base (9) of the butt hinge.

[0014] The round strut (1) has four types of fixings for fixing to the ground, three rigid fixings (Figures 4a, 4b and 4c) and one articulated fixing (Figure 5). Figure 4a is a received installation of the strut (1) in which the tube (24) is introduced in its channel (3) at one end and is inserted in the bed plate at the other end, intercalating the trim (25), its base (27) being coplanar with the ground and provided with a borehole (28) for the passage of the tube (4) and a recess (26) for fitting the strut (1). The strut is fixed by means of the plate (29) which is introduced in the groove (5) of the strut (1) and by means of the stud bolts (31) screwed in the boreholes (30) of the plate (29) exerting a deformation of the bottom of the groove (5) and creating a firm attachment of the strut (1) to the tube (24). Figure 4b is an installation screwed to a bed plate in which the tube (24) is welded inside the borehole (34) of the base plate (32) having three boreholes (33) for its fixing to a bed plate by means of the plugs (35). The strut (1) is fixed to the tube (24) by means of the plate (29) as in the assembly of Figure 4a. In the assembly of Figure 4c to a flooring edge, it is the plate (29) which is welded to the anchoring plate (36) provided with the three boreholes (33) for the fixing by means of the plugs (35), and the strut (1) is fixed by introducing the plate (29) in its groove (5) and pressing with the butt hinges (31).

[0015] The articulated foot of Figure 5 is formed by a base (41) with a lower support surface (46), a central hollow (48) and an upper spherical surface (47) on which the body (39) is supported, which body is provided with a spherical indentation (49), a borehole (51), a central hollow (53), a recess (55) at its lower part for fitting the base of the screw (40) and an upper hollow (54) for fitting the centering element (38). The tube (24), on which the strut (1) is fixed by means of the plate (29) and the stud bolts (31), traverses the centering element (38) through its borehole (57), the body through the hollow (53) and has an inner threading (58) at its lower end which is screwed on the screw (40), maintaining the assembly of these four parts firmly attached. The assembled assembly is coupled on the base (41), the assembly being pressed by the nut (44) and the washer (43), which is seated on the plane (52) of the body (39), screwed in the

stud (42) received in the ground and traversing the base (41) through its hollow (48) and the body (39) through its borehole (51). The protector (37) is finally installed by fitting in the tongue and groove joint of the back (56) of the body (39) and screwing in the borehole (50) of the body (39) the screw (45) introduced in the borehole (78) of the protector.

[0016] Figure 6a is an assembly of the articulated foot for the oval strut (71) and (72) formed by a base (80) with a central hollow (82), a planar seat (83) which is supported on the ground and a spherical surface (81) on which the spherical indentation (84) of the lower face of the body (79) is seated, which body is equally provided with a central hollow (89) and with four ribs (85) fitting in the channels (86), (87) and (88) of the strut (71) and (72). The firm fixing is carried out by means of the stud (42), received in the ground, passing through the central hollows (82) of the base (80) and (89) of the body (79), with the washer (43) seated on the plane (90) of the body (79) and with the pressure exerted by the nut (44) maintaining the assembly firm. Once the strut (71) and (72) has been fitted, it is fixed to the articulated foot by means of the screws (73) traversing the grooves (5) and they are fitted in the ribs (85) of the body (79).

[0017] Figure 6b shows the rigid assembly of the oval strut (71) and (72) to the ground by means of the body (91) of the planar base (92), with a central borehole (89) and four ribs (85) fitting in the channels (86), (87) and (88) of the strut (71) and (72). The firm fixing is carried out by means of the stud (42), received in the ground, passing through the central hollow (89) of the body (91), with the washer (43) seated on the plane (90) of the body (91) and with the pressure exerted by the nut (44) maintaining the body (91) firm. Once the strut (71) and (72) has been fitted, it is fixed to the articulated foot by means of the screw (73) traversing the grooves (5) and they are fitted in the ribs (85) of the body (91).

[0018] The abutment (59) of Figure 7a has a cylindrical face (60) with a central seat (66), a planar face (63) with two boreholes (61) and a central rib (64) having an upper cylindrical face with a borehole (62) and a seat (65). Figures 7b and 7c show the crosshead assemblies of two abutments (59) by means of the rivet (67) attaching the two parts through the central borehole (62), placing the seats (65) against one another or the seat (65) of one against the seat (66) of the other, allowing the abutments (59) to rotate freely with respect to one another, and with the screws (68) and/or (69) screwed in the boreholes (61).

[0019] Figure 8 illustrates the assembly of a solid profile (93) on the assembly of Figure 3 for making the upper parts of fences, gratings and railings. The solid profile (93) has a slot (94) in which the ball joint case (95) is housed and screwed with the screws (97), which case is provided with a hollow (96) in which the lugs (13) of the ball joint (7) fit. This system allows rotating the solid profile (93) with respect to the vertical axis of the strut (1) and inclining it on the axis of the lugs (13) to a maximum angle

defined by the inclined planes (14) of the ball joint (7). Once the solid profile (93) is aligned with the plane of the ground, the position is fixed by driving the tip (98) of the butt hinge (8) in the bottom of the case (95) rotating the butt hinge (8) with a tool introduced in its borehole (15).

[0020] Figure 9 is the assembly of a solid profile (93) as a crosspiece for forming fences, gratings and railings on a strut (1) using the crosshead of two abutments (59) of Figure 7c. The solid profile (93) has a slot (99) in which an abutment (59) fits, placing its plane (63) on the plane (100) of the hollow (99), and fixed by means of the screws (69), closing the cylinder of the solid profile (93) with its cylindrical face (60). The other abutment (59) enters by sliding in the groove (5) of the strut (1), fitting its central rib (64) between the lips (70) of the groove (5), closing the cylinder of the strut (1), and being fixed by means of the stud bolts (68). The articulation of the crosshead allows inclining the solid profile and aligning it with respect to the plane of the ground.

[0021] Figure 10 is the assembly of two tubular metallic profiles, in this case the oval profile (71) and (72) acts as a strut and the round profile (1) as a crosspiece for forming fences, gratings and railings, in which in both profiles the abutment enters in the groove (5), fitting the central rib (64) in the lips (70) of this groove and being fixed to each of them by means of the stud bolts (68). The articulated attachment of the crosshead allows freely inclining the crosspiece with respect to the strut.

[0022] Figure 11 depicts the longitudinal assembly of two solid profiles (93) provided with a central borehole (104) in which the centering element (103) is inserted. The cover (102) has a central borehole (108) for the passage of the centering element (103) and two boreholes (107) for the screws (106) which are screwed in the boreholes (105) of the solid profile (93).

[0023] Figure 12 depicts the longitudinal assembly of two tubular metallic profiles (1) in which the cover (109) with a central hollow (110) is assembled to the profile (1) by means of two screws (112) which are introduced in its boreholes (111) and are screwed in the open tubular ribs (4) of the profile (1) in which the centering element (113) and the plate (114) are introduced in its channel (3) and its groove (5) respectively. The plate (114) is provided with four threaded boreholes (116) in which the stud bolts (115) fixing the assembly of the two profiles (1) are assembled.

[0024] Figure 13a depicts the fixing of a crosspiece or handrail carried out with a tubular metallic profile (1) to the wall, using the cover (117) provided with two boreholes (119) for its fixing to the profile (1) by means of the screws (120) which are screwed in the channels (4) of the profile (1) and a slot (118) in which the flat bar (125) of the fixing (121) enters. The flat bar (125) slides inside the groove (5) of the profile allowing its adjustment to the wall and is fixed by means of the stud bolts (123) which are screwed in the boreholes (124) of said flat bar (125). The fixing (121) has a centering element (127) which is embedded in the wall, preventing the rotation of the fixing,

and a borehole (126) in which the plug (122) for anchoring to a wall is housed.

[0025] Figure 13b depicts the fixing to a wall of a crosspiece or handrail carried out with a solid profile (93), using the cover (102) provided with two boreholes (107) for screwing the screws (106) in the boreholes (105) of the solid profile (93) and a central borehole (108) for the passage of the centering element (131) of the fixing (128) penetrating the borehole (104) of the profile (93). The fixing (128) has a centering element (129) which is embedded in the wall preventing the rotation of the fixing, and a borehole (130) in which the plug (122) for anchoring to a wall is housed.

[0026] Figure 14 defines the articulated cramp for boards, glass, phenolics or composite panels formed by the abutment (59) which is introduced in the groove (5), the screw (132) attaching the cramp to the abutment (59), the stud bolts (68) for fixing the abutment (59) to the strut (1), the cramp support (138), the bolt (137), the support clamp (133), the joints (134) and (135), the tightening clamp (136) and the screws (141). The cramp is articulated on the shaft of the bolt (137) and is installed on the strut (1) by introducing the abutment (59) in the groove (5) being fixed by the butt hinges (68).

[0027] Figure 15 depicts the assembly to the strut (1) of the cable duct formed by the abutment (59) which is introduced in the groove (5), the screw (132) attaching the cable duct system to the abutment (59), the stud bolts (68) for fixing the abutment (59) to the strut (1), the core (145), the cable (144), the bushing (148) and the screw (151). The core (145) has a central shaft (146) in which the cable (144) is wound, which cable passes through the boreholes (149) of the bushing (148) provided with a central borehole (150) for inserting the screw (151) which is screwed in the borehole (152) of the core (145).

[0028] Having suitably described the nature of the invention, it is hereby stated for all intents and purposes etc...

Claims

1. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof formed by a main basic set of vertical and horizontal supporting members and an assembly of pre-assembled articulation elements and the assembly of the complete installation, **characterized by** comprising:

- . - a set of tubular metallic profiles, one round profile (1) and another oval profile, formed by a male part (71) and another female part (72) assembled together, serving indistinctly as vertical or horizontal supporting members and being completed with a joint sealer batten (2);
- . - a ball joint (7), butt hinge (8) assembly for the attachment between tubular or solid struts and

- stringers;
- . - an assembly member (24) for the tubular strut (1) with a receiving foot; a screwing foot for screwing to a bed plate and a fixing foot for fixing to a flooring edge;
 - . - articulated base foot (41) for assembling the tubular strut (1) to the anchoring tube (24);
 - . - oval articulated base foot (80) for assembling the oval profile (71) and (72) and a fixed foot formed by an oval body (91) for this same profile (71) and (72);
 - . - an anchoring to a wall by means of terminating part (117) the round tubular metallic strut profile (1);
 - . - an anchoring of a solid profile (93) to a wall by means of terminating part (102);
 - . - articulated cramp formed by an abutment (59) for assembling in a round tubular profile (1) and,
 - . - cable ducts formed by an abutment (59) for assembling in a round profile tubular (1).
2. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claim 1, wherein the tubular supporting members are **characterized in that** they have one to four grooves (5) respectively and a batten (2) consisting of two longitudinal teeth (6) for its clipping in the grooves (5).
 3. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claims 1 and 2, wherein the oval tubular profile assembly is **characterized in that** it is made by fitting the projections (76) of the profile (72) in the groove (77) of the profile (71) which in turn fits its distal face (74) in the groove (75) of the profile (72), finally being attached by the screws (73).
 4. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claims 1 and 2, wherein each part (71) and (72) of the oval profile is **characterized in that** they have a groove (5) and the tongue and groove joint of both creates two more grooves (5).
 5. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claim 1, wherein a ball joint (7) and butt hinge (8) assembly is **characterized in that** it consists of a base (9) of the butt hinge with a central borehole (18) in which the butt hinge (8) is introduced, being kept fixed by means of its lower threading (17) with the nut (11) and washer (10) which is supported on the plane (20) of the cover (9), allowing the butt hinge (8) to freely rotate on its axis.
 6. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claims 1 and 4, wherein the butt hinge (8) is **characterized in that** the threading (16), finished with the tip (98) in which the ball joint (7) is screwed, is at the upper part of the butt hinge (8).
 7. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claims 1, 4 and 5, wherein the butt hinge (8) ball joint (7) assembly is **characterized in that** it is assembled in the strut (1), fitting a milled cylinder (21) of the base (9) of the butt hinge (8) in the channel (3) of the strut (1) placing this milling (21) against the face (23) of the channel (3) and screwing in the open vertical channels (4) of the strut (1) the screws (22) which are introduced in the boreholes (19) of the base (9) of the butt hinge.
 8. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claim 1, wherein the assembly for the tubular strut (1) with a receiving foot for receiving a flooring edge is **characterized in that** a tube (24) is introduced in its channel (3) at one end and is inserted in the bed plate at the other end, intercalating a trim (25), its base (27) being coplanar with the ground and provided with a borehole (28) for the passage of the tube (4) and a recess (26) for fitting the strut (1), and the fixing of which is done by means of the plate (29) which is introduced in the groove (5) of the strut (1) and by means of the stud bolts (31) screwed in the boreholes (30) of the plate (29).
 9. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claims 1 and 7, wherein the assembly to the bed plate is **characterized in that** it is a screwed installation in which the tube (24) is welded inside the borehole (34) of the base plate (32) having three boreholes (33) for its fixing to the bed plate by means of the plugs (35) and the strut (1) is fixed to the tube (24) by means of the plate (29).
 10. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claims 1, 7 and 8, wherein the assembly to the flooring edge is **characterized in that** the plate (29) is welded to the anchoring plate (36) provided with the three boreholes (33) for fixing by means of the plugs (35), and the strut (1) is fixed by introducing the plate (29) in its groove (5) and pressing with the butt hinges (31).
 11. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claim 1, wherein the articulated foot of the strut (1) is **characterized in that** it is formed by a base (41) with a lower support surface

- (46), a central hollow (48) and an upper spherical surface (47) on which the body (39) is supported, which body is provided with a spherical indentation (49), a borehole (51), a central hollow (53), a recess (55) at its lower part for fitting the base of the screw (40) and an upper hollow (54) for fitting the centering element (38) and the tube (24), on which the strut (1) is fixed by means of the plate (29) and the stud bolts (31), traversing the centering element (38) through its borehole (57), the body through the hollow (53) having a lower threading (58) at its lower end which is screwed on the screw (40), maintaining the assembly of these four parts firmly attached.
12. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claims 1 and 10, wherein the assembled four part assembly is **characterized in that** it is coupled on a base (41), the assembly being pressed by the nut (44) and the washer (43), which is seated on the plane (52) of the body (39), screwed in the stud (42) received in the ground and traversing the base (41) through its hollow (48) and the body (39) through its borehole (51), and finally a protector (37) is installed which is fitted in the tongue and groove joint of the back (56) of the body (39) and screwing in the borehole (50) of the body (39) the screw (45) introduced in the borehole (78) of the protector (37).
13. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claim 1, wherein the assembly of the articulated foot for the oval strut is **characterized in that** it is formed by a base (80) with a central hollow (82), a planar seat (83) which is supported on the ground and a spherical surface (81) on which a spherical indentation (84) of the lower face of the body (79) is seated, which body is equally provided with a central hollow (89) and four ribs (85) fitting in the channels (86), (87) and (88) of the strut (71) and (72), the firm fixing of which is carried out by means of the stud (42), received in the ground, passing through the mentioned central hollows (82) of the base (80) and (89) of the body (79), with the washer (43) seated on the plane (90) of the body (79) and with the pressure exerted by the nut (44), being finally fixed to the articulated foot by means of the screws (73) traversing the grooves (5) and they are screwed in the ribs (85) of the body (79).
14. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claim 1, wherein the rigid assembly of the oval strut is **characterized in that** it is carried out by means of the body (91) of the planar base (92), with a central borehole (89) and four ribs (85) fitting in the channels (86), (87) and (88) of the strut (71) and (72) and the firm fixing of which is carried out by means of the stud (42), received in the ground, passing through the central hollow (89) of the body (91), with the washer (43) seated on the plane (90) of the body (91) and with the pressure exerted by the nut (44), being fixed to the articulated foot by means of the screws (73) traversing the grooves (5) and they are screwed in the ribs (85) of the body (91).
15. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claim 1, wherein the abutment (59) is **characterized in that** it has a cylindrical face (60) with a central seat (66), a planar face (63) with two boreholes (61) and a central rib (64) having an upper cylindrical face with a borehole (62) and a seat (65).
16. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claims 1 and 14, wherein the crosshead assembly of the abutments (59) is **characterized in that** it is carried out by means of a rivet (67) attaching the two parts by the central borehole (62), placing the seats (65) against one another or the seat (65) of one against the seat (66) of the other, allowing the abutments (59) to rotate freely with respect to one another, and with the screws (68) and/or (69) screwed in the boreholes (61).
17. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claim 1, wherein the assembly of the solid profile (93) for assembling the upper parts is **characterized in that** it has a slot (94) in which the ball joint case (95) is housed and screwed with the screws (97), which case is provided with a hollow (96) in which the lugs (13) of the ball joint (7) fit and once the solid profile (93) is aligned, which solid profile pivots on the axis of the lugs (13), with the plane of the ground, the position is fixed by driving the tip (98) of the butt hinge (8) in the bottom of the case (95) rotating the butt hinge (8) with a tool introduced in its borehole (15).
18. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claims 1 and 16, wherein for the assembly of the solid profile (93) as a crosspiece on a strut (1) using the crosshead of two abutments (59), it is **characterized in that** the solid profile (93) has a slot (99) in which an abutment (59) fits placing its plane (63) on the plane (100) of the hollow (99) and is fixed by means of the screws (69) closing the cylinder of the solid profile (93) with its cylindrical face (60) and by the other abutment (59) entering by sliding in the groove (5) of the strut (1), fitting its central

rib (64) between the lips (70) of the groove (5), closing the cylinder of the strut (1), and being fixed by means of the stud bolts (68).

19. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claims 1, 16 and 17, wherein the assembly of two tubular metallic profiles, in this case the oval profile (71) and (72) with the round profile (1), is **characterized in that** the first profile acts as a strut and the second profile acts as a crosspiece in which in both profiles, the abutment enters in the groove (5) fitting the central rib (64) in the lips (70) of this groove and being fixed to each of them by means of the stud bolts (68), allowing the rotation between them. 5
20. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claims 1, 16, 17 and 18, wherein the longitudinal assembly of two solid profiles (93) is **characterized in that** they are provided with a central borehole (104) in which the centering element (103) is inserted; a cover (102) having a central borehole (108) for the passage of the centering element (103) and two boreholes (107) for the screws (106) which are screwed in the boreholes (105) of the solid profile (93). 10
21. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claims 1, 16, 17, 18 and 19, wherein the longitudinal assembly of two tubular metallic profiles (1) is **characterized in that** a cover (109) with a central hollow (110) is assembled to the profile (1) by means of two screws (112) which are introduced in its boreholes (111) and are screwed in the open tubular ribs (4) of the profile (1) in which the centering element (113) and the plate (114) are introduced in its channel (3) and its groove (5) respectively, said plate (114) being provided with four threaded boreholes (116) in which the stud bolts (115) fixing the assembly of the two profiles (1) are assembled. 15
22. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claims 1, 16, 17, 18, 19 and 20, wherein the fixing of the crosspiece or handrail carried out with a tubular metallic profile (1) to the wall is **characterized in that** a cover (117) is used provided with two boreholes (119) for its fixing to the profile (1) by means of the screws (120) which are screwed in the channels (4) of the profile (1) and a slot (118) in which the flat bar (125) of the fixing (121) enters, which flat bar (125) slides inside the groove (5) of the profile allowing its adjustment to the wall and being fixed by means of the stud bolts (123) 20

which are screwed in the boreholes (124) of said flat bar (125), the fixing (121) having a centering element (127) which is embedded in the wall preventing the rotation of the fixing, and a borehole (126) in which the plug (122) for anchoring to a wall is housed.

23. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claims 1, 16 to 21, wherein the fixing to a wall of a crosspiece or handrail carried out with a solid profile (93) is **characterized in that** it uses a cover (102) provided with two boreholes (107) for screwing the screws (106) in the boreholes (105) of the solid profile (93) and a central borehole (108) for the passage of the centering element (131) of the fixing (128) penetrating the borehole (104) of the profile (93); the fixing (128) having a centering element (129) which is embedded in the wall preventing the rotation of the fixing, and a borehole (130) in which the plug (122) for anchoring to the wall is housed. 25
24. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claim 1, wherein the articulated cramp for boards, glass, phenolics or composite panels is **characterized in that** it is formed by the abutment (59) which is introduced in the groove (5), a screw (132) attaching the cramp to the abutment (59), the stud bolts (68) for fixing the abutment (59) to the strut (1), the cramp support (138), the bolt (137), the support clamp (133), the joints (134) and (135), the tightening clamp (136) and the screws (141), such that the cramp is articulated on the shaft of the bolt (137) and is installed on the strut (1) by introducing the abutment (59) in the groove (5), being fixed by the butt hinges (68). 30
25. Metallic profiles and pre-assembled elements for forming articulated fences and railings and assembly thereof according to claim 1, wherein the assembly of the cable duct to the strut (1) is **characterized by** being formed by the abutment (59) which is introduced in the groove (5), by means of the screw (132) attaching the cable duct system to the abutment (59), the stud bolts (68) for fixing the abutment (59) to the strut (1), the core (145), the cable (144), the bushing (148) and the screw (151), the core (145) having a central shaft (146) in which the cable (144) is wound, which cable passes through the boreholes (149) of the bushing (148) provided with a central borehole (150) for inserting the screw (151) which is screwed in the borehole (152) of the core (145). 35

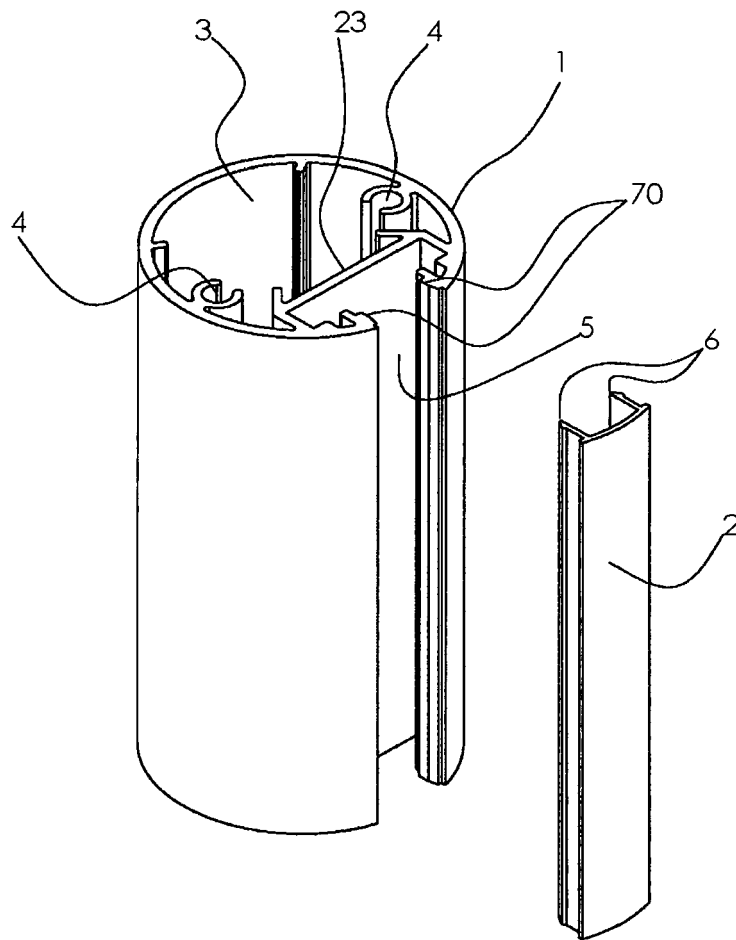


FIG. 1

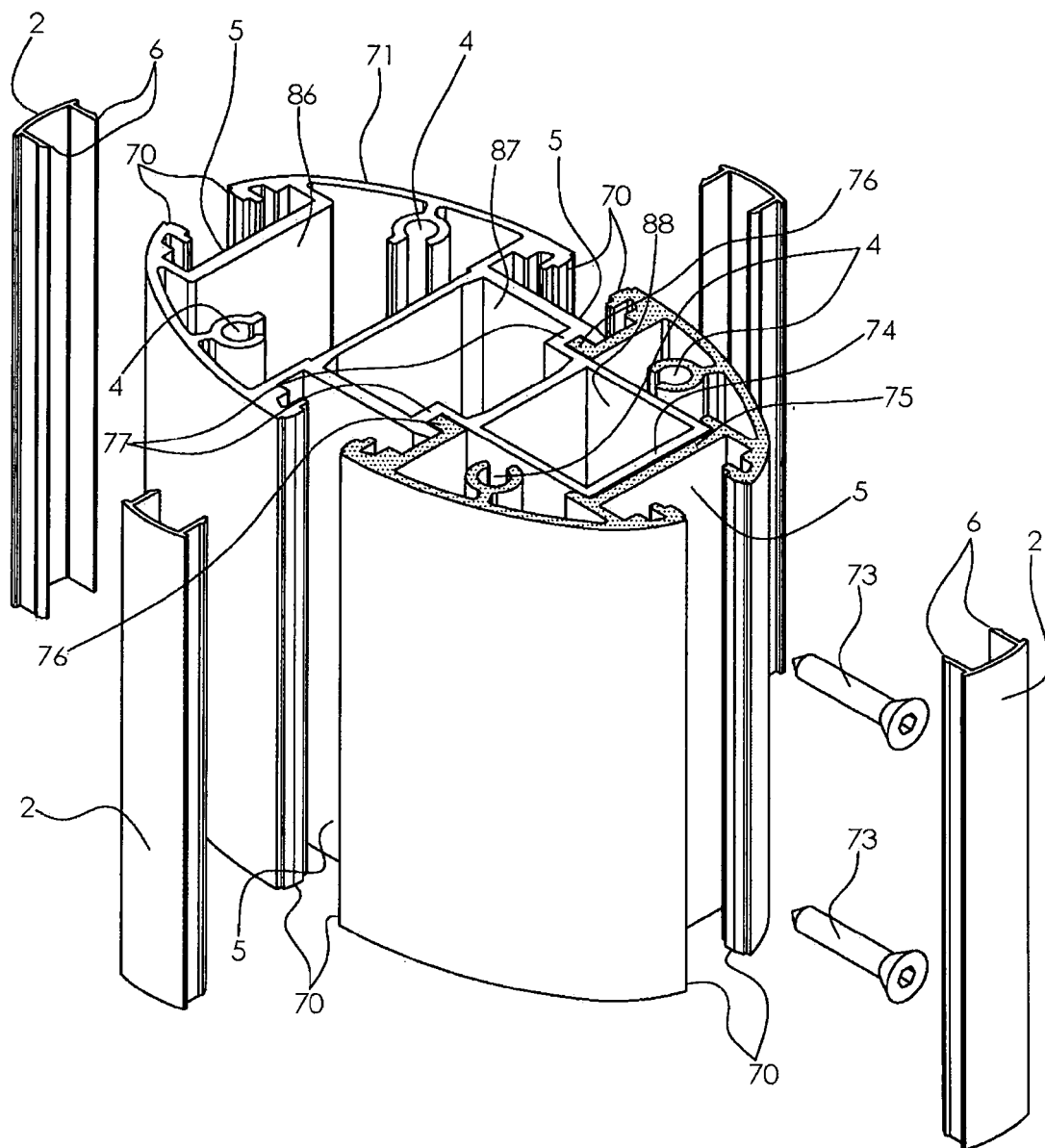


FIG. 2

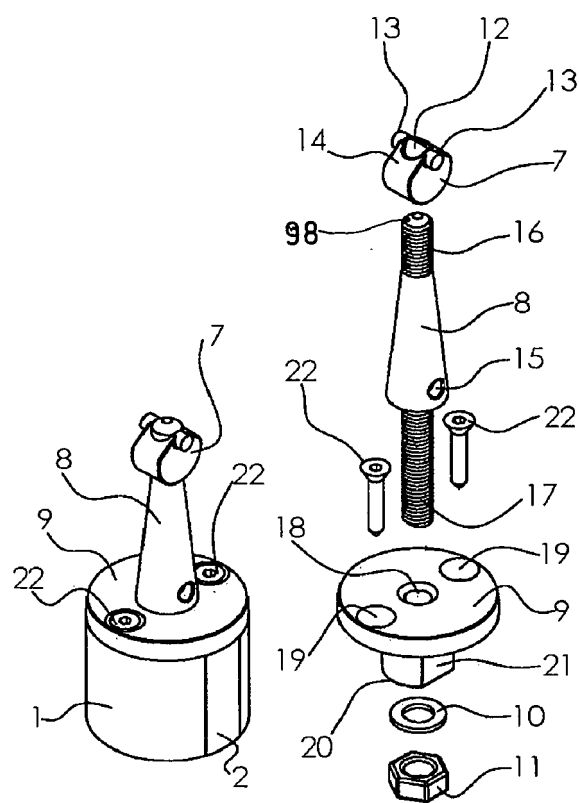


FIG. 3

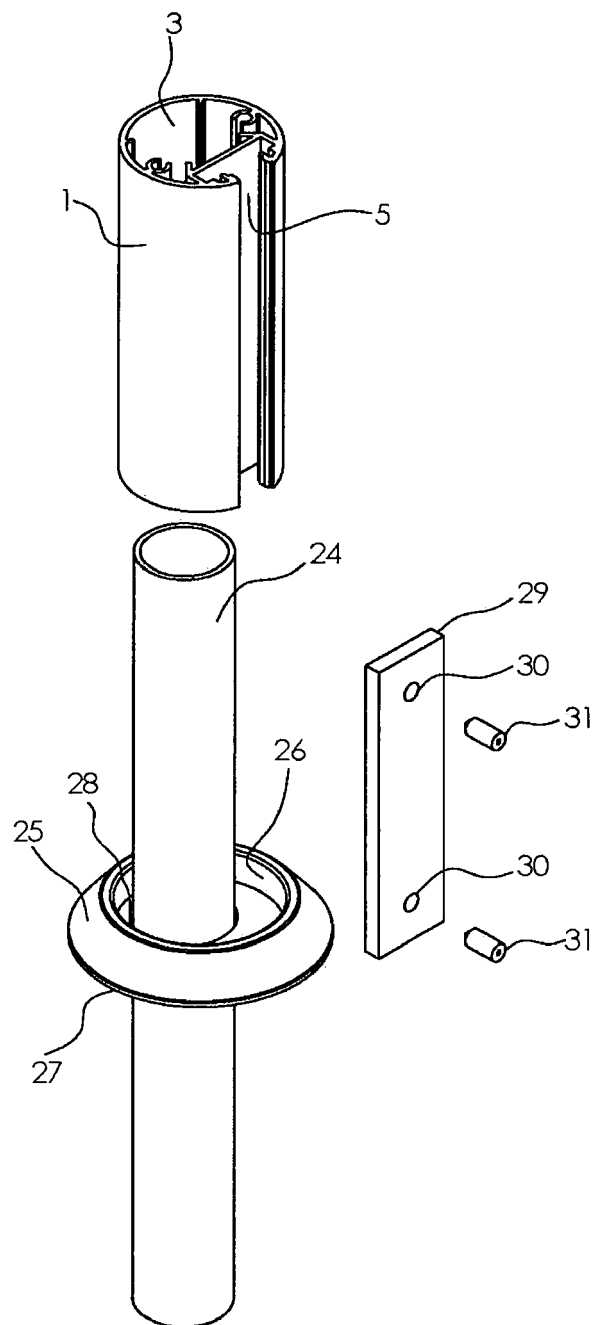


FIG. 4a

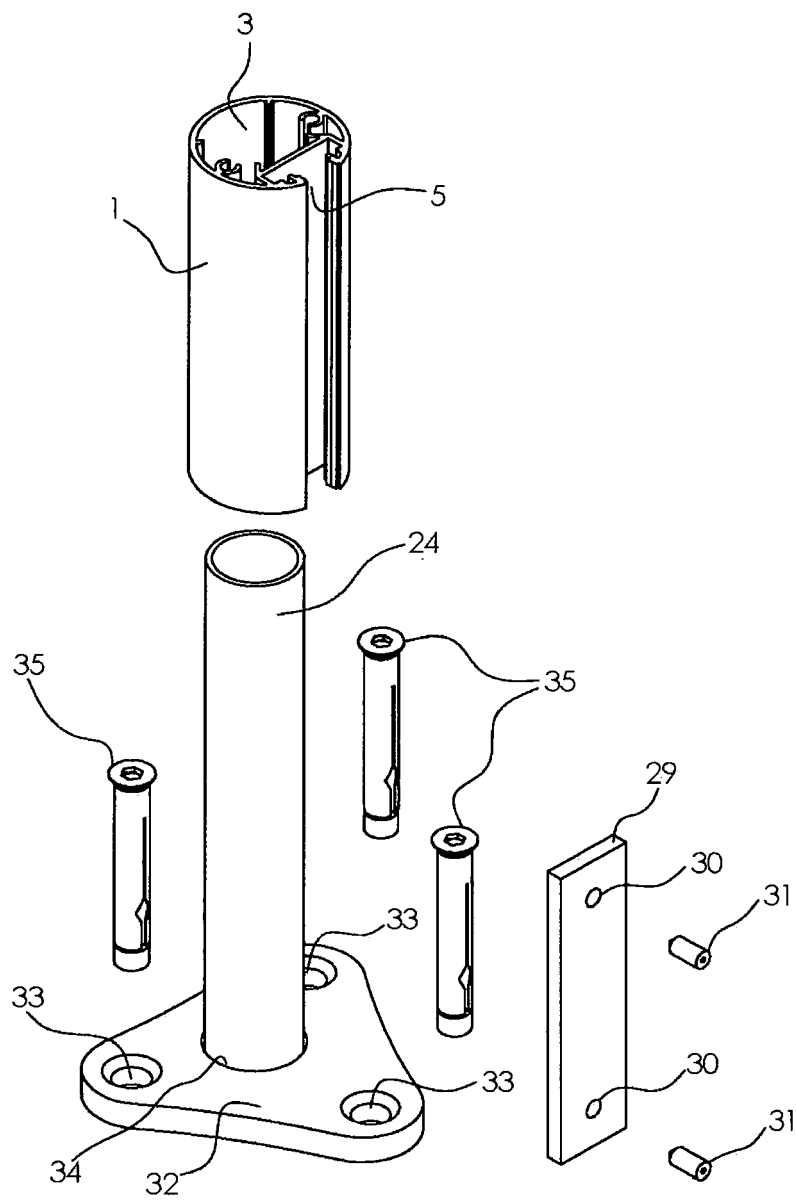


FIG. 4b

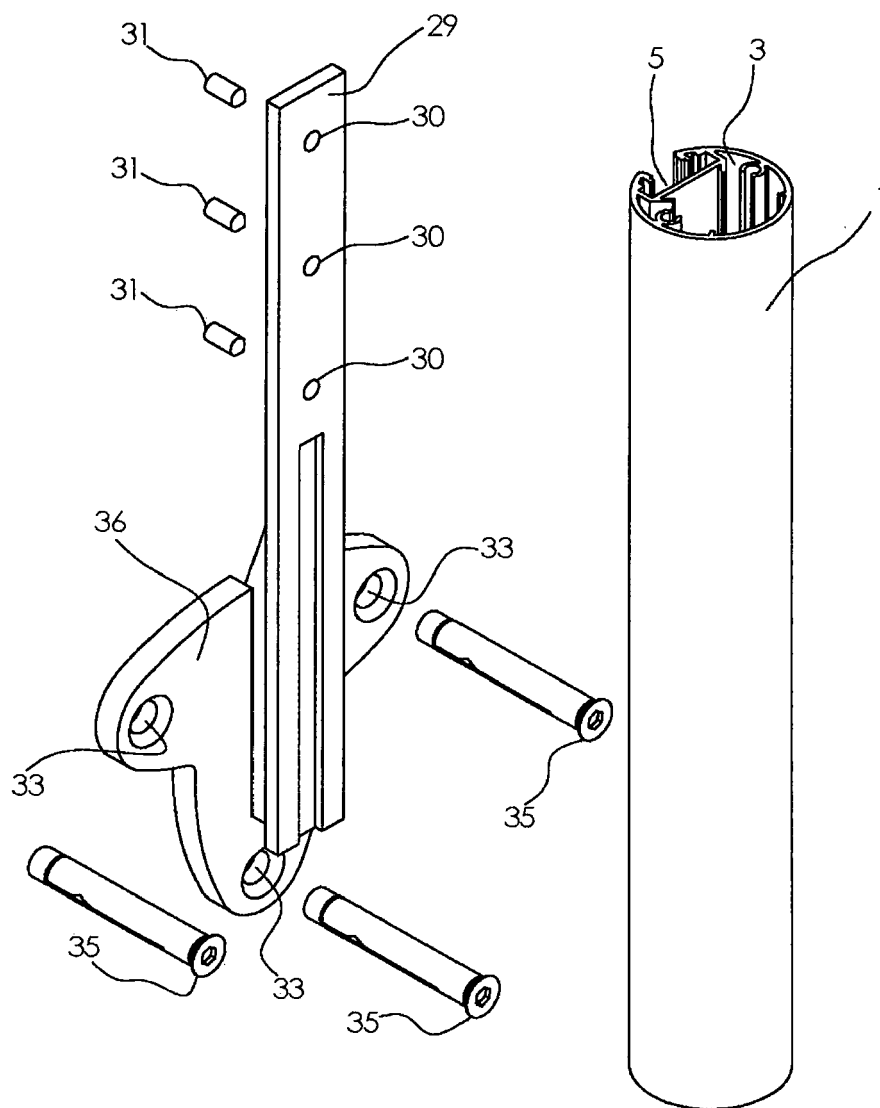


FIG. 4c

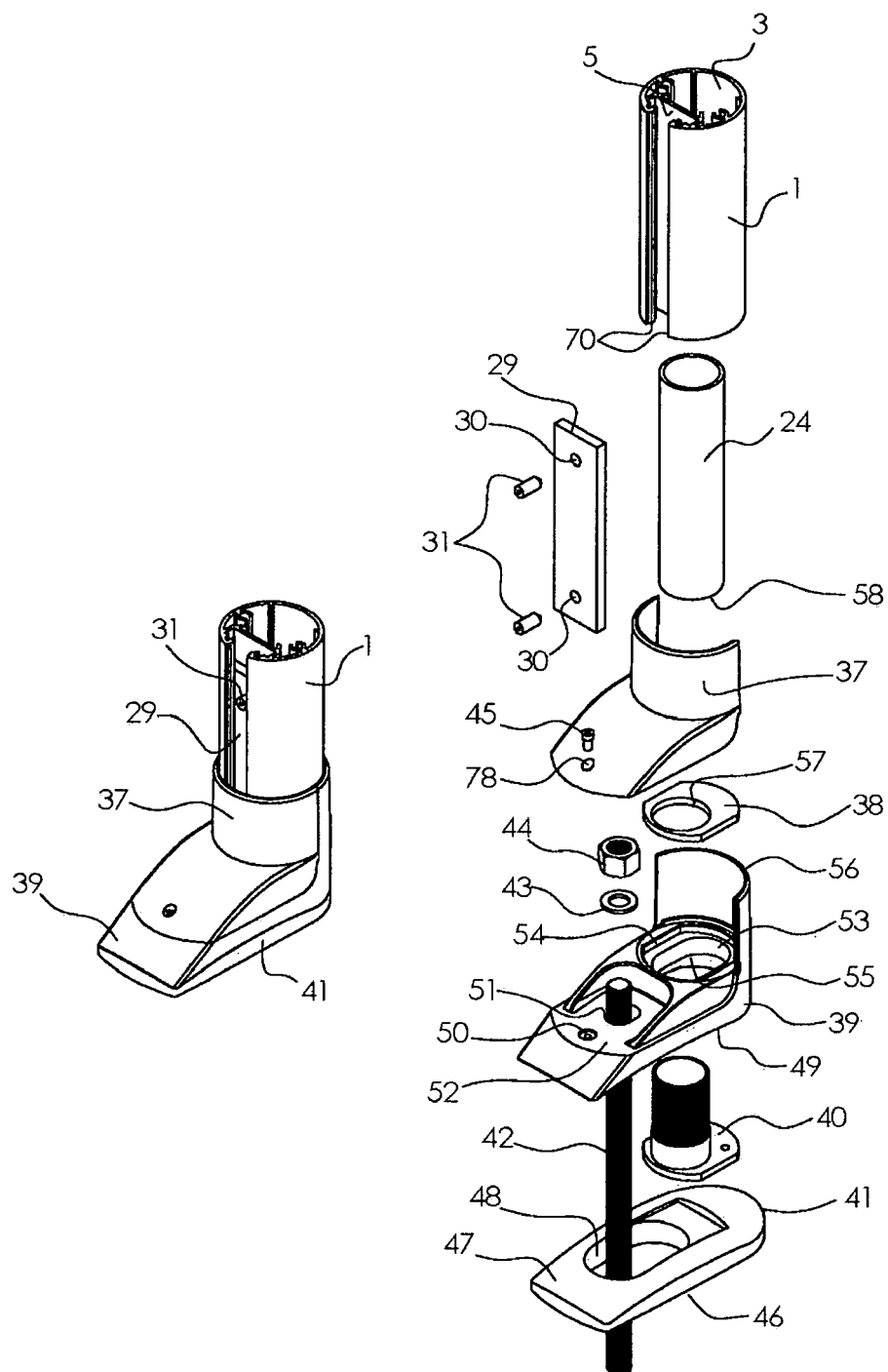


FIG. 5

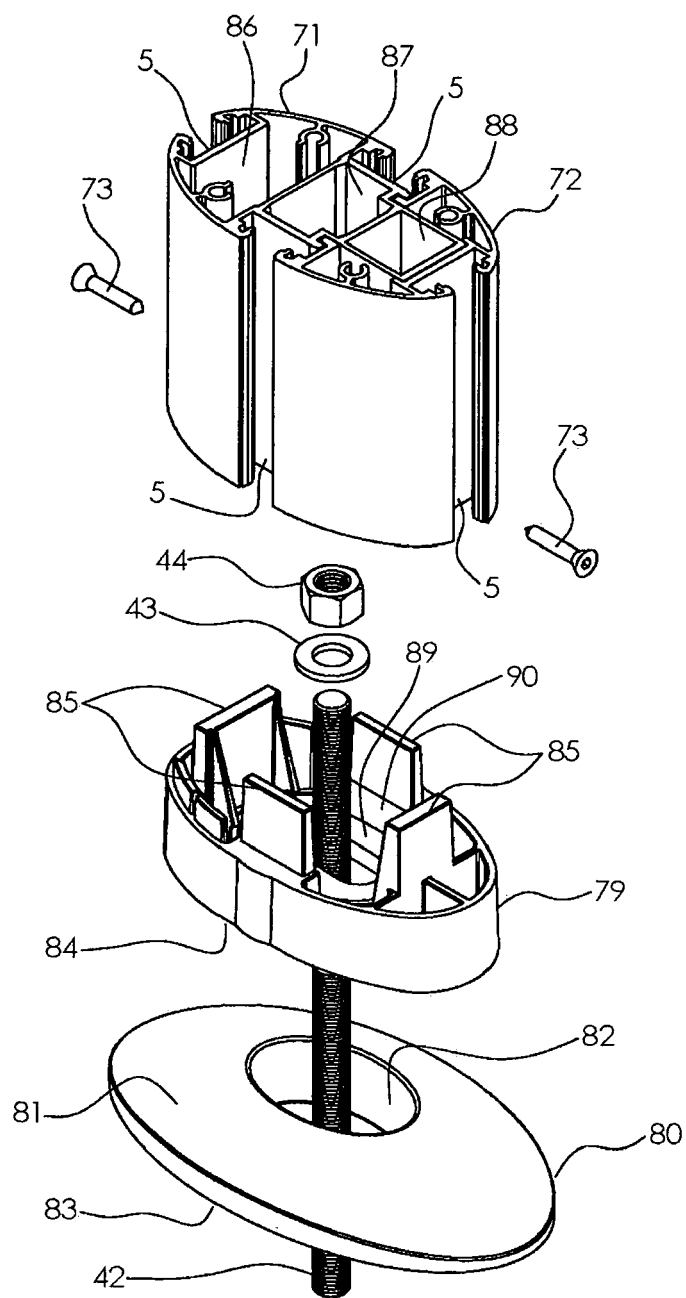


FIG. 6a

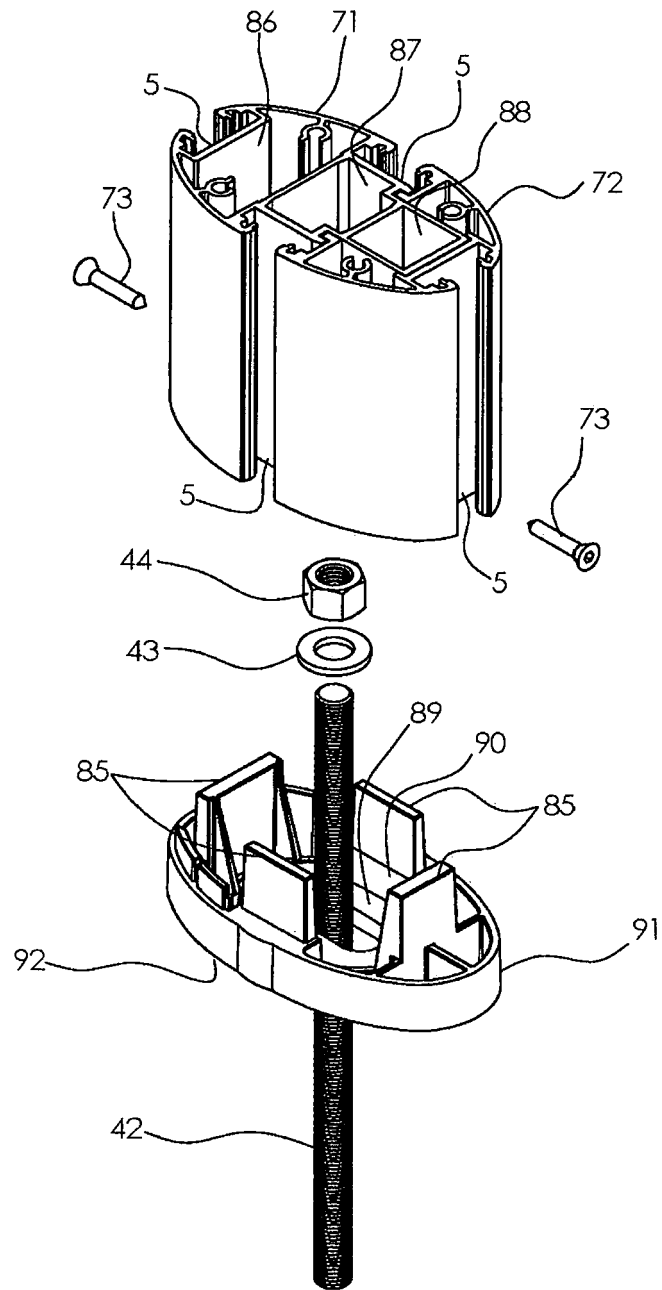


FIG. 6b

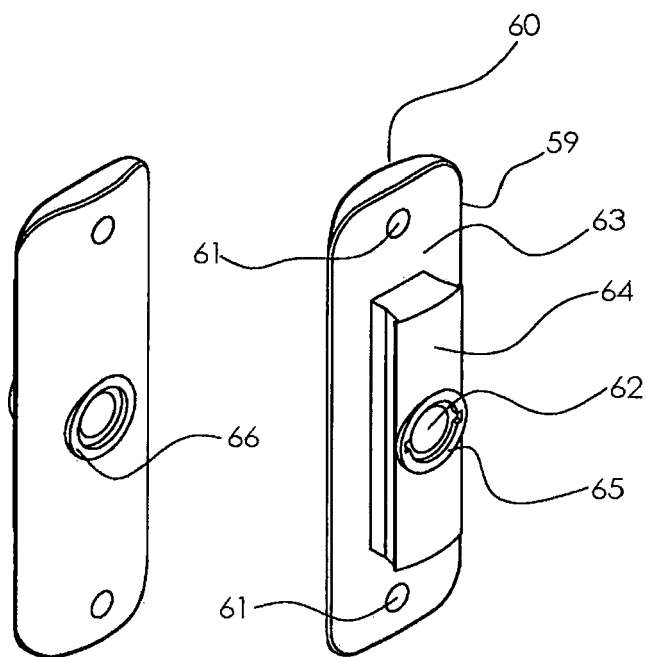


FIG. 7a

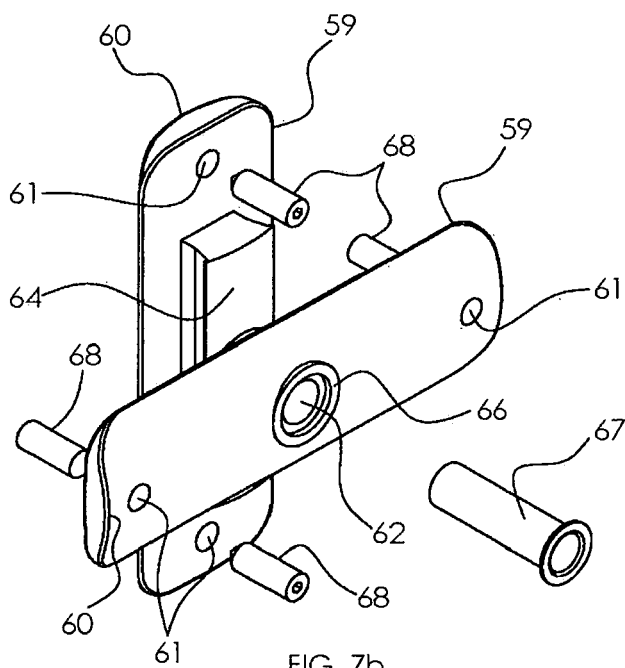
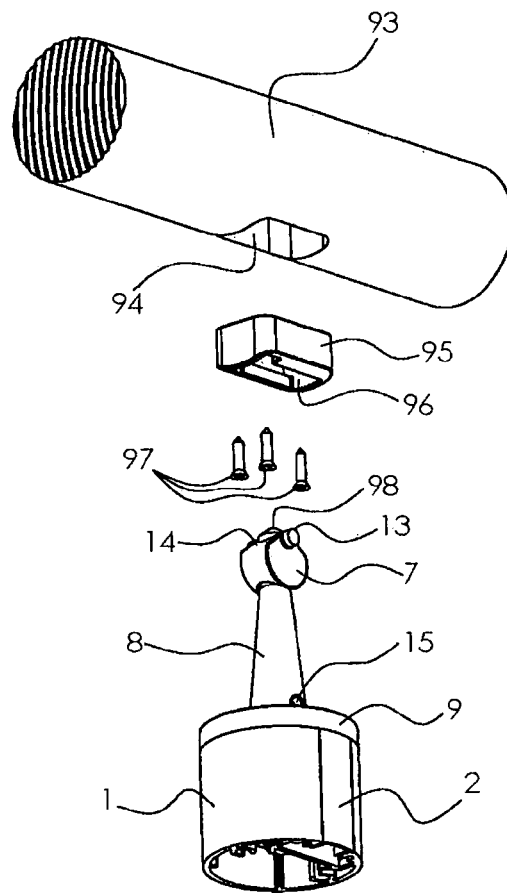
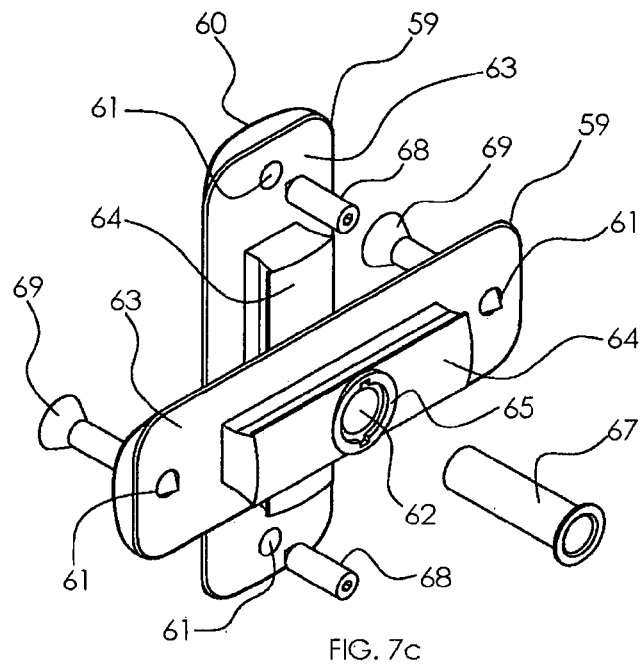


FIG. 7b



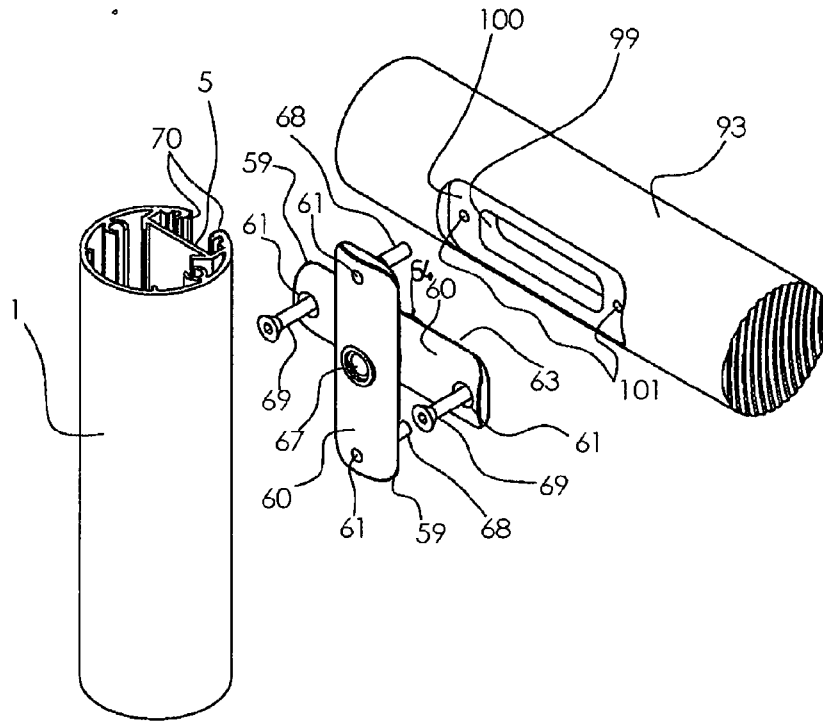


FIG. 9

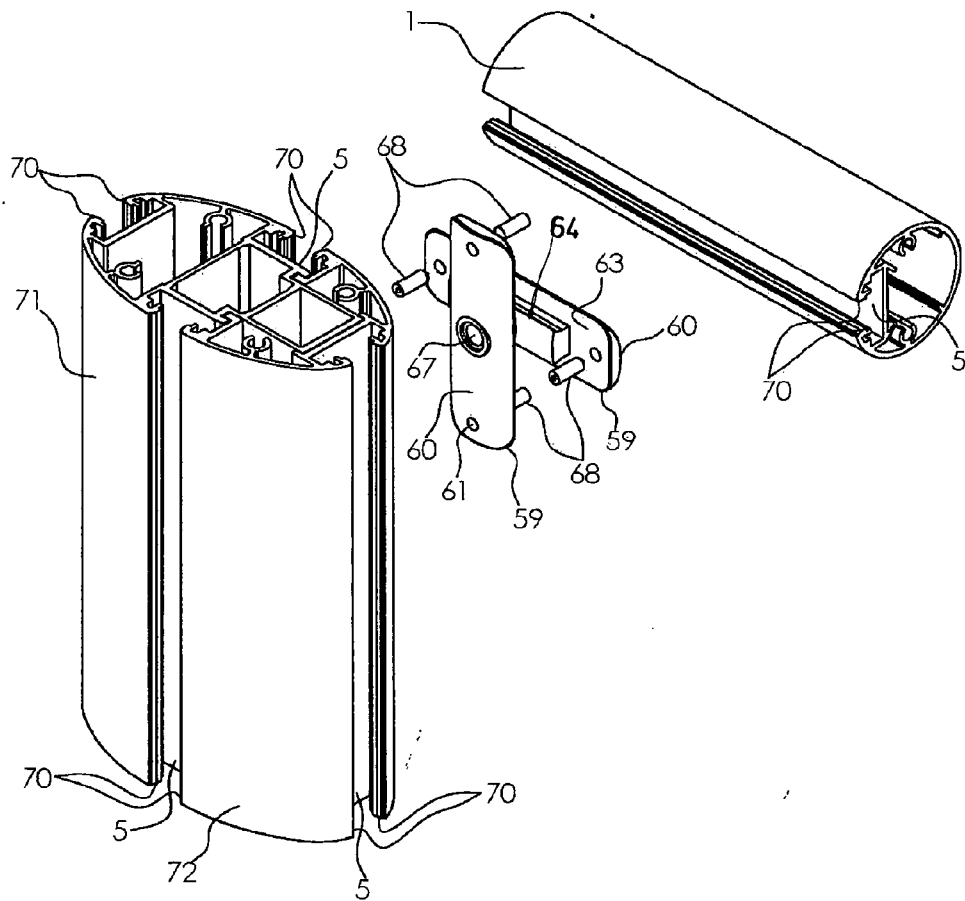


FIG. 10

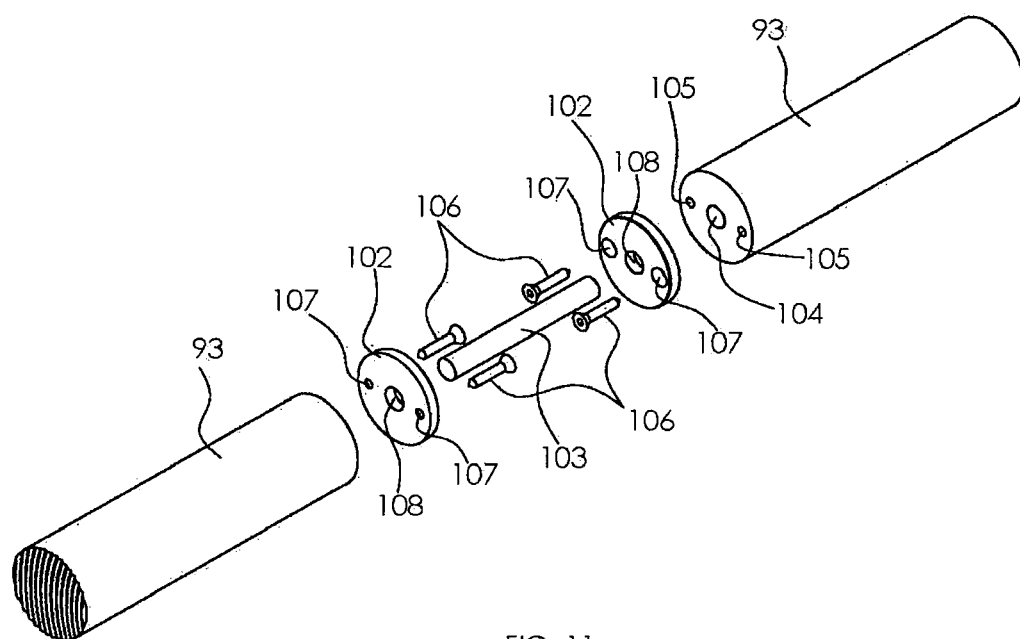


FIG. 11

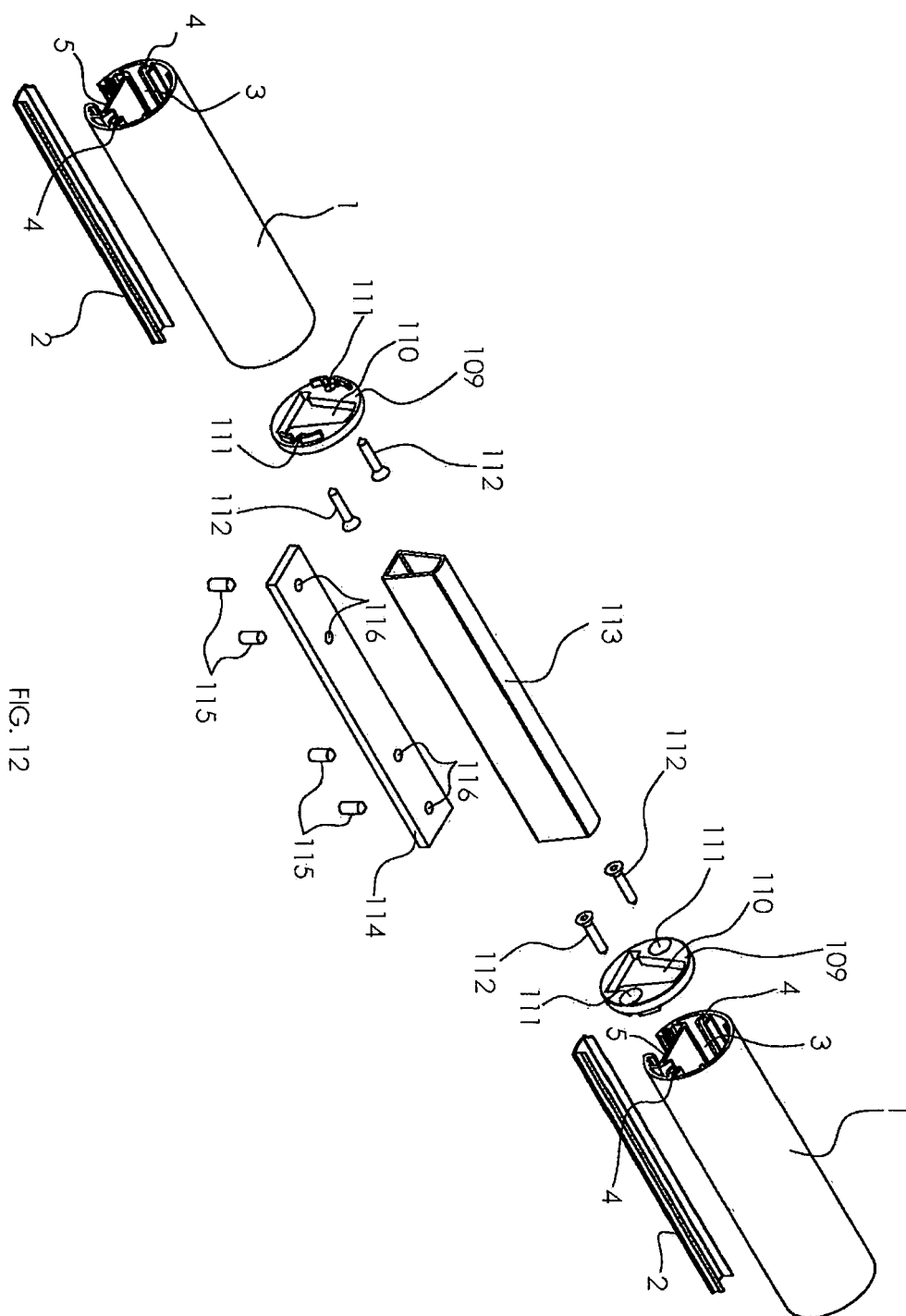


FIG. 12

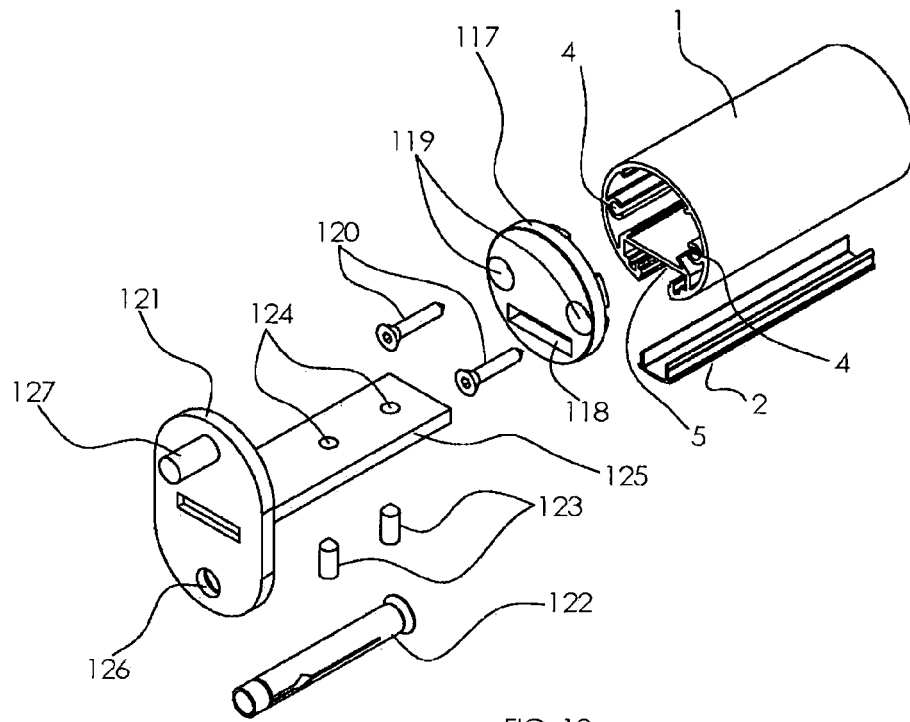


FIG. 13a

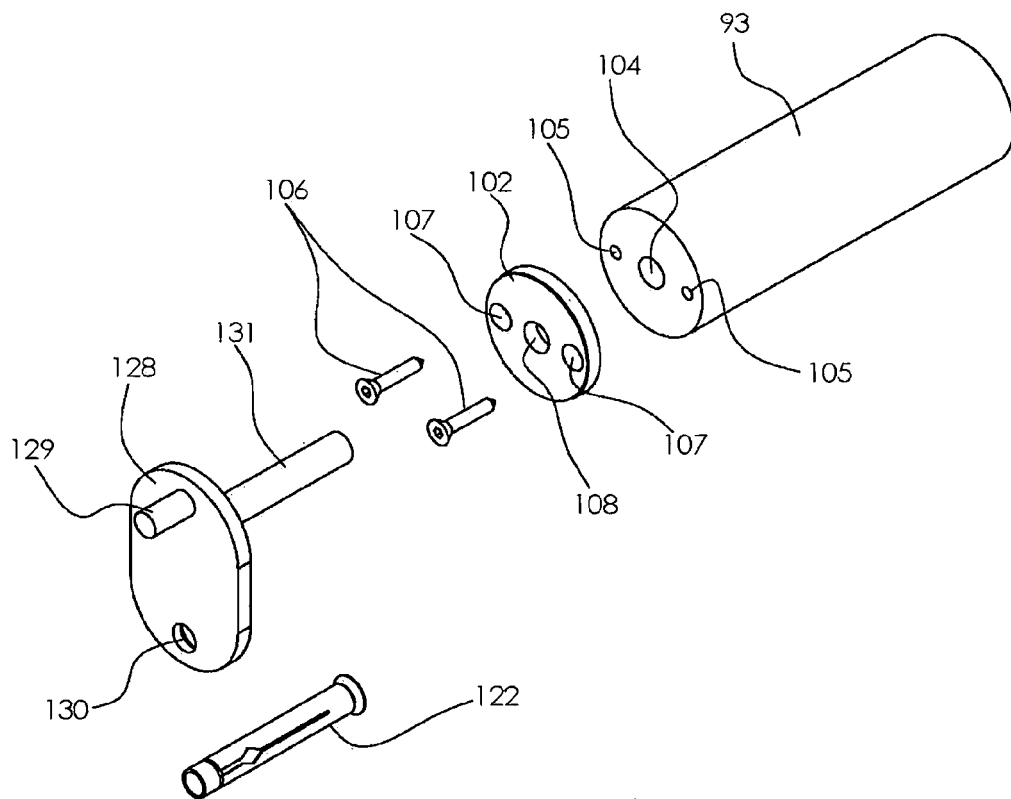


FIG. 13b

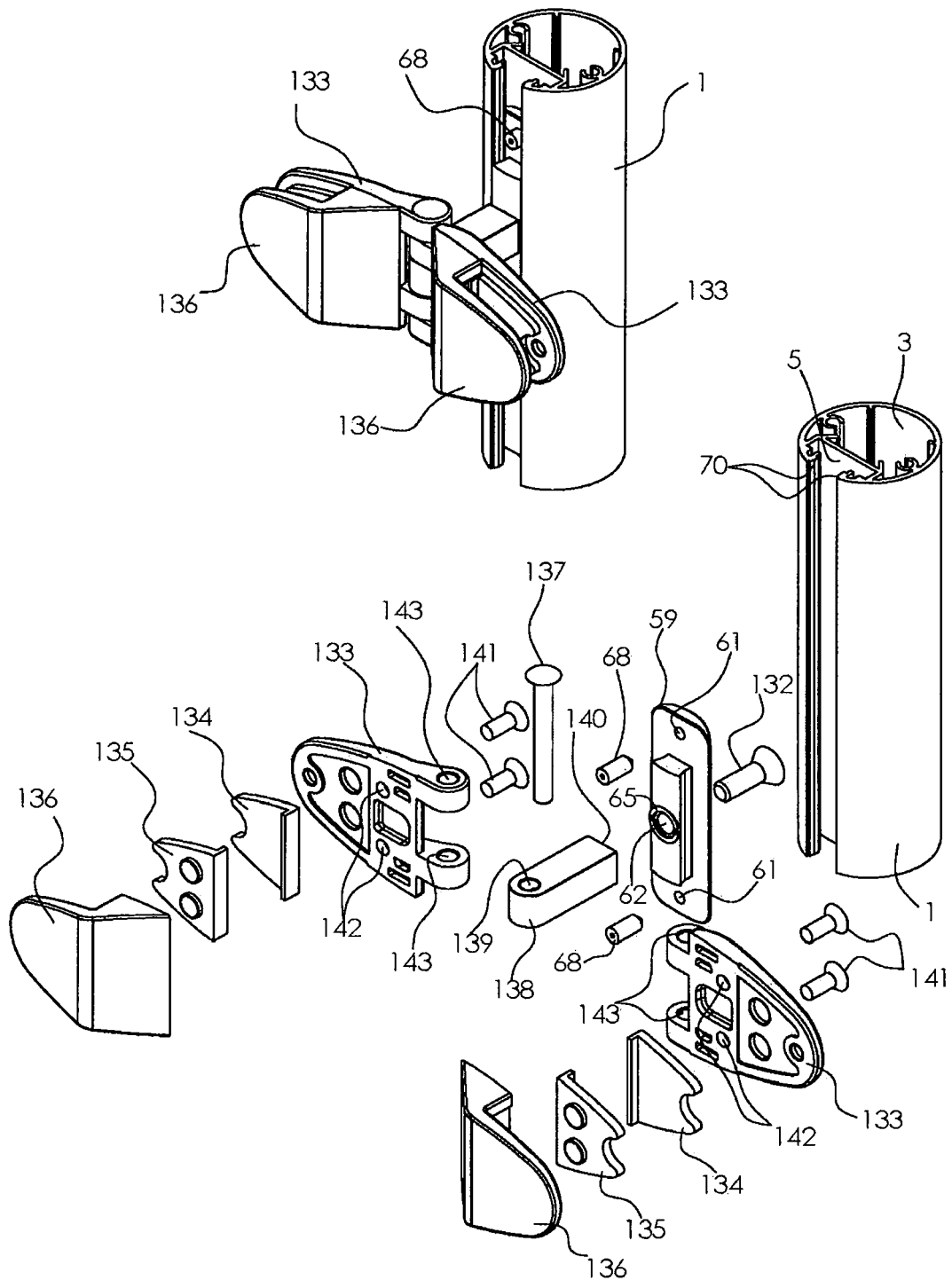


FIG. 14

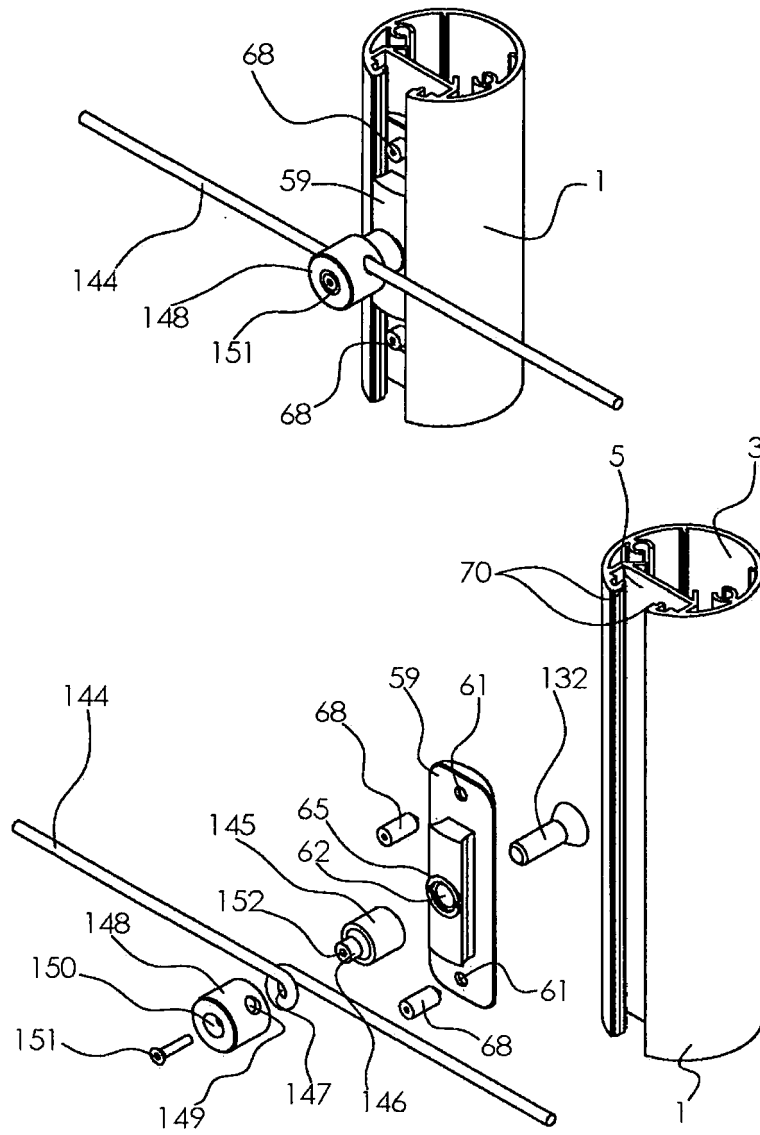


FIG. 15



EUROPEAN SEARCH REPORT

Application Number
EP 08 38 0138

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 13 October 2008	Examiner Schmidt, Carola
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EP 08 38 0138

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