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(54) **SUSPENDED FITTINGS, ESPECIALLY FOR UNIT FURNITURE OR SHELVING SYSTEMS**

(57) A suspended fitting especially for unit furniture or shelf frameworks formed by a mutually demountable way set suspended rail (1) and an assembly unit (2) where the assembly unit (2) contains a base body (21) formed by a thin-walled recess (211) modified for fixation of rectifying components and equipped with structural elements for setting and fixation to a furniture component (4). The essence of the invention is that the rectifying components of the assembly unit (2) are formed by a mutually demountable way connected plate nut (22) and a multi-part cam rectifying element (23) set in a through recess (218) of the central part of the base body (21) where the cam rectifying element (23) consists of a flat positioning cam (231) firmly connected with a hollow set screw (233) in whose inner cavity (2332) is placed a fixation set screw (234), whereas the suspended rail (1) is modified for a seat and guidance of the positioning cam (231) in parallel direction with a support surface of the base body (21).

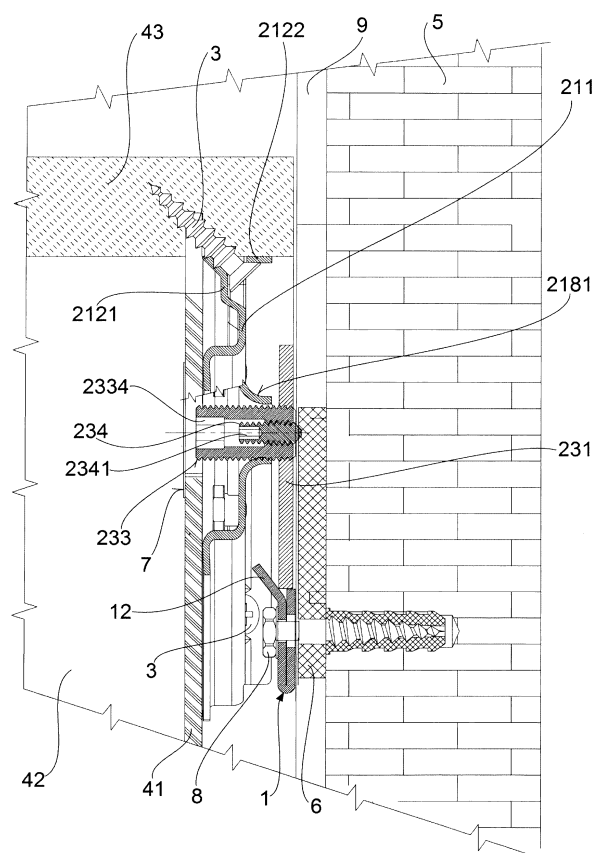


FIG. 14

Description

Art domain

[0001] The invention concerns a new design of the suspended fitting which is designed to be used especially for fixing, accurate setting and securing of kitchen unit furniture or shelf frameworks for the walls of interiors of the buildings.

Present prior art

[0002] At present are in the furniture industry used various suspended fittings which serve for fixation of furniture components, for example cabinets or shelves, on the walls or screens of interiors of the buildings. The design of the suspended fittings differs according to the type of suspending components and their requested maximal load, they differ according to type of the material into which are fixed and especially according to the method if they are fixed on the supporting framework or directly on the wall. In case of use of fittings for fixation of furniture units, for example kitchen units, is required for these fittings to enable vertical and horizontal rectifying of furniture components and also setting of the slant of the component in the frontward direction when is necessary to adjust it due to wall or screen unevenness for given furniture set to look like a monolithic unit. These are mostly two-part fittings whose first part contains a base board and is fixed on the corpus of furniture component and the second part is formed as a supporting plate which is fixed on the wall or framework and it is from above fixed the base board. Adjustment of the position of furniture components is designed as sets of rectifying screws, shanks, hinged arms, connections or pegs procured in the end parts with a slant dentation and exemplary designs of suspended furniture fittings are described in the files EP 707815, EP 555924, IT 1237839, EP 636328, EP 2149316, EP 2520198, EP 2412275, EP 2997854, EP 2786676, EP 389053, EP 1844682, EP 3025620, EP 2696725, EP 1250070, EP 2627216, EP 2219495, EP 2946692, EP 3045077, US 9033294 or EP 2654508. Known designs of suspended fittings are altogether structurally difficult, they are relatively heavy and require quite considerable build-up space, which in many cases negatively influences also design of furniture components. Another disadvantage of known designs is that the fitting enables relatively small correction of resetting of furniture components in horizontal and vertical direction which makes preparation of the assembly works difficult, especially accuracy of fixation of suspended boards on the wall. Another disadvantage is the necessity of formation of relatively big manipulation openings in the back wall of the component which enables access to rectifying elements of the fitting and with it connected necessity of use of big covers for blinding of these openings. And final disadvantage is that known designs of the fitting mostly do not allow universal use on both sides of the

furniture component and have to be produced in two types, namely right-sided and left-sided.

[0003] The aim of presented invention is to enhance the assortment of suspended fittings with a new design of this assembly element which basically removes all mentioned drawbacks of known designs, is simple concerning design and production, has low weight, is universally usable for left and right side of furniture components, enables quite big correction of setting of the furniture component on the wall and all of this with use of only one small assembly opening in the back wall of the furniture component and one special assembly tool.

Essence of the invention

[0004] The given target is reached with an invention which is a suspended fitting especially for unit furniture or shelf frameworks formed by mutually demountable way set a suspended rail and an assembly unit where the assembly unit contains a base body formed by a thin-walled recess modified for fixation of rectifying components and equipped with structural elements for setting and fixation to furniture component. The essence of the invention is in the fact that the rectifying components of the assembly unit are formed by mutually demountable way connected a plate nut and a multi part cam rectifying element set in a through recess of the central part of the base body where the cam rectifying element consists of a flat positioning cam firmly connected to a hollow set screw in whose inner cavity is placed a fixation set screw, whereas the suspended rail is adapted in the way to seat and guide the positioning cam in direction which is parallel to the support surface of the base body.

[0005] In an advantageous design is the base body shaped as trapezoid and its side arms form an angle 90° , they are shaped as peripheral grooves finished with support walls wherein the long base and also short base of the base body are equipped with support welts whose end parts are led in parallel with the central surface of the base body whereas the end parts of the peripheral grooves of the side arms adjacent to the long base are equipped in an outward direction transversally led distant lugs whose peripheral edges are at the same level as the supporting welts.

[0006] It is also advantageous when the distant lugs are tilted under angle 45° and are press shaped from partial offcuts formed in the peripheral grooves.

[0007] Also is advantageous when a circular through recess is equipped with an output neck whereas the base body is on the wall opposed to formation of the through recess equipped with at least one positioning element whereas in an optimal case is the base body equipped with three positioning elements made as pegs with head.

[0008] Likewise is advantageous when a plate nut is formed with a flat circular disc in whose central part is formed a connecting opening whose diameter size corresponds with the diameter of the output neck of the base body and which is equipped with an inner thread and also

there are on its perimeter formed two opposed in direction to the perimeter of the disc placed rounded recesses.

[0009] And finally is advantageous when a cam rectifying element consists of a flat positioning cam in which if formed a thread opening which is situated asymmetrically and inside of it is fixed a hollow set screw whose inner thread diameter and lead corresponds with the size of the inner thread of the plate nut whereas the surface of the inner cavity of the set screw is not only in the part which adjoins to the positioning cam equipped with a connecting thread for placement of a fixation set screw which is equipped with a front hexagonal manipulation cavity but also in the end part which is screwed into the nut plate with an inner hexagon.

[0010] In an optimal case is the fitting completed with one or more support pads which are equipped with side notches which dimensionally correspond with assembly opening in the suspension rail whereas on their inner centre directed surfaces are formed seats for rest on the support surface of the inner arm of the suspended rail.

[0011] The presented invention achieves new and higher efficiency because the suspended fitting has a simple design thus is also easy for production with use of relatively low financial costs. Big benefit is the fact that it has low height thus it requires small assembly space and it is usable without any problems even for furniture components whose back wall is 10mm distant from back edge of the side plate. Mutual setting of the functional elements of particular parts of the fitting enables their resetting in horizontal direction of 14mm to the left and right, possibly even more, which requires lower accuracy during primary assembly. At the same time the design ensures a firm and easy fixation of the base board of the fitting in the side plate of furniture component and enables use of thicker connection screws which increases firmness of the connection of the fitting and the furniture component and virtually eliminates its break out. Finally a shift of position of the connection screws with their slant direction nearly eliminates damage of the furniture component during the assembly of the fitting. An indispensable advantage is also possibility of easy rectification of the position of the fitting in horizontal and vertical direction through one small assembly opening formed in the back wall of the furniture component which is covered only with a sticker. Big advantage of new fitting is likewise its possible universal use for assembly of left and right side plate of the furniture without any structural modification.

Description of enclosed drawings

[0012] Particular examples of design of the invention are schematically illustrated in enclosed drawings where:

Fig. 1 is a front view of the fitting set for fixation by the right side plate of the furniture,
fig. 2 is a front view of the fitting set for fixation by the left side plate of the furniture,
fig. 3 is an axonometric view of the fitting from the

fig. 1 transversal from the right,

fig. 4 is an axonometric view of the fitting from the fig. 3 rotation 90°,

fig. 5 is an axonometric view of the fitting from the fig. 3 rotation 135°,

fig. 6 is an axonometric view of the fitting from the fig. 3 rotation 180°,

fig. 7 is an exploded axonometric view of the fitting from the fig. 4,

fig. 8 is a partial axonometric view of the fitting from the fig. 7 rotation 180°,

fig. 9 is an axonometric view of two suspended fittings fixed by the left and right side plate of neighboring furniture components,

fig. 10 is a vertical axial cut of the fitting which is fixed in the furniture part and fixed on the wall,

fig. 11 is an axonometric view of supporting pad of the fitting,

fig. 12 is an axonometric view of the fitting from the fig. 5 equipped with the supporting pad,

fig. 13 is an exploded view of the fitting from the fig. 12 and

fig. 14 is a vertical axial cut of the fitting from the fig. 12 fixed in the furniture component and fixed on the wall.

[0013] The drawings which illustrate introduced invention and consequently described examples of particular design do not in any case anyhow limit the extent of the protection yet merely clarify the essence of the invention.

Examples of invention design

[0014] A suspended fitting according to the invention is formed by two mutually demountable-way connectable basic parts namely a suspended rail 1 and an assembly unit 2 which consists of a basic body 21, a plate nut 22, a multipart cam rectifying element 23. The suspended rail 1 is made of strip iron shaped into two parallel vertically directed an outer arm 11 and an inner arm 12 where the outer arm 11 is straight and the inner arm 12 is in its upper part bent outward thus it forms a horizontal guiding groove in the shape of a one side fork designed for support and side movement of particular part of the cam rectifying element 23 of the assembly unit 2. On the outer arm 11 and also on the inner arm 12 are at the same horizontal level formed couples of oval shaped outer assembly openings 111 and inner assembly openings 121 where the outer assembly openings 111 are wider with widening in direction to themselves, so they form on the outer arm 12 supporting surfaces 122 whose function will be described below.

[0015] The base body 21 is formed by an indented thin-walled pressed piece 211 in the shape of trapezoid which is made for example by pressing from metal sheet and whose side arms 212 form an angle 90° and are shaped as peripheral grooves 2121 finished with supporting walls 2122. A long basis 213 and also a short basis 214 of the

base body 21 are equipped with a L-shaped supporting welts 215 whose end parts 2151 are led in parallel with a central surface of the base body 21. The end parts of the peripheral grooves 2121 of the side arms 212 adjacent to the long basis 213 are equipped in an outward transversal direction with distant lugs 216 sloping under angle 45° which are press shaped from partial offcuts 217 formed in the peripheral grooves 2121 and whose peripheral edges are on the same level as the supporting welts 215. In the central part of the base body 21 is formed a circular through recess 218 which is equipped with an output neck 2181 designed for setting and assembly of further elements of the assembly unit 2 to which is likewise designed a trinity of positioning elements 219 formed as pegs with a head which are fixed on wall of the base body 21 opposed to the place of the central recess 218. And then the central part of the base body 21 is equipped with a set of unspecified technological recesses 2101 which serve as improvement of strength parameters of this structural element.

[0016] The plate nut 22 is formed by a flat circular disc 2201 in whose central part is formed a connection opening 2202 whose diameter size corresponds with the diameter of the output neck 2181 of the base body 21 and which is equipped not only with an inner thread 2203 but also there are on its perimeter formed two opposed in direction to the perimeter of the disc 2201 situated rounded recesses 2204.

[0017] The cam rectifying element 23 consists of a flat positioning cam 231 in which is formed a thread opening 232 which is placed asymmetrically and is in it fixed, preferably pressed-in, a hollow set screw 233 whose inner thread 2331 diameter and lead corresponds with the dimensions of the inner thread 2203 of the plate nut 22. The surface of the inner cavity 2332 of the set screw 233 is not only in the part adjoining to the positioning cam 231 equipped with a connecting thread 2333 for setting of a fixation set-screw 234 which is equipped with a front hexagonal manipulation cavity 2341 but also is in its end part which is screwed in the plate nut 22 equipped with an inner hexagon 2334 which is evident from the figs. 7 and 8. The front of the set screw 233 which adjoins to this manipulation cavity 2341 is equipped with at least one, preferably six, deformation zone 2335, for example a recess for possibility to secure mutual dead setting of the positioning cam 231 and the set screw 233 after assembling of the rectifying element 23.

[0018] The described design of the suspended fitting is not only possible design according to the invention, as for possibility of perfect fixation of the furniture parts 4 even on the walls 5 whose parts are covered with a ceramic or other tiles 9 is possible to complete the fitting with one or more supporting pads 6 as it is illustrated in figs. 11 to 14. These supporting pads 6 are equipped with side notches 61 which dimensionally correspond with outer assembly openings 111 of the suspended rail 1 whereas on their inner centrally directed surfaces are formed seats 62 of rest on the supporting surfaces 122

of the inner arm 12 of the suspended rail 1 during the assembly of the fitting. According to the thickness of the tiles there can be during assembly used one or more supporting pads 6.

[0019] The assembly of the suspended fitting goes in three steps when in the first independent phase is fixed the set screw 233 in the positioning cam 231 in the way that its end part matches the front surface of the positioning cam 231 and into its inner cavity 2332 is screwed the fixing set screw 234. In the second phase is the plate nut 22 placed above the central through recess 218 of the base body 21 where it is locked against the movement in the axial direction by the help of positioning elements 219. Then is the structural set, formed by the positioning cam 231, the set screw 233 and the fixation set screw 234, screwed from the side of the output neck 2181 in the connecting opening 2202 of the plate nut 22, herewith is the suspended fitting ready as an unit for fixation into selected furniture part 4.

[0020] Before the installation of the suspended fitting into the furniture part 4, for example a kitchen cabinet, is into its back wall 41, milled the assembly opening 411 in the level of expected placement of the central axis of fixed base body 21 in which is placed the set screw 233 of the cam rectifying element 23. On the wall 5 is by the help of fixing screws 8 fixed the suspended rail 1 in the vertical level which enables contact of the surfaces of its guiding groove with the side surface of the positioning cam 231 of the cam rectifying element 23 of assembled ready-made assembly unit 2.

[0021] After these preparatory steps is the assembly unit 2 fixed to the furniture component 4 in the way that is, by the help of the connecting screws 3 transversally led in partial offcuts 217, screwed to the side plate 42 and also to the upper wall 43 of the furniture component 4.

[0022] During rectification of the furniture component 4 on the wall 5 is at first done through turning of the positioning cam 231 of the rectifying element 23 by the help of a special spanner inserted through the manipulation opening 411 of the back wall 41 of the furniture component 4 into the inner hexagon 2334 in the rightward direction the first setting of its vertical suspension on the left side and then is the same action carried out on the right side in the way to be maximally used possible tolerance 17mm for accurate setting of the vertical position of the furniture component 4. This is possible to do even for neighboring part of the furniture unit as it is illustrated in fig. 9. Then is done locking of the furniture component 4 against fall out by the help of fixing set screw 234 which is equipped on the outer end part with an unmarked tip for better fixation in the wall 5. Then is done by the help of rotating of the plate nut 22 to the left or right by the help of a special non-illustrated tool inserted into their recesses 2204 setting of suspension of the furniture component 4 in direction of possible tilt with regard to the wall 5 and herewith are compensated unevenness and imperfections of its surface. In the next step of the assembly is locked mutual coupling of the set screw 233 against

rotation in the plate nut 22 namely by the hit of non-illustrated mean on the deformation zones 2335 whereby comes to deformation of adjoining profiles of the inner thread 2203 of the disc 2201 of the plate nut 22 and the inner thread 2331 of the set screw 233 and to locking of their fixed non-rotating connection. At the end is the manipulation opening 411 of the back wall 41 covered with a cover 7.

Industrial utility

[0023] The suspended fitting designed according to presented invention is to be used for fixation, accurate setting and locking of kitchen unit furniture or shelf frameworks on walls or screens of interior of buildings.

REFERENCE LIST

[0024]

1 Suspended rail
11 Outer arm
111 Outer assembly opening
12 Inner arm
121 Inner assembly opening
122 Support surface
2 Assembly unit
21 Base body
211 Thin-walled recess
212 Side arm
2121 Peripheral groove
2122 Support wall
213 Long basis
214 Short basis
215 Support welt
2151 End surface
216 Distant lug
217 Partial offcut
218 Through recess
2181 Output neck
219 Positioning element
2101 Technological recess
22 Plate nut
2201 Disc
2202 Connecting opening
2203 Inner thread
2204 Recess
23 Cam rectifying element
231 Positioning cam
232 Thread opening
233 Set screw
2331 Outer thread
2332 Inner cavity
2333 Connecting thread
2334 Inner hexagon
2335 Deformation zone
234 Fixing set screw
2341 Manipulation cavity

3 Connecting screw
4 Furniture component
41 Back wall
411 Manipulation opening
5 42 Side plate
43 Upper wall
5 Wall
6 Support pad
61 Side notch
10 62 Seat
7 Cover
8 Fixing screw
9 Tiling

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Claims

1. A suspended fitting especially for unit furniture or shelf frameworks formed by a mutually demountable way set suspended rail (1) and an assembly unit (2) where the assembly unit (2) contains a base body (21) formed by a thin-walled recess (211) modified for fixation of rectifying components and equipped with structural elements for setting and fixation to a furniture component (4) **wherein** the rectifying components of the assembly unit (2) are formed by a mutually demountable way connected plate nut (22) and a multi-part cam rectifying element (23) set in a through recess (218) of the central part of the base body (21) where the cam rectifying element (23) consists of a flat positioning cam (231) firmly connected with a hollow set crew (233) in whose inner cavity (2332) is placed a fixation set screw (234), whereas the suspended rail (1) is modified for a seat and guidance of the positioning cam (231) in parallel direction with the support surface of the base body (21).
2. The suspended fitting according to the claim 1, **wherein** the base body (21) is shaped as a trapezoid and its side arms (212) form angle 90°, are shaped as peripheral grooves (2121) finished with support walls (2122) where the long base (213) and also the short base (214) of the base body (21) are equipped with support welts (215) whose end parts (2151) are led in parallel with the central surface of the base body (21), whereas the end parts of the peripheral grooves (2121) of the side arms (212) adjacent to the long base (213) are equipped with in an outward direction transversally led distant lugs (216) whose peripheral edges are in the same level as the support welts (215).
3. The suspended fitting according to the claim 2, **wherein** the distant lugs (216) are tilted under the angle 45° and are press shaped from partial offcuts (217) formed in the peripheral grooves (2121).
4. The suspended fitting according to some from the

claims 1 to 3, **wherein** circular through recess (218) is equipped with an output neck (2181) whereas the base body (21) is on the opposed wall from position of the through recess (218) equipped with at least one positioning element (219).

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5. The suspended fitting according to the claim 4, **wherein** the base body (21) is equipped with three positioning elements (219) formed as pegs with a head.

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6. The suspended fitting according to some from the claims 1 to 5, **wherein** the plate nut (22) is formed by a flat circular disc (2201) in whose central part is formed a connecting opening (2202) whose diameter size corresponds with the diameter of the output neck (2181) of the base body (21) and which is equipped not only with an inner thread (2203) but also there are on its perimeter formed two opposed in direction toward the perimeter of the disc (2201) situated rounded recesses (2204).

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7. The suspended fitting according to some from the claims 1 to 6, **wherein** the cam rectifying element (23) consists of a flat positioning cam (231) in which is formed a thread opening (232) which is placed asymmetrically and is in it fixed a hollow set screw (233) whose inner thread (2331) diameter and lead corresponds with the size of the inner thread (2203) of the plate nut (22), whereas the surface of the inner cavity (2332) of the set screw (233) is, not only in the part adjoining to the positioning cam (231) equipped with a connecting thread (2333), for insertion of the fixation set screw (234), which is equipped with a front hexagonal manipulation cavity (2341), but also in the end part of screwed into the plate nut (22) with an inner hexagon (2334).

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8. The suspended fitting according to some from the claims 1 to 7, **wherein** it is completed with one or more support pads (6) which are equipped with side notches (61) which dimensionally correspond with outer assembly openings (111) of the suspended rail (1), whereas on their inner centrally directed surfaces are formed seats (62) for seat of the support surface (122) of the inner arm (12) of the suspended rail (1).

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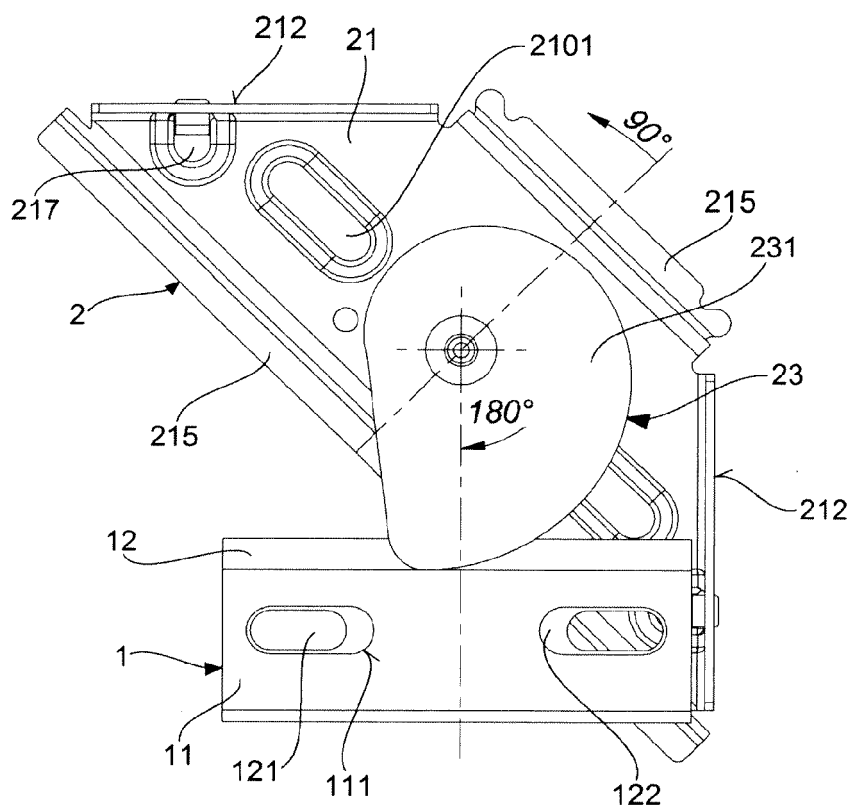


FIG. 1

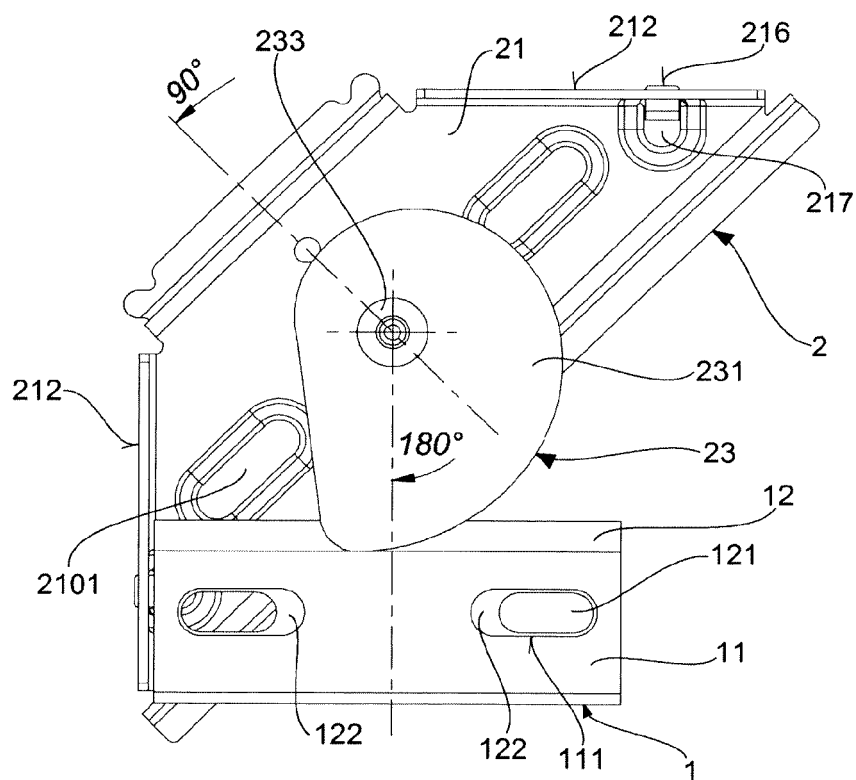
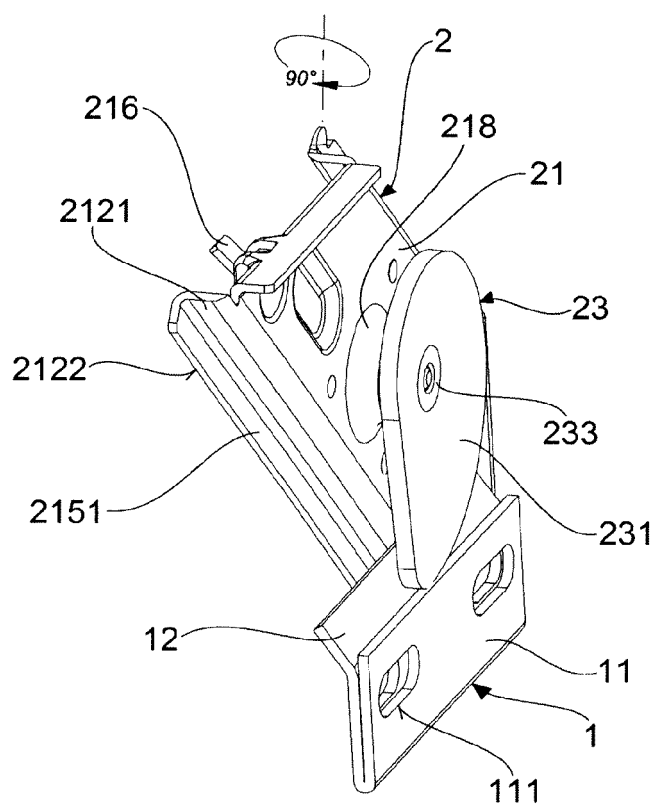
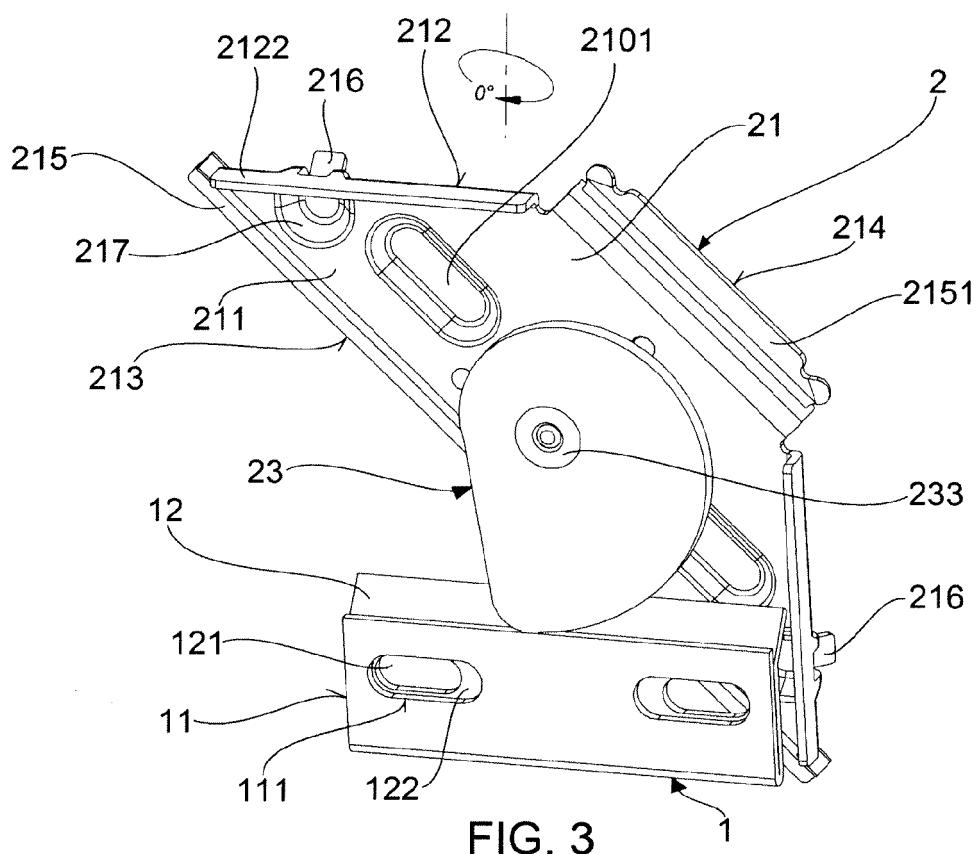


FIG. 2



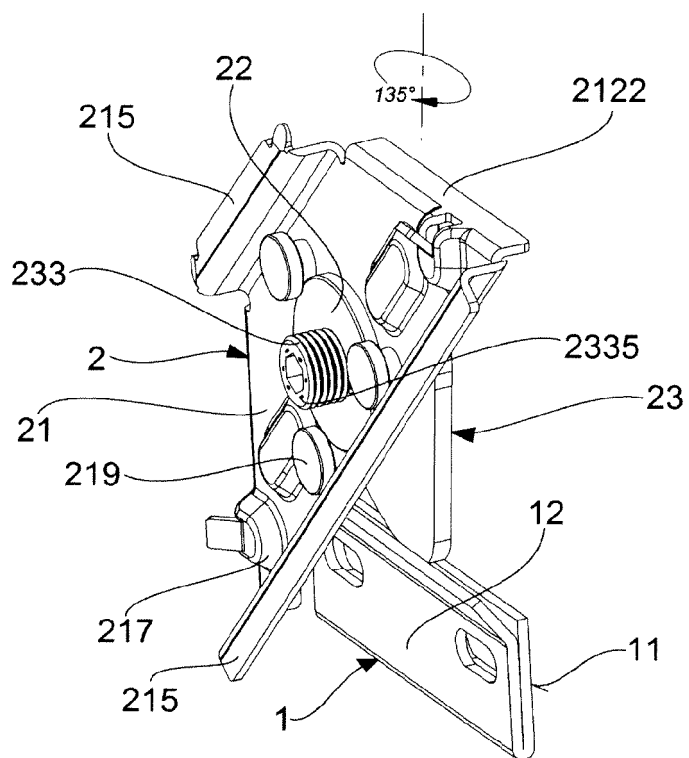


FIG. 5

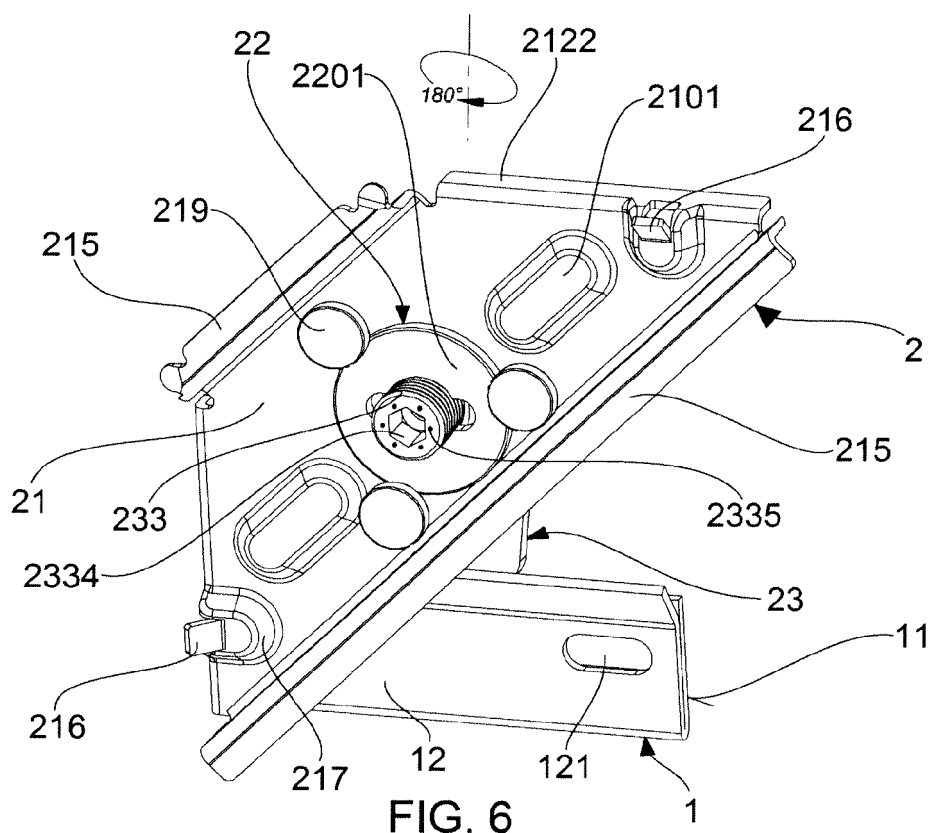


FIG. 6

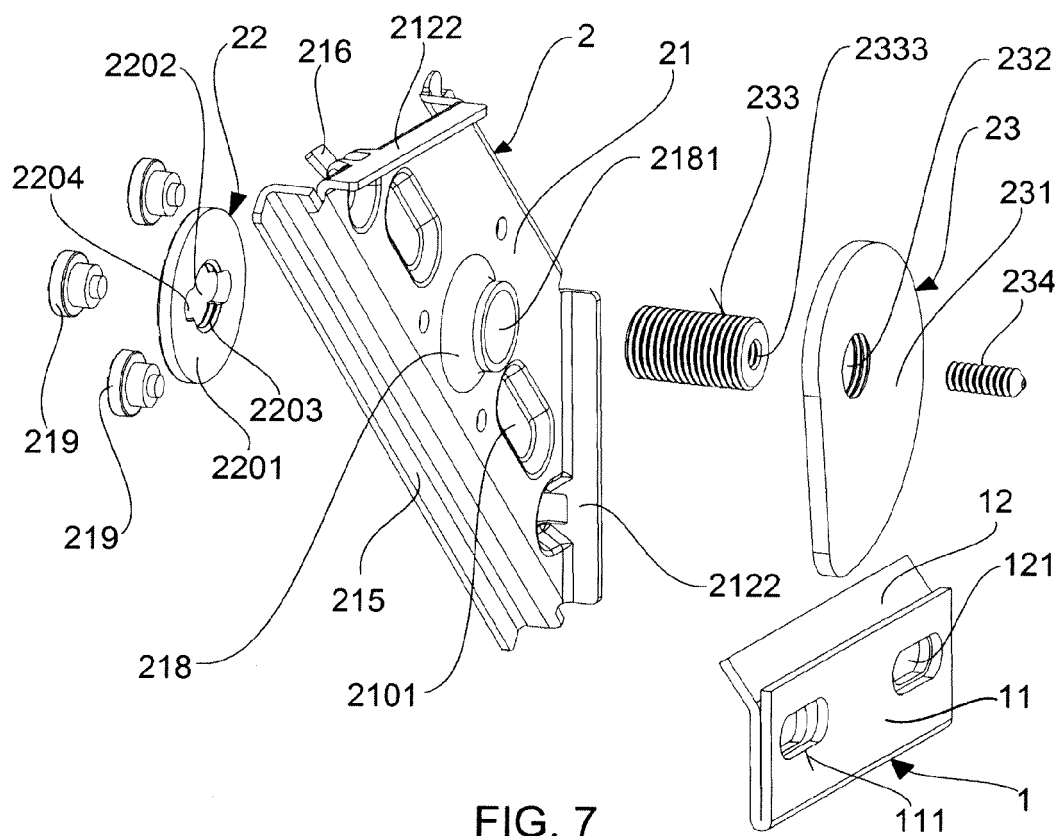


FIG. 7

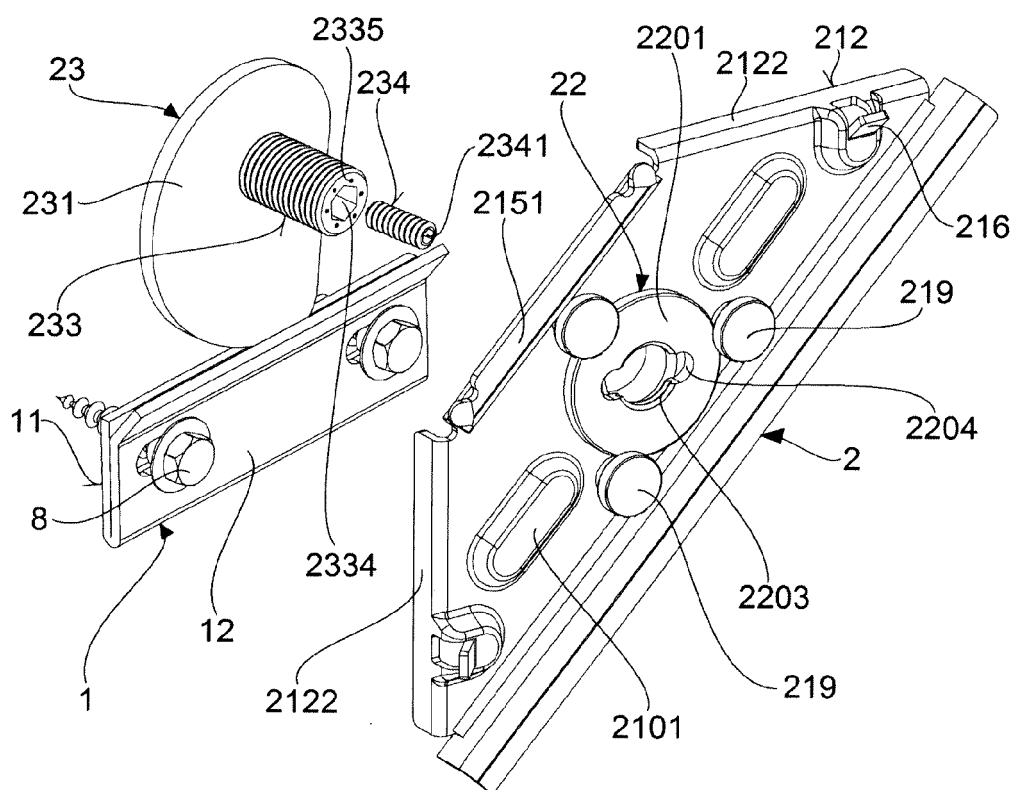
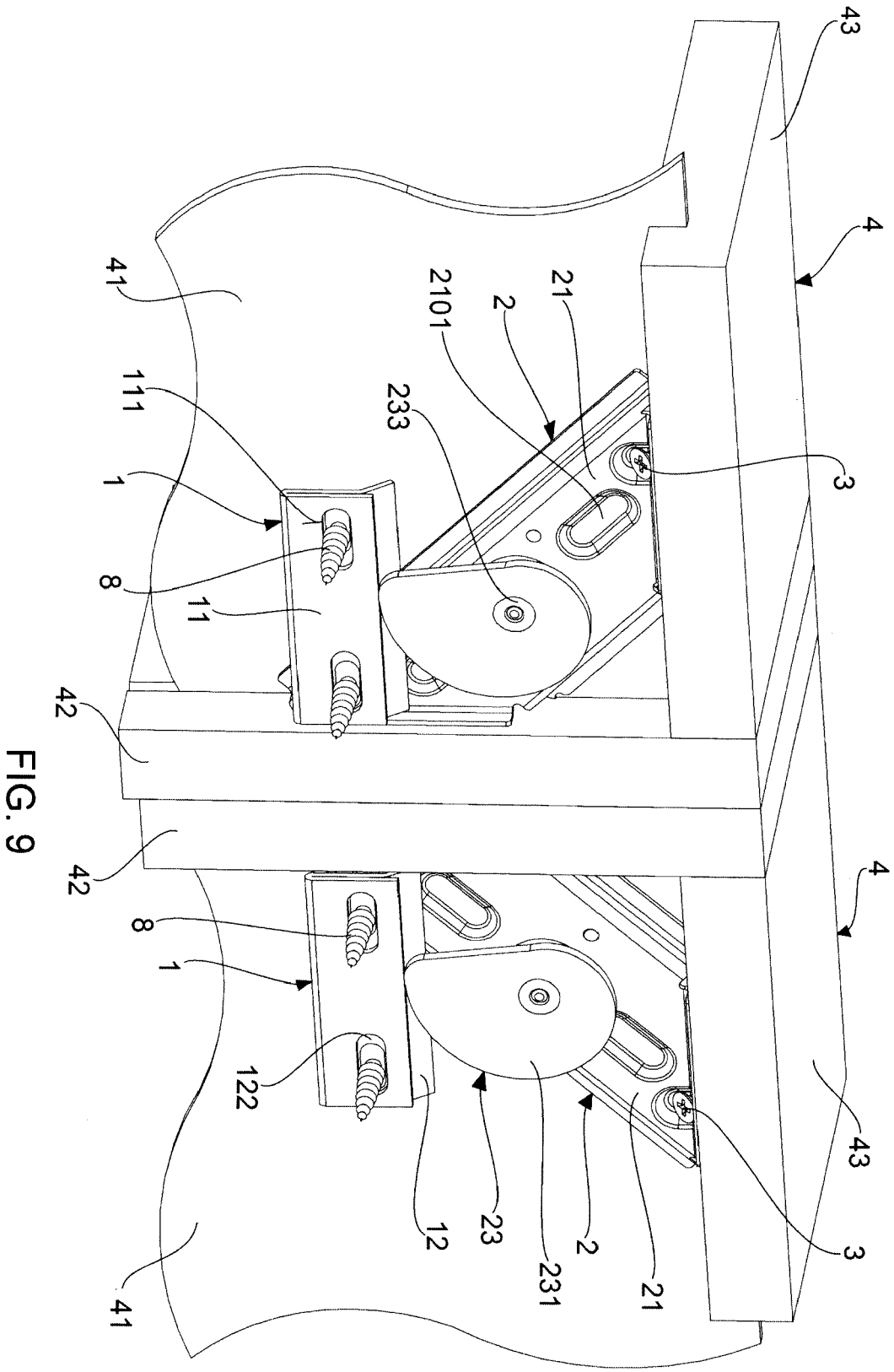
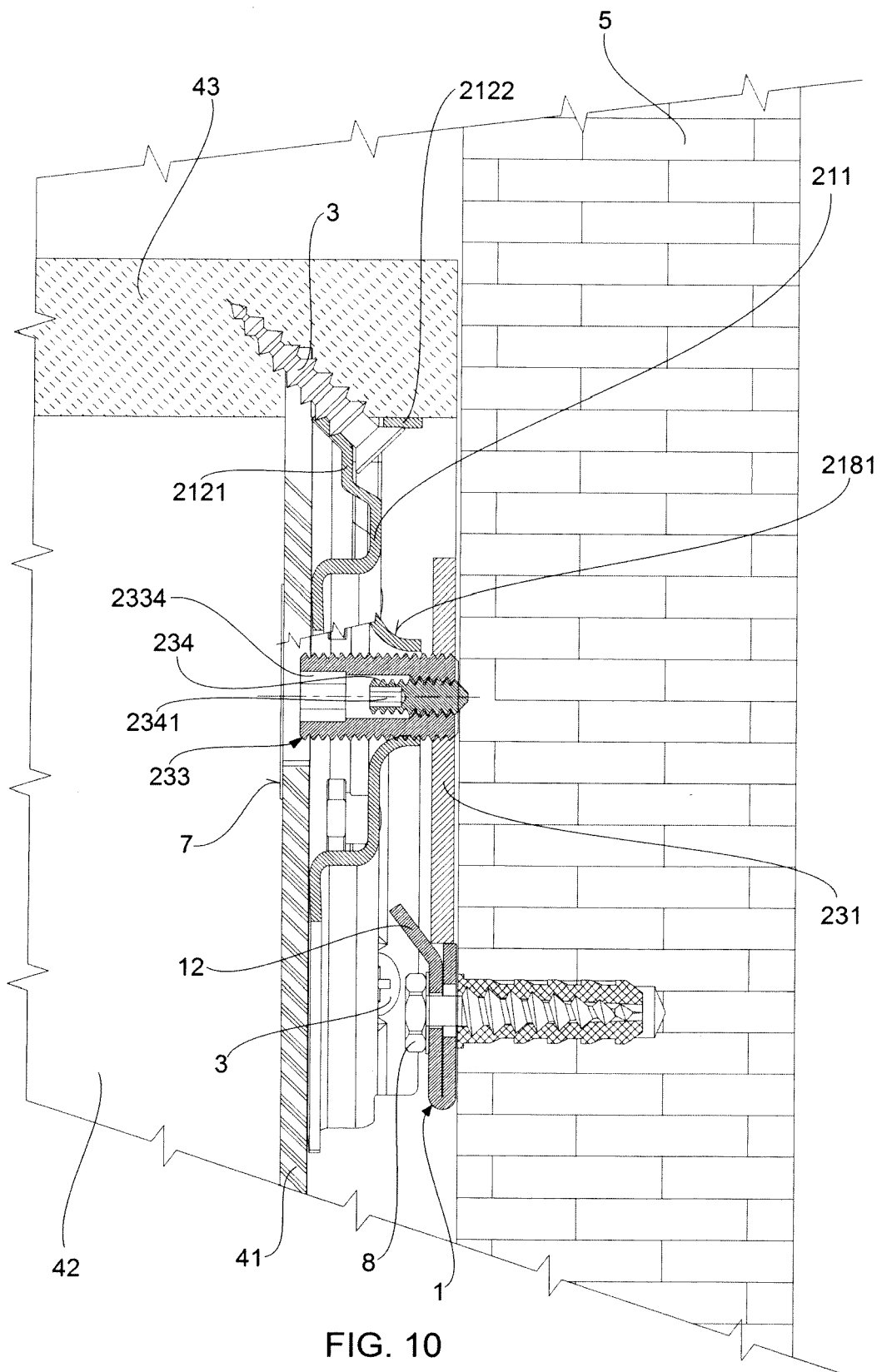


FIG. 8





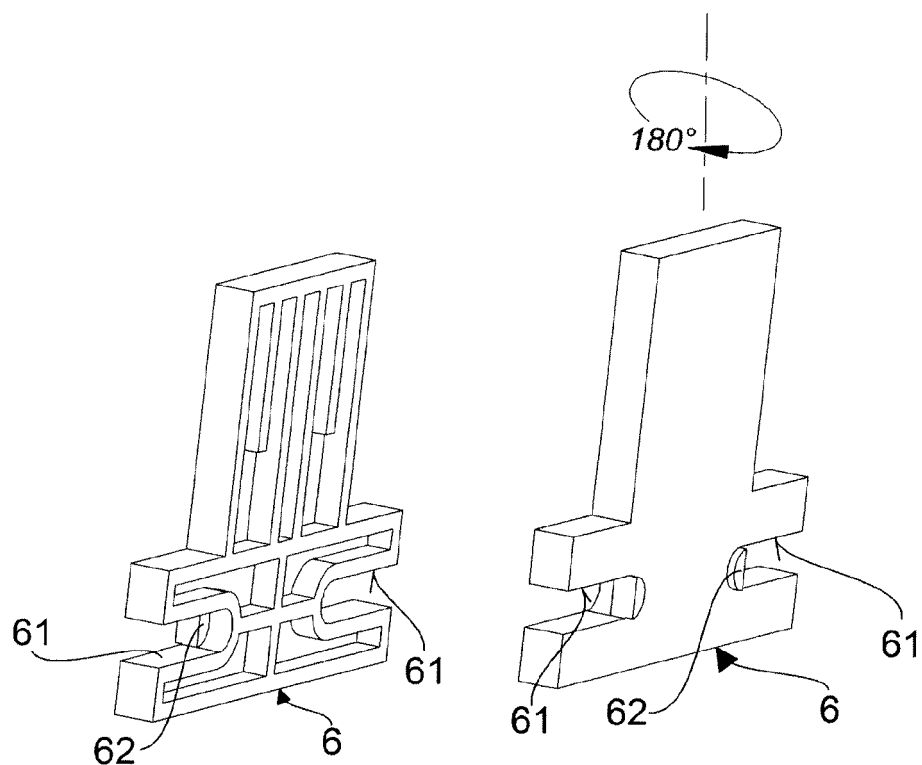


FIG. 11

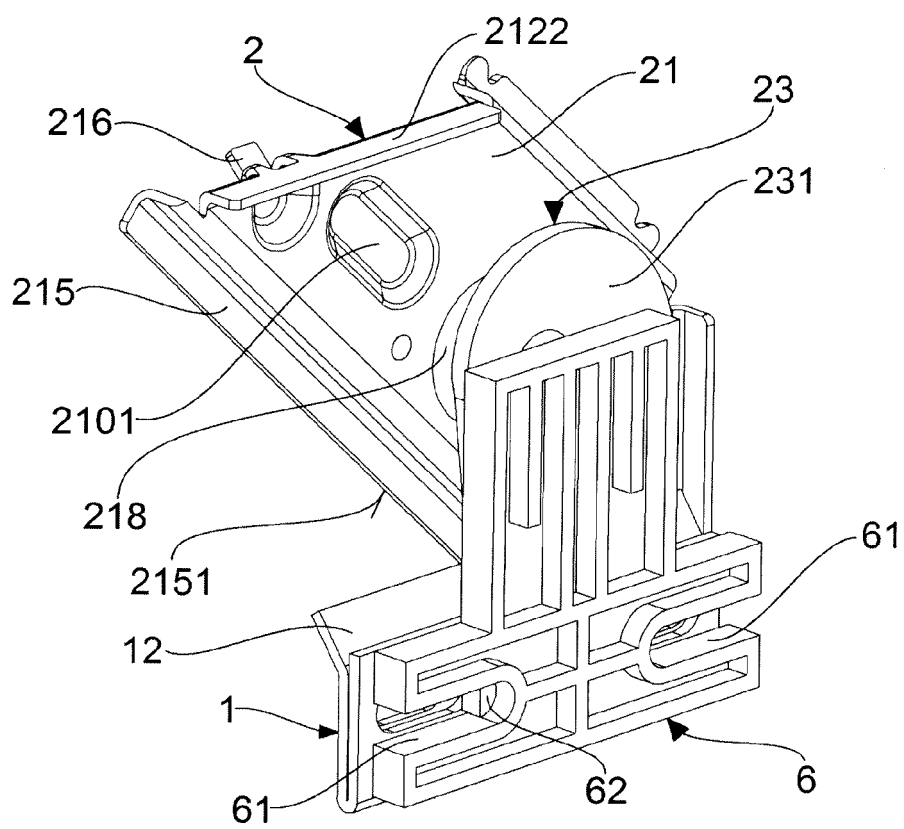


FIG. 12

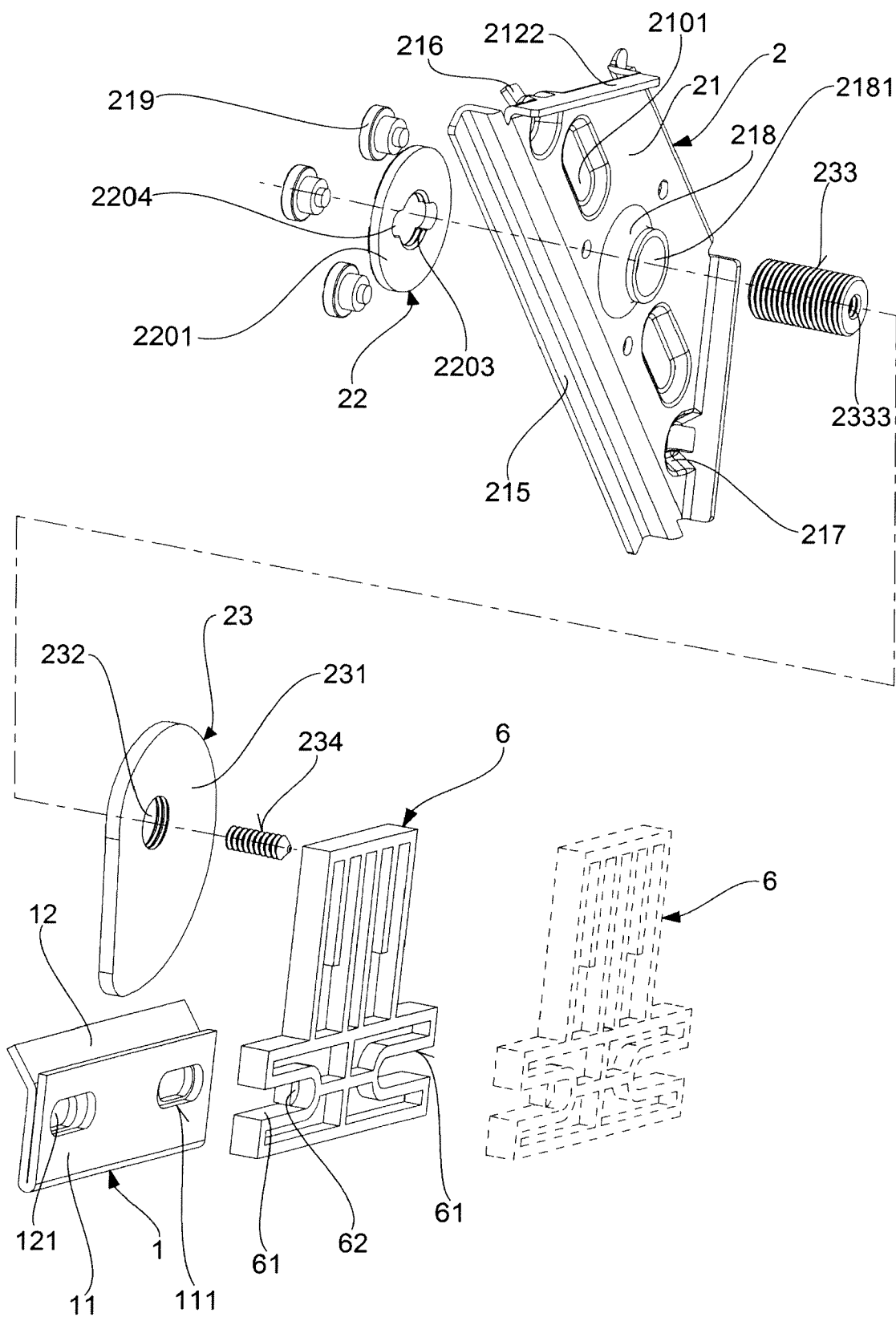


FIG. 13

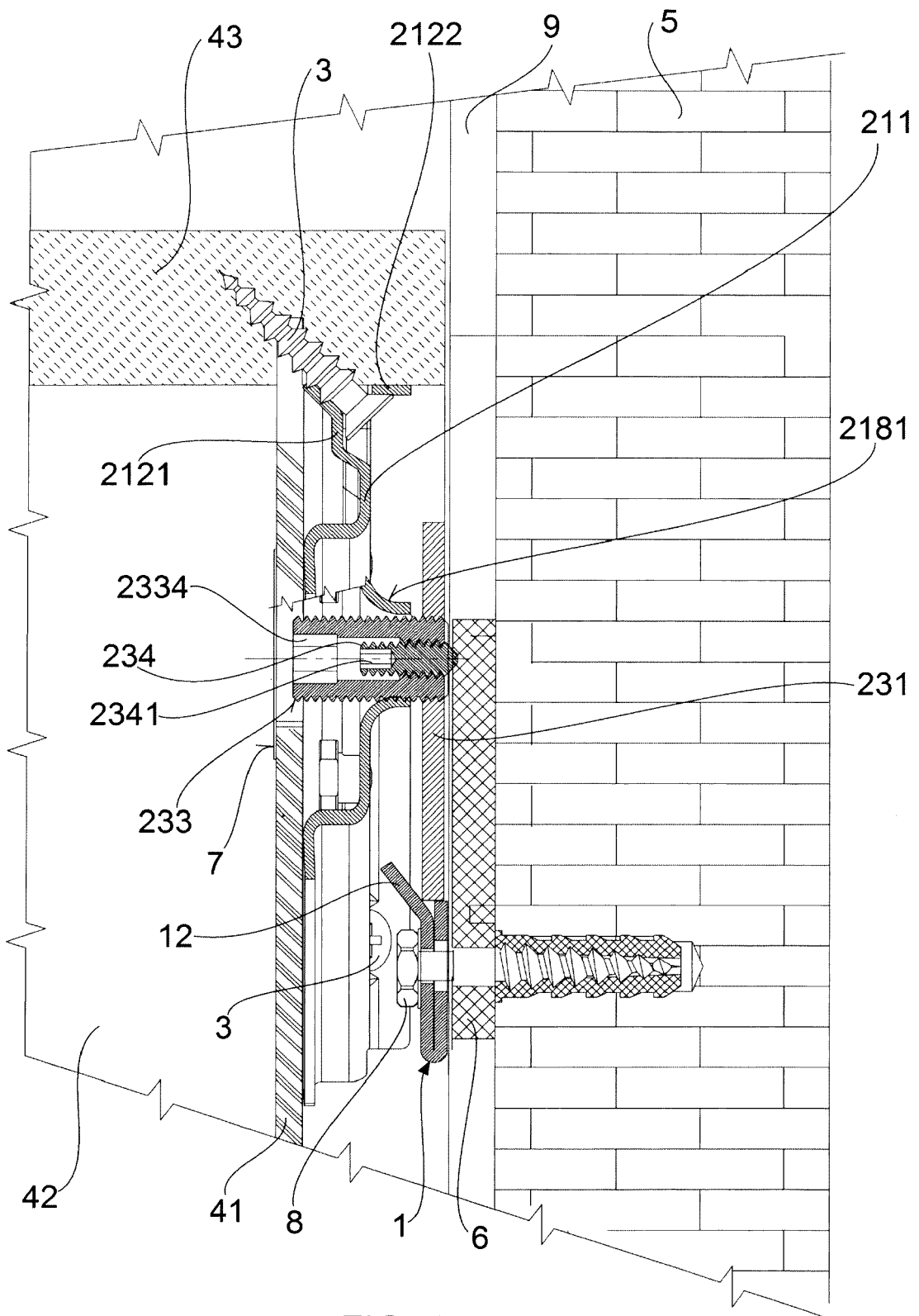


FIG. 14



EUROPEAN SEARCH REPORT

Application Number
EP 18 46 6002

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2006/112799 A1 (AL PODJETJE ZA INZENIRING TRGO [SI]; TAVCAR VOJKO [SI]; KRANJC MILOSLA) 26 October 2006 (2006-10-26) * page 1, line 1 - page 4, line 25; figures 1-9 *	1,2,4,7	INV. A47B95/00
X	DE 29 42 946 A1 (HEINZE RICHARD GMBH CO KG [DE]) 26 March 1981 (1981-03-26) * page 2, line 20 - page 6, line 32; figures 1-2 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 1 August 2018	Examiner Kohler, Pierre
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EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 18 46 6002

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2006112799 A1	26-10-2006	SI 21760 A WO 2006112799 A1	31-10-2005 26-10-2006
DE 2942946 A1	26-03-1981	DE 2942946 A1 DE 7930056 U1	26-03-1981 24-01-1980

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 707815 A [0002]
- EP 555924 A [0002]
- IT 1237839 [0002]
- EP 636328 A [0002]
- EP 2149316 A [0002]
- EP 2520198 A [0002]
- EP 2412275 A [0002]
- EP 2997854 A [0002]
- EP 2786676 A [0002]
- EP 389053 A [0002]
- EP 1844682 A [0002]
- EP 3025620 A [0002]
- EP 2696725 A [0002]
- EP 1250070 A [0002]
- EP 2627216 A [0002]
- EP 2219495 A [0002]
- EP 2946692 A [0002]
- EP 3045077 A [0002]
- US 9033294 B [0002]
- EP 2654508 A [0002]