(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 969 983 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
17.09.2008 Bulletin 2008/38

(51) Int Cl.:
A47K 17/02 *(2006.01)*

(21) Application number: **08250155.2**

(22) Date of filing: **12.01.2008**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA MK RS

(30) Priority: **10.03.2007 GB 0704675**

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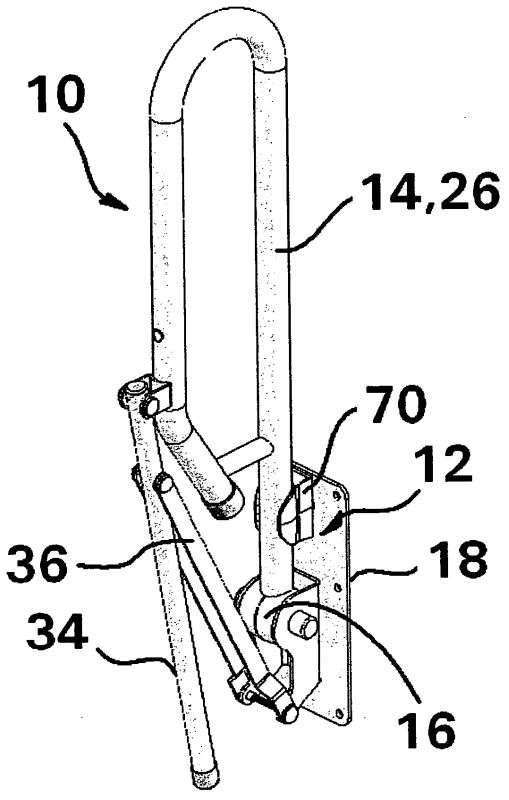
(54) Hand rail

(57) A vertically pivotable surface-mountable hand rail (10) for supporting an elderly or infirm person, comprises a surface-mountable base element (12), an elongate hand-rail member (14), and a pivotable clamping knuckle (16) which interconnects the hand-rail member (14) and the base element (12) for in use vertical pivotable movement of the hand-rail member (14). The clamping knuckle (16) projects laterally to a longitudinal extent of the hand-rail member (14) for preventing or limiting in use horizontal movement of the hand-rail member (14). A toilet-roll holder (172) is also provided.

Fig.2



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Description

[0001] The present invention relates to a vertically pivotable surface-mountable hand rail for supporting an elderly or infirm person.

[0002] A drop down hand-rail for supporting an elderly or infirm person, for example during toileting or showering, is known. However, the hand-rail extends a significant distance once in the lowered or horizontal condition. When the hand-rail is gripped by a user, side-to-side lateral stability of the hand-rail is poor, and thus the hand-rail tends to sway. This leads to a sense of insecurity and anxiety when the hand-rail is being used.

[0003] The hand-rail is also typically formed from dip-coated steel, and is thus heavy. The hand-rail, once unlatched from its vertical storage position, is free to fall to its horizontal condition under gravity, and this uninhibited movement can be hazardous due to its weight and inertia.

[0004] The present invention seeks to overcome these problems.

[0005] According to a first aspect of the present invention, there is provided a vertically pivotable surface-mountable hand rail for supporting an elderly or infirm person, the hand rail comprising a surface-mountable base element, an elongate hand-rail member, and a pivotable clamping knuckle which encloses the hand-rail member and which interconnects the hand-rail member and the base element for in use vertical pivotable movement of the hand-rail member, the clamping knuckle projecting laterally to a longitudinal extent of the hand-rail member for preventing or limiting in use horizontal movement of the hand-rail member.

[0006] Preferably, the knuckle is separate of the hand-rail member.

[0007] Beneficially, the knuckle may include two inter-engagable clamping elements between which the hand-rail member is clampable. In this case, each clamping element includes a channel complementarily shaped to receive at least part of the hand-rail member.

[0008] Preferably, the base element includes a channel in which the knuckle is pivotably received.

[0009] Advantageously, the knuckle may include an axle element which engages the knuckle with the hand-rail member, and the knuckle with the base element.

[0010] Preferably, the hand-rail member includes a hand-grip element and a supporting leg. In this case, the supporting leg may be pivotably engaged with the hand-grip element.

[0011] More preferably, the vertically pivotable surface-mountable hand rail further comprises damping means for damping a lowering movement of the hand-rail member. In this case, the damping means may be included as part of the pivotable clamping knuckle.

[0012] Preferably, the damping means includes one or more frictional projections. In this case, one or more said fi-ictional projections may be provided on the pivotable clamping knuckle and frictionally engage with the base element *or vice versa.*

[0013] Beneficially, the or each frictional projection may be spring-biased. In this case, the said spring-biasing may be provided by a flexible beam on which the frictional projection is provided.

[0014] According to a second aspect of the invention, there is provided a clampable toilet-roll holder comprising a body element, clamping means for clamping the body element to a supporting bar, and an elongate member for releasably supporting a toilet roll.

[0015] Preferably, the clamping means comprises a hinge provided on the body element, so that the body element is foldable for clamping. In this case, the hinge is a live hinge integrally formed as part of the body element.

[0016] Optionally, the clamping means may include non-screw-threaded fasteners for retaining the body element around the bar.

[0017] Preferably, the elongate member comprises two elongate parts which are fastenable together. In this case, the two elongate parts may extend in parallel with each other.

[0018] Beneficially, the two elongate parts may be integrally formed with the body element.

[0019] Preferably, the clampable toilet-roll holder is a one-piece toilet-roll holder.

[0020] According to a third aspect of the invention, there is provided a vertically pivotable surface-mountable hand-rail in accordance with the first aspect of the invention in combination with a clampable toilet-roll holder in accordance with the second aspect of the invention.

[0021] The present invention will now be more particularly described, by way of example only, with reference to the accompanying drawings, in which :

Figure 1 is a side view of a first embodiment of a vertically pivotable surface-mountable hand-rail, in accordance with the first aspect of the invention and in a lowered support condition;

Figure 2 is a perspective view of the hand-rail shown in Figure 1, in a raised storage condition;

Figure 3 is an exploded view of the hand-rail;

Figure 4 is an enlarged view of a pivotable clamping knuckle of the hand-rail;

Figure 5 is a cross-sectional view through one part of the clamping knuckle;

Figure 6 is a cross-sectional view through the clamping knuckle, in a plane A-A shown in Figure 1;

Figure 7 shows a perspective view of a second embodiment of a vertically pivotable surface-mountable hand-rail, in accordance with the third aspect of the invention and having one embodiment of a clampable toilet roll holder in accordance with the second aspect of the invention;

Figure 8 shows an enlarged view of the interior of the toilet-roll holder, shown in an unfolded condition;

Figure 9 shows the exterior of the toilet-roll holder, shown in the unfolded condition; and

Figure 10 shows the toilet-roll holder in a folded con-

dition.

[0022] Referring firstly to Figures 1 to 6 of the drawings, there is shown a first embodiment of a vertically pivotable surface-mountable hand rail 10 which comprises a base element 12, a hand-rail member 14, and a separate pivotable clamping knuckle 16 which interconnects the hand-rail member 14 and the base element 12.

[0023] The base element 12 is typically formed from metal and is fixedly attachable to a surface, such as a wall, via screw-threaded fastening devices, such as screws. The base element 12 includes a base plate 18 and a knuckle-receiving channel 20, typically welded to the base plate 18. Two series of corresponding pivot apertures 22, 24 are formed in spaced-apart relationship in sides of the channel 20.

[0024] The hand-rail member 14 comprises an elongate tubular hand-grip element 26 which has a through pivot opening 28 adjacent a first end 30 thereof and a looped-back second end 32. A lateral cross-sectional shape of the hand-grip element 26 is preferably circular, but maybe non-circular.

[0025] The hand-rail member 14 also comprises a height-adjustable supporting leg 34, pivotably connected to the hand-grip element 26 partway therealong. An elongate brace 36 is pivotably connected to the leg 34, intermediate the ends thereof. The brace 36 may be of fixed or adjustable length.

[0026] The pivotable clamping knuckle 16 is preferably formed from moulded plastics. The knuckle 16 comprises two inter-engagable clamping parts 38 and an axle 40 having a head end 42 and a screw-threaded end 44, as best seen in Figures 3 and 4. Each clamping part 38 is a thick circular disk with a hand-grip receiving channel 46 formed diametrically across a first major surface 48, and a pivot hole 50 formed centrally therethrough. Each channel 46 has a semi-circular or arcuate lateral cross-section, complementarily shaped to receive an exterior surface of the hand-grip element 26. Inter-engagement is typically provided by integrally formed lugs 52 which project from the first major surface 48 of one or each clamping part 38, and which are receivable as an interference fit in complementary openings 54 integrally formed in the first major surface 48 of the or each other clamping part 38.

[0027] The hand rail 10 also includes damping means for damping a lowering movement of the hand-rail member 14. The damping means is included as part of the clamping knuckle 16, and comprises a plurality of, in this case four, flexible beams 56 equi-angularly spaced from each other and formed in or on a second major surface 58 of each clamping part 38, opposite the said first major surface 48. Each beam 56 is integrally formed as part of the respective clamping part 38 of the knuckle 16, and has an arcuate longitudinal extent which extends in the plane of the second major surface 58. Although each beam 56 could be connected to the clamping part 38 at only one end, in this embodiment, both ends are connected to the clamping part 38.

[0028] The damping means further comprises a frictional projection 60 integrally formed, typically centrally, on each beam 56. Each frictional projection 60 projects perpendicularly away from the second major surface 58 of the respective clamping part 38 of the knuckle 16.

[0029] To assemble the hand rail 10, the two clamping parts 38 of the pivotable clamping knuckle 16 are located around the first end 30 of the hand-grip element 26, so that the hand-grip element 26 is received and fully enclosed in the hand-grip receiving channels 46, and push-fit engaged with each other. The pivot holes 50 of the clamping parts 38 are aligned with the through pivot opening 28 of the hand-grip element 26. The knuckle 16 and the first end 30 of the hand-grip element 26 are located in the knuckle-receiving channel 20, in alignment with the first series of pivot apertures 22. The screw-threaded axle 40 is inserted through the first series of pivot apertures 22, the pivot holes 50 of the clamping parts 38 of the knuckle 16, and the through pivot opening 28 of the hand-grip element 26. The axle 40 is fastened in place by a mating screw-threaded fastening element, such as a nut 62, which is threadingly engaged with the screw-threaded end 44. Protective rubber or plastics caps 64 are push-fit engaged with the head end 42 and the fastening element 62 to cover the ends of the axle 40 to prevent possible injury.

[0030] The brace 36, which is pivotably connected to the leg 34 of the hand-rail member 14, is pivotably engaged with the knuckle-receiving channel 20 via the second series of pivot apertures 24. As shown in Figure 3, the brace 36 in the present embodiment is a two part element, with the parts being connected to opposite sides of the leg 34 and opposing pivot apertures 24 via a single or two separate fastening devices 66, such as push-on 'star-lock' fasteners, screw-threaded fasteners, or any other suitable fastener. As before, ends of the or each fastening device are coved by protective caps 68.

[0031] The axle 40 is tightened sufficiently so that the sides of the knuckle-receiving channel 20 press onto the second major surfaces 58 of the clamping parts 38 of the knuckle 16. This causes the knuckle 16 to tightly clamp and support the hand-grip element 26. Since the knuckle 16 both clamps and extends laterally to both sides of the hand-grip element 26, side-to-side swaying movement of the hand-rail member 14 is significantly reduced and substantially eliminated.

[0032] Furthermore, the damping means provides for frictional point contact between the knuckle 16 and the sides of the knuckle-receiving channel 20. Consequently, lowering of the hand-rail member 14 is retarded and thus occurs much more predictably and smoothly.

[0033] As shown in Figures 1, 2 and 6, the base element 12 can include an optional push-fit retaining channel 70 for releasably holding the hand-grip element 26 when the hand-rail member 14 is in a raised condition. Alternatively, the push-fit retaining channel can be provided as a separate device which is surface-mountable,

typically in spaced relationship with the base element.

[0034] Referring now to Figures 7 to 10, there is shown a second embodiment of a vertically pivotable surface-mountable hand rail 110. Parts of the hand rail 110 which are identical to those described above have the same references, and further detailed description is omitted.

[0035] The hand rail 110 of this embodiment differs from that of the first embodiment in that an attachable clampable toilet-roll holder 172 is provided. The toilet-roll holder 172 comprises a foldable body element 174, and a two part elongate member 176 for rotatably supporting a toilet roll.

[0036] The body element 174 is formed from moulded plastics, and includes a live hinge 178 integrally formed midway between ends 180 of the body element 174. Two opposing open-ended channels 182 are formed fully across the body element 174, from one side 184 to the other and immediately adjacent the live hinge 178. Longitudinal extents of the channels 182 and the hinge 178 are parallel with each other. One or more locating projections 186 are included within one or both channels 182.

[0037] Snap fastening and locating lugs 188 and corresponding openings 190 are formed on the interior 192 of the toilet-roll holder 172.

[0038] The live hinge 178, open-ended channels 182, and lugs 188 and openings 190 form clamping means for clamping the toilet-roll holder 172 around a supporting bar.

[0039] Each part 194 of the elongate member 176 is itself elongate and is formed at one end 180 of the body element 174 remote from the live hinge 178. Each part 194 is integral with and projects from one side 184 of the body element 174, and thus extends in parallel with the other part 194. A lateral cross-sectional shape of each part 194 is semi-circular, providing a convex profile, and each part 194 has matching or substantially matching lateral and longitudinal extents.

[0040] To prevent a toilet roll from being easily accidentally slidably removable, each elongate part 194 of the elongate member 176 includes a flange or lip 196 at its free distal end which extends generally perpendicularly to the longitudinal extent of the elongate member 176.

[0041] To attach the toilet-roll holder 172 to the hand rail 110, one channel 182 of the body element 174 is offered up to a portion of the hand-grip element 26 of the hand rail 110, adjacent to the looped-back end 32. The portion of the hand-grip element 26 conveniently includes one or more corresponding openings 198, shown in Figure 2, for accepting the or each locating projection 186, and each channel 182 is dimensioned to complementarily receive a portion of the hand-grip element 26.

[0042] The body element 174 is then folded around the hand-grip element 26 via the live hinge 178 so that the hand-grip element 26 is fully or substantially fully received by both channels 182. The lugs 188 and corresponding openings 190 are interengaged to retain the body element 174 clamped around the hand-grip element 26.

[0043] Once the body element 174 is folded, the two parts 194 of the elongate member 176 abut and interconnect to form a single spindle on which a toilet roll is slidably receivable for rotation.

[0044] Due to the or each locating projection, the toilet-roll holder is prevented from sliding along the hand-grip element.

[0045] It will be understood that, although it is advantageous to provide a live hinge so that the body element is foldable for clamping, the live hinge is not essential, and the body element can include a dedicated separate clamping plate as an alternative. In this latter case, the body element is not foldable. The clamping plate could be connected via independent threaded fasteners.

[0046] The elongate member can be formed as a single integral element, instead of two elongate parts.

[0047] The interference push-fit fasteners can be replaced with independent screw-threaded fasteners, or one or more snap-fit fasteners.

[0048] Although it is convenient to provide a live hinge, the hinge can be a separate element attached or attachable to the body element. In this case, the body element includes two parts instead of being a single unitarily formed element.

[0049] The toilet-roll holder described above is one-piece. However, it can be formed from multiple parts. For example, the elongate member can be attachable to the body element, and/or the body element can be two separate parts instead of a single unitary part.

[0050] The toilet-roll holder can be provided with the hand-rail, or can be provided as a separate retro-fit device.

[0051] It is also envisaged that the toilet roll holder described above can also be used with a fixed hand-rail, rather than pivotable hand-rail, and/or can be attachable to a rung of a ladder-style towel radiator.The flexible beams of the damping means described above are advantageous, since the spring-biasing of the frictional projections accommodates wear and irregularities in the sides of the abutting knuckle-receiving channel. However, the flexible beams could be dispensed with simply in favour of the frictional projections.

[0052] As an alternative to the integrally formed flexible beams, separate springs, such as coil or leaf springs, could be utilised.

[0053] The damping means is a preferred option, but is not essential. Furthermore, as part of the damping means, only the or each frictional projection is an essential part and need not necessarily be spring-biased.

[0054] Although a pivotable leg is described above, the leg can be fixed. Consequently, the brace could be dispensed with.

[0055] Alternatively, the leg, and thus the brace also, can be dispensed with altogether.

[0056] Although a two part pivotable clamping knuckle, which is separate of the hand-rail member, is suggested,

the knuckle could be a one part device which clamps the hand-grip element against one side of the knuckle receiving channel.

[0057] The frictional projections of the damping means can be provided on the base element instead of the knuckle.

[0058] It is thus possible to dramatically reduce or eliminate side to side sway of the hand-rail member by use of the pivotable clamping knuckle which projects laterally to a longitudinal extent of the hand-rail member. It is further possible to damp a previously uninhibited lowering movement of the hand-rail member, to allow a more controlled descent or drop. Additionally, it is possible to provide an extremely easy to fit and cost-effective optional toilet-roll holder, without requiring drilling for mounting purposes.

[0059] The embodiments described above are given by way of examples only, and various other modifications will be apparent to persons skilled in the art without departing from the scope of the invention, as defined by the appended claims.

Claims

1. A vertically pivotable surface-mountable hand rail for supporting an elderly or infirm person, the hand rail (10; 110) comprising a surface-mountable base element (12), an elongate hand-rail member (14), and a pivotable clamping knuckle (16) which encloses the hand-rail member (14) and which interconnects the hand-rail member (14) and the base element (12) for in use vertical pivotable movement of the hand-rail member (14), the clamping knuckle (16) projecting laterally to a longitudinal extent of the hand-rail member (14) for preventing or limiting in use horizontal movement of the hand-rail member (14).

2. A vertically pivotable surface-mountable hand rail as claimed in claim 1, wherein the knuckle (16) is separate of the hand-rail member (14).

3. A vertically pivotable surface-mountable hand rail as claimed in claim 1 or claim 2, wherein the knuckle (16) includes two inter-engagable clamping elements (38) between which the hand-rail member (14) is clampable.

4. A vertically pivotable surface-mountable hand rail as claimed in claim 3, wherein each clamping element (38) includes a channel (46) complementarily shaped to receive at least part of the hand-rail member (14).

5. A vertically pivotable surface-mountable hand rail as claimed in any one of the preceding claims, wherein the base element (12) includes a channel (20) in which the knuckle (16) is pivotably received.

6. A vertically pivotable surface-mountable hand rail as claimed in any one of the preceding claims, wherein the knuckle (16) includes an axle element (40) which engages the knuckle (16) with the hand-rail member (14), and the knuckle (16) with the base element (12).

7. A vertically pivotable surface-mountable hand rail as claimed in any one of the preceding claims, wherein the hand-rail member (14) includes a hand-grip element (26) and a supporting leg (34).

8. A vertically pivotable surface-mountable hand rail as claimed in claim 7, wherein the supporting leg (34) is pivotably engaged with the hand-grip element (26).

9. A vertically pivotable surface-mountable hand rail as claimed in any one of the preceding claims, further comprising damping means (60) for damping a lowering movement of the hand-rail member (14).

10. A vertically pivotable surface-mountable hand rail as claimed in claim 9, wherein the damping means (60) is included as part of the pivotable clamping knuckle (16).

11. A vertically pivotable surface-mountable hand rail as claimed in claim 9 or claim 10, wherein the damping means includes one or more frictional projections (60).

12. A vertically pivotable surface-mountable hand rail as claimed in claim 11, wherein one or more said frictional projections (60) are provided on the pivotable clamping knuckle (16) and frictionally engage with the base element (12), *or vice versa.*

13. A vertically pivotable surface-mountable hand rail as claimed in claim 11 or claim 12, wherein the or each frictional projection (60) is spring-biased.

14. A vertically pivotable surface-mountable hand rail as claimed in claim 13, wherein the said spring-biasing is provided by a flexible beam (56) on which the frictional projection (60) is provided.

15. A clampable toilet-roll holder (172) comprising a body element (174), clamping means (178, 182, 188, 190) for clamping the body element (174) to a supporting bar, and an elongate member (176) for releasably supporting a toilet roll.

16. A clampable toilet-roll holder as claimed in claim 15, wherein the clamping means (178, 182, 188, 190) comprises a hinge (178) provided on the body element (174), so that the body element (174) is foldable for clamping.

17. A clampable toilet-roll holder as claimed in claim 16,

wherein the hinge (178) is a live hinge integrally formed as part of the body element (174).

18. A clampable toilet-roll holder as claimed in any one of claims 15 to 17, wherein the clamping means (178, 182, 188, 190) includes non-screw-threaded fasteners (188) for retaining the body element (174) around the bar.

19. A clampable toilet-roll holder as claimed in any one of claims 15 to 18, wherein the elongate member (176) comprises two elongate parts (194) which are fastenable together.

20. A clampable toilet-roll holder as claimed in claim 19, wherein the two elongate parts (194) extend in parallel with each other.

21. A clampable toilet-roll holder as claimed in claim 19 or claim 20, wherein the two elongate parts (194) are integrally formed with the body element (174).

22. A clampable toilet-roll holder as claimed in any one of claims 15 to 21, which is a one-piece toilet-roll holder.

23. A vertically pivotable surface-mountable hand-rail (10; 110) as claimed in any one of claims 1 to 14 in combination with a clampable toilet-roll holder (172) as claimed in any one of claims 15 to 22.

Fig.1

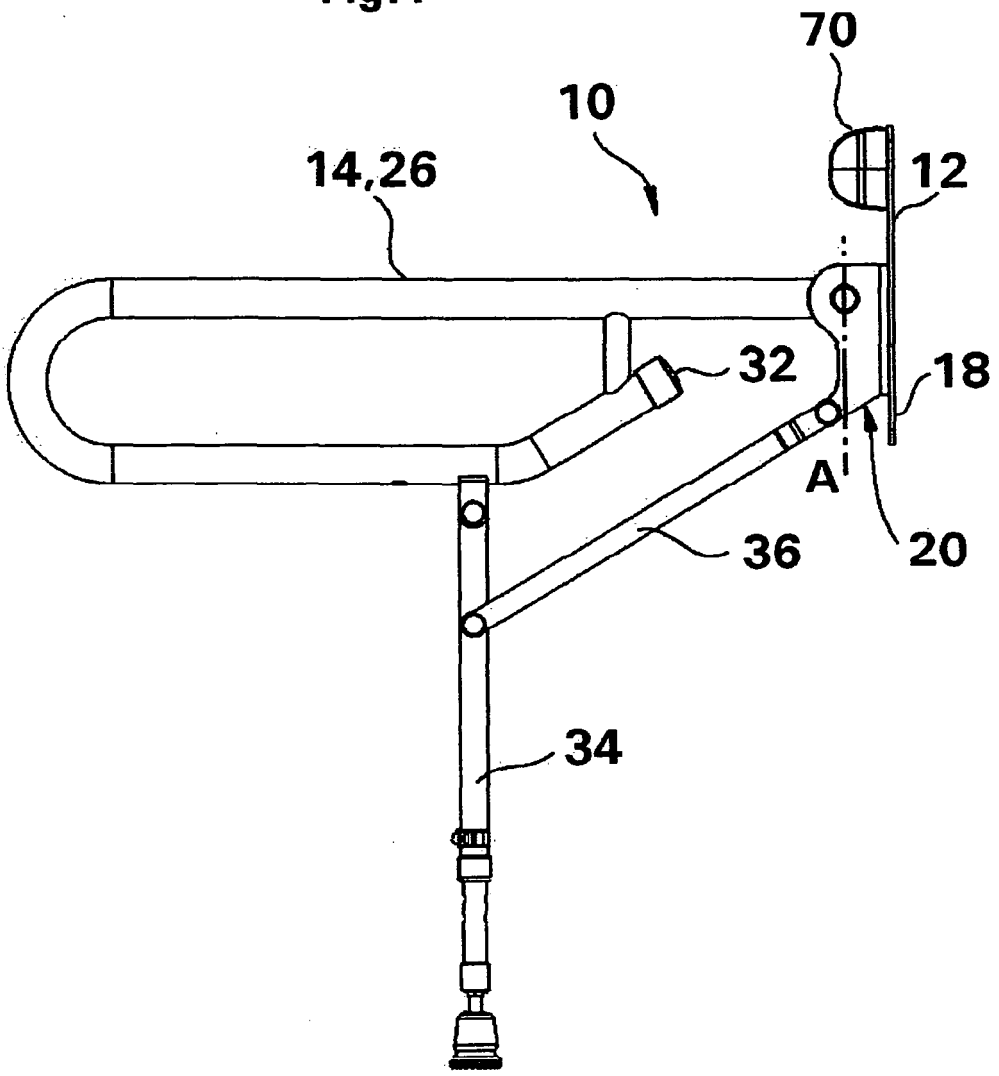

Fig.2

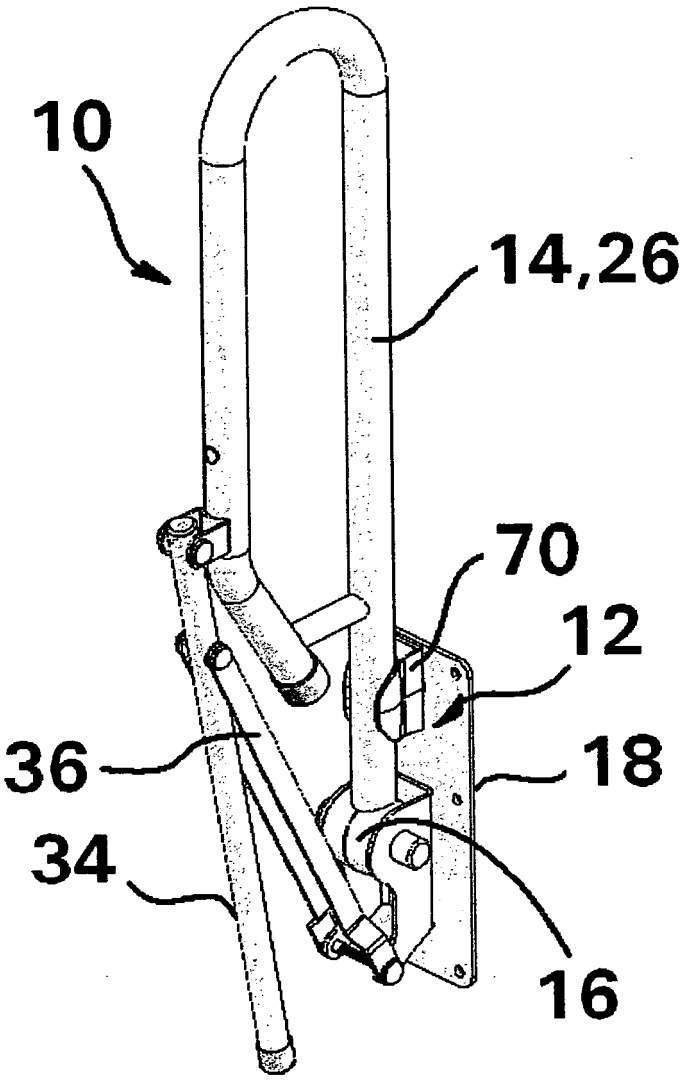

Fig.3

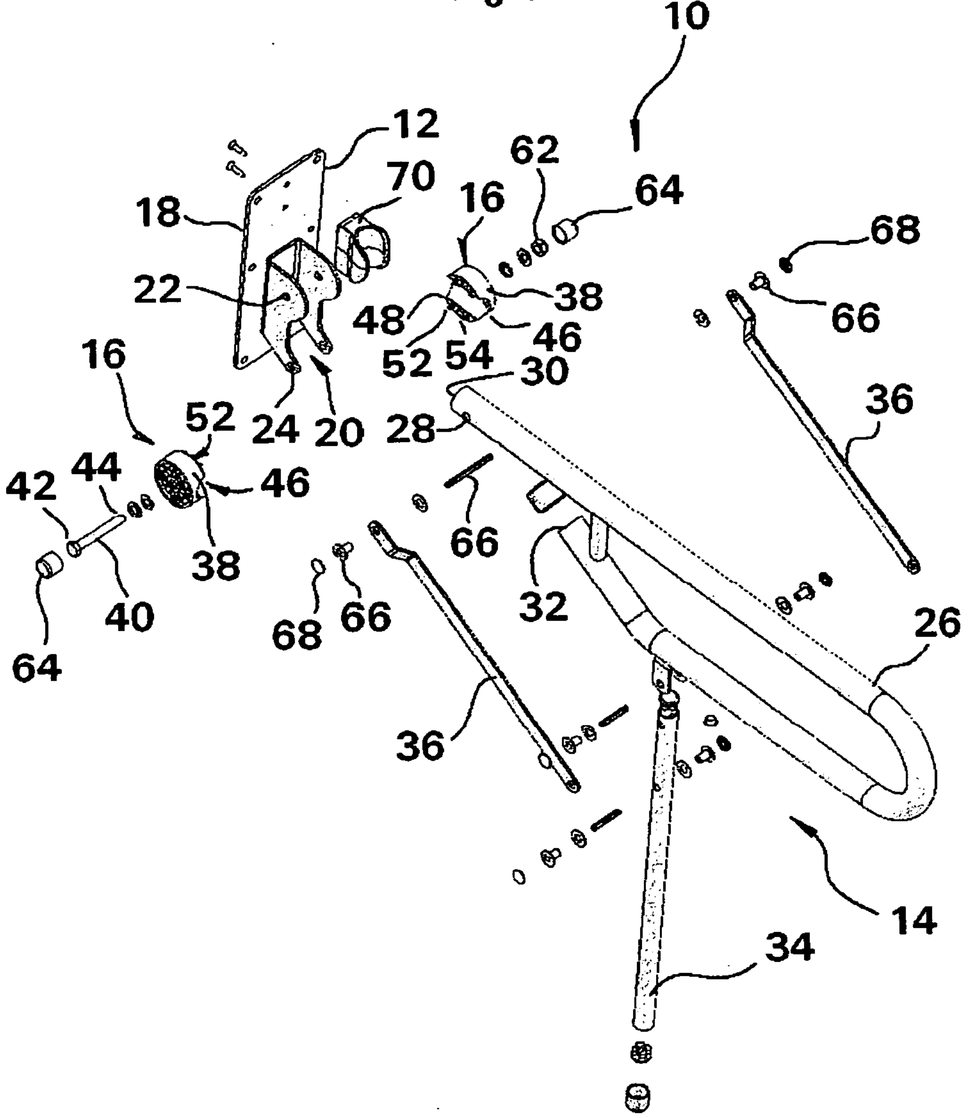
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Fig.4

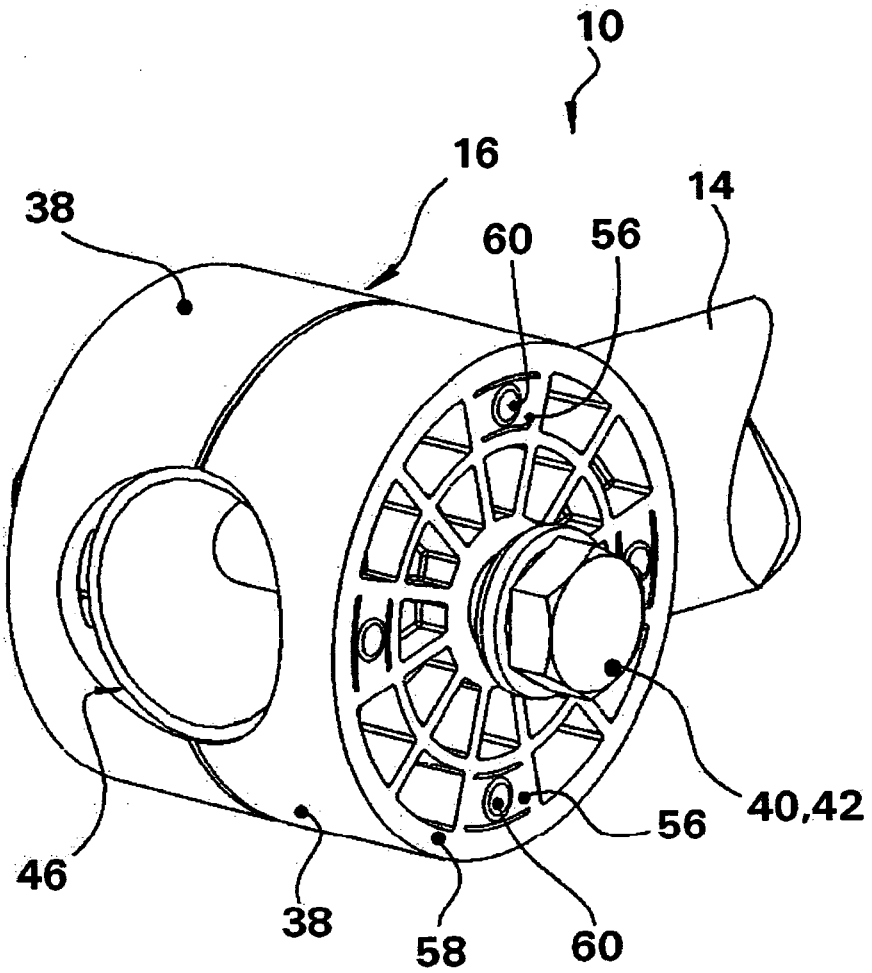


Fig.5

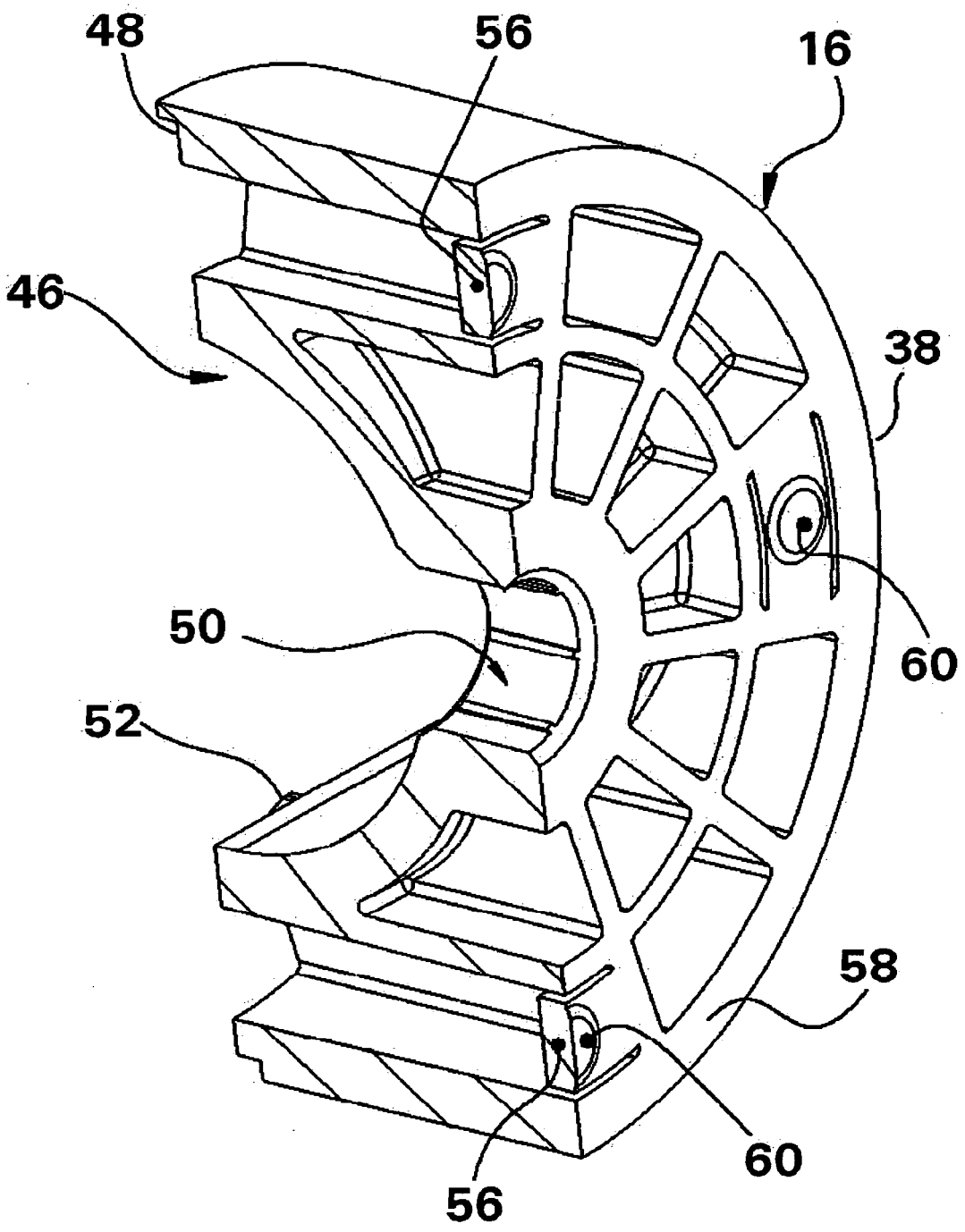


Fig.6

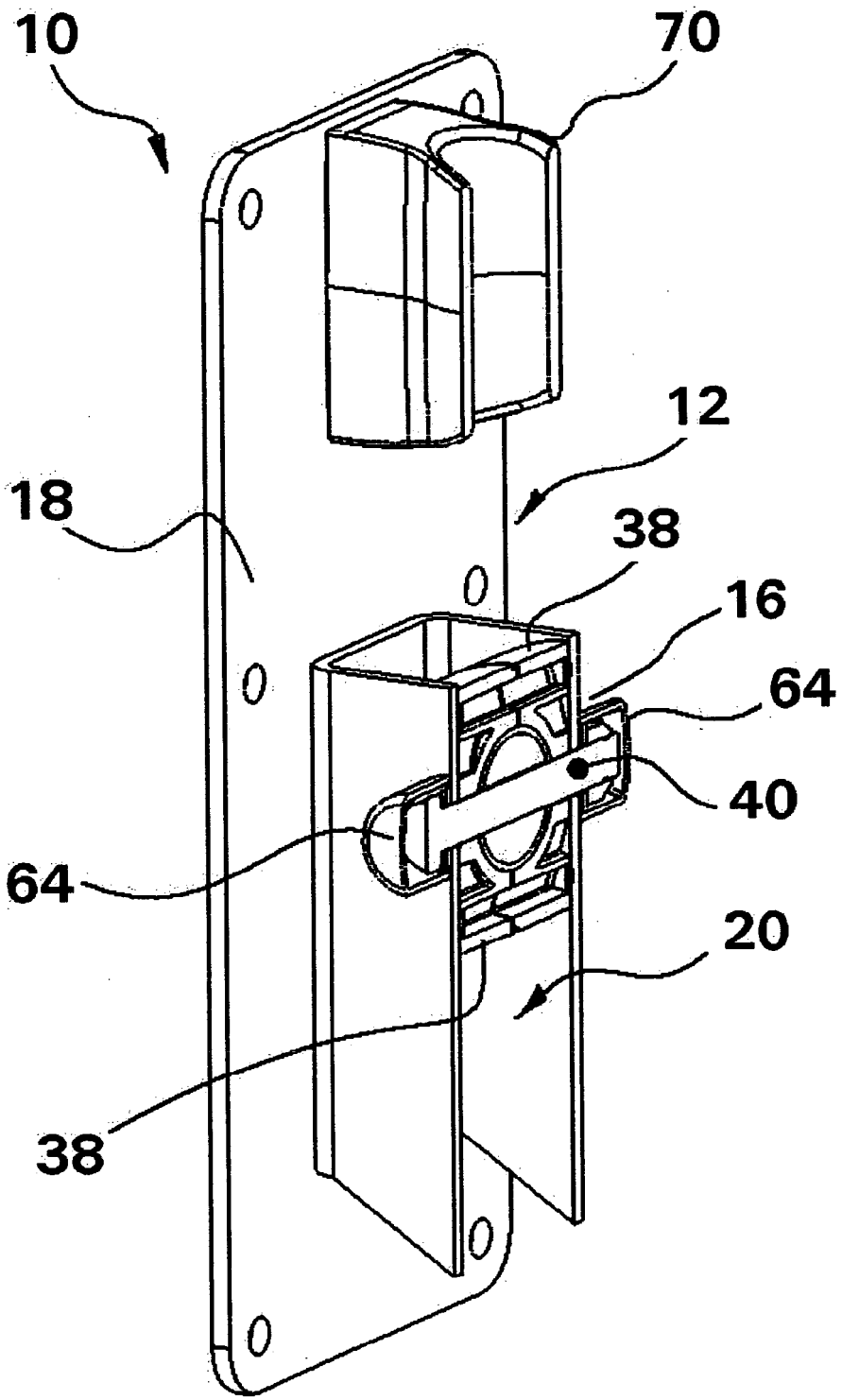


Fig.7

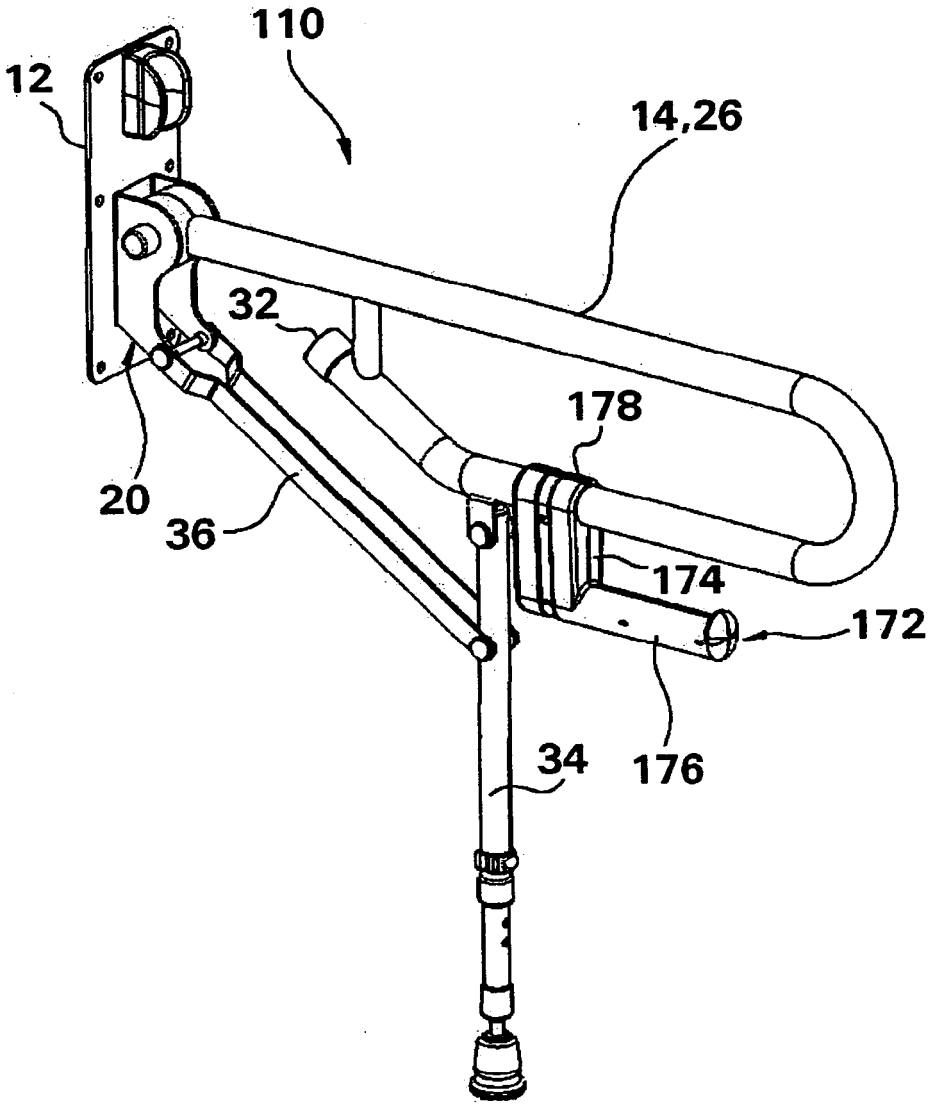
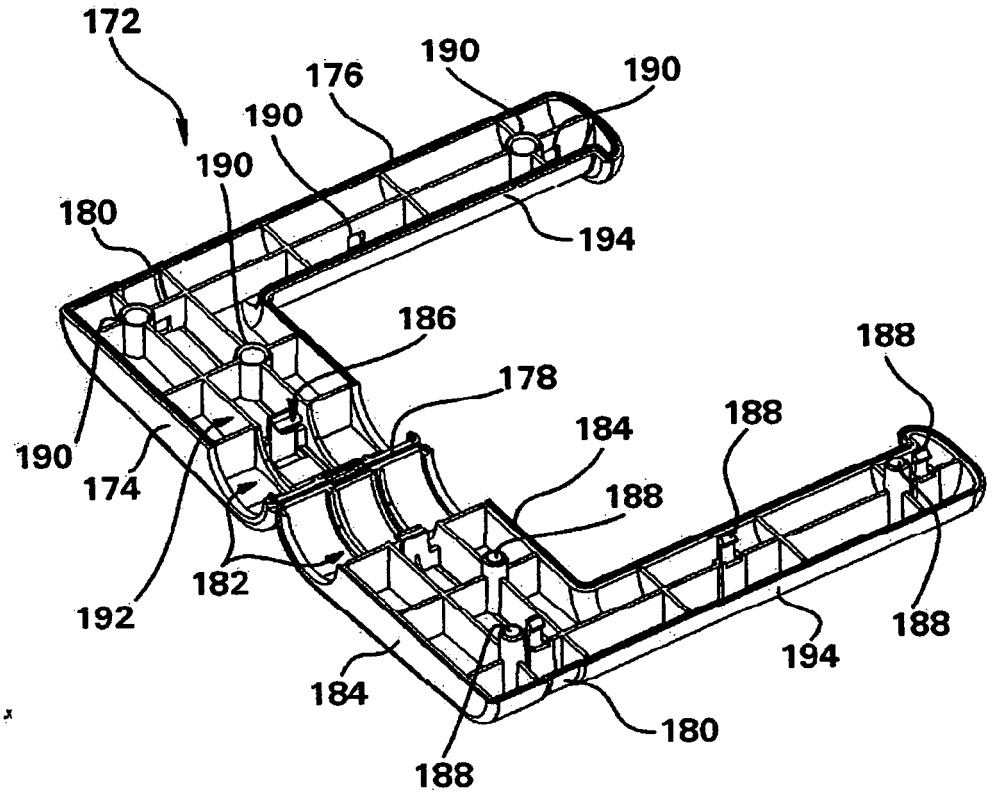


Fig.8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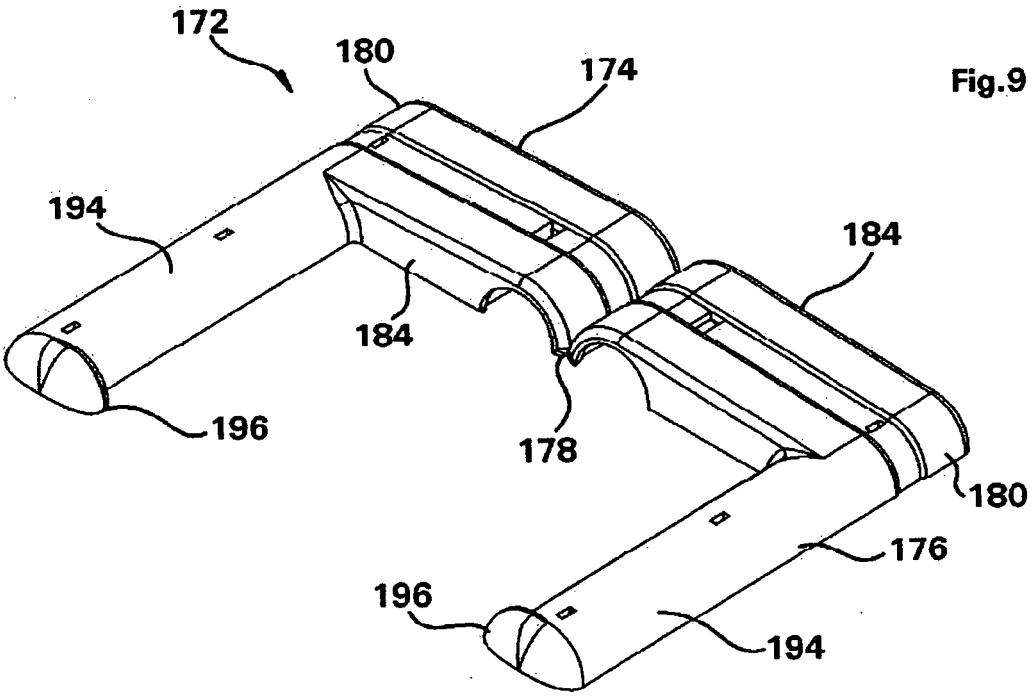
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Fig.9

Fig.10