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(54) **Bed rail arrangement**

(57) The medical bed has two longitudinal barriers, each formed of three or four bed rails made of hollow aluminium profile having an oblong cross-section. The rails are connected to one another through the straps (14) retained within the profiles of the rails through clips (not shown). At each end of each rail (6), a sliding shoe (11) protrudes from end segment (6a or 6c) of the rail and slides in the hollow profile of one of the C-shaped profile forming uprights located at both ends of the bed. The higher bed rail (6) has at each end a ratchet or retractable catch (8) that fits into a cut (13a) in the upper end of the C-shaped profile of the upright.

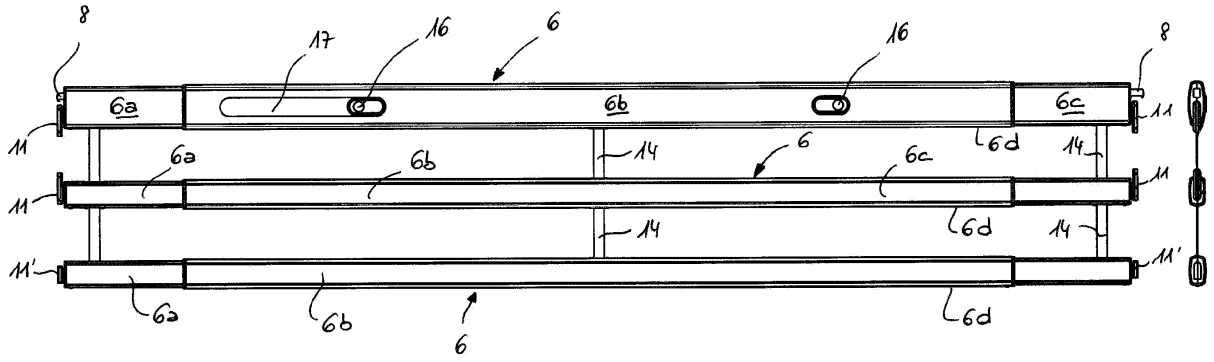

FIG.2A

FIG.2B

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Description

Technical field

[0001] The present invention generally relates to bed rail arrangement.

Background of the invention

[0002] In the course of efforts for improving the manufacturing of medical beds, proposals have already been made to realise such articles as comprising, on a longitudinal side thereof, a movable barrier formed of a plurality of rails held on uprights belonging to the end faces of the bed.

[0003] Certain standards which must be observed put a limit value to the force required for lifting the barrier by hand. The safety of the bed further requires that the rail should not be too heavy and that the regulation of the height of the different parts of the barrier be as light as possible. In addition thereto, consideration of manufacturing costs and aesthetic have to be observed.

Summary of the invention

[0004] The subject matter of the present invention is therefore a medical bed arrangement comprising, on a longitudinal side thereof, a barrier formed of a plurality of bed rails held on uprights belonging to the end faces of the bed, **characterized in that** means are provided on said bedrails and uprights for enabling secure lifting or lowering of the rails by hand while keeping them parallel, and for fasten them in definite positions in said barrier.

[0005] Further advantageous features of the invention form the subject matter of the dependent claims.

Brief description of the drawings

[0006] A first embodiment of the subject matter of the invention as well as some variants are described hereinafter by way of non-restrictive example. The following description refers to the drawings wherein :

- Fig. 1 is a perspective view of a medical bed with a barrier able to be lifted or lowered by hand,
- Figs 2A and 2B are respectively a side view in elevation and a front view showing a set of three bed rails arranged for being mounted to form an adjustable barrier on a bed as that of Fig. 1,
- Figs 3A and 3B are respectively an outer perspective view and a partly cut perspective view of a mechanism comprising a movable ratchet and a sliding shoe located in the upper bed rail at one end thereof,
- Figs 4A and 4B are two perspective views from different angles of view of one of the uprights within which are mounted the sliding shoes,
- Figs 5A and 5B are same perspective views of the uprights of Figs 4A and 4B, with the gliders in other positions,
- Figs 6A and 6B are perspective views of one of the upper sliding shoes,
- Figs 7A and 7B are perspective views of the lower sliding shoes,
- Fig. 8 is a partly cut perspective side view of the end part of the upper rail showing in particular the clip holding a strap, and
- Fig. 9 is a perspective view of the clip of Fig. 8 in the open position.

Detailed description of embodiments of the invention

[0007] The medical bed 1 shown in Fig. 1 comprises a carriage with four wheels 2, support parts 3 arranged for receiving a mattress (not shown) and security means arranged for avoiding that a patient lying on the mattress may fall from the bed. These security means comprise two end faces 4 at the ends of the support 3 and two longitudinal barriers 5, each of which is formed of a number of bedrails 6 extending from one end face 4 to the other.

[0008] In the example of Fig. 1, the barriers 5 comprise each two bedrails 6, but the embodiment described hereafter has, for each barrier, three bedrails (Figs 2A and 2B). They could also comprise more or less than three rails. These side rails are made of aluminium profiles, as they are light weight, and can be manufactured to the desired shape. Of course, said rails could also be made of any other suitable material, such for example plastic or wood. According to the described embodiment, each rail is divided into three parts, 6a, 6b and 6c, where the middle part 6b has a somewhat larger profile than the two others, the latter partly entering the middle part 6b, so that the rails are telescopic and can be used for beds of different standards. For facility of handling, only one of the rails parts 6a or 6c is telescopic, while the other is secured to the middle part through a blind rivet 6d. From Figs 2A and 2B, it is further seen that the upper rail 6 is higher than the two others. It is so stronger and also provides room for inner mechanisms located therein.

[0009] The three bedrails 6 are connected to one another by straps 14 of flexible material having a great importance for the handling and the regulation of the barriers as it will appear later on.

[0010] Referring now more specifically to the upper bedrail 6 and to Figs 3A and 3B, a part of the inner mechanisms located in this upper bedrail 6 is shown. Telescopic portion 6a of this rail contains, at its upper part

and within a plastic fitting 7 adapted to the inner shape of the profile, a plastic ratchet 8 sliding in the fitting 7 and equipped with a coil spring 9. Ratchet 8 can be retracted by hand against the force of spring 9 as will be explained later on. Beneath the guiding portion of the fitting 7 for the ratchet 8 extends a side fitting 10 enclosing a side protruding portion 11b in form of an eyelet belonging to a sliding shoe or glider 11. Ratchet 8 and glider 11 protrude from the end face of the telescopic rail part 6a. A pin 19 traverses the elongate eyelet 11b and connects the side portion 11b of glider 11 to the fitting 10.

[0011] The elements represented in Figs 4A, 4B, 5A and 5B complete the use of the mechanisms partly represented in Fig. 3. The bed shown in Fig. 1 has uprights 12 along each vertical edge of end faces 4. These uprights 12 are made of a C-shaped aluminium hollow profile having a rectangular cross-section and a vertical lengthwise arranged slot 13 in the center of the face directed towards the bed, as seen in Figs 4 and 5. The slot 13 and the inner portion of the profile guide a number of gliders 11 corresponding to the number of the rails. As can better be seen from Figs 6A and 6B, all gliders except the lower bottom ones have a mainly T-shaped sliding portion 11a from which the eyelet portion 11b extends laterally within the fitting 10 (Fig. 3) .

[0012] From Figs 4 and 5, it can be further seen that the slot 13 of upright 12 presents in its upper portion a lateral cut 13a, the width of which corresponds to the width of protruding portion of ratchet 8, and the height of which is somewhat greater than the thickness of ratchet 8.

[0013] Concerning the two lower bedrails 6, they are smaller than the upper rail as already mentioned, and do not comprise the fitting 7 with ratchet 8. They contain fittings 10 receiving a glider portion 11b of a second glider 11 or a third glider 11'. Note that the sliding portion 11a' and the cross-sectional shape of the lower bottom sliding shoes or gliders 11' differ from what is represented in Fig. 6. As represented in Figs 7A and 7B, the portion 11 a' is shorter and its cross-section has a shape in I (rectangular in the end) instead of T.

[0014] The arrangement at the end of upper bed rail 6 is shown in Fig. 8 where upper ratchet 8 and upper glider 11 with elongated sliding portion 11 a is visible. Also shown in Fig. 8 are a clip 15 and the higher end of a strap 14. It follows from Fig. 2 that each barrier made of three bedrails uses 9 clips all such as clip 15. As represented in an open position in Fig. 9, each clip is made of one part of plastic material with higher and lower rigid flat portions 15a and a pair of narrow and thin flexible parallel connecting portions 15b, between higher and lower flat portion. Two pairs of corresponding eyelets 15c and pins 15d clearly visible on Fig. 9 permit to lock the clip in closed position, after folding, thus blocking a cylindrical tension bar into the cut down clip. A strap end, inserted around this cylindrical bar 19 is thus held firmly when the clip is closed and secured through reciprocal engagement of the said eyelets/pins. Once closed, the clip 15 is inserted into an oblong slot in the rail 6 and moved to its final position as for example shown in Fig. 8. In the middle rail, one clip is inserted from above through an oblong slot in the upper part of the rail and one clip is inserted from below through an oblong slot in the bottom part of the rail.

[0015] The handling of the barriers is very light and provides a maximum of safety.

[0016] Firstly, it follows from Fig. 2 that the release mechanism located in the upper bed rail 6 can be controlled by hand easily. Two finger grips 16 (Fig. 2A) placed approximately one meter from each other are guided within the alu profile so as to be movable over two or three centimeters and controlled from exterior by a finger. Each one of these grips is connected by a wire to one of the springs 9 controlling the catches 8. As shown in Figs 3 and 8, the latter have a hook shape locking it when engaging the opening 13a. The operator has also to lift the bed rail and to pull the finger grips 16 towards the center of the bedrail for releasing the rail. In the telescopic version, the release mechanism is fitted to the end portion 6a of the rail, so that it will follow the extension of the side rail. An oblong slot 17 in the outer profile limits the movement of the inner profile to approximately 25 cm in one end.

[0017] For further explaining the handling of the barrier, some details must be given concerning the arrangement at the bottom of the uprights 12 (Figs 4 and 5). The uprights 12 are open at their lower end in such a manner that mounting of the bed rails 6 can be made by inserting the shoes or gliders 11 from the lower end in the uprights 12. As shown in Figs 4 and 5, the base of upright 12 is provided with a spring loaded pin 18 repulsed when the sliding portion 11 a, 11 a' of a shoe 11, 11' slides upwardly in the upright 12. Once all shoes 11, 11' have been introduced, due to its conformation, the lower bottom shoe 11', said lower bottom shoe is prevented to come out of the rail due to the presence of pin 18, which prevents the side rails to fall down when lowered. A second pin 20 is placed about 10 to 15 centimeters over the spring loaded pin 18. This second pin is arranged so as to retain the shoe 11' of the lower bottom rail 6 due to the full ultimate portion 11c of the I-shaped (or rectangular) of the sliding portion 11 a' of said shoe 11'. This prevents that the lower bottom rail can slide upwards which would leave room for the patient to pass under it. Due to the T-shape of their sliding portions 11a, the other shoes 11 are not retained by said second pin 20.

[0018] The T-shaped sliding portions of gliders 11 provided at the first and second bed rails are somewhat longer than the lowest one and abut their elongated ends when lowering the upper rail. This leaves a space of approximately 5 cm in height between the two rails thus avoiding that the operator's fingers may be pinched.

Claims

1. A medical bed arrangement comprising, on a longitudinal side of the bed, a barrier formed of a plurality of bed rails (6) held on uprights (12) belonging to the end faces (4) of the bed, **characterized in that** means (8, 11, 11' 14, 15, 18, 19) are provided on said bedrails (6) and uprights (12) for enabling secure lifting or lowering of the rails by hand while keeping them parallel, and for fasten them in definite positions in said barrier.

2. A medical bed arrangement according to claim 1, **characterized in that** the bed rails (6) are made of hollow profiles having oblong cross-sections.

3. A medical bed arrangement according to claim 2, **characterized in that** an upper bed rail (6) is provided at both ends with lengthwise movable ratchets (8) engaging an aperture (13a) in the corresponding upright (12) for locking the bed rail at its maximum height.

4. A medical bed arrangement according to claim 3, **characterized in that** the bed rails are guided at both ends through sliding shoes (11, 11') each of which is locked through a pin (19) at one end of a bedrail (6) and engages a vertical lengthwise arranged slot (13) in the upright located at the corresponding end of the bed.

5. A medical bed arrangement according to claim 4, **characterized in that** the uprights (12) are hollow aluminium profile of rectangular cross-section for guiding the shoes (11).

6. A medical bed arrangement according to claim 5, **characterized in that** said uprights are provided with an arrangement of pins (20), locking the lowest shoe (11') againts lifting, but permitting passage of the other sliding shoes (11).

7. A medical bed arrangement according to claims 5 or 6, **characterized in that** said uprights are provided with an arrangement of spring located pins (18) locking the lowest shoe (11') against said shoe (11') coming out of the uprights.

8. A medical bed arrangement according to claim 4, **characterized in that** a number of bed rails (6) extending lower than the said upper bed rail are connected to one another and to the said upper bed rail through straps (14) of definite length determining a maximum spacing between the bed rails (6) and increasing the stiffness of the barrier.

9. A medical bed arrangement according to claim 8, **characterized in that** the straps (14) are locked in the aluminium profiles through plastic clips (15) located within the inner space of the aluminium profile, the straps (14) coming out of the profile through short slots in narrow edges of the profile.

10. A medical bed arrangement according to claim 2, **characterized in that** each bed rail is made up of three segments (6a, 6b, 6c) of aluminium profiles of different sizes, end segments (6a, 6c) engaging a middle segment (6b) so that the bed rail is extendable.

11. A medical bed arrangement according to claim 2, **characterized in that** the uprights (12) are rectilinear hollow aluminium profiles of rectangular cross-section with a slot (13) along one face of said profile.

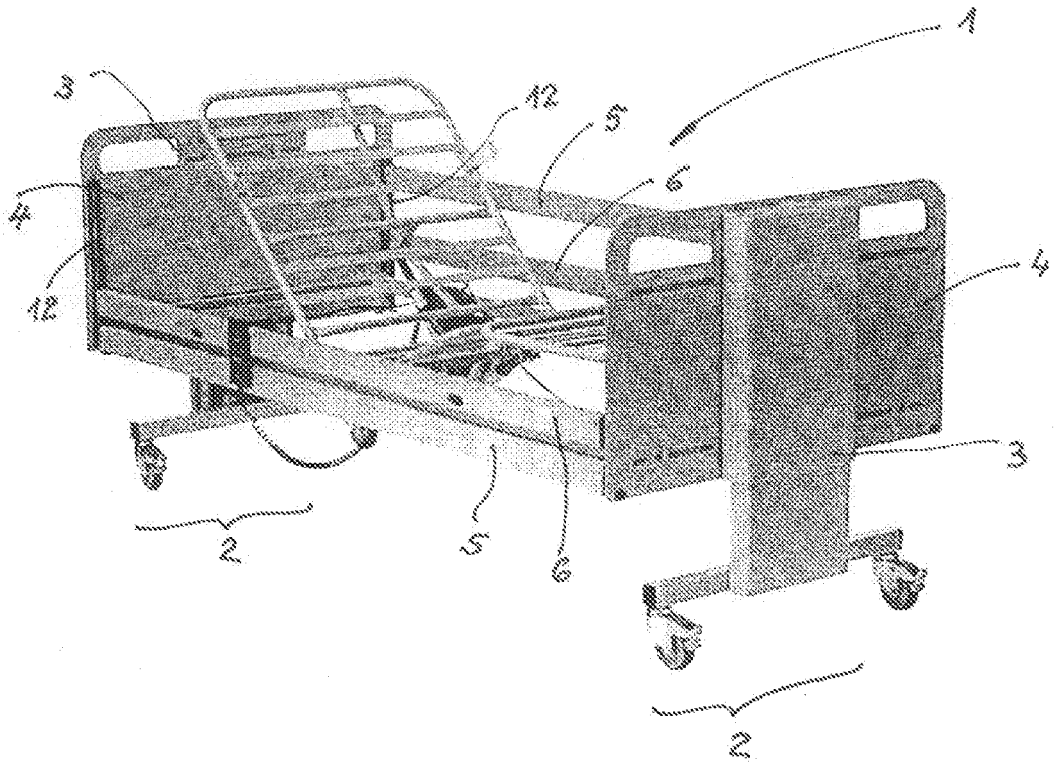

FIG.1

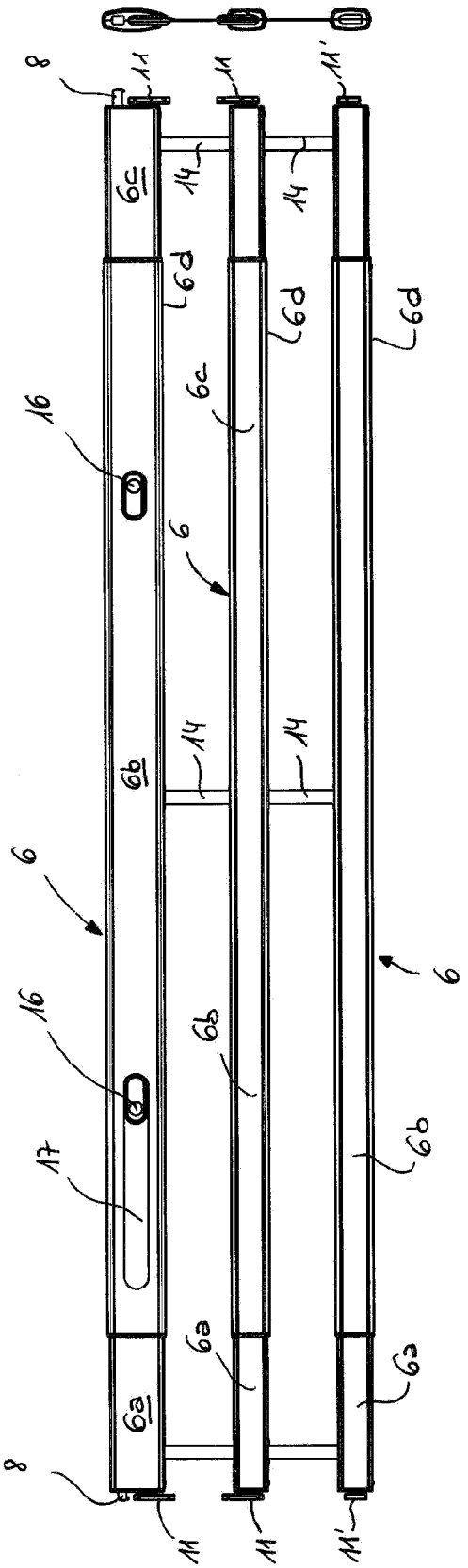
8
11
11
11'
6c
14
14
6d
6d
6d
16
6c
6
14
14
6b
6
16
6b
17
6b
6a
6a
6a
8
11
11
11'

FIG.2A

FIG.2B

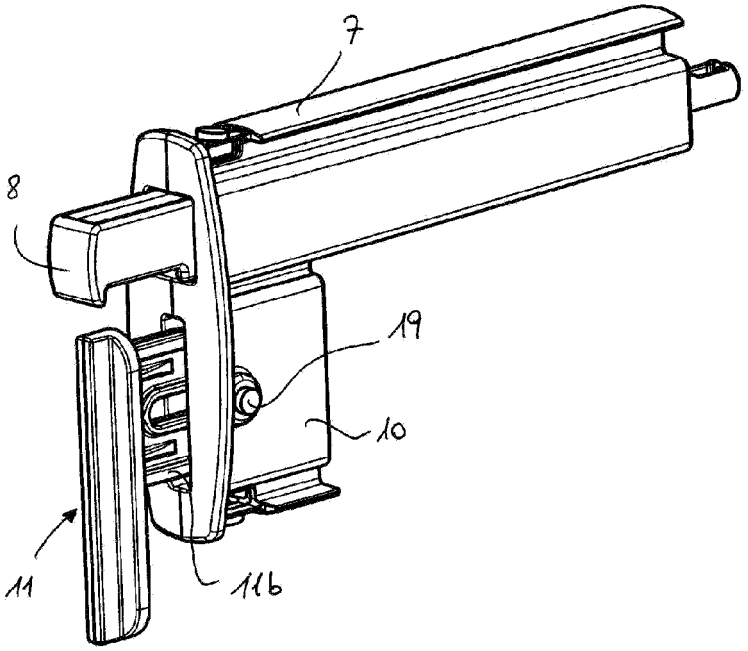

FIG.3A

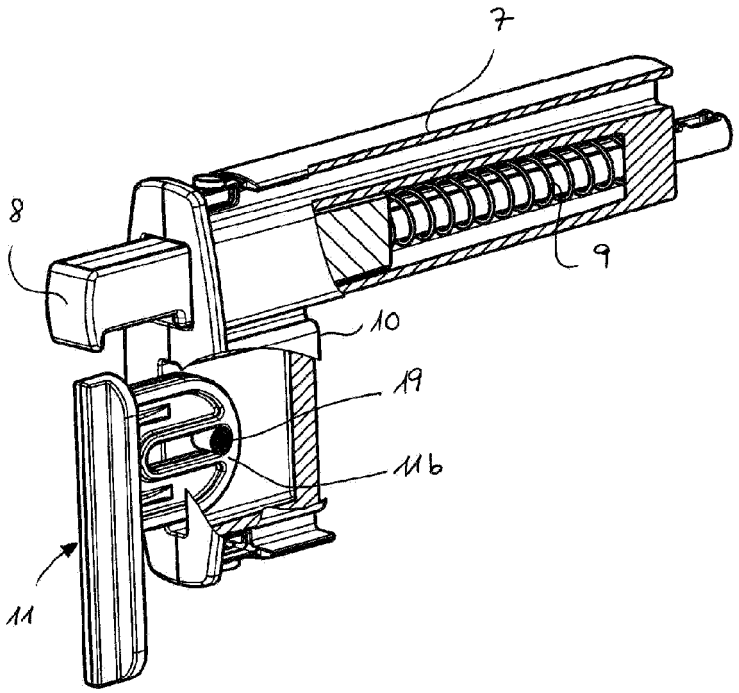

FIG.3B

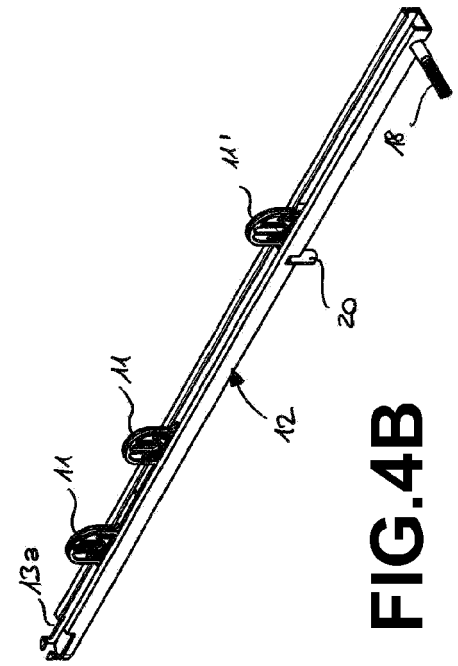

FIG.4B

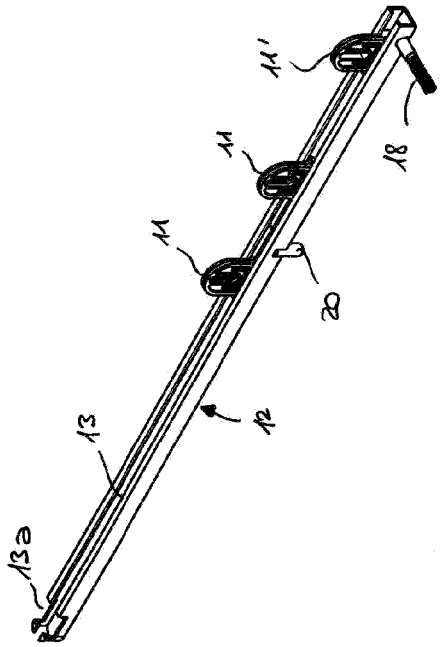

FIG.5B

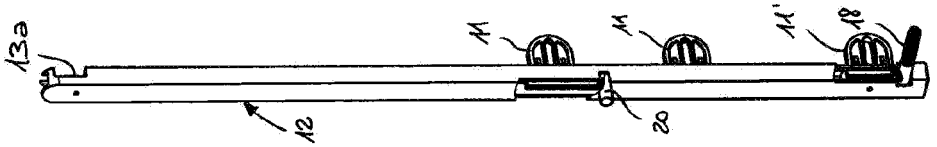

FIG.5A

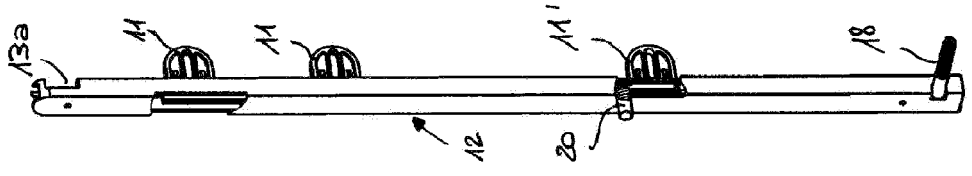

FIG.4A

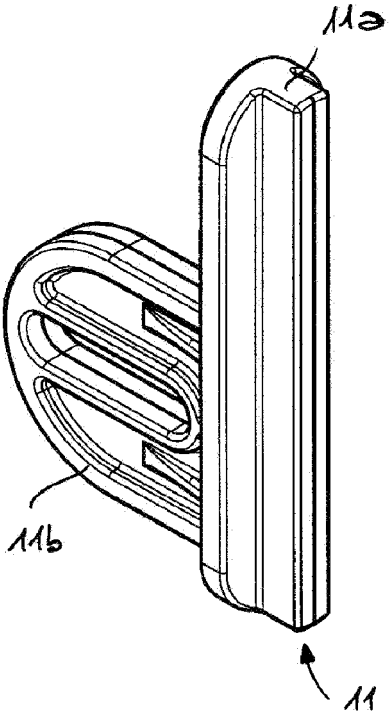

FIG.6A

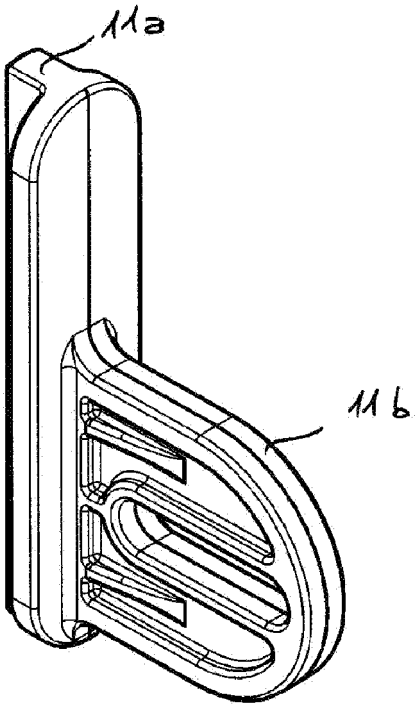

FIG.6B

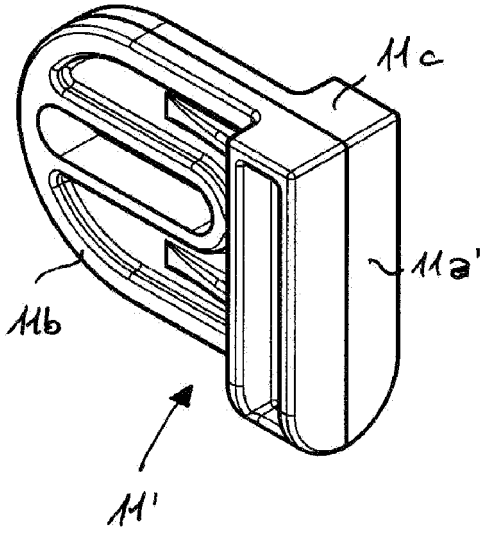

FIG.7A

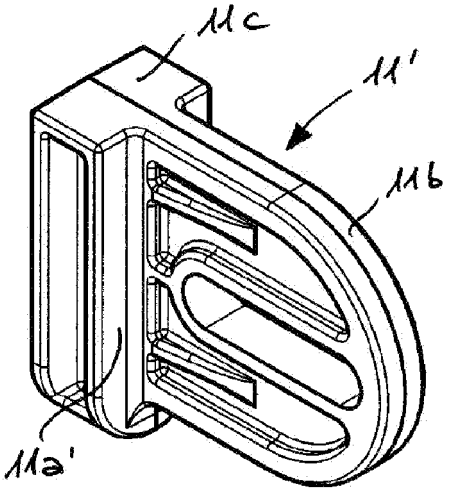

FIG.7B

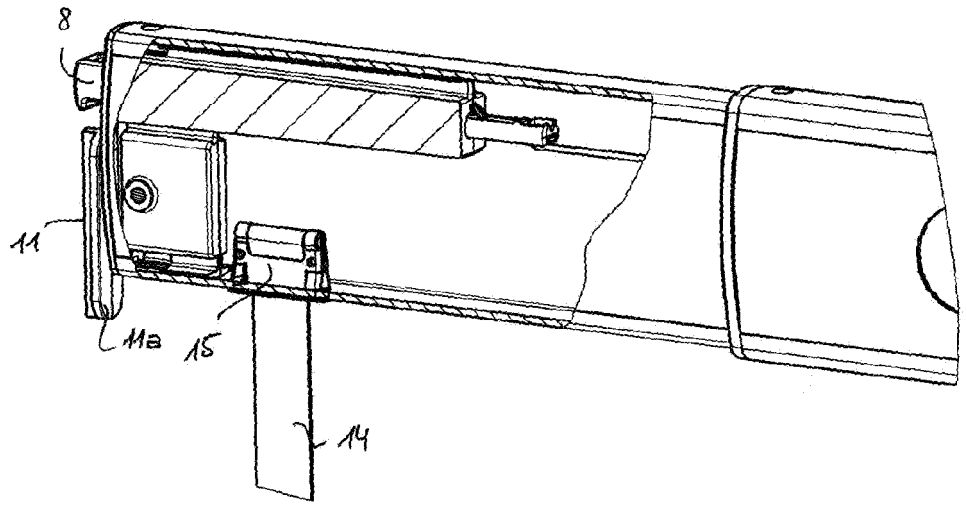

FIG.8

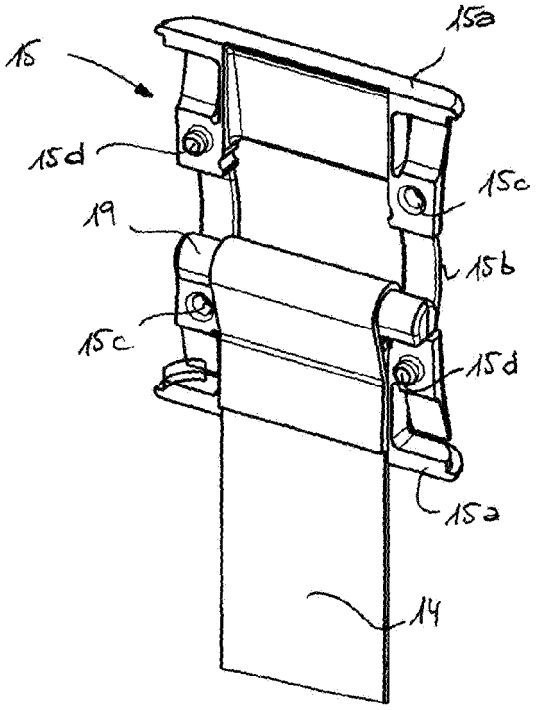

FIG.9

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EUROPEAN SEARCH REPORT

Application Number
EP 08 17 2631

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

A61G
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	15 May 2009	Godot, Thierry

CATEGORY OF CITED DOCUMENTS

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