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(54) **Construction system for furniture**

(57) The system (1) comprises at least one pair of sections (2), parallel to each other, applied to a support (post, wall, etc.) by means of fixing means (3) adapted to maintain a preset distance between the sections

The sections of each pair are advantageously made of a metal material (preferably aluminium) or of another equivalent material (PVC, wood, etc.) and the fixing means (3) are adapted to adjust the pair of sections (2) in height, depth and/or inclination.

Between the sections (2) of each pair there is at least one movable carriage (4), provided with pairs of wheels (5) adapted to slide in hollows (6) present in said sections, which carries a furnishing element (cabinets, shelves, mirrors, etc.); alternatively the carriage (4) slides on one of the sections (2).

The carriage (4) is locked in position by means of reversible locking means (7).

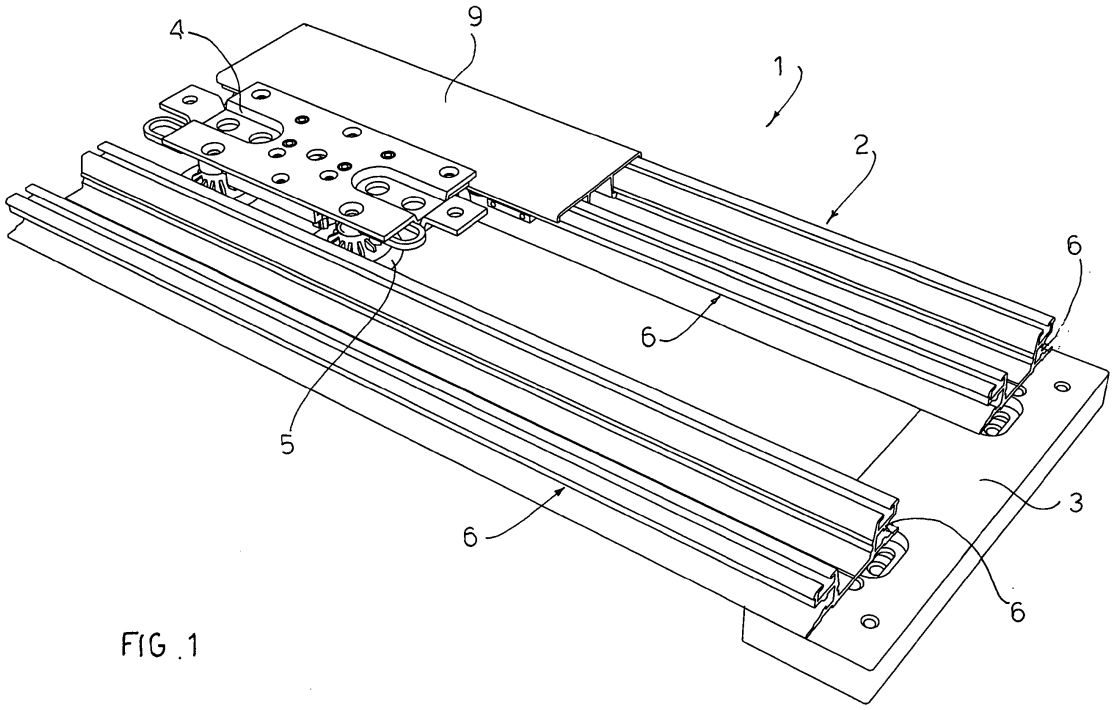

FIG. 1

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Description

[0001] The present invention refers to a construction system for furniture consisting of a supporting structure (which extends essentially in a vertical plane) which carries the furnishing elements (such as, for example, shelves, cabinets, mirrors, beds, etc.).

[0002] The furnishing elements can be made to slide along the supporting structure and may be projecting or provided with wheels (or other equivalent means) that rest on the floor.

[0003] Construction systems for furniture are known to the art, consisting of one or more cross pieces, supported by uprights or applied to a wall, to which are fixed the furnishing elements, whose position cannot be modified simply and rapidly: in fact, to change the position of a furnishing element it is often necessary to dismantle the furniture item at least partially.

[0004] The fact that the position of the furniture is (practically) fixed represents (or can represent) a limitation to the creativity of a designer when designing the furniture for a room, since it is necessary to leave around each item of furniture the space necessary for access by the user, even when it is not in use.

[0005] This limitation does not exist when adopting the construction system forming the subject matter of the present invention, wherein the furnishing elements can be made to slide along the supporting structure and moved easily, allowing exploitation of the available space to be optimised (or, at least, improved).

[0006] Object of the present invention is to create a construction system for furniture able to overcome the limits presented by construction systems of the prior art; this object is achieved by means of a construction system which presents the characterising elements illustrated in claim 1.

[0007] Further advantageous characteristics of the invention form the subject matter of the dependent claims.

[0008] The invention will now be described with reference to purely exemplifying (and therefore non limiting) embodiments thereof, illustrated in the appended figures, wherein

Figure 1 shows diagrammatically a perspective view of a construction system according to the invention;

- Figure 2 shows diagrammatically an exploded view of the fixing means for the pair of sections of Figure 1 to a support;
- Figure 3 shows diagrammatically an exploded view of a pair of sections applied to the fixing means of Figure 2;
- Figure 4 shows diagrammatically a front view of a carriage;
- Figure 5 shows diagrammatically a front view of the intermediate frame belonging to the carriage of Figure 4;
- Figure 6 shows diagrammatically an exploded perspective view of a carriage;
- Figure 7 shows diagrammatically the end of a section and the end of stroke means of a carriage;
- Figure 8 shows diagrammatically a closing stopper to be applied to a section;
- Figure 9 shows diagrammatically a variation on the construction system of Figure 1, in which the carriages slide astride the sections.

[0009] In the appended figures corresponding elements will be designated by the same reference numerals.

[0010] The construction system for furniture forming the subject matter of the present invention consists of a supporting structure (which extends essentially in a vertical plane) which carries the furnishing elements and which comprises, in combination with each other, at least one pair of sections, at least two fixing means - placed behind each pair of sections - which keep the sections of each pair parallel to each other and with a preset distance between their axes of symmetry, and at least one carriage - carried by at least one of the sections of each pair and provided with wheels which run in hollows present in said sections - which carries the furnishing element.

[0011] The preset distance between the axes of symmetry of the sections of each pair is preferably 13 cm and in any case between 3 and 32 cm.

[0012] The total depth of the supporting structure is preferably 4.5 cm and in any case between 0.5 and 12 cm.

[0013] The sections of each pair are advantageously identical and made of a metal material (preferably aluminium) or of another equivalent material (PVC, wood, etc.).

[0014] The fixing means are applied (by means of screws, nails, hooks and/or other known fixing means) to a support (omitted in the appended figures for the sake of simplicity of the graphic representation) such as, for example, a wall, an upright and/or a panel; the carriages carry the furnishing elements required on a case-by-case basis.

[0015] In the appended figures the construction system is designated by 1, the metal sections by 2, the fixing means by 3, a carriage by 4, the wheels of the carriage 4 by 5, and the hollows present in the sections 2, in which the wheels 5 run, by 6.

[0016] Figure 1 shows diagrammatically a perspective view of a construction system 1, produced according to the invention, which comprises a pair of metal sections 2; one of the fixing means 3 (Figures 2 and 3), placed behind the pair of sections 2, which keep the sections 2 parallel to each other and with a preset distance between their axes of symmetry; a carriage 4 (Figures 4 to 6), inserted between the sections 2 and provided with wheels 5 able to run in hollows 6 present in the sections 2.

[0017] Also visible in Figure 1 is a portion of a covering element 9 applied to one of the sections 2: said element

9 hides the sections 2 from the user's sight and consists of a body of (preferably) plastic and/or metal material bent into a C-shape and applied by pressure to a section 2.

[0018] The element 9, which can be omitted without departing from the scope of the invention, can be easily applied and replaced and can have the colour or combination of colours required on a case-by-case basis to meet the specific needs of the user.

[0019] The pair of sections 2 can be applied horizontally and/or vertically to a support, can be disposed in various ways on the support and equipped with the furnishing elements required on a case-by-case basis to meet a specific need.

[0020] The pair of sections 2 can be applied to a wall or to uprights, to form a dividing wall.

[0021] Figure 2 shows diagrammatically an exploded view of the fixing means 3, adapted to adjust the position of the pair of sections 2 in height, depth and/or inclination.

[0022] Said fixing means 3 comprise:

- a fixed plate 31, adapted to be applied to the support, which has at least one pair of threaded bushes 35; and
- a movable plate 32, which has a pair of slotted through holes 36 having their major axis coinciding with that of the movable plate 32 and, at each end, at least one threaded hole 37.

[0023] The slotted holes 36 allow a longitudinal movement of the movable plate 32 with respect to the fixed plate 31: this allows the position of the movable plate 32 and, consequently, of the pair of sections 2 carried by the movable plate 32, to be adjusted in height.

[0024] The sections 2 are connected to the movable plate 32 by means of screws 41 (Figure 3) inserted in the threaded holes 37 whilst the movable plate 32 is connected to the fixed plate 31 by means of a pair of screws 40 which pass through the slotted holes 36 of the movable plate 32 and enter the threaded bushes 35 of the fixed plate 31.

[0025] Advantageously, to allow the fixing means 3 to adjust the position of the movable plate 32 which carries the pair of sections 2 in height, depth and/or inclination:

- the fixed plate 31 further has two slotted through holes (33, 34) having their major axes at right angles to each other, in which are inserted means (omitted in the appended figures for the sake of simplicity of the graphic representation) of applying the fixing means 3 to the support;
- the movable plate 32 further has, at each end, at least one pair of threaded through holes 38 in each of which is seated a pin 39 which acts on the fixed plate 31 to adjust the position of the movable plate 32 (and of the pair of sections 2 carried by the movable plate 32) in depth and/or inclination with respect to the fixed plate 31; for the sake of simplicity of the graphic representation, only one of the threaded through holes and one of the pins are designated by the reference numerals 38 and 39, respectively, in Figure 2.

[0026] These adjustable fixing means make it possible to obtain a perfect parallelism between a plurality of pairs of sections 2 even if the floor is not perfectly level and/or the support (for example a wall) is not perfectly smooth: it is therefore possible to use furnishing elements that are too big and/or too heavy to be carried by a single construction system according to the invention, by fixing them to carriages 4 carried by a plurality of pairs of sections 2 positioned at different heights.

[0027] Figure 3 shows diagrammatically an exploded view of a pair of sections 2 applied to the fixing means 3 of Figure 2; visible in Figure 3 are the screws 41, inserted into the holes 42 present in the sections 2 and into the threaded holes 37 of the movable plate 32, which connect the sections 2 to the fixing means 3.

[0028] The holes 42 are advantageously slotted holes having their major axis coinciding with the longitudinal axis of symmetry of the section 2 and equidistant from each other with respect to the length of the section 2.

[0029] Also visible in Figure 3 is the covering element 9 applied by pressure to one of the sections 2.

[0030] Figure 4 shows diagrammatically a front view of a carriage 4, which comprises a front plate 41, a rear plate (omitted in the appended figures to the sake of simplicity of the graphic representation) and an intermediate frame 51 (Figure 5) which carries two pairs of wheels 5 and means 7 (partially visible in Figure 4 and described with reference to Figure 5) adapted to lock the carriage 4 in position in a reversible manner.

[0031] The front plate 41 has two tongues 42 with holes, adapted to carry at least one furnishing element.

[0032] The carriage 4 is of such a width that its wheels 5 are engaged adequately in the hollows 6 of the sections 2, preventing any deformations induced by the weight of the least one furnishing element carried by the carriage 4 from causing the wheels 5 to leave the hollows 6 accidentally.

[0033] Figure 5 shows diagrammatically a front view of the intermediate frame 51 of the carriage 4, which is composed of two parts (52, 53), each of which carries a pair of wheels 5; the part 53 further carries the reversible locking means 7.

[0034] The part 52 is removable and has reference appendages 54 able to engage in holes formed in the front plate 41.

[0035] Such an embodiment of the intermediate frame proves advantageous since it allows a carriage 4 to be added between the two sections 2 without having to remove the carriages 4 previously inserted between said sections: for this purpose it is sufficient to remove the removable part 52 of the frame 51 from the carriage 4 to be added before positioning it between the sections 2 inserting the wheels 5 of the part 53 into the hollows 6 of

one of the sections 2, insert the wheels 5 of the part 52 into the hollows 6 of the other section 2, push the part 52 of the carriage 4 sideways until it engages the reference appendages 54 of the part 52 in holes formed in the front plate 41, not visible in figure 4 because they are occupied by the appendages 54, and fix the part 52 of the frame 51 to the front plate 41 and to the rear plate by means of screws or other functionally equivalent fixing means.

[0036] Each of the reversible locking means 7 consists of a body 55, adapted to translate on the lower edge of the part 53 of the intermediate frame 51 which carries the locking means 7, which has a pin 56 which, when the locking means 7 is activated causing the body 55 to return into the carriage 4, engages in seats 57 formed on one face of a wheel 5 to lock said wheel.

[0037] The locking means 7 are reversible since it is possible to disengage the pin 56 from the seat 57 of the wheel 5 by extracting the body 55 from the carriage 4.

[0038] In Figure 5 one wheel 5 is locked by the locking means 7 whilst the other wheel 5 is free to turn.

[0039] Figure 6 shows diagrammatically an exploded perspective view of the carriage 4 of Figure 4; visible in Figure 6 are the front plate 41, the two parts (52, 53) of the intermediate frame 51, each of which carries a pair of wheels 5, the reversible locking means 7 carried by the part 53 of the intermediate frame 51 and the reference appendages 54 carried by the part 52 of the intermediate frame 51.

[0040] The screws (or other functionally equivalent means) adapted to fix the part 52 of the frame 51 to the front plate 41 have been omitted in Figure 6 for the sake of simplicity of the graphic representation.

[0041] Figure 7 shows diagrammatically the end of a section 2 and the means, designated by 70 in Figure 7, to be inserted in one end of the hollow 6 of a section 2 to limit the stroke of the carriage and prevent it from coming out of the hollow 6.

[0042] The means 70 comprise an enlarged part 71, having a shape matching that of a hollow 6, to be inserted by pressure into the end of the hollow 6, and an elastic area 72, to be inserted in the hollow 6, having an undulated shape adapted to engage with a wheel 5 of the carriage 4, locking it.

[0043] Figure 8 shows diagrammatically a portion of a section 2, a portion of the covering element 9 and a closing stopper 80, having four protrusions 81 with a shape matching that of the hollow 6, to be inserted by pressure into the hollows 6 of the sections 2 to seal said sections.

[0044] Figure 9 shows diagrammatically a variation on the construction system of Figure 1, in which the carriages slide astride one of the sections 2.

[0045] Visible in Figure 9 is a pair of sections 2, kept parallel to each other and at a preset distance by the fixing means 3; on each of the sections 2 is applied a carriage 4 movable along said section.

[0046] The carriages 4 are of such a width that their wheels 5 are engaged adequately in the hollows 6 present in the opposite sides of the section 2, preventing any deformations induced by the weight of the least one furnishing element carried by the carriage 4 from causing the wheels 5 to leave the hollows 6 accidentally.

[0047] Without departing from the scope of the invention, it is possible to use the hollows 6 to hang non slidable furnishing elements such as, for example, clothes hooks, shelves, decorative textile panels, etc.

[0048] Again without departing from the scope of the invention, a person skilled in the art can make those modifications and/or improvements to the construction system for furniture described herein as suggested by normal experience and/or by the natural evolution of the art.

Claims

1. A construction system (1) for furniture, consisting of a supporting structure which carries the furnishing elements, **characterised in that** the structure comprises, in combination with each other:

   - at least one pair of sections (2);
   - at least two fixing means (3), placed between each pair of sections (2) and adapted to keep the sections (2) of each pair parallel to each other and with a preset distance between their axes of symmetry, the fixing means (3) being fixed to a support;
   - at least one carriage (4), carried by a least one of the sections (2) of each pair and provided with wheels (5) adapted to slide in hollows (6) present in said sections, which carries a furnishing element.

2. A construction system (1) as in claim 1, **characterised in that** the at least one carriage (4) is inserted between the sections (2) of each pair of sections (2).

3. A construction system (1) as in claim 1, **characterised in that** the fixing means (3) are placed behind each pair of sections (2).

4. A construction system (1) as in claim 1, **characterised in that** the fixing means (3) are adapted to adjust the position of the pair of sections (2) in height, depth and/or inclination.

5. A construction system (1) as in claim 1, **characterised in that** the fixing means (3) comprise:

   - a fixed plate (31), adapted to be fixed to the support and having at least one pair of threaded bushes (35); and
   - a movable plate (32), which has a pair of slotted through holes (36) having their major axis coinciding with that of the movable plate (32) and, at each end, at least one threaded hole (37).

6. A construction system (1) as in a claim 5, **characterised in that** the fixed plate (31) further presents two slotted through holes (33, 34) having their major axes at right angles to each other, in which are inserted means to apply the fixing means (3) to the support;

7. A construction system (1) as in claim 5, **characterised in that** the movable plate (32) further has, at each end, at least one pair of threaded through holes (38) in each of which is seated a pin (39) acting on the fixed plate (31) to adjust the position of the movable plate (32) carrying the pair of sections (2) in depth and/or inclination with respect to the fixed plate (31).

8. A construction system (1) as in claim 5 **characterised in that** the sections (2) are connected to the fixing means (3) by means of screws (41) inserted in holes (42) present in the sections (2) and in the threaded holes (37) of the movable plate (32) belonging to the fixing means (3).

9. A construction system (1) as in claim 8, **characterised in that** the holes (42) present in the sections (2) slotted holes having their major axis coinciding with the longitudinal axis of symmetry of the section (2).

10. A construction system (1) as in claim 5, **characterised in that** the movable plate (32) is connected to the fixed plate (31) by means of a pair of screws (40) which pass through the slotted holes (36) of the movable plate (32) and enter the threaded bushes (35) of the fixed plate (31).

11. A construction system (1) as in claim 1, **characterised in that** it further comprises a covering element (9) to be applied to the sections (2), said covering element (9) consisting of a C-shaped body applied by pressure to one of the sections (2).

12. A construction system (1) as in claim 1, **characterised in that** the carriage (4) comprises a front plate (41) having tongues (42) with holes adapted to carry at least one furnishing element, a rear plate and an intermediate frame (51) which carries two pairs of wheels (5) and means (7) adapted to lock the carriage (4) reversibly in position.

13. A construction system (1) as in claim 12, **characterised in that** the intermediate frame (51) is composed of two parts (52, 53), each of which carries a pair of wheels (5), one of said parts (53) further carrying the reversible locking means (7).

14. A construction system (1) as in claim 13, **characterised in that** one of the parts (52) of the intermediate frame (51) is removable and has reference appendages (54) adapted to engage in holes formed in the front plate (41).

15. A construction system (1) as in claim 13, **characterised in that** each of the reversible locking means (7) consists of a body (55), adapted to translate reversibly on the lower edge of the part (53) of the intermediate frame (51) that carries the locking means (7), which has a pin (56) adapted to engage reversibly in seats (57) formed on one face of a wheel (5) to lock said wheel.

16. A construction system (1) as in claim 1, **characterised in that** the at least one carriage (4) slides astride one of the sections (2) of each pair of sections (2).

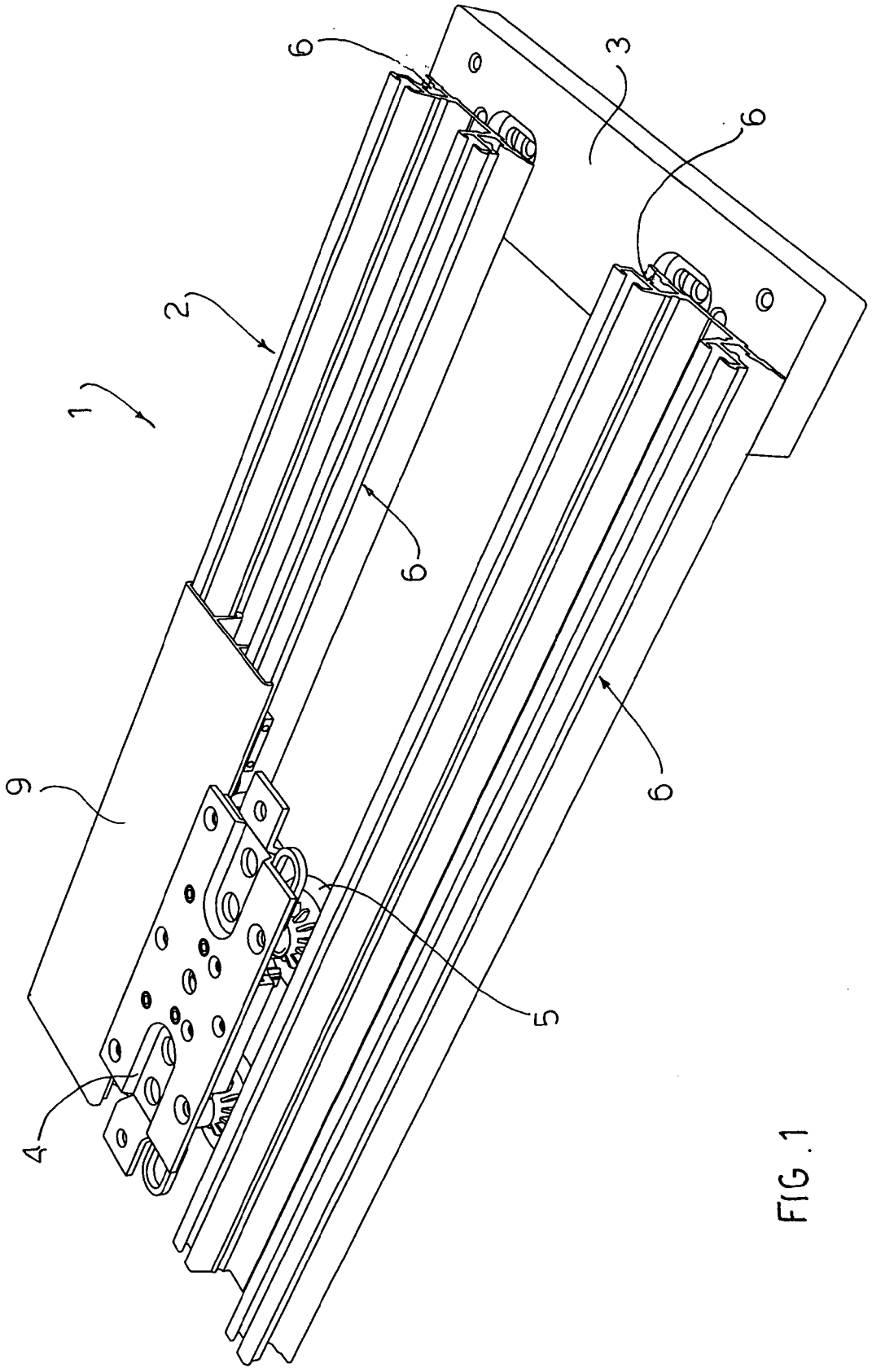


FIG. 1

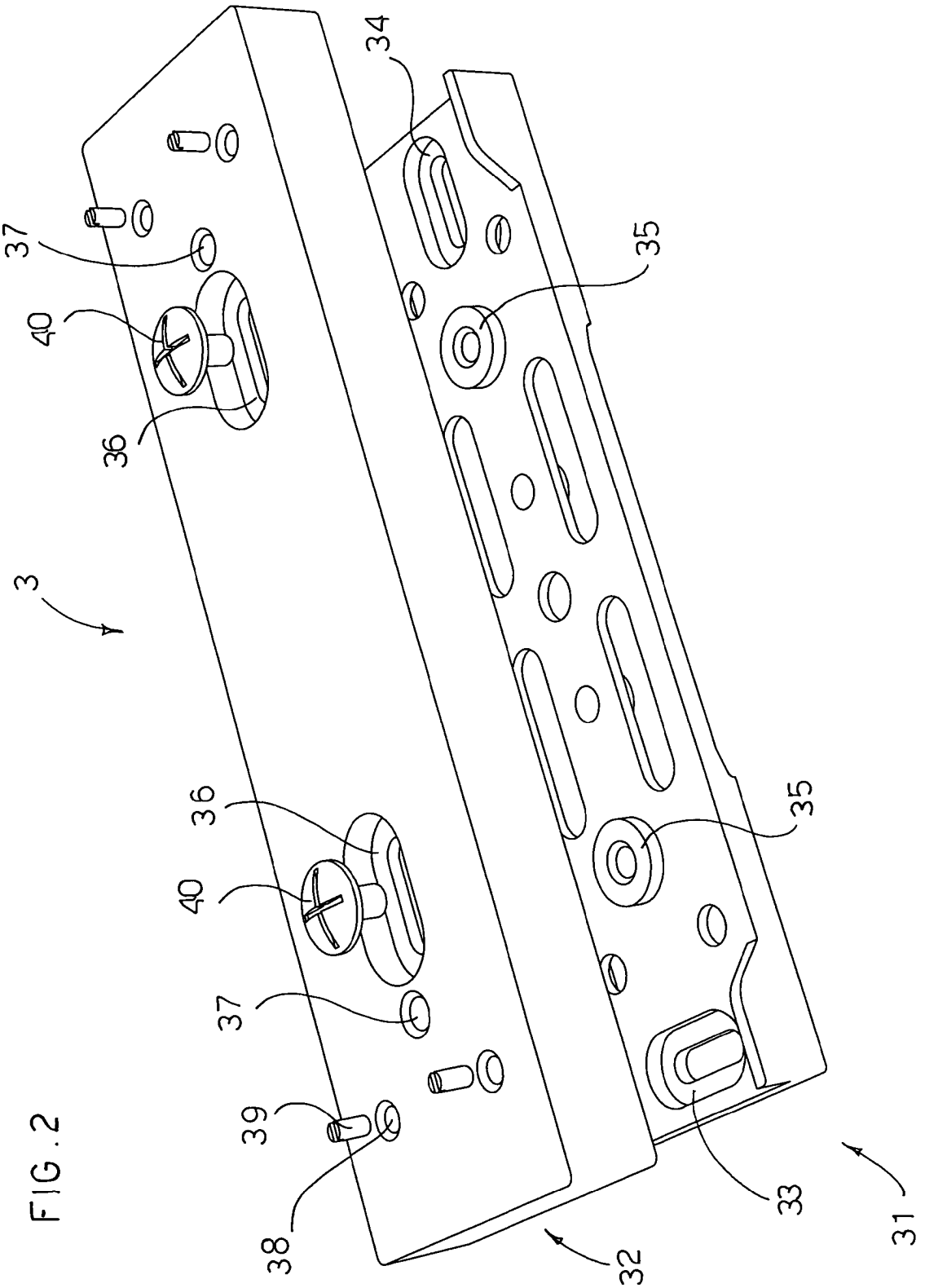


FIG.2

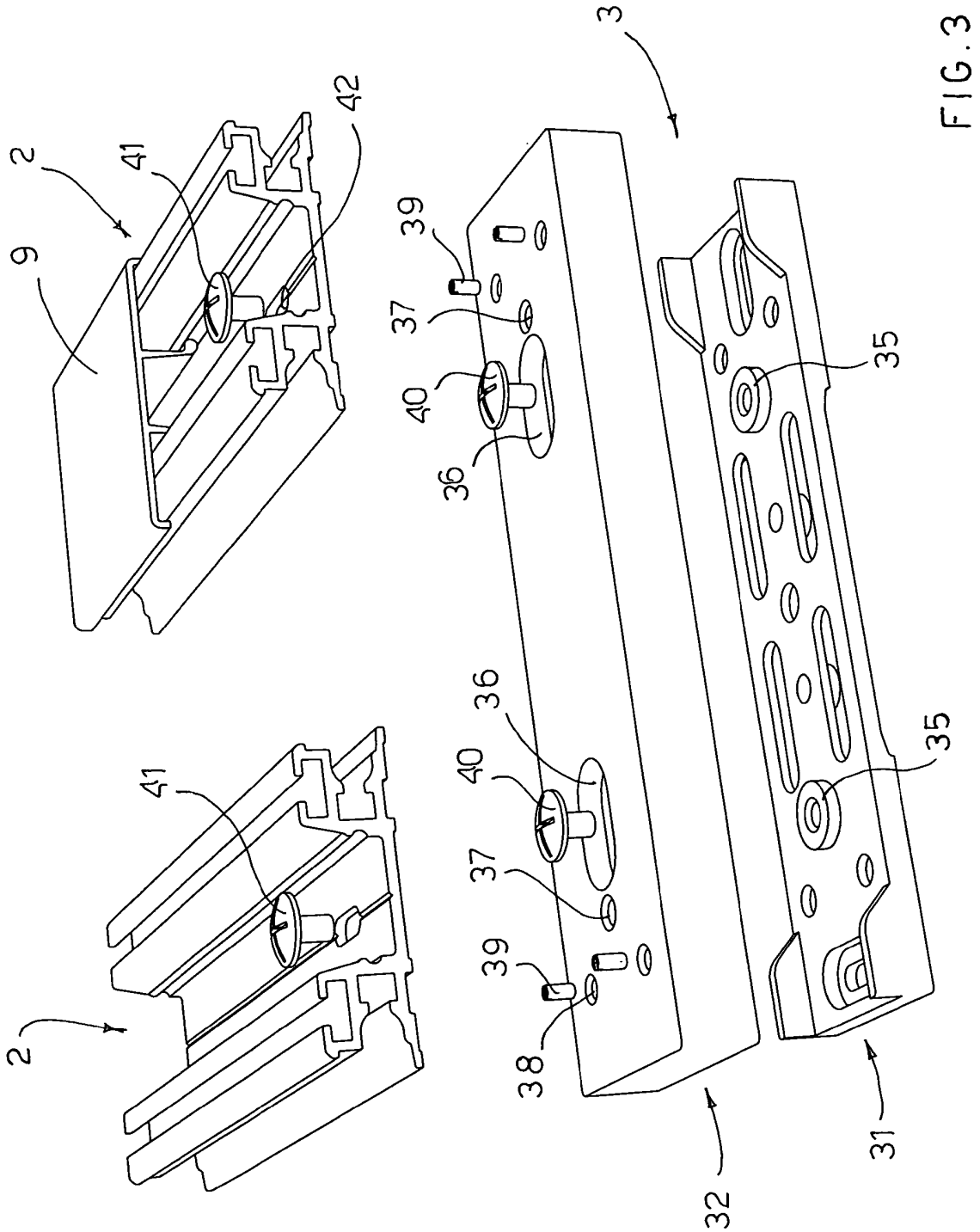


FIG.3

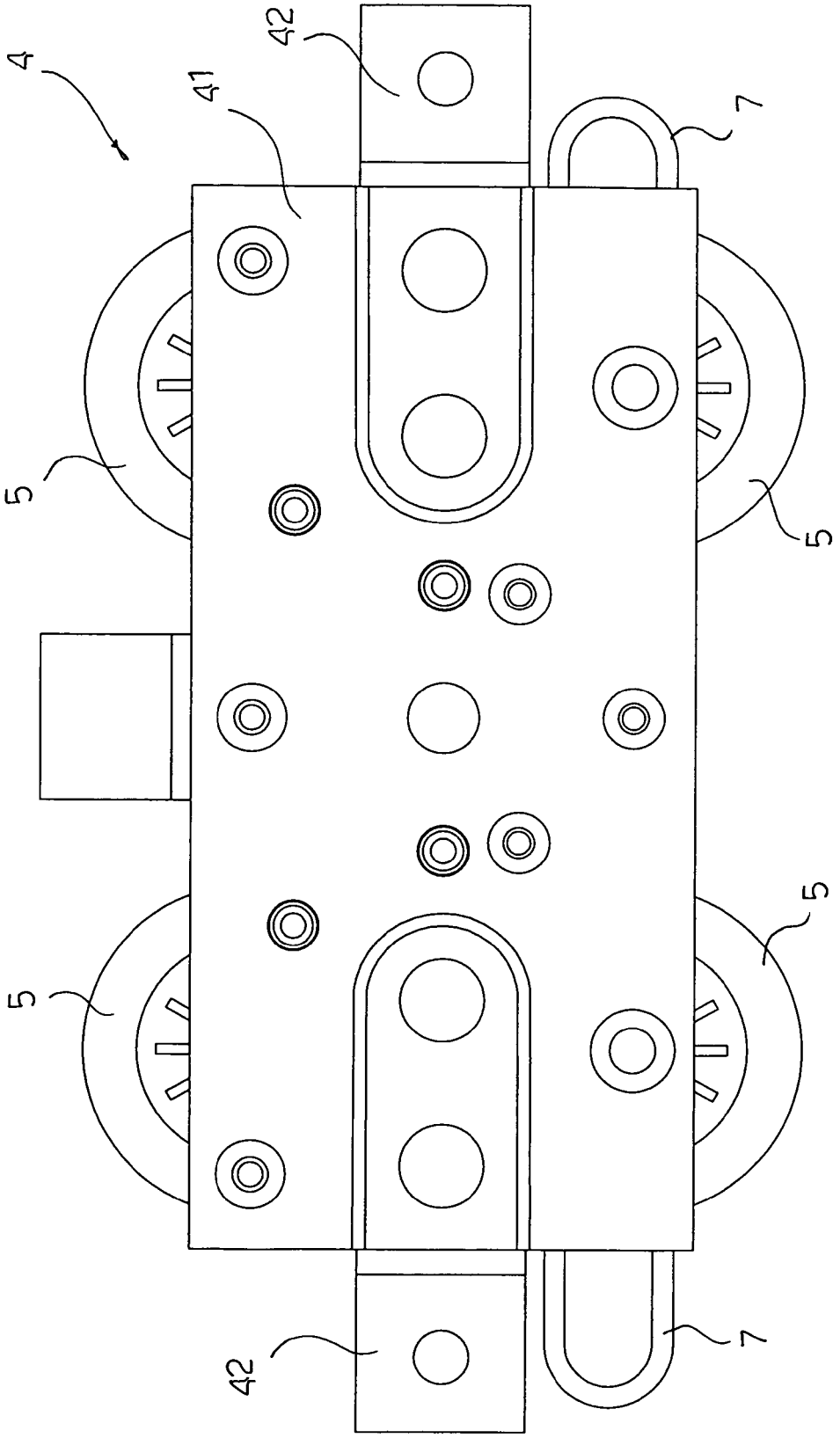


FIG. 4

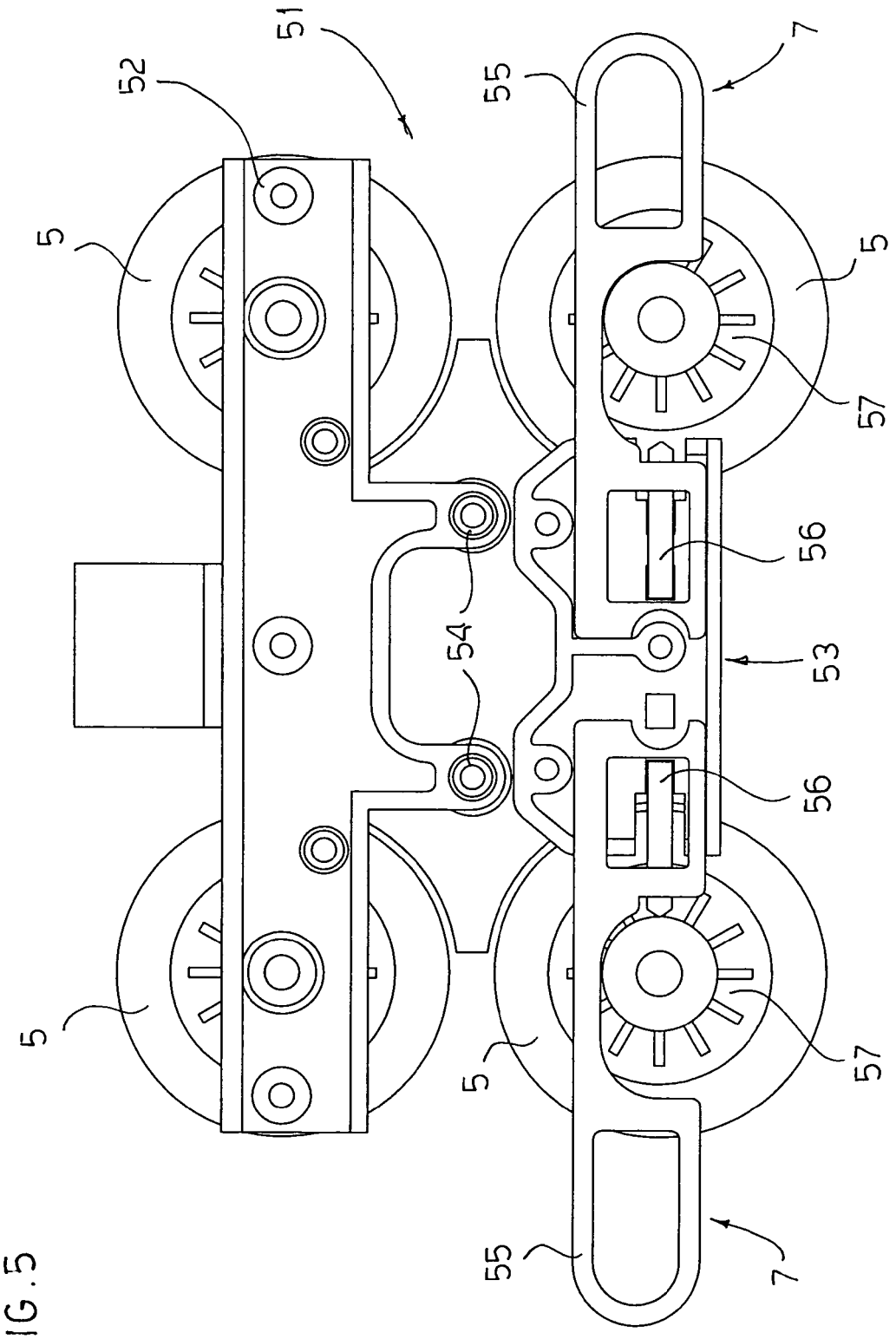


FIG.5

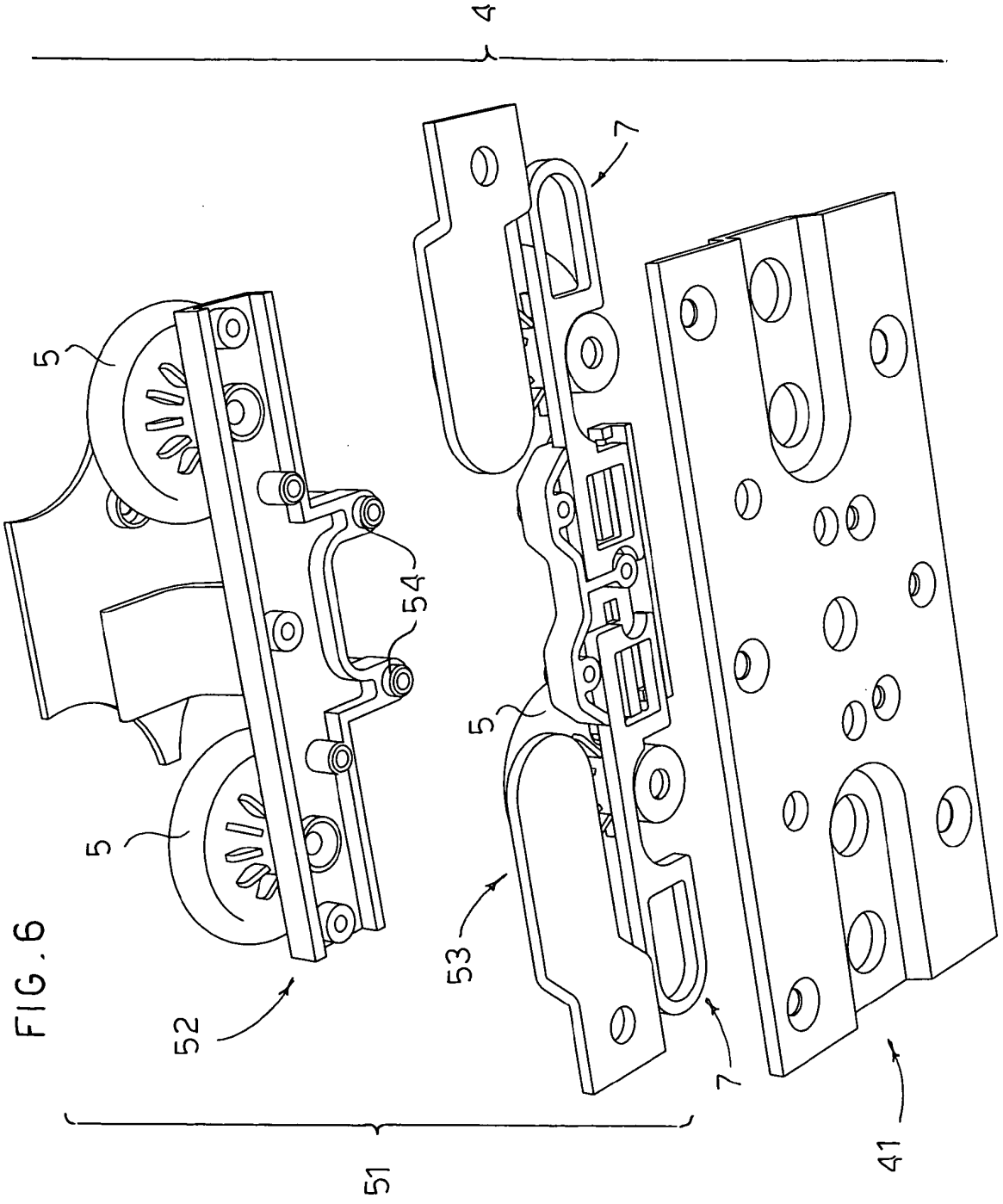


FIG. 6

FIG. 7

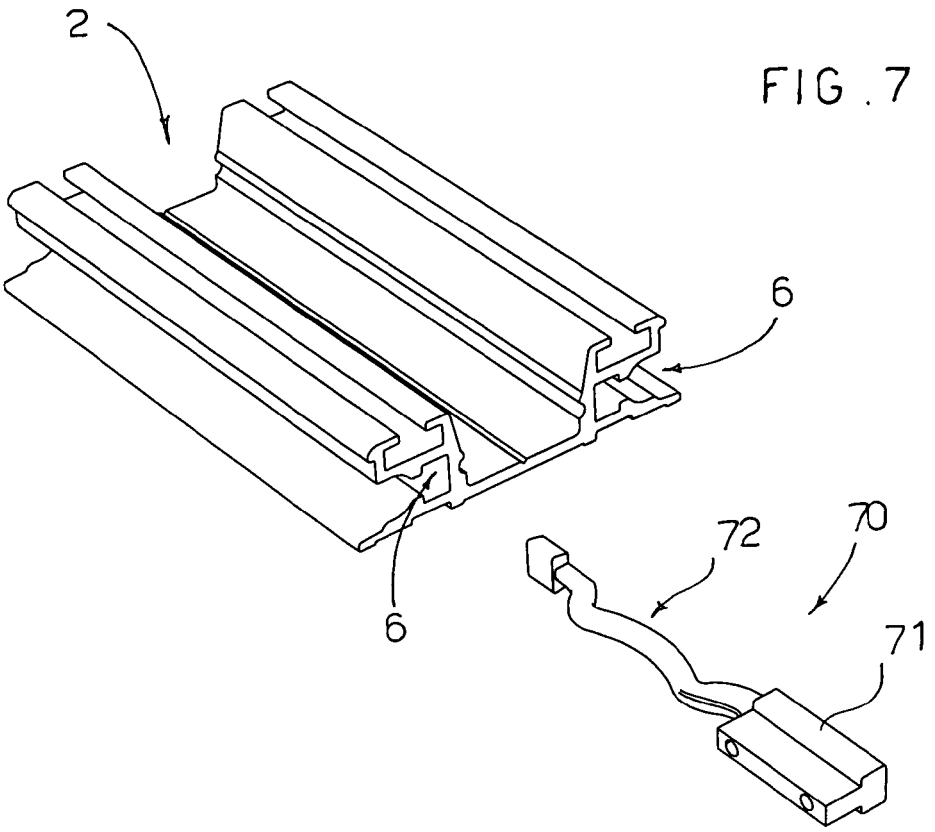
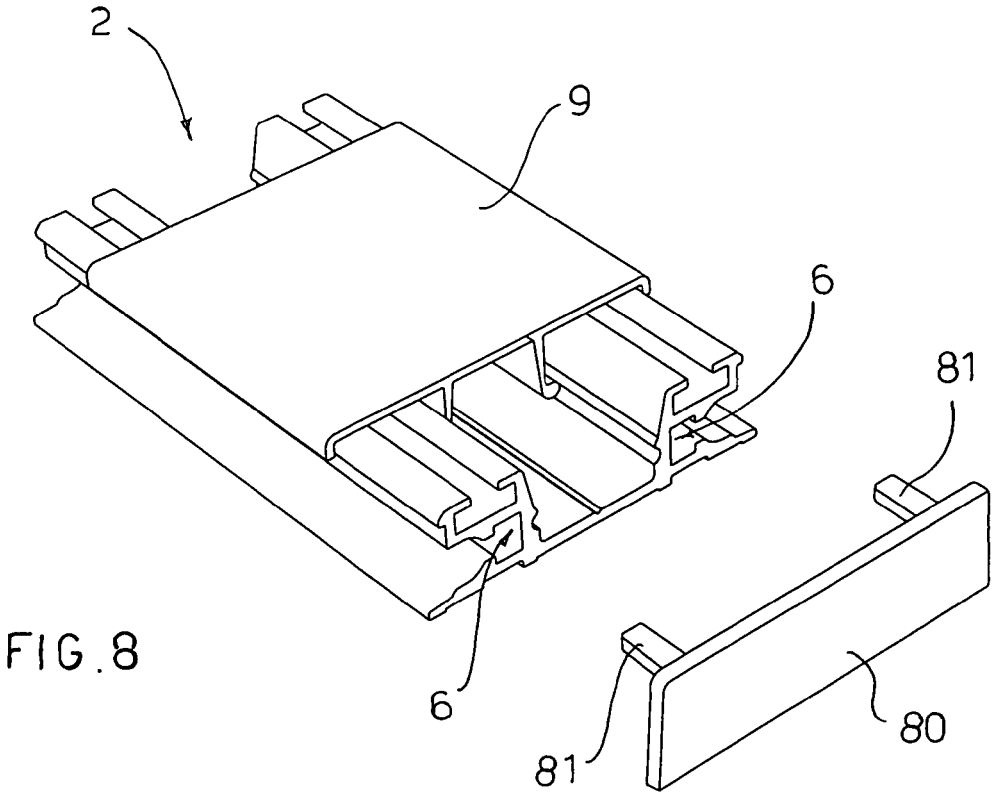


FIG. 8



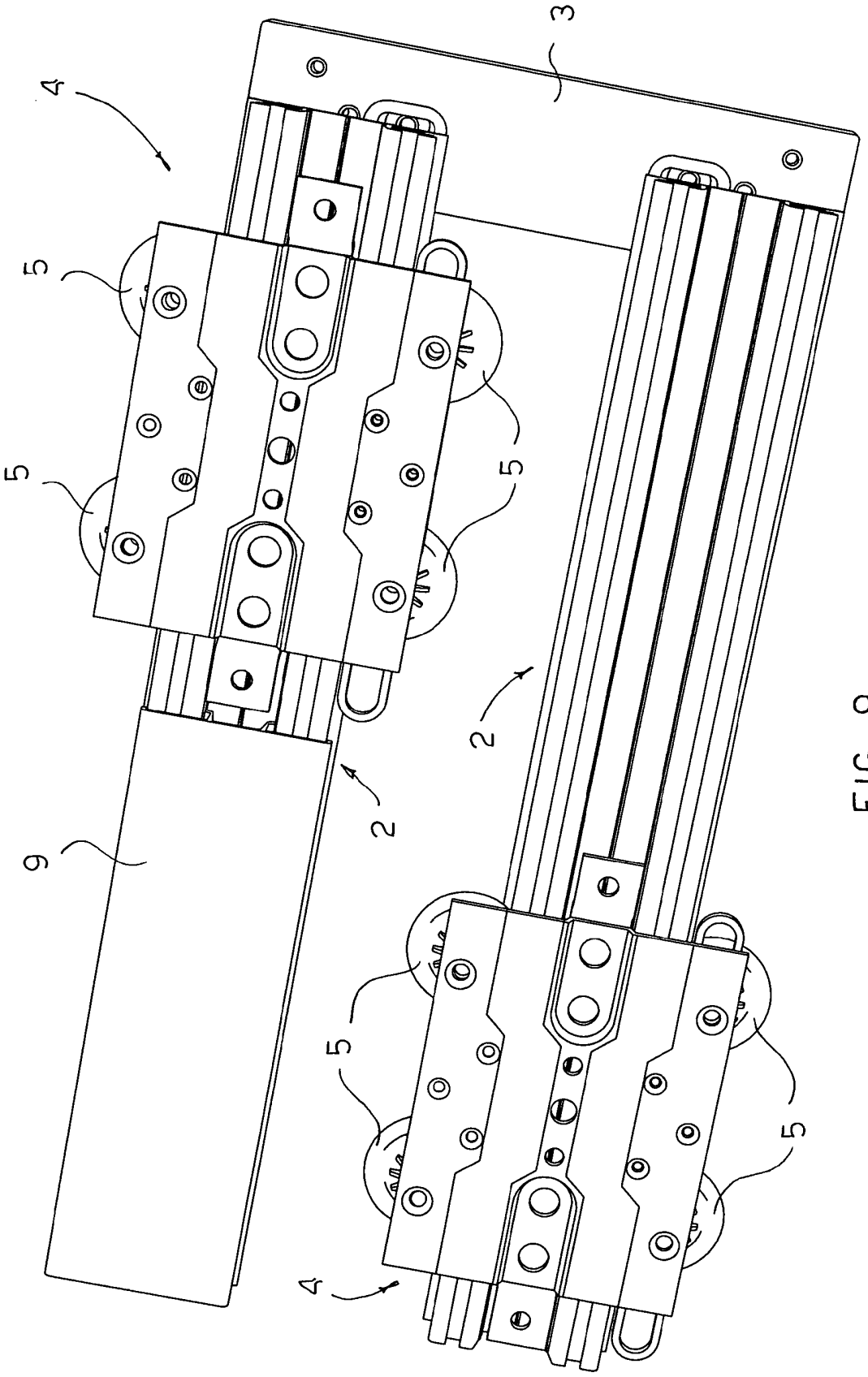


FIG. 9