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(71) Applicant: **De la Haye, Cornelis Franciscus**
2597 RP Den Haag (NL)

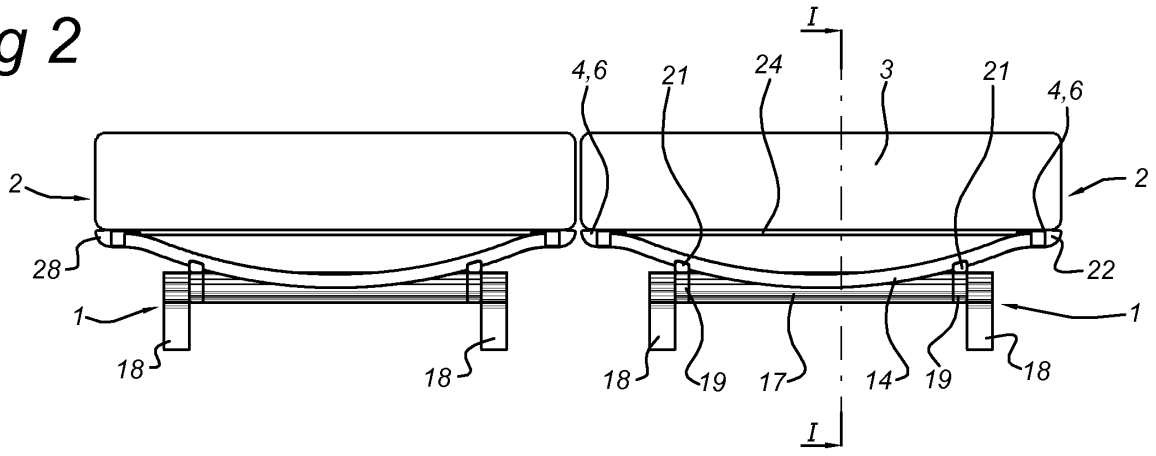
(72) Inventor: **De la Haye, Cornelis Franciscus**
2597 RP Den Haag (NL)

(74) Representative: **Ketelaars, Maarten F.J.M.**
Nederlandsch Octrooibureau
J.W. Frisolaan 13
2517 JS Den Haag (NL)

(54) **Adjustable spiral mattress supporting base with trapping safeguard**

(57) A spiral mattress supporting base comprises a fixed lower frame (1) and an upper frame (2) which is mounted directly upon the fixed lower frame (1) and which comprises movable upper frame members (4-6). The upper frame (2) has upper longitudinal sections (11-13, 20) and traverse members (14, 15) extending transversely between the longitudinal sections, between which upper longitudinal sections (11-13, 20) a network (24) of interlocked helical springs is spanned. The lower frame (1) has lower longitudinal sections (16). The transverse distance between the lower longitudinal sections (16) is smaller than the transverse distance between the upper longitudinal sections (11-13, 20).

Fig 2



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Description

[0001] The invention relates to a spiral mattress supporting base, comprising a fixed lower frame, an upper frame which is mounted directly onto the lower frame and which comprises movable upper frame members, as well as supporting means by means of which at least a portion of the upper frame is supported by the lower frame, which upper frame consists of longitudinal sections disposed transversely at a fixed distance in relation to one another, and traverse members extending between the longitudinal sections, between which upper longitudinal sections a network of interlocked helical springs is spanned, which lower frame consists of lower longitudinal sections which are at a fixed distance in relation to one another in transverse direction.

[0002] Such a spiral mattress supporting base is known in the prior art. The longitudinal sections thereof and possibly the cross-sections at the longitudinal ends thereof, which are in full view, usually have a slim line form that must be advantageous to the design of the spiral mattress support. In the folded down position the longitudinal sections of the upper mattress are positioned directly on top of the longitudinal sections of the lower mattress in an effort to retain the general impression of a slim line construction. A mattress may subsequently be placed upon the upper frame. Alternatively, the upper frame between which the diagonally spanned helical springs are fastened, may also be constructed as part of a so-called "box spring". In that case, a lower mattress is attached to the upper frame, upon which lower mattress further upper mattresses may be placed.

[0003] However, there are various drawbacks associated with this known construction of the spiral mattress supporting base. Firstly, the longitudinal sections of the lower frame and of the upper frame cannot easily be stacked to form a slim line whole. The joint thickness of the stacked longitudinal sections still shows a minimum thickness that cannot be ignored and which could adversely affect the appearance of the spiral mattress supporting base.

[0004] A further drawback related to the sections that lie one on top of the other relates to the comfort of the spiral mattress supporting base. When folding down the movable upper frame members onto the fixed lower frame, there is the risk of trapping. In this manner, the user could accidentally get a hand or arm trapped between the longitudinal sections of the lower frame and upper frame when manipulating the control means of the movable upper frame members, which control means are usually located on a lateral side of the spiral mattress supporting base and attached to a longitudinal section. During the continued downward movement of the upper frame members, trapping could subsequently occur. Such a problem may also arise when two spiral mattress supporting bases are set up adjacent to one another, wherein the user of the one spiral mattress supporting base is exposed to the risk of trapping if the user of the one spiral mattress supporting base operates the movable upper frame members of the other spiral mattress supporting base.

[0005] The object of the invention therefore is to provide a spiral mattress supporting base of the kind referred to in the foregoing, which does not have these drawbacks. That goal is achieved due to the fact that the transverse distance between the lower longitudinal sections is smaller than the transverse distance between the upper longitudinal sections and due to the fact that the supporting means engage from a distance within the outer ends of at least one of the traverse members, such that the sections of the lower frame and upper frame no longer rest upon each other. Furthermore, the supporting means are moved inwardly relative to the longitudinal sections of the upper frame members, so that these are hidden from view and no longer expose anyone to the risk of trapping.

[0006] In the known spiral mattress supporting base, as in the spiral mattress supporting base according to the invention, a lower frame and an upper frame are present. However, the longitudinal sections thereof are laterally displaced relative to each other in such a manner that they remain at a considerable distance from one another, even when the movable upper frame members are folded down. Thus, the risk of trapping is considerably reduced or even prevented. In addition, such an offset arrangement of the longitudinal sections leads to the lower frame remaining largely out of view, which works to the advantage of the overall appearance of the spiral mattress supporting base. Moreover, the lower frame may then be constructed less luxuriously and less expensive without this affecting the general quality impression of the spiral mattress supporting base.

[0007] The same positive effect can be achieved at the level of the head end and foot end of the spiral mattress supporting base. There, provisions can be made so that the distance between the outermost lower transverse sections is smaller than the distance between the outermost upper transverse sections. Here, the lower frame is also better hidden from view, while the risk of trapping is prevented.

[0008] As previously described, the upper frame rests upon the lower frame. The adjustable upper frame members also rest upon the lower frame, wherein, in accordance with the prior art, the longitudinal sections rest precisely on top of one another. In an offset position of the longitudinal sections in relation to one another, such a direct support is more difficult to achieve, or impossible. It is for this reason that, according to the invention, the spiral mattress supporting base is constructed in such a manner that at least one of the traverse members and/or the lower longitudinal sections are provided with or bear supporting means.

[0009] The support function of the lower frame is achieved by using the transverse members, which cross transversely over the lower longitudinal sections of the lower frame. In the most extreme downwardly moved po-

sition of the movable upper frame members, the traverse members rest upon the lower longitudinal sections, thus ensuring an excellent support. This support can be obtained in numerous ways. This means that it is also important that the support be sturdy and noise-free. This can be achieved if at least one of the traverse members bears a downwardly directed support which engages with or across a lower longitudinal section. The support preferably consists of an absorbent material, such as rubber.

[0010] Preferably, the supporting means are arranged upon the movable upper frame members, and in such a position that they are aligned relative to the corresponding longitudinal section of the lower frame.

[0011] As is known, the upper frame may comprise an upper frame section mounted in a fixed position upon the lower frame. There is a hingeable movable upper frame member attached to the fixed upper frame member. According to an optional arrangement, at least one of the movable upper frame members is constructed articulated. The articulated upper frame member may be arranged at the foot end, so that the guide hinge is disposed approximately at the same height of the user's knee joint. In addition, the upper frame member arranged at the head end may also be articulated.

[0012] Each of the articulated movable upper frame members comprise two members hingeably attached to one another, each comprising two traverse members disposed at a fixed distance in relation to one another in a longitudinal direction. These traverse members are each provided with supports, so that a stable support is ensured for each individual member.

[0013] To further increase the comfort of the spiral mattress supporting base, the circumference of the upper frame may bear an edge trim formed from a soft or elastic material. Such an elastic edge trim may guard against the risk of trapping in the case of two spiral mattress supporting bases being placed next to one another.

[0014] The lower frame is preferably supported on the floor by legs. Such legs can be fastened to the lower longitudinal sections and/or to the lower transverse sections. Generally speaking, legs are attached to the four corners of the lower frame of single spiral mattress supporting bases. In an arrangement with two spiral mattress supporting bases placed adjacent to one another, there may therefore be a total of eight legs. However, preference is given to an arrangement that would have only four legs, even in such a case. This can be achieved by two adjacently arranged spiral mattress supporting bases in conjunction with coupling sections for coupling the lower frames of the spiral mattress supporting bases. The jointly coupled spiral mattress supporting bases form a single sturdy whole on the corners of which four feet suffice.

[0015] As described in the foregoing, the supporting means engage at a distance within the outer ends of the traverse members. This means that the supporting means are not arranged at the outer ends of the traverse members, but inwardly at a distance from those outer ends. Therefore, the supporting means do not coincide with the longitudinal sections of the upper mattress, but lie at a distance from those longitudinal sections on the inner side thereof. The supporting means may be constructed as stops which operate in the most downwardly moved position of the movable members of the upper mattress and then rest upon one another. This means that a support attached to the upper frame member lies in abutment with a longitudinal section of the lower frame, or conversely, that a support attached to the lower frame lies in abutment with the upper frame member. Also, a support attached to the upper frame member may lie in abutment with a support attached to the lower frame.

[0016] The movable upper frame members can be adjusted by control means or by adjusting and securing means, for example in the form of a lever with a plunger/cylinder device. In the raised position of the upper frame members, these may be stabilized using said control means. It is also possible to only apply securing means which lock the upper frame members in a desired position, after these have been manually adjusted.

[0017] The invention further relates to a box spring, comprising a spiral mattress supporting base, as described in the foregoing, as well as a fixed box spring mattress attached to the spiral mattress supporting base. The box spring mattress may comprise a circumferential element surrounding the outermost sections of the upper frame. Furthermore, the box spring mattress may comprise a lower mattress.

[0018] The invention will now be described with reference to the exemplary embodiment shown in the figures.

Figure 1 shows a side view of a first embodiment of the spiral mattress supporting base according to the invention.

Figure 2 shows an end view of two spiral mattress supporting bases placed next to each other according to figure 1.

Figure 3 shows a second embodiment of the spiral mattress supporting base constructed as a box spring mattress.

Figure 4 shows an end view of two box spring mattresses placed next to each other according to figure 3.

Figure 5 shows an alternative end view.

Figure 6 shows a top view of the spiral mattress supporting base according to figure 1, without a support surface.

[0019] The spiral mattress shown in figures 1, 2 and 6 according to the invention comprises a fixed lower frame 1 and, in its entirety, the lower frame indicated by the numeral 2. The upper mattress 3 is shown schematically on top of the upper frame 2. The upper frame 2 comprises the movable upper frame members 4, 5 and 6. The movable upper frame member 4 which is intended for supporting the body is attached by means of a hinge 8 to the fixed upper frame member 7. Further to this, the movable

upper frame member 5 is attached to said upper frame member 7 by hinge 9 The further upper frame member 6 is attached by hinge 10 at the other end of the fixed upper frame member 7. The upper frame members 5 and 6 are intended for the support of the legs. The upper frame members 4, 5 and 6 may be moved between the folded down position, indicated by continuous lines, and the folded up position, indicated by interrupted lines, by support bodies and actuators 30, which are known and are indicated schematically. Instead of actuators, locking devices may also be applied which only secure the upper frame members in the desired position. Adjustment of the upper frame members is therefore performed manually. In the embodiment of figures 1 and 2 a detachable soft trim 28 is attached all around the entire upper frame 2. This provides protection against the hard sections of the upper frame.

[0020] The upper frame member 4 consists of the upper longitudinal sections 11 and the upper transverse sections 22 which extends between there at the end; the upper frame member 5 consists of the upper longitudinal sections 12 and the upper frame member 6 consists of the upper longitudinal sections 13 and the upper transverse sections 23 which extends between these. The fixed upper frame member 7 consists of the upper longitudinal sections 20. These upper longitudinal sections 11-13 and 20 are all jointly connected by traverse members 14, 15 extending transversely between the upper longitudinal sections which, as can be seen in the end view of figure 2, have a downwardly curved shape. The traverse members indicated with 14 are all attached to a movable upper frame member 4-6, the traverse members indicated with 15 are all attached to the upper frame member 7. These latter traverse members are therefore permanently attached to the lower frame 1. The support surface 24, which is known, consists of interlocked helical springs and is spanned between the upper longitudinal sections 11-13 and 20.

[0021] In turn, the lower frame 1 consists of two lower longitudinal sections 16 and two lower transverse sections 17, as well as of feet 18 which are disposed at the corner points where the lower longitudinal sections and the lower transverse sections are attached to one another. Furthermore, fixed supports 19 are attached to the lower longitudinal sections 16 at the position of the traverse members 14.

[0022] The traverse members 14 which are attached to the movable frame members 4-6, are all provided opposite the corresponding supports 19 on the lower frame with supporting rubbers 21 which rest on the supports 19, as shown in figure 1 by continuous lines.

[0023] These supporting rubbers 21 are arranged inwardly at a distance from the upper longitudinal sections 4-6, thus further enhancing the slim line appearance of the spiral mattress supporting base. To further increase the comfort, a soft edge trim 28 is attached to the outer side of the upper longitudinal sections 11-13 and 20 and of the upper traverse sections 22, 23.

[0024] In the alternative arrangement of figures 3 and 4, a spiral mattress supporting base is shown which corresponds to that of figures 1 and 2, but onto which the box spring mattress indicated by 25 is coupled in its entirety. This box spring mattress 25 consists of the lower mattress 27 and the circumferential element 26 attached to the circumference thereof, which covers the upper longitudinal sections 11-13 and 20 as well as the upper transverse sections 22 and 23 (the soft edge trim 28 is omitted here). The upper mattress 3 is placed on top of this box spring mattress 25.

[0025] The alternative arrangement of Figure 5 shows an embodiment wherein two adjacently arranged spiral mattress supporting bases according to the invention are coupled by means of coupling sections 29 which are attached to the transverse sections 17. In this embodiment only four feet 18 are present.

List of reference numerals

[0026]

1. Lower frame
2. Upper frame
3. Upper mattress
4. Movable upper frame member
5. Movable upper frame member
6. Movable upper frame member
7. Fixed upper frame member
8. Hinge
9. Hinge
10. Hinge
11. Upper longitudinal section
12. Upper longitudinal section
13. Upper longitudinal section
14. Traverse member
15. Traverse member
16. Lower longitudinal section
17. Lower transverse section
18. Foot
19. Support
20. Upper longitudinal section
21. Supporting rubber
22. Upper transverse section
23. Upper transverse section
24. Transversely spanned interlocking helical springs
25. Box spring
26. Circumferential element
27. Lower mattress
28. Edge trim
29. Coupling section
30. Adjusting and/or locking means

Claims

1. Spiral mattress support, comprising a fixed lower frame (1), an upper frame (2) which is mounted di-

rectly onto the lower frame (1) and which comprises movable upper frame members (4-6), as well as supporting means (19, 21) by means of which at least a part of the upper frame (2) is supported by the lower frame (1), which upper frame (2) consists of longitudinal sections (11-13, 20) disposed transversely at a fixed distance in relation to one another and traverse members (14, 15) extending between the longitudinal sections, between which upper longitudinal sections (11-13, 20) a network (24) of interlocked helical springs is spanned, which lower frame (1) consists of lower longitudinal sections (16) which are at a fixed distance in relation to one another in-transverse direction, **characterized in that** the transverse distance between the lower longitudinal sections (16) is smaller than the transverse distance between the upper longitudinal sections (1-13, 20) and that the supporting means (19, 21) engage at a distance between the outer ends of at least one of the traverse members (14).

2. Spiral mattress supporting base according to claim 1, wherein at least one of the traverse members (14) and/or the lower longitudinal sections (16) bear/are provided with supporting means (19, 21).

3. Spiral mattress supporting base according to claim 2, wherein at least one of the traverse members (14) bears a downwardly directed support (21) which engages with or across a lower longitudinal section (16) or a support (19) attached thereto.

4. Spiral mattress supporting base according to claim 2 or 3, wherein one of the traverse members (14) bears a supporting rubber (21) with an engaging surface formed from the absorbent material.

5. Spiral mattress supporting base according to any of the claims 2-4, wherein the supporting means (19, 21) are disposed upon the movable upper frame members (4-6).

6. Spiral mattress supporting base according to any of the preceding claims, wherein the upper frame (2) comprises an upper frame member (20) fixed to the lower frame (1) and a hingeable movable upper frame member (4, 5) arranged on at least one side of the fixed upper frame member (20).

7. Spiral mattress supporting base according to claim 6, wherein a movable upper frame (4, 5) is hingeably attached to at least one of the sides of the fixed upper frame (20).

8. Spiral mattress supporting base according to any of the preceding claims, wherein at least one of the movable upper frame members (5, 6) is formed articulated.

9. Spiral mattress supporting base according to any of the preceding claims, wherein adjusting means and/or securing means (30) are provided, which, on the one hand, engage the lower frame (1) and one of the movable upper frame members (4-6) on the other.

10. Spiral mattress supporting base according to any of the preceding claims, wherein the upper longitudinal sections (11-13) and/or the upper transverse sections (22, 23) are provided with an edge trim (28) formed from a relatively soft material.

11. Spiral mattress supporting base according to any of the preceding claims, wherein the lower frame (1) is provided with lower transverse sections (17) which extend transversely between the lower longitudinal sections (16).

12. Spiral mattress supporting base according to claim 11, wherein the distance between the outermost lower transverse sections (17) is smaller than the distance between the outermost upper transverse sections (22, 23).

13. Spiral mattress supporting base according to claim 11 or 12, wherein feet (18) are attached to the lower longitudinal sections (16) and/or to the lower transverse sections (17).

14. In combination, two adjacently arranged spiral mattress supporting bases according to any of the preceding claims in conjunction with coupling sections (29) for coupling the lower frames (1) of the spiral mattress supporting bases.

15. Box spring, comprising a spiral mattress supporting base according to any of the preceding claims 1-13, and a box spring mattress (25) mounted in a fixed position onto the spiral mattress supporting base.

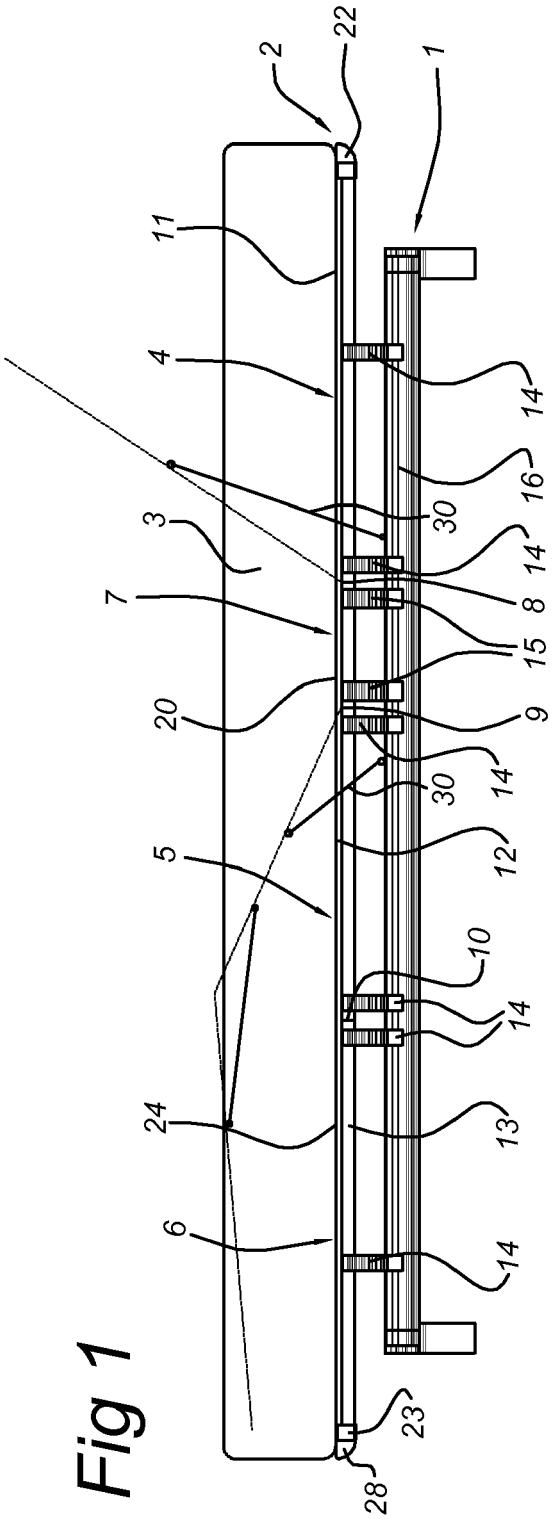
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Fig 1

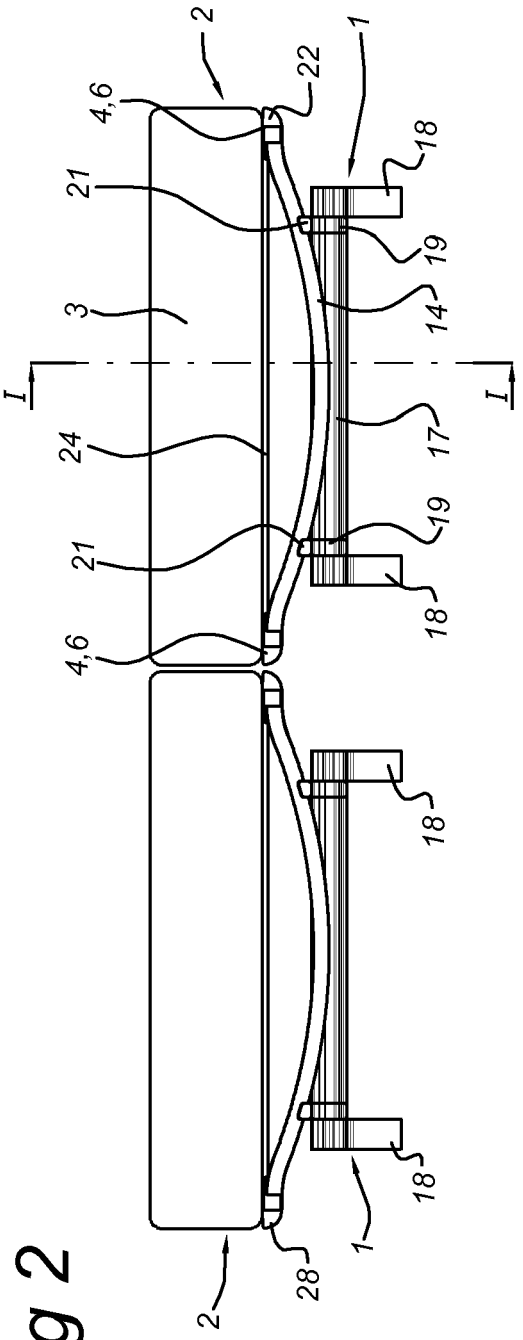
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Fig 2

Fig 3

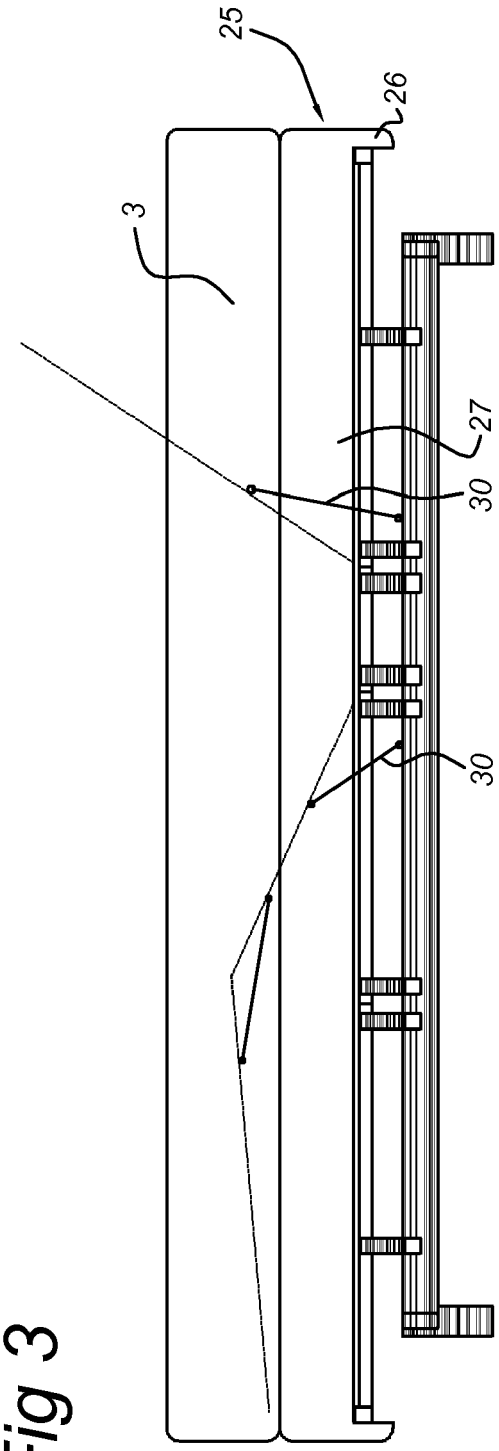
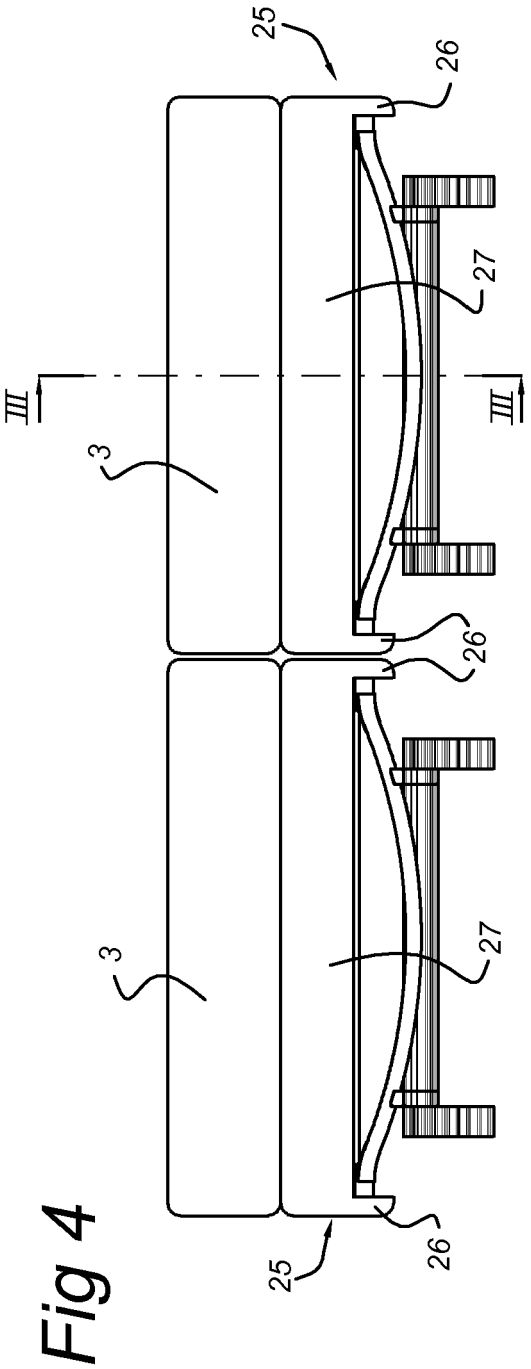


Fig 4



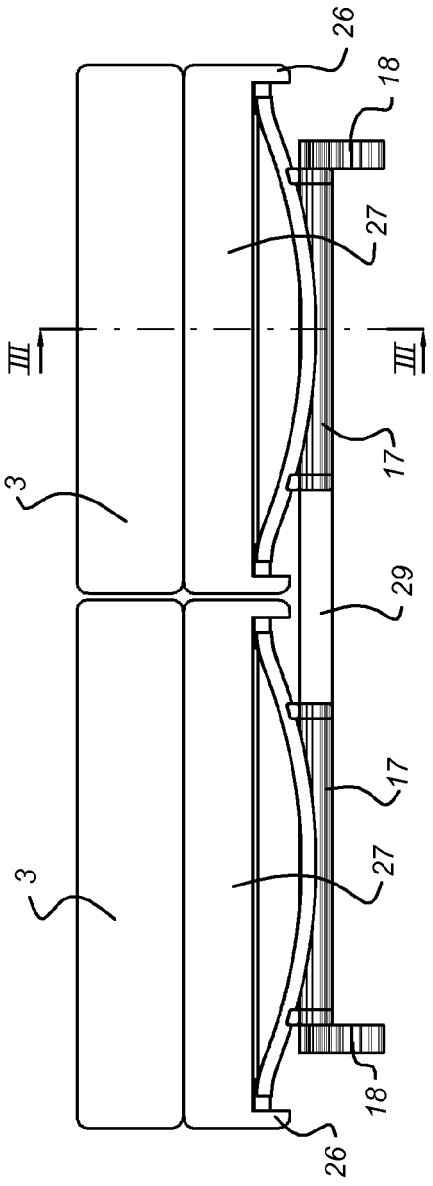

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Fig 5

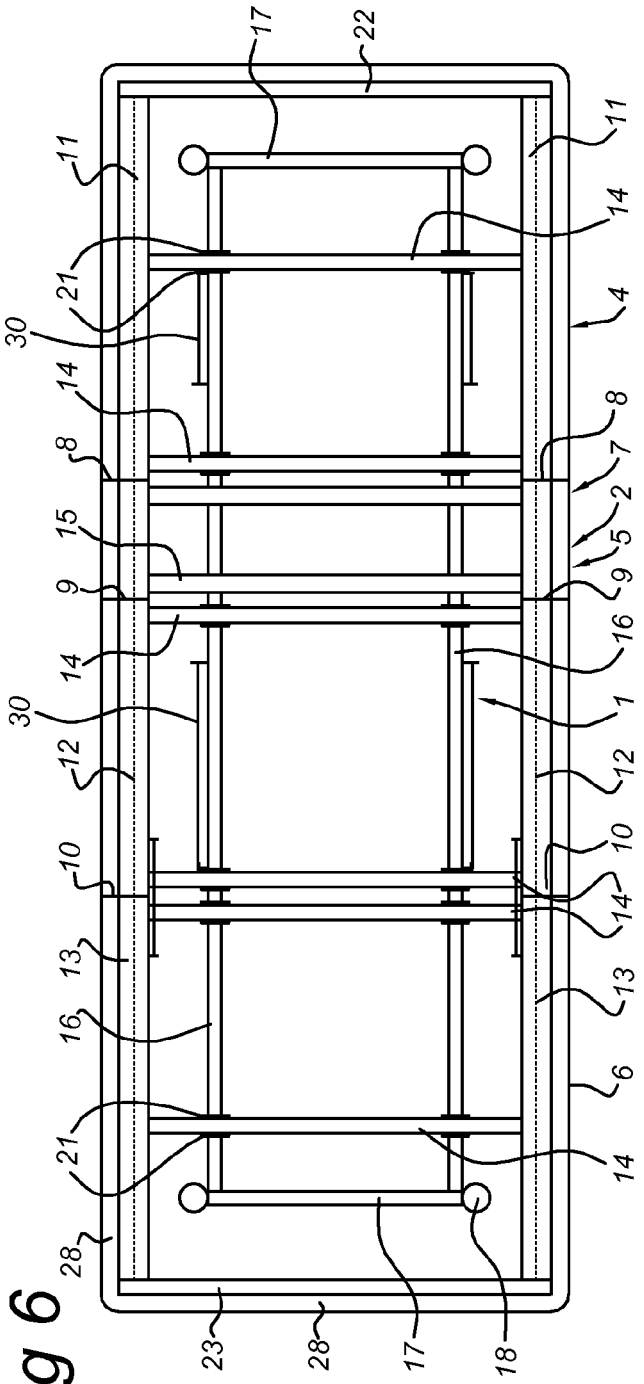
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Fig 6