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(54) Chair

(57) A chair (1), in particular an office swivel chair, comprises a seat support (4) arranged on a frame (2) and a pivotably mounted back rest (3) pressed into an upright initial position by at least one spring, wherein the force of the spring is adjustable, wherein at least one block (9) of elastomer material is provided as the spring, which can be compressed by pivoting the back rest (3).

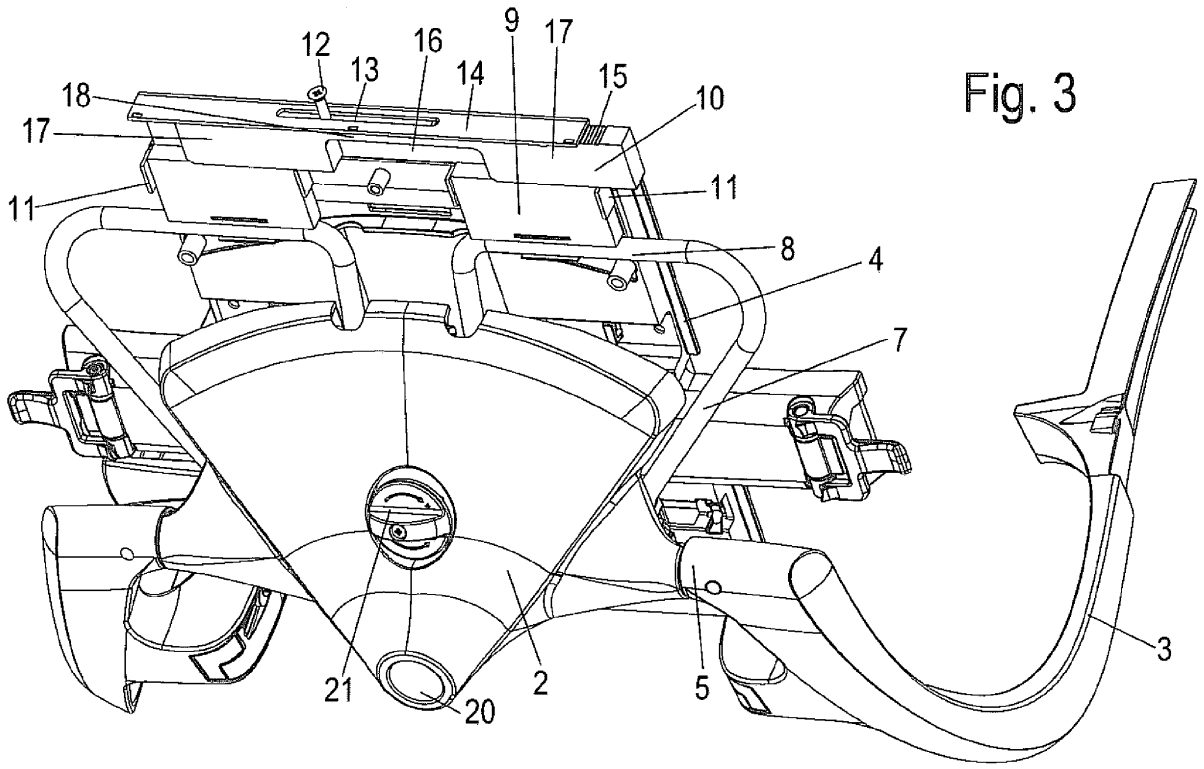

Fig. 3

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Description

[0001] The invention relates to a chair, particularly an office swivel chair, with a seat support arranged on a frame and a pivotably mounted back rest pressed into an upright initial position by at least one spring, the force of the spring being adjustable.

[0002] DE 198 10 768 discloses an office swivel chair having a back rest support mounted on a frame so that it can pivot around a horizontal axis, wherein by pivoting the back rest a seat support is shifted simultaneously. Underneath the seat a spring acts on the seat support to push the back rest into an upright position via an interconnection of the seat support. Herein an adjustment mechanism is provided having a rotating device arranged underneath the seat to adjust the force of the spring. The rotating device is not easily accessible for the user in the seated position, while exactly in the seated position an adjustment is desired, since the readjusted spring force can then be tested by the user. Moreover the rotating device only renders a finer adjustment.

[0003] Thus the object of the present invention is the provision of a chair in which the spring force bringing the back rest into an upright position is adjustable in an easy way.

[0004] This object is achieved by a chair having the features of claim 1.

[0005] According to the invention, the biasing mechanism comprises at least one spring with a block of elastomer material, which can be compressed by pivoting the back rest. Thus the necessary return force for the back rest can be provided in a simple way while a particularly compact and flat construction can be realised. Moreover the block of elastomer material is permanently elastic and has only a low dead weight. According to a preferred embodiment of the invention, an adjusting element is provided via which the compressible volume of the at least one block is adjustable. Thus the spring force can be changed in a simple way, the adjusting element having a contact surface contacting a lateral edge of the at least one elastomer block, wherein by moving the adjusting element the size of the contact surface on the block can be changed. Thus the adjusting element can comprise a slide which can be moved parallel to a lateral edge of the block, wherein the actuation of the slide can be carried out in a simple way while the user is seated, to adjust the desired return force. In addition, the slide can be moved smoothly between different positions so that with one adjusting movement the spring force can be changed from a minimum position to a maximum position.

[0006] Preferably the slide is formed in the shape of a rail and comprises a recess adjacent to the contact surface into which the elastomer block can be pressed at least partially. Thus the volume of the material of the block provided for the compression can be changed in a simple way, wherein the non-compressible volume is pressed into the recess on the slide in a simple way.

[0007] To avoid a shifting of the slide during the load phase, particularly by transverse forces acting on the slide, preferably at least one holding means is provided to fixate the chosen position. The slide can comprise detents and/or teeth on the side opposite the contact surface, which cooperates with a holding device of the frame for fixation. Thus a fixation can be ensured particularly in the loaded position.

[0008] According to another embodiment the seat support is shiftably mounted, and when the back rest is pivoted the seat support is shifted. The at least one block of elastomer material can be supported on the frame or on the seat support and be compressed by the pushing movement of the seat so that a particularly compact construction results.

[0009] For a particularly smooth adjusting movement to adjust the spring force, the slide is preferably shiftably guided in the upright position of the back rest with a clearance or form-fitting between the lateral edge of the block and a holding means. Then no clamping force by the elastomer block acts on the slide during the adjustment procedure.

[0010] The block of elastomer material is preferably formed from a foamed material and has a volume between 5 cm^3 and 120 cm^3, preferably between 10 cm^3 and 100 cm^3. Several blocks of elastomer material can be provided on the chair, in particular two blocks, which enable a transmission of force symmetrical to the central plane of the seat support. Moreover, several springs can be provided for biasing the back rest which are only partly formed as blocks of elastomer material.

[0011] The invention will hereinafter be explained in more detail by an example of an embodiment, making reference to the accompanying drawings, in which:

Fig. 1 is a side view of a chair according to the invention in upright position;
Fig. 2 is a side view of the chair of Fig. 1 with pivoted back rest;
Fig. 3 is a perspective view of the adjustment mechanism of the chair of Fig. 1;
Fig. 4 is a bottom view of the chair of Fig. 1 with minimum return force; and
Fig. 5 is a bottom view of the chair of Fig. 1 with maximum return force.

[0012] A chair 1 comprises a frame 2 on which a back rest 3 is pivotably mounted. To this end, a horizontal axle 5 is rotatably held on the frame 2. In addition, a seat support 4 is shiftably guided on the frame 2, the seat support 4 being movable via a cantilever 6 protruding from the back rest 3. By pivoting the back rest 3 to the rear, the seat support 4 is also shifted to the rear (Fig. 2).

[0013] To bias the back rest 3 into an upright position, a first spring is provided in the form of a wire bracket 7, which can be tensioned or relaxed by means of an adjusting device 21. Corresponding adjusting mechanisms for mechanical springs are known and will thus not be explained in detail. The spring can also be formed as

shown in DE 198 10 768. Furthermore such a spring can be omitted within the present invention.

[0014] The chair 1 is constructed as an office chair, wherein a receptacle 20 for a foot is formed on the frame 2.

[0015] To bias the back rest 3 into an upright position, additionally a block 9 of an elastomer material is provided, in particular of a foamed material, for instance of a cellular polyurethane elastomer, which is held between a contact rail 8 on the wire bracket 7 and a slide 10. The block 9 has the shape of a cuboid, wherein a plate-shaped holder 11 fixed on the underside of the seat support 4 is provided on each opposing end face. The holders 11 can be formed angularly to support the block 9 of elastomer material on the underside.

[0016] The chair 1 is formed symmetrically to a central vertical plane, wherein a block 9 of elastomer material is arranged on each side. On the front side of the block 9 a slide 10 is provided which is supported by a rail-shaped holding means 14 on the side opposite the block 9. The holding means 14 is connected to the seat support 4 and comprises an oblong hole 13 in which a grip portion 12 for adjusting the slide 10 is arranged. The slide 10 can be moved in horizontal direction parallel to a lateral edge 90 of the block 9.

[0017] The slide 10 comprises a contact surface 91 which can contact the lateral edge 90 of the block 9 at least partially. By adjusting the position of the slide 10, the size of the contacting area of the contact surface 91 is adjusted. Adjacent to the contact surface 91 a recess 16 is formed on the slide, into which at least a part of the block 9 can be pressed. The slide 10 comprises two cuboid protrusions 17 connected to one another via a web 18.

[0018] In Fig. 4 the slide 10 is adjusted to minimum spring power. The protrusions 17 of the slide 10 are disenganged from the two blocks 9 of elastomer material. If the back rest 3 is pivoted to the rear, the seat support 4 is also moved to the rear, so that the rail-shaped holding means 14 and the slide 10 are moved towards the elastomer blocks 9. The elastomer block 9 on the right side can be inserted into the recess 16 so that the lateral edge 90 of the block 9 is not impinged by the contact surface 91. On the left side the block 9 is arranged at a distance to the protrusion 17 and is not compressed either. A return force is exclusively created by the additional mechanical spring.

[0019] In Fig. 5 the slide 10 is arranged in a position for creating a maximum return force. The contact surface 91 on the protrusion 17 is arranged opposite the lateral edge 90 of the block 9 over the entire length, so that now when the back rest 3 is pivoted, the block 9 is compressed over the entire length. When the back rest 3 is pivoted, the distance between the slide 10 and the contact surface 8 of the wire bracket 7 decreases, as can be seen in Fig. 2. Thus the blocks 9 of elastomer material create a return force to bring the back rest 3 into an upright position.

[0020] When the elastomer blocks 9 are compressed, they push the slide 10 towards the rail-shaped holding means 14 on which fastening means are provided to avoid movement of the slide 10 in the tensioned position. To this end a toothing 15 is formed on the slide 10 which cooperates with corresponding teeth or detent means on the rail-shaped holding means 14. Thus an accidental shifting of the slide 10 by transverse forces is avoided, which occur when the slide 10 compresses, for instance, only a part of the block 9 while another part is pressed into the recess 16.

[0021] In the embodiment shown, two spaced-apart blocks 9 of elastomer material, particularly polyurethane, are provided, which renders a particularly flat construction of the seat support 4 possible. Of course it is also possible to provide more blocks 9 of elastomer material or only a single bock 9. The block 9 could then also be positioned centrally under the seat support.

[0022] The at least one block 9 of elastomer material can provide an additional spring force to return the back rest if at least one additional spring is provided to bring the back rest 3 in an upright position. Of course it is also possible to omit other springs and to provide the return force for the back rest 3 exclusively via one or several blocks 9 of elastomer material.

[0023] In the embodiment shown, the slide 10 is shifted parallel to the lateral edge 90 of the block 9, wherein a smooth guiding is possible in the unloaded state, particularly when the slide 10 is arranged with a clearance between the rail-shaped holding means 14 and the elastomer block 9. It is also possible to move the slide 10 in vertical direction to adjust the spring force by the elastomer block. Moreover, instead of the slide 10 a pivoting mechanism or another mechanism can be provided to vary the size of the contact surface on the elastomer block 9.

[0024] Furthermore the at least one block of elastomer material can also be used in a chair whose seat support 4 is fixed to the frame 2 and which does not allow a shifting movement.

Claims

1. Chair (1), particularly an office swivel chair comprising a seat support (4) arranged on a frame (2) and a pivotably mounted back rest (3) pressed into an upright initial position by at least one spring, the force of the spring being adjustable, **characterised in that** at least one block (9) of elastomer material is provided as spring, which can be compressed by pivoting the back rest (3).

2. Chair according to claim 1, **characterised in that** an adjusting element (10) is provided by means of which the compressible volume of the at least one block (9) is adjustable.

3. Chair according to claim 2, **characterised in that**

the adjusting element (10) comprises a contact surface (91) contacting a lateral edge (90) of the at least one elastomer block (9), and the size of the contact surface (91) contacting the block (9) can be changed by moving the adjusting element (10).

4. Chair according to claim 2 or 3, **characterised in that** the adjusting element (10) comprises a slide which can be moved parallel to a lateral edge (90) of the block (9).

5. Chair according to one of claims 1 to 4, **characterised in that** the slide (10) is formed in the shape of a rail and comprises a recess (16) adjacent to a contact surface (91), into which the elastomer block (9) can be pressed at least partially.

6. Chair according to one of claims 1 to 5, **characterised in that** the slide (10) comprises at least one holding means (15) to fixate the chosen position.

7. Chair according to claim 6, **characterised in that** the slide (10) has detents and/or teeth (15) on the side opposite the contact surface (91), which cooperates with a holding device (14) of the frame for fixation.

8. Chair according to one of claims 1 to 7, **characterised in that** the seat support (4) is shiftably mounted, and when the back rest (3) is pivoted, the seat support (4) is shifted.

9. Chair according to one of claims 1 to 8, **characterised in that** the at least one block (9) of elastomer material is held on the frame (2) or on the seat support (4) and can be compressed by a pushing movement of the seat support (4).

10. Chair according to one of claims 1 to 9, **characterised in that** in the upright position of the back rest (3) the slide (10) is shiftably guided in the clearance between the lateral edge (90) of the block (9) and a holding means (14).

11. Chair according to one of claims 1 to 10, **characterised in that** the block (9) is formed of elastomer material of foamed material and has a volume between 5 cm^3 and 120 cm^3, preferably between 10 cm^3 and 100 cm^3.

12. Chair according to one of claims 1 to 11, **characterised in that** at least two spaced-apart blocks (9) of elastomer material are provided.

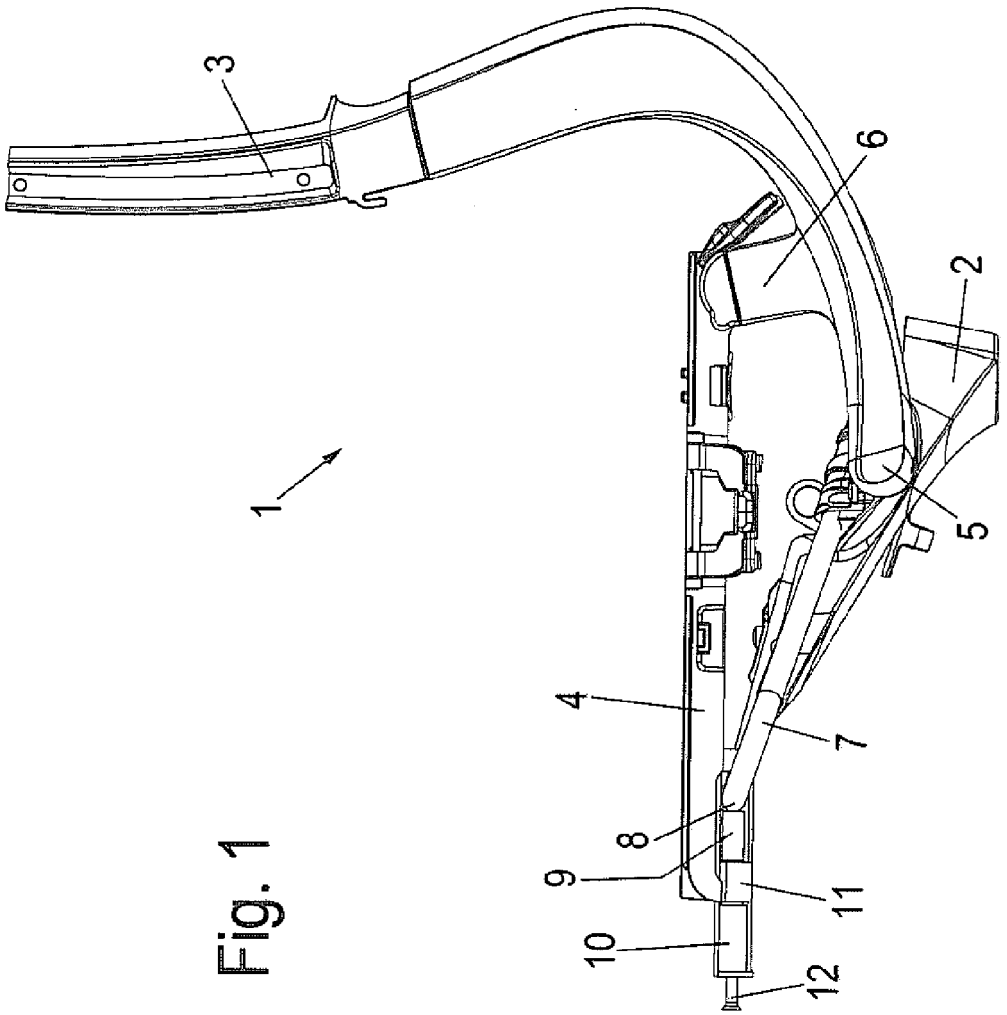


Fig. 1

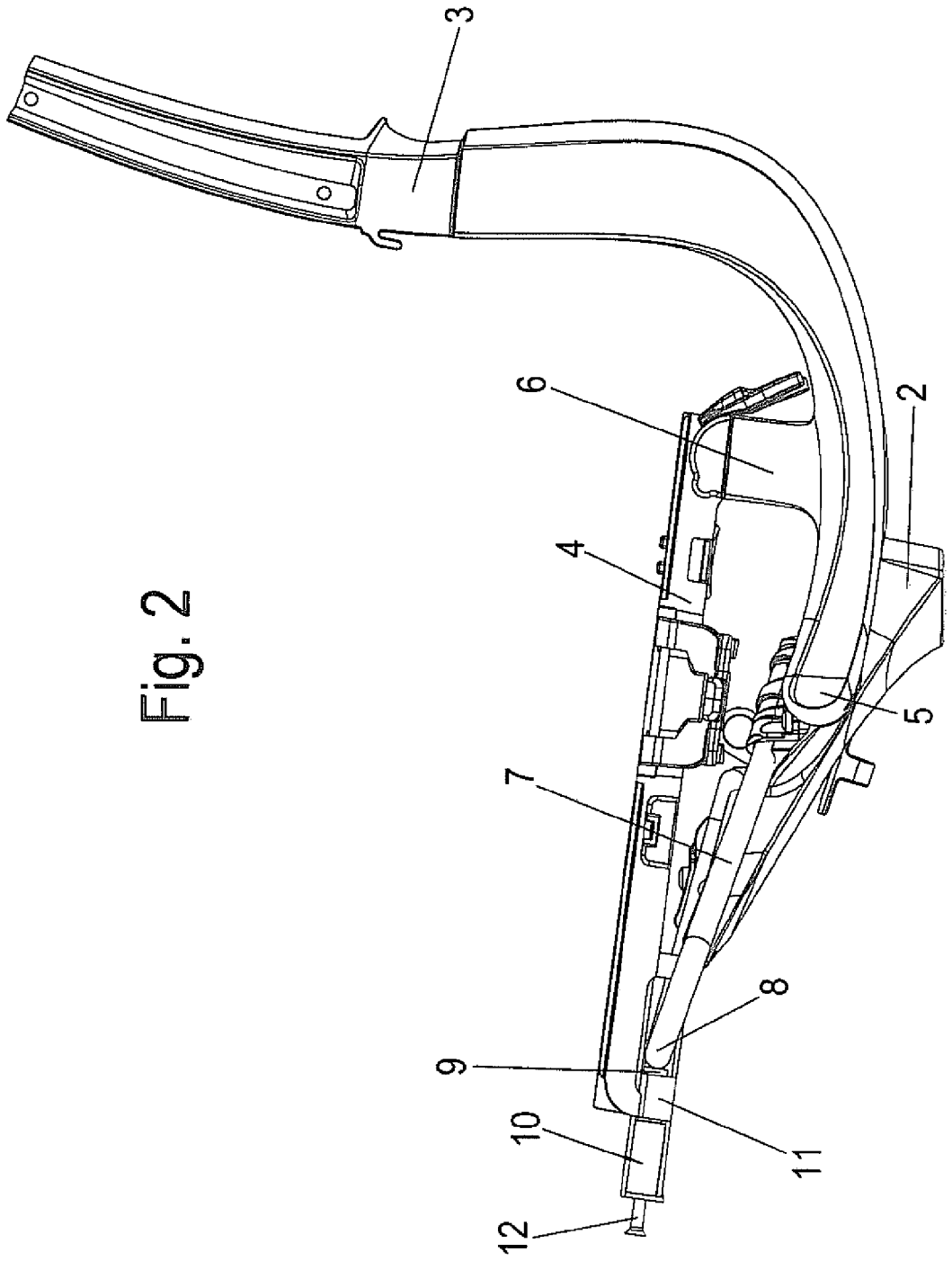
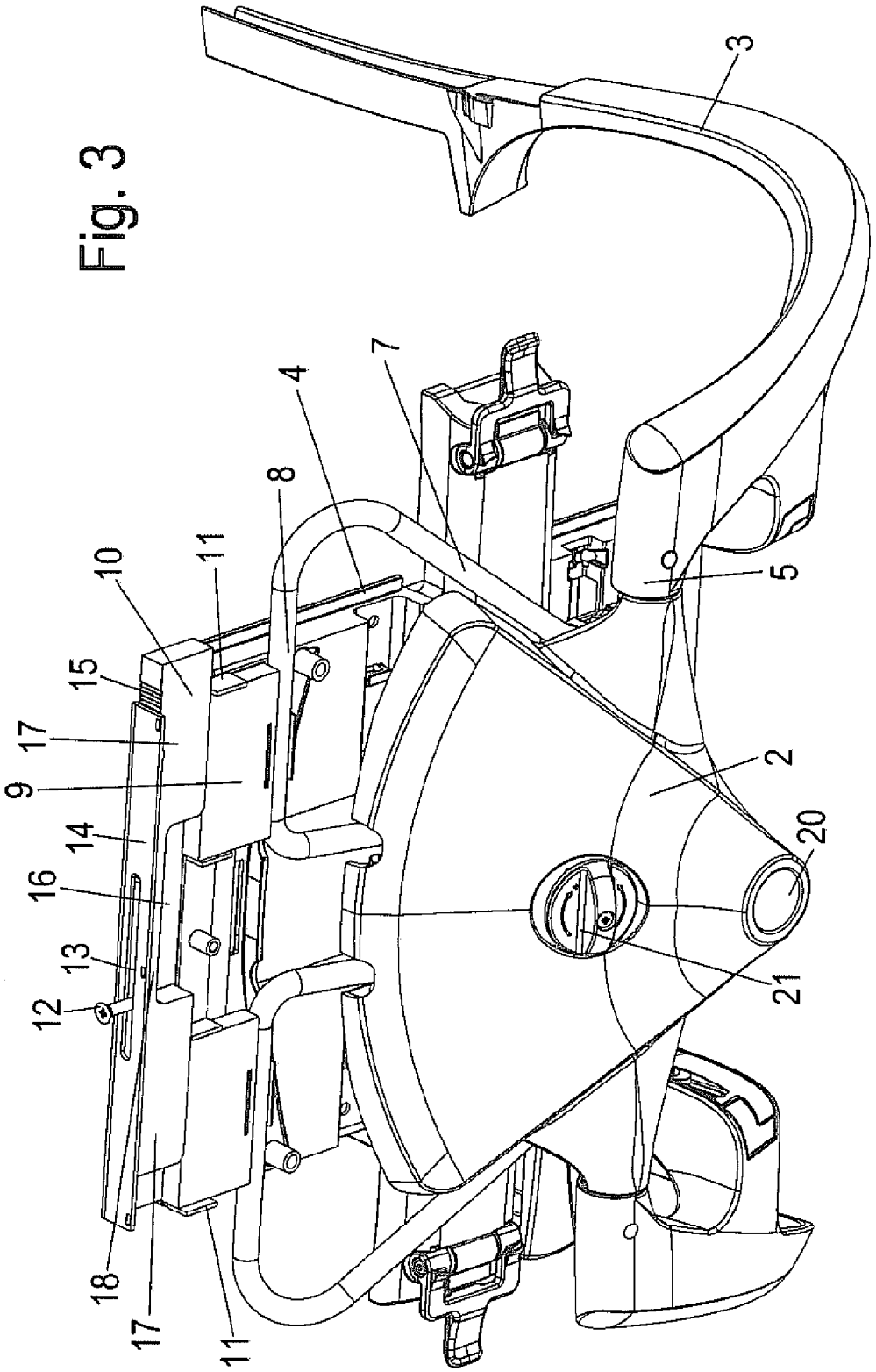


Fig. 2

Fig. 3



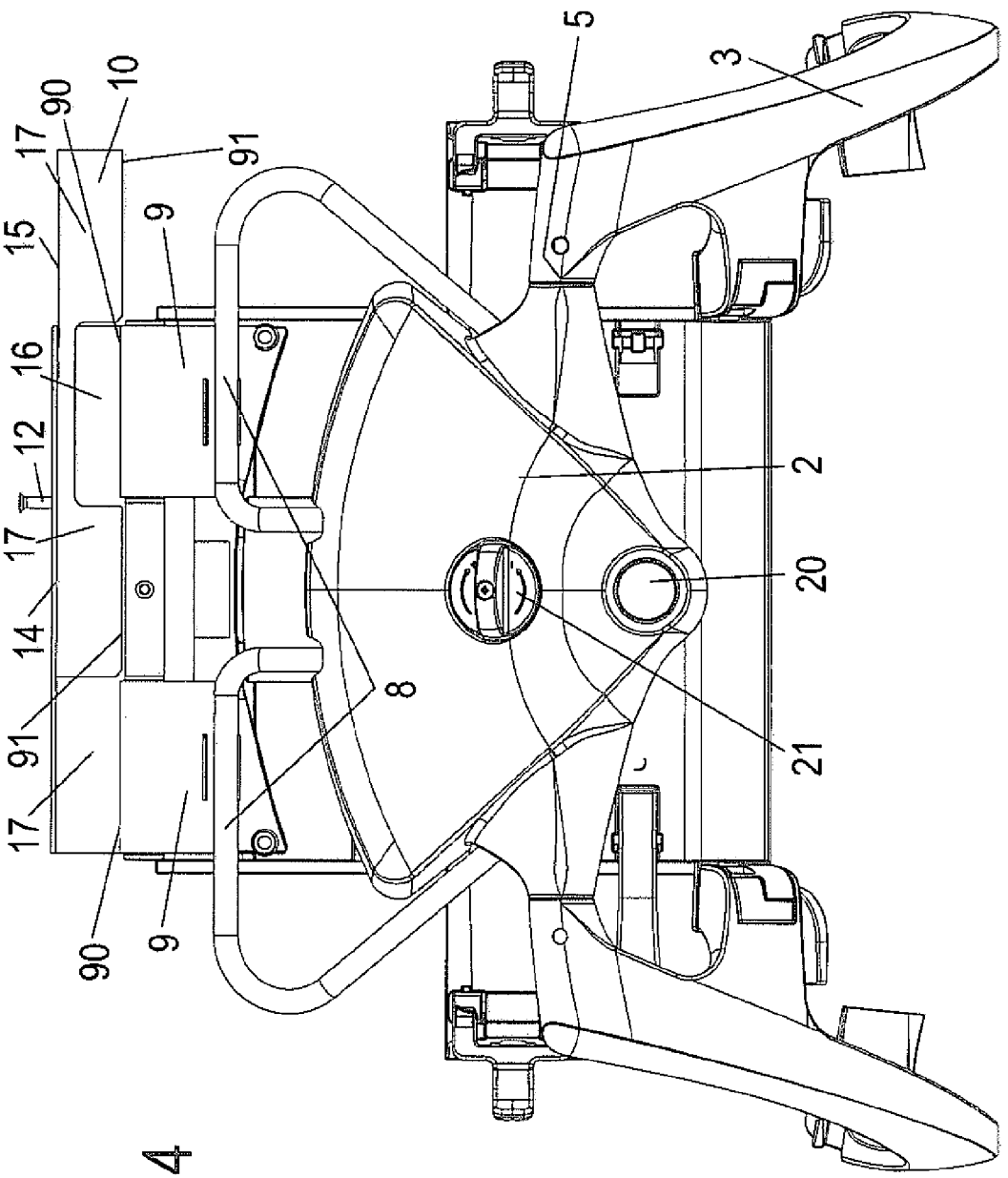


Fig. 4

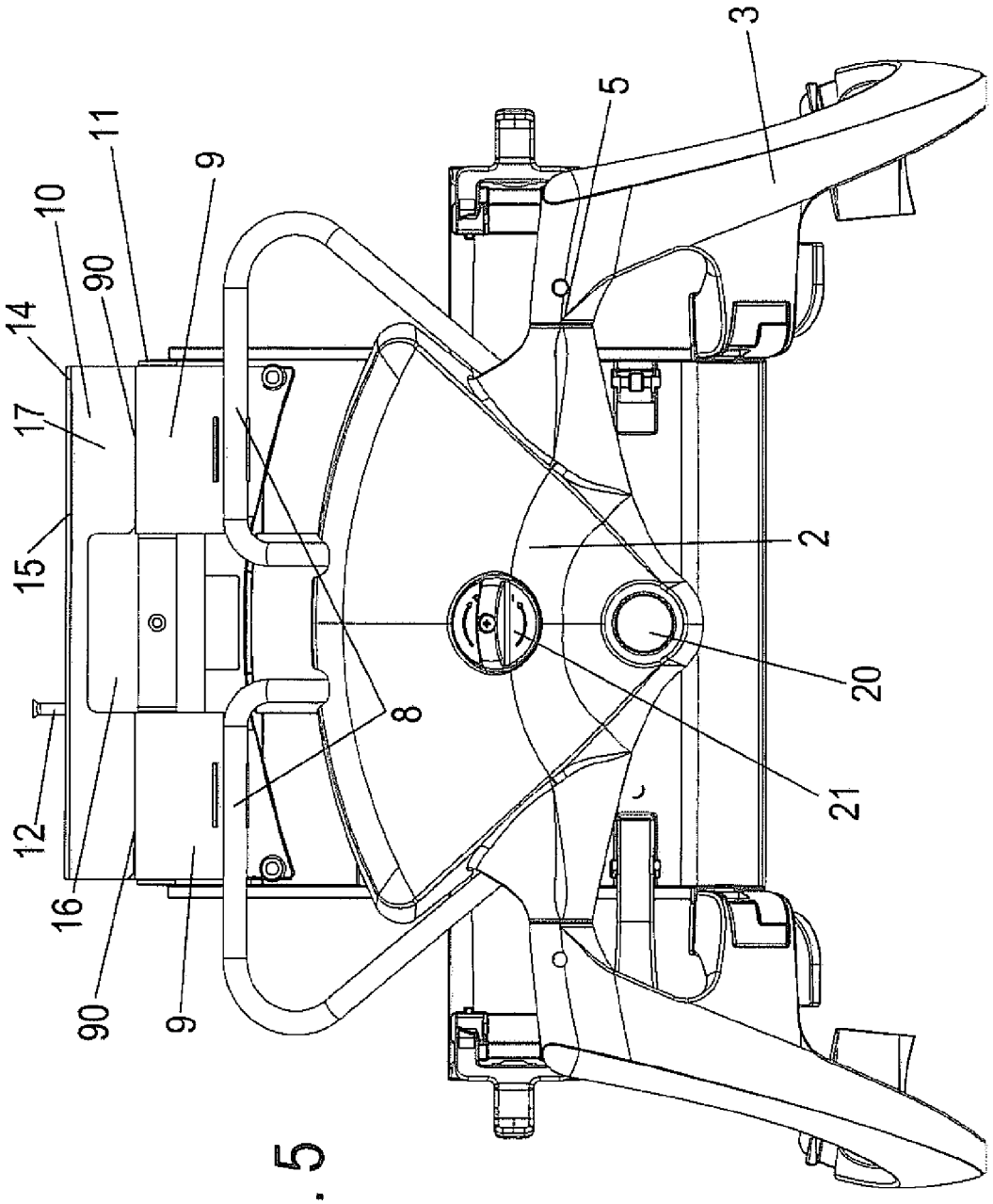


Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 11 15 6811

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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1 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	19 May 2011	Kis, Pál

CATEGORY OF CITED DOCUMENTS

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REFERENCES CITED IN THE DESCRIPTION

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