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(54) **SUPPORT DEVICE ADJUSTABLE BY AN ELECTRIC MOTOR**

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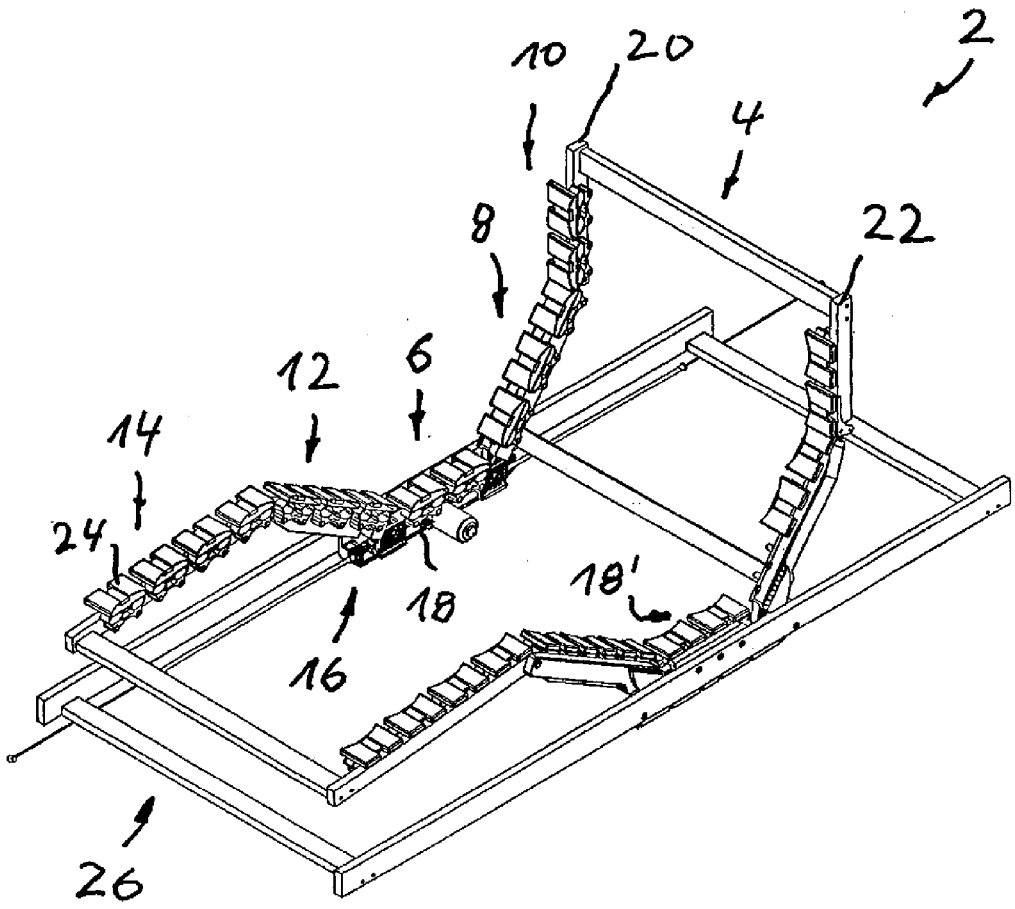
(57) **ABSTRACT**

Support device, adjustable by an electric motor, for padding of seating, or reclining furniture, in particular a mattress of a bed, has a base body which includes support parts on which the padding is supported during use. The support parts include one stationary first support part, a pivot axis, and a second support part pivotably adjustable relative to first support part about the pivot axis. Support device has a drive apparatus for adjusting second support part relative to first support part. Second support part is configured so pivot axis is supported so as to be translationally movable in the longitudinal direction of the support device. Second support part is in drive connection with drive apparatus so that during pivoting adjustment, second support part undergoes translational movement away from first support part. During translational movement, second support part runs up against a first raising element, and thus pivots.



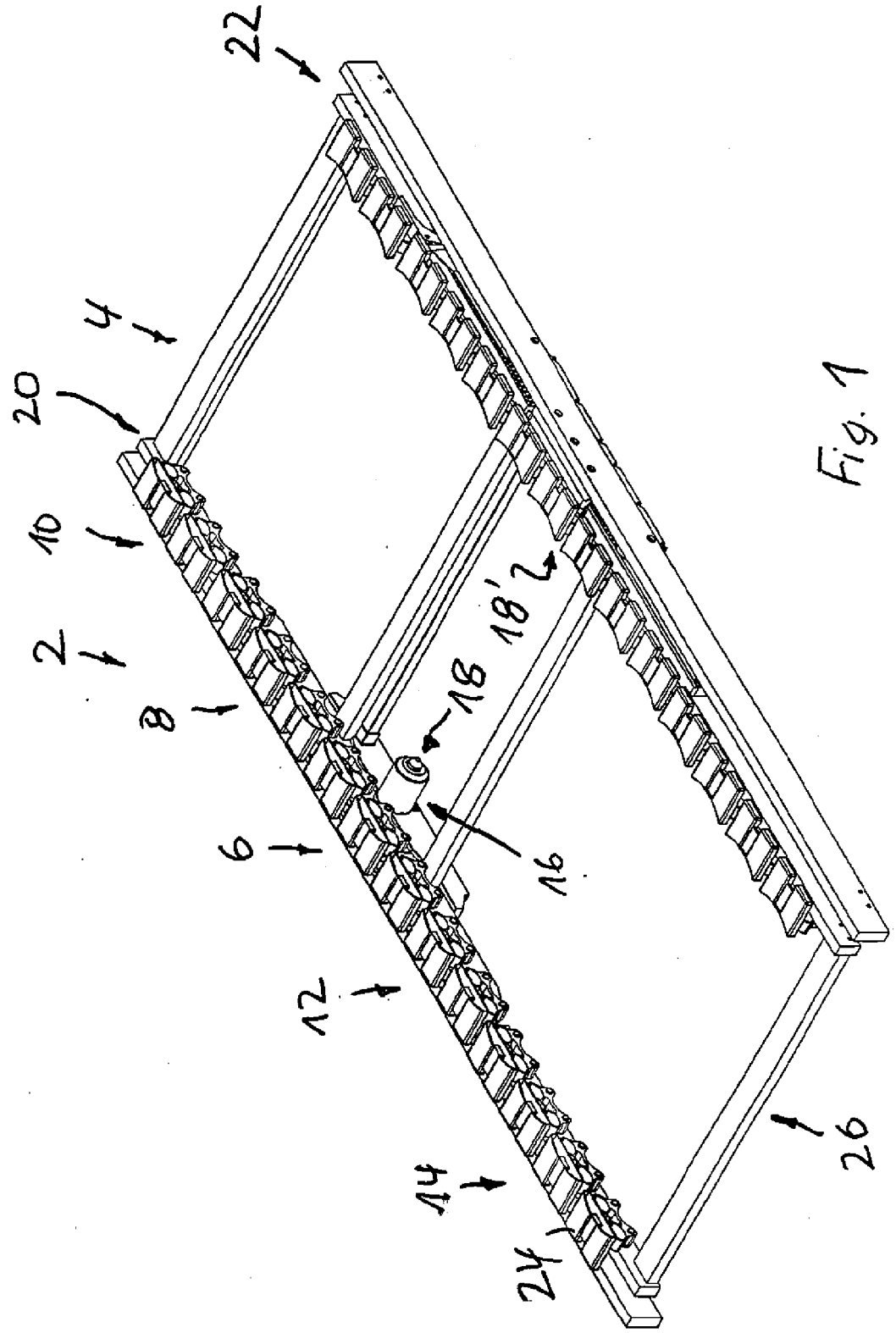


Fig. 1

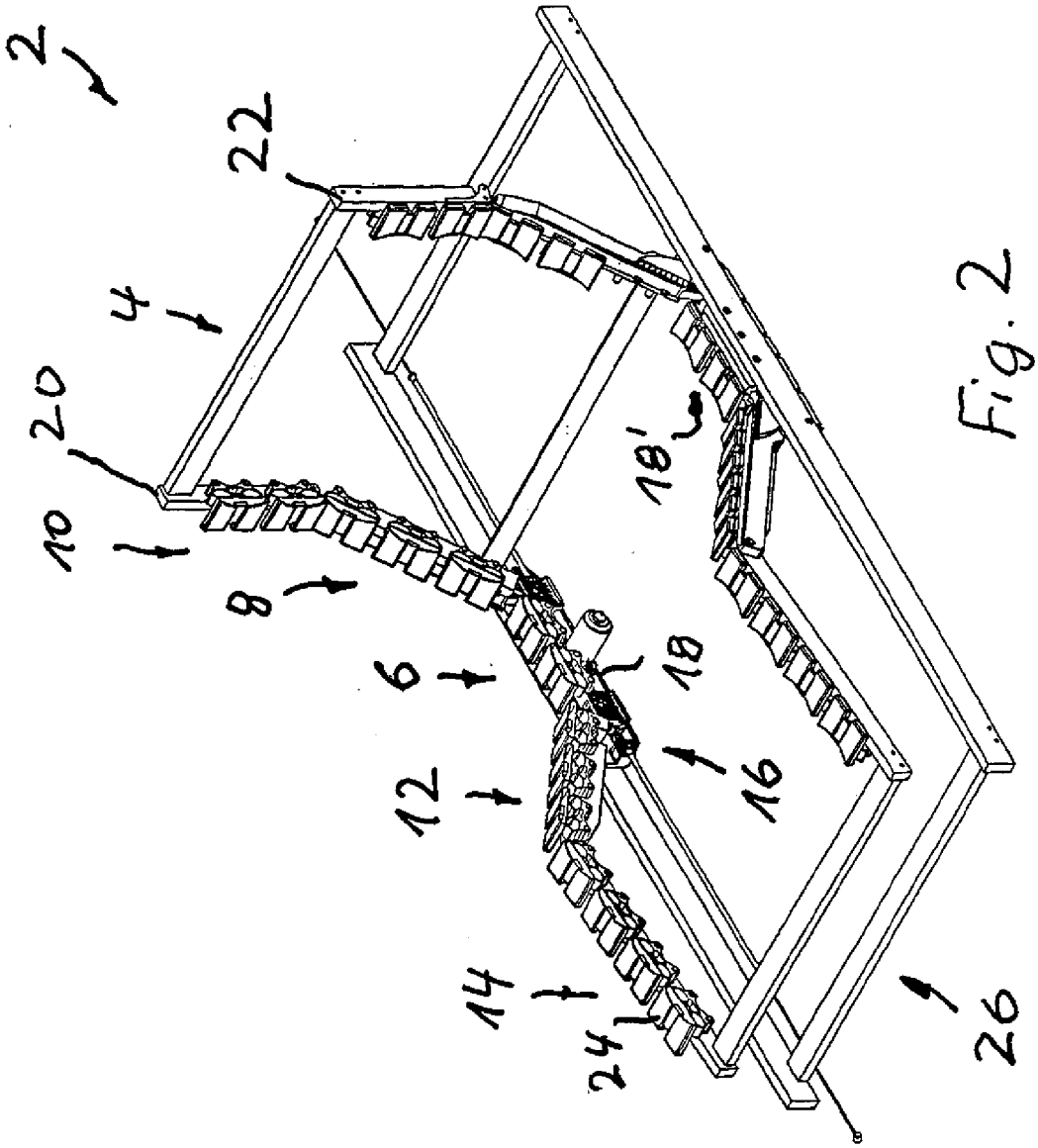


Fig. 2

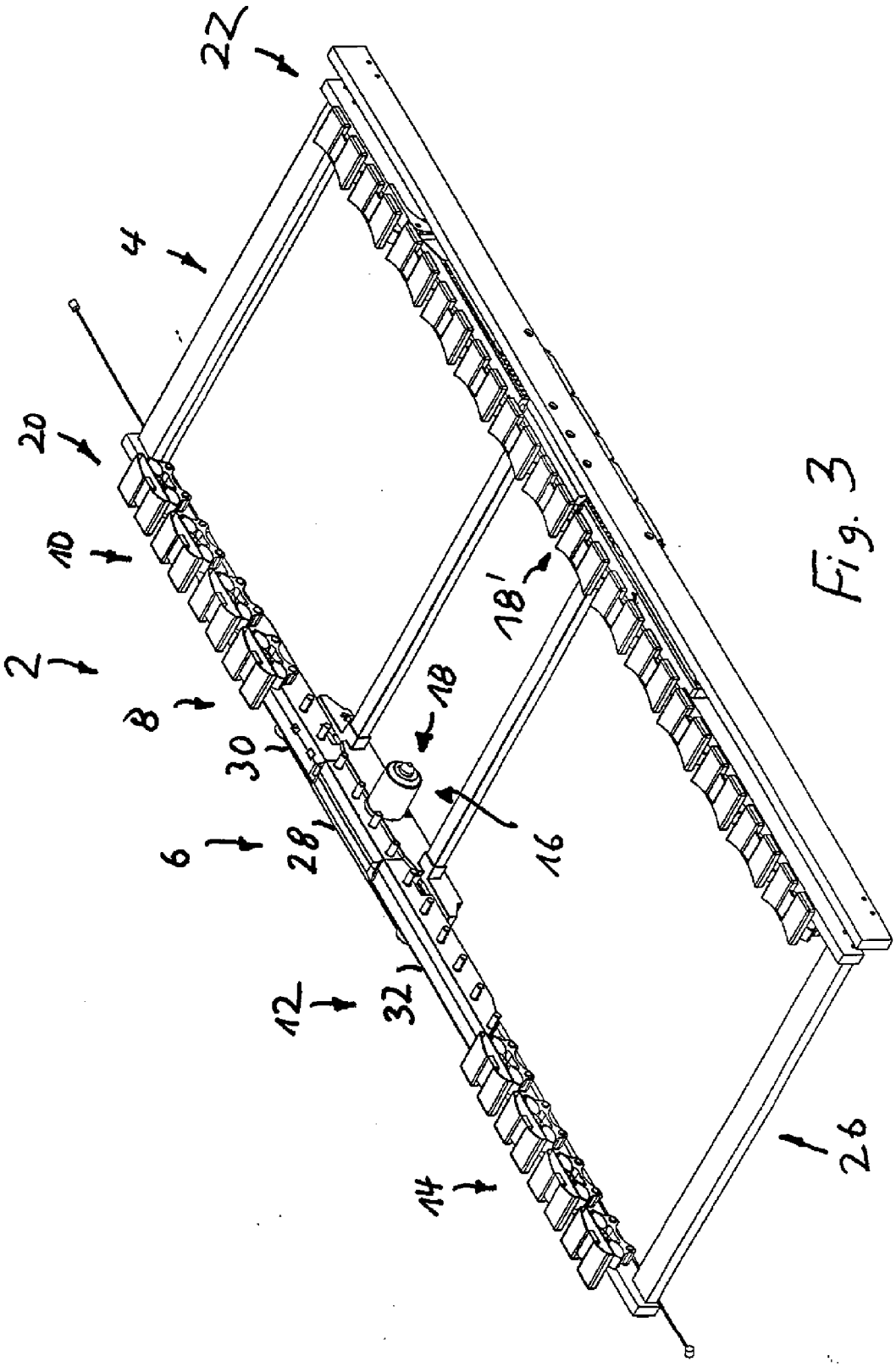


Fig. 3

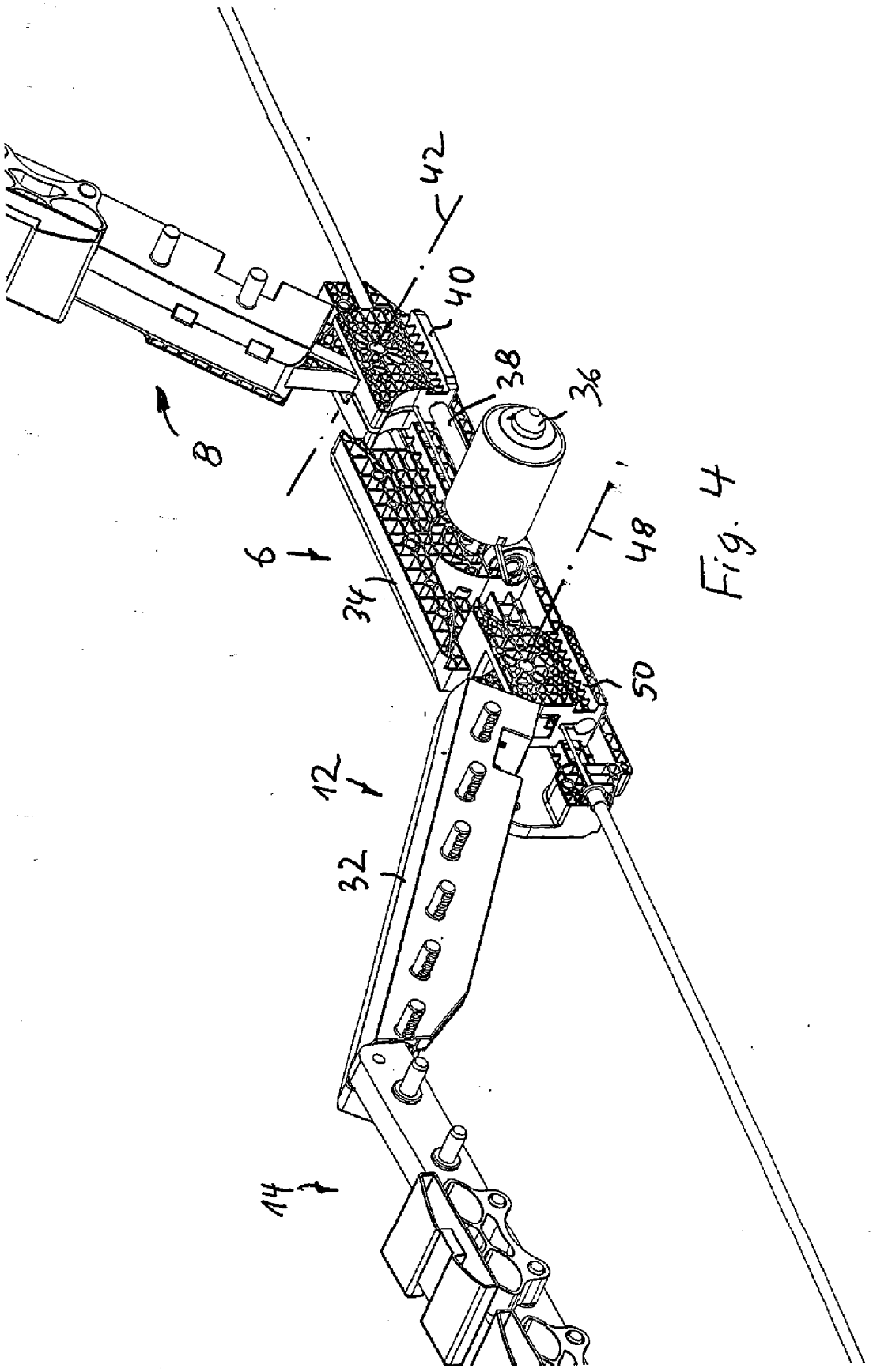


Fig. 4

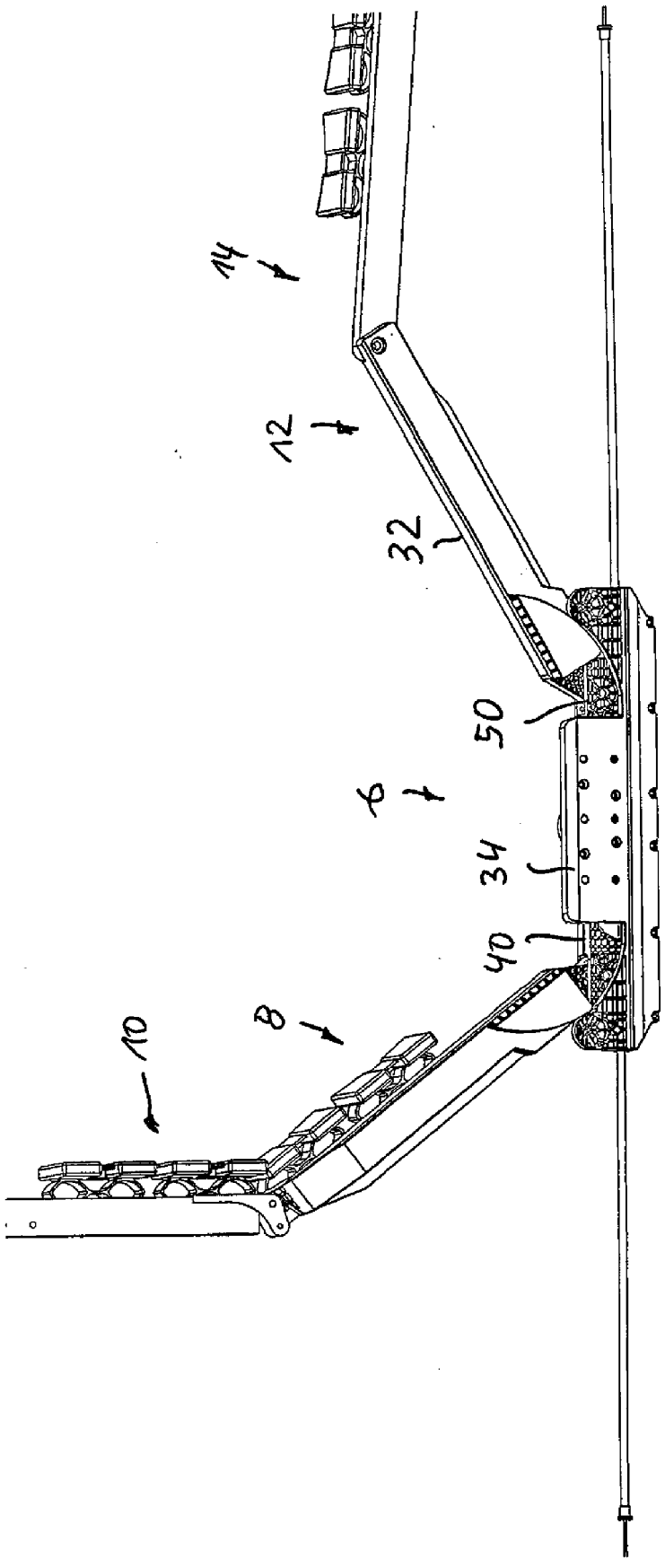


Fig. 5

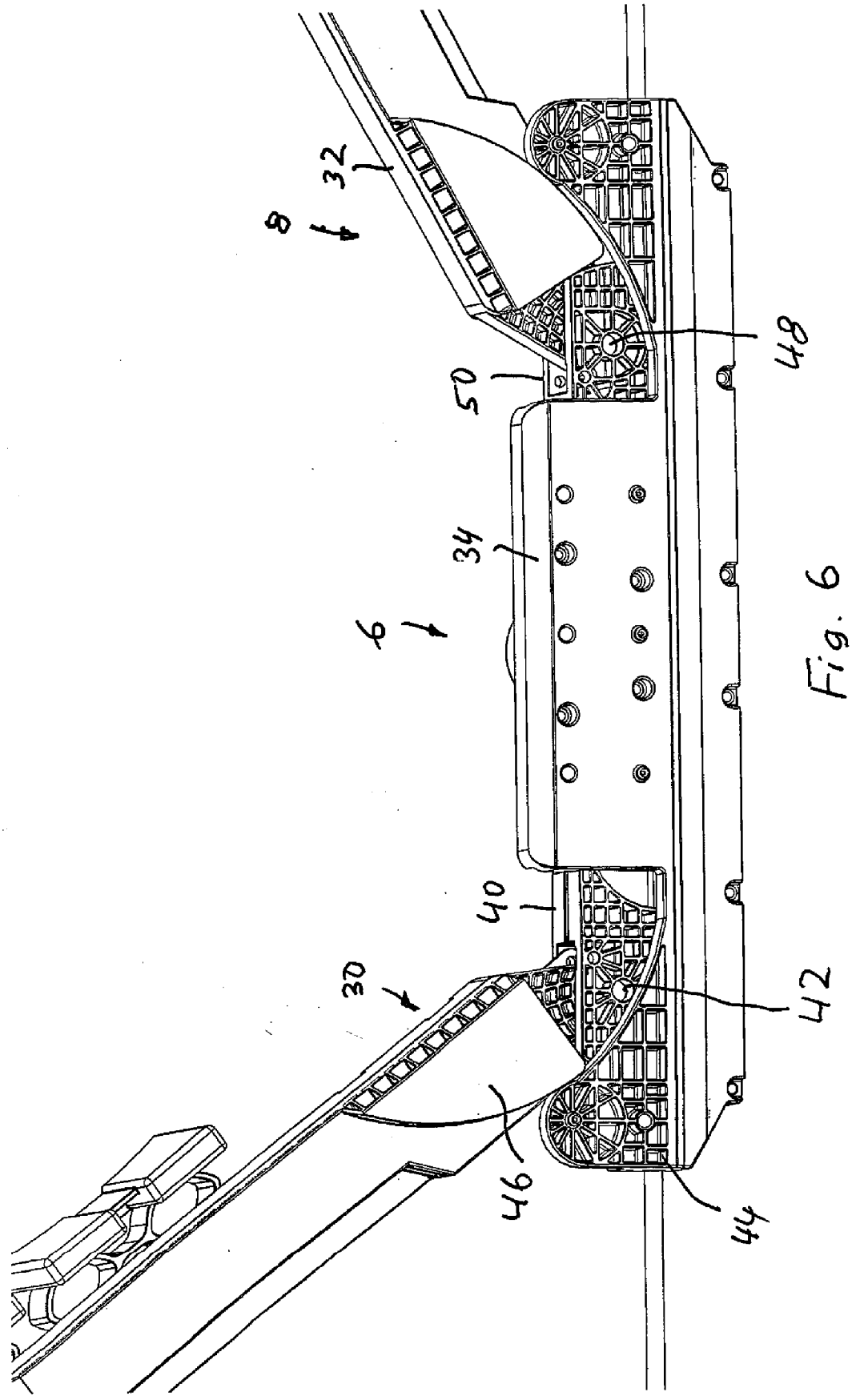


Fig. 6

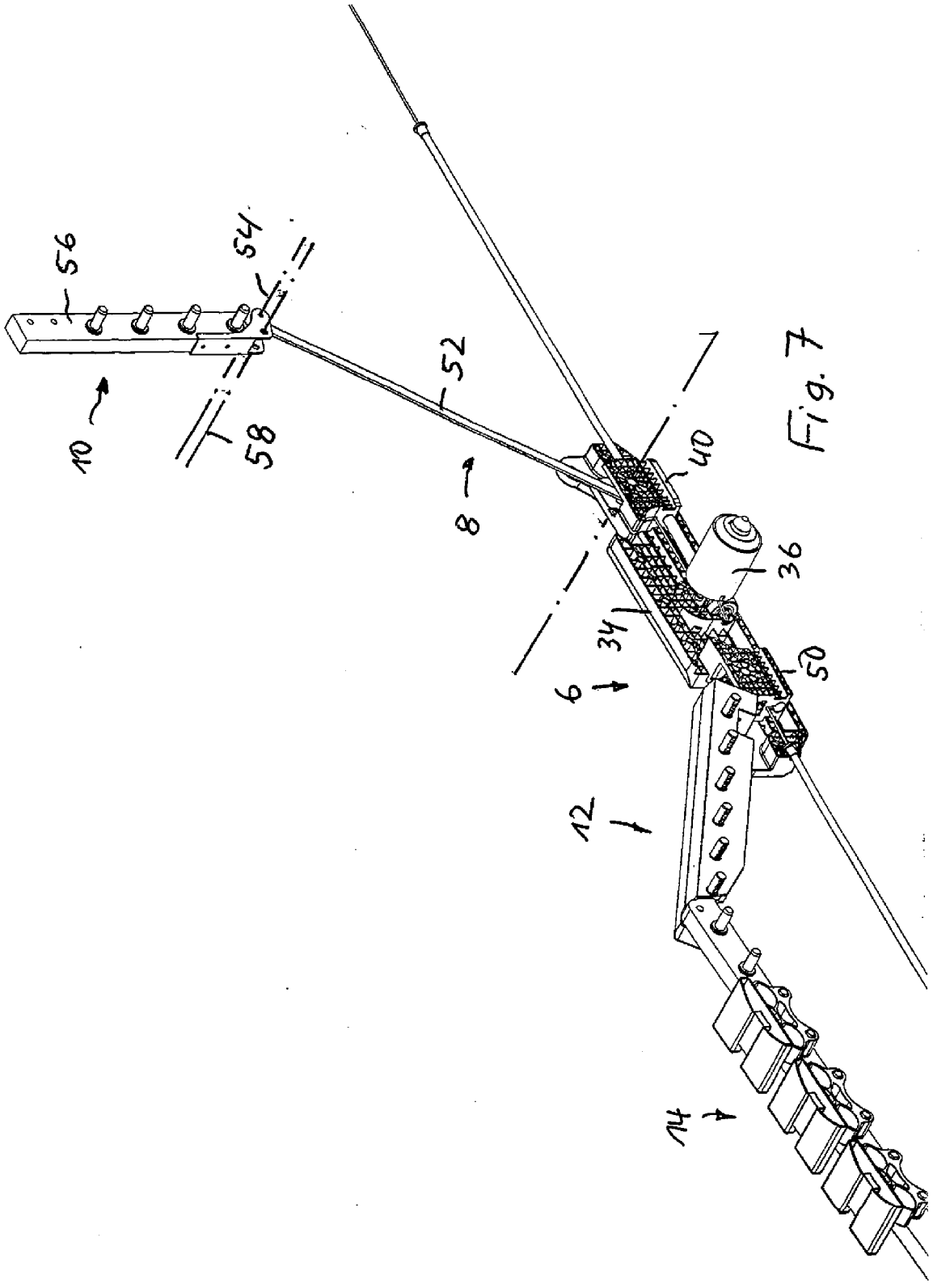


Fig. 7

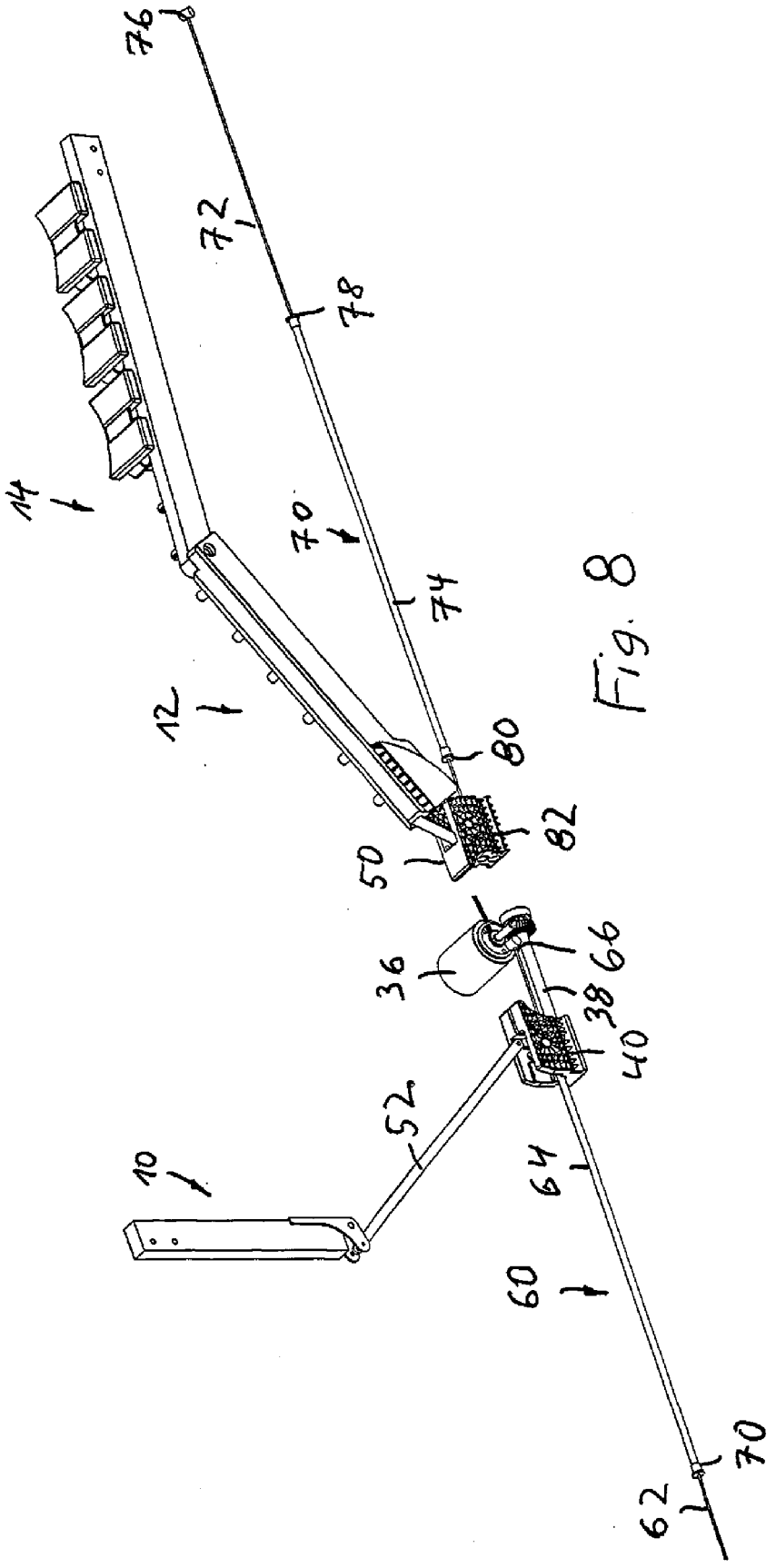
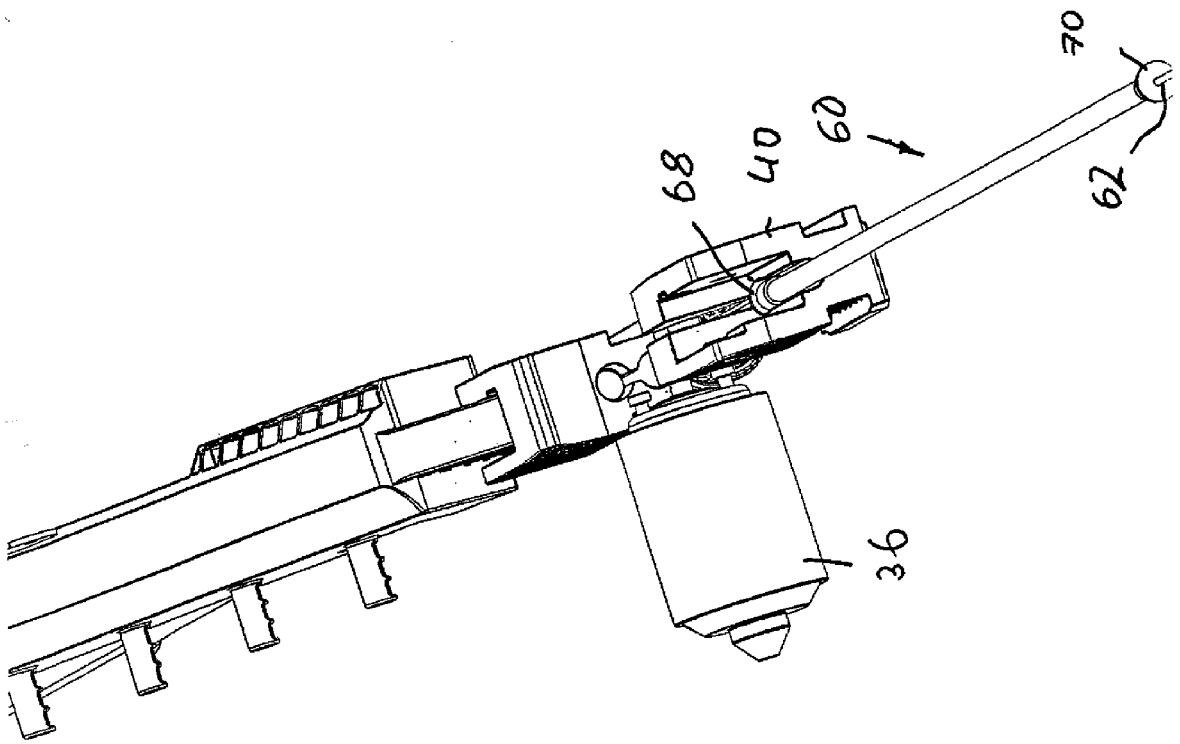


Fig. 8

Fig. 9



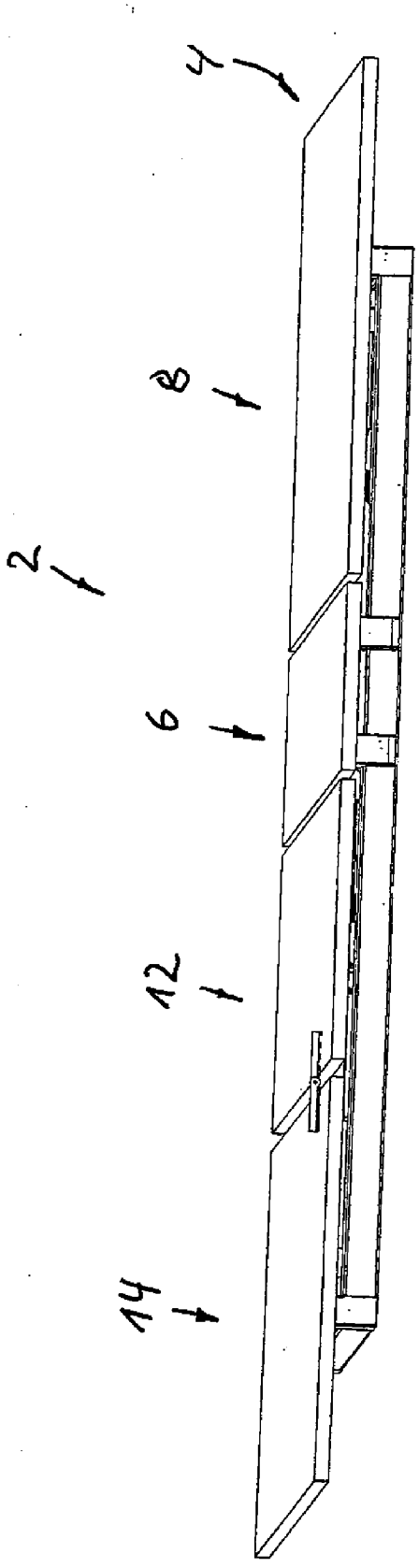


Fig. 10

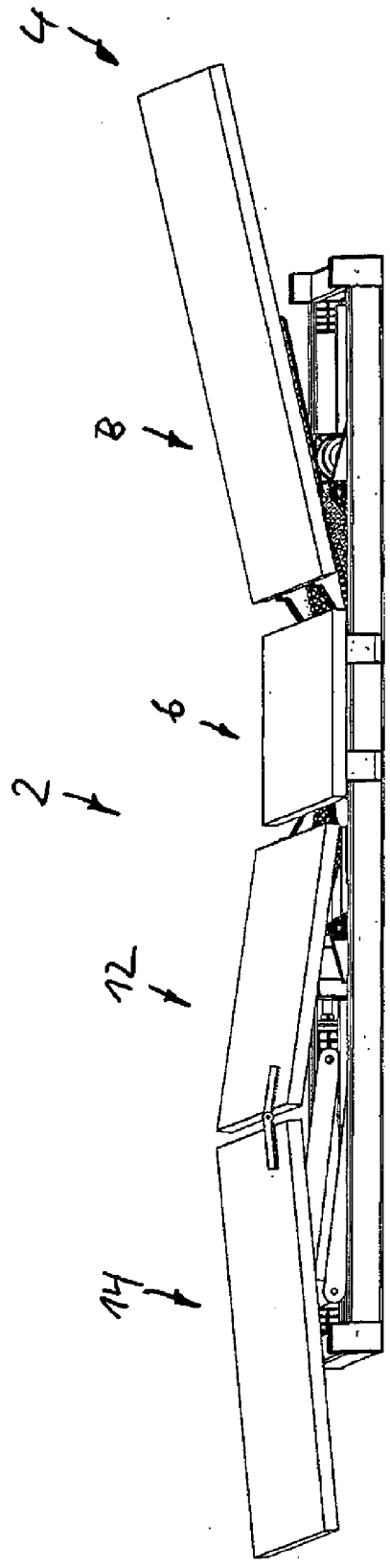


Fig. 11

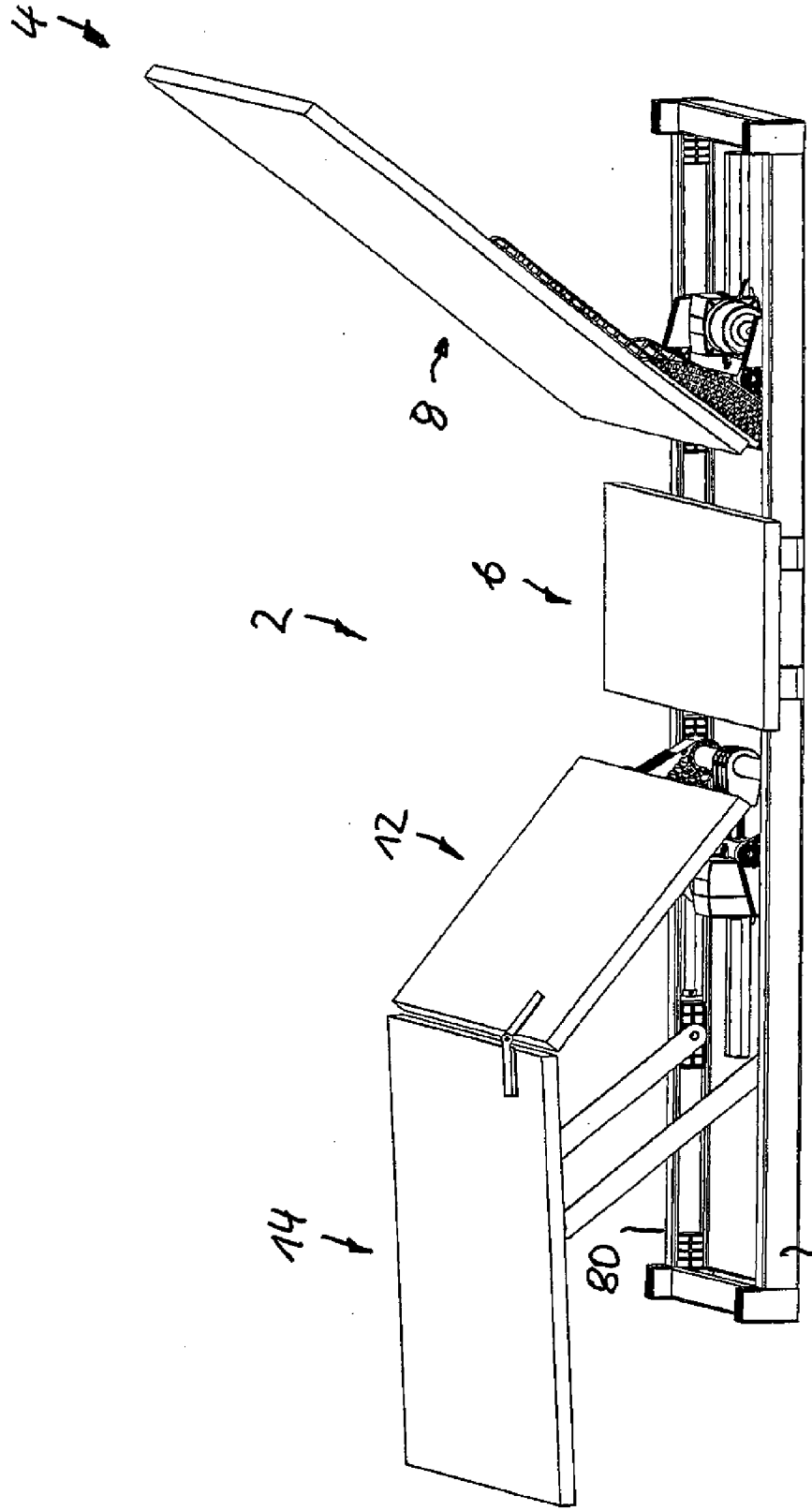
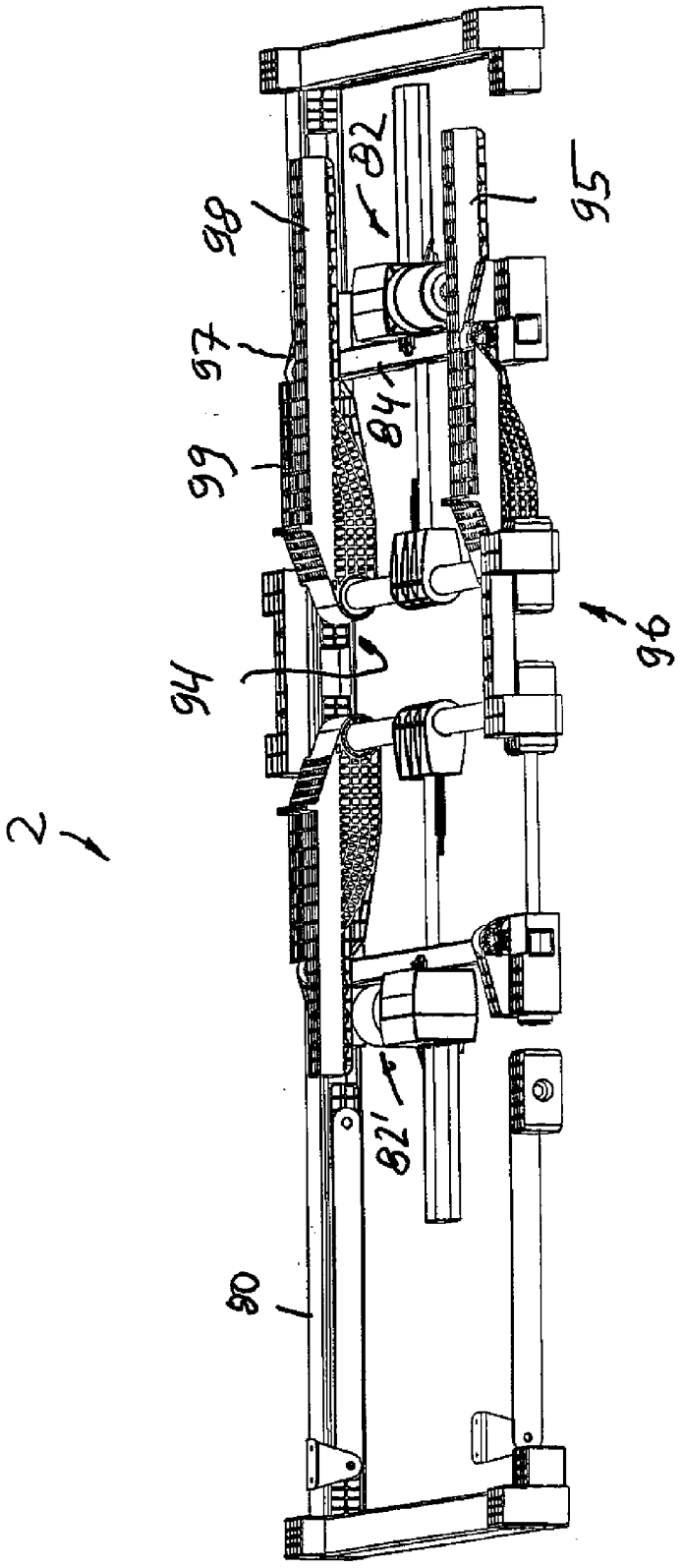


Fig. 12



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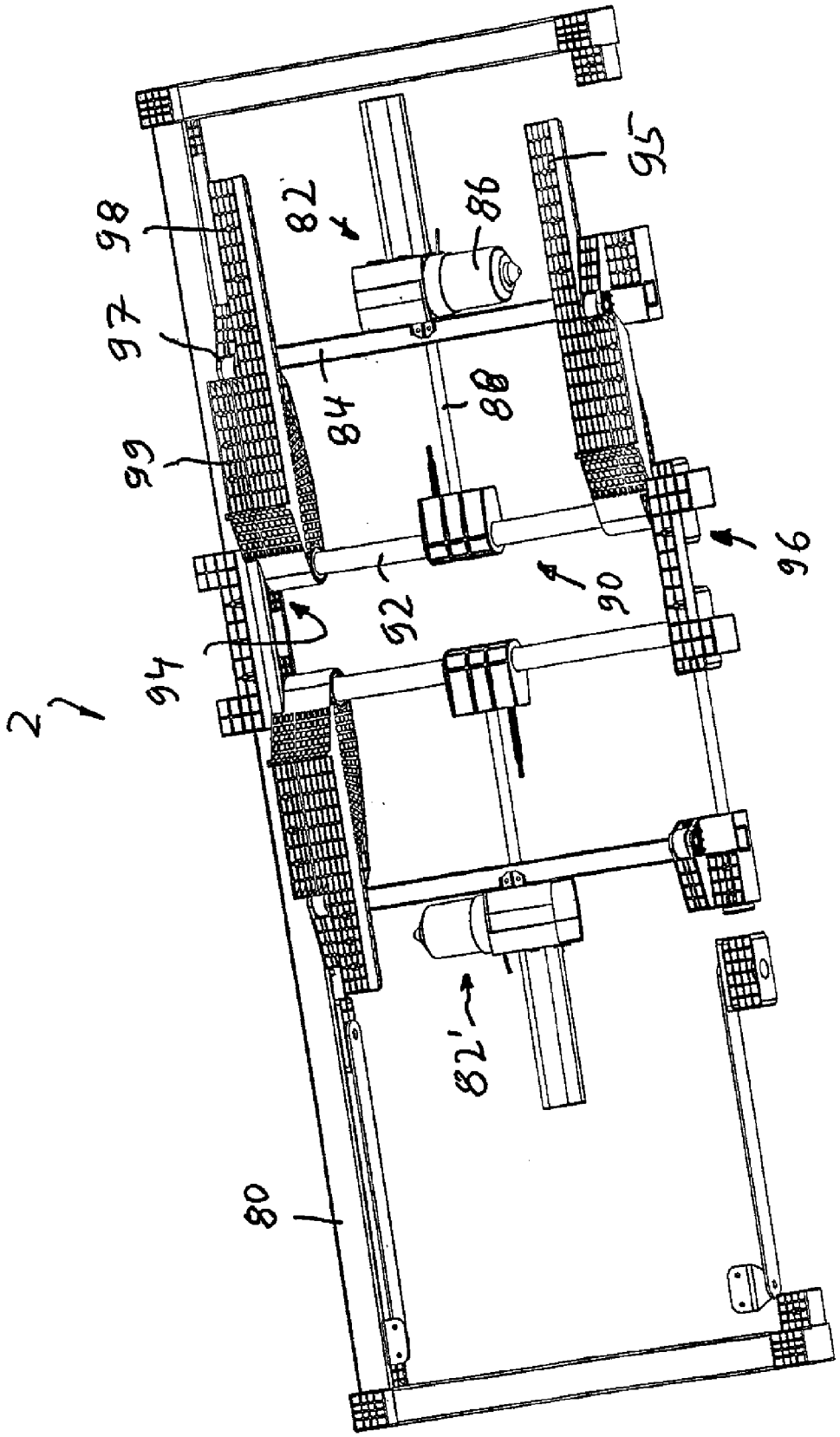


Fig. 14A

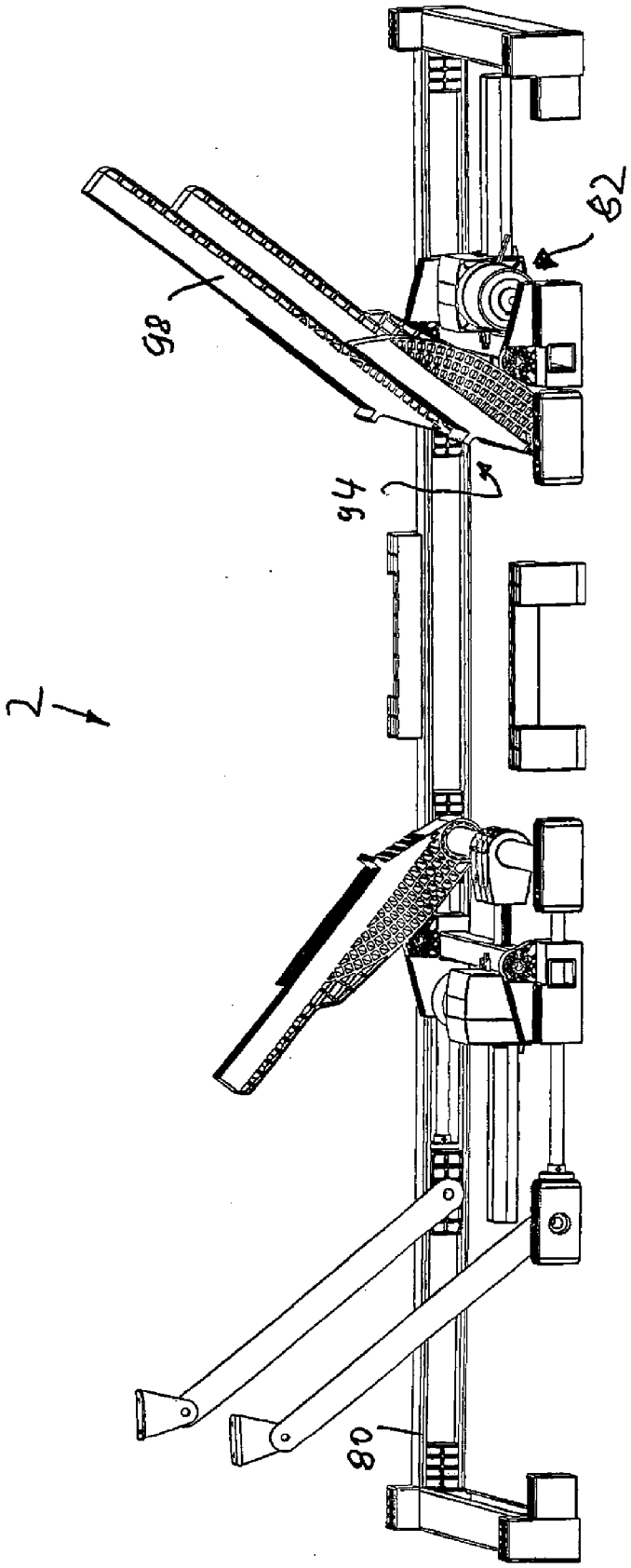


Fig. 14B

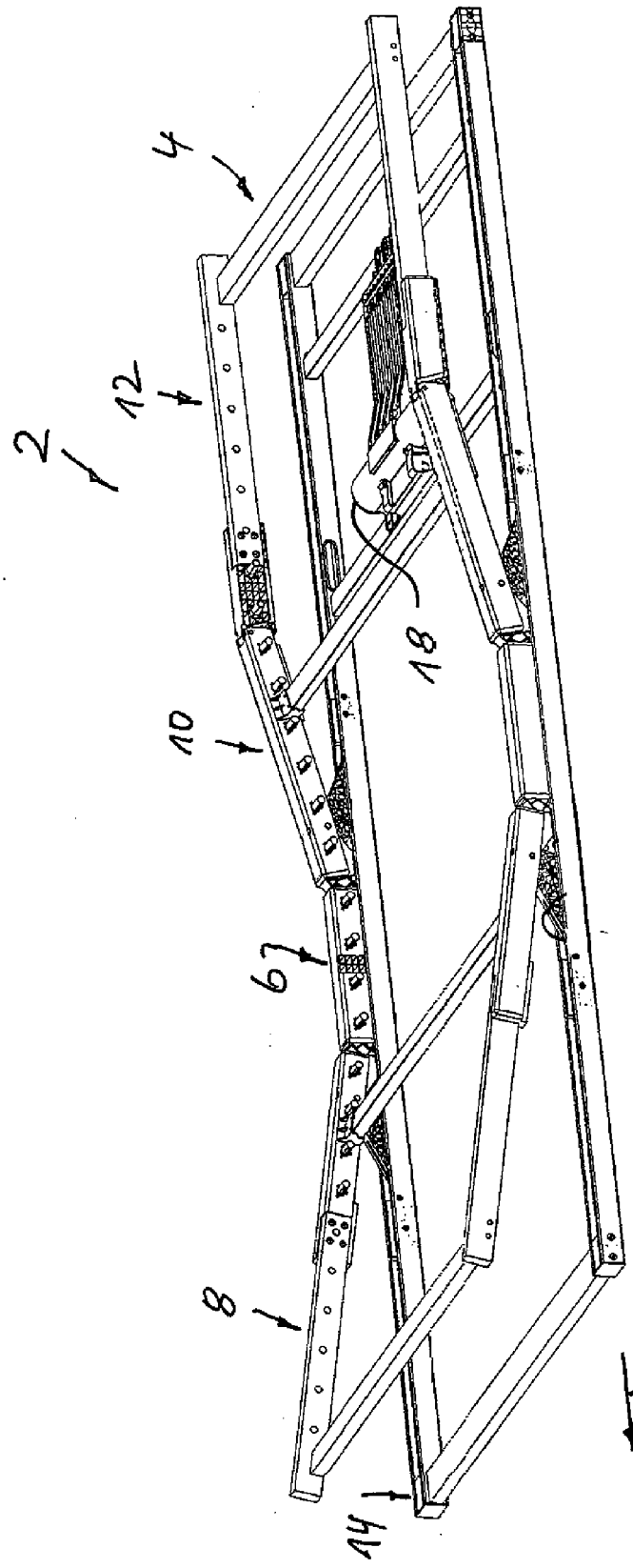
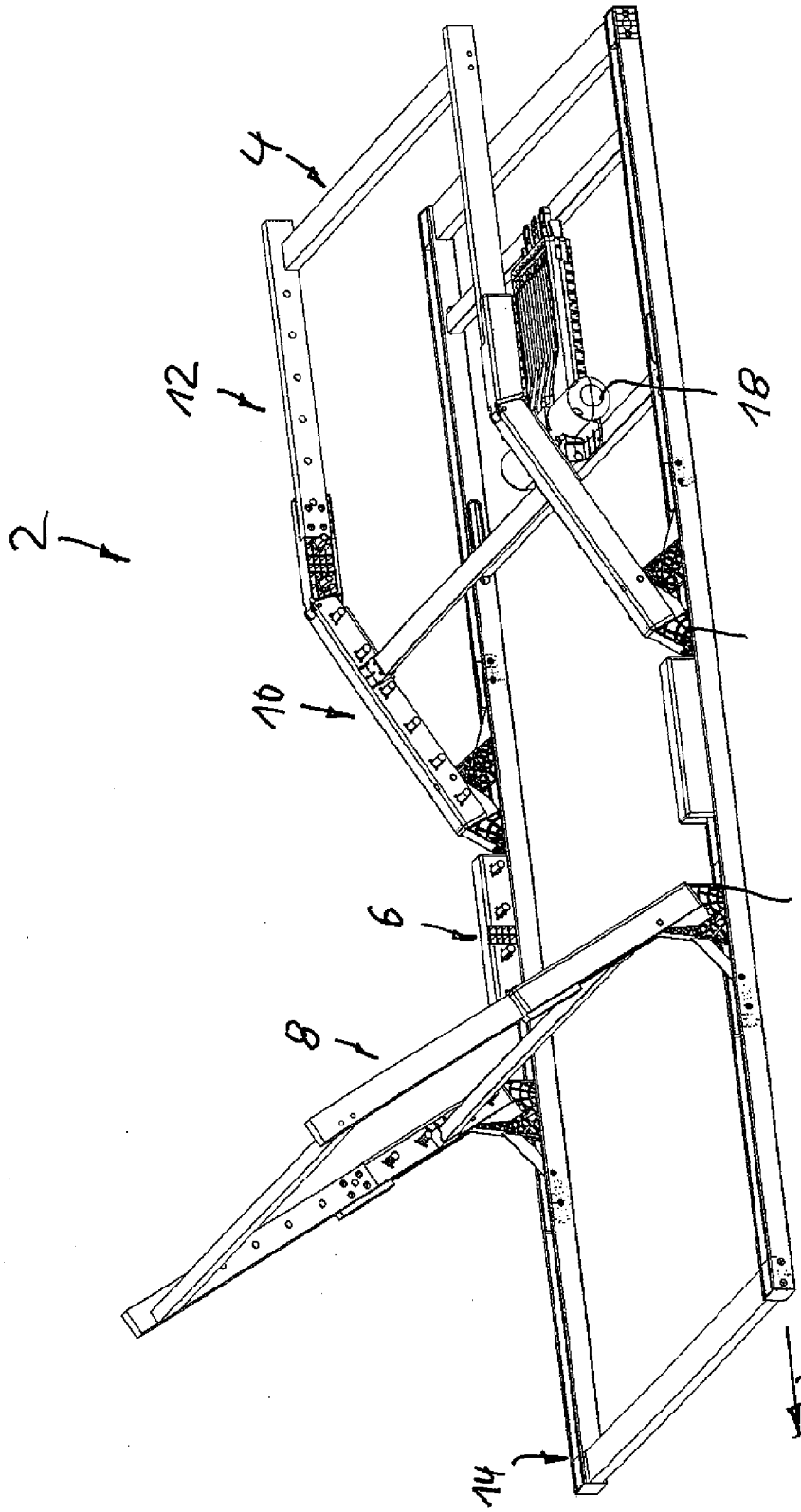


Fig. 15



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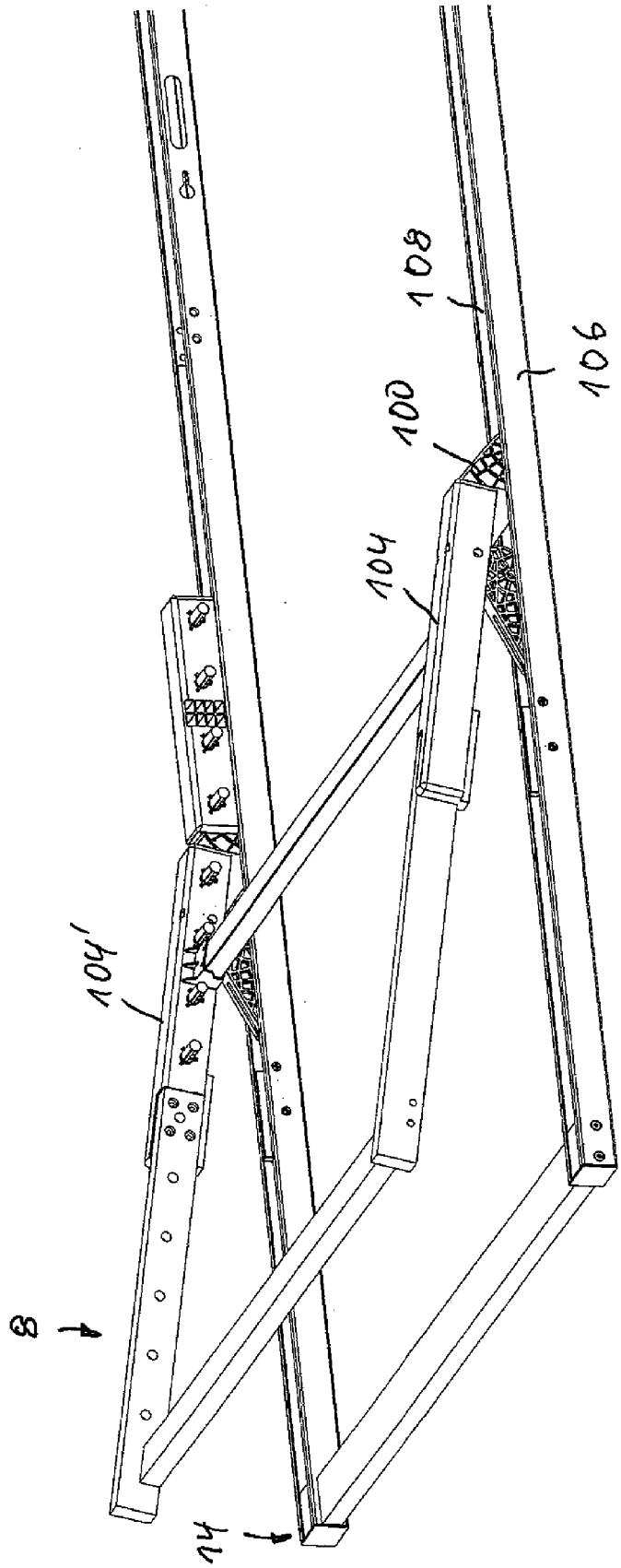

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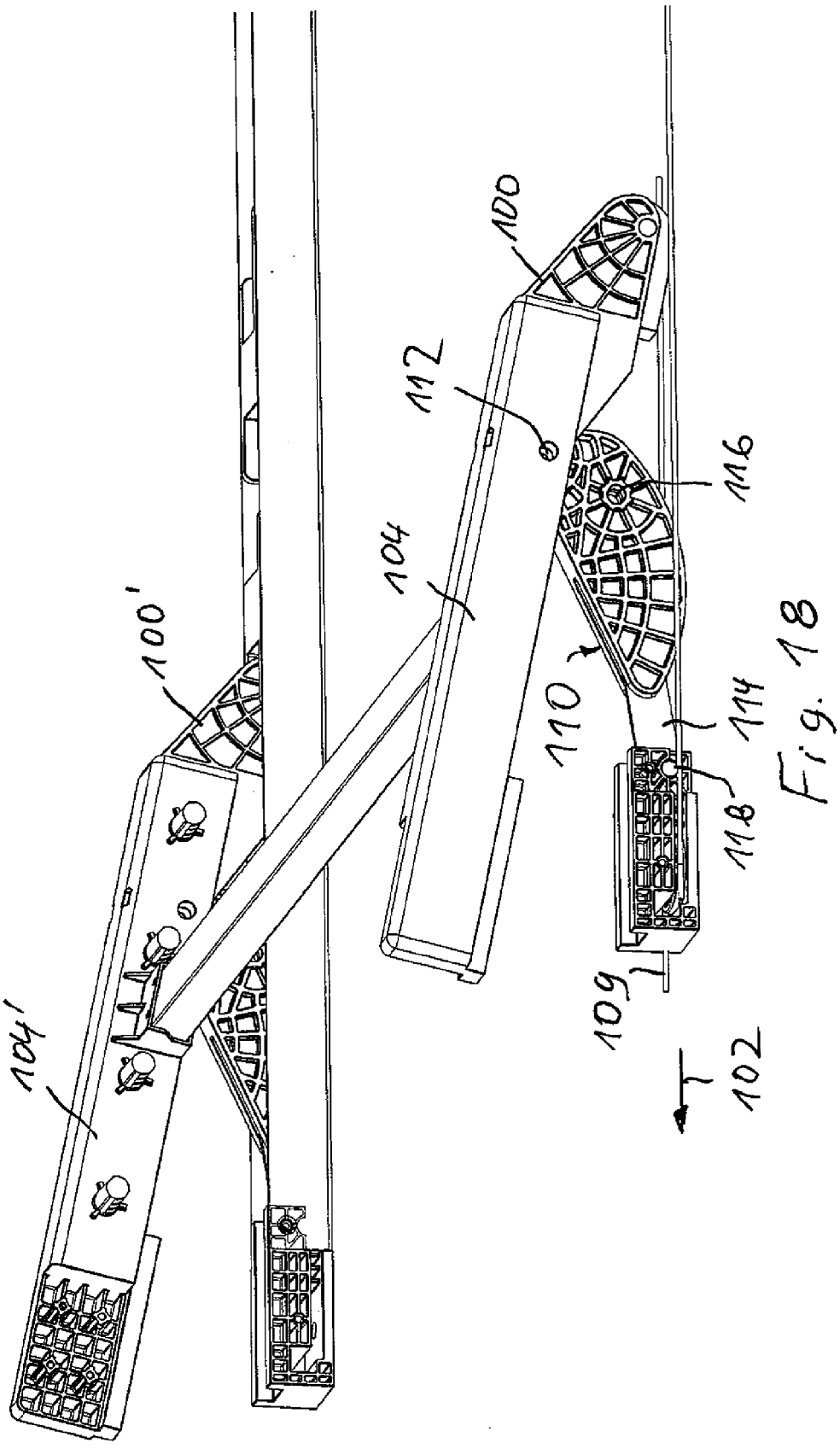

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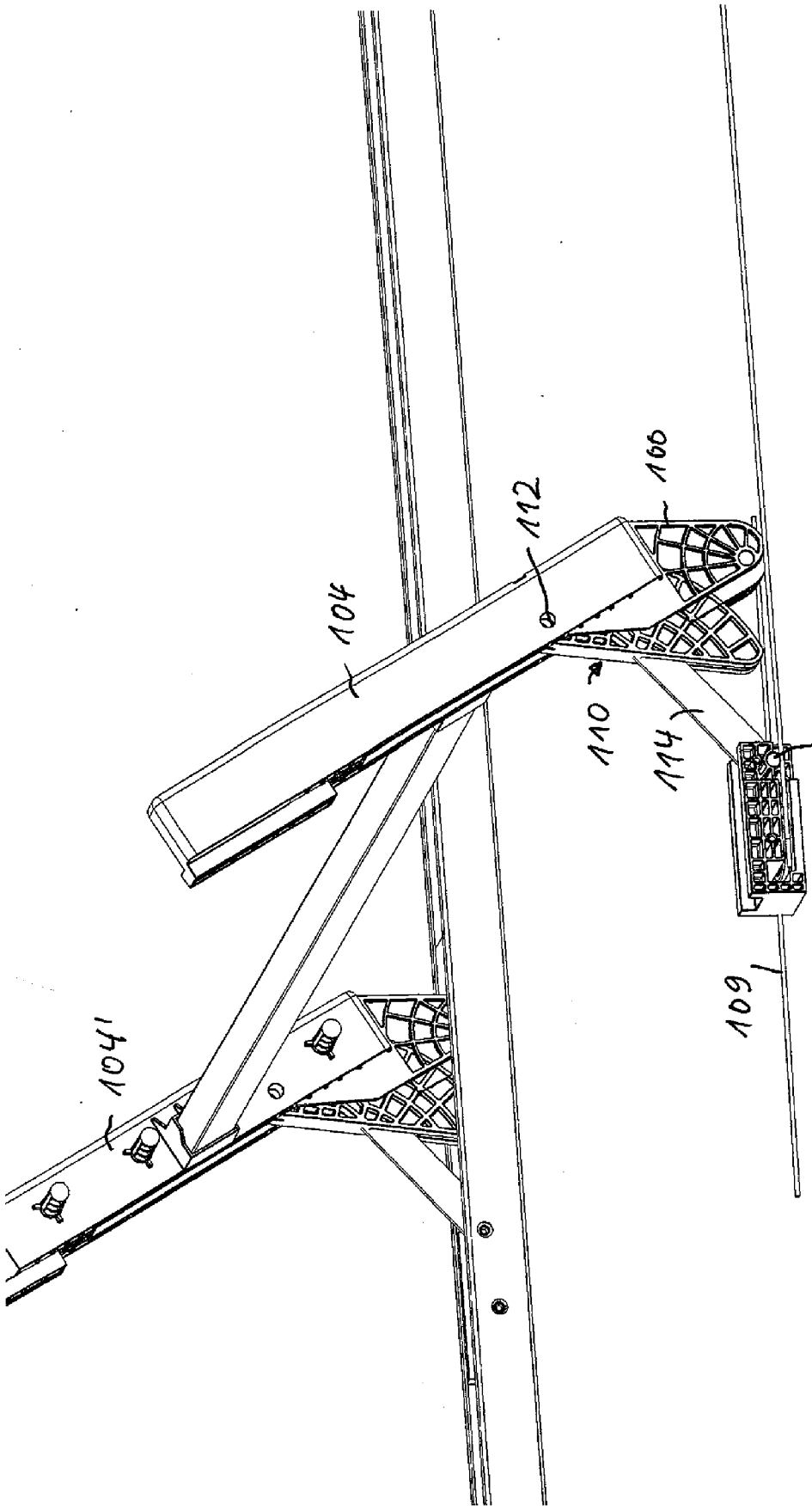


Fig. 19

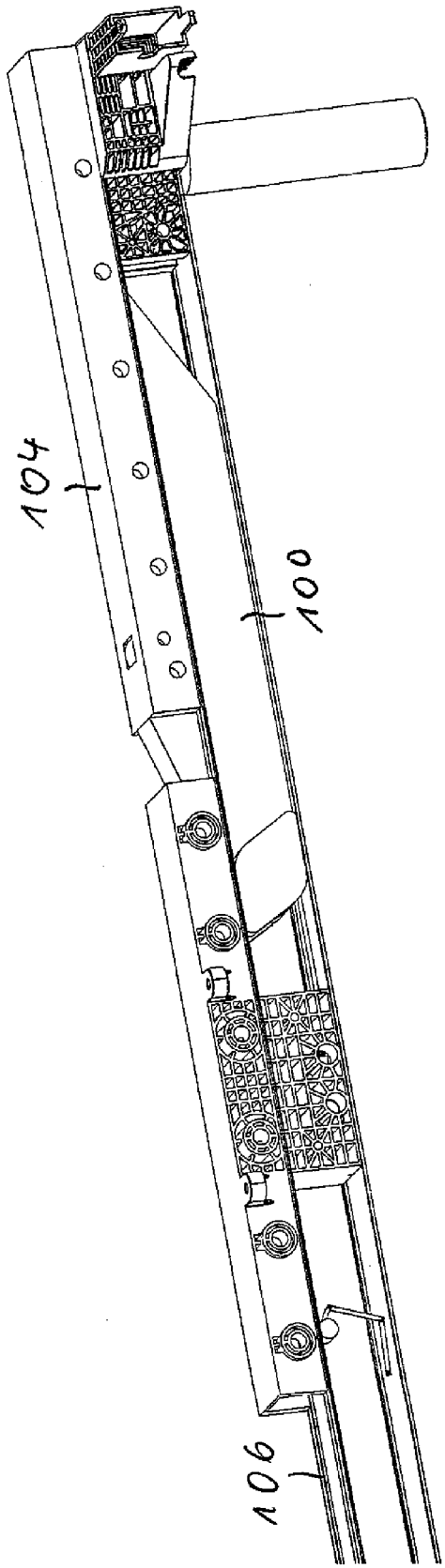


Fig. 20

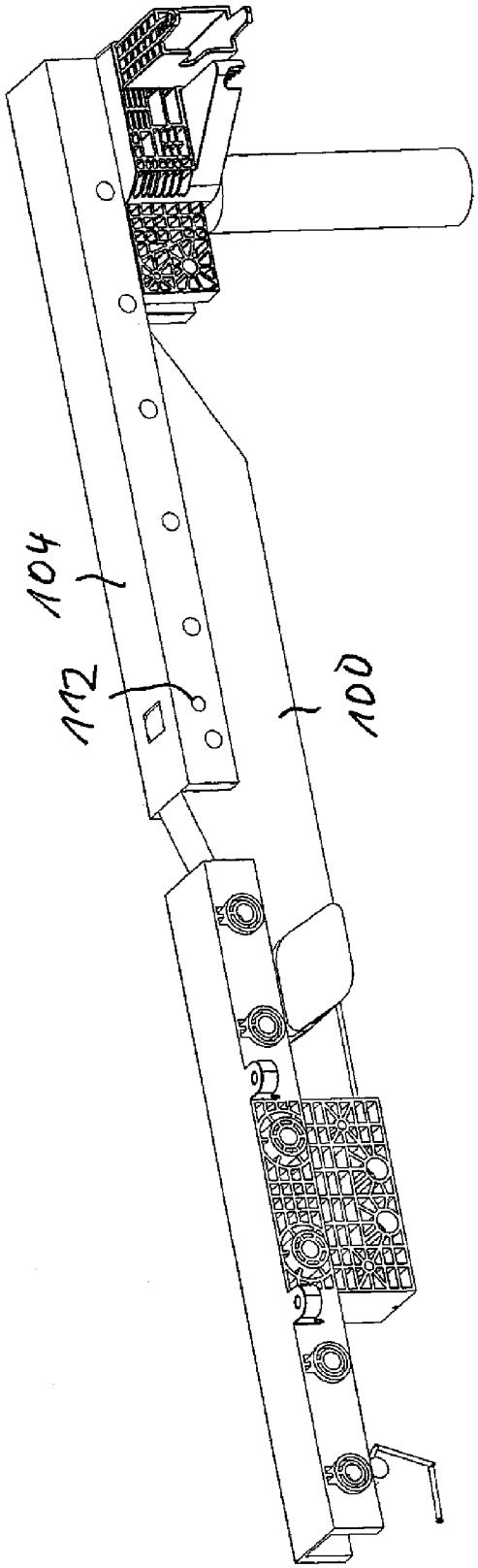


Fig. 21

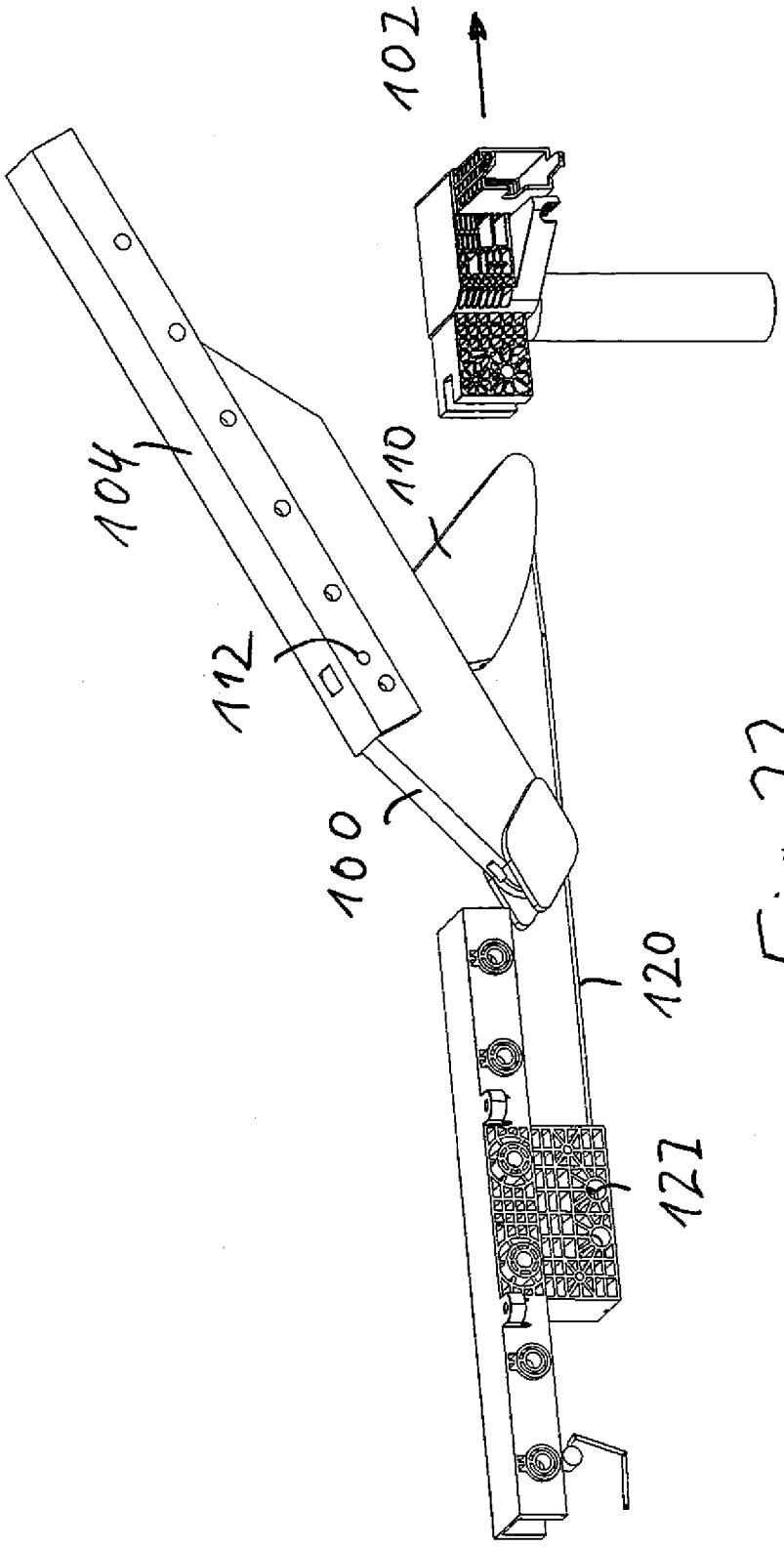


Fig. 22

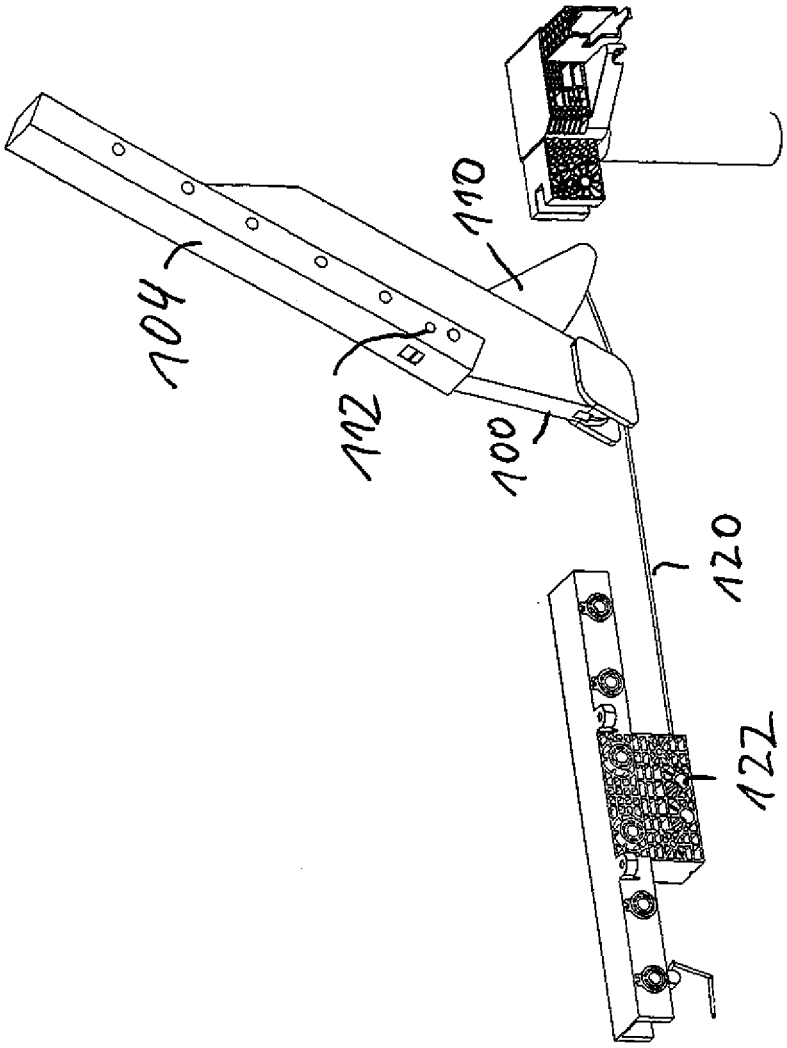
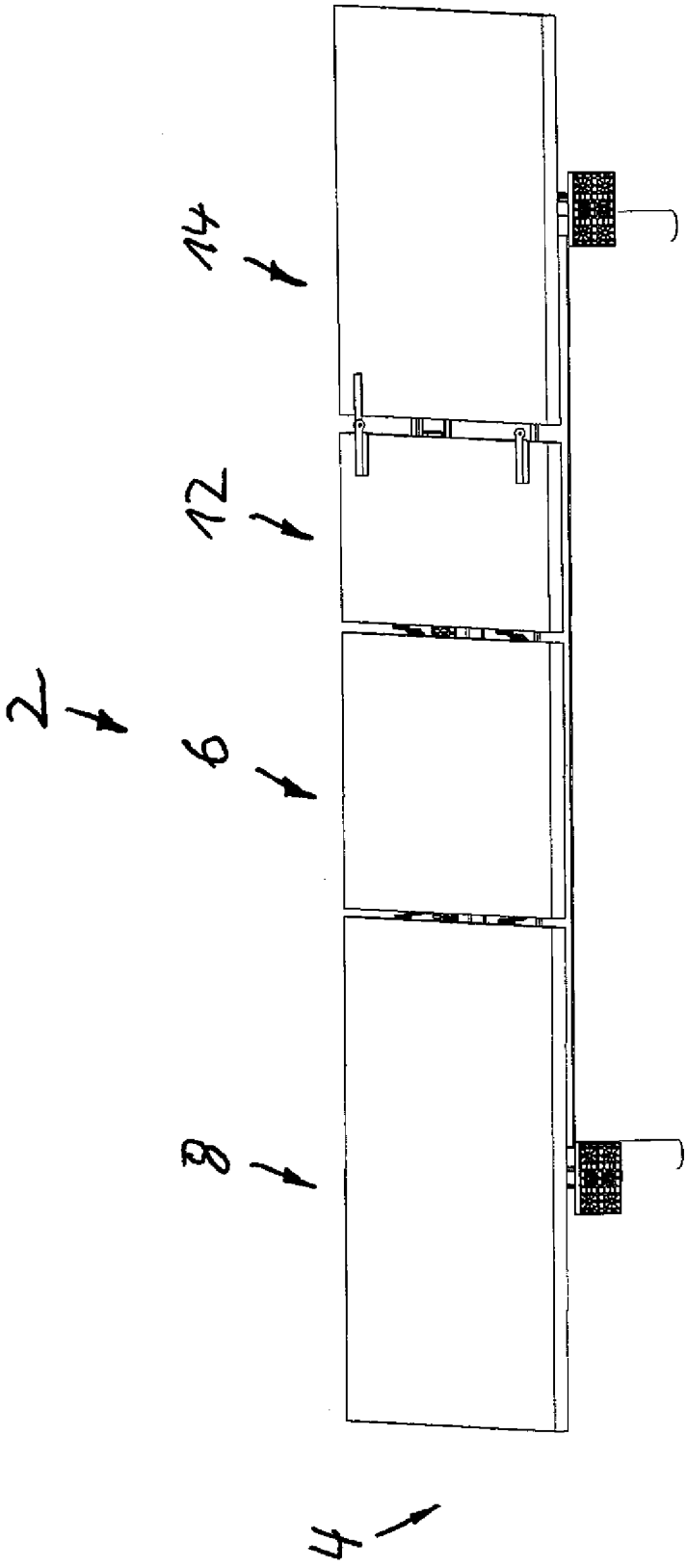


Fig. 23



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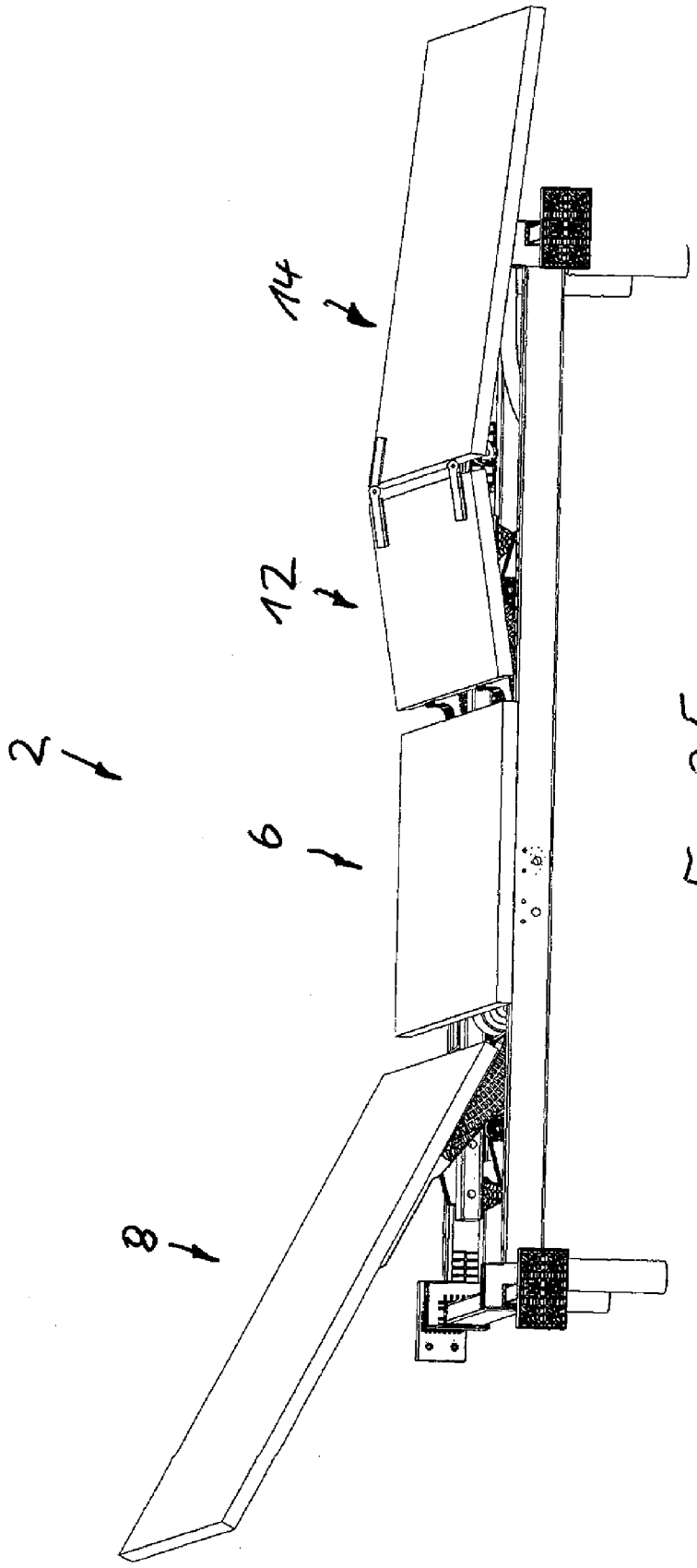
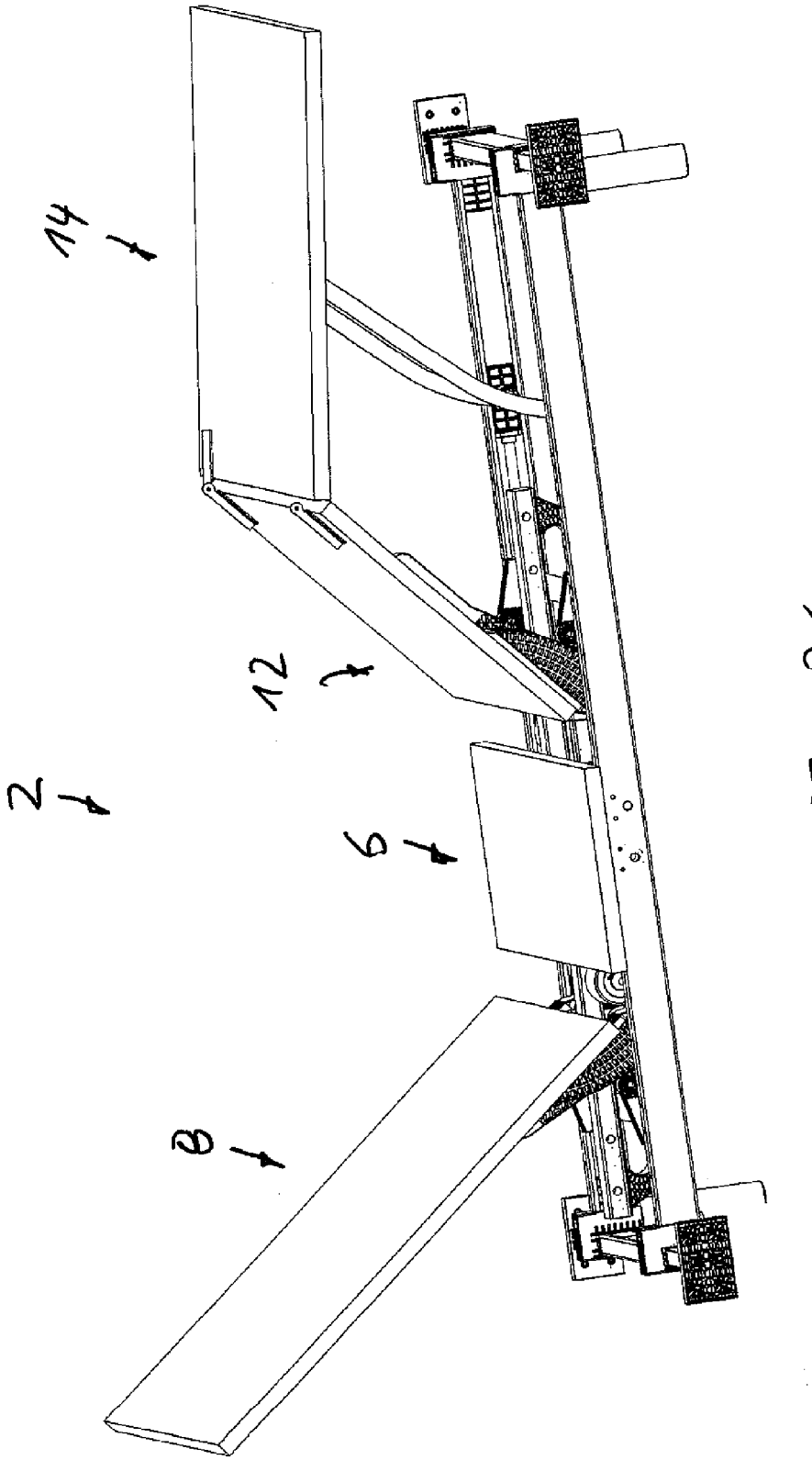


Fig. 25



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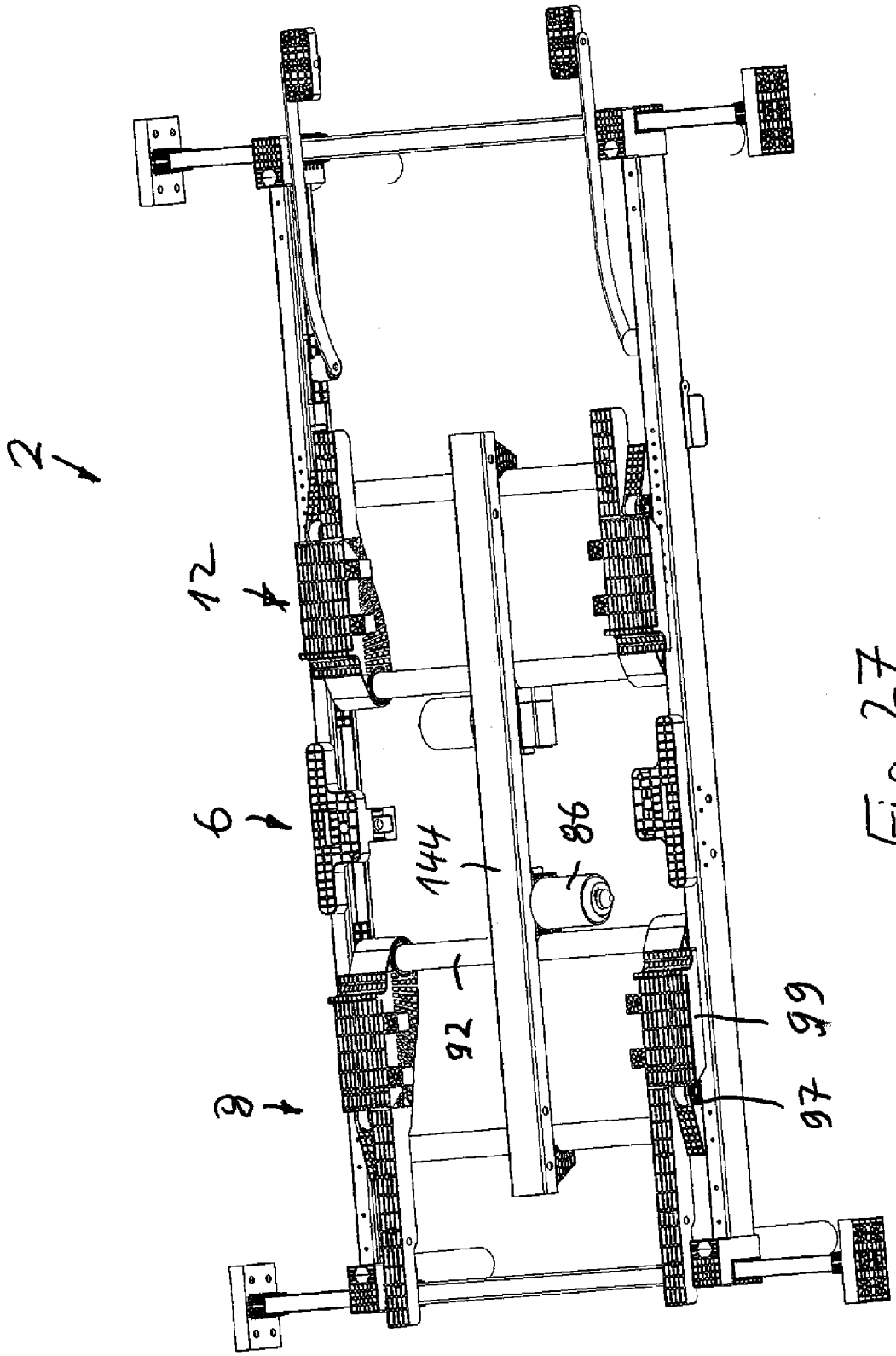


Fig. 27

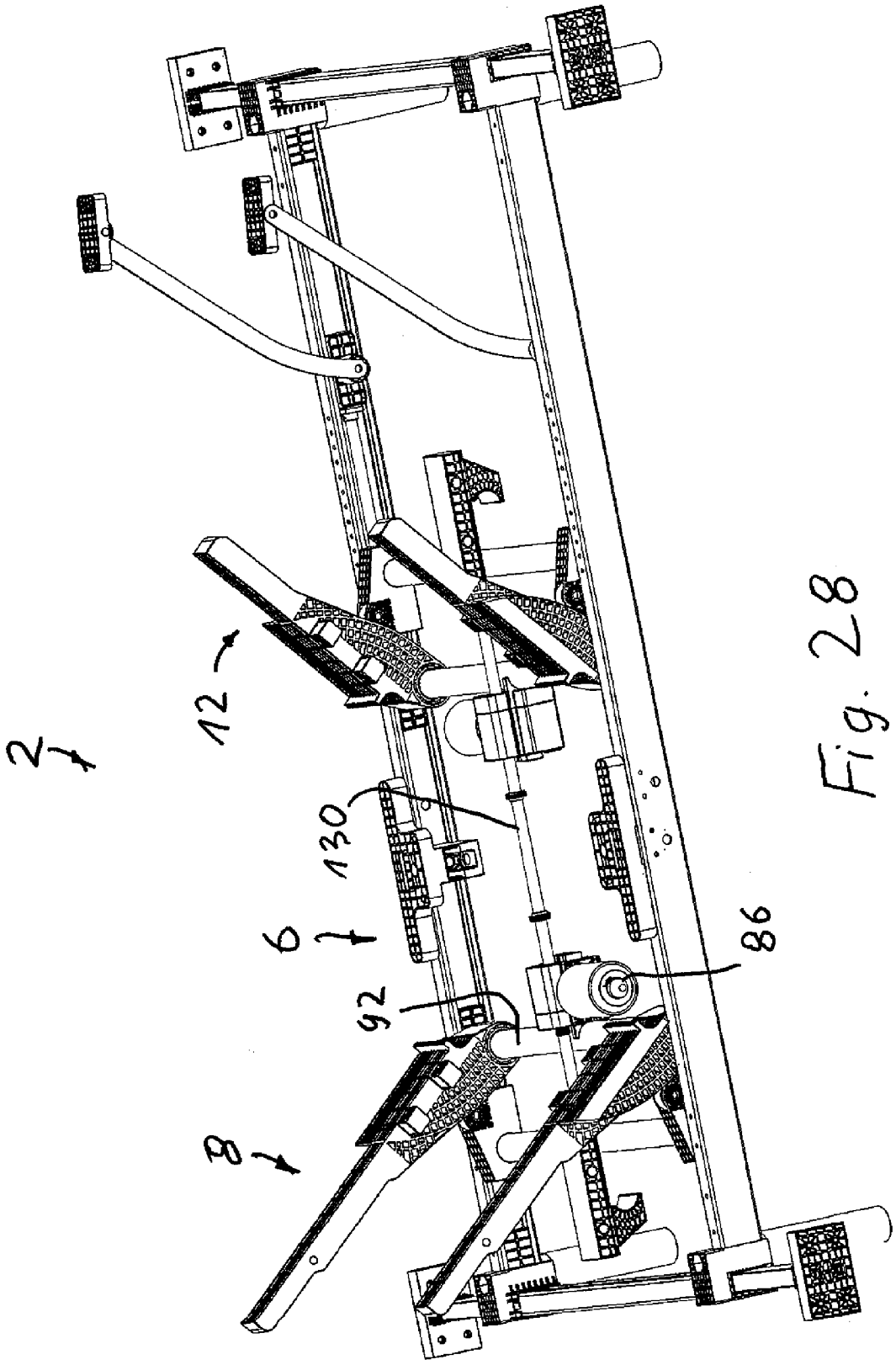


Fig. 28

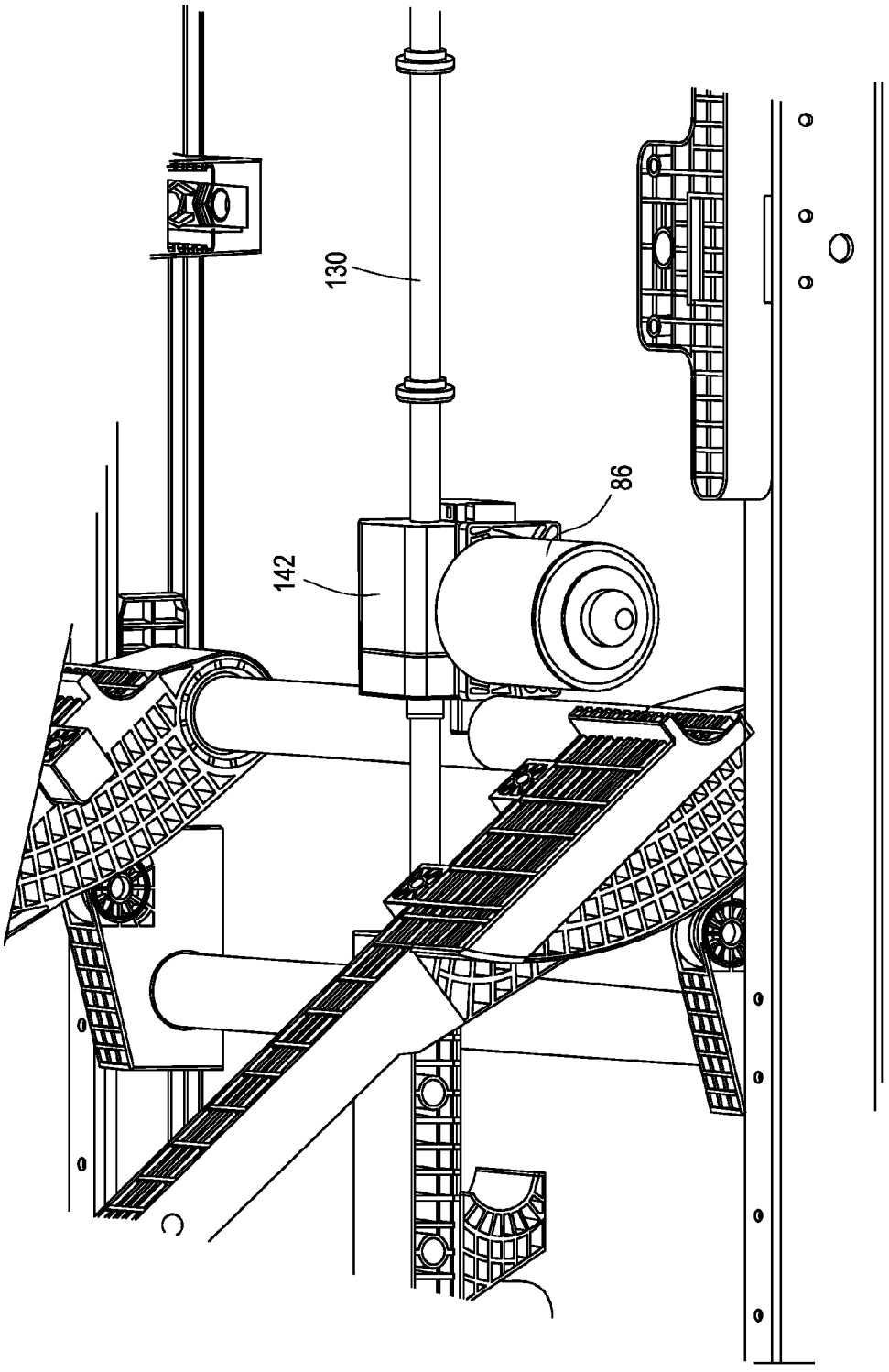
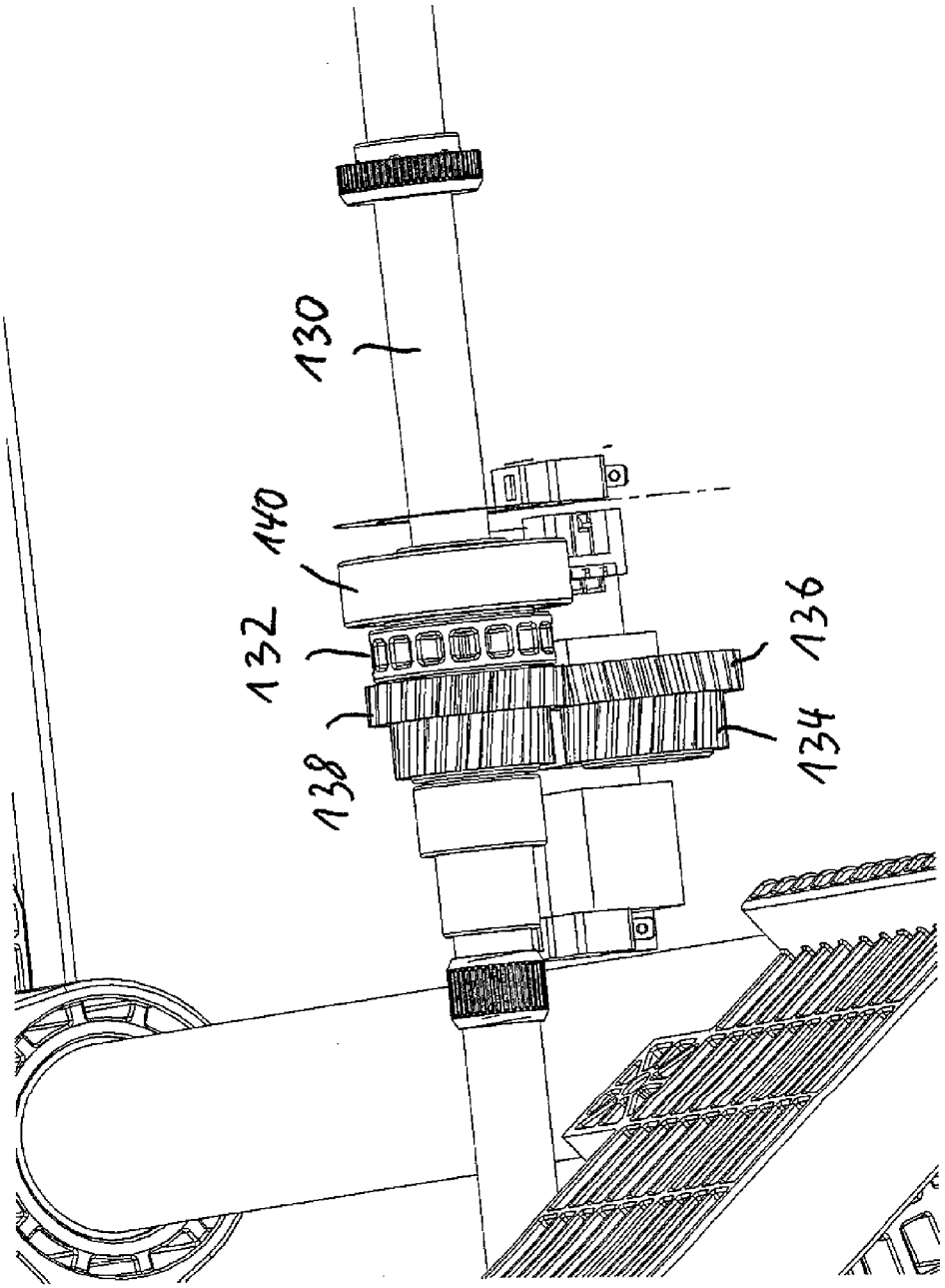


Fig. 29

Fig. 30



SUPPORT DEVICE ADJUSTABLE BY AN ELECTRIC MOTOR

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the priority of German Application No. 10 2015 106 991.1, filed May 5, 2015, and this application claims the priority of German Application No. 10 2014 115 075.9, filed Oct. 16, 2014, and this application claims the priority of European Application No. 15 002 289.5, filed Aug. 1, 2015, and each of which is incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The invention relates to a support device, adjustable by an electric motor, for padding of seating and/or reclining furniture, in particular a mattress of a bed.

BACKGROUND OF THE INVENTION

[0003] For adjusting slatted frames, for example, so-called double drives are known which have a housing, designed as a separate component which is connectable to the slatted frame, and in which two adjustment units are accommodated, one of which is used, for example, for adjusting a back support part, and the other, for adjusting a leg support part of the slatted frame. In the known double drives, the adjustment units are designed as a spindle drive, the drive coupling taking place at a support part, which is to be adjusted, via a coupling lever which is connected in a rotationally fixed manner to a pivot shaft which is associated with the support part to be adjusted. For adjusting the support part, the spindle nut of the spindle drive presses against the coupling lever, so that the pivot shaft, and thus the support part, swivels. Double drives of this type are known from EP 0372032 A1 and DE 3842078 A1, for example.

[0004] A furniture drive designed as a double drive is known from both DE 10017989 C2 and DE 10017979 C2, in which each adjustment unit has an electromotively driven winding device for a traction means, in the form of a cable, belt, or chain, which is connected in the manner of a pulley block to a pivot lever which is connected in a rotationally fixed manner to a pivot shaft, which in turn is in operative connection with a support part to be adjusted.

[0005] Furniture drives which operate according to a similar principle are also known from DE 3409223 C2, DE 19843259 C1, and EP 1020171 A1.

[0006] Furthermore, double drives which operate according to different principles are known from DE 197292812 A1, DE 29811566 U1, and DE 29714746 U1.

[0007] An adjustable slatted frame is known from DE 3900384 in which the adjustment of a head support part or leg support part of the slatted frame takes place by means of a pneumatic cylinder.

[0008] A gas spring adjustment fitting for slatted frames is known from DE 29602947 U1, in which a pull cable is provided for actuating the gas spring.

[0009] A slatted frame is known from DE 3103922 A1 in which the adjustment of an upper body support part, for example, takes place via a windshield wiper motor and a scissor lift.

[0010] A double drive is known from EP 1294255 B1 in which the transmission of force from a linear movable drive element to a pivot lever, which is in operative connection with a pivot shaft that is in operative connection with a support part to be adjusted, takes place via a pulley block. Similar furniture drives are also known from FR 2727296, DE 3409223 C2, DE 19843259 C1, GB 2334435, and U.S. Pat. No. 5,528,948.

[0011] In addition, slatted frames are known in which the adjustment apparatus for adjusting a support part is partially or completely integrated into a base body of the slatted frame. In this sense, DE 19962541 C2 (corresponding to EP 1239755 B1, JP 2001-546280, and U.S. Pat. No. 6,754,922) discloses and describes a support device, adjustable by an electric motor, having a first support part which has mutually parallel longitudinal beams, and which in the support apparatus known from the cited publication is formed by a stationary center support part. The known support apparatus also has further support parts, which are adjustable relative to the first support part by a drive means. In the support apparatus known from the cited publication, a first longitudinal beam of the first support part for accommodating the drive means is designed as a hollow profile, wherein the entire drive, including a drive motor, is accommodated in the hollow longitudinal beam. For this reason, the drive motor does not protrude beyond the first longitudinal beam in the vertical direction thereof, so that the support apparatus known from the cited publication has an extremely small installation height. A similar support apparatus is also known from DE 10046751 (corresponding to EP 1239754 B1, JP 2001-547994, and U.S. Pat. No. 6,961,971).

[0012] A motor-adjustable support apparatus for a mattress of a bed is known from WO 96/29970, having multiple support parts, following one another in the longitudinal direction of the support apparatus, which are pivotable relative to a first support part via a drive means. The support parts are supported on an outer frame whose profile height is significantly greater than the profile height of the support parts. In the support apparatus known from the cited publication, portions of the outer frame are designed as a hollow profile, and portions of the drive means for adjusting the support parts relative to one another are accommodated in the hollow profile. The drive motor is situated on an inner side of a portion of the outer frame.

[0013] A motor-adjustable support apparatus for a mattress of a bed is known from DE 69507158 T2 (corresponding to EP 0788325 B1), having a first support part which has a longitudinal beam, and at least one second support part which is pivotable relative to the first support part via a drive means. In the known support apparatus, the drive motor is situated outside the base area of the support apparatus and is fastened to a frame-like extension of the first support part.

[0014] A slatted frame is known from EP 1633219 B1, in which portions of the adjustment apparatus are accommodated in a hollow longitudinal beam, while the drive motor is situated outside the longitudinal beam, and through a recess is in drive connection with the portions of the adjustment apparatus accommodated in the longitudinal beam.

[0015] A furniture drive which is provided for adjusting a drawer relative to a body of a cabinet is known from WO 2008/113401, in which the adjustment of the drawer takes place via a flexible toothed rack which is in engagement with a gearwheel.

[0016] A slatted frame having an integrated adjustment apparatus is known from DE 10 2008 028586 A1, in which the transmission of force from drive motors of the adjustment apparatus to the support parts to be adjusted takes place via pull cables which are guided over deflection points.

[0017] The known support devices, having support parts which are pivotably adjustable relative to one another, in principle have a high level of comfort for the user. However, it is disadvantageous that during a pivoting adjustment of, for example, an upper body support part relative to a stationary center support part, the mattress is compressed, the compression being greater the more the upper body support part is adjusted relative to the center support part. As a result of compression of the mattress, the free end of the mattress resting on the upper body support part is displaced with increasing adjustment relative to the free end of the upper body support part.

[0018] To avoid this disadvantage, it is known from DE 20 2015 100 471 U1 to translationally move the upper body support part simultaneously with the pivoting adjustment. A support device, adjustable by an electric motor, of the type in question for padding of seating and/or reclining furniture, in particular a mattress of a bed, is known from the cited publication, having a base body which includes support parts on which the padding is supported during use of the support device, the support parts having at least one stationary first support part and a second support part which is pivotably adjustable relative to the first support part about a pivot axis. A drive apparatus is provided for adjusting the second support part relative to the first support part.

[0019] The second support part is designed and configured in such a way that the pivot axis is supported so as to be translationally displaceable in the longitudinal direction of the support device, the second support part being in drive connection with the drive apparatus in such a way that during the pivoting adjustment, the second support part, at least in phases, simultaneously undergoes a translational movement away from the first support part.

OBJECTS AND SUMMARY OF THE INVENTION

[0020] An object of the invention is to provide a support device adjustable by an electric motor having a simplified design.

[0021] Those and other objects are achieved by the invention set forth herein.

[0022] The invention provides that during an adjustment from an unadjusted starting position, in which the support parts span an essentially horizontal support plane, the second support part undergoes a pivoting movement as well as a translational movement in the direction of a maximally adjusted end position of the adjustment movement in which the support parts are pivoted relative to one another, in order to avoid compression of the mattress. The invention provides that during the translational movement, the second support part or a component connected thereto runs up against a first raising element which is stationary relative to the first support part, and thereby pivots. Adjustment mechanics having a particularly simple design are provided in this way.

[0023] A further advantage of the invention is that the support device is particularly robust due to the fact that the adjustment mechanics require only relatively few components.

[0024] The support device according to the invention may be used in any given furniture item in which support parts are pivotably adjustable relative to one another. In particular, the support device according to the invention is suited for a design as a slatted frame or as a support device for a box spring mattress.

[0025] The adjustment of the first support part relative to the first support part may take place corresponding to any given suitable kinematics. It is possible, for example, that during the adjustment in different kinematic phases, the second support part in each case undergoes either a pivoting movement or a translational movement. In this regard, one advantageous further embodiment of the invention provides that the second support part is in drive connection with the drive apparatus in such a way that during the overall adjustment movement between an unadjusted starting position, in which the second support part together with the first support part spans a horizontal or approximately horizontal support plane, and an end position of the adjustment movement, the second support part simultaneously undergoes both a pivoting movement and a translational movement. Compression of the mattress is thus avoided, not only in the end position of the adjustment movement, but also in adjustment positions between the starting position and the end position.

[0026] To achieve both a translational movement and a pivoting movement in a simple manner with a small number of components, another advantageous further embodiment of the invention provides a slide on which the pivot axis is supported and which is translationally movable by the drive apparatus.

[0027] The drive apparatus of the support device according to the invention may have any given design. For example and in particular, the drive apparatus may have at least one Bowden cable drive. The construction and mode of operation of such a Bowden cable drive are known from EP 2 792 277 A1, the entire disclosed content of which is hereby incorporated by reference into the present application.

[0028] With regard to the drive apparatus, one advantageous further embodiment of the invention provides that the drive apparatus has a linear drive for translationally moving the second support part. The linear drive, for example and in particular, may be designed as a spindle drive, wherein the output member of the spindle drive, for example and in particular, may be formed by a spindle nut which is situated on a threaded spindle in a rotationally fixed manner and movable in the axial direction, and which is in rotary drive connection with an electric motor. The spindle nut, for example and in particular, may form the slide on which the pivot axis is supported. However, in a kinematic reversal of the above-described embodiment, the output member of the spindle drive may also be formed by a threaded spindle which is supported in a rotationally fixed manner and movable in the axial direction, and on which a stationary spindle nut, which is rotationally drivable by an electric motor, is situated.

[0029] One advantageous further embodiment of the embodiment having the slide provides that the slide is translationally movably supported on a longitudinal guide.

[0030] Another advantageous further embodiment of the invention provides that the first raising element is situated laterally next to a translational movement path of the second support part, and that a second raising element is connected to the second support part, the first raising element being situated in the movement path of the second raising element in such a way that during the translational movement of the second support part, the second raising element cooperates with the first raising element in order to pivot the second support part. This ensures that the second support part in the unadjusted starting position may be situated horizontally or approximately horizontally in order to span a horizontal or essentially horizontal support plane together with the first

support part, but at the same time, to be able to easily overcome a dead center at the beginning of the adjustment movement when the second support part pivots, in that the second raising element which is connected to the second support part runs up against the first raising element.

[0031] One extremely advantageous further embodiment of the invention provides that the raising element effects pivoting of the second support part according to the principle of operation of an inclined plane or a cam mechanism.

[0032] One advantageous further embodiment of the embodiment having the cam mechanism provides that at least one raising element at its outer periphery is designed as a cam body in such a way that the first raising element and the second raising element cooperate with one another in the manner of a cam mechanism.

[0033] One advantageous further embodiment of the above-mentioned embodiment provides that cooperating run-up surfaces of the first raising element and of the second raising element have, at least in sections, a complementary or approximately complementary design with respect to one another.

[0034] Another advantageous further embodiment of the invention provides that the first raising element and/or the second raising element is/are designed and configured, in other words, configured and located, in such a way that the lever arm which acts to pivot the second support part lengthens from an unadjusted starting position toward an end position of the adjustment movement of the second support part.

[0035] The invention is explained in greater detail below with reference to the appended drawings, which illustrate embodiments of a support device according to the invention. All features which are described in the description, illustrated in the drawings, and claimed in the patent claims, alone or in any arbitrary suitable combination with one another, constitute the subject matter of the invention, regardless of their recapitulation in the patent claims, and regardless of their description or illustration in the drawings. Subcombinations of Claim **1** in which one or more features of Claim **1** are omitted or replaced by other features are also included in the disclosed content of the present application.

[0036] Relative terms such as left, right, up, and down are for convenience only and are not intended to be limiting.

BRIEF DESCRIPTION OF THE DRAWINGS

[0037] The drawings show the following:

[0038] FIG. **1** shows a perspective view of a first embodiment of a support device according to the invention in the form of a slatted frame, in an unadjusted starting position;

[0039] FIG. **2** shows, in the same manner as FIG. **1**, the embodiment according to FIG. **1** in an end position of the adjustment movement of an upper body support part and a leg support part;

[0040] FIG. **3** shows, in the same manner as FIG. **1**, the embodiment according to FIG. **1** with some components omitted for purposes of manner;

[0041] FIG. **4** shows, in the same manner as FIG. **2**, details of a drive apparatus of the support device according to FIG. **1**;

[0042] FIG. **5** shows, in the same manner as FIG. **4**, details of the drive apparatus from a different perspective;

[0043] FIG. **6** shows, in the same manner as FIG. **5**, a detail from FIG. **5**, but in enlarged scale;

[0044] FIG. **7** shows, in the same manner as FIG. **5**, the drive apparatus from FIG. **5**, with further components of the support device omitted to clarify the adjustment of the head support part relative to the upper body support part;

[0045] FIG. **8** shows, in the same manner as FIG. **7** but from a different perspective, the support device according to FIG. **2**, with even further components of the support device omitted;

[0046] FIG. **9** shows a detail from FIG. **8** from a different perspective and in enlarged scale;

[0047] FIG. **10** shows a perspective view of a second embodiment of a support device according to the invention in the starting position of the adjustment movement, in which the support parts span a horizontal support plane;

[0048] FIG. **11** shows, in the same manner as FIG. **10**, the support device according to FIG. **10**, with the support parts in an adjustment position which is between the starting position and the end position of the adjustment movement;

[0049] FIG. **12** shows, in the same manner as FIG. **10**, the support device according to FIG. **10**, with the support parts in the end position of the adjustment movement;

[0050] FIG. **13** shows, in the same manner as FIG. **10**, the support device according to FIG. **10**, with components of the support device omitted to clarify the construction of the drive apparatus;

[0051] FIG. **14**A shows, in the same manner as FIG. **13**, but in a slightly altered perspective, the support device according to FIG. **10**;

[0052] FIG. **14**B shows, in the same manner as FIG. **13**, the support device according to FIG. **10** in the end position of the adjustment movement;

[0053] FIG. **15** shows, in a perspective view, a third embodiment of a support device according to the invention in a first adjustment position,

[0054] FIG. **16** shows, in the same manner as FIG. **15**, the support device according to FIG. **15** in a second adjustment position which corresponds to a maximum adjustment position;

[0055] FIG. **17** shows, in the same manner as FIG. **15** but in enlarged scale, a detail from FIG. **15**, with further components of the support device omitted for the sake of clarity;

[0056] FIG. **18** shows, in the same manner as FIG. **17**, a detail from FIG. **17**;

[0057] FIG. **19** shows, in the same manner as FIG. **18**, the detail from FIG. **18** in an adjustment position which corresponds to the adjustment position of the support device illustrated in FIG. **16**;

[0058] FIG. **20** shows a perspective view of a component of a fourth embodiment of a support device according to the invention in a starting position of the adjustment movement;

[0059] FIG. **21** shows, in a similar manner, the embodiment according to FIG. **20**, with a profile rail omitted for purposes of illustration;

[0060] FIG. **22** shows, in the same manner as FIG. **21**, the embodiment according to FIG. **22** in a first adjustment position;

[0061] FIG. **23** shows, in the same manner as FIG. **22**, the embodiment according to FIG. **21** in a second adjustment position which corresponds to an end position of the adjustment movement;

[0062] FIG. **24** shows a perspective view of a fifth embodiment of a support device according to the invention in a starting position of the adjustment movement;

[0063] FIG. **25** shows, in the same manner as FIG. **24**, the support device according to FIG. **25** in a first adjustment position;

[0064] FIG. **26** shows, in the same manner as FIG. **24**, the support device according to FIG. **24** in a second adjustment position which corresponds to an end position of the adjustment movement;

[0065] FIG. **27** shows, in the same manner as FIG. **24**, the support device according to FIG. **24**, with components of the support device omitted for purposes of illustration;

[0066] FIG. **28** shows, in the same manner as FIG. **27**, the support device according to FIG. **24** in the end position of the adjustment movement;

[0067] FIG. **29** shows a detail from FIG. **28**, with further components of the support device omitted; and

[0068] FIG. **30** shows a detail from FIG. **29**, with further components of the support device omitted.

DETAILED DESCRIPTION OF THE INVENTION

[0069] Identical or corresponding components are provided with the same reference numerals in the figures of the drawing. The drawings schematically depict embodiments of a support device according to the invention. Components of the support device are omitted in individual figures of the drawing for purposes of illustration. These components are to be supplemented accordingly in a conceptually analogous manner.

[0070] Reference is made to FIGS. **1** to **9** below for explaining a first embodiment of the invention.

[0071] FIG. **1** illustrates a first embodiment of a support device **2**, adjustable by an electric motor, according to the invention, which in this embodiment is designed as a slatted frame. The support device **2** has a base body **4** which includes support parts on which a mattress of a bed is supported during use of the support device **2**. The mattress is consistently omitted in the drawings for purposes of illustration.

[0072] In the illustrated embodiment, the support device **2** (see FIG. **2**) has a stationary center support part **6**, to which an upper body support part **8** is articulatedly connected and pivotably adjustable about a horizontal pivot axis, and the end of the upper body support part facing away from the center support part **6** is articulatedly connected to a head support part **10** and pivotably adjustable about a horizontal pivot axis. A leg support part **12** is articulatedly connected to the end of the center support part **6** facing away from the upper body support part **8** and is pivotably adjustable about a horizontal pivot axis, and the end of the leg support part facing away from the center support part **6** is articulatedly connected to a calf support part **14** and pivotably adjustable about a horizontal pivot axis.

[0073] For the pivoting adjustment of the support parts **6** to **14** relative to one another, an electric motor drive apparatus **16** is provided which has a drive unit **18** that is situated on a first longitudinal beam **20** on the center support part **6**. A further drive unit **18'** of the electric motor drive apparatus **16** is situated on a second longitudinal beam **22**, at a distance from the first longitudinal beam **20** and transverse to the longitudinal direction of the support device **2**. The drive units **18**, **18'** are explained in greater detail below with reference to FIGS. **5** to **9**.

[0074] Connected to the support parts **6** to **14** are slat holders, on which elastic slats which support the mattress are held during use of the support device **2**. Only one slat holder, denoted by reference numeral **24**, is provided in the drawing (see FIG. **1** and FIG. **2**). The elastic slats are not illustrated in the drawing for purposes of illustration.

[0075] FIG. **1** shows the support device **2** in an unadjusted starting position of the support parts **6** to **14**, in which the support parts **6** to **14** together span a horizontal or approximately horizontal support plane for supporting the mattress.

[0076] FIG. **2** shows the support device **2** in an end position of the adjustment movement, in which the upper body support part **8** together with the head support part **10** and the leg support part **12** together with the calf support part **14** are maximally pivoted relative to the center support part **6**, and thus adjusted. The starting position of the support device **2** corresponds to a lying position of the support device **2**, while the end position illustrated in FIG. **2** corresponds to a sitting position. Any desired adjustment positions between the starting position and the end position are possible.

[0077] A power supply means and a control means for controlling the drive unit **16** are not illustrated in the drawing for purposes of illustration. However, the construction and mode of operation of such a power supply means and a control means are generally known to those skilled in the art, and therefore are not explained here in greater detail.

[0078] According to the invention, the upper body support part **8** is designed and configured, in other words, configured and located, in such a way that the pivot axis is supported so as to be translationally movable in the longitudinal direction of the support device **2**. This prevents the mattress from being compressed during the pivoting adjustment of the upper body support part **8** relative to the center support part **6**. A high level of comfort is thus ensured for a user of the support device **2**, also in the adjusted position of the upper body support part **8**. As is apparent from a comparison of FIGS. **1** and **2**, as a result of the translationally movable bearing of the pivot axis, the distance between the slat holders, situated adjacently at a distance from one another in the starting position (see FIG. **1**), on the center support part **6** and on the upper body support part **8** increases during an adjustment from the starting position in the direction of the end position. Compression of the mattress is avoided in this way.

[0079] The same also applies for an adjustment of the leg support part **12** relative to the center support part **6**. The pivot axis associated with the leg support part **12** is likewise supported so as to be translationally movable in the longitudinal direction of the support device **2**. Accordingly, the distance between the slat holders on the center support part **6** and on the leg support part **12**, which in the starting position of the adjustment movement (see FIG. **1**) are situated adjacent to one another, increases during a pivoting adjustment of the leg support part **12** relative to the center support part **6**. Compression of the mattress is thus avoided, also in the area of the leg support part **12**. Due to the mutually independent adjustment and translational movement of the upper body support part **8** and of the leg support part **12** relative to the center support part **6**, compression of the mattress is avoided in any adjustment position, and the mattress is thus uncompressed in all adjustment positions of the support device **2**.

[0080] As is apparent from FIGS. **1** and **2**, the support device **2** has an outer frame **26**, to which the base body **4** is fastened.

[0081] FIG. **3** shows the support device **2** according to FIG. **1**, with slat holders omitted on the first longitudinal beam **20** in the area of the center support part **6**, the upper body support part **8**, and the leg support part **12** for purposes of illustration, so that first longitudinal beams **28**, **30**, **32** of the center support part **6**, of the upper body support part **8**, and of the leg support part **12**, respectively, are discernible.

[0082] The design of the support device **2** according to the invention is explained in greater detail below with regard to the drive apparatus **16**, with reference to FIGS. **4** to **6**.

[0083] Only the drive unit **18** associated with the first longitudinal beam **20** is explained in greater detail below. The drive unit associated with the second longitudinal beam **22** has a corresponding design, and therefore is not explained here in greater detail.

[0084] The drive unit **18** has a base element **34**, which in this embodiment is formed by an injection-molded part made of plastic, and on which the components of the drive unit **18** are situated or supported. Situated on the base element **34** is an electric motor **36** whose output shaft is in rotary drive connection with a threaded spindle **38** which is stationarily supported on the base element **34** so as to be rotationally drivable. In the illustrated embodiment, the rotary drive connection between the output shaft of the electric motor **36** and the threaded spindle **38** is established via a worm gear. The output member of the drive unit **18** is formed by a spindle nut **40** which is situated on the threaded spindle **38** in a rotationally fixed manner and is movable in the axial direction of the threaded spindle.

[0085] The spindle nut **40** forms a slide on which a pivot axis **42** is supported, about which the upper body support part **8** is pivotable relative to the center support part **6** (see FIG. **3** and FIG. **4**).

[0086] FIG. **5** shows the drive unit **18** from the side facing away from the electric motor **36**.

[0087] FIG. **6** shows the drive unit **18** in the same illustration as FIG. **5**, but in enlarged scale.

[0088] The adjustment of the upper body support part **8** (second support part) relative to the center support part **6** (first support part) is completed in such a way that the second support part or a component connected thereto runs up against a first raising element during the translational movement, and thereby pivots. As explained with reference to FIG. **4**, a translational movement of the spindle nut **40**, and thus of the upper body support part **8**, relative to the center support part **6** is effected by means of the spindle drive **38**, **14**. In the illustrated embodiment, the pivoting movement of the upper body support part **8** relative to the center support part **6** is effected in that a first raising element **44** is situated laterally next to the translational movement path of the spindle nut **40**, and thus of the upper body support part **8**, and a second raising element **46** connected to the upper body support part **8** runs up against the first raising element, so that the upper body support part **8** pivots relative to the center support part **6**.

[0089] The first raising element **44** is formed in one piece with the first longitudinal beam **30** of the upper body support part **8**, in the illustrated embodiment the first longitudinal beam **30** and the second raising element **46** likewise being formed by an injection-molded part made of plastic. In the illustrated embodiment, the second raising element **46** is thus connected to the upper body support part **8** so as to prevent pivoting. However, in a modification of this embodiment, the second raising element may also be movably connected to the upper body support part **8**, provided that raising of the upper body support part **8**, and thus pivoting thereof relative to the center support part **6**, is effected in the desired manner.

[0090] As is apparent in particular from FIG. **6**, in the illustrated embodiment the raising elements **44**, **46** have the cross-sectional shape of a cam body, the raising elements **44**, **46** in the illustrated embodiment having cross sections that are essentially complementary. As is apparent from FIG. **6**, the upper body support part **8** is horizontal in the starting position (see FIG. **1**), the dead center of the pivoting adjustment of the upper body support part **8** being overcome during the translational movement of the spindle nut **40**, and the pivoting movement thus being carried out.

[0091] To avoid distortion of the upper body support part **8** during the adjustment, the translational movement of the slide **40** of the first drive unit **18** formed by the spindle nut **40** is transferred to a translationally movably supported slide of the drive unit associated with the second longitudinal beam **22**. For this purpose, a synchronization means is provided, as explained in greater detail below with reference to FIGS. **8** and **9**. This slide, which is translationally movably supported on the drive unit provided on the second longitudinal beam **22**, is driveless, so that the adjustment of the two longitudinal beams of the upper body support part **8** is effected by the electric motor **36**, the synchronization means ensuring that distortion of the upper body support part **8** does not occur.

[0092] The adjustment of the leg support part **12** takes place in a corresponding manner. For this purpose, the first longitudinal beam **32** of the leg support part **12** is supported on a slide **50** so as to be pivotable about a pivot axis **48**, the slide being translationally movably supported on the base element **34** of the drive unit **18**.

[0093] The drive unit associated with the second longitudinal beam **22** has an electric motor which corresponds to the drive unit **18**, and which drives a slide that is formed by the spindle nut of a spindle drive, as previously described for the slide **40**. Translational movements of this driven slide of the drive unit associated with the second longitudinal beam **22** are transferred to the slide **50** by the synchronization means, described in greater detail below. The slides associated with the upper body support part **8** are thus driven by the electric motor **36**, while the slides associated with the leg support part **12** are driven by the electric motor which is associated with the drive unit associated with the second longitudinal beam **22**. In other words, the electric motor **36** effects an adjustment of the upper body support part **8** together with the head support part **10**, while the corresponding electric motor associated with the second longitudinal beam **22** effects an adjustment of the leg support part together with the calf support part.

[0094] Due to the pivotable connection of the calf support part **14** to the leg support part **12**, on account of its gravitational force the calf support part **14** pivots relative to the leg support part **12** when the leg support part is pivoted. The end position of the adjustment movement (see FIG. **2**) is defined by a stop which acts between the leg support part **12** and the calf support part **14**.

[0095] The adjustment of the head support part **10** relative to the upper body support part **8** is explained below with reference to FIG. **7**.

[0096] For adjusting the head support part **10**, a rod-like adjusting element **52** is provided, one end of which is pivotably supported on the slide **40**, coaxially with respect to the pivot axis **42**. The other end of the adjusting element **52** is supported about a pivot axis **54** on a first longitudinal beam **56** of the head support part **10**. The pivot axis **54** is eccentrically supported with respect to a pivot axis **58**, about which the head support part **10** is pivotable relative to the upper body support part **8**. Due to the eccentric arrangement of the pivot axis **54** relative to the pivot axis **58**, the head support part **10** pivots relative to the upper body support part **8** when the upper

body support part **8** pivots relative to the center support part **6**, until the end position of the adjustment movement is reached (see FIG. **2**).

[0097] The return of the support parts **8** to **14** to the starting position relative to the center support part **6** (see FIG. **1**) takes place under the weight force of the support parts **6** to **12**, optionally additionally under the load of a person lying on the support device **2**, the drive apparatus remaining switched on.

[0098] In the illustrated embodiment, the first raising element **44** is stationary relative to the center support part **6** (first support part), while the second raising element **46** is movably situated. However, depending on the particular requirements, it is also possible for both raising elements **44**, **46** to be movably situated relative to the first support part.

[0099] The synchronization means according to the invention has a Bowden cable **60** (see FIG. **8**) which has a pull cable (core) **62** that is accommodated in sheathing **64** which is flexible but resistant to compression in the pulling direction. One end **66** of the pull cable **62** is fixed to a stationary base element **34**. The end **68** of the sheathing facing the end **66** of the pull cable **62** is immovably fixed to the slide **40**, as is apparent from FIG. **9**.

[0100] As explained above, a slide which corresponds to the slide **40** but which has a driveless design is provided on the second longitudinal beam **22**.

[0101] The other end of the pull cable **62** facing away from the end **66** is immovably fixed to this driveless slide, while the other end **69** of the sheathing facing away from the end **68** is immovably fixed to a base element which is associated with the second longitudinal beam **22**, and on which the driveless slide is translationally movably supported. The connection of the pull cable **62** and of the end **69** of the sheathing to this driveless slide is not shown in the drawing for purposes of illustration.

[0102] In the starting position of the adjustment movement, the distance of the spindle nut **40** from the end **66** of the pull cable fixed to the base element **34** is at a minimum. During the adjustment movement, the spindle nut **40** translationally moves to the left in FIG. **8**, whereby the upper body support part **8** pivots in the manner previously described.

[0103] During the translational movement of the spindle nut **40** to the left in FIG. **8**, the pull cable **62** of the Bowden cable **60** remains stationary, while the sheathing in FIG. **8** is displaced to the left. The distance of the end **70** of the Bowden cable **60** from the associated end of the pull cable **62** decreases due to this displacement of the sheathing. Since the end **69** is fixed to the further base element associated with the second longitudinal beam **22**, and the pull cable is fixed to the driveless slide associated with this base element, this slide moves synchronously with the slide formed by the spindle nut **40**. The adjustment force exerted by the electric motor **36** is thus introduced synchronously or approximately synchronously into the two longitudinal beams of the upper body support part **8**, thus avoiding distortion of the upper body support part **8** during the adjustment movement.

[0104] As already described above, the drive unit associated with the second longitudinal beam **22** likewise has a slide, in the form of a spindle nut, which is driven by an electric motor, the configuration corresponding to the configuration described for the base element **34**, the electric motor **36**, and the spindle drive **38**, **40**. A Bowden cable **70** having a pull cable **72** and sheathing **74** is used as a synchronization means. Corresponding to the configuration described for the end **66** of the Bowden cable **60**, the end **76** of the Bowden cable **70** is fixed to the base element **34** associated with the second longitudinal beam **22**, while the end **78** of the sheathing **74** facing the end **76** of the pull cable **72** is fixed to this spindle nut. The end **80** of the sheathing **74** facing away from the end **78** is fixed to the base element **34**, not illustrated in FIG. **8**, while the end of the pull cable **72** facing away from the end **76** is fixed to a driveless slide **82** associated with the leg support part **12**.

[0105] The distance between the slide **82** and the end **80** of the sheathing **74** decreases during a movement of the spindle nut, associated with the second longitudinal beam **22**, in the direction of the end position of the adjustment movement, so that the slide **82** moves to the right in FIG. **8**. The adjustment force exerted by the electric motor associated with the second longitudinal beam **22** is thus synchronously introduced into the two longitudinal beams of the leg support part **12**.

[0106] As already explained above, the electric motor **36** associated with the first longitudinal beam **20** thus effects an adjustment of the upper body support part **8** together with the head support part **10** relative to the center support part **6**, while the electric motor associated with the second longitudinal beam **22** effects an adjustment of the leg support part **12** together with the calf support part **14**.

[0107] Reference is made to FIGS. **10** to **14**B below.

[0108] FIG. **10** shows the second embodiment in a view corresponding to FIG. **1**. The second embodiment differs from the first embodiment, firstly, in that the support device **2** is designed for supporting a box spring mattress. Since in such a box spring mattress the suspension, provided by the elastic slats in the case of a slatted frame, is integrated into the mattress, the support parts have a plate-like design in the embodiment according to FIG. **10**.

[0109] In the illustrated embodiment, the support device has a 4-element design, and has a stationary center support part **6** to which an upper body support part **8** on the one hand, and a leg support part **12** in addition to a calf support part **14** on the other hand, are pivotably adjustably connected.

[0110] FIG. **11** shows the support device **2** in an adjustment position which is between the starting position of the adjustment movement illustrated in FIG. **10** and an end position of the adjustment movement illustrated in FIG. **12**, in which the support parts **8**, **12**, **14** are maximally adjusted relative to the center support part **6**.

[0111] The drive apparatus **16** of the second embodiment is explained in greater detail below with reference to FIGS. **13** to **14**B. Various components of the support device **2** are omitted in FIGS. **13** to **14**A for purposes of illustration.

[0112] FIGS. **13** and **14**A show the support device **2** from different perspectives in the starting position, while FIG. **14**B shows the support device **2** in the end position of the adjustment movement.

[0113] In this embodiment, the outer frame **26** has longitudinal beams **80**, **80'**, each of which is formed by a C profile. The openings of the C profiles of the longitudinal beams **80**, **80'** face one another. A drive unit **82** is provided for adjusting the upper body support part **8** relative to the center support part **6**, while a further drive unit **82'** is provided for adjusting the leg support part **12** together with the calf support part **14** relative to the center support part **6**. Only the drive unit **82** is explained in greater detail below. The drive unit **82'** has a corresponding design, and its components are provided with reference numerals that correspond to the reference numerals of the drive unit **82**.

[0114] The drive unit has an electric motor **86** which is situated on a stationary first crossbeam **84** and which is in rotary drive connection with a rotationally drivable spindle nut which is situated on a threaded spindle **88** that is movable in the axial direction and rotationally fixed. The end of the threaded spindle **88** facing away from the electric motor **86**, and thus facing away from the spindle nut, is immovably connected to a slide **90** which has a second crossbeam **92**, the ends of which are connected to slide elements **94**, **96**, which are captured in the C profiles of the longitudinal beams **80**, **80'**, respectively, and translationally movably guided. Longitudinal beams **98**, **95** are supported on the crossbeam **92** so as to be pivotable about a pivot axis defined by the crossbeam.

[0115] For adjusting the upper body support part **8** relative to the center support part **6**, the electric motor **86** drives the spindle nut in such a way that the slide **90** translationally moves in the direction of the first crossbeam **84**. Situated on the first crossbeam **84** is a first raising element **97**, which cooperates with a second raising element **99** that is connected to the longitudinal beam **98** so as to prevent pivoting, in order to pivot the upper body support part **8**. The basic principle according to which the upper body support part **8** simultaneously undergoes a translational movement and a pivoting movement is therefore the same as in the first embodiment.

[0116] The same applies for the other longitudinal beam **95** of the upper body support part **8**.

[0117] It is apparent from FIGS. **14**A and **14**B that during the adjustment, the lift of the translational movement of the upper body support part **8** is higher than in the first embodiment. This reflects the fact that a higher lift is necessary for a box spring mattress in order to avoid compression.

[0118] Compression of the mattress in the area of the upper body support part **8** and in the area of the leg support part **12** is also avoided in the second embodiment.

[0119] FIG. **14**B shows the support device **2** in the end position of the adjustment movement.

[0120] A third embodiment of a support device according to the invention, in the form of a slatted frame **2**, is explained in greater detail below with reference to FIGS. **15** to **19**.

[0121] In this embodiment, the support device **2** has a center support part **6**, an upper body support part **8**, a leg support part **10**, and a calf support part **12**.

[0122] In a starting position of the adjustment movement, the support parts **6**, **8**, **10**, **12** together span an essentially horizontal support plane for supporting a mattress, not illustrated in the drawing. Elastic slats of the slatted frame **2** are not depicted in the drawing in order to simplify the illustration.

[0123] The functional principle according to the invention is explained in greater detail below with reference to an adjustment of the upper body support part **8**. An adjustment element, which in this embodiment is formed by a pivot lever **100** (see FIG. **16**), is associated with the upper body support part **8**, which is pivotably adjustable relative to the stationary center support part **6** about a horizontal pivot axis, in order to pivot the upper body support part. In this embodiment, the upper body support part **8** is operatively connected to the pivot lever **100** in such a way that during the pivoting adjustment, the upper body support part **8** undergoes, at least in phases, a translational movement relative to the stationary support part **6** along a linear axis. This linear axis is denoted by reference numeral **102** in FIG. **15**. As is apparent from a comparison of FIGS. **15** and **16**, during the pivoting movement the upper body support part **8** simultaneously undergoes a translational movement along the linear axis **102**, in particular in such a way that the upper body support part moves away from the stationary center support part **6**. Since the upper body support part **8** thus undergoes a pivoting movement as well as a translational movement, compression of a mattress (not illustrated in the drawing for reasons of clarity) supported by the slatted frame **2** is avoided.

[0124] FIG. **17** shows a detail from FIG. **15** in the area of the pivot lever **100**, which is connected in a rotationally fixed manner to a side beam **104** of the upper body support part **8**. The slatted frame **2** has a mirror-symmetrical design with respect to its longitudinal center plane. Accordingly, a pivot lever **100'** which corresponds to the pivot lever **100** is likewise associated with the other longitudinal beam **104'** of the upper body support part in order to introduce adjustment forces into the upper body support part **8** symmetrically with respect to the longitudinal center plane. The function and construction of the pivot lever **100'** correspond to those of the pivot lever **100**. For this reason, the construction and function of only the pivot lever **100** are explained in greater detail below.

[0125] The pivot lever **100** is guided along the linear axis **102** on a linear guide, in the illustrated embodiment this linear guide having a profile rail **106**. The profile rail **106** is formed by a C profile having a slot whose inside clearance is dimensioned in such a way that the end of the pivot lever **100** facing the longitudinal beam **104** extends through the slot, but the opposite end of the pivot lever **100** is captured in the profile rail **106**.

[0126] FIG. **18** shows a detail in the area of the pivot lever **100**, with the profile rail **106** omitted for purposes of illustration.

[0127] A raising means which is used for raising and pivoting the pivot lever **100** during the translational movement is associated with the pivot lever **100**.

[0128] To achieve a translational movement of the pivot lever **100** in the direction indicated by the arrow **102**, the end of a pull cable of a Bowden cable, not illustrated in the drawing for reasons of clarity, is fixed to the pivot lever **100**. The other end of the pull cable is guided to the drive unit **18** (see FIG. **15**).

[0129] In the illustrated embodiment, the raising means is a raising lever **110**, one end of which is articulatedly connected to the pivot lever **100** and pivotable about a pivot axis **112** which is eccentric and parallel with respect to the pivot axis of the pivot lever **100**. At the beginning of the adjustment movement, the other end of the raising lever **110** is supported on a support surface at the base of the guide formed by the profile rail **106**.

[0130] In the illustrated embodiment, the design is selected such that the pull cable of the Bowden cable pulls the pivot lever **100** against the raising lever **110**. An abutment element is associated with the raising lever in order for the raising lever **110** to be used as an abutment for pivoting the pivot lever **100**. In this embodiment, the abutment element is formed by a bracket **114** which is subjected to pressure during the pivoting of the pivot lever, and whose one end is connected to the raising lever **110** so as to be rotatable about a rotational axis **116**, eccentrically with respect to the pivot axis **112**, and whose other end is rotatably connected to a stationary rotary bearing **118** during the adjustment of the pivot lever **110**.

[0131] Beginning from a starting position of the adjustment movement, in which the upper body support part **8** together with the stationary center support part **6** and the further support parts **10**, **12** span an essentially horizontal support plane,

the pivoting adjustment of the upper body support part **8** is completed in such a way that a traction effect is exerted on the pivot lever **110** via the pull cable of the Bowden cable, so that the pivot lever **110** undergoes a translational movement in the direction of the arrow **102**, whereby it is pulled against the raising lever **110**, which rises and thereby pivots the pivot lever **100**. FIG. **18** shows an adjustment position in which the pivot lever **110** has moved opposite a starting position of the adjustment movement, in the direction **102** away from the center support part **6** and also has pivoted about its pivot axis. The pull cable of the Bowden cable associated with the pivot lever **100** is denoted by reference numeral **109** in FIG. **18**.

[0132] In the further course of the adjustment movement, the pivot lever **100** translationally moves farther in the direction of the arrow **102** and is thereby further pivoted until the end position of the adjustment movement illustrated in FIG. **19** is reached, in which the raising lever **110** is completely lifted from the support surface formed by the base of the profile rail **106**.

[0133] Due to the translational and pivoting movement of the upper body support part **8** thus achieved during the adjustment, compression of a mattress which is supported by the slatted frame **2** is avoided, or at least reduced.

[0134] A fourth embodiment of a support device according to the invention is explained below with reference to FIGS. **20** to **23**, with only the area of the pivot lever **100** depicted for purposes of illustration. The same as for the previously described embodiment, the end of the pivot lever facing away from the longitudinal beam **104** of the upper body support part **8** is captured in the profile rail **106**.

[0135] FIG. **20** shows the starting position of the adjustment movement, in which the upper body support part **8** together with the other support parts spans a horizontal support plane. The profile rail **106** is omitted in FIGS. **21** to **23** for purposes of illustration.

[0136] The embodiment illustrated in FIGS. **20** to **23** differs from the embodiment illustrated in FIGS. **15** to **19** primarily in that the abutment element is designed as a cable which is subjected to tensile stress during the pivoting of the pivot lever **100**. The cable **120** may be formed, for example, by a thin wire cable. However, it may also be replaced by some other band- or chain-shaped traction means. One end of the cable **120** is fixed to the raising lever **110**, eccentrically with respect to the pivot axis **112**. The other end of the cable **120** is fixed to a fastening point **122** (see FIG. **22**) which is stationary during the pivoting of the pivot lever.

[0137] It is apparent from FIG. **22** that the cable **120** runs through under the end of the pivot lever **100**, which is supported on the base of the profile rail, and is guided to the fastening point **122**.

[0138] The adjustment of the pivot lever **100**, starting from the starting position of the adjustment movement illustrated in FIG. **21**, is completed in such a way that the pivot lever **100** is pulled against the raising lever **110** in the direction of the arrow **102** by means of the Bowden cable, which once again is omitted for reasons of clarity. In the manner described for the preceding embodiment, the pivot lever **100** hereby simultaneously undergoes a translational movement in the direction of the arrow **102** and also a pivoting movement which is counterclockwise in FIG. **22**, until the end position of the adjustment movement illustrated in FIG. **23** is reached.

[0139] Both illustrated embodiments simulate the function of a curved hinge, in which the pivot axis about which the pivot lever **100** is effectively pivoted is displaced into an area above the pivot lever **100**, and thus in actuality, into the area of the mattress that is supported by the slatted frame **2**.

[0140] With reference to FIGS. **24** to **30**, a fifth embodiment of a support device **2** according to the invention is explained below, which in its construction and mode of operation largely corresponds to the embodiment according to FIGS. **10** to **14**B. In particular, the embodiment illustrated in FIGS. **24** to **30** is likewise designed for supporting a box spring mattress.

[0141] The embodiment according to FIGS. **24** to **30** also corresponds to the embodiment according to FIGS. **10** to **14**B, in that a spindle drive is provided for transferring the drive force of the electric motor **86** to the support part to be adjusted. However, compared to the embodiment in FIGS. **10** to **14**B, the mode of operation of the spindle drive is kinematically reversed. Whereas in the embodiment according to FIGS. **10** to **14**A, the output member of the drive apparatus is formed by a threaded spindle **88** which is supported in the axial direction of the drive apparatus (see FIG. **14**A), and on which a stationary spindle nut which is rotationally drivable by means of the electric motor **86** is situated, the embodiment according to FIGS. **24** to **30** has a stationarily situated and affixed threaded spindle **130** below the support parts **6** to **14**. A spindle nut **132** which is rotationally drivable by means of the electric motor **86** is placed on the threaded spindle **130** (see FIG. **30**). The output shaft of the electric motor **86** is designed as a worm gear, and is engaged with a worm gear wheel **134**, to which a spur gear **136** is connected in a rotationally fixed manner, this spur gear being engaged with a further spur gear **138** which is connected in a rotationally fixed manner to the spindle nut **132**. Depending on the rotational direction of the output shaft of the electric motor **86**, the spindle nut **132** is thus rotated in one rotational direction or the other, so that it moves in the axial direction of the threaded spindle **133**.

[0142] The spindle nut **132** is supported on a housing **142** by means of a ball bearing **140**, the electric motor **86** being situated on the housing. The housing **142** is immovably connected to the crossbeam **92** (see FIG. **29**).

[0143] The threaded spindle **130** is covered by a cover **144** (see FIG. **27**).

[0144] Beginning at the starting position of the adjustment movement illustrated in FIG. **27**, for adjusting the upper body support part **8** relative to the center support part **6**, the electric motor **86** drives the spindle nut **140** in such a way that it moves on the threaded spindle **130**, to the left in FIG. **27**. Due to the immovable connection of the housing **142** to the crossbeam **92**, the crossbeam **92** is moved to the left in FIG. **27**, so that the upper body support part is pivoted in the manner described above for the embodiment according to FIGS. **10** to **14**B.

[0145] The adjustment mechanics for adjusting the leg support part **12** together with the calf support part **14** relative to the center support part **6** have a corresponding design, and therefore are not explained here in greater detail. The associated spindle nut likewise travels on the threaded spindle **130**.

[0146] Identical or corresponding components are provided with the same reference numerals in the various figures of the drawing and the various embodiments. When components are omitted in the figures of the drawing for reasons of illustration or depiction, the components in question are to be supplemented in each case in the other figures in an analogous manner. It is apparent to those skilled in the art that the features of the individual embodiments are also exchangeable among the embodiments, and the features disclosed with

regard to one embodiment may also be provided in identical or corresponding form in the other embodiments. It is also apparent to those skilled in the art that the features disclosed for the individual embodiments in each case further embody the invention taken alone, i.e., independently of the further features of the particular embodiment.

[0147] While this invention has been described as having a preferred design, it is understood that it is capable of further modifications, and uses and/or adaptations of the invention and following in general the principle of the invention and including such departures from the present disclosure as come within the known or customary practice in the art to which the invention pertains, and as may be applied to the central features hereinbefore set forth, and fall within the scope of the invention.

What is claimed is:

1. Support device, adjustable by an electric motor, for padding of seating or reclining furniture, comprising:

a) a base body including support parts on which the padding is supported during use of the support device, the support parts including a stationary first support part and a second support part pivotably adjustable relative to the first support part about a pivot axis;

b) a drive apparatus for adjusting the second support part relative to the first support part;

c) the second support part being configured and located in such a way that the pivot axis is supported so as to be translationally movable in the longitudinal direction of the support device; and

d) the second support part being in drive connection with the drive apparatus in such a way that during the pivoting adjustment, the second support part, at least in phases, simultaneously undergoes a translational movement away from the first support part, and during the translational movement, the second support part or a component connected to the second support part runs up against a first raising element, and thereby pivots.

2. Support device according to claim **1**, wherein:

a) the second support part is in drive connection with the drive apparatus in such a way that during the overall adjustment movement between an unadjusted starting position, in which the second support part together with the first support part spans a horizontal or approximately horizontal support plane, and an end position of the adjustment movement, the second support part simultaneously undergoes both a pivoting movement and the translational movement.

3. Support device according to claim **1**, wherein:

a) a slide is provided, on which the pivot axis is supported, and which is translationally movable by the drive apparatus.

4. Support device according to claim **3**, wherein:

a) the drive apparatus has a linear drive for translationally moving the second support part.

5. Support device according to claim **3**, wherein:

a) the slide is translationally movably supported on a longitudinal guide.

6. Support device according to claim **1**, wherein:

a) the first raising element is situated laterally next to a translational movement path of the second support part, and a second raising element is connected to the second support part, the first raising element being situated in the movement path of the second raising element in such a way that during the translational movement of the second support part, the second raising element cooperates with the first raising element in order to pivot the second support part.

7. Support device according to claim **1**, wherein:

a) at least of the first raising element and the second raising element effects pivoting of the second support part according to the principle of operation of an inclined plane or a cam mechanism.

8. Support device according to claim **7**, wherein:

a) at least of the first raising element and the second raising element at its outer periphery is configured as a cam body in such a way that the first raising element and the second raising element cooperate with one another in the manner of a cam mechanism.

9. Support device according to claim **7**, wherein:

a) cross sections of the first raising element and the second raising element have, at least in sections, a complementary or approximately complementary configuration with respect to one another.

10. Support device according to claim **6**, wherein:

a) at least of the first raising element and the second raising element is configured and located in such a way that a lever arm which acts to pivot the second support part lengthens from an unadjusted starting position toward an end position of the adjustment movement of the second support part.

11. Support device according to claim **1**, wherein:

a) the first raising element or a second raising element are configured and located in such a way that a lever arm which acts to pivot the second support part lengthens from an unadjusted starting position toward an end position of the adjustment movement of the second support part.

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