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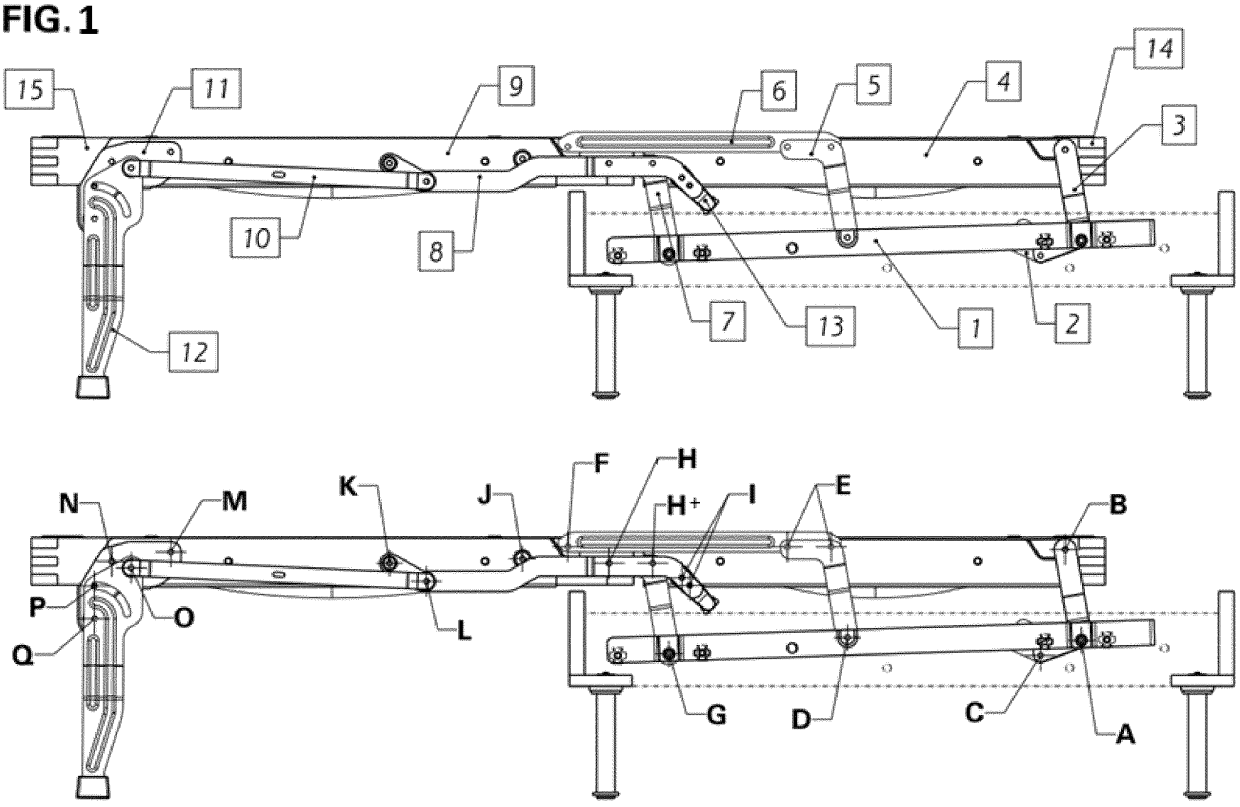
(54) **FOLDING FRAMEWORK FOR FOLDING FURNITURE**

(57) The invention relates to a folding framework for an item of folding furniture such as a sofa bed, as well as an item of folding furniture comprising this framework.

FIG. 1



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Description

TECHNICAL FIELD

[0001] The invention relates to a folding framework for an item of folding furniture such as a sofa bed, as well as an item of folding furniture comprising this framework.

PRIOR ART

[0002] Such folding frameworks for a piece of folding furniture, particularly a sofa bed, are often used in the prior art.

[0003] Thus, such a folding framework is known from WO 2004 086 913 (WO '913). The framework according to WO '913 comprises two roto-translational couplings, which are connected at a first end to a body support coupling and at a second end are connected to two different base beams.

[0004] The framework according to WO '913 is disadvantageous since the two ends of the roto-translational couplings are connected vertically spaced to the two said base beams. Such vertical spacing requires a framework that requires a substantial amount of (vertical) space for folding and unfolding. In addition, the inventors note that the shape and placement of the roto-translational couplings does not allow a smooth unfolding of the framework.

[0005] In addition, the framework from WO '913 has an additional drawback. In many situations, it happens that users sit on the edge of the bed for a moment when they get up. It is not comfortable here due to the high protruding couplings above the mattress surface.

[0006] A similar framework is known from BE 1 029 887, which relates to an improved fold-out recliner bed, with reinforced support for the hinged sections of the recliner bed during unfolding and in the unfolded position. However, it is inconvenient to unfold due to lack of cooperation between separate components.

[0007] Similarly, in CN 111 329 279, a sofa bed conversion framework is disclosed, which comprises bilaterally symmetrical supports, wherein each support consists of a support frame, a head connecting circular pipe, a back small hinge, two groups of pull rods, a leg large hinge, a bed tail foot, three groups of pull rods, one group of pull rods and a bolt. Again, it faces substantial difficulties during unfolding and folding.

[0008] The present invention aims to solve at least some of the above problems or drawbacks. The aim of the invention is to provide a method which eliminates these disadvantages.

SUMMARY OF THE INVENTION

[0009] The invention relates, in a first aspect, to a folding framework suitable for provision in a piece of folding furniture, such as a sofa or sofa bed, according to claim 1. The proposed framework is highly advantageous because the collapsed framework is very compact (in terms of height), ensuring that the piece of folding furniture has a comfortable seat height, and moreover can also be manipulated more easily. Moreover, it allows a very simple and minimally burdensome procedure for folding and unfolding the framework, whereby, with the manipulation of one component, the rest of the framework automatically unfolds, without the need for further actions, as is often the case normally (such as separately unfolding feet or additional supports).

[0010] Specific preferred embodiments are described in claims 2 to 13.

[0011] In a second aspect, the invention relates to a piece of folding furniture comprising a framework according to the first aspect of the invention. Preferably, this piece of folding furniture is a sofa or a sofa bed, preferably a sofa bed.

DESCRIPTION OF THE FIGURES

[0012]

Figure 1 shows a lateral view of the unfolded framework in a piece of folding furniture, wherein in the upper figure the components are indicated, and in the lower figure the points where the components are fixedly, rotatably, pivotably, or hingeably connected to each other.

Figures 2, 3, 4, 5, and 6 show successive lateral views of the framework as it is unfolded.

DETAILED DESCRIPTION

[0013] Unless otherwise defined, all terms used in the description of the invention, including technical and scientific terms, have the meanings as commonly understood by a person skilled in the art to which the invention pertains. For a better understanding of the description of the invention, the following terms are explained explicitly.

[0014] In this document, "a" and "the" refer to both the singular and the plural, unless the context presupposes otherwise. For example, "a segment" means one or more segments.

[0015] When the term "around" or "about" is used in this document with a measurable quantity, a parameter, a duration or moment, and the like, then variations are meant of approx. 20% or less, preferably approx. 10% or less, more preferably approx. 5% or less, even more preferably approx. 1% or less, and even more preferably approx. 0.1% or less than and of the quoted value, insofar as such variations are applicable in the described invention. However, this must be understood to mean that the value of the magnitude where the term "approximately" or "around" is used, is itself specifically disclosed.

[0016] The terms "comprise," "comprising," "consist of," "consisting of," "provided with," "have," "having," "include," "including," "contain," "containing" are syno-

nyms and are inclusive or open terms that indicate the presence of what follows, and which do not exclude or prevent the presence of other components, characteristics, elements, members, steps, as known from or disclosed in the prior art.

[0017] 'Framework' in the context of the present text is to be understood as an assembly of parts that serves as a supporting structure for further elements and/or structures. Such parts can be, for example, couplings, coupling pieces, brackets or frames. Such structures can be a sofa bed. Preferably, a framework is provided internally to such structures. Such a framework can also be provided externally to said structures. Such a framework can be provided both internally and externally to said structures.

[0018] 'Coupling' is to be understood in the context of the present text as an element suitable for entering into a coupling or connection with another coupling, bracket and/or frame, etc. This can be done, for instance, by means of a simple opening in which the coupling and one of the aforementioned elements are anchored, for instance by means of a hook, screw or other coupling piece. 'Beam' should be understood in the context of the current text as a substantially beam-shaped framework element.

[0019] 'Pivotable' or 'hingeable' should be understood in the context of the current text as rotatable about a support point. The support point can be a connection point between two couplings or between a coupling and another framework element.

[0020] The term "longitudinal axis" should be understood within the context of the current text as a rectilinear axis that is parallel to a side of a surface or a rectilinear axis that connects two connection points to each other.

[0021] "Longitudinal" should be understood in the context of the present text as a direction that is horizontal when the framework is placed on a horizontal 10 surface. In essence, said direction is the direction in which the framework, i.e., the various mattress frames, is folded and/or unfolded.

[0022] Quoting numeric intervals by the endpoints includes all integers, fractions, and/or real numbers between the endpoints, including those endpoints.

[0023] In the following, both aspects of the present invention are dealt with together. Any feature described herein may refer to any aspect, even if the feature is described in conjunction with a specific aspect of present invention.

[0024] It will be apparent to a person skilled in the art that any technical element described according to the aspects of the invention can be provided in appropriate numbers without departing from the subject matter of the present invention. In particular, the components of the framework, such as the head support couplings, the body support couplings, as well as the other couplings and components, can be provided in multiples, for instance, double, triple, quadruple, quintuple, etc. Preferably, at least the head support couplings, the body support couplings, the body support mattress- and head support mattress brackets, and the couplings therebetween are provided in duplicate. Preferably, said components are provided in duplicate respectively on each (longitudinal) side in a direction perpendicular to the longitudinal direction of a framework.

[0025] The terms "head support mattress bracket" and "head support mattress frame" and the like on the one hand, and "body support mattress bracket" and "body support mattress frame" and the like on the other hand do not imply any functional limitation in terms of length or function (that they only support the head or body), and are solely for indicating which end of the framework is concerned (head or foot). As seen in the figures, the two pieces are substantially the same size, which is more compact in the folded state.

[0026] A framework according to the invention has the capability to be unfolded from a folded state to an unfolded state. Thus, the framework in unfolded condition can be equipped with one or more mattress frames, suitable for receiving a mattress. Hereby, it is possible to mount and/or secure the mattress to the mattress frame.

[0027] In a first aspect, the invention relates to a folding framework suitable for coupling in a piece of folding furniture, preferably a sofa or sofa bed, the framework comprising on both lateral sides:

a. a base beam suitable for coupling to opposite lateral sides of the piece of folding furniture;
b. a substantially rectangular head support mattress bracket, comprising a long head support side;
c. a substantially rectangular body support mattress bracket, comprising a long body support side;
d. a first head support coupling with a first end hingedly connected to the base beams and with a second end hingedly connected to the head support mattress bracket;
e. a second head support coupling with a first end hingedly connected to the base beams and with a second end hingedly connected to the head support mattress bracket;
f. a first body support coupling having a first end hingedly connected to the body support mattress bracket, and with a second end hingedly connected to the head support mattress bracket via a first hinge point;
g. a second body support coupling having a first end hingedly connected to the base beams and with a second end hingedly connected to the body support mattress bracket;
h. a foot portion, comprising a foot member and a foot member bracket, wherein the foot member bracket is connected to the body support mattress bracket, and wherein the foot member is hingedly connected to the foot member bracket at a hinge point at a first end of the foot member, wherein the first end of the foot member is opposed to a second end of the foot

member comprising a footrest for resting on a ground surface in the unfolded state of the framework;

i. a synchronization coupling having a first end hingedly connected to the foot member and with a second end hingedly connected to the first body support coupling, wherein the synchronization coupling is connected to the foot member via a second hinge point at the first end of the foot member, wherein the second hinge point is positioned more distally with respect to the footrest than the hinge point.

[0028] The base beams are essentially elongated and serve to anchor the framework to a housing of the piece of folding furniture and are provided on both lateral sides of the framework. Preferably, as shown in the Figures, they are provided tilted forward at a slight angle relative to the horizontal plane, for better force distribution during folding and unfolding.

[0029] The head support mattress brackets and body support mattress brackets are typically also elongated and provided on both sides of the framework, and serve to hold mattress frames, to support a mattress, or directly for a mattress itself (e.g., box spring).

[0030] The first and second head support couplings ensure a simple elevation of the head support mattress brackets from a lower position beneath the base beams in the folded state of the framework (see Fig. 2 for example) to a higher position during unfolding (see Fig. 3-5 and Fig. 1 and 6 in the unfolded state).

[0031] The first and second body support couplings enable a simple elevation and especially shifting of the body support brackets from a position just above the base beams when folded, to a position extending from the head support mattress brackets when unfolded, thus providing an elevation but primarily a shift along the longitudinal axis of the framework.

[0032] By hingedly connecting the body support couplings to the base beams and the head support mattress bracket as indicated, this double movement is made possible without substantial additional effort.

[0033] Finally, the synchronization coupling (and the configuration of the foot portion) ensures that the foot portion folds in and out with the mattress brackets.

[0034] In this way, a system is provided that folds in and out in one motion by manipulating the most distal part relative to the housing of the piece of folding furniture, namely the body support mattress bracket (or the mattress frame provided thereon/therein). With this, the foot portion automatically folds in or out, and the head support bracket also moves to the folded or unfolded position.

[0035] According to an embodiment, the synchronization coupling is connected to the first end of the first body support coupling at a first coupling point, wherein the first body support coupling is connected to the body support mattress bracket at a second coupling point, wherein the second coupling point is positioned more extremely toward the first end of the first body support coupling than the first coupling point, and wherein the first coupling point is located off-axis with respect to the second coupling point and the first hinge point. Preferably, the second coupling point and the first coupling point are located in a middle section of the body support mattress bracket, wherein the middle section pertains to a central zone that extends over a maximum of 40%, preferably a maximum of 30%, and more preferably a maximum of 25% around the midpoint of the body support mattress bracket. Here, the first and second coupling points are located at the end of the middle section most proximal to the head end of the framework (the end of the middle section that is proximal to the head support mattress bracket in the unfolded state).

[0036] The above configuration ensures a simple power transmission, and thereby driving/movement, between the support mattress brackets (body and head). By not positioning the first body support coupling too far on the body support mattress bracket, the load arm is kept short enough to ensure that the load on it does not become too great, and it does not risk bending or deforming, while also ensuring that the force required for unfolding remains manageable for most users.

[0037] According to an embodiment, the foot bracket and the foot member are hingedly connected via the hinge point and via a pin-in-groove mechanism, comprising a pin on one of the foot bracket or the foot member, and a groove on the other of the foot member or the foot bracket, wherein the groove has the shape of a circular arc and wherein the pin extends through the groove and stands perpendicular to the plane of the groove. The circular arc is part of a circle with as its midpoint the hinge point. Preferably, the pin is on the foot bracket, and the groove is on the foot member, which allows for a simpler construction that does not impact other parts.

[0038] Such a mechanism simplifies the movement and also provides limits, so that over-rotation or deformation is no longer possible. Moreover, the movement is guided, so that damage to parts is virtually impossible. Due to the connections between the foot bracket, the foot member, the body support mattress bracket, and the synchronization coupling, it is also ensured that other mechanisms cannot rotate beyond certain positions.

[0039] According to an embodiment, the second head support coupling and the head support mattress bracket are hingedly connected at an eighth hinge point, wherein the eighth hinge point and the first hinge point are the same hinge point.

[0040] According to an embodiment, the second head support coupling and the first body support coupling are rigidly joined via one or more coupling fixing points. Preferably, one of the coupling fixing points is the first hinge point. In this way, with one coupling, multiple mechanisms can be driven, and the synchronization between the individual elements is optimal so that no multiple separate load points or resistances are experienced when folding or unfolding.

[0041] According to an embodiment, the first head support coupling is hingedly connected with the base

beams via a third hinge point. Herein, the third hinge point is positioned at the first end of the base beams, and the first head support coupling is hingedly connected to the head support mattress bracket via a fourth hinge point. The fourth hinge point is positioned at the first end of the head support mattress bracket. The mentioned first ends of the base beams and the head support mattress bracket are located distally relative to the body support mattress bracket in the unfolded state of the framework.

[0042] According to an embodiment, the second head support coupling is hingedly connected to the base beams via a fifth hinge point at a second end of the base beams, wherein the first hinge point is positioned at a second end of the head support mattress bracket, and wherein said second ends of the base beams and the head support mattress bracket are proximal to the body support mattress bracket in the unfolded state of the framework.

[0043] According to an embodiment, the second body support coupling comprises an L-shaped rotating rod and an elongated steering rod, wherein the L-shaped rotating rod is hingedly connected at the first end to the base beams via a sixth hinge point, and wherein the steering rod is hingedly connected at the first end to the body support mattress bracket via a seventh hinge point. The rotating rod and the steering rod are fixedly interconnected at a second end of the rotating rod and the steering rod via one or more rod fixing points, with the steering rod extending in line with an arm of the L-shaped rotating rod.

[0044] According to an embodiment, the foot bracket is rigidly connected to the body support mattress bracket at two or more foot fixing points. In this manner, this anchoring is sufficiently robust to withstand the necessary forces (both during loading and manipulation), especially considering the limited distance between the foot fixing points and the hinge point that connects the foot bracket and the foot member, and the reactive force on this can be relatively high. To withstand this with certainty, multiple fixation is recommended.

[0045] According to an embodiment, the body support mattress bracket is provided with one or more stop elements that extend laterally and are positioned such that the first body support coupling rests against the stop elements when the head support mattress bracket and the body support mattress bracket are in line with each other in the unfolded state of the framework, and the stop elements prevent further rotation of the first body support coupling. Preferably, the stop element is provided singly on each lateral side of the framework, and extends outwardly, away from the framework over a limited length so that it respects the width of the piece of folding furniture and fits within it. Due to the fact that the first body support coupling is hingedly connected directly to the body support mattress bracket, and therefore lies close to it, with the only requirement being sufficient space to avoid obstructions due to friction and the like between the two, the stop element only needs to be very short to already be in the path of the first body support coupling. In this way, this body support coupling also provides a structural contribution to the sturdiness of the framework under load, so that the coupling between the body and head support mattress bracket is not overly stressed.

[0046] According to an embodiment, the first head support coupling is L-shaped and includes two arms which extend from a central connection. A first of the arms ends at the first end of the first head support coupling, with the second end positioned at the central connection and comprising a third hinge point with which the first head support coupling is hingedly connected to the base beams. A second of the arms is provided with a rigid stop element. The stop element rests, in the folded state of the framework, on a first end of the base beams, which first end of the base beams is located distally relative to the body support mattress bracket in the unfolded state of the framework. The rigid stop element is preferably rigidly connected to the first head support coupling at a stop fixing point at the end of the second of the arms.

[0047] By working with such a stop element, it is ensured that in the folded state, the head support mattress coupling cannot move/rotate further once the folded state is reached, thus damaging the mechanism.

[0048] According to an embodiment, the framework further comprises a head support mattress frame for receiving and supporting a mattress, the head support mattress frame provided at the head support mattress bracket, and a body support mattress frame for receiving and supporting a mattress, the body support mattress frame provided at the body support mattress bracket. The mattress frames can also be directly provided on the brackets, or even integrated therewith as a one-piece component.

[0049] As stated, the mattress frames can also be immediately provided with a mattress, and for example, take the form of box springs.

[0050] According to an embodiment, the first body support coupling is joined to both lateral sides of the framework via a coupling rod, preferably the coupling rod is rigidly joined to the first body support coupling via one or more coupling fixing points, which is parallel to the plane defined by the base beams and substantially perpendicular to the head support sides, wherein the coupling rod, in the unfolded state of the framework, lies against the underside of the head support mattress bracket.

[0051] According to an embodiment, one or more parts of the framework are optionally connected in one piece on both sides, preferably through a separate connecting element or connecting rod (or multiple, at different positions to better distribute forces).

[0052] This connecting rod supports the synchronized operation of both sides, ensures a better distribution of forces, and can prevent damage to the mechanism during uneven force exertion by a user when manipulating it, by redistributing the force.

[0053] According to a preferred embodiment, the framework in a folded state has a maximum height of 30 cm, preferably no more than 25 cm. The housing should not be included in this calculation.

[0054] According to a preferred embodiment, the unfolded framework has a length from the most distal ends of the body support brackets and head support brackets (or body support mattress frame and head support mattress frame) of at least 1.50 m, preferably at least 1.75 m, more preferably at least 2.00 m, and even more preferably at least 2.10 m or even 2.20 m.

[0055] According to a preferred embodiment, the body support bracket and the head support bracket have a length of at least 60 cm, preferably at least 70 cm, more preferably at least 75 cm, or even 80 cm, 85 cm, 90 cm, 95 cm, or 100 cm.

[0056] According to a preferred embodiment, the base beams, brackets, and couplings are made of metal, and more preferably, the other elements, such as the foot portion, are also made of metal.

[0057] In a second aspect, the invention relates to a piece of folding furniture, preferably a sofa or sofa bed, comprising a seat portion and optionally a back portion, wherein the seat portion includes a hollow housing in which the folding framework is a framework according to the first aspect, and is attached with the base beams to the inside of the hollow housing.

[0058] In what follows, the invention is described by way of non-limiting examples illustrating the invention, and which are not intended to and should not be interpreted as limiting the scope of the invention.

EXAMPLES

[0059] Fig. 1 shows the framework in the unfolded state.

[0060] Figures 2-6 show the framework in successive positions of unfolding, starting from a folded state in Fig. 2 to an unfolded state in Fig. 6. It is self-evident that the reverse procedure, folding it up, can be considered as the reverse of the steps for unfolding, and is visible through the sequence of Fig. 6, 5, 4, 3, and 2.

[0061] The invention consists of creating a mechanism that can be very easily transformed from a sofa to a bed and provides a new kinematics to easily handle it forward, and can, for example, also be fixed to a wall or partition, for better support and stability for force distribution.

[0062] The foot portion (11, 12) is integrated to synchronize the opening and closing in a single movement.

[0063] Fixed stops are also present on the mechanism in the sofa and bed positions (folded and unfolded states) that allow for proper support of the individual components in both the folded and unfolded states, thereby distributing the load better and preventing over-rotations.

[0064] As shown in Fig. 2 and 3, by performing the A-A movement, the framework begins to open. Hereby, the contact point "2-2" of the stop element (2) of the first head support coupling (3) no longer touches the contact point "1-1" of the base beams (1) in Fig. 3, after resting on it in Fig. 2. The stop element (2) is fixedly connected to the first head support coupling (3) via the stop fixing point (C). In the same motion A-A, the body support mattress frame (15) provided on the body support bracket (9) is moved upward and partially forward, causing the other connected parts to move along, and the framework mechanism begins to open.

[0065] In Fig. 4, the framework opens even further: the body support mattress frame (15) and the body support mattress bracket (9) move further upward with the aid of the steering rod (6), which is attached to the base beam (1) via the sixth hinge point (D). Further, the rotating rod (5) is also attached to the steering rod (6) via the rod fixing points (E). The steering rod is hingedly attached to the body support mattress bracket via the seventh hinge point (F). Finally, the first body support coupling (8) is rigidly connected with the (L-shaped) second head support coupling (7) via the coupling fixing points (H, H+). This second head support coupling (7) is itself hingedly attached to the base beams (1) via the fifth hinge point (G). The first body support coupling (8) is hingedly connected, on the one hand, to the body support mattress bracket (9) via the second coupling point (K), and also to the synchronization coupling (10) via the first coupling point (L), with the second coupling point (K) located more distally than the first coupling point (L) relative to the coupling fixing points (H, H+).

[0066] As a result, the movement of the first body support coupling (8) causes a mutually different movement of the synchronization coupling (10) and the body support mattress bracket (9), thereby allowing the foot portion to be moved. The foot bracket (11) is fixedly connected to the body support mattress bracket (9) via the foot fixing points (M, N). The foot member (12) itself is hingedly attached to the foot bracket (11) via the hinge point (Q) and is hingedly attached to the other end of the synchronization coupling (10), so that the foot member (12) can fold in and out from and against the body support mattress bracket (9) relative to the fixed foot bracket (11).

[0067] The pin (P) is finally provided on the foot bracket (11) and is movable in a groove on the foot member (12) in the form of a circular arc with the midpoint as the hinge point (Q), to avoid deformation of the foot member.

[0068] On the base beams (1), the first head support coupling (3) is further hingedly provided via the third hinge point (A), wherein the other end of the first head support coupling (3) is hingedly provided to the head support mattress bracket (4) via the fourth hinge point (B).

[0069] The head support mattress bracket (14) can then be provided on or to the head support mattress frame (4).

[0070] In Fig. 5, the further opening of the mechanism is visible via movement A-A. The foot member (12) thereby then unfolds further without touching the housing of the piece of folding furniture, due to the delayed unfolding via the positioning and configuration of the first body support coupling (8) and the synchronization coupling

(10). In this position, the body support mattress bracket (9) and the body support mattress frame (15) are at the highest position, given the most perpendicular orientation of the first body support coupling (8) and the steering rod (6). By providing a coupling rod (13), the stability and synchronization of movement on both lateral sides is guaranteed in this position, which is attached to the first body support couplings via the coupling fixing points (I).

[0071] In Fig. 6, finally, the fully unfolded system is visible, with the foot member (12) touching the ground. Here it is also visible that the first body support coupling (8) rests against the stop element (J) at its underside, thereby preventing further rotation, and thus preventing the framework from resting on the piece of folding furniture (outside at the base beams (1), which are connected to it).

[0072] To close the framework, a user can move an end (most distal with respect to the piece of folding furniture for maximum moment) of the body support mattress frame (15) or the body support mattress bracket (9) upwards, thereby initiating the folding, and the rest of the mechanism follows this movement.

[0073] The present invention should not be construed as being limited to the embodiments described above and certain modifications or changes may be added to the examples described without having to re-evaluate the appended claims. For example, the present invention was described with reference to pieces of folding furniture such as chairs, sofas, sofa beds, armchairs, etc., but it should be clear that the invention can be applied to, for example, chests or cabinets.

Listing of components:

[0074]

(1) base beam
(2) stop element
(3) first head support coupling
(4) head support mattress bracket
(5) rotating rod
(6) steering rod
(5, 6) second body support coupling
(7) second head support coupling
(8) first body support coupling
(9) body support mattress bracket
(10) synchronization coupling
(11) foot member bracket
(12) foot member
(13) coupling rod
(14) head support mattress frame
(15) body support mattress frame
(A) third hinge point
(B) fourth hinge point
(C) stop fixing point
(D) sixth hinge point
(E) rod fixing points
(F) seventh hinge point
(G)fifth hinge point
(H, H+) coupling fixing points
(H+) first hinge point
(I) coupling fixing points
(J) stop elements
(K) second coupling point
(L) first coupling point
(M, N) foot fixing points
(O) second hinge point
(P) pin
(Q) hinge point

Claims

1. Folding framework suitable for a piece of folding furniture, preferably a sofa or sofa bed, the framework comprising on both lateral sides:

a. a base beam (1) suitable for coupling to opposite lateral sides of the piece of folding furniture;
b. a substantially rectangular head support mattress bracket (4), comprising a long head support side;
c. a substantially rectangular body support mattress bracket (9), comprising a long body support side;
d. a first head support coupling (3) with a first end hingedly connected to the base beams (1) and with a second end hingedly connected to the head support mattress bracket (4);
e. a second head support coupling (7) with a first end hingedly connected to the base beams (1) and with a second end hingedly connected to the head support mattress bracket (4);
f. a first body support coupling (8) having a first end hingedly connected to the body support mattress bracket (9), and with a second end hingedly connected to the head support mattress bracket (4) via a first hinge point (H+);
g. a foot portion, comprising a foot member (12);
h. a synchronization coupling (10) having a first end hingedly connected to the foot member (12) and with a second end hingedly connected to the first body support coupling (8);
characterized in that the framework comprises a second body support coupling (5, 6) having a first end hingedly connected to the base beams (1) and with a second end hingedly connected to the body support mattress bracket (9);
and **in that** the foot portion comprises a foot member bracket (11), wherein the foot member bracket (11) is connected to the body support mattress bracket (9), and wherein the foot member (12) is hingedly connected to the foot member bracket (11) at a hinge point at a first end of the foot member (12), wherein the first end of the

foot member (12) is opposed to a second end of the foot member (12) comprising a footrest for resting on a ground surface in the unfolded state of the framework;
and **in that** the synchronization coupling (10) is connected to the foot member (12) via a second hinge point (O) at the first end of the foot member, wherein the second hinge point (O) is positioned more distally with respect to the footrest than the hinge point (Q).

2. The folding framework according to the preceding claim 1, wherein the synchronization coupling (10) is connected to the first end of the first body support coupling (8) at a first coupling point (L), wherein the first body support coupling (8) is connected to the body support mattress bracket (9) at a second coupling point (K), wherein the second coupling point (K) is positioned more distally towards the first end of the first body support coupling (8) than the first coupling point (L), and wherein the first coupling point (L) is positioned off-axis relative to the second coupling point (K) and the first hinge point (H+).

3. The folding framework according to any of the preceding claims 1 or 2, wherein the foot bracket (11) and the foot member (12) are hingedly connected via the hinge point (Q) and via a pin-in-groove mechanism, comprising a pin (P) on one of the foot bracket (11) or the foot member (12), preferably on the foot bracket (11), and a groove on the other of the foot member (12) or the foot bracket (11), preferably on the foot member (12), wherein the groove is in the shape of a circular arc and wherein the pin (P) protrudes through the groove and stands perpendicular to the plane of the groove.

4. The folding framework according to any of the preceding claims 1 to 3, wherein the second head support coupling (7) and the head support mattress bracket (4) are hingedly connected at an eighth hinge point (H+), wherein the eighth hinge point and the first hinge point (H+) are the same hinge point.

5. The folding framework according to any of the preceding claims 1 to 4, wherein the second head support coupling (7) and the first body support coupling (8) are rigidly connected via one or more coupling fixing points (H, H+), preferably wherein one of the coupling fixing points is the first hinge point (H+).

6. The folding framework according to any of the preceding claims 1 to 5, wherein the first head support coupling (3) is hingedly connected to the base beams (1) via a third hinge point (A), wherein the third hinge point (A) is positioned at a first end of the base beams (1), and wherein the first head support coupling (3) is hingedly connected to the head support mattress bracket (4) via a fourth hinge point (B), wherein the fourth hinge point (B) is positioned at a first end of the head support mattress bracket (4), wherein said first ends of the base beams (1) and the head support mattress bracket (4) are located distal to the body support mattress bracket (9) in the unfolded state of the framework.

7. The folding framework according to any of the preceding claims 1 to 6, wherein the second head support coupling (7) is hingedly connected to the base beams (1) via a fifth hinge point (G) at a second end of the base beams (1), wherein the first hinge point (H+) is positioned at a second end of the head support mattress bracket (4), and wherein said second ends of the base beams (1) and the head support mattress bracket (4) are located proximally relative to the body support mattress bracket (9) in the unfolded state of the framework.

8. The folding framework according to any of the preceding claims 1 to 7, wherein the second body support coupling (5, 6) comprises an L-shaped rotating rod (5) and an elongated steering rod (6), wherein the L-shaped rotating rod (5) is hingedly connected with a first end to the base beams (1) via a sixth hinge point (D), and wherein the steering rod (6) is hingedly connected with a first end to the body support mattress bracket (9) via a seventh hinge point (F), and wherein the rotating rod (5) and the steering rod (6) are fixedly connected to each other at a second end of the rotating rod (5) and the steering rod (6) via one or more rod fixing points (E), wherein the steering rod (6) extends in the prolongation of an arm of the L-shaped rotating rod (5).

9. The folding framework according to any of the preceding claims 1 to 8, wherein the foot bracket (11) is rigidly connected to the body support mattress bracket (9) at two or more foot fixing points (M, N).

10. The folding framework according to any of the preceding claims 1 to 9, wherein the body support mattress bracket (9) is provided with one or more stop elements (J) that extend laterally, and are positioned such that the first body support coupling (8) comes to rest against the stop elements (J) when the head support mattress bracket (4) and the body support mattress bracket (9) are in line with each other in the unfolded state of the framework, and the stop elements (J) prevent further rotation of the first body support coupling (8).

11. The folding framework according to any of the preceding claims 1 to 10, wherein the first head support coupling (3) is L-shaped, and comprises two arms extending from a central connection, wherein a first

of the arms ends in the first end of the first head support coupling (3), wherein the second end is positioned at the level of the central connection and comprises a third hinge point (A) with which the first head support coupling (3) is hingedly connected to the base beams (1), and wherein a second of the arms is provided with a rigid stop element (2), wherein the stop element (2), in the folded state of the framework, rests on a first end of the base beams (1), which first end of the base beams (1) is located distally with respect to the body support mattress bracket (9) in the unfolded state of the framework, wherein the rigid stop element is preferably rigidly connected at a stop fixing point (C) at the end of the second of the arms to the first head support coupling (3).

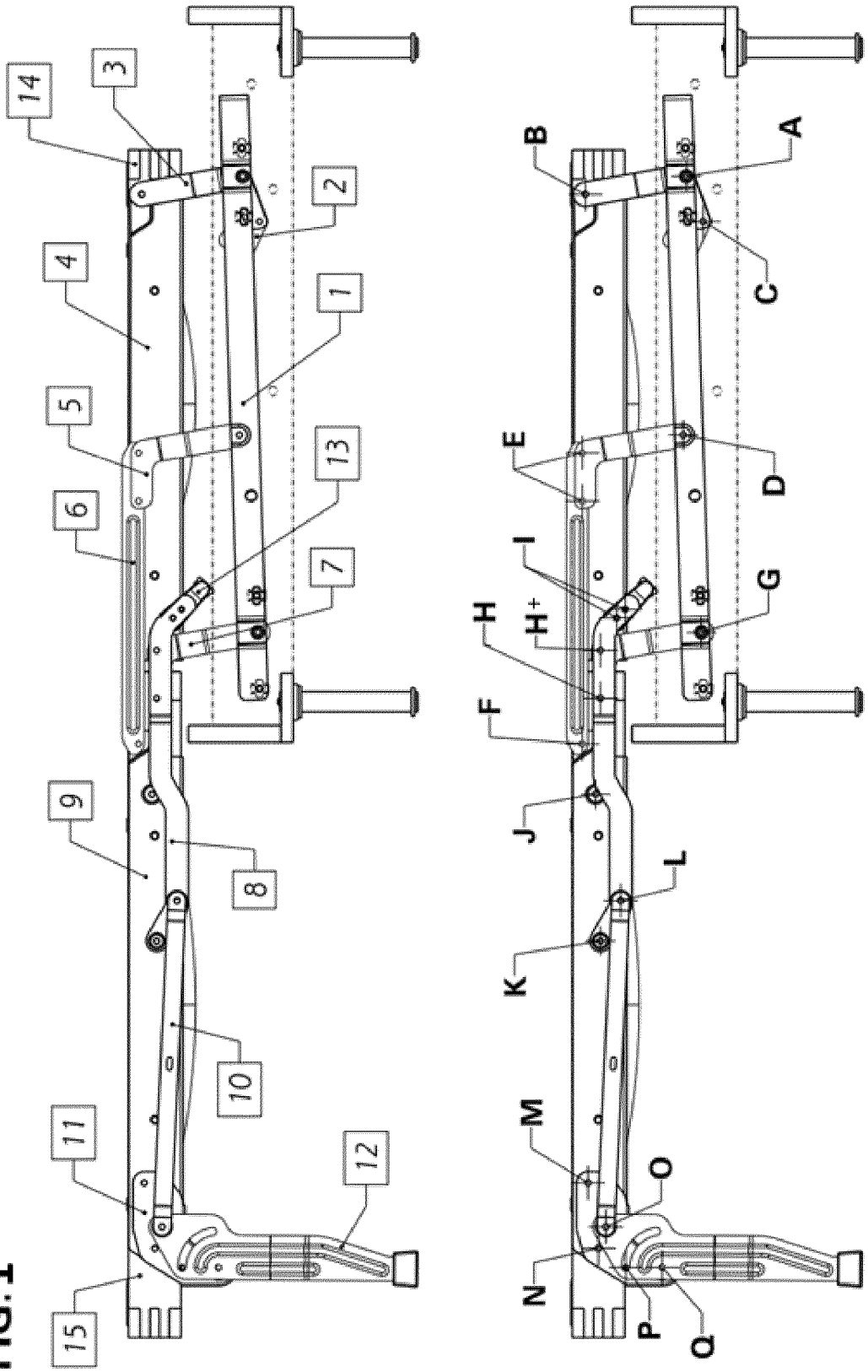
12. The folding framework according to any of the preceding claims 1 to 11, further comprising a head support mattress frame (14) for receiving and supporting a mattress, the head support mattress frame (14) provided on the head support mattress bracket (4), and a body support mattress frame (15) for receiving and supporting a mattress, the body support mattress frame (15) provided on the body support mattress bracket (9).

13. The folding framework according to any of the preceding claims 1 to 12, wherein the first body support coupling (8) is connected to both lateral sides of the framework via a coupling rod (13), preferably the coupling rod (13) is rigidly connected to the first body support coupling (8) via one or more coupling fixing points (I), which is parallel to the plane defined by the base beams and substantially perpendicular to the head support sides, wherein the coupling rod (13) in the unfolded state of the framework abuts against the underside of the head support mattress bracket.

14. The folding framework according to any of the preceding claims 1 to 13, wherein the framework in a folded state has a maximum height of 30 cm, preferably a maximum of 25 cm.

15. Piece of folding furniture, preferably a sofa or sofa bed, comprising a seat portion and optionally a back portion, wherein the seat portion includes a hollow housing in which the folding framework according to any of the preceding claims 1 to 14 is secured with the base beams (1) on the inside of the hollow housing.

FIG.1



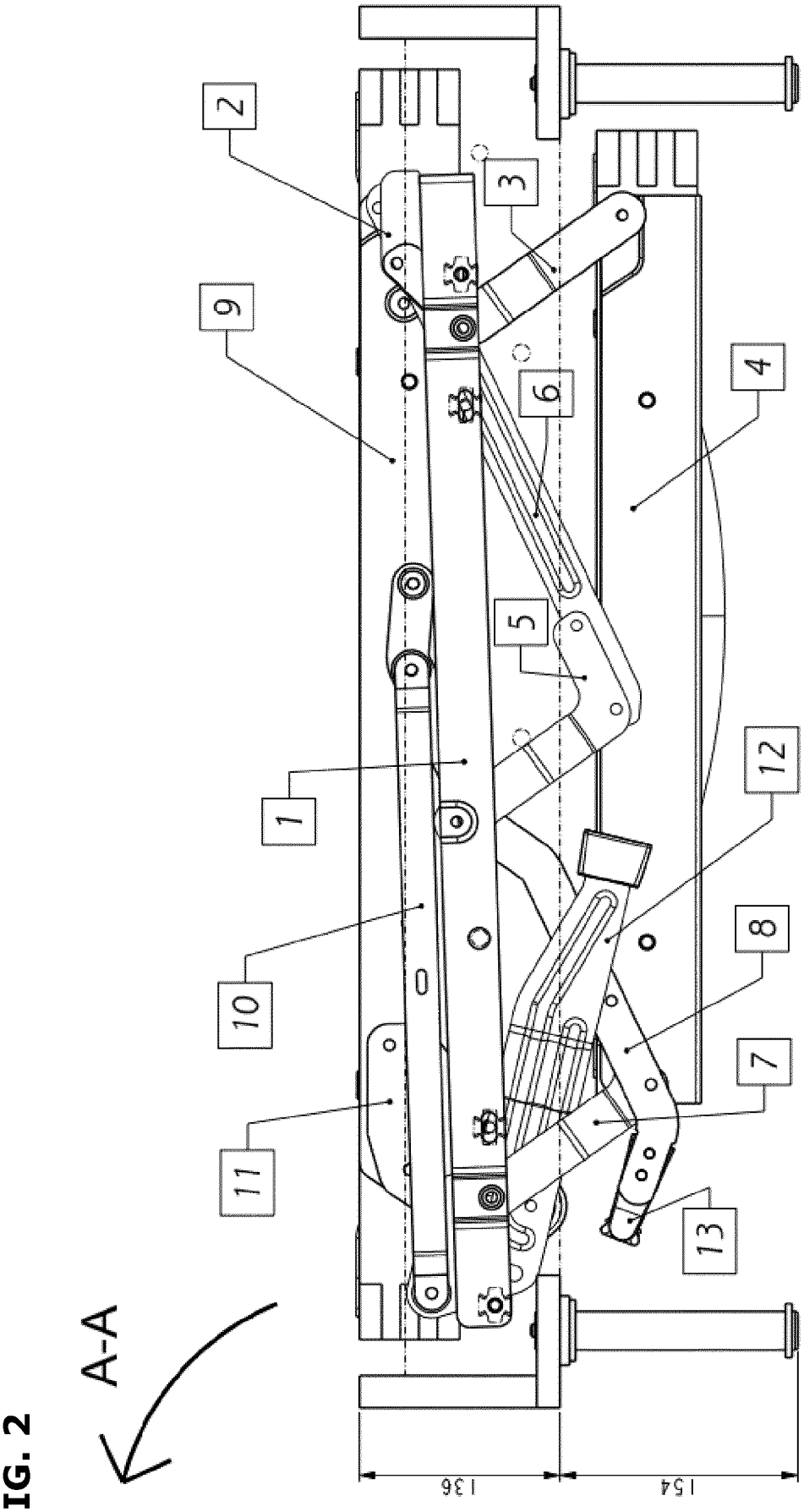


FIG. 2

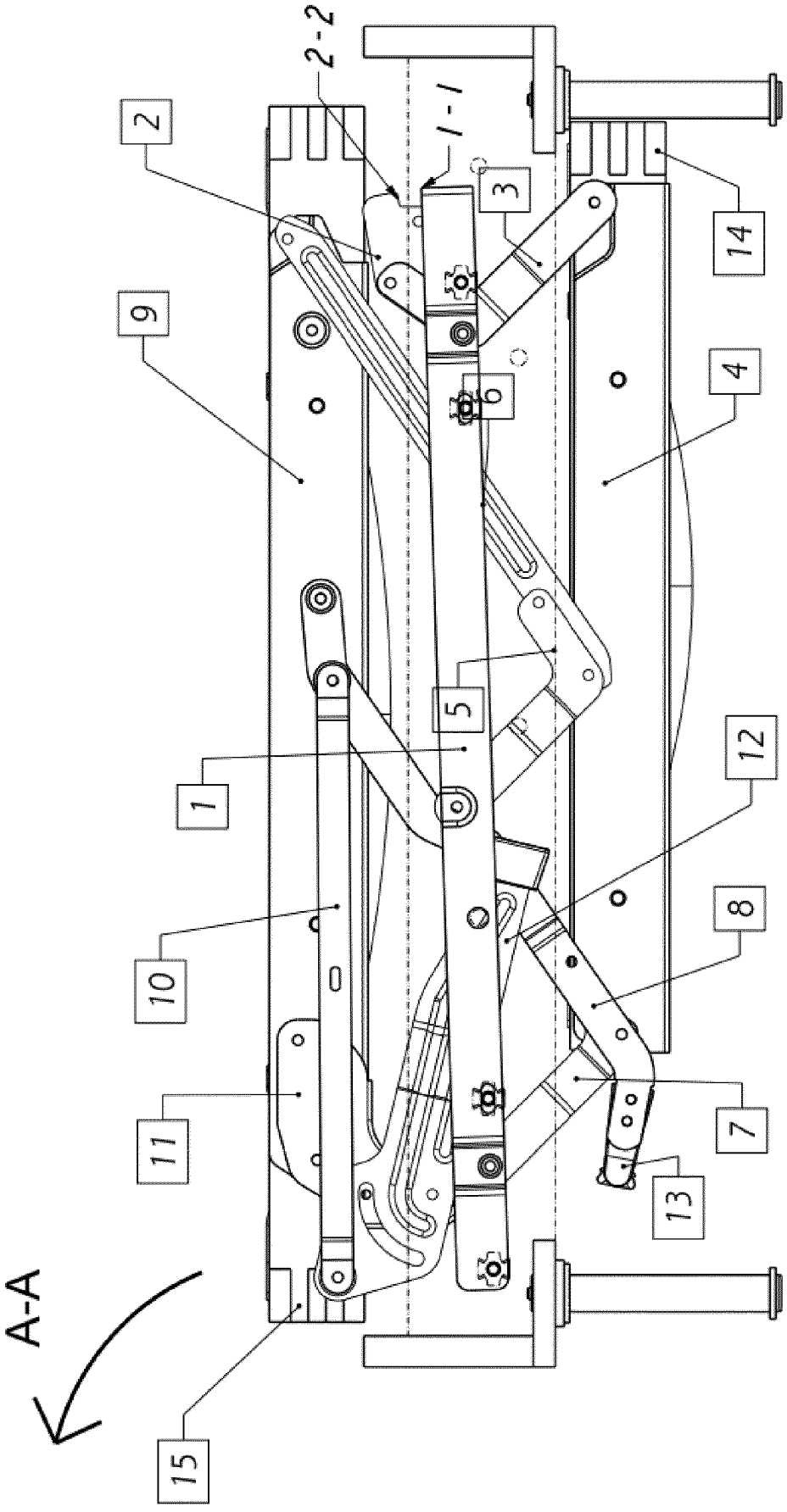
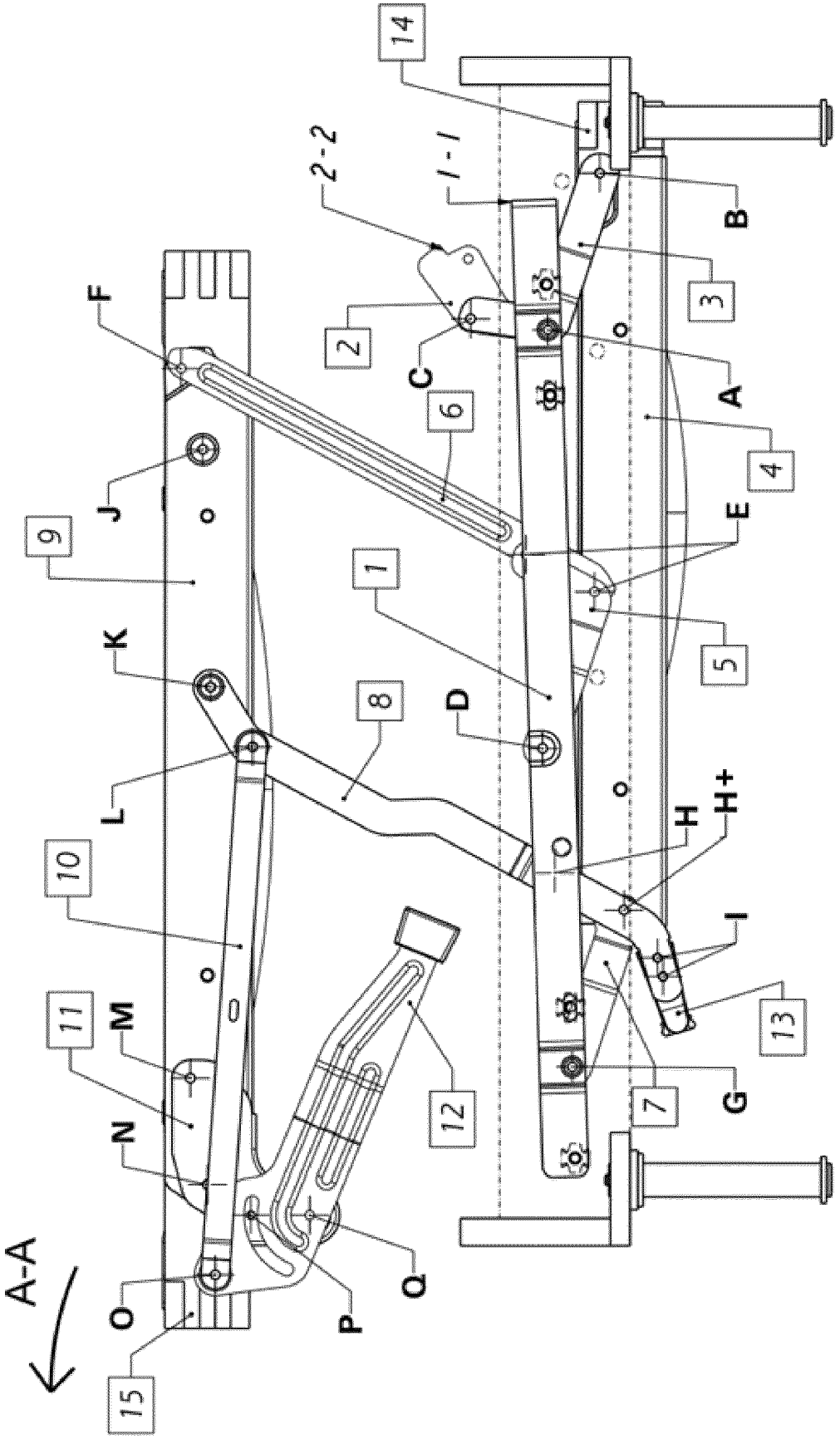


FIG. 3

FIG. 4



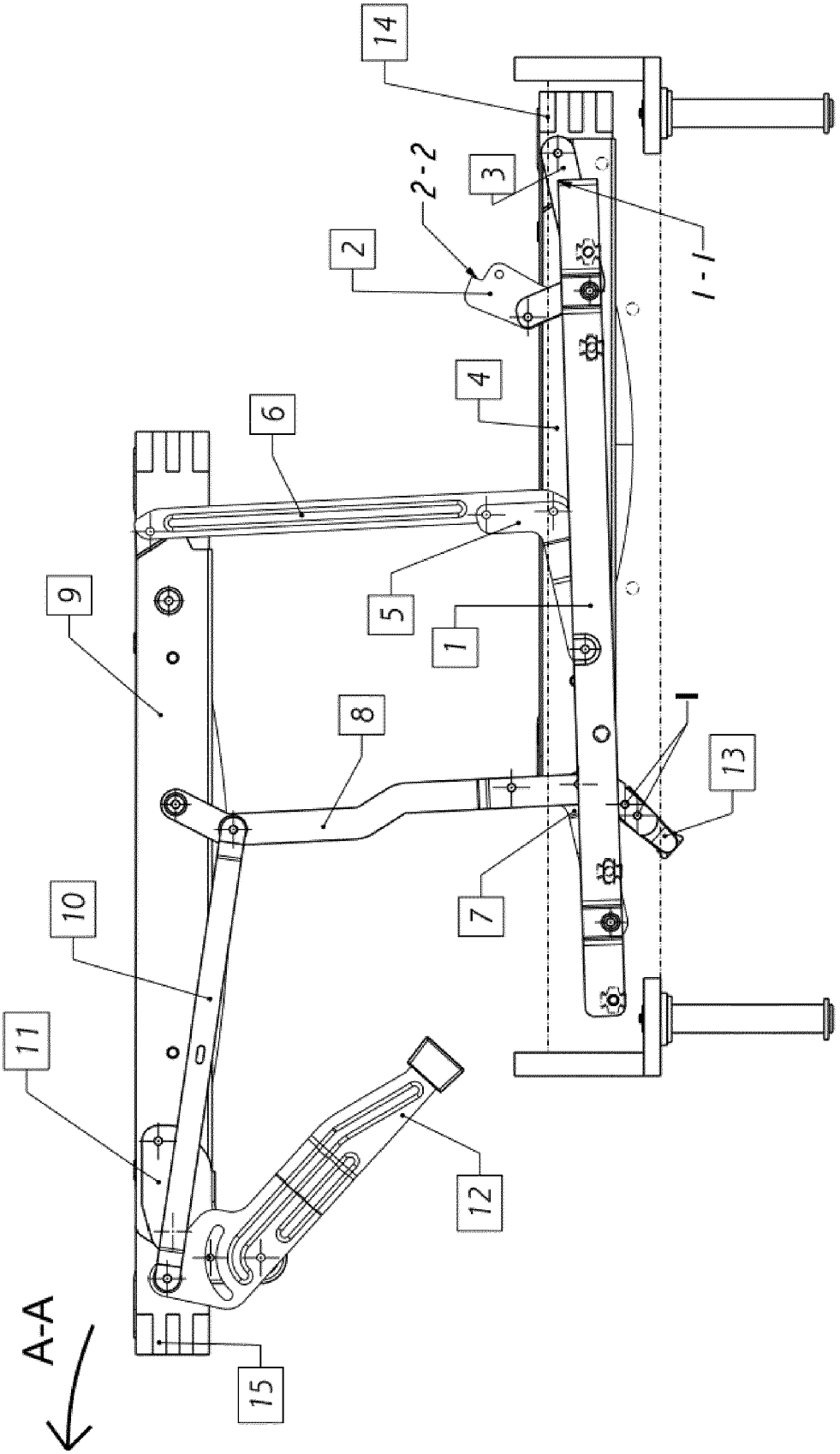


FIG. 5

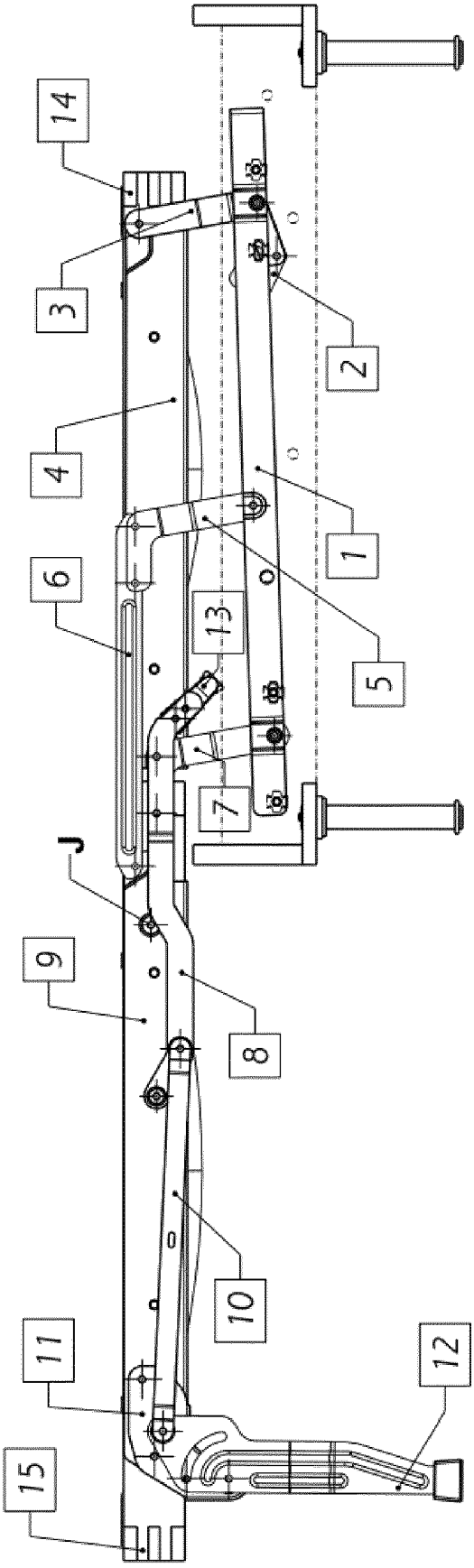


FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 24 21 7969

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	BE 1 029 887 A1 (SEDAC MECOBEL NV [BE]) 26 May 2023 (2023-05-26) * figures 1-2 * -----	1-15	INV. A47C17/04 A47C19/12
A	CN 111 329 279 A (YANG ZHUOXIAN) 26 June 2020 (2020-06-26) * figures 1-3 * -----	1-15	

TECHNICAL FIELDS SEARCHED (IPC)

A47C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	27 March 2025	Melo Sousa, Filipe

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27-03-2025

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BE 1029887 A1	26-05-2023	NONE	
CN 111329279 A	26-06-2020	NONE	

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- BE 1029887 **[0006]**
- CN 111329279 **[0007]**