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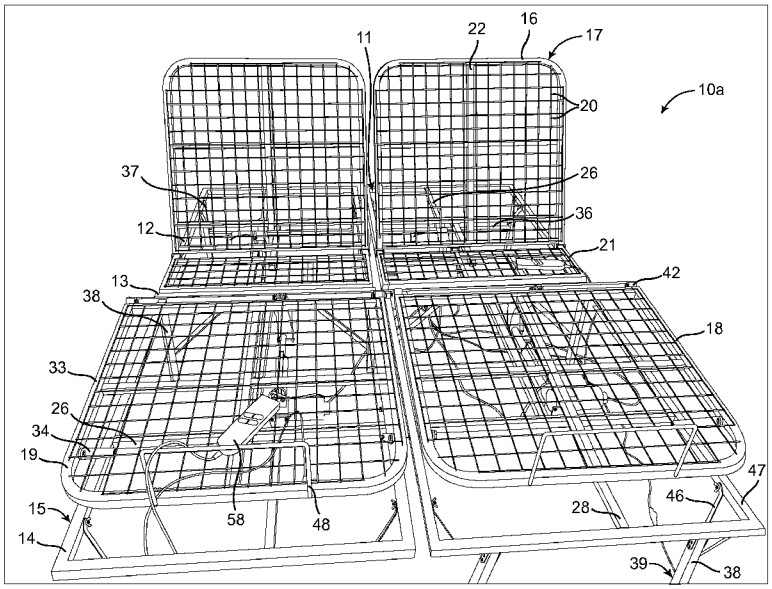

FIG. 1

(57) Abstract: A motorized bed frame includes a support assembly having a torso section and a leg section. An adjustable assembly having a torso section and a leg section is positioned on the support assembly and pivotally coupled thereto. An actuating assembly is coupled to the support assembly and the adjustable assembly for articulating the torso section and leg section of the adjustable assembly relative to the support assembly when the bed frame is in an open configuration. Multiple bed frames could be coupled together side-by-side for larger mattress supports, and adjacent torso sections and leg sections of the adjustable assembly could be controlled simultaneously. The bed frame is foldable to a compact configuration without disassembly of parts.

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MOTORIZED FOLDABLE BED FRAME ASSEMBLY

FIELD

[0001] The present disclosure relates to bed frames and in particular to a motorized foldable bed frame assembly configured to fold from an open and adjustable state to a compactly closed or folded state.

BACKGROUND

[0002] Motorized bed frames exist in the prior art. However, the existing motorized bed frames have several disadvantages. For example, in U.S. Pat. No. 8,935,817, which is incorporated herein by reference, even though the bed frame is capable of being packaged sufficiently compact for mail shipment, the motor must be detached prior to folding the bed frame due to space constraints between the folded frames. Therefore, assembly and disassembly is required to use and store the bed frame.

[0003] Another disadvantage of the prior art bed frames, including the bed frame mentioned above is that the mattress is not capable of being fully supported by the frame. That is, because the surface area of the inner frame is less than the surface area of the mattress, the edges of the mattress are not supported in the inclined positions. Thus, useful mattress space is decreased when the bed frame is inclined.

[0004] Yet another disadvantage is that there are certain difficulties with manufacturing. The inner frame must be attached to the outer frame in a precise manner to accomplish a co-planar relationship with each other when the bed frame is in an open and flat configuration. This is difficult to accomplish because of the inconsistency in welding of parts, and without a co-planar surface the mattress is not stably supported.

[0005] Prior art bed frames, including motorized bed frames often times require the support brackets of the support legs to be disassembled prior to folding. As such, setting up and folding the bed frame takes much effort and is very time consuming.

[0006] Another disadvantage is that it is difficult to synchronize the articulation of adjacent frames when they are used side-by-side for larger mattress supports.

SUMMARY

[0007] Embodiments of the present disclosure provide for a light-weight (under 150 lbs) motorized bed frame assembly that is easily configured by the user (e.g., extendable and collapsible without the use of tools), and can be folded directly in half without detaching the motors. The motorized bed frame assembly of the present disclosure also provides a stable, full support surface for the mattress in all positions as well as synchronized articulation when used in larger configurations.

[0008] The following presents a simplified summary of some embodiments of the invention in order to provide a basic understanding of the invention. This summary is not an extensive overview of the invention. It is not intended to identify key/critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some embodiments of the invention in a simplified form as a prelude to the more detailed description that is presented later.

[0009] An object of the present invention is to provide a bed frame comprising: a lower assembly comprising: a lower torso section and an lower leg section, said lower torso and lower leg sections each having a frame defining an lower perimeter; at least one structural support bar coupled to each of said lower torso and lower leg sections and positioned within the lower perimeter; and at least one support leg pivotally coupled to each of said lower torso and lower

leg sections; a central leg assembly having at least one support leg, the lower torso and lower leg sections pivotally coupled together by the central leg assembly; an upper assembly comprising: an upper torso section, the upper torso section having a frame defining an upper perimeter; and at least one structural support bar coupled to said upper torso section and positioned within the upper perimeter; wherein the upper torso section is positioned within the lower perimeter of the lower torso section and pivotally coupled thereto; and a first actuating assembly comprising: a first actuator coupled to a first movable jack extending therefrom, the first actuator pivotally coupled to the at least one structural support bar of the lower torso section; and a first bracket comprising a first end and a second end, said first end coupled to the at least one structural support bar of the upper torso section and said second end pivotally coupled to a distal end of the first movable jack; wherein the first movable jack is fully extended when a bottom portion of the upper torso section engages a top portion of the lower torso section and the first movable jack is less than fully extended when the upper torso section is raised from the lower torso section.

[0010] Another object of the present invention is to provide a bed frame comprising: a lower assembly comprising: an lower torso section and an lower leg section, said lower torso and lower leg sections each having a frame defining an lower perimeter; at least one structural support bar coupled to each of said lower torso and lower leg sections and positioned within the lower perimeter; and at least one support leg pivotally coupled to each of said lower torso and lower leg sections; a central leg assembly having at least one support leg, the lower torso and lower leg sections pivotally coupled together by the central leg assembly; an upper assembly comprising: an upper torso section, the upper torso section having a frame defining an upper perimeter; and at least one structural support bar coupled to said upper torso section and positioned within the upper perimeter; wherein the upper torso section is positioned within the lower perimeter of the

lower torso section and pivotally coupled thereto; and a first actuating assembly comprising: a first actuator coupled to a first movable jack extending therefrom; and a first bracket comprising a first end and a second end; wherein one of the first actuator and first movable jack is pivotally coupled to the at least one structural support bar of the lower torso section, the other one of the first actuator and first movable jack is pivotally coupled to the first bracket first end, and the first bracket second end is coupled to the at least one structural support bar of the upper torso section.

[0011] Yet another object of the present invention is to provide a bed frame comprising: a support assembly comprising: a torso section and a leg section; at least one structural support bar coupled to each of said torso and leg sections; and at least one support leg coupled to each of said torso and leg sections; at least one adjustable assembly comprising: a frame, the frame having at least one structural support bar coupled thereto; wherein the at least one adjustable assembly is positioned on the support assembly and pivotally coupled thereto; and at least one actuating assembly comprising a first end and a second end; and at least one bracket comprising a first end and a second end, the at least one bracket first end pivotally coupled to the at least one actuating assembly second end; wherein one of the at least one actuating assembly first end and the at least one bracket second end is coupled to the support assembly, and the other one of the at least one actuating assembly first end and the at least one bracket second end is coupled to the at least one adjustable assembly.

[0012] The foregoing has outlined rather broadly the more pertinent and important features of the present invention so that the detailed description of the invention that follows may be better understood and so that the present contributions to the art can be more fully appreciated. Additional features of the invention will be described hereinafter which form the subject of the claims of the invention. It should be appreciated by those skilled in the art that the conception

and the disclosed specific methods and structures may be readily utilized as a basis for modifying or designing other structures for carrying out the same purposes of the present invention. It should be realized by those skilled in the art that such equivalent structures do not depart from the spirit and scope of the invention set forth in the appended claims.

BRIEF DESCRIPTION OF DRAWINGS

[0013] The above and other objects, features, and advantages of the present disclosure will be more apparent from the following detailed description taken in conjunction with the accompanying drawings, in which:

[0014] FIG. 1 is a perspective view of an embodiment of a motorized foldable bed frame assembly in an open and elevated configuration;

[0015] FIG. 2 is a perspective view of the bed frame of FIG. 1 in an open and flat configuration;

[0016] FIG. 3 is a side perspective view of the bed frame of FIG. 1 in a partially folded and flat configuration;

[0017] FIG. 4 is a side perspective view of the bed frame of FIG. 1 in a fully folded and flat configuration;

[0018] FIG. 5 is a partial side perspective view of the bed frame of FIG. 1 in an open and elevated configuration;

[0019] FIG. 6 is a side perspective view of the bed frame of FIG. 1 in an open and flat configuration;

[0020] FIG. 7 is a side perspective view of an embodiment of a support leg assembly;

[0021] FIG. 8 is a bottom perspective view of another embodiment of a support leg assembly;

[0022] FIG. 9 is a top perspective view of another embodiment of a support leg assembly;

[0023] FIG. 10 is a perspective view of the bed frame of FIG. 1 showing an upper torso section in an open and raised configuration; and

[0024] FIG. 11 is a perspective view of the bed frame of FIG. 1 showing an upper leg section of in an open and raised configuration.

[0025] To facilitate an understanding of the invention, identical reference numerals have been used, when appropriate, to designate the same or similar elements that are common to the figures. Further, unless stated otherwise, the features shown in the figures are not drawn to scale, but are shown for illustrative purposes only.

DETAILED DESCRIPTION

[0026] Exemplary embodiments are described herein to provide a detailed description of the present disclosure. Variations of these embodiments will be apparent to those of skill in the art. Moreover, certain terminology is used in the following description for convenience only and is not limiting. For example, the words "right," "left," "top," "bottom," "upper," "lower," "inner" and "outer" designate directions in the drawings to which reference is made. The word "a" is defined to mean "at least one." The terminology includes the words above specifically mentioned, derivatives thereof, and words of similar import.

[0027] FIG. 1 is a perspective view of an embodiment of a motorized foldable bed frame assembly 10a of the present invention in an open and elevated configuration. The foldable bed frame 10a is comprised generally of a lower torso assembly 11, a lower leg assembly 15, and a central leg assembly 13. In exemplary embodiments, the bed frame 10a in the open configuration may have overall dimensions of 75″×39″ (Twin); 80″×38″ (Twin XL); or 80″×30″. Other sizes are anticipated, such as an 80″×60″ (Queen) bed frame, and an 80″×76″ (King) bed frame. In the

preferred embodiment the clearance between the floor and lower assemblies 11 and 15 is 14 inches but could be varied depending on design. In an exemplary embodiment, the bed frame 10a is constructed from powder-coated steel, although numerous alternative construction materials are anticipated.

[0028] Referring again to FIGS. 1, the lower torso assembly 11 includes a lower torso section 12 and the lower leg assembly 15 includes a lower leg section 14, each defining a substantially rectangular lower perimeter. Structural support bars 26, 28, may be fixed to each of the lower torso and leg sections 12 and 14 within the lower perimeter. In this embodiment, a static seat portion 21 is fixedly coupled to a top portion of the lower torso section 12 and is formed by structural support bars 26.

[0029] Referring to FIGS. 1 and 2, the bed frame 10a may further comprise an upper torso assembly 17 and an upper leg assembly 19. When in use, a mattress may be removably coupled to the upper torso assembly 17 and the upper leg assembly 19. The upper torso assembly 17 and the upper leg assembly 19 may be comprised generally of an upper torso section 16 and an upper leg section 18, respectively, each defining a substantially rectangular upper perimeter. Structural support bars 22, 24 may be fixedly coupled to the upper torso and leg sections 16, 18 to increase structural integrity and load tolerance. Mattress support bars 20 may be coupled to the upper torso section 16 and upper leg section 18 to provide support points for a mattress.

[0030] Referring again to FIGS. 1 and 2, the upper leg section 18 includes a thigh portion 32 and a calf portion 33. Support bars 24 may be fixedly coupled to each of the thigh and calf portions 32, 33 to increase structural integrity and load tolerance. A mattress retainer 48 may be rotatably coupled to a distal end of the upper leg section 18 such that it may be folded flat in a closed position (FIG. 3) or engaged to retain a mattress in an extended position (FIGS. 1 and 2).

The calf portion 33 may be pivotally coupled to the thigh portion 32 by an upper leg frame coupling member 42. The upper leg frame coupling member 42 should be configured to allow for movement between the thigh and calf portions 32, 33. The upper leg section 18 may be pivotally coupled to the lower leg section 14 by a leg frame arm 34. The leg frame arm 34 may provide stability for the upper leg assembly 19 when moving between an engaged or raised configuration (FIG. 1) and a flat configuration (FIG. 2).

[0031] Referring to FIGS. 1-3, in an embodiment, the upper torso assembly 17 and the upper leg assembly 19 are pivotally connected to the lower torso assembly 11 and the lower leg assembly 15, respectively, by assembly coupling members 44. Assembly coupling members 44 may be a hinge, bolt, pin, or the like, configured to enable the upper torso assembly 17 and upper leg assembly 19 to pivot in response to engagement with an actuating assembly, which is described in detail below.

[0032] Referring again to FIGS. 1-6, in a preferred embodiment, the lower torso assembly 11 and the lower leg assembly 15 are pivotally coupled to the central leg assembly 13 by frame coupling members 30. The central leg assembly 13 may be comprised of support legs 38 and a center frame bar 31. The frame coupling members 30 may be a hinge, bolt, pin, or the like, configured to enable the lower torso assembly 11 and the lower leg assembly 15 to pivot in a substantially 90 degree path in relation to the central leg assembly 13 between the open position (FIGS. 1, 2, 5, and 6) and the folded position (FIG. 3 and 4).

[0033] Referring to FIGS 7-9, the bed frame 10a includes a support leg assembly 39a, 39b, 39c. The support leg assembly 39a, 39b, 39c includes one or more support legs 38 pivotally coupled to the distal ends of the lower torso and leg sections 12 and 14 by frame leg coupling

members 37. The frame leg coupling members 37 may be any hinge or pin configured to enable the support legs 38 to pivot in a substantially 90 degree path in relation to the lower torso and leg sections 12 and 14 between an engaged position and a folded position. A leg support bar 36 may be fixedly coupled between opposing support legs 38 to provide structural stability to the support legs 38. Support arms 46 may be coupled to the lower torso and leg sections 12 and 14 to maintain the support legs 38 in the engaged position as shown in FIGS. 1, 7, and 8.

[0034] In one embodiment 39a, as shown in FIG. 7, the support arm 46 is coupled to the lower torso and leg sections 12 and 14 by engaging a support bolt 47 with an aperture positioned on the lower torso and leg sections 12 and 14. The support bolt 47 is secured by a wing nut to enable mechanical torque by manual manipulation without the use of a tool, such as a screw driver or hex key. In this embodiment, an upper portion of the frame leg coupling member 37 is pivotally coupled to a side portion of the frame 12 and extends vertically downward therefrom, and a lower portion of the leg coupling member 37 is fixedly coupled (e.g., welded) to the support leg 38. The support bolt 47 is disconnected from the support leg 38 when the bed frame is folded.

[0035] In another embodiment 39b, as shown in FIG. 8, an upper portion of the leg coupling member 37 is fixedly coupled (e.g., welded) to an end portion of the frame 14 and extends downwardly therefrom , and a lower portion of the leg coupling member 37 is pivotally coupled to the support leg 38. In this embodiment, one end of the support arm 46 is pivotally coupled to a side portion of the frame 14 while another end of the support arm 46 is pivotally coupled to the support leg 38. The support arm 46 is a Z-shaped configuration to accommodate for the offset between the side portion of the frame 14 and the support leg 38. In other embodiments, the position of the support leg 38 could be closer to or further away from the side portion of the frame 14. In this embodiment, the support bolt 47 is disconnected to fold the support leg 38.

[0036] Referring to FIG. 9, another embodiment of the support leg assembly 39c is shown. The support leg assembly 39c includes one or more support legs 38 pivotally coupled to the distal ends of the lower torso and leg sections 12 and 14 by frame leg coupling members 37. The frame leg coupling members 37 may be any hinge or pin configured to enable the support legs 38 to pivot in a substantially 90 degree path in relation to the lower torso and leg sections 12 and 14 between an engaged position and a folded position. In this embodiment, the leg coupling member 37 includes a flange extending from an end portion of the frame 12/14 and a bolt which extends through the flange and the support leg 38 and secured to a side portion of the frame 12/14 for a pivotal connection.

[0037] Still referring to FIG. 9, one end of a leg support bar 36 is fixedly coupled to a support leg 38 and another end of the leg support bar 36 is pivotally coupled to an inner portion of the lower assembly 11, 15 to provide structural stability to the support legs 38. Support arms 46 may be coupled to structural support bars 12 and 14. In this embodiment, the support arm 46 includes a first support section 70 pivotally coupled to a second support section 71 in an overlapping manner. Overlapping portions of the first and second support sections 70, 71 are lockable with a locking engagement means 72 such as a slidable sleeve as shown here. The support leg 38 is secured substantially perpendicular to the frame 12/14 when the first and support sections 70, 71 are locked, and easily foldable substantially parallel to the frame 12/14 when the first and second support sections 70, 71 are unlocked and folded against each other. In this embodiment, the leg support bar 36 is attached to the frame 12/14 and support leg 38 at all times.

[0038] Referring to FIG. 10, the bed frame 10a includes an actuator assembly 500. The actuator assembly 500 includes a bracket 60 having a first end 62 and second end 64. The first end 62 is

fixedly coupled (e.g., welded) to a structural support bar 22 of the upper torso section 16. The second end 64 is pivotally coupled to a distal end of the jack 54. A proximal end of the jack 54 is slidably coupled to an actuator (or motor) 50 which is pivotally coupled to a structural support bar 26 of the lower torso section 12. In the preferred embodiment, the actuator 50 is a 12V electric linear actuating motor, although other commercially equivalent actuating motors are anticipated. Thus, the actuator 50, jack 54 and bracket 60 form the actuating assembly 500 for raising and lowering the upper torso section 16 between a flat configuration (FIG. 2) to a raised configuration (FIG. 1). In the preferred embodiment, the jack 54 is fully extended and overlapped with the bracket 60 when the upper torso section 16 is in a flat configuration (FIG. 2 and 3), and the jack 54 is retracted and the bracket 60 is positioned at an angle from the lower torso section 12 when the upper torso section 16 is in a raised configuration (FIGS. 1 and 10).

[0039] Referring to FIG. 11, another actuator assembly 500 is located on leg sections 14, 18. A leg actuator 52 is pivotally coupled to a structural support bar 28 of the lower leg section 14 and operably engaged with a jack 56. The jack 56 is pivotally coupled to the thigh portion 32 of the upper leg section 18 such that when the leg actuator 52 is engaged, the jack 56 extends and retracts to elevate or recline the upper leg section 18. More specifically, the bed frame 10a includes a bracket 60 having a first end 62 and a second end 64. The first end 62 is fixedly coupled (e.g., welded) to a structural support bar 24 of the upper leg section 18. The second end 64 is pivotally coupled to a distal end of the jack 56. Thus, the actuator 52, jack 56 and bracket 60 form the actuating assembly 500 for raising and lowering the upper leg section 18 between a flat configuration (FIG. 2) to a raised configuration (FIG. 1). In the preferred embodiment, the jack 56 is fully extended and overlapped with the bracket 60 when the upper leg section 18 is in a flat configuration (FIGS. 2 and 3), and the jack 56 is retracted and the

bracket 60 is positioned at an angle from the lower leg section 14 when the upper leg section 18 is in a raised configuration (FIGS. 1 and 11).

[0040] Referring to FIG. 1, the foldable bed frame 10a may have an actuator controller 58 configured to selectively engage the torso actuator 50 and the leg actuator 52 to elevate or recline the upper torso section 16 and the upper leg section 18, respectively. The actuator controller 58 may be any wireline or wireless electronic control module capable of communicating an electronic input to the actuators 50, 52.

[0041] The bed frame 10a of the present disclosure could be used as a single bed frame or two or more bed frames could be combined to form a larger mattress support surface as shown in the figures. As shown in FIG. 2, adjacent lower assemblies 11, 15 are fixedly coupled via coupling means 80 such as a nut and bolt combination. The actuating assemblies 500 are coupled to one or more actuator controllers 58 and further coupled to a control box (not shown) so that adjacent upper torso assemblies 17 and adjacent upper leg assemblies 19 are articulated in unison when inclining and reclining the same. In an embodiment, the actuator controller 58 contains an adapter configured to control the torso actuator 50 and the leg actuator 52 simultaneously. In another embodiment, each adjacent attached frame is separately controlled when multiple users and mattresses are present and each user desires to control only her side of the frame.

[0042] Referring to FIGS. 3 and 4, in a preferred embodiment, the torso actuator 50 and the leg actuator 52 are coupled to structural support bars 22 and 28 of the lower torso and leg sections 12 and 14 in a mirrored but offset configuration relative to each other (FIG. 3), such that when the bed frame 10a is configured in a folded configuration (see, e.g. FIGS. 3 and 6), the actuators 50 and 52 are free from interference in relation to each other. Furthermore, the vertically overlapping configuration of the upper and lower frame assemblies provides sufficient

space for the bed frame to fully fold without detaching the actuator assemblies 500 from the frame as shown in FIG. 4.

[0043] In the preferred embodiments, the bed frame 10a folds substantially flat in a folded configuration as shown for example in FIG. 6 such that the lower torso section 12 and the lower leg section 14 are parallel in relation to each other. When collapsed in the folded configuration, bed frame 10a may have an overall thickness of between about three inches and about eight inches. Configuring bed frame 10a in a folded configuration may reduce packaging and shipping costs of the motorized bed frame and may reduce set-up and folding time for a user.

[0044] The present disclosure includes that contained in the appended claims as well as that of the foregoing description. Although this invention has been described in its exemplary forms with a certain degree of particularity, it is understood that the present disclosure of has been made only by way of example and numerous changes in the details of construction and combination and arrangement of parts may be employed without departing from the spirit and scope of the invention.

CLAIMS

1. A bed frame comprising:

a lower assembly comprising: a lower torso section and an lower leg section, said lower torso and lower leg sections each having a frame defining an lower perimeter; at least one structural support bar coupled to each of said lower torso and lower leg sections and positioned within the lower perimeter; and at least one support leg pivotally coupled to each of said lower torso and lower leg sections;

a central leg assembly having at least one support leg, the lower torso and lower leg sections pivotally coupled together by the central leg assembly;

an upper assembly comprising: an upper torso section, the upper torso section having a frame defining an upper perimeter; and at least one structural support bar coupled to said upper torso section and positioned within the upper perimeter; wherein the upper torso section is positioned within the lower perimeter of the lower torso section and pivotally coupled thereto; and

a first actuating assembly comprising: a first actuator coupled to a first movable jack extending therefrom, the first actuator pivotally coupled to the at least one structural support bar of the lower torso section; and a first bracket comprising a first end and a second end, said first end coupled to the at least one structural support bar of the upper torso section and said second end pivotally coupled to a distal end of the first movable jack; wherein the first movable jack is fully extended when a bottom portion of the upper torso section engages a top portion of the lower torso section and the first movable jack is less than fully extended when the upper torso section is raised from the lower torso section.

2. The bed frame of claim 1, wherein the upper assembly further comprises an upper leg section, the upper leg section having a frame further defining the upper perimeter; and at least one structural support bar coupled to said upper leg section and positioned within the upper perimeter; wherein the upper leg section is positioned within the lower perimeter of the lower leg section and pivotally coupled thereto.

3. The bed frame of claim 2, further comprising a second actuating assembly comprising: a second actuator coupled to a second movable jack extending therefrom, the second actuator pivotally coupled to the at least one structural support bar of the lower leg section; and a second bracket comprising a first end and a second end, said first end coupled to the at least one structural support bar of the upper leg section and said second end pivotally coupled to a distal end of the second movable jack, wherein the second movable jack is fully extended when a bottom portion of the upper leg section engages a top portion of the lower leg section and the second movable jack is less than fully extended when the upper leg section is raised from the lower leg section.

4. The bed frame of claim 3, wherein the upper leg section further comprises at least two portions pivotally coupled together.

5. The bed frame of claim 4, wherein at least one of the portions of the upper leg section is substantially horizontal when the upper leg section is raised from the lower leg section.

6. The bed frame of claim 1, wherein in a folded configuration the lower torso and lower leg sections are folded against the upper torso section such that each section is adjacent to and substantially parallel to each other.

7. A bed frame comprising:

a lower assembly comprising: an lower torso section and an lower leg section, said lower torso and lower leg sections each having a frame defining an lower perimeter; at least one structural support bar coupled to each of said lower torso and lower leg sections and positioned within the lower perimeter; and at least one support leg pivotally coupled to each of said lower torso and lower leg sections;

a central leg assembly having at least one support leg, the lower torso and lower leg sections pivotally coupled together by the central leg assembly;

an upper assembly comprising: an upper torso section, the upper torso section having a frame defining an upper perimeter; and at least one structural support bar coupled to said upper torso section and positioned within the upper perimeter; wherein the upper torso section is positioned within the lower perimeter of the lower torso section and pivotally coupled thereto; and

a first actuating assembly comprising: a first actuator coupled to a first movable jack extending therefrom; and a first bracket comprising a first end and a second end;

wherein one of the first actuator and first movable jack is pivotally coupled to the at least one structural support bar of the lower torso section, the other one of the first actuator and first movable jack is pivotally coupled to the first bracket first end, and the first bracket second end is coupled to the at least one structural support bar of the upper torso section.

8. The bed frame of claim 7, wherein the upper assembly further comprises an upper leg section, the upper leg section having a frame defining an upper perimeter; and at least one structural support bar coupled to said upper leg section and positioned within the upper perimeter; wherein the upper leg section is positioned within the lower perimeter of the lower leg section and pivotally coupled thereto.

9. The bed frame of claim 8, further comprising a second actuating assembly comprising: a second actuator coupled to a second movable jack extending therefrom; and a second bracket comprising a first end and a second end;

wherein one of the second actuator and second movable jack is pivotally coupled to the at least one structural support bar of the lower leg section, the other one of the second actuator and second movable jack is pivotally coupled to the second bracket first end, and the second bracket second end is coupled to the at least one structural support bar of the upper leg section.

10. The bed frame of claim 9, wherein the bracket of at least one of the first and second actuating assemblies further comprises a slot, the corresponding movable jack being movable therein.

11. The bed frame of claim 7, wherein in a folded configuration the lower torso and lower leg sections are folded against the upper torso section such that each section is adjacent to and substantially parallel to each other.

12. The bed frame of claim 7, wherein the first actuator and first movable jack are positioned below the lower assembly when the upper assembly is in a flat configuration and when the upper assembly is in a raised configuration.

13. The bed frame of claim 7, wherein the lower torso section includes a seat portion extending within the lower perimeter and adjacent to the upper torso section.

14. A bed frame comprising:

a support assembly comprising: a torso section and a leg section; at least one structural support bar coupled to each of said torso and leg sections; and at least one support leg coupled to each of said torso and leg sections;

at least one adjustable assembly comprising: a frame, the frame having at least one structural support bar coupled thereto; wherein the at least one adjustable assembly is positioned on the support assembly and pivotally coupled thereto; and

at least one actuating assembly comprising a first end and a second end; and

at least one bracket comprising a first end and a second end, the at least one bracket first end pivotally coupled to the at least one actuating assembly second end;

wherein one of the at least one actuating assembly first end and the at least one bracket second end is coupled to the support assembly, and the other one of the at least one actuating assembly first end and the at least one bracket second end is coupled to the at least one adjustable assembly.

15. The bed frame of claim 14, further comprising a central leg assembly having at least one support leg, the torso and leg sections pivotally coupled together by the central leg assembly such that the torso and leg sections are foldable from an open configuration wherein the torso and leg sections are substantially co-planar, and a folded configuration wherein the torso and leg sections are adjacent to and substantially parallel to each other.

16. The bed frame of claim 14, wherein the at least one actuating assembly is an actuator operably coupled to a jack.

17. The bed frame of claim 16, wherein the actuator is an electric motor.

18. The bed frame of claim 16, wherein the jack is fully extended when the at least one adjustable assembly is in a flat configuration.

19. The bed frame of claim 14, wherein the at least one adjustable assembly further comprises at least two sections pivotally coupled together.

20. The bed frame of claim 14, wherein the at least one bracket includes a slot such the actuating assembly second end is movable therein.

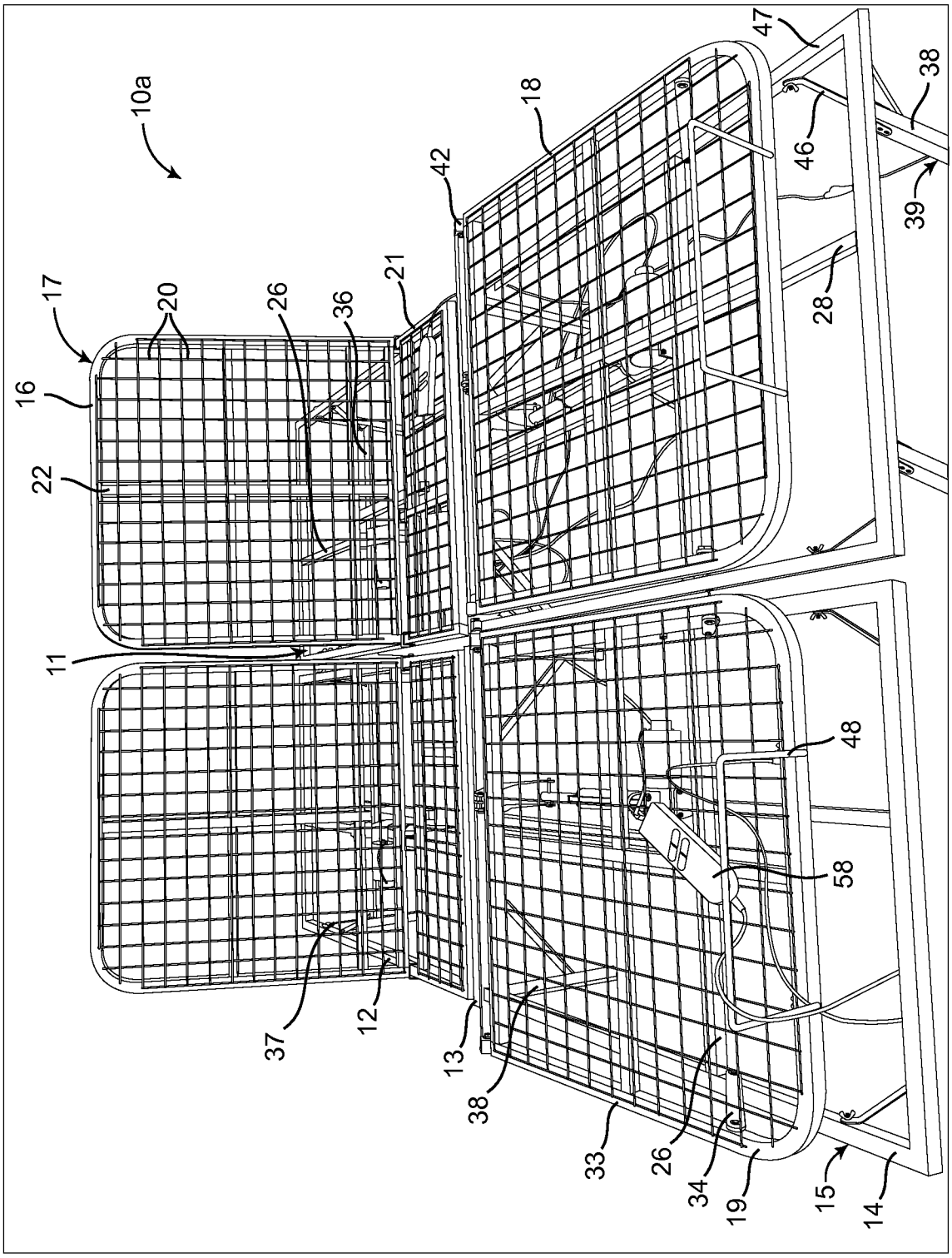
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FIG. 1

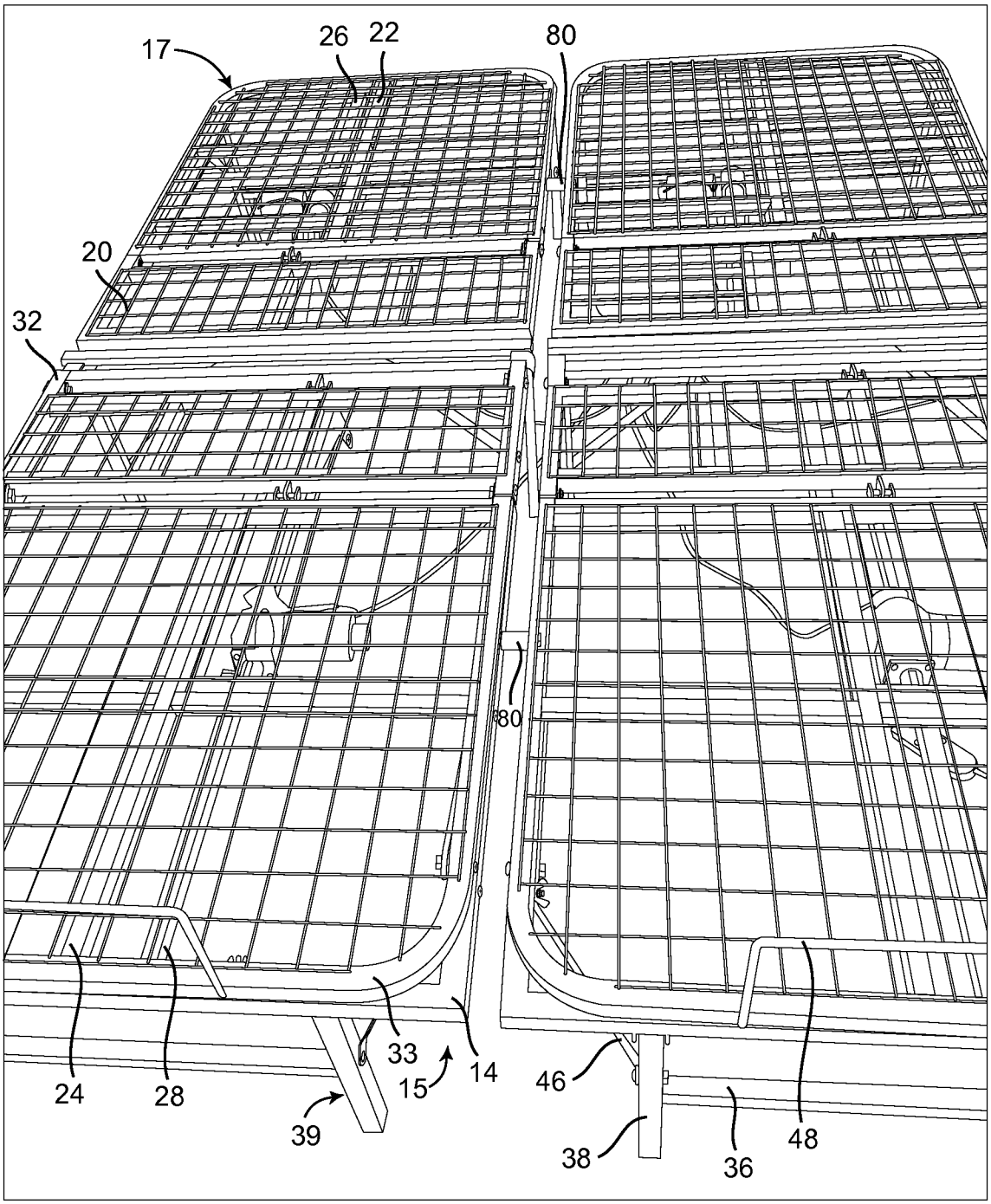

FIG. 2

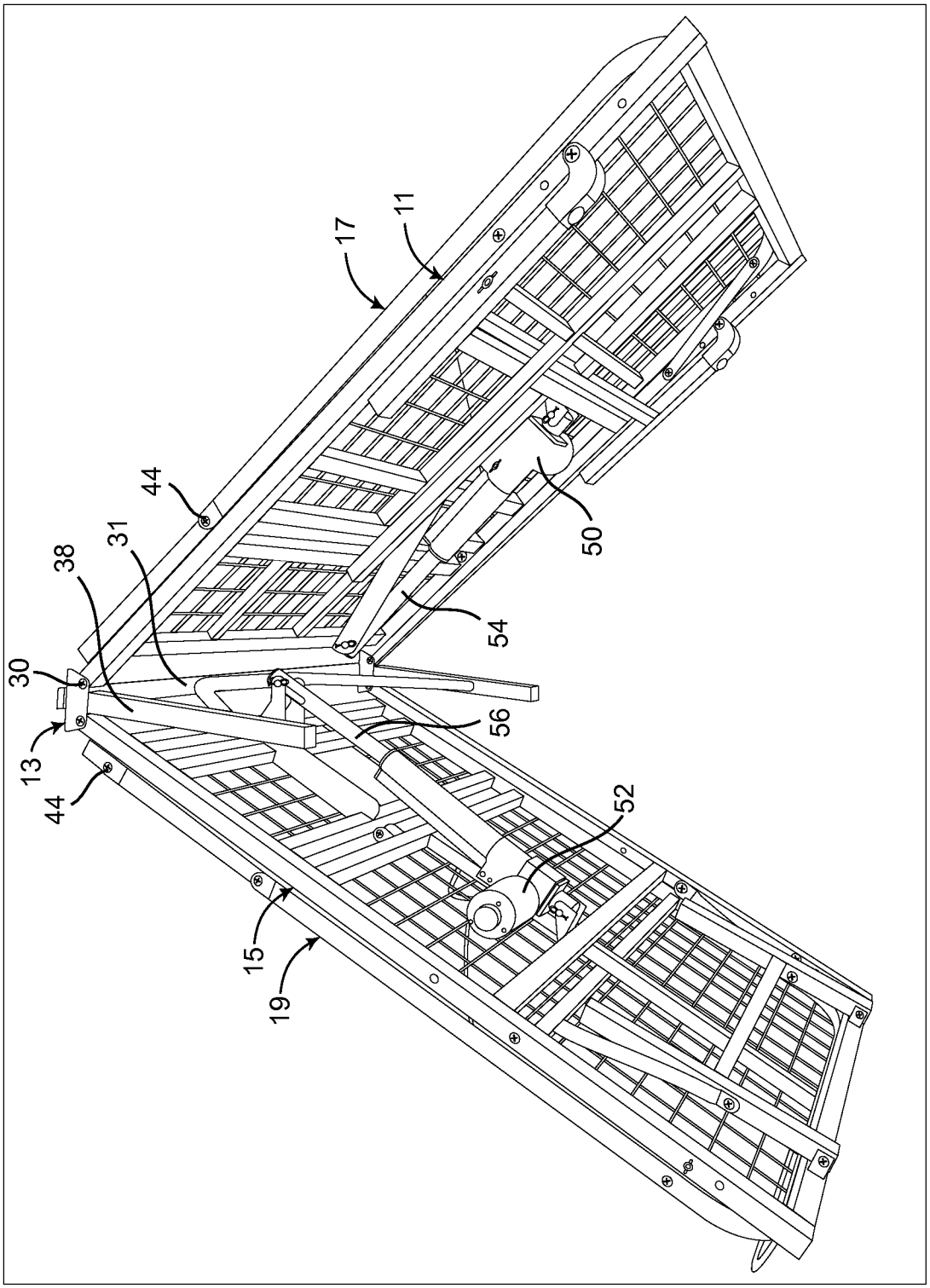

FIG. 3

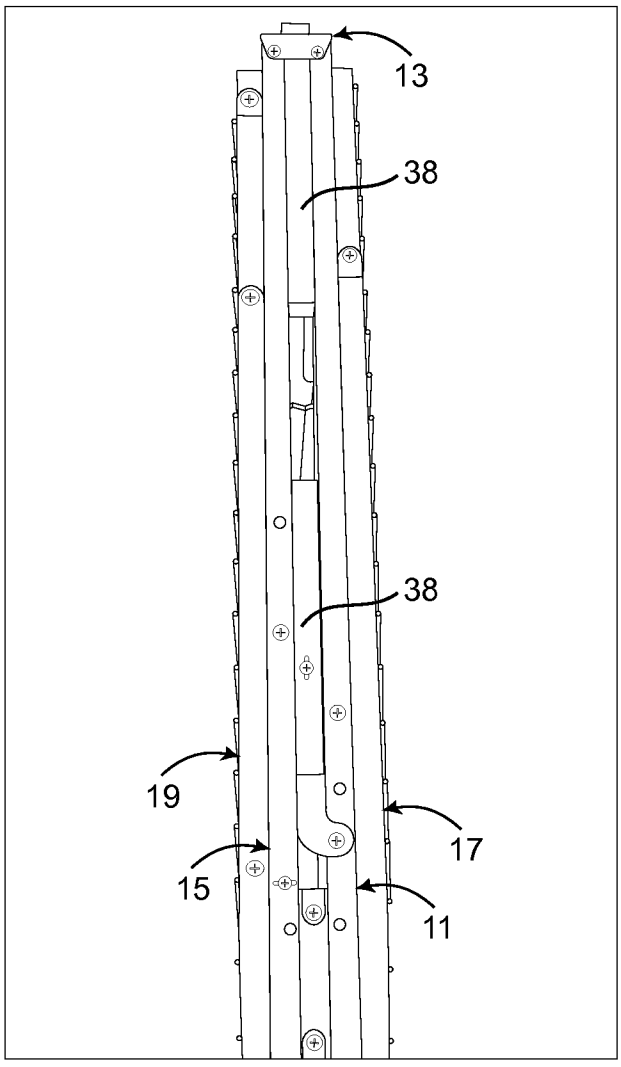

FIG. 4

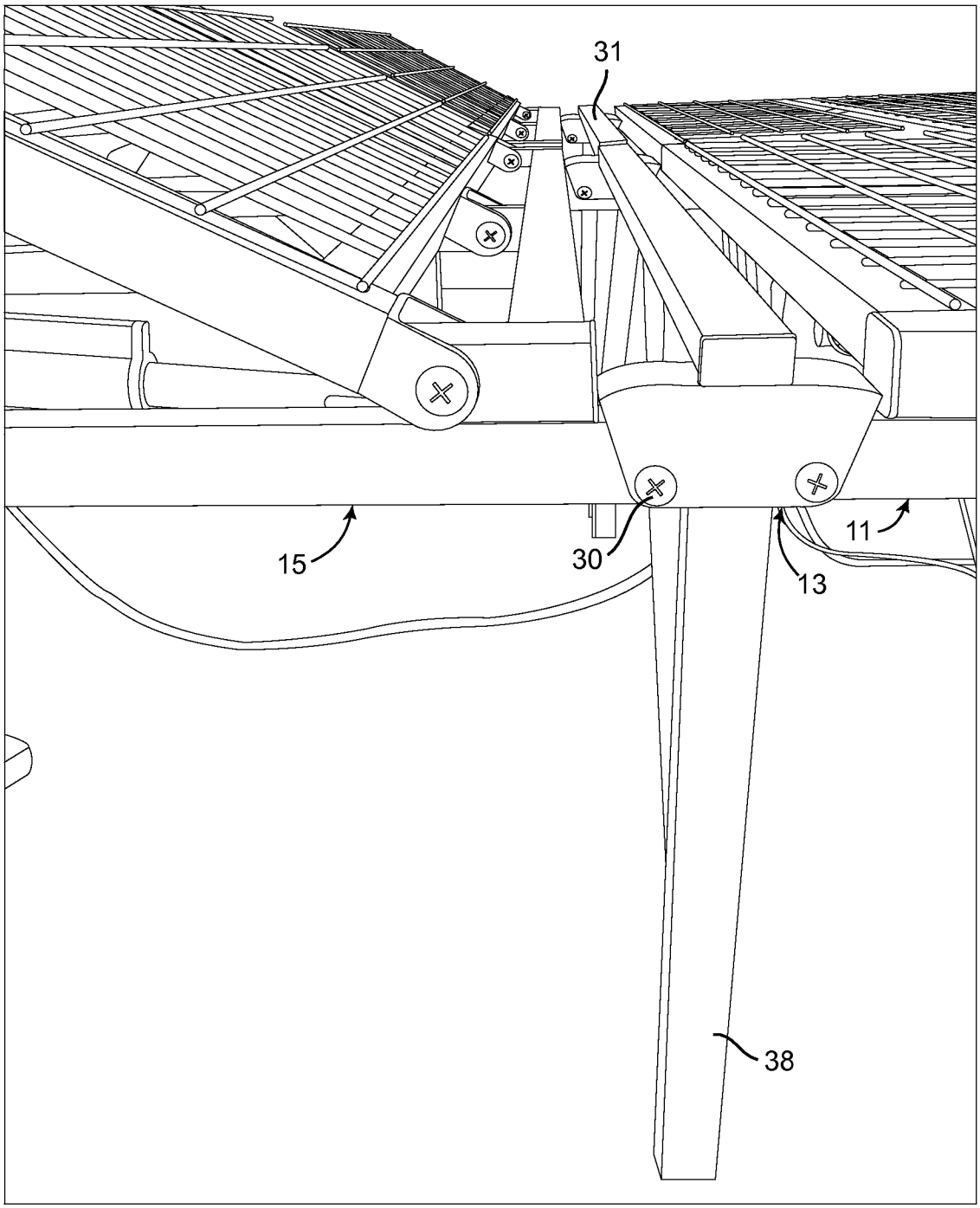

FIG. 5

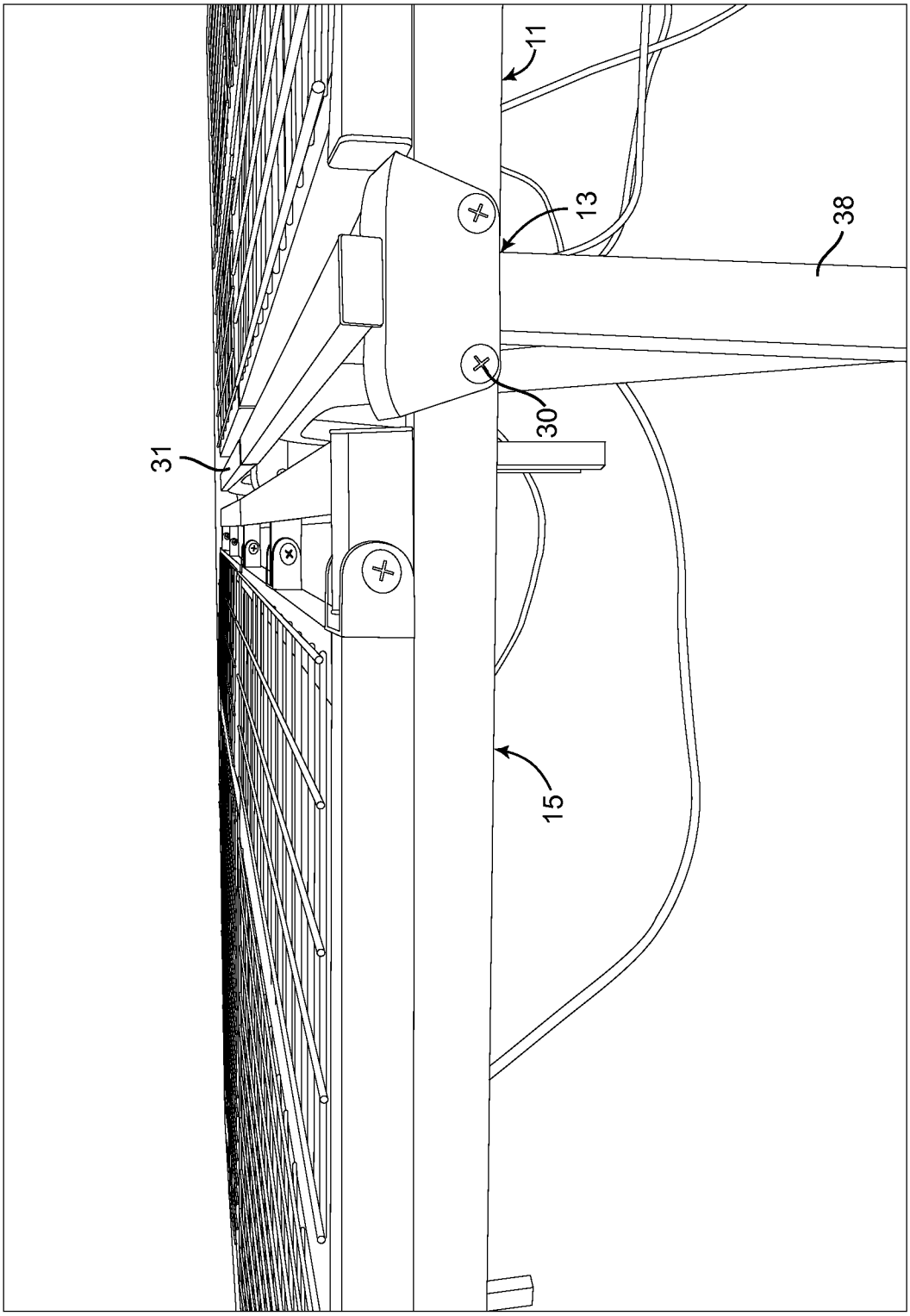

FIG. 6

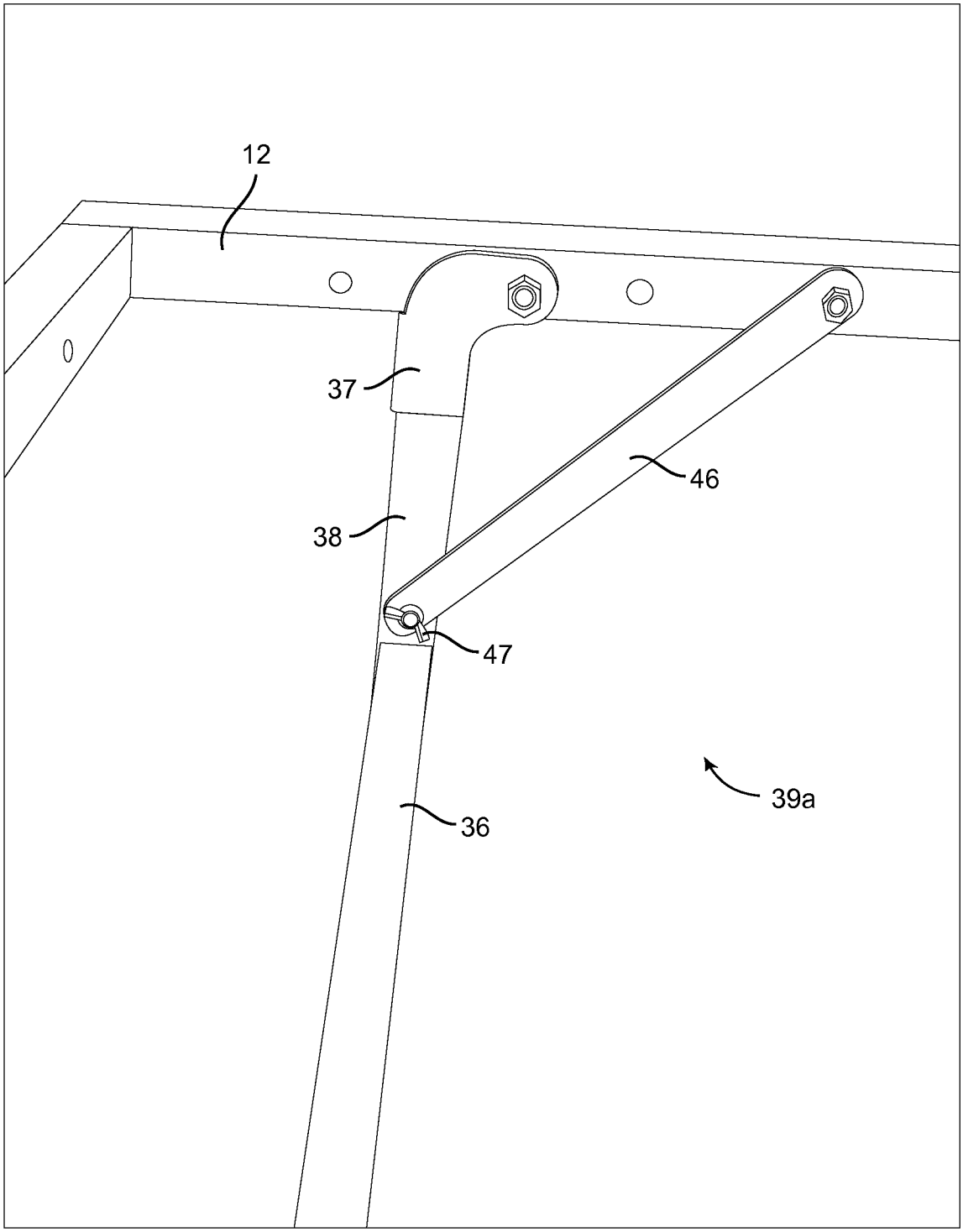

FIG. 7

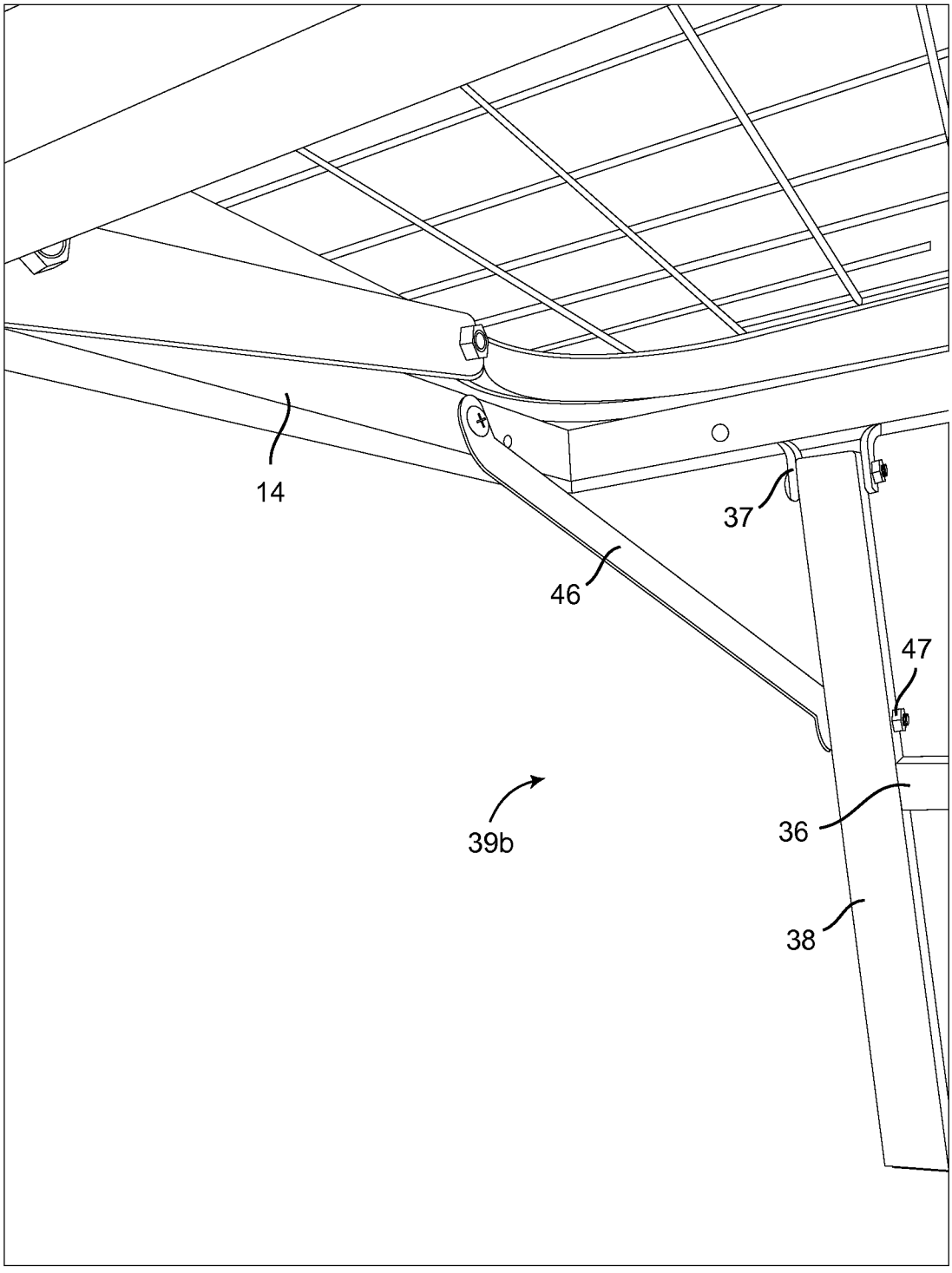

FIG. 8

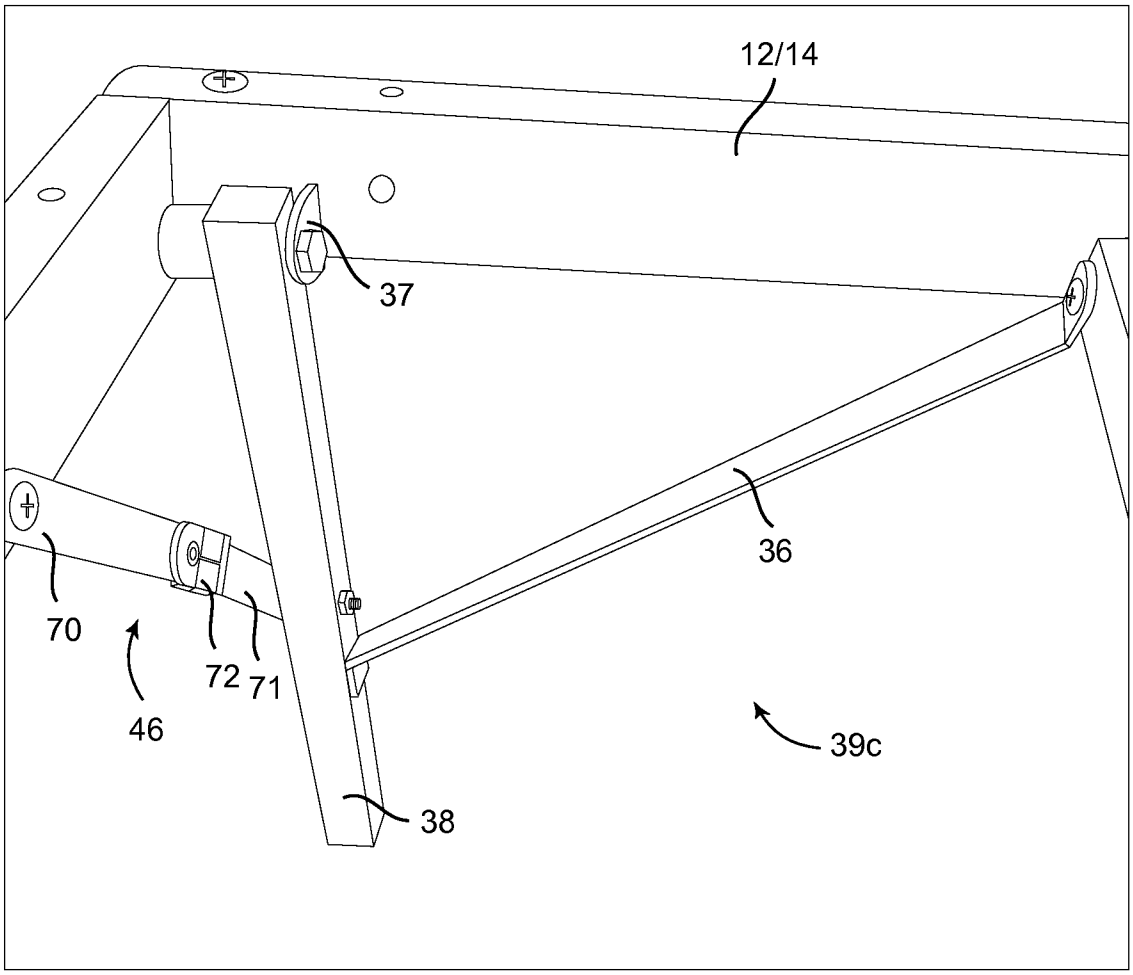

FIG. 9

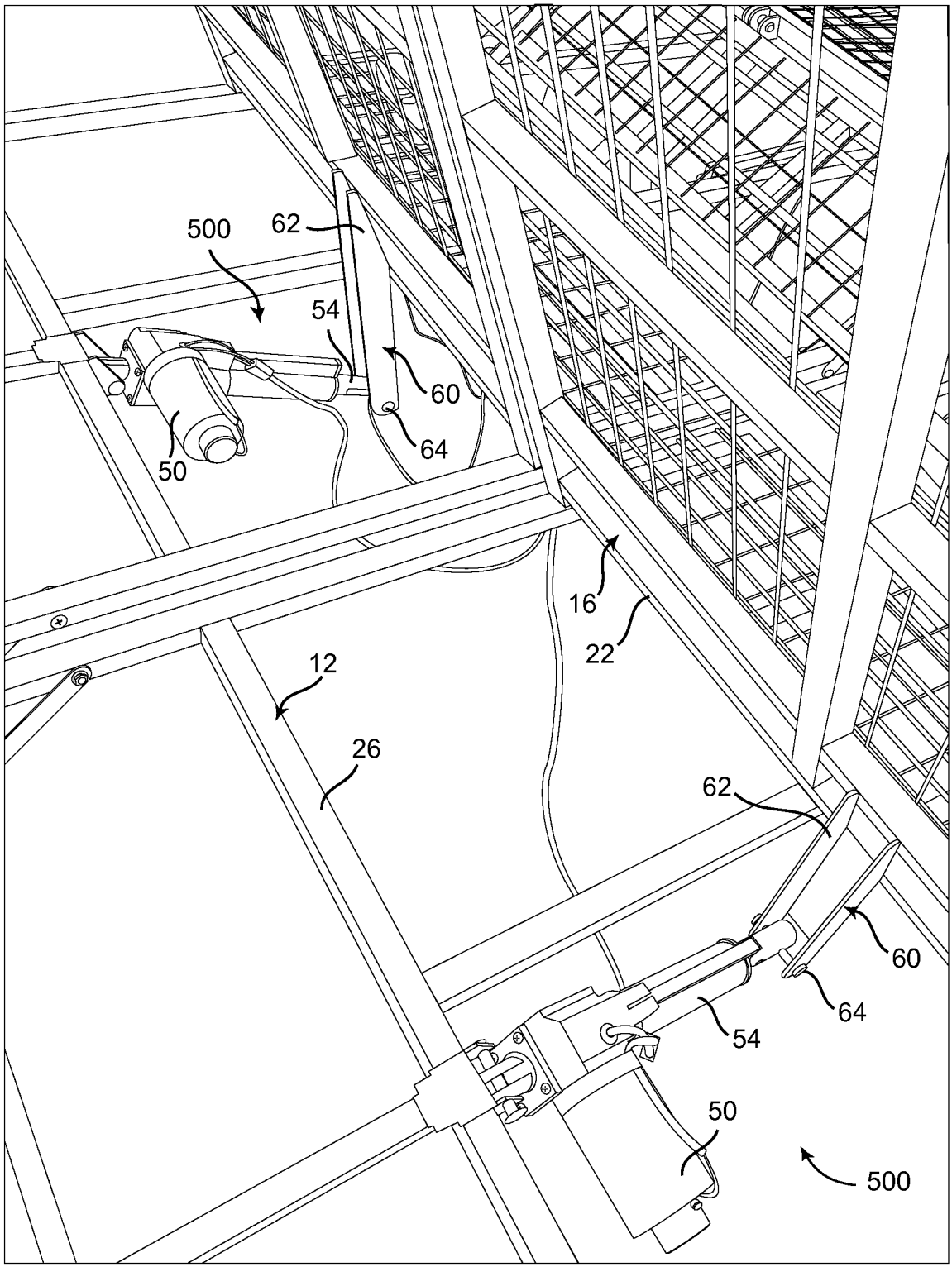

FIG. 10

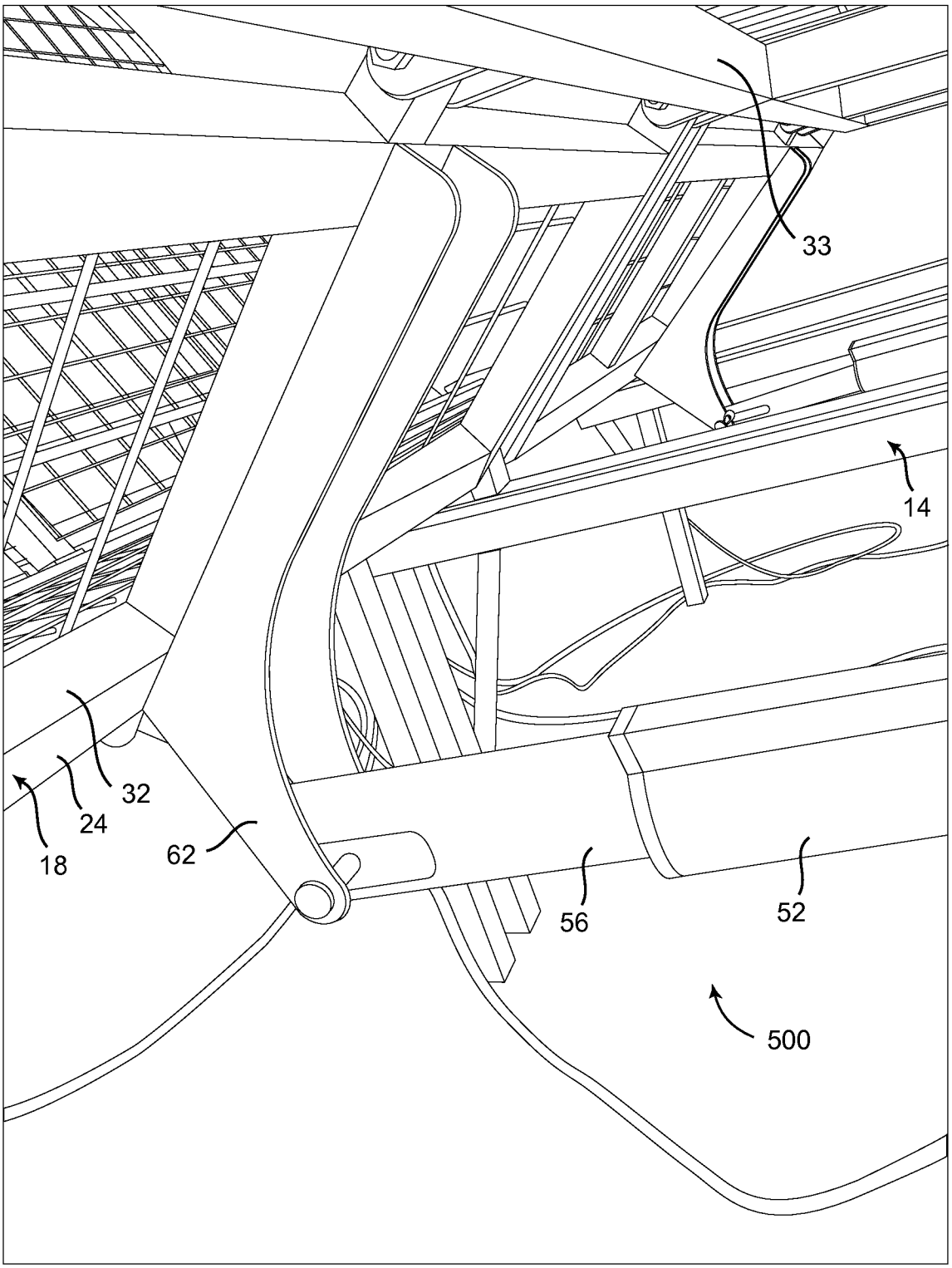

FIG. 11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2015/049629

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - A47C 20/04 (2015.01)
CPC - A47C 20/041 (2015.11)
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - A47C 19/02, 19/12, 19/20, 20/04, 20/12; A61G 7/002, 7/015, 7/018 (2015.01)
USPC - 5/11, 174, 612, 613, 616, 618, 619; 74/128; 254/124

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
CPC - A47C 19/021, 19/122, 19/20, 20/041, 20/12; A61G 7/002, 7/015, 7/018 (2015.11) (keyword delimited)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Orbit, Google Patents, Google Scholar, Google.
Search terms used: bed, frame, pivot, folding, motor, actuator, extended, jack, leg, couple, torso, calf, assembly, mattress, static, structure, thickness, package, perimeter, bar, movable.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 8,935,817 B2 (SUH) 20 January 2015 (20.01.2015) entire document	1-20
A	US 7,810,189 B2 (BOUDREAU) 12 October 2010 (12.10.2010) entire document	1-20
A	US 7,530,125 B2 (NEUENSWANDER) 12 May 2009 (12.05.2009) entire document	1-20
A	US 7,930,780 B2 (CLENET) 26 April 2011 (26.04.2011) entire document	1-20

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
01 November 2015	10 DEC 2015
Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer Blaine Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774