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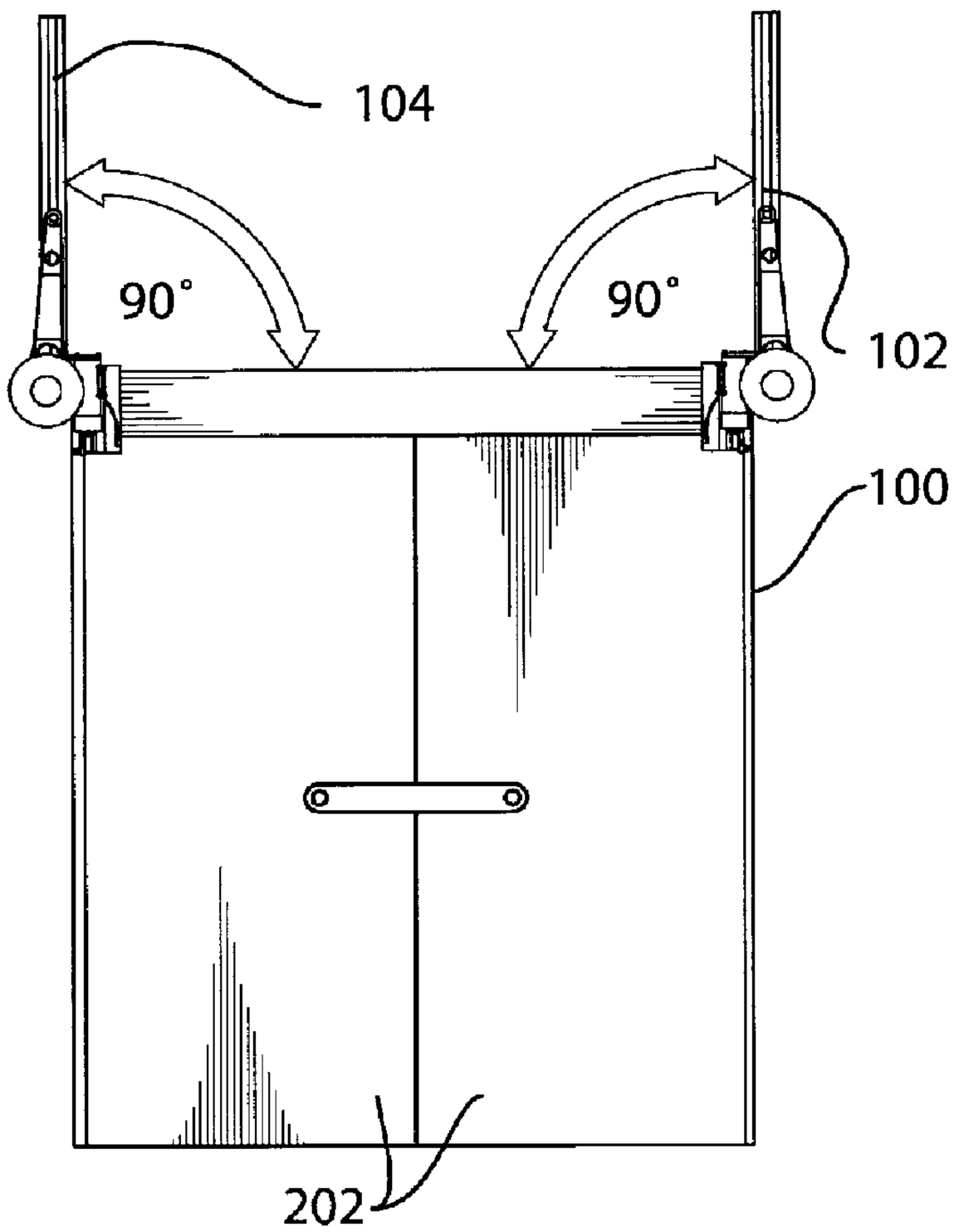

(57) Abrégé/Abstract:
A trailer comprising a chassis, a set of wheels for rollably supporting the chassis on the ground, and a rigid container carried by the chassis. The rigid container comprises a floor, a sidewall, an access door for loading/unloading materials into the container, and a

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(57) Abrégé(suite)/Abstract(continued):
convertible rigid roof. The convertible roof is movable between a closed position which permits waste or other materials to be compressed into the trailer, and an open position which permits the trailer to be loaded with bulk goods from the top. The convertible roof includes movable rigid panels, and a locking bar for holding the panels closed and connecting the opposite sidewalls of the trailer to each other against the expansion pressure exerted by loosely compressed materials transported in the trailer. The panels may be rotating panels hinged to a wall, or may be provided as sliding panels running in tracks.

ABSTRACT

A trailer comprising a chassis, a set of wheels for rollably supporting the chassis on the ground, and a rigid container carried by the chassis. The rigid container comprises a floor, a sidewall, an access door for loading/unloading materials into the container, and a convertible rigid roof. The convertible roof is movable between a closed position which permits waste or other materials to be compressed into the trailer, and an open position which permits the trailer to be loaded with bulk goods from the top. The convertible roof includes movable rigid panels, and a locking bar for holding the panels closed and connecting the opposite sidewalls of the trailer to each other against the expansion pressure exerted by loosely compressed materials transported in the trailer. The panels may be rotating panels hinged to a wall, or may be provided as sliding panels running in tracks.

CONVERTIBLE TRAILER

FIELD OF THE INVENTION

[0001] The present invention relates generally to the field of transportation. More particularly, the present invention relates to a trailer for the transportation of compacted garbage and/or bulk material.

BACKGROUND OF THE INVENTION

[0002] Garbage, waste, or any other materials which are compacted for transportation require the use of fixed walled containers or trailers which allow the transportation of materials in compacted form or compacting of the material in the container or trailer itself. These types of trailers cannot backhaul any bulk goods on the way back from the unloading site, as their fixed and closed top does not allow loading from the top using a conventional loader, similar to an open-top trailer.

[0003] With the rising cost of fuel, the disposal of garbage becomes increasingly expensive, especially when the trailer cannot backhaul any goods to reduce the cost of waste disposal, and thus, returns empty from the unloading site.

[0004] On the other hand, open top trailers, even those which include a cover, cannot be used for compacting or for the transport of loosely compacted material.

[0005] United States Patent Application Publication No.2007/0126209 (Wolfe) describes a trailer that converts into a shed. The trailer of Wolfe includes a convertible roof comprising two panels. However, the panels cannot be locked, and the walls are not rigid enough to withstand compressed materials.

[0006] European Patent Application No. 1,120,363 and United Kingdom Patent Application No. 2,429,006 (Sumpter) describe a trailer for the collection of waste comprising a chassis and a container. The container comprises a roof including an aperture closeable by a cover that slides over the aperture by means of a channel assembly. The cover may be a partly or fully retractable flexible sheet.

[0007] The structure of Sumpter does not allow the trailer to be used for transporting loosely compressed materials because the materials are distributed in the container using

reciprocating slats, not a compactor. Furthermore, the cover disclosed in Sumpter is flexible and would thus not be able to withstand any pressure from within the container. Sumpter clearly does neither teach nor suggest using the container disclosed for transport of loosely compacted materials.

[0008] Neither Wolfe nor Sumpter deal with loosely compacted materials, and thus, fail to recognize the structural challenged created by internal pressures in a trailer upon compression of loose materials therein.

[0009] It is, therefore, desirable to provide a trailer that can load and contain loosely compacted material, and which can also backhaul bulk goods on the way back from the unloading site in order to reduce the cost of transportation.

SUMMARY OF THE INVENTION

[0010] It is an object of the present invention to provide a trailer which can hold loosely compacted material or allows material to be compressed inside the trailer, but can also be loaded from the top to backhaul bulk goods on the way back from an unloading site.

[0011] This specification refers to loosely compacted materials which are compacted and maintained in the compacted condition solely by the trailer without any secondary containment or bundling structures. Thus, loosely compacted materials continuously exert an expansion on the containment structure in which they are held.

[0012] In an aspect, the invention provides a convertible trailer comprising a chassis, a set of wheels for rollably driving the chassis on the ground, a rigid container carried by the chassis comprising a floor, a wall, and a roof, and an access door for loading loosely compressed materials into the container. The roof includes a movable rigid panel connected to the wall of the container, and movable between a closed position wherein the panel forms part of a solid roof that permits the container to be loaded with loosely compressed materials from the access door, and an open position wherein the container can be loaded from the top with bulk material. The container includes a locking bar for securing the panel in the closed position and for strengthening the wall against the outward pressure exerted by the loosely compressed materials loaded in the container.

[0013] The container is preferably rectangular including a rear wall, a front wall and two opposite sidewalls. In an embodiment, the roof includes two panels hinged to the opposite sidewalls of the container. The locking bar is preferably secured to one panel and includes an opening which overlaps at least one threaded hole in the other panel when the panels are in closed position, for releasably locking two panels in the closed position. The locking bar is preferably provided adjacent and substantially aligned with the hinges connecting the panels to the sidewalls, for connecting the opposite sidewalls to each other against the outward pressure exerted by the loosely compressed materials compacted in the trailer.

[0014] The container includes a rotation mechanism for moving the panel between the closed position and the open position. The rotation mechanism may be stoppable at any position of the panels.

[0015] In another aspect of the invention, the invention provides a convertible container for bulk goods or loosely compacted materials, comprising a floor, a wall, a roof, and an access door for loading loosely compressed materials into the container. The roof includes a movable rigid panel connected to the wall of the container, and movable between a closed position wherein the panel forms part of a solid roof that permits the container to be loaded with loosely compressed materials from the access door, and an open position wherein the container can be loaded from the top with bulk material. The container includes a locking bar for securing the panel in the closed position and for strengthening the wall against the outward pressure exerted by the loosely compressed materials loaded in the container.

[0016] In a further aspect, the invention provides a convertible trailer comprising a chassis, a set of wheels for rollably driving said chassis on the ground, a rigid container carried by the chassis comprising a floor, a roof, a front wall, a rear wall and two sidewalls, and an access door for loading loosely compressed materials into the container. The roof includes a plurality of rigid sliding panels movable in tracks between a closed position wherein the panels form part of a solid roof that permits the container to be loaded with loosely compressed materials from the access door, and an open position wherein the container can be loaded from the top with bulk material. The container includes a locking bar

for securing the panels in the closed position, and for strengthening the sidewalls against the outward pressure exerted by the loosely compressed materials loaded in the container.

[0017] Other aspects and features of the present invention will become apparent to those ordinarily skilled in the art upon review of the following description of specific embodiments of the invention in conjunction with the accompanying figures.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] Embodiments of the present invention will now be described, by way of example only, with reference to the attached Figures, wherein:

Figure **1** is a top view of a convertible trailer in accordance with an embodiment of the invention;

Figure **2** is a rear view of the container of the trailer when the panels are 90 degrees open;

Figure **3** is a rear view of the container of the trailer when the panels are fully open and the trailer is being loaded from the top;

Figure **4** is an exploded view illustrating an embodiment of the invention, in which, the locking bar is provided at both panels;

Figure **5** illustrates the rotation mechanism of the panels;

Figure **6** illustrates a container including a one-piece roof connected to a sidewall;

Figure **7** illustrates a container including a one-piece roof connected to the rear wall;

Figure **8** illustrates a container including a one-piece roof connected to the front wall;

Figure **9** illustrates a container trailer including two panels connected to the rear and front walls of the trailer;

Figure **10a** is a top view of a container including a convertible roof comprising four panels in closed position;

Figure **10b** illustrates an embodiment of the container of Figure **10a**, in which, all of the four panels are in open position;

Figure **11a** is a top view of a container including a convertible roof comprising three panels in closed position;

Figure **11b** illustrates an embodiment of the container of Figure **11a**, in which, all of the three panels are in open position;

Figure **12a** is a top view of a container including a convertible roof comprising sliding panels movable perpendicular to the longitudinal direction of the trailer;

Figure **12b** illustrates an embodiment of the convertible roof of Figure **12a** when in the open position;

Figure **12c** illustrates another embodiment of the convertible roof of Figure **12a** when in the open position;

Figure **13a** is a top view of a container including a convertible roof comprising sliding panels movable parallel to the longitudinal direction of the trailer;

Figure **13b** illustrates an embodiment of the convertible roof of Figure **13a** when in the open position; and

Figure **13c** illustrates another embodiment of the convertible roof of Figure **13a** when in the open position.

DETAILED DESCRIPTION

[0019] Generally, the present invention provides a container for loosely compacted materials which is convertible to a top loading bulk good container. In a preferred embodiment the invention provides a trailer comprising a chassis, a set of wheels for rollably supporting the chassis on the ground, and a rigid container carried by the chassis. The rigid container comprises a floor, a sidewall, an access door for loading/unloading materials into the container, and a convertible rigid roof. The convertible roof is movable between a closed position which permits waste or other materials to be compressed into the trailer, and an open position which permits the trailer to be loaded with bulk goods from the top. The convertible roof includes movable rigid panels, and a locking bar for holding the panels closed and connecting the opposite sidewalls of the trailer to each other against the expansion pressure exerted by loosely compressed materials transported in the trailer. The

panels may be rotating panels hinged to a wall, or may be provided as sliding panels running in tracks.

[0020] Figure **1** illustrates by way of example, a top view of a convertible trailer **100** in accordance with an embodiment of the invention. In the embodiment shown in Figure **1**, the roof of the trailer is made of two movable panels **102** and **104**. When the panels **102** and **104** are in a closed position, as illustrated in Figure **1**, the convertible trailer **100** may be loaded with loosely compressed materials, such as garbage, from the access door using a compactor (not shown). The compactor applies pressure on the materials loaded in order to remove gaps for the most efficient use of the space inside the trailer. When the compactor is operated, the roof must be closed and rigid in order to withstand the outward expansion pressure exerted by the loose materials being compacted.

[0021] Once the convertible trailer **100** is unloaded at the unloading site, it may be loaded again to backhaul bulk goods on the return trip, in order to reduce transportation costs. If uncompressed bulk goods are to be transported, the convertible roof of the trailer **100** may be opened to allow the loading of the convertible trailer **100** from the top. For instance, the trailer **100** may be loaded with bulk goods like sand, gravel, or the like using a conventional loader **110**. Figure **2** is a rear view of the container of convertible trailer **100** when the panels **102** and **104** are **90** degrees open, and the access door **202** is closed, while Figure **3** is a rear view of the container of the convertible trailer **100** when the panels **102** and **104** are fully open (**270** degrees), and the trailer is being loaded from the top.

[0022] As shown in Figures **1** to **3**, panels **102** and **104** are movable between a closed position, in which, the panels are substantially parallel and coplanar so as to form a solid hard roof as shown in Figure **1**, and an open position, in which, the panels are **270** degrees rotated from the closed position and, in which, the panels are substantially parallel to the left and right sidewalls of the trailer, as shown in Figure **3**.

[0023] When panels **102** and **104** are in the closed position, at least one locking bar **106** secures both panels to each other. The locking bar **106** may be provided on one of the panels or on both. Figure **4** is an exploded view showing by way of example the locking bar **106** provided at both panels, in accordance with an embodiment of the invention. The locking bar **106** may be welded or permanently secured to one of the panels at one side and has one

or more openings **400** at the other side, as illustrated in Figure **4**. The openings **400** provided in the locking bar overlap one or more threaded openings **402** in the other panel when the panels are in closed position for releasably securing the locking bar **106** to the other panel using bolts or the like.

[0024] Panels **102** and **104** are connected to the sidewalls of the trailer by hinges **108** as shown in Figures **1** and **4**. The locking bar **106** is provided adjacent, and preferably aligned with the hinges **108** for connecting the sidewalls **112** and **114** to each other against the outward expansion pressure exerted by the loose materials being compacted for preventing the sidewalls and the roof from bulging out and deforming.

[0025] Panels **102** and **104** are provided with a rotation mechanism that allows them to move between the closed position shown in Figure **1**, and the open position shown in Figure **3**. Figure **5** illustrates, by way of example, an embodiment of the rotation mechanism that rotates the panels. As shown in Figure **5**, the rotation mechanism includes a bracket **502** and a worm drive or any other suitable rotating means **504**. The bracket **502** is provided at the side of each of panels **102** and **104**, and connected to the panel at one end and to the motor **504** at the other end.

[0026] While Figures **1** to **4** illustrate a roof that is made by two panels that open sideways, the convertible roof can be implemented in many different ways. For instance, Figure **6** illustrates a container **600** of a convertible trailer including a one-piece roof panel **602** which is connected to one of the sidewalls **604** by hinges **606**. Similar to the panels **102** and **104** of Figure **1**, the panel **602** is provided with a rotation mechanism **608** that allows it to move between a closed position that allows garbage to be loaded in the trailer using a compactor, and an open position that allows the trailer to be loaded from the top. The container **600** includes at least one locking bar **610** adjacent the hinge **606** and a lock **612** provided on the opposite sidewall for releasably locking the panel **602** when in closed position, and connecting the opposite sidewalls **604** to each other against the outward expansion pressure exerted by the loose materials being compacted. The lock **612** may be connected to panel **602** adjacent the locking bar **610**, or may be connected to the locking bar directly.

[0027] The rotation mechanism **608** is similar to the bracket and motor combination illustrated in Figure **5**. Due to the size of the roof, which is approximately double the size of each panel **102** and **104**, it is possible to use the rotating mechanism at opposite sides of the roof **602** e.g. one at the front and one at the back of the trailer, as illustrated in Figure **6**.

[0028] Figures **7** illustrates a different embodiment, in which, the convertible trailer includes a container **700** comprising a one-piece roof panel **702** connected to the rear wall **704** by hinges **706**. The convertible trailer **700** is equipped with a rotating mechanism **708** to open and close the roof **702**. The roof **702** opens backward as indicated by arrow **710**. The container **700** includes at least one locking bar **712** provided at the panel **702**, and locks **716** provided at the opposite sidewalls **714** for releasably locking the panel **702** when in closed position, and for connecting the opposite sidewalls **714** to each other against the outward expansion pressure exerted by the loose materials compacted in the trailer. The locks **716** may be connected to the panel **702** adjacent the locking bar **712**, or may be connected directly to the locking bar **712**.

[0029] Figure **8** illustrates an embodiment, in which, the convertible trailer includes a container **800** comprising a one-piece roof panel **802**. In the embodiment illustrated in Figure **8**, the roof **802** is connected to the front wall **804** by hinges **806**. The convertible trailer **800** is equipped with a rotating mechanism **808** to open and close the roof **802**. The roof **802** opens forward as indicated by arrow **810**.

[0030] Similar to container **700** of Figure **7**, the container **800** includes at least one locking bar **812** provided at the panel **802** and locks **816** provided at the sidewalls for for releasably locking the panel **802** in the closed position, and for connecting opposite sidewalls **814** to each other against the outward expansion pressure exerted by the loose materials compacted in the trailer. The locks **816** may be connected to the panel **802** adjacent the locking bar **812**, or may be connected to the locking bar **812** directly.

[0031] In another embodiment, as illustrated by way of example in Figure **9**, the convertible trailer includes a container **900** comprising a convertible roof including two panels **902** and **904** connected to the rear and front walls of the trailer, respectively. Panels **902** and **904** are connected to the walls by hinges **906**. The convertible trailer **900** is equipped with a rotating mechanism **908** to open and close the panels **902** and **904**. Panel **902** opens

backward as indicated by arrow **910**, while panel **904** opens forward as indicated by arrow **912**.

[0032] Each of panels **902** and **904** is provided with at least one locking bar **914,** and sidewalls **916** are provided with locks **918** for releasably locking the panels **902** and **904** in the closed position, and for connecting opposite sidewalls **916** to each other against the outward expansion pressure exerted by the loose materials compacted in the trailer. The locks **918** may be connected to the panels **902** and **904** adjacent the locking bars **914**, or may be connected directly to the locking bars **914**.

[0033] Figure **10a** is a top view of a container **1000** of a trailer including a convertible roof comprising four panels **1002**, **1004**, **1006**, and **1008**, when the panels are in closed position. The panels are hinged to the walls by hinges **1010**. Panels **1002**, **1004**, **1006**, and **1008** are connected to the rear wall **1012**, sidewalls **1014** and **1016**, and front wall **1018**, respectively.

[0034] Figure **10b** illustrates an embodiment of the convertible trailer **1000** of Figure **10a**, in which, all of the four panels are in an open position. As illustrated in Figure **10b**, the convertible trailer **1000** is equipped with a rotating mechanism **1019** to open and close the panels. Panel **1002** opens backward as indicated by arrow **1020**, panel **1008** opens forward as indicated by arrow **1022**, and panels **1004** and **1006** open sideways as indicated by arrows **1024** and **1026**, respectively.

[0035] Panels **1002**, and **1008** are provided with a locking bar **1028,** and sidewalls **1014** and **1016** are provided with locks **1030** for releasably locking the panels **1002** and **1008** in the closed position, and for connecting the opposite sidewalls **1014** and **1016** to each other against the outward expansion pressure exerted by the loose materials compacted in the trailer.

[0036] Panels **1004** and **1006** may be locked to each other similar to panels **102** and **104** of Figures **1** and **4**. That is, a locking bar **1032** may be provided on either or both of panels **1004** and **1006** aligned with or adjacent hinges **1010**. The locking bar **1032** may be welded or permanently secured to one of the panels **1004** and **1006** at one side, and has one or more openings **1034** at the other side. The openings **1034** of the locking bar **1032** overlap one or more threaded openings in the other panel e.g. panel **1004** in Figures **10**a and **10**b,

when the panels are in closed position for releasably securing the locking bar **1032** to panel **1004** using bolts or the like, and for connecting opposite sidewalls **1014** and **1016** to each other to prevent them from bulging out and deforming under the outward expansion pressure exerted by the loose materials compacted in the trailer.

[0037] Although all the four panels are shown open in Figure **10b**, it is possible to selectively choose one or more panels to open while the other panel(s) is in closed position.

[0038] Figure **11a** is a top view of a container **1100** of a trailer including a convertible roof comprising three panels **1102**, **1104**, and **1006**, when the panels are in closed position. Panel **1106** is connected to rear wall **1108**, panel **1104** is connected to one of the sidewalls **1110**, and panel **1102** is connected to front wall **1112**. The panels are connected to the walls by hinges **1114**.

[0039] Figure **11b** illustrates an embodiment of the convertible trailer **1100** of Figure **11a.** As illustrated in Figure **11b**, the convertible trailer **1100** is equipped with a rotating mechanism **1115** to open and close the panels. Panel **1102** opens forward as indicated by arrow **1116**, panel **1106** opens backward as indicated by arrow **1118**, and panel **1104** opens sideway as indicated by arrow **1120**. Each of the panels is provided with a locking bar **1120** and the sidewalls are provided with locks **1122** for releasably locking the panels in the closed position and for connecting the opposite sidewalls **1110** to each other to prevent them from bulging out and deforming under the outward expansion pressure exerted by the loose materials compacted in the trailer. The locking bar **1120** of panel **1104** is provided aligned with and/or adjacent the hinge **1114** for providing a strong connection between the sidewalls **1110**.

[0040] Although all the three panels are shown open in Figure **11b**, it is possible to selectively choose one or more panels to open while the other panel(s) is in closed position.

[0041] Figure **12a** is a top view of a container **1200** of a trailer including a convertible roof comprising a plurality of sliding panels **1201**, **1202**, **1204**, **1206**, **1208**, **1210**. The container includes at least one locking bar **1212** extending between the opposite sidewalls **1214** and **1216** in order to connect the sidewalls to each other for preventing the sidewalls and the panels **1201** to **1210** from bulging out and deforming under the outward expansion

pressure exerted by the loose materials compacted in the trailer. Sliding panels **1201** to **1210** open and close in a direction perpendicular to the longitudinal direction of the trailer.

[0042] Figure **12b** illustrates an embodiment of the container **1200**, in which, the convertible roof opens when a number of sliding panels move toward sidewall **1214** as indicated by arrow **1218**, and the other sliding panels move toward sidewall **1216** as indicated by arrow **1220**. The panels can be stored in storage compartments **1222** adjacent the sidewalls **1214** and **1216**.

[0043] Figure **12c** illustrates a different embodiment of the container **1200**, in which, the sliding panels move in one direction, as indicated by way of example, by arrow **1224**. In the embodiment illustrated in Figure **12c**, only one storage compartment **1222** needs to be provided for storing the sliding panels. While Figure **12c** illustrates the sliding panels moving toward sidewall **1214**, it is also possible to implement the system so that the panels move in the opposite direction toward sidewall **1216**.

[0044] Figure **13a** is a top view of container **1300** of a convertible, in accordance with another embodiment of the invention, in which a convertible roof comprises a plurality of sliding panels **1301**, **1302**, **1304**, **1306**, **1308**, **1310** etc. which open and close parallel to the longitudinal direction of the trailer **1300**. A storage compartment **1312** is provided adjacent the rear wall **1314** and/or front wall **1316** of the trailer **1300** for storing the sliding panels when the roof is in open position. The container **1300** includes at least one locking bar **1318** extending between the opposite sidewalls **1320** and **1322** in order to connect the sidewalls to each other for preventing the sidewalls and the panels **1301** to **1310** from bulging out and deforming under the outward expansion pressure exerted by the loose materials compacted in the trailer.

[0045] Figure **13b** illustrates an embodiment of the container **1300**, in which the convertible roof opens when the sliding panels move in one direction as indicated by arrow **1318**. While Figure **13b** illustrates the sliding panels moving toward the rear wall **1314**, it is also possible to implement the system so that the panels move in the opposite direction toward the front wall **1316**.

[0046] Figure **13c** illustrates another embodiment of the container **1300**, in which the convertible roof opens when the panels move in opposite directions as indicated by arrows

1320 and **1322**. That is, some of the panels move backward toward rear wall **1314**, and the other ones move forward toward the front wall **1316**.

[0047] In the embodiments shown in Figures **12a** to **13c**, the convertible roof is equipped with a drive mechanism (now shown) for moving the sliding panels between an open position and closed position. The implementation of such rotation mechanism is known for someone of skill in the art, and need not to be described in detail herein.

[0048] Additionally, while the embodiments shown and described herein, disclose a roof that is completely convertible, it is also possible to provide a roof that is partially convertible by having a convertible portion and a stationary portion. It is also possible to have a convertible roof that is made of both sliding panels, in accordance with one of the embodiments shown in Figures **12a** to **13c**, and rotating panels in accordance with one of the embodiments shown in Figures **1** to **11b**.

[0049] Moreover, the movement of the rotating and/or sliding panels may be stopped and/or paused at any position desired.

[0050] While the embodiments shown in Figures **1** to **13c** illustrate a longitudinal container, it is possible to implement the convertible roof of the invention in a trailer having oval, cylindrical, or any polygonal shaped container including a floor, a sidewall, and an access door for loading compressed materials when the convertible roof is in closed position.

[0051] Furthermore, different locks may be used for locking the panels in closed positions for connecting opposite sidewalls by the locking bar against the outward pressure of the compressed materials. The implementation and details of such locks are known in the art, and will not be described in detail herein.

[0052] In the preceding description, for purposes of explanation, numerous details are set forth in order to provide a thorough understanding of the embodiments of the invention. However, it will be apparent to one skilled in the art that these specific details are not required in order to practice the invention.

[0053] The above-described embodiments of the invention are intended to be examples only. Alterations, modifications and variations can be effected to the particular embodiments by those of skill in the art without departing from the scope of the invention, which is defined solely by the claims appended hereto.

CLAIMS:

1. A convertible trailer comprising:

a chassis;

a set of wheels for rollably driving said chassis on the ground;

a rigid container carried by the chassis comprising a floor, a wall, and a roof;

an access door for loading loosely compressed materials into the container;

said roof including a movable rigid panel connected to the wall of the container, and movable between a closed position wherein the panel forms part of a solid roof that permits the container to be loaded with loosely compressed materials from the access door, and an open position wherein the container can be loaded from the top with bulk material; and

a locking bar for selectively maintaining the panel in the closed position against outward pressure exerted by the loosely compressed materials when loaded in the container and for strengthening the wall against the outward pressure.

2. The convertible trailer of claim 1, wherein the container includes a rotation mechanism for moving the panel between the closed position and the open position.

3. The convertible trailer of claim 1, wherein the roof includes a stationary portion, and a convertible portion.

4. The convertible trailer of claim 2, wherein the container is rectangular shaped, and the wall of the container includes a rear wall, a front wall and two opposite sidewalls.

5. The convertible trailer of claim 2, wherein the rotation mechanism is stoppable at any position of the panels.

6. A convertible trailer, comprising:

a chassis;

a set of wheels for rollably driving said chassis on the ground;

a rigid container carried by the chassis comprising a floor, a wall, and a roof;

an access door for loading loosely compressed materials into the container;

said roof including a movable rigid panel connected to the wall of the container, and movable between a closed position wherein the panel forms part of a solid roof that permits the container to be loaded with loosely compressed materials from the access door, and an open position wherein the container can be loaded from the top with bulk material; and

a locking bar for selectively maintaining the panel in the closed position against outward pressure exerted by the loosely compressed materials when loaded in the container and for strengthening the wall against the outward pressure;

wherein the container includes a rear wall, a front wall and two opposite sidewalls; and

wherein the roof includes two panels, one panel connected to one of the sidewalls and the other panel connected to one of the rear and front walls.

7. The convertible trailer of claim 6, wherein the convertible roof includes three panels, one connected to one of the sidewalls, and the other two are connected to the front and rear walls.

8. The convertible trailer of claim 6, wherein the convertible roof includes three panels, one connected to one of the front and rear walls, and the other two are connected to the sidewalls.

9. The convertible trailer of claim 6, wherein the convertible roof includes four panels, one panel connected to each wall.

10. A convertible trailer comprising:

a chassis;

a set of wheels for rollably driving said chassis on the ground;

a rigid container carried by the chassis comprising a floor, a wall, and a roof;

an access door for loading loosely compressed materials into the container;

said roof including a movable rigid panel connected to the wall of the container, and movable between a closed position wherein the panel forms part of a solid roof that permits the container to be loaded with loosely compressed materials from the access door, and an open position wherein the container can be loaded from the top with bulk material; and

a locking bar for selectively maintaining the panel in the closed position against outward pressure exerted by the loosely compressed materials when loaded in the container and for strengthening the wall against the outward pressure;

wherein the container includes a rear wall, a front wall and two opposite sidewalls; and

wherein the roof includes two panels hinged to the opposite sidewalls of the container, and wherein the locking bar is secured to one panel and includes an opening which overlaps at least one threaded hole in the other panel when the panels are in closed position, for releasably locking two panels in the closed position.

11. The convertible trailer of claim 10, wherein the locking bar is provided adjacent and substantially aligned with the hinges connecting the panels to the sidewalls, for connecting the opposite sidewalls to each other against the outward pressure exerted by the loosely compressed materials compacted in the trailer.

12. A convertible container for bulk goods or loosely compacted materials, comprising:

a floor;

a wall with an access door for loading loosely compressed materials into the container;

a roof, said roof including a movable rigid panel connected to the wall of the container, and movable between a closed position wherein the panel forms part of a solid roof that permits the container to be loaded with loosely compressed materials from the access door, and an open position wherein the container can be loaded from the top with bulk material; and

a locking bar for selectively maintaining the panel in the closed position against outward pressure exerted by the loosely compressed materials when loaded in the container and for strengthening the wall against the outward pressure.

13. A convertible trailer comprising:

a chassis;

a set of wheels for rollably driving said chassis on the ground;

a rigid container carried by the chassis comprising a floor, a roof, a front wall, a rear wall and two sidewalls;

an access door for loading loosely compressed materials into the container;

said roof including a plurality of rigid sliding panels movable in tracks between a closed position wherein the panels form part of a solid roof that permits the container to be loaded with loosely compressed materials from the access door, and an open position wherein the container can be loaded from the top with bulk material; and

a locking bar for selectively maintaining the panel in the closed position against outward pressure exerted by the loosely compressed materials when loaded in the container and for strengthening the wall against the outward pressure.

14. The convertible trailer of claim 13, wherein the sliding panels move in a direction that is perpendicular to the longitudinal direction of the trailer.

15. The convertible trailer of claim 14, wherein some of the panels move toward one of the sidewalls and the other panels move toward the opposite sidewall to open.

16. The convertible trailer of claim 13, wherein the sliding panels move in a direction that is parallel to the longitudinal direction of the trailer.

17. The convertible trailer of claim 16, wherein some of the panels move toward the rear wall and the other panels move toward the front wall to open.

18. The convertible trailer of claim 13, wherein the container is provided with a drive mechanism for moving the panels between the closed position and the open position.

19. The convertible trailer of claim 18, wherein the drive mechanism is stoppable at any position of the panels.

20. The convertible trailer of claim 13, wherein the roof includes a stationary portion, and a convertible portion.

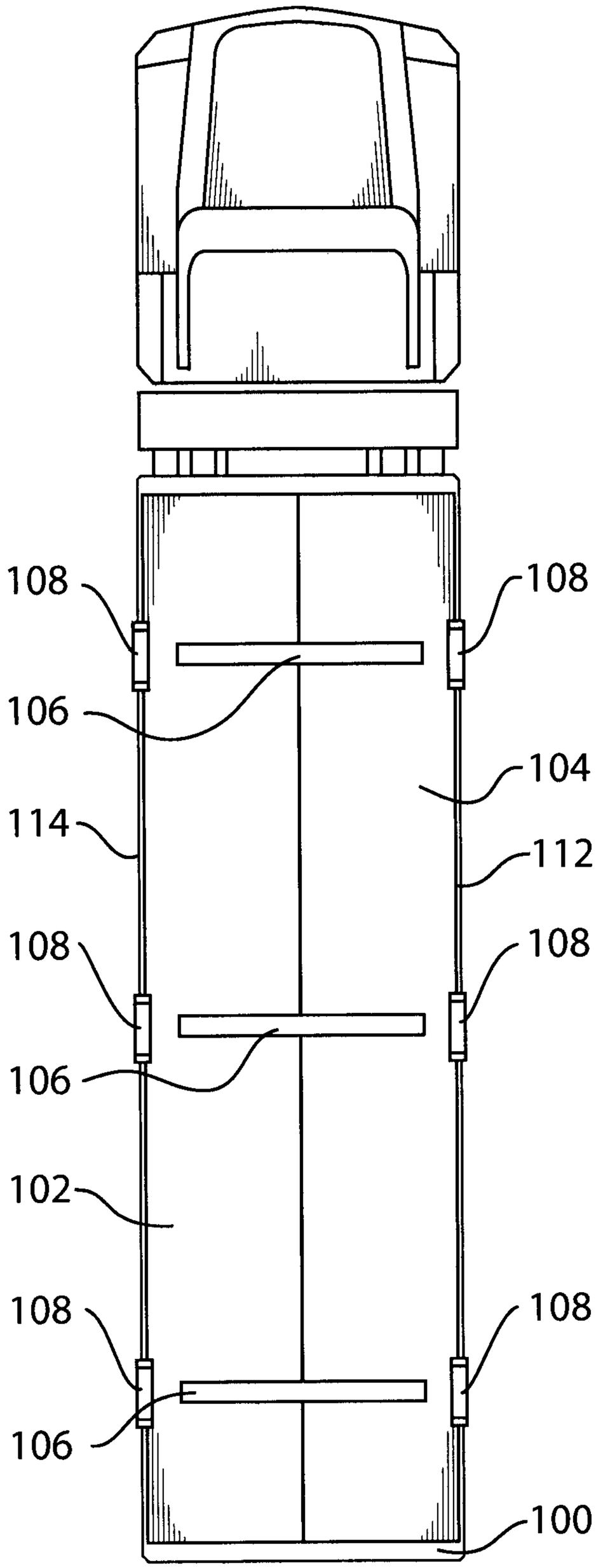

FIG. 1

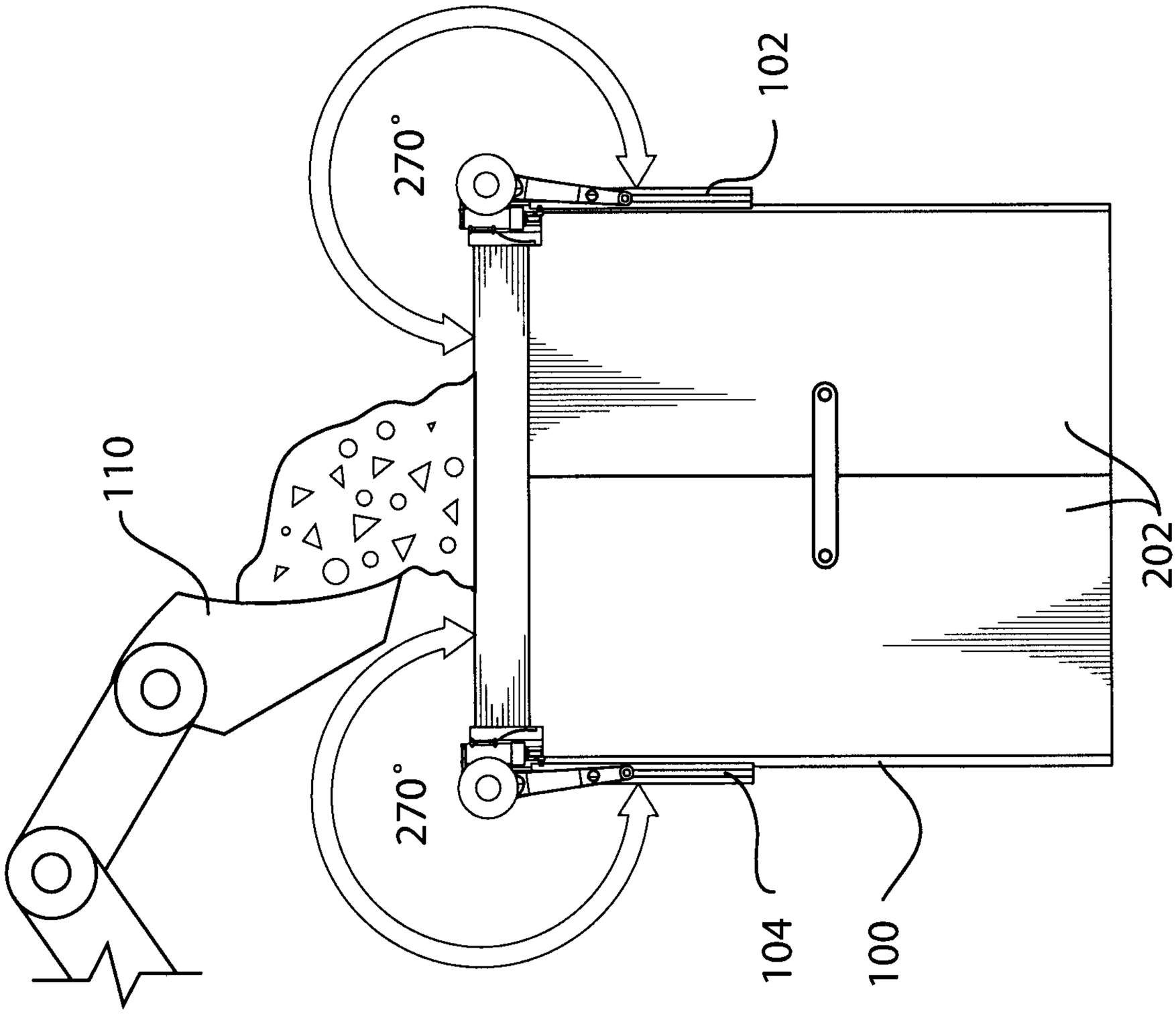

FIG.3

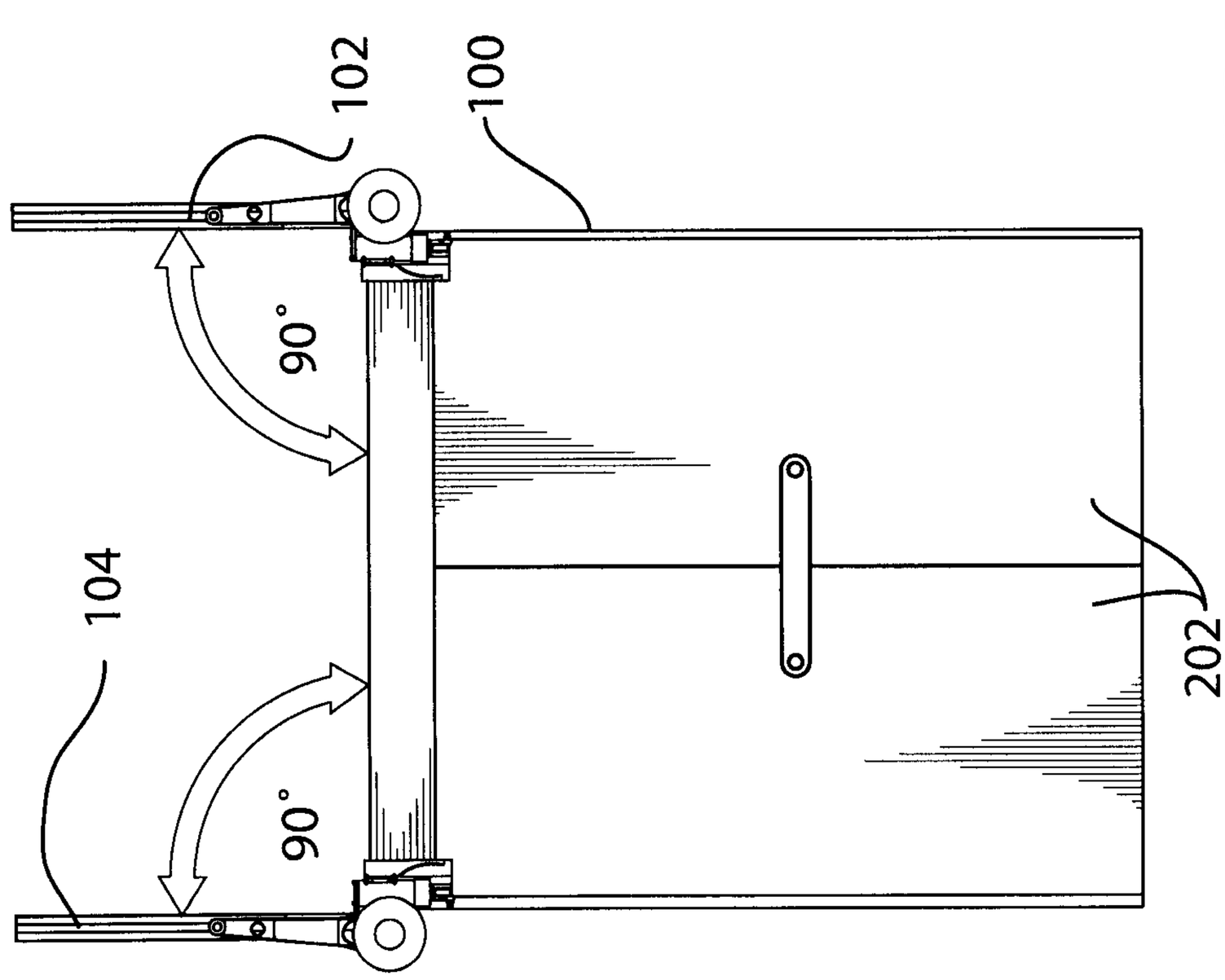

FIG.2

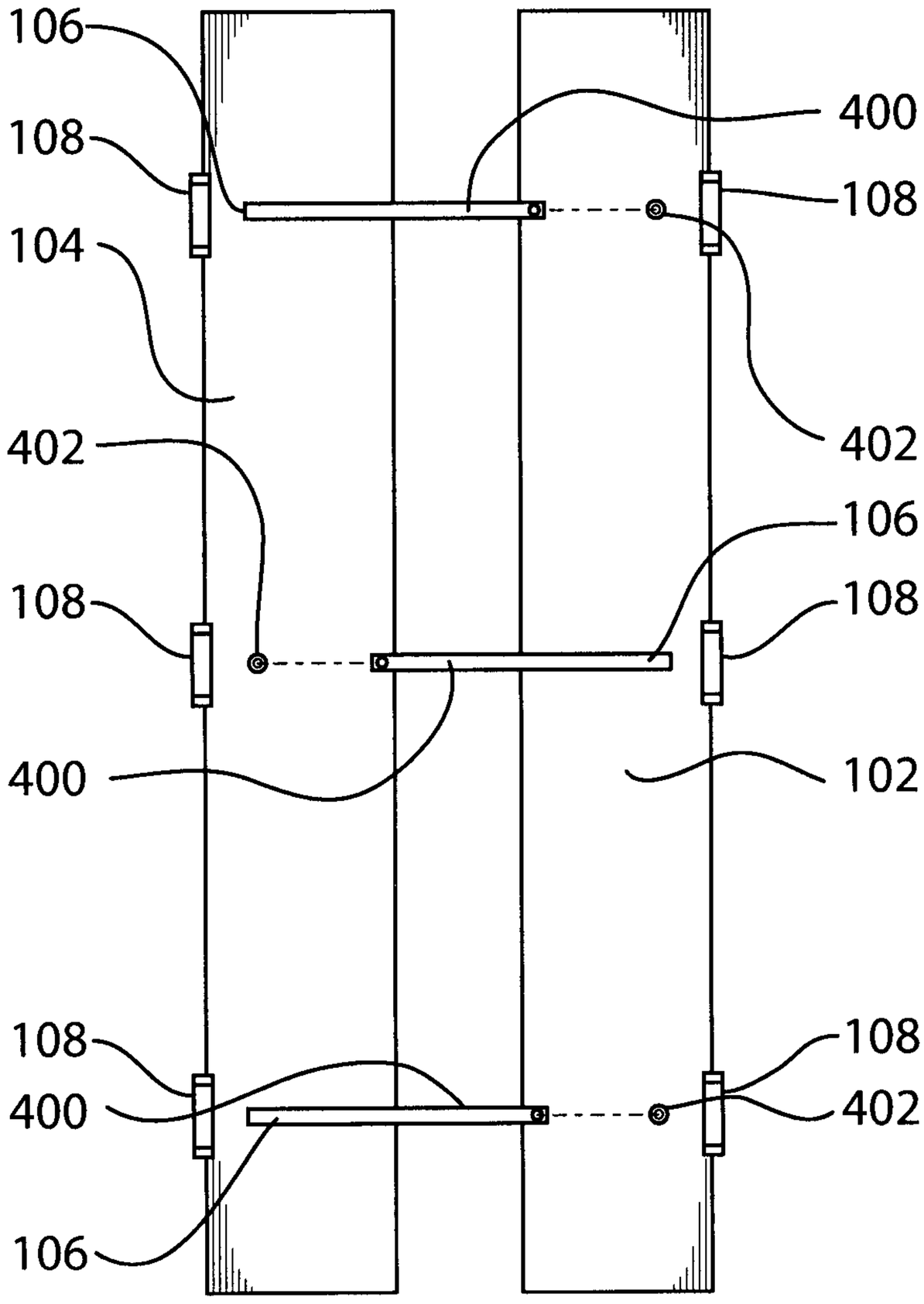
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FIG. 4

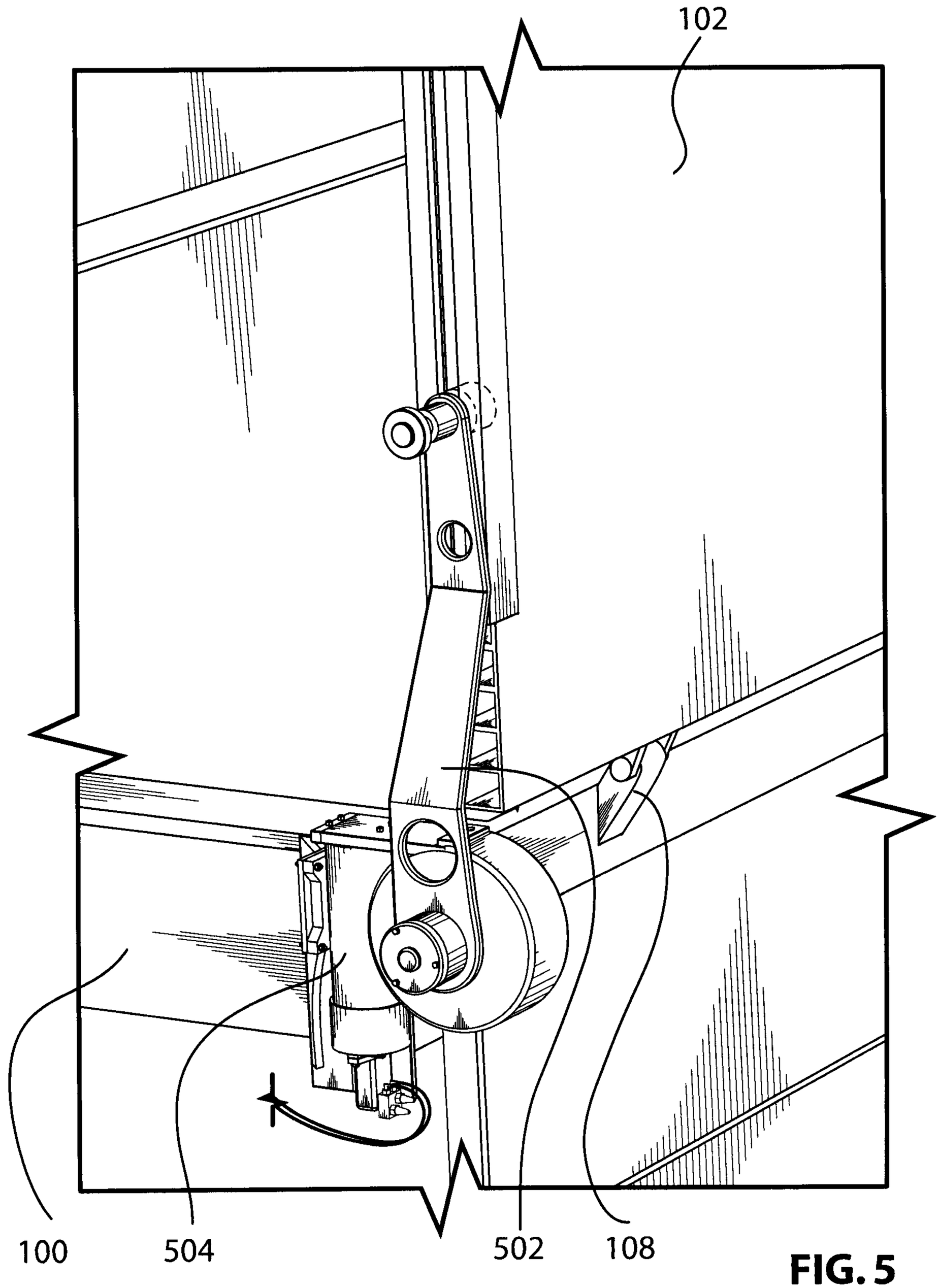

FIG. 5

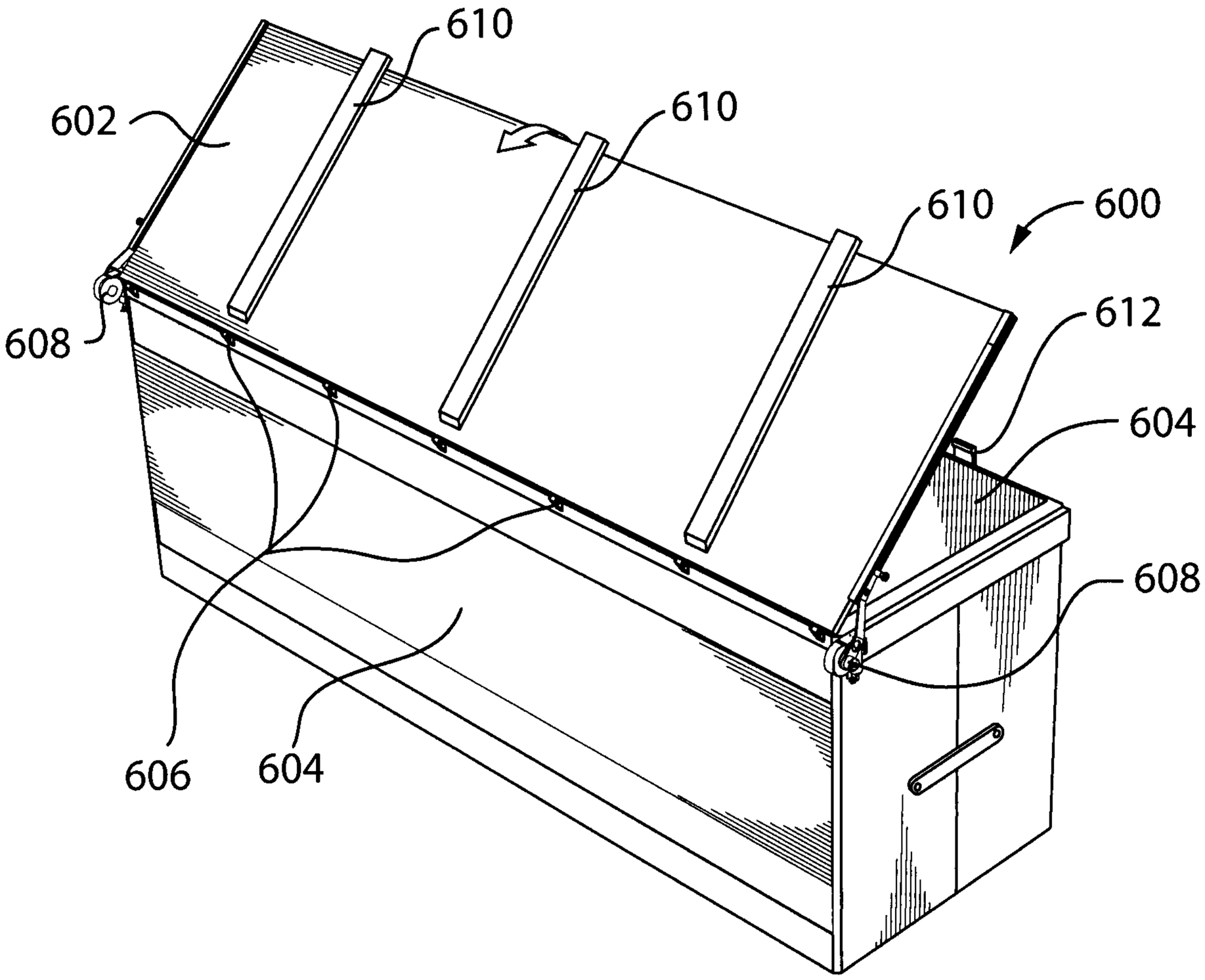

FIG. 6

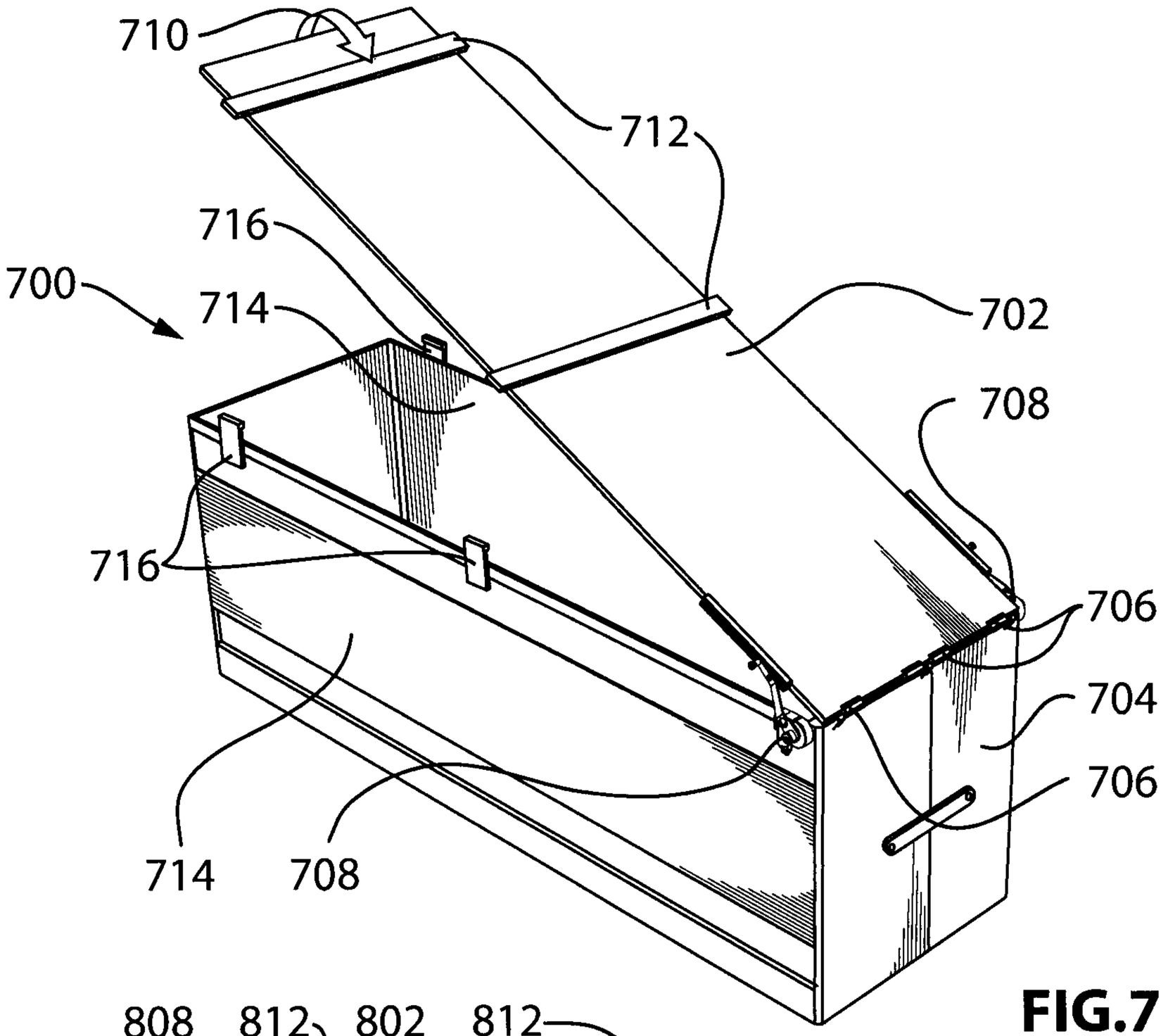
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FIG.7

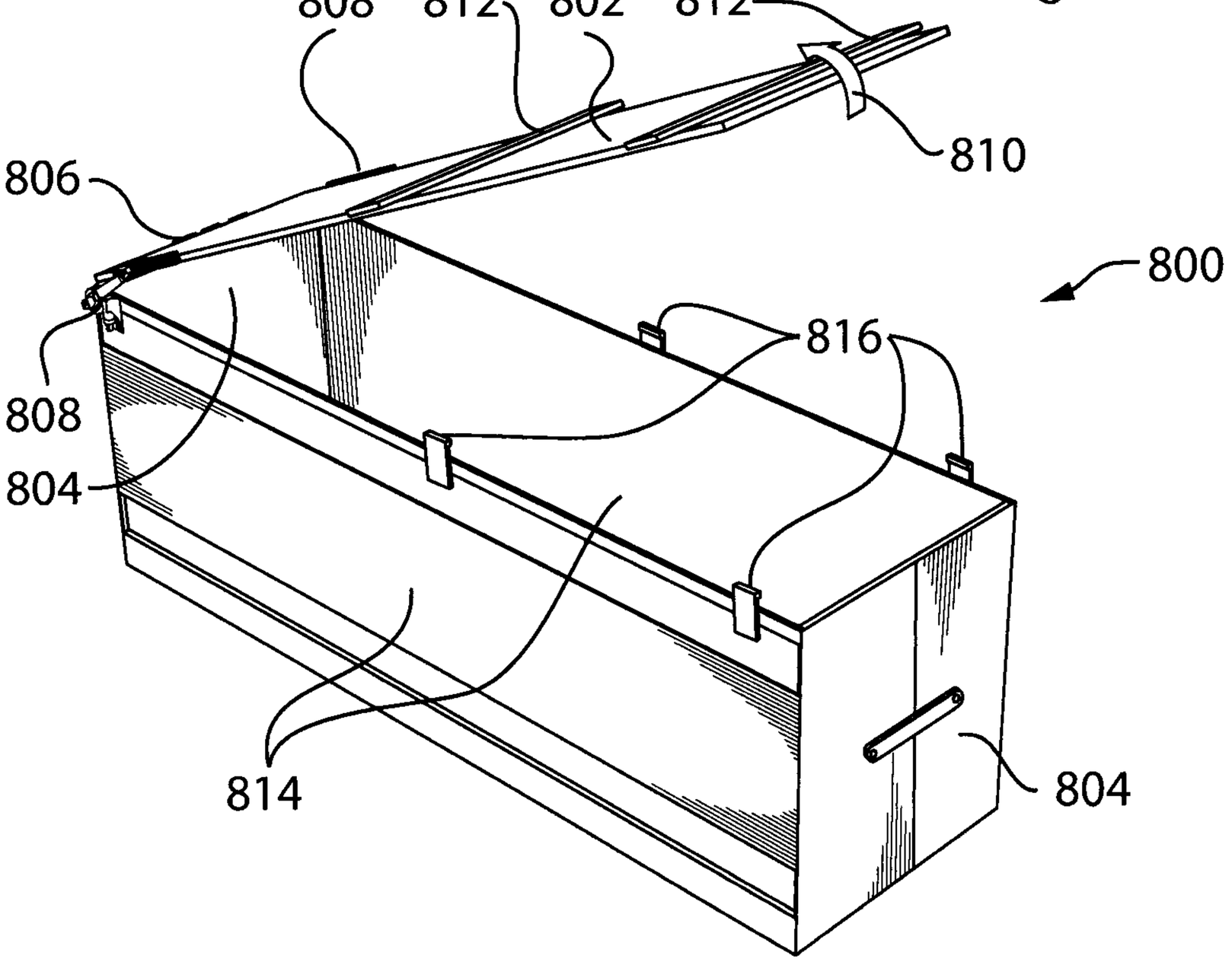
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FIG. 8

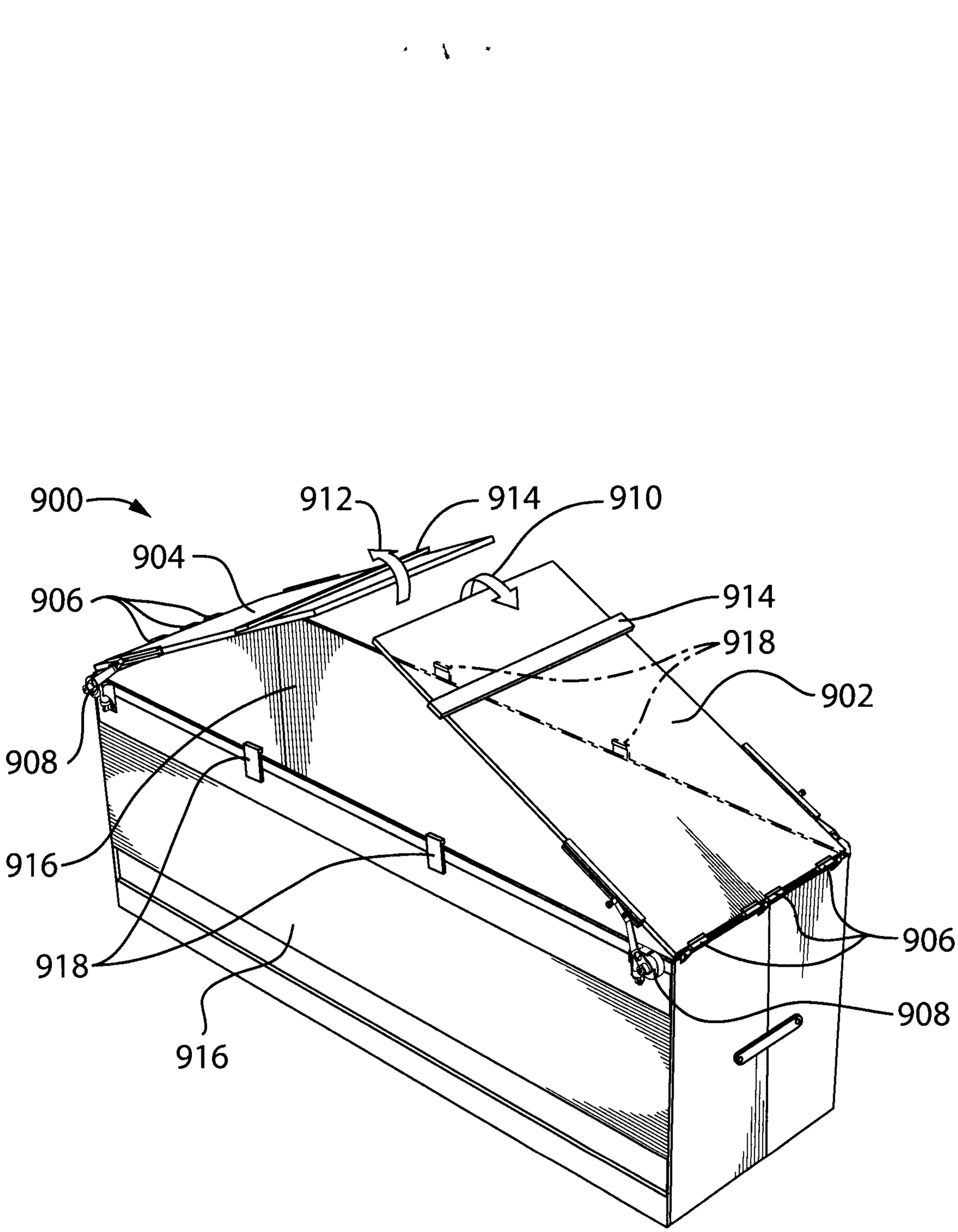


FIG. 9

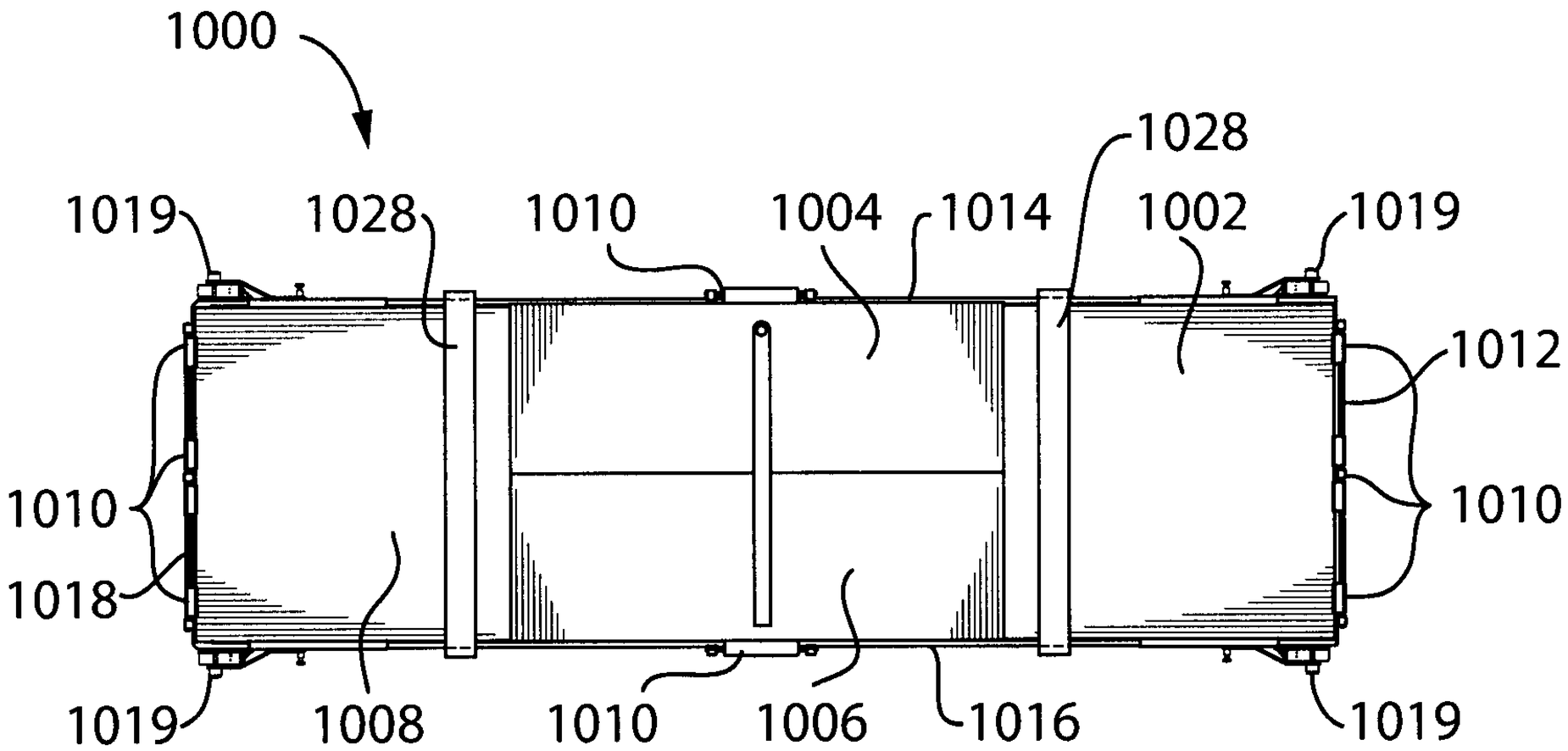


FIG. 10a

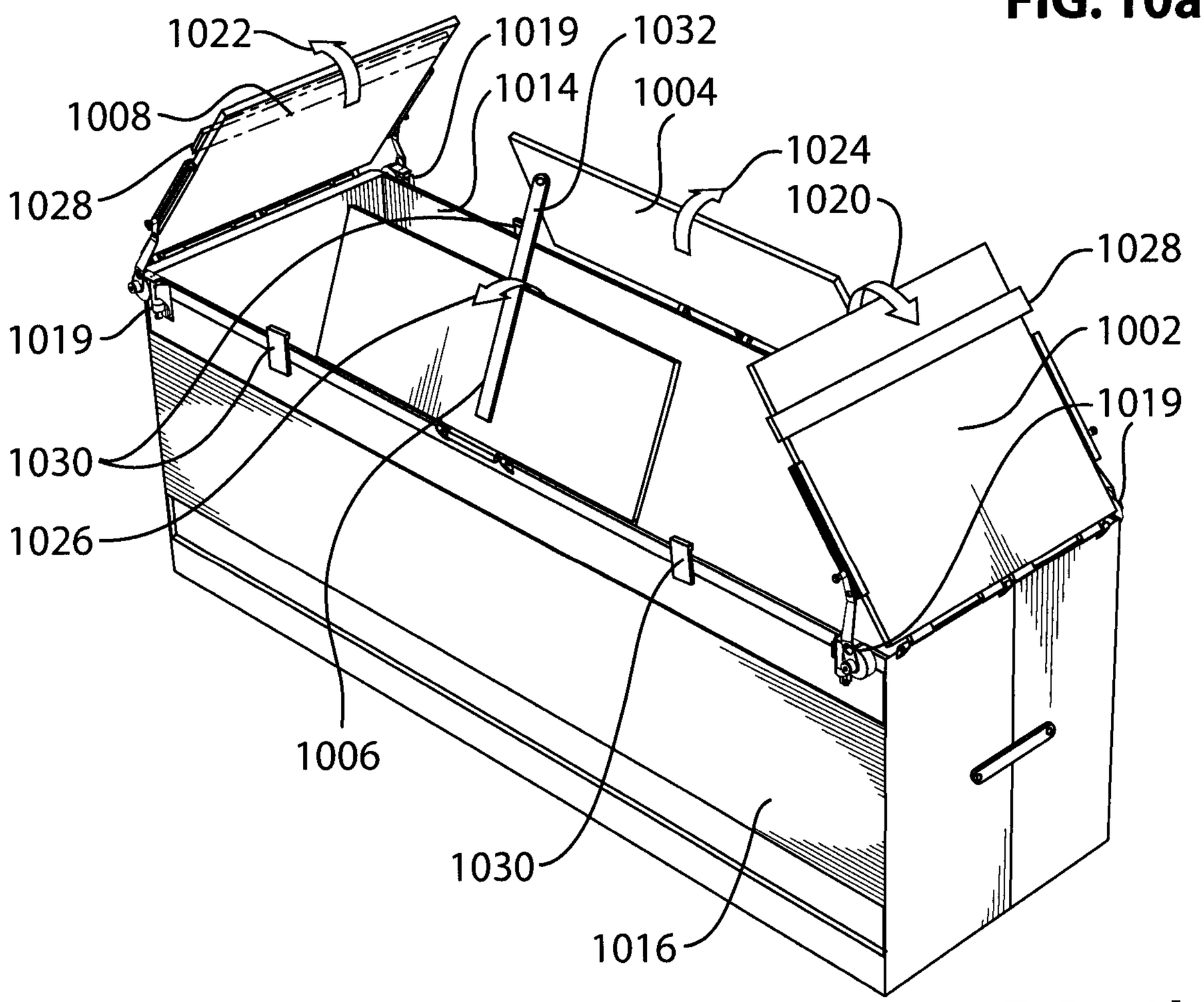


FIG. 10b

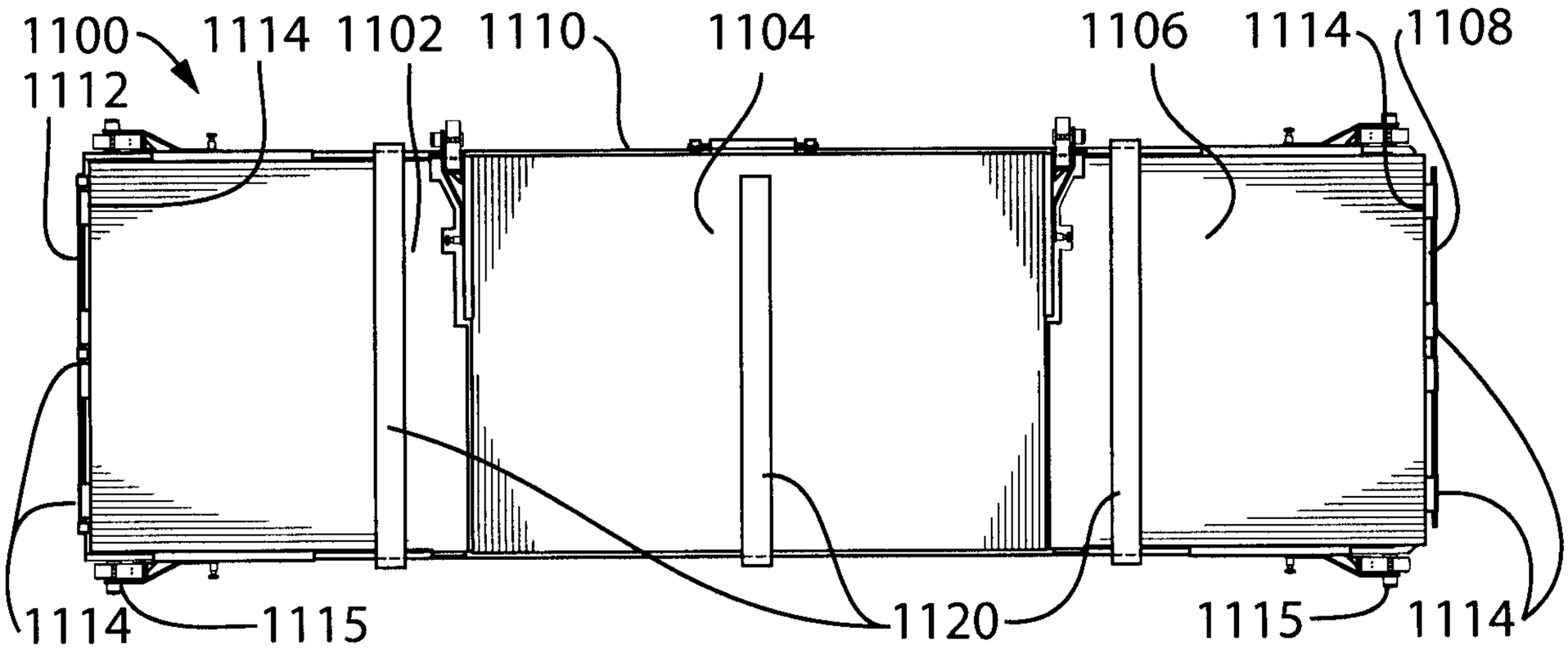


FIG. 11a

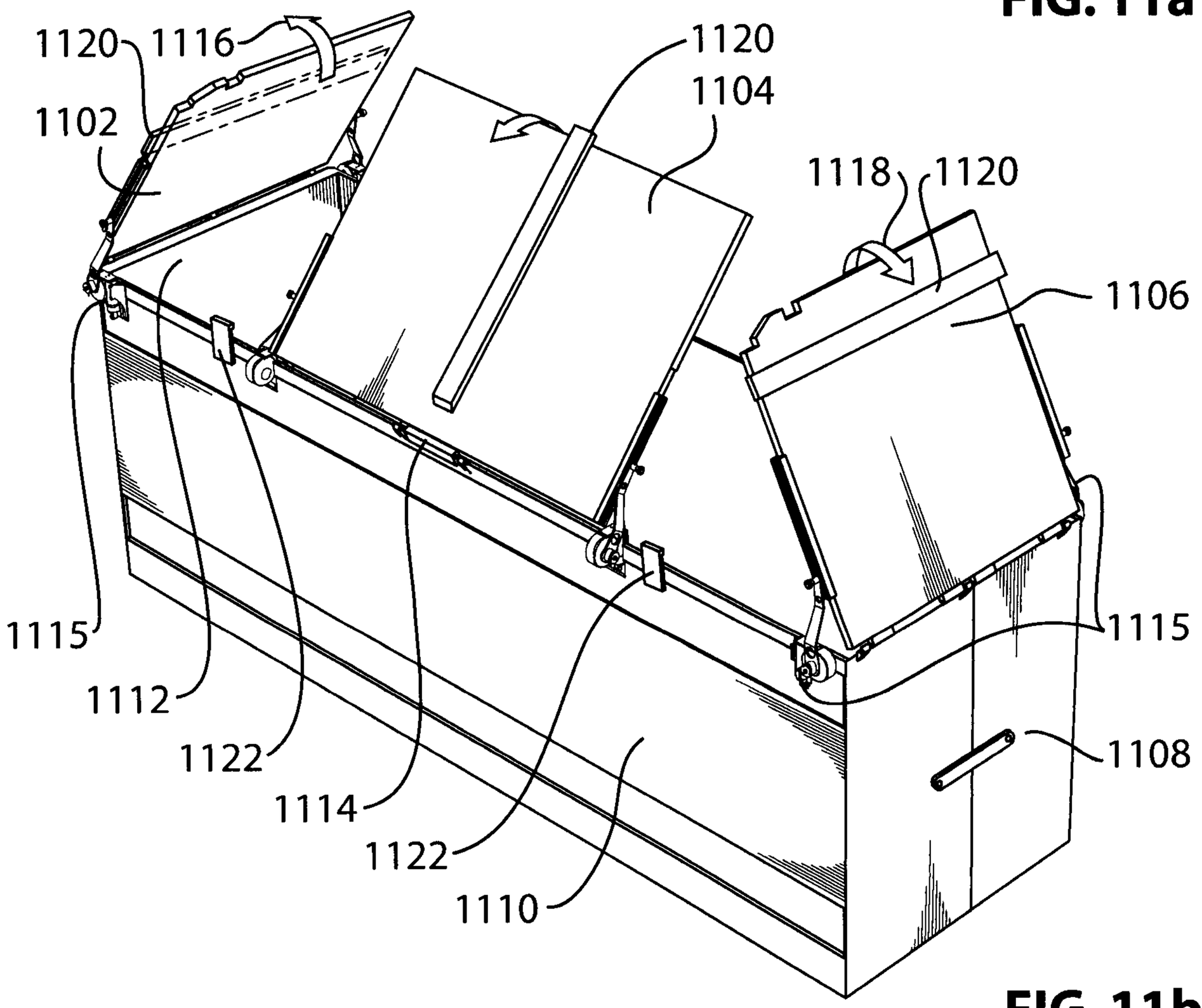


FIG. 11b

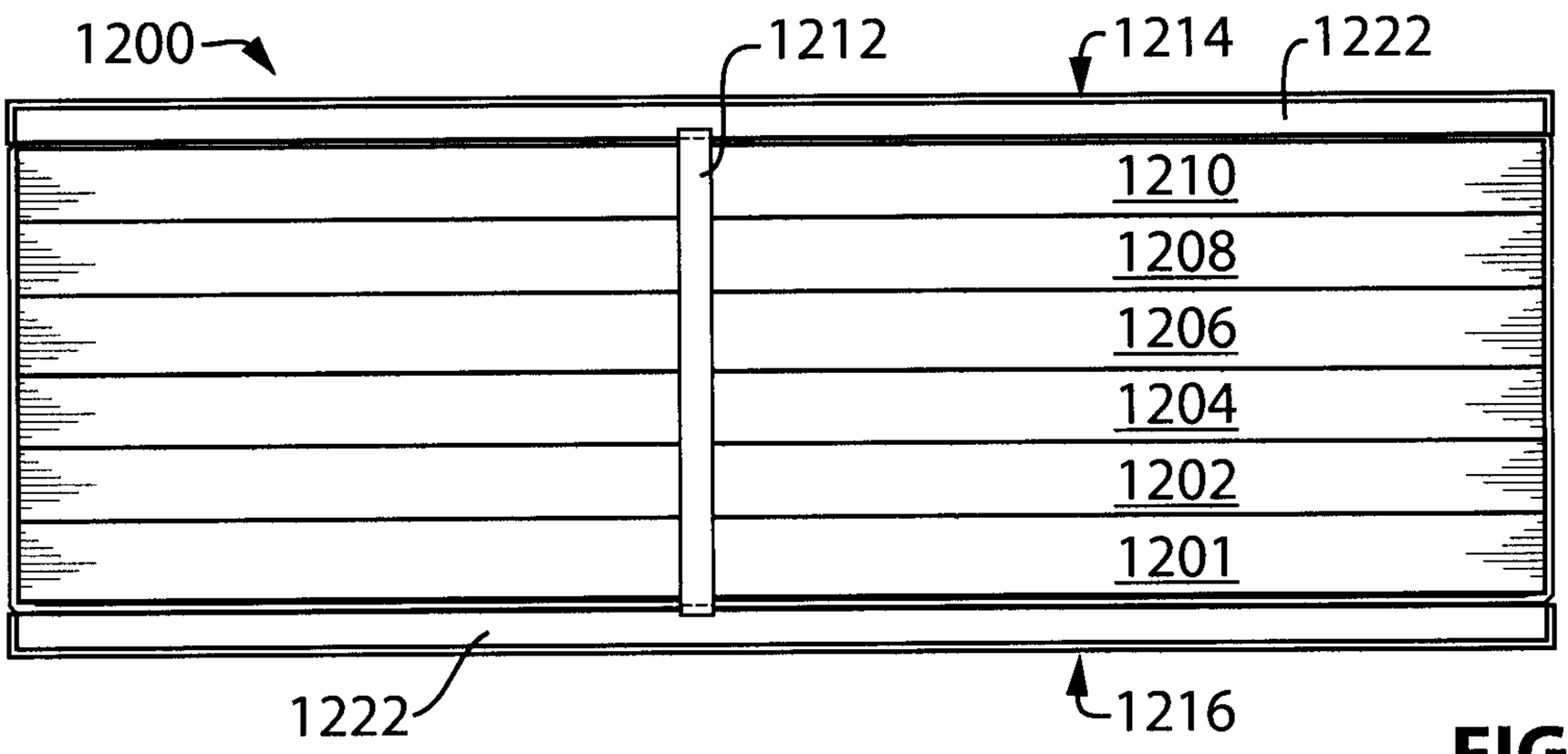


FIG. 12a

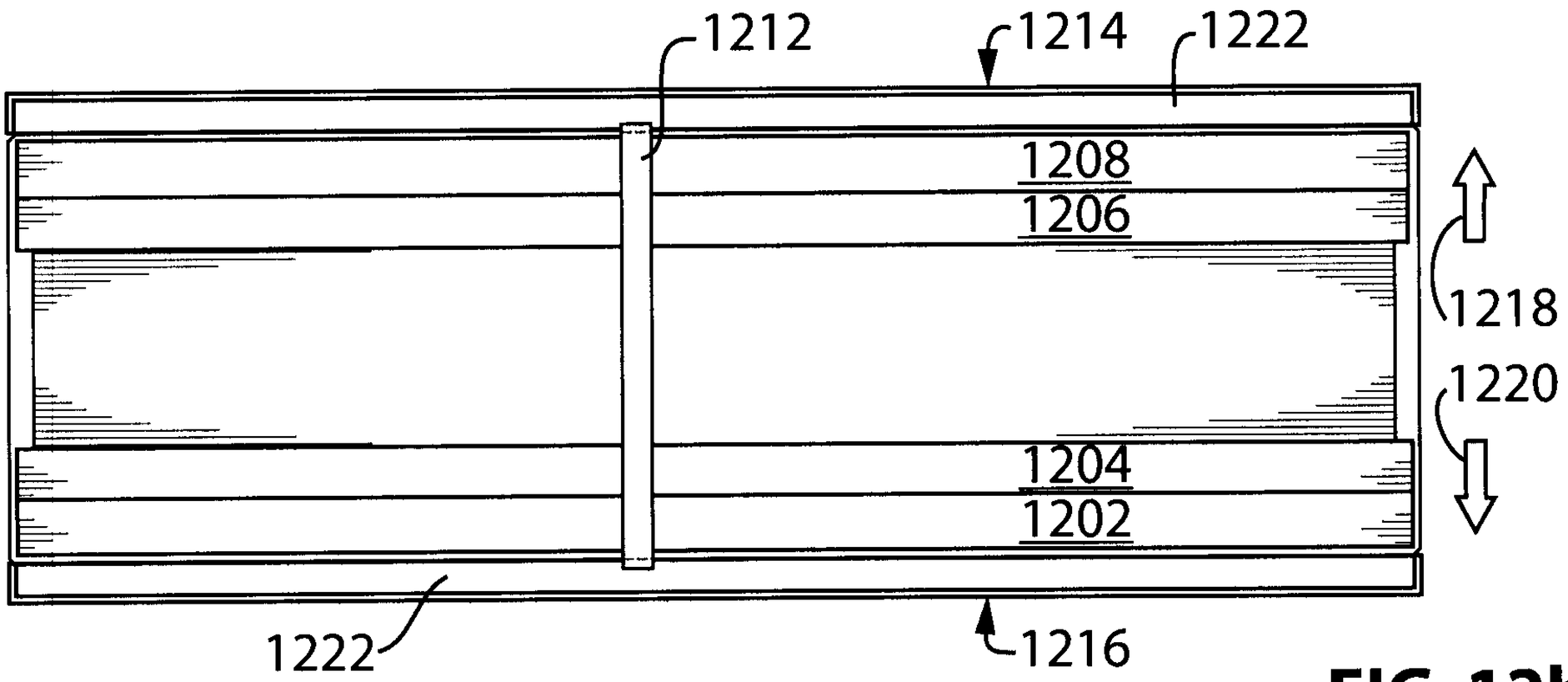


FIG. 12b

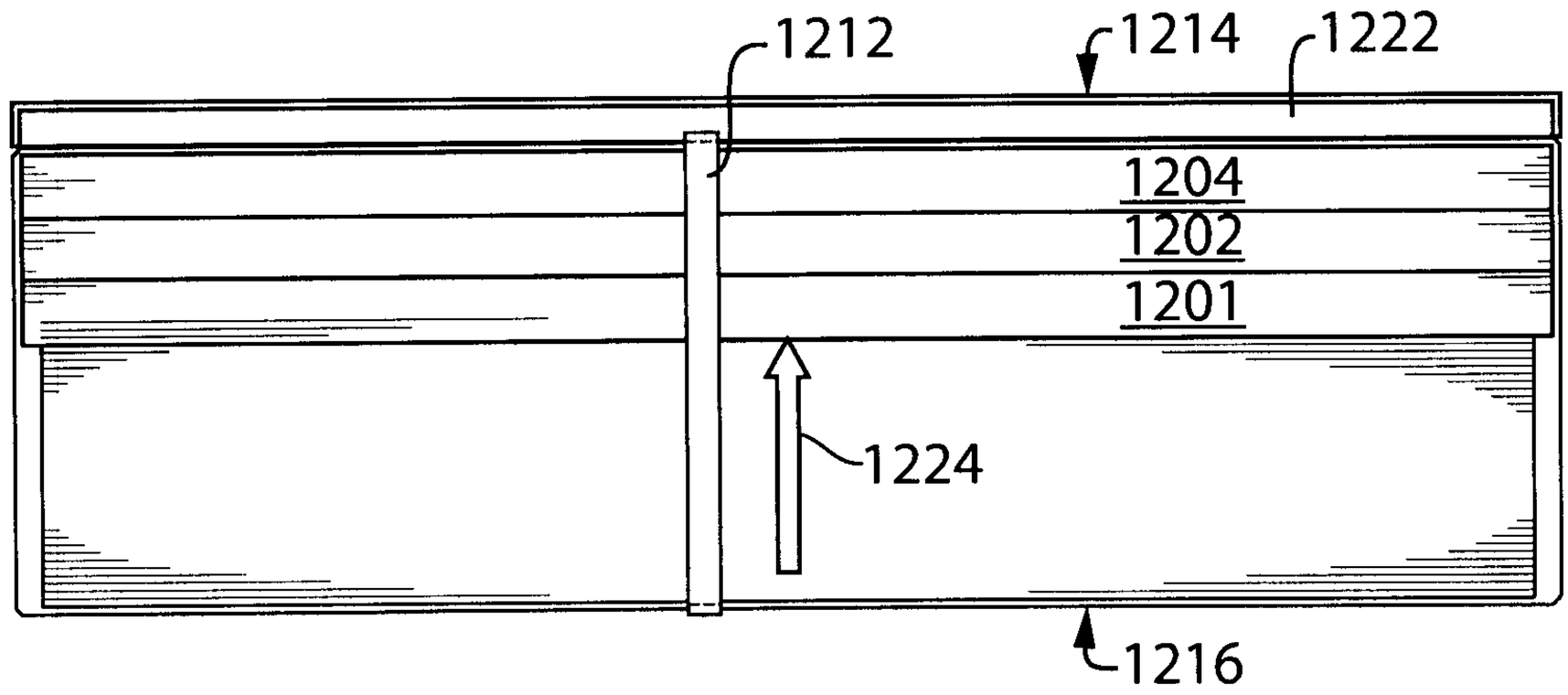


FIG. 12c

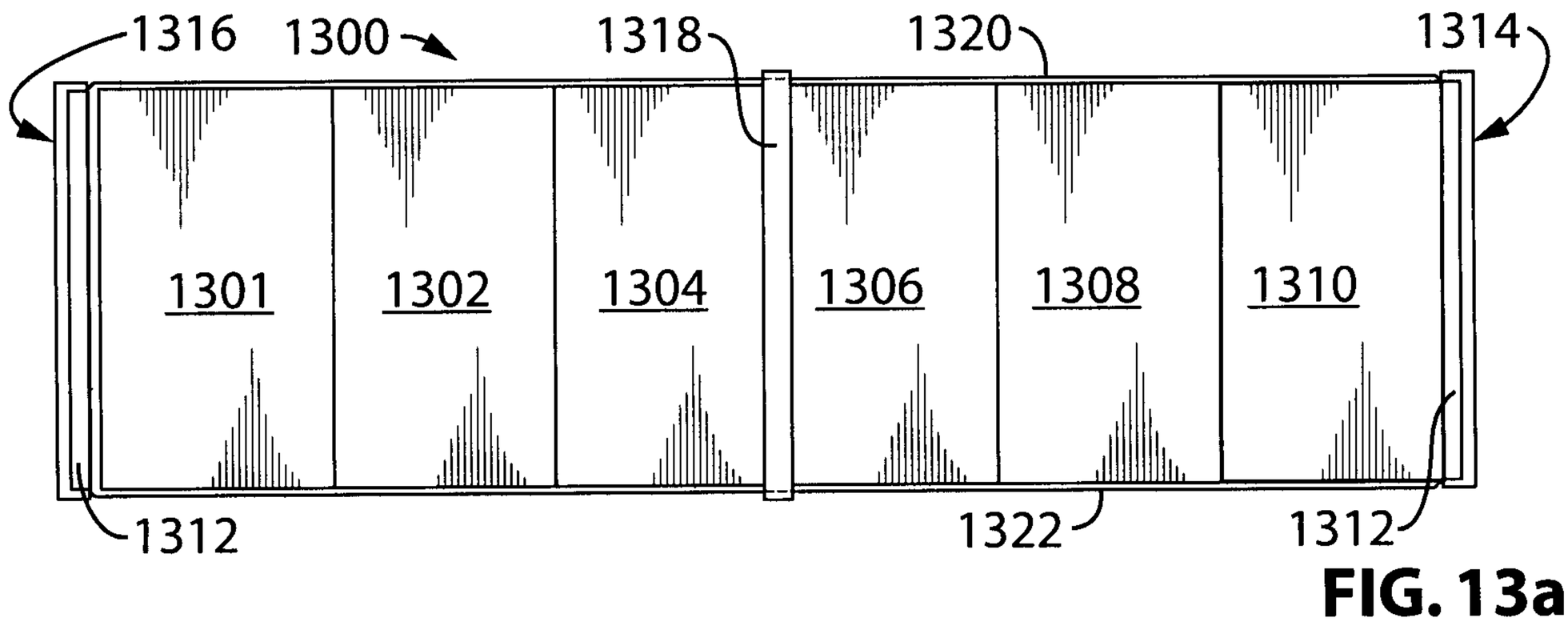


FIG. 13a

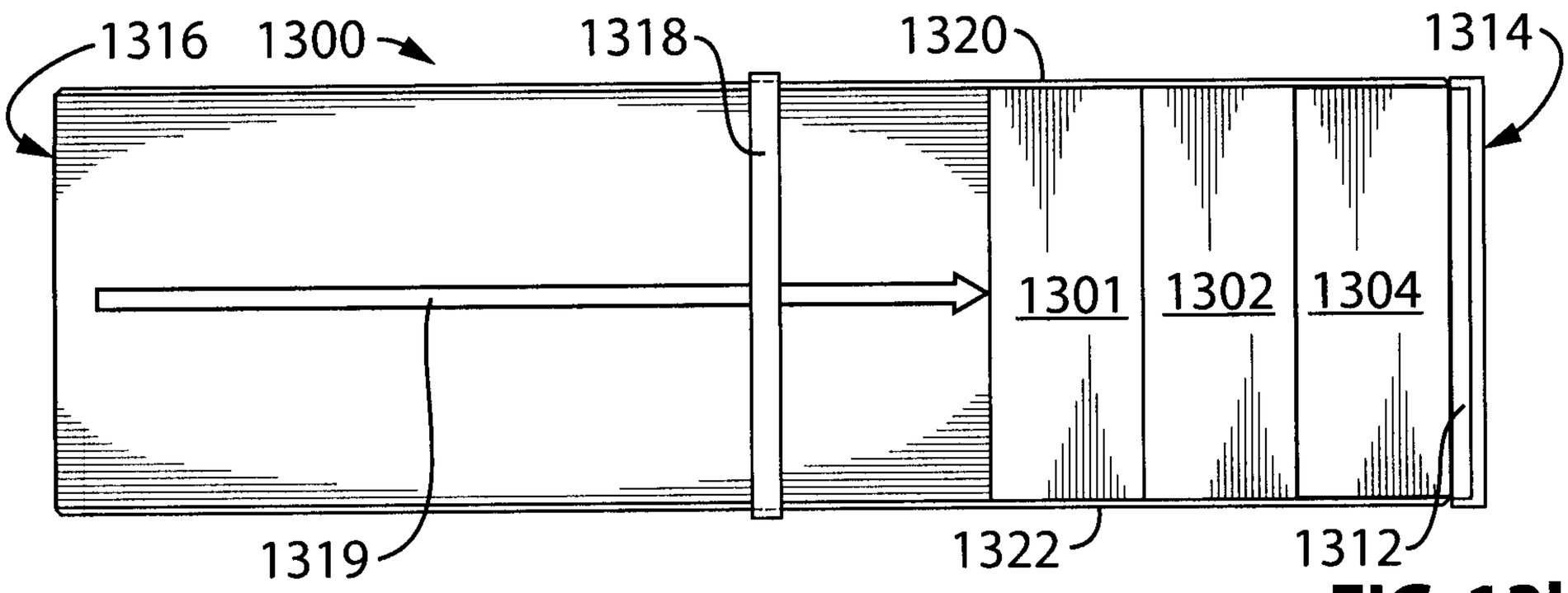


FIG. 13b

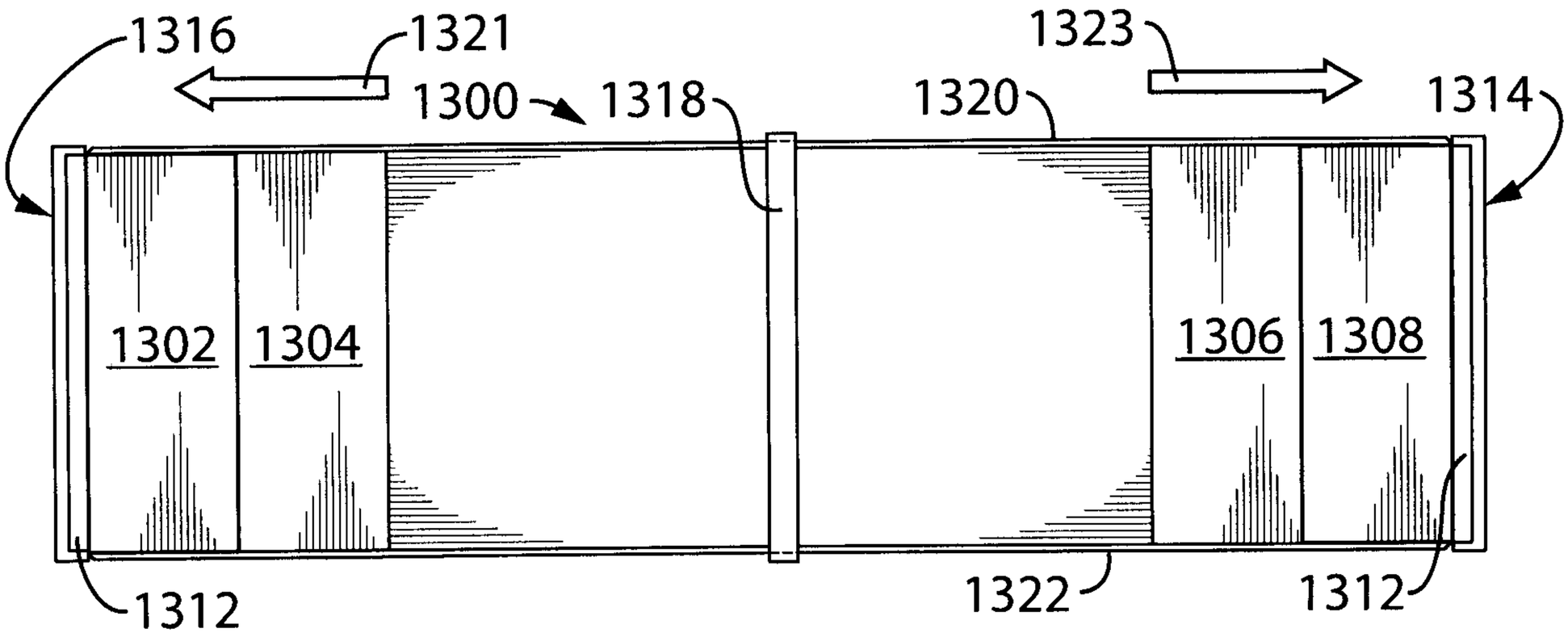
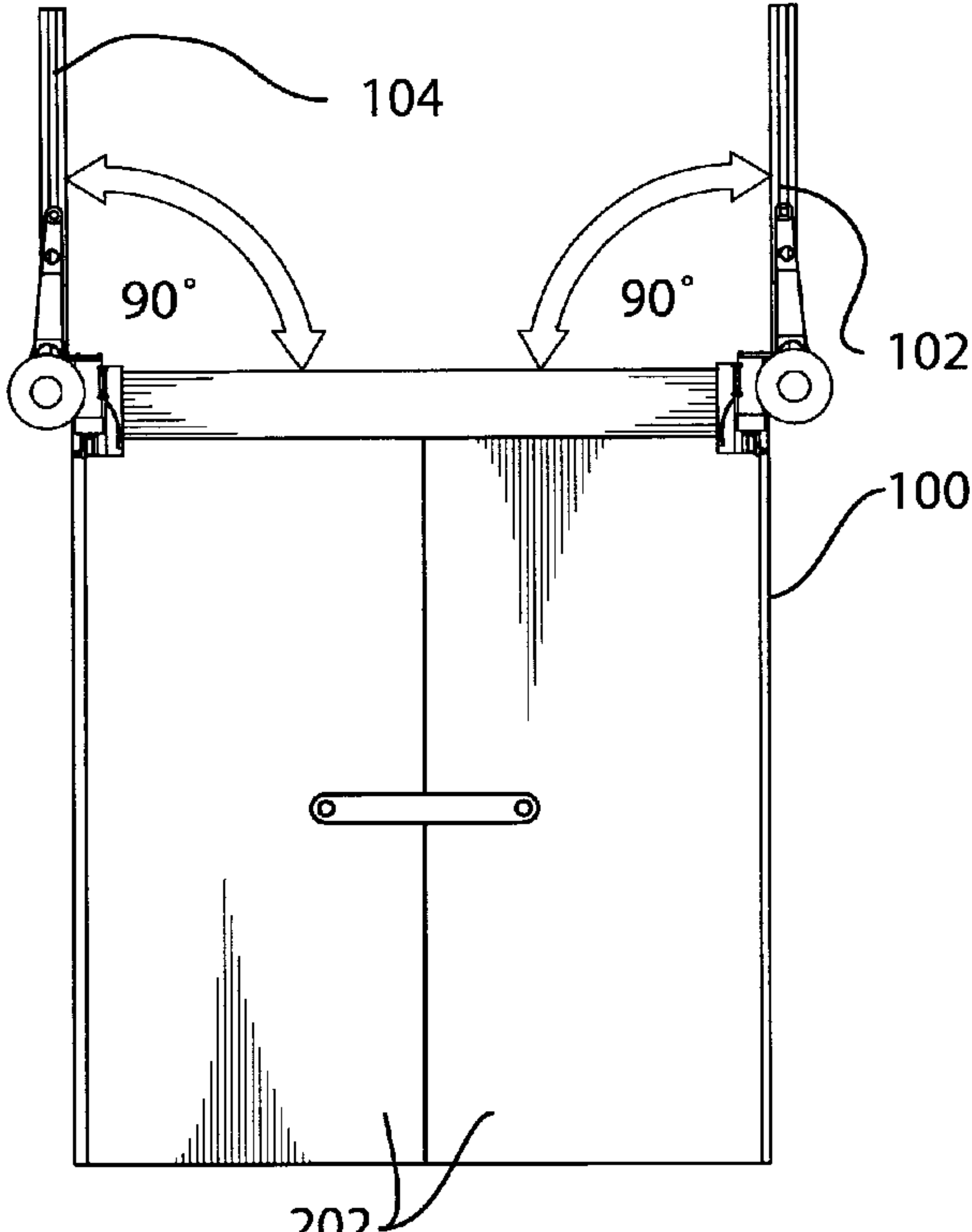


FIG. 13c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