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(54) **EXTENDABLE HAND TRUCK**

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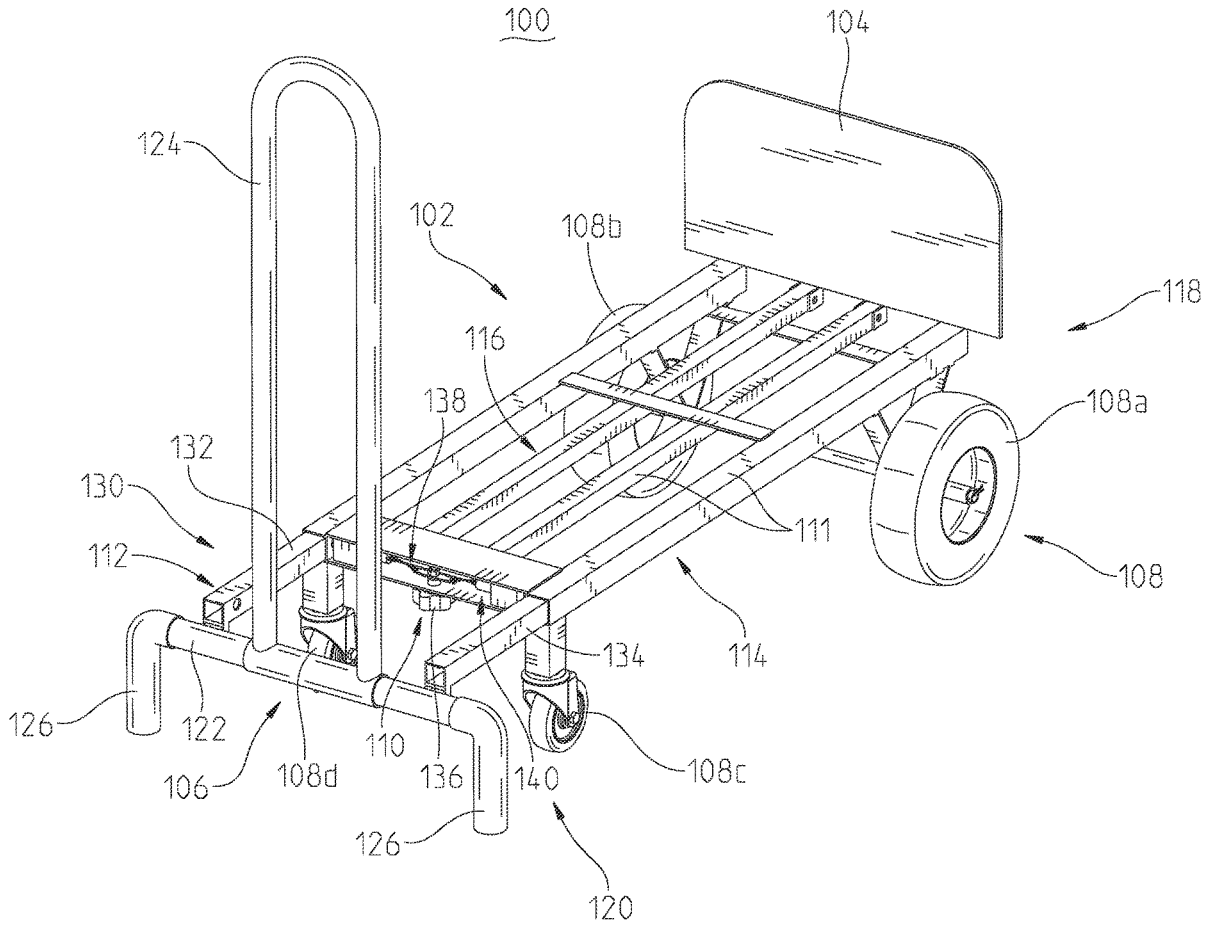
CPC ***B62B 1/125*** (2013.01); ***B62B 1/002*** (2013.01); *B62B 2206/02* (2013.01)

(57) **ABSTRACT**

A hand truck includes a chassis, a nose plate disposed at a lower end of the chassis, a handle disposed at an upper end of the chassis, a plurality of wheels and a fastener. The chassis includes a first section and a second section. The fastener locks the first section relative to the second section in a first arrangement and permits movement of the first section relative to the second section in a second arrangement.



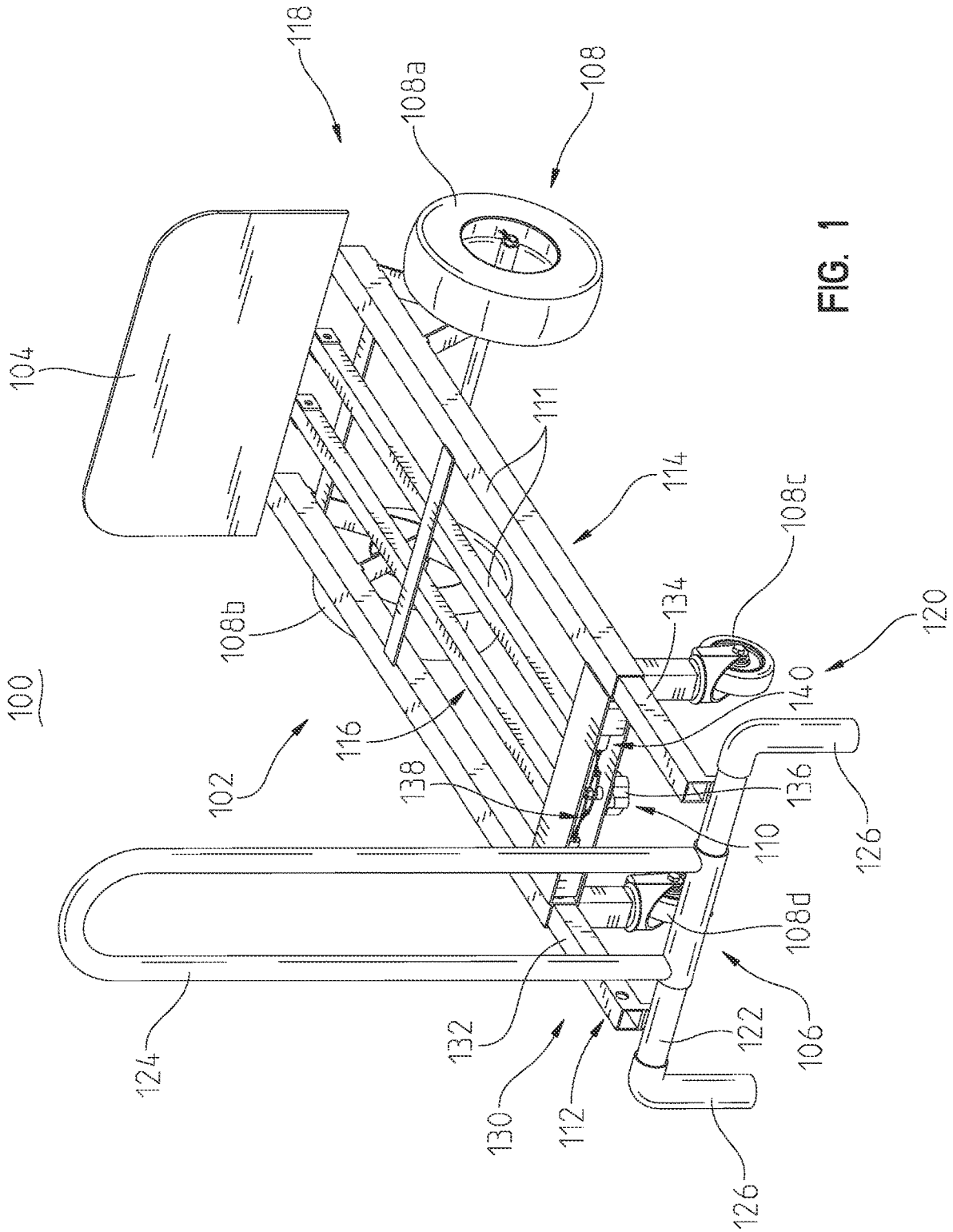

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FIG. 1

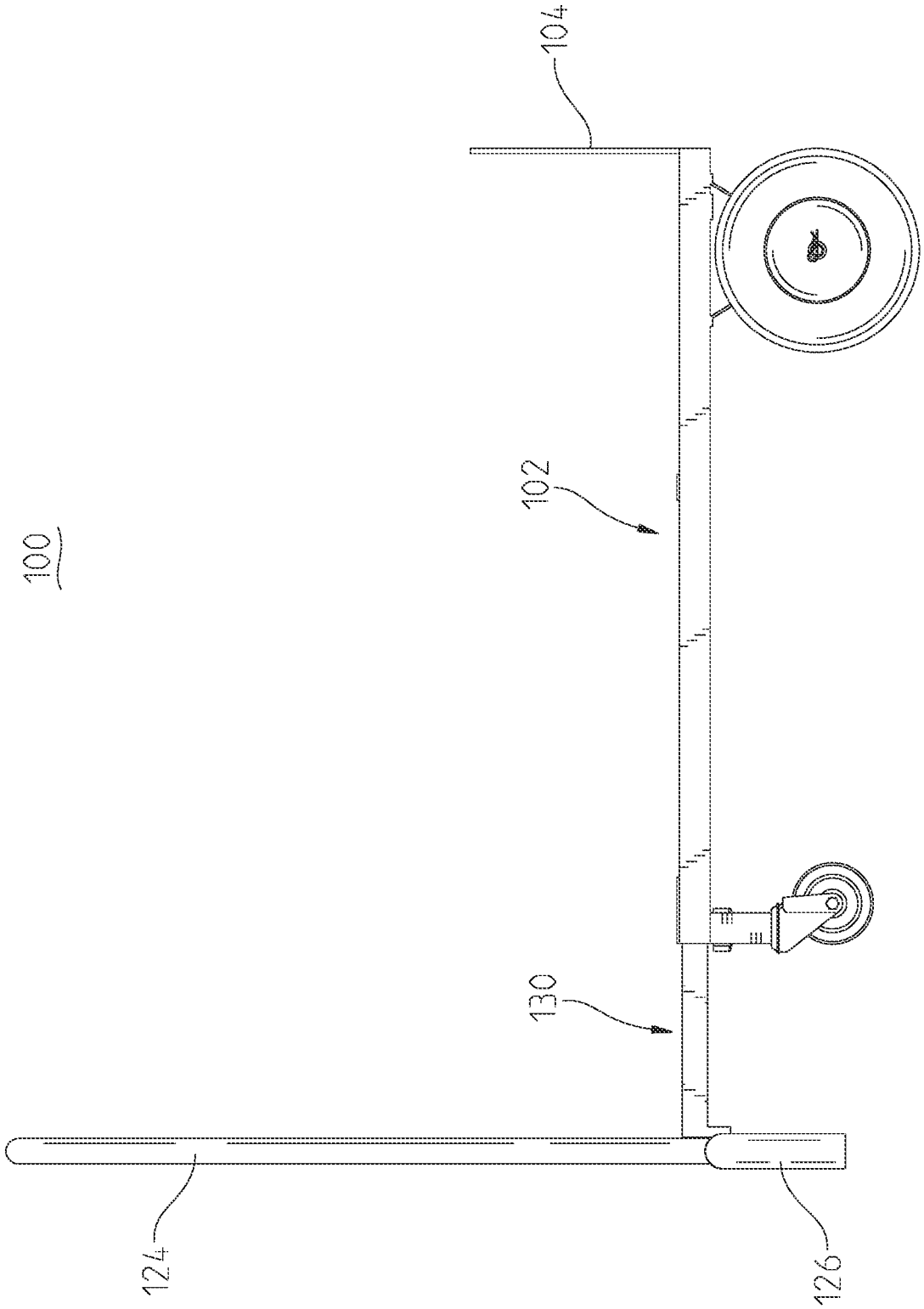

FIG. 2

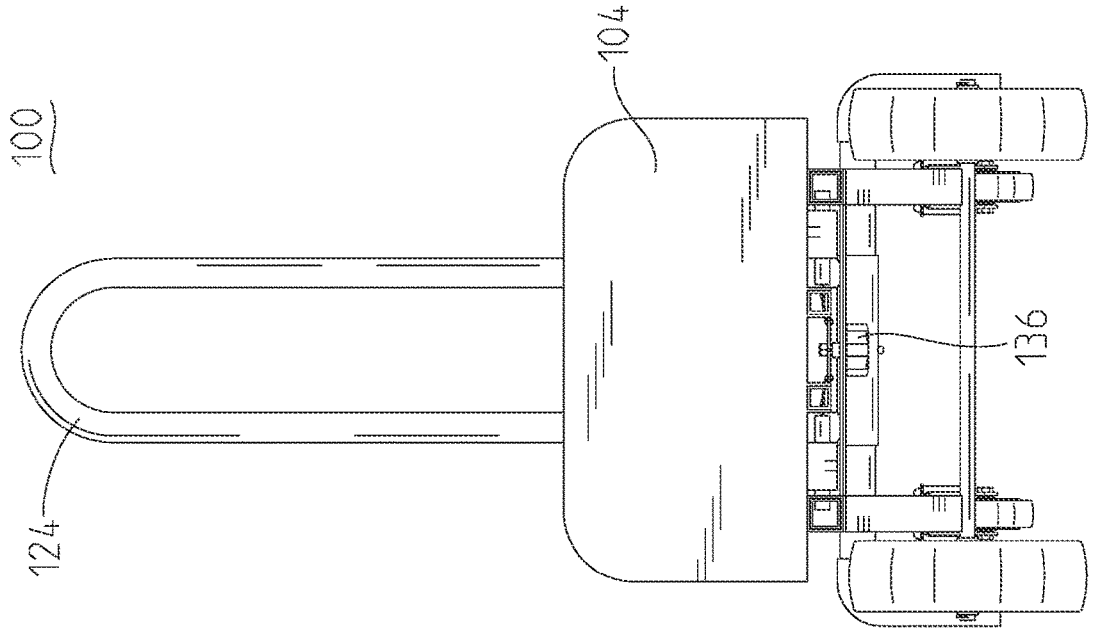

FIG. 4

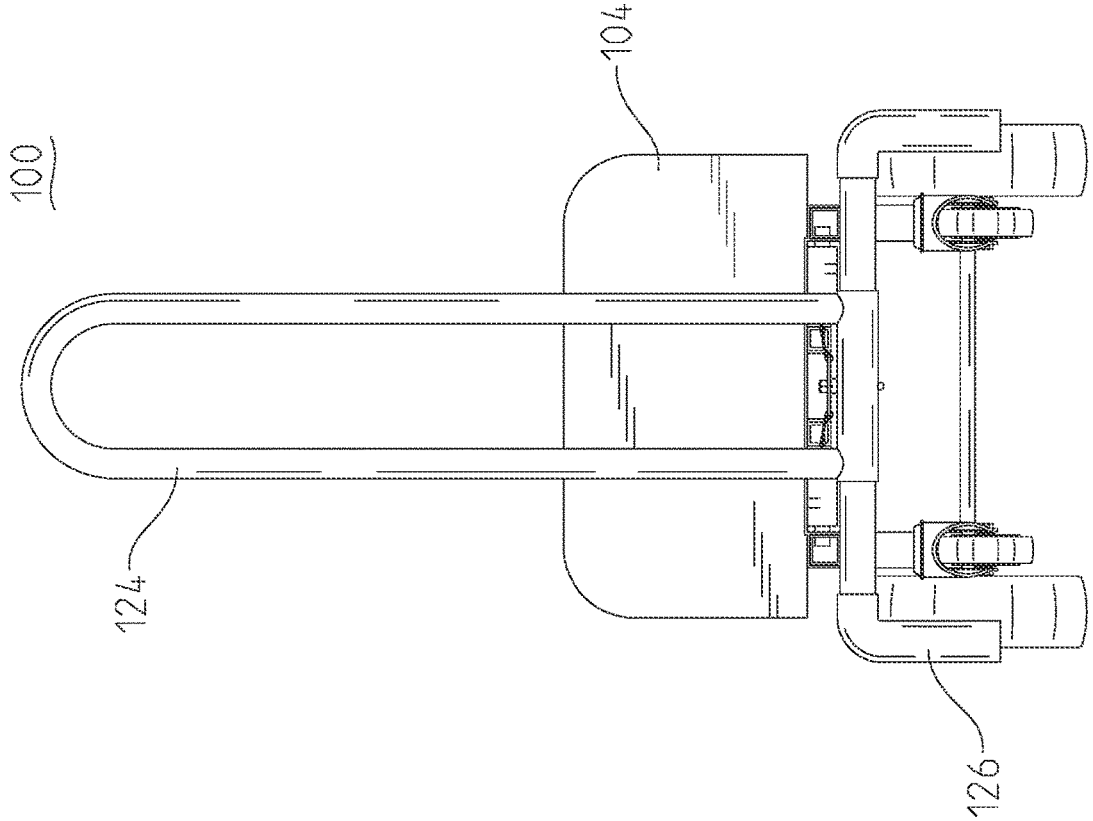

FIG. 3

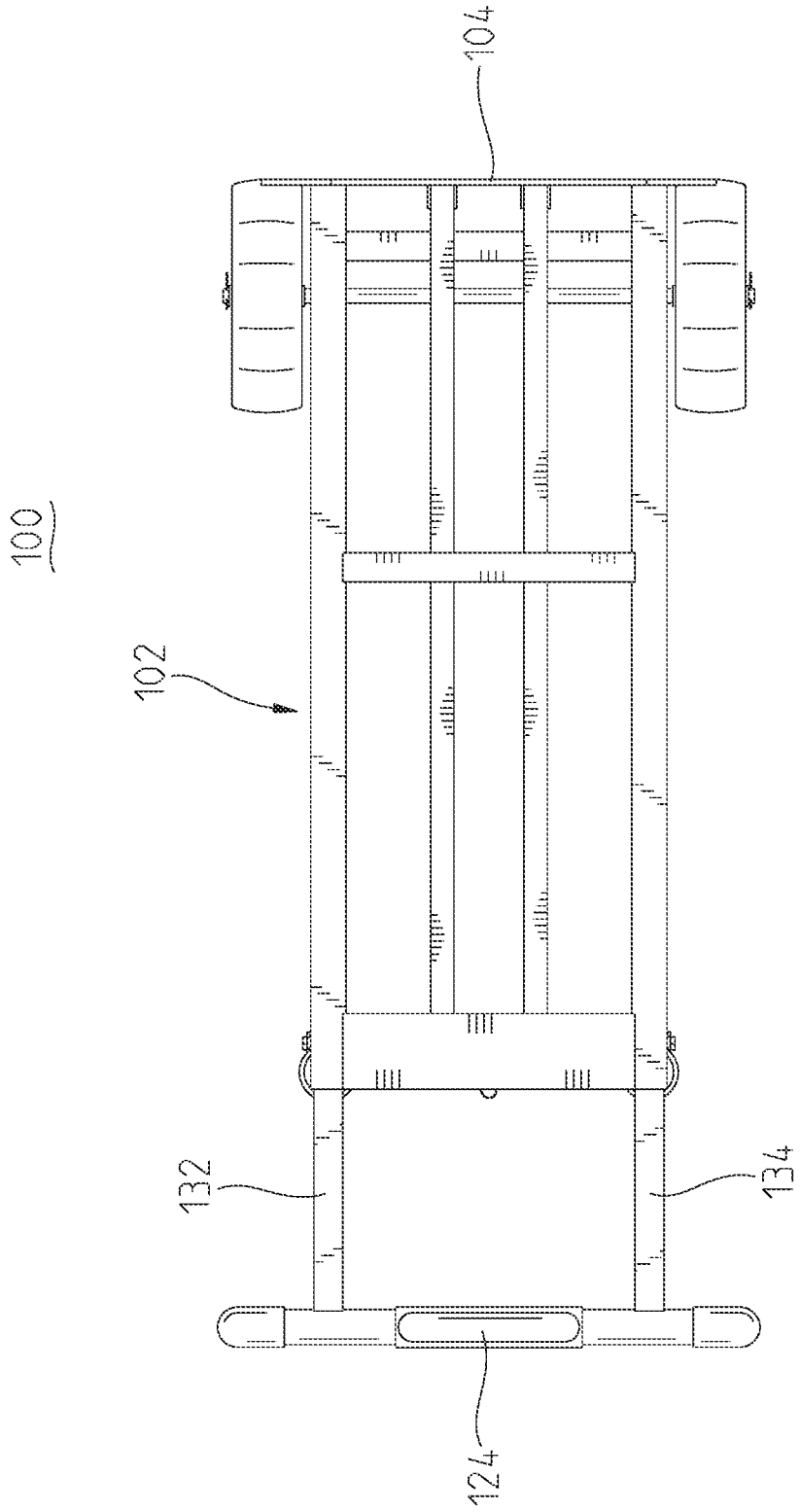

FIG. 5

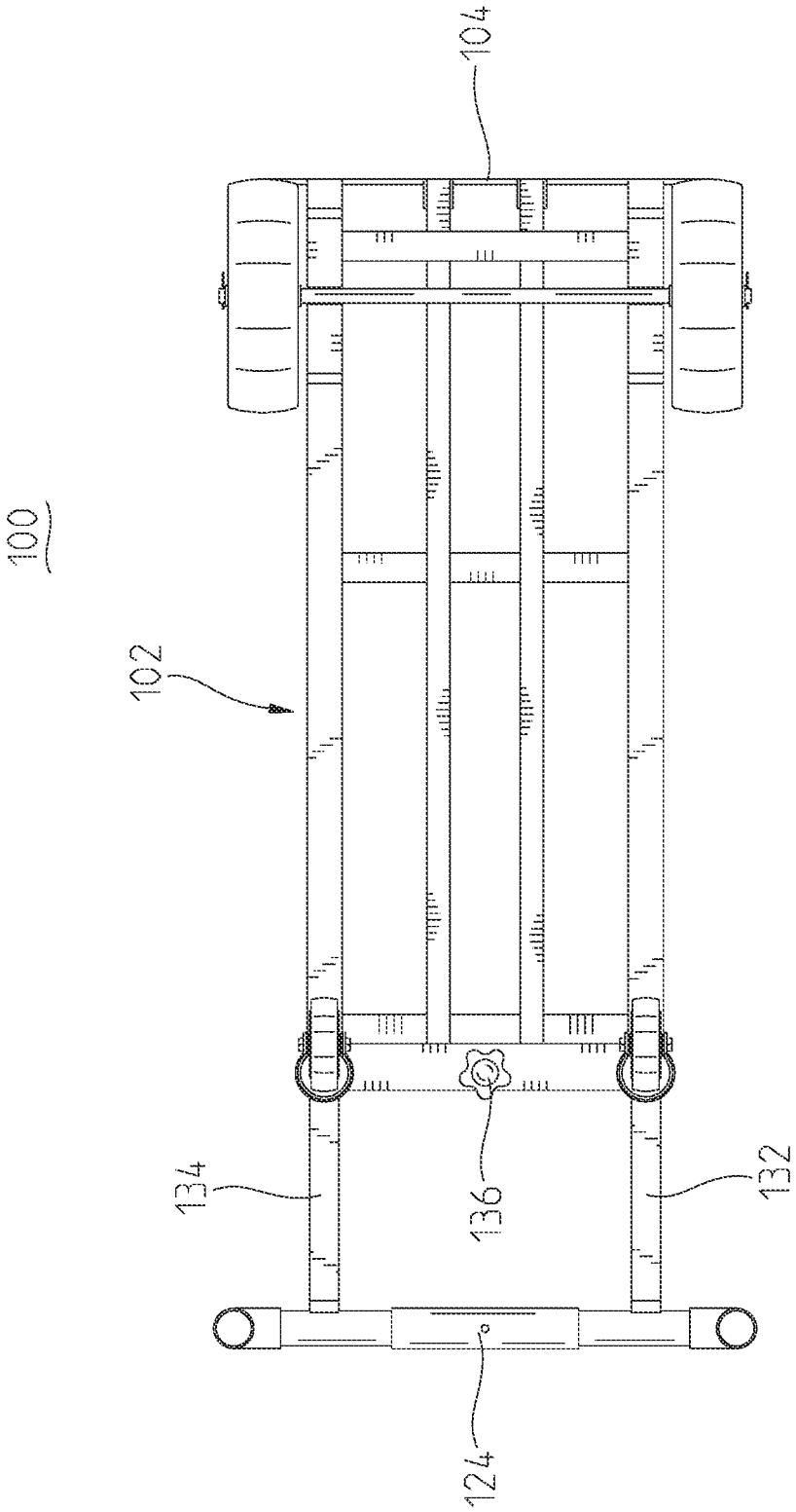

FIG. 6

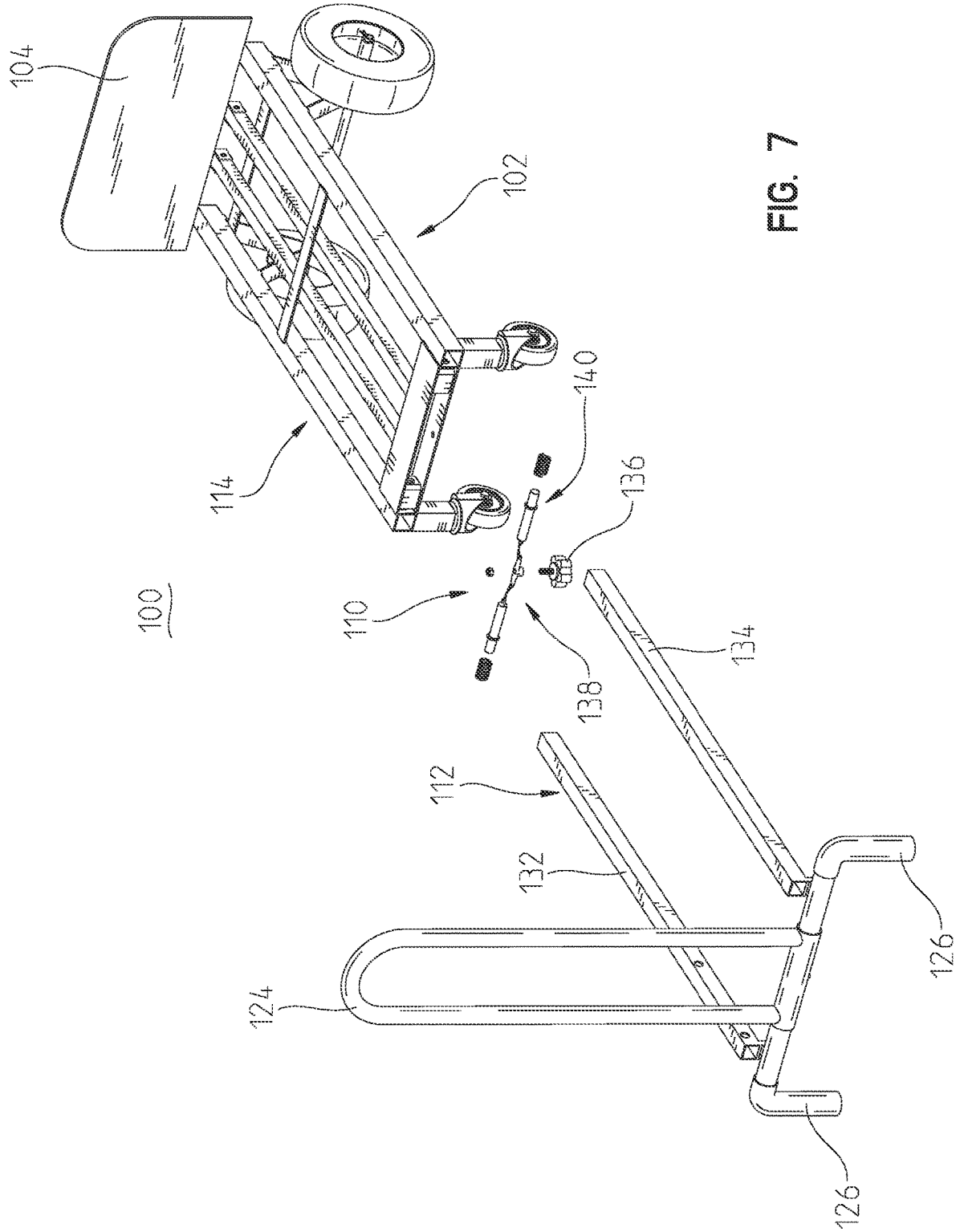

FIG. 7

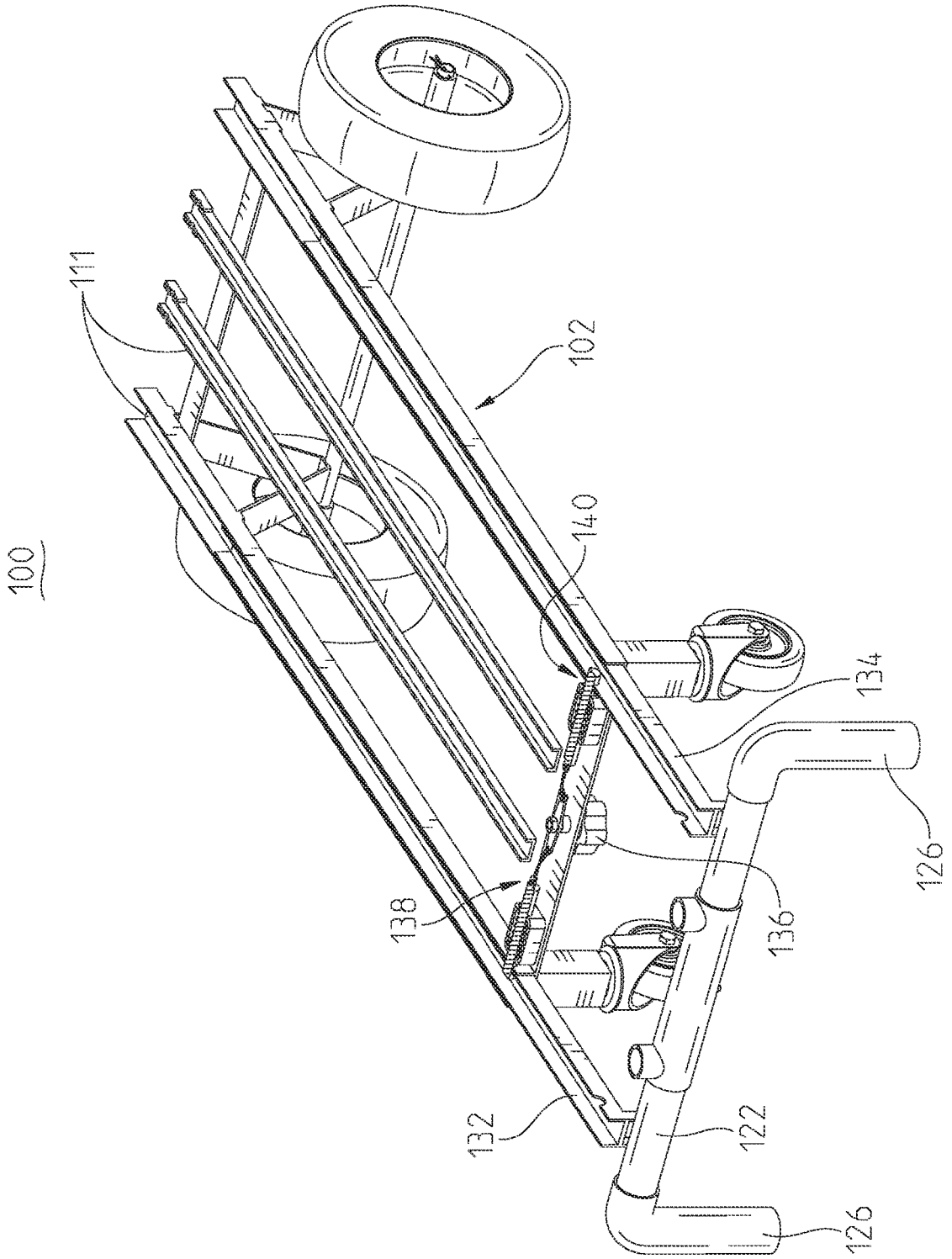

FIG. 8

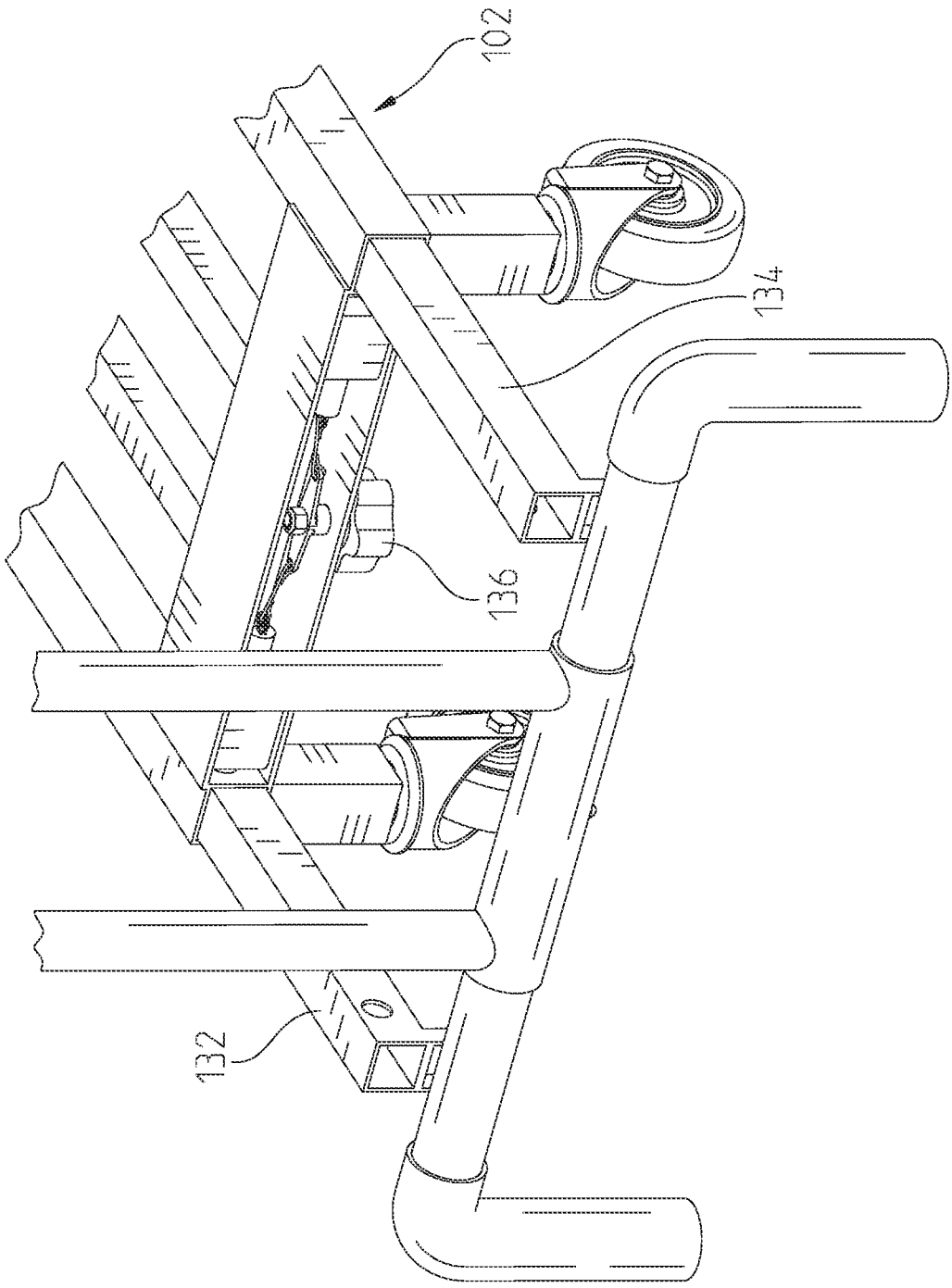

FIG. 9

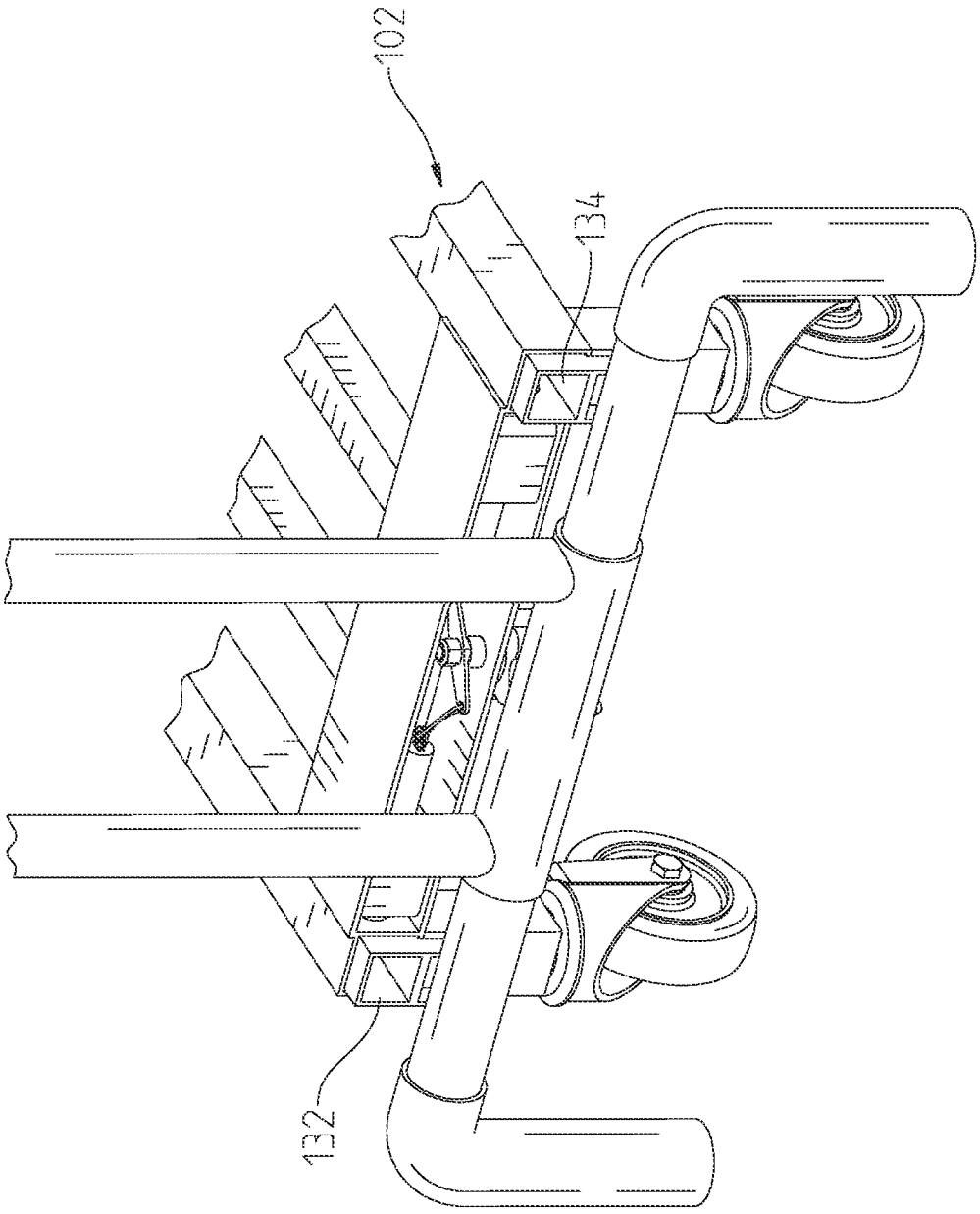

FIG. 10

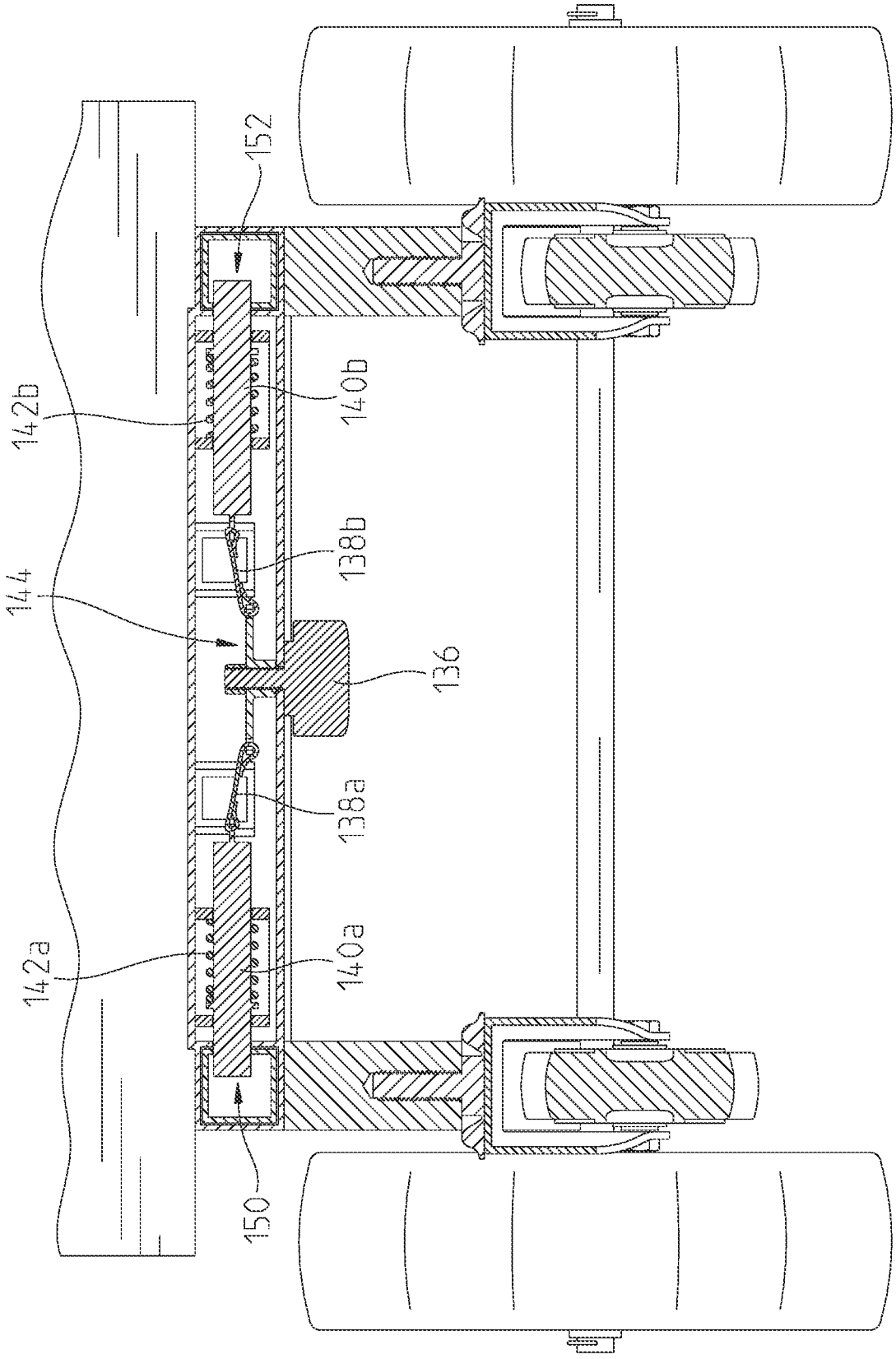

FIG. 11

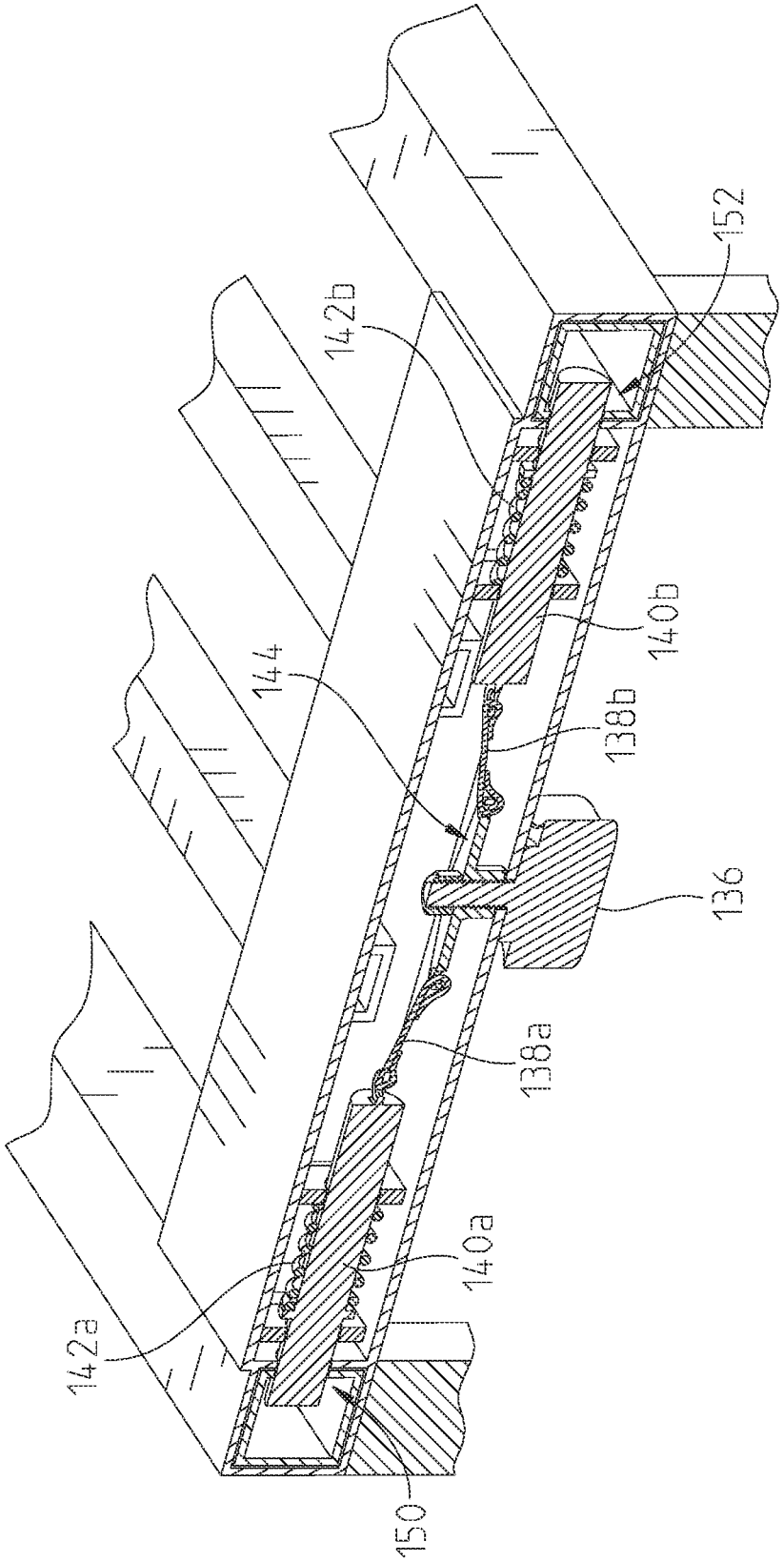

FIG. 12

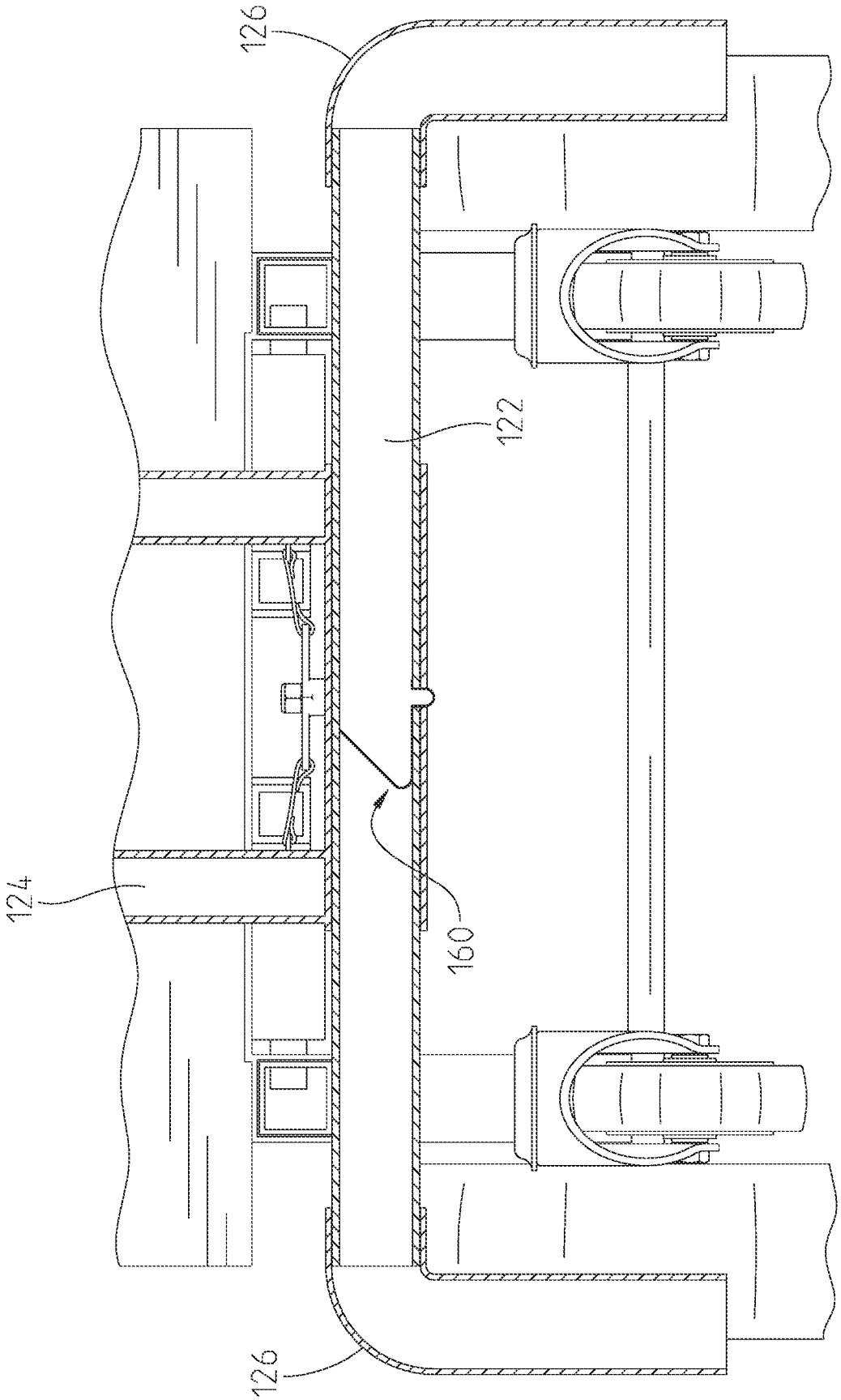

FIG. 13

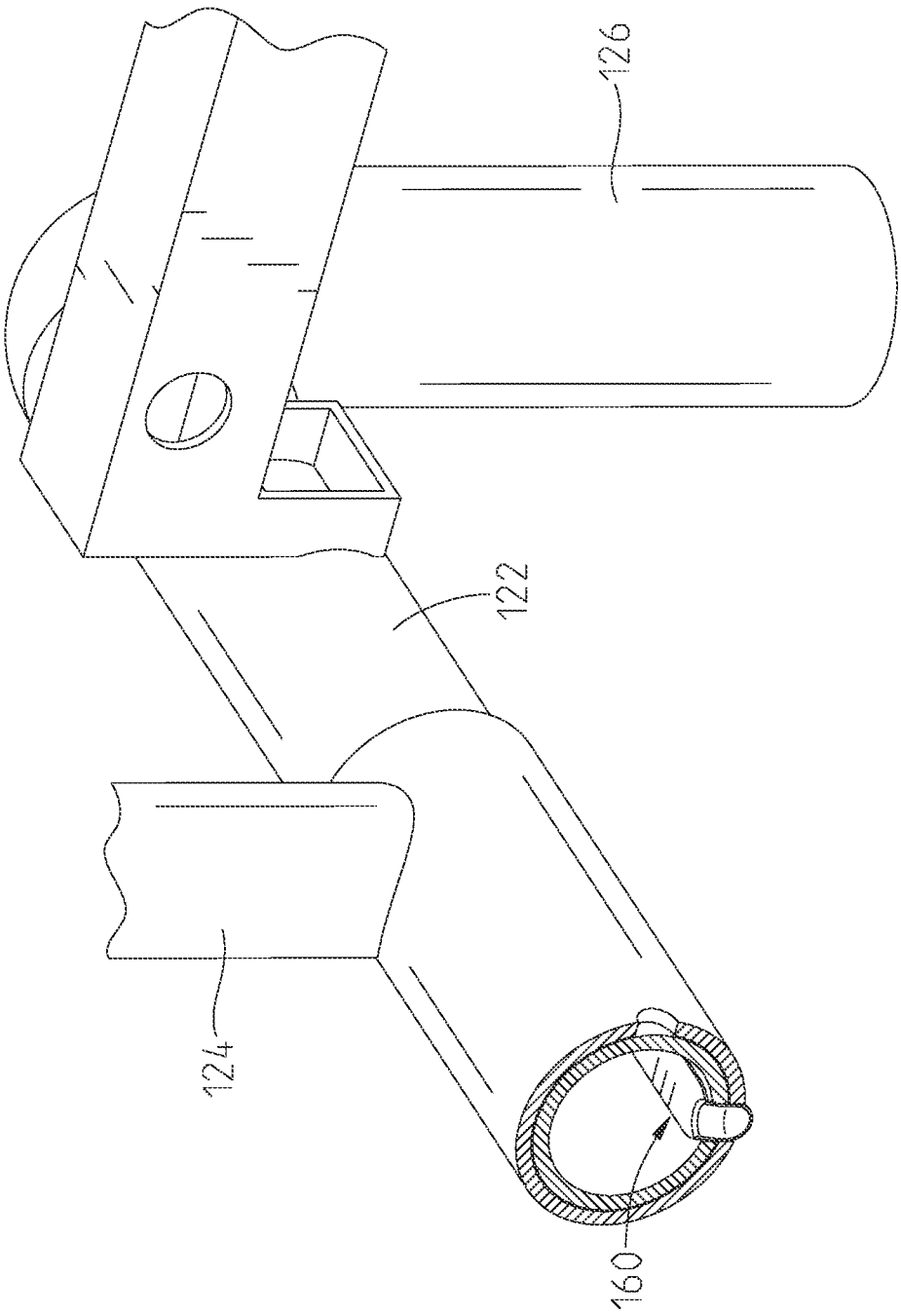

FIG. 14

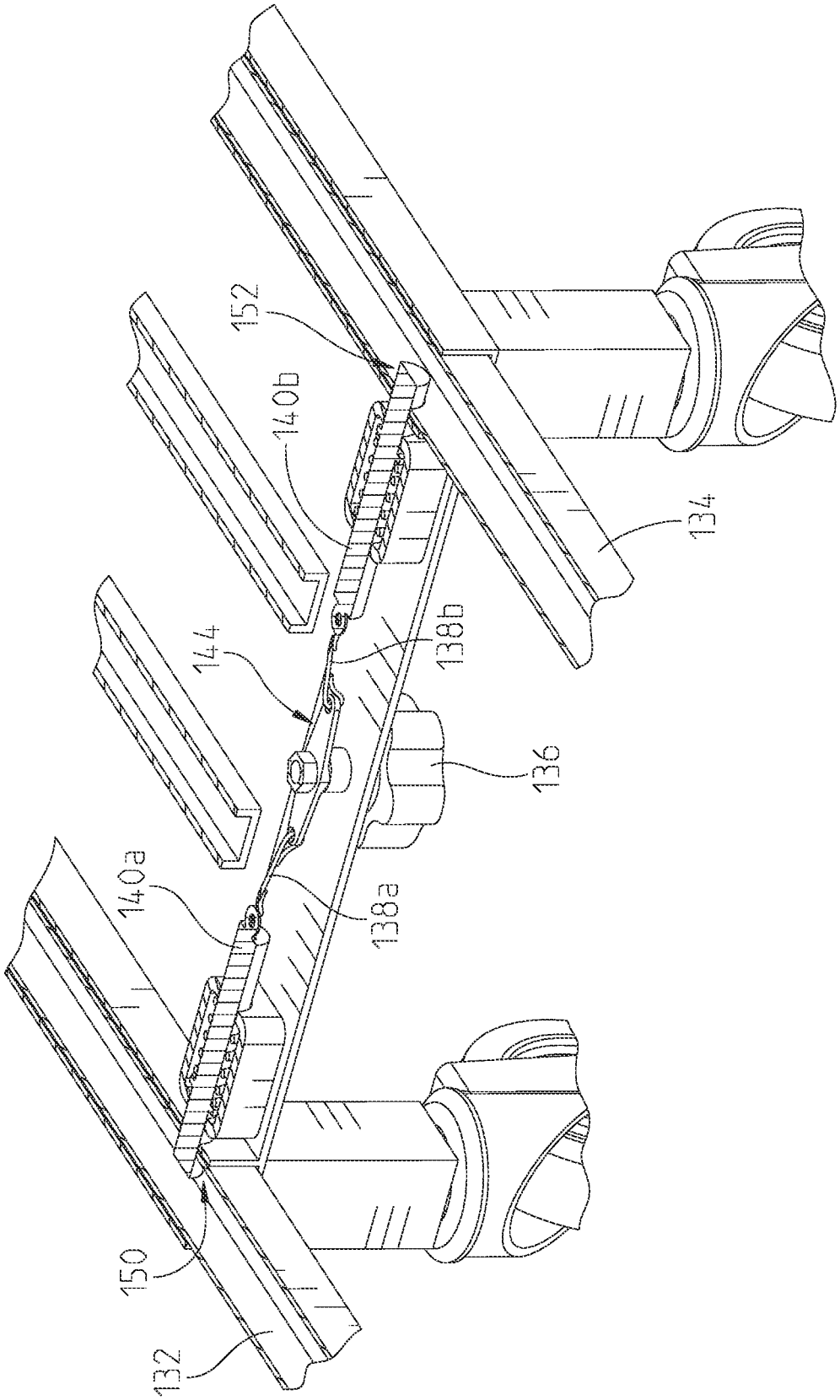

FIG. 15

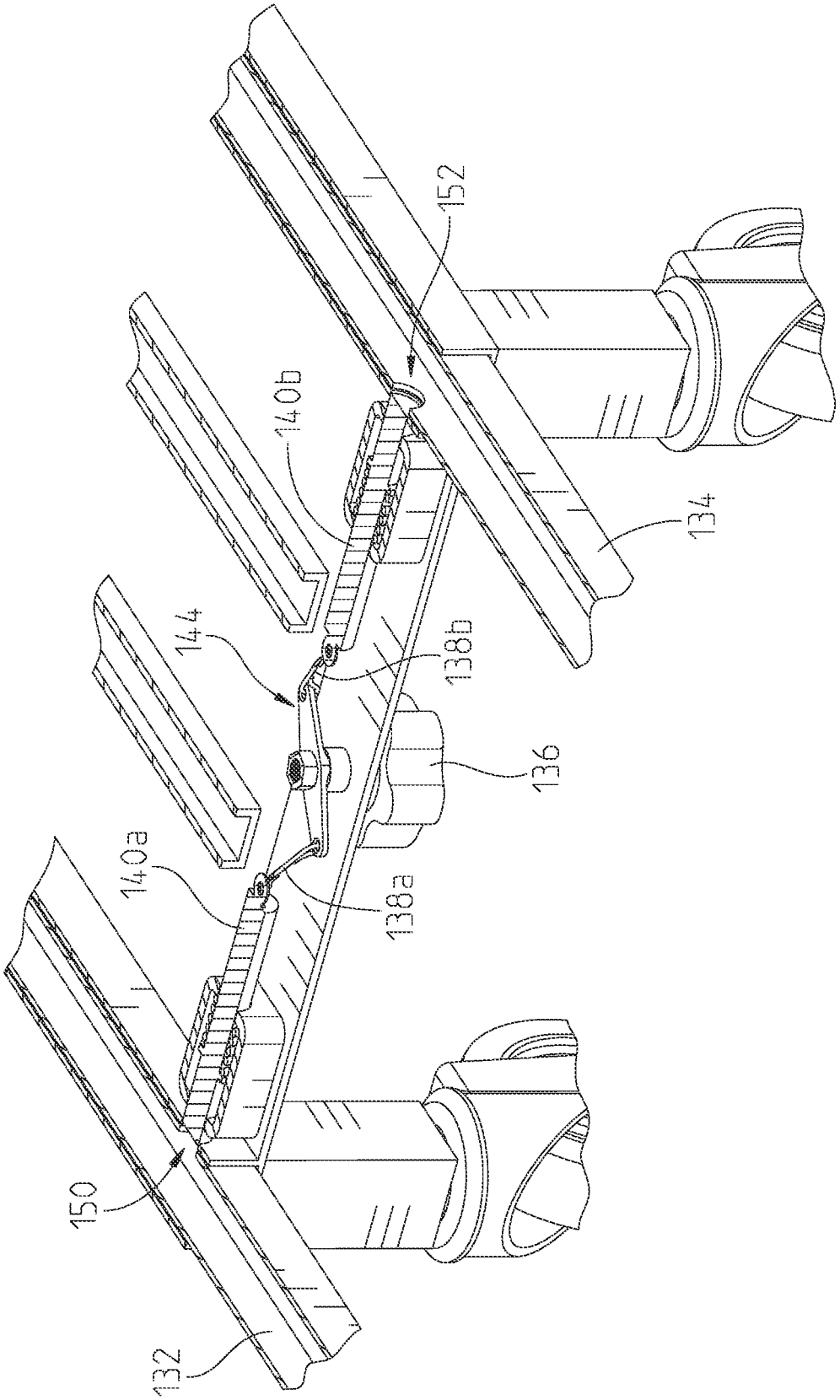

FIG. 16

EXTENDABLE HAND TRUCK

RELATED APPLICATIONS

[0001] The present application claims priority to U.S. Provisional Patent Application Ser. No. 63/324,291, filed Mar. 28, 2022, the entire disclosure of which is expressly incorporated by reference herein.

FIELD OF THE DISCLOSURE

[0002] The present disclosure relates generally to hand trucks, and more particularly, to hand trucks with extendable chassis.

BACKGROUND OF THE DISCLOSURE

[0003] Conventional hand trucks allow operators to transport items without having to manually lift the full weight of the items. However, when transporting oversized items, the operator must continuously balance the items so as to prevent the items from falling. Accordingly, there is a need for improved hand truck designs that can accommodate different sized items.

BRIEF SUMMARY OF THE DISCLOSURE

[0004] In an exemplary embodiment of the present disclosure, a hand truck is provided. The hand truck includes a chassis, a nose plate, a handle, a plurality of wheels and a fastener. The chassis includes a first section and a second section with the first section being moveable relative to the second section. The first section and the second section cooperate to form a cargo support surface. The nose plate is disposed at a lower end of the chassis while the handle is disposed at an upper end of the chassis. The plurality of wheels includes a first wheel and a second wheel disposed adjacent the nose plate and a third wheel disposed adjacent the handle. In a first arrangement, the fastener operates to lock the first section relative to the second section. In a second arrangement, the fastener operates to permit movement of the first section relative to the second section. The fastener is carried by one of the first section and the second section in both the first arrangement and the second arrangement.

[0005] In one example, the first section includes an extension member mounted in a telescoping relationship with the second section to allow an operator to adjust a distance between the nose plate and the handle. In a refinement thereof, the first section includes a first and second extension members mounted in telescoping relationships with the second section. The first and second extension members extend relative to the second section to provide a first area of the cargo support surface and retract relative to the second section to provide a second area of the cargo support surface that is smaller than the first area.

[0006] In another example, the fastener includes an operator input, a retractable pin and a biasing member. In the first arrangement, the retractable pin is received in an opening in the extension member. In the second arrangement, the retractable pin is removed from the opening in the extension member. Absent an actuation of the operator input, the biasing member operates to bias the retractable pin into the opening in the extension member. In yet another example, the fastener includes a hooking element coupled to the operator input and the retractable pin. The hooking element moves in response to the actuation of the operator input. In turn, the hooking element moves the retractable pin such that the retractable pin is either received in the opening in the extension member or removed from the opening in the extension member.

[0007] In a variation thereof, the fastener includes a pair of retractable pins and a pair of biasing members. In the first arrangement, a first retractable pin of the pair of retractable pins is received in an opening in the first extension member and a second retractable pin of the pair of retractable pins is received in an opening in the second extension member. In the second arrangement, the first retractable pin is removed from the opening in the first extension member and the second retractable pin is removed from the opening in the second extension member. Absent an actuation of the operator input, the pair of biasing members operates to bias the pair retractable pins into the respective openings in the first and second extension members.

[0008] In a further example, the operator input is positioned between the first and second extension members. The operator input is positioned on a first side of the chassis opposite the cargo support surface and along a longitudinal centerline plane of the hand truck. The operator input may be a rotatable knob. In a yet further example, each of the plurality of wheels extends away from the first side of the chassis opposite the cargo support surface. Each of the plurality of wheels is coupled to the second section independent of the first section of the chassis.

[0009] In still another example, the hand truck is configured to move between a first orientation and a second orientation. In the first orientation, the first wheel and the second wheel are in contact with a surface to roll over the surface while the third wheel is not in contact with the surface. In the second orientation, the first wheel, the second wheel and the third wheel are in contact with the surface to roll over the surface. When configured in the first orientation, the handle is in a folded position aligned parallel to the chassis. When configured in the second orientation, the handle is in an upright position aligned perpendicular to the chassis.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The above-mentioned and other features and advantages of this disclosure, and the manner of attaining them, will become more apparent and will be better understood by reference to the following description of exemplary embodiments taken in conjunction with the accompanying drawings, wherein:

[0011] FIG. **1** illustrates a perspective view of an extendable hand truck;

[0012] FIG. **2** illustrates a side view of the extendable hand truck of FIG. **1**;

[0013] FIG. **3** illustrates a front view of the extendable hand truck of FIG. **1**;

[0014] FIG. **4** illustrates a back view of the extendable hand truck of FIG. **1**;

[0015] FIG. **5** illustrates a top view of the extendable hand truck of FIG. **1**;

[0016] FIG. **6** illustrates a bottom view of the extendable hand truck of FIG. **1**;

[0017] FIG. **7** illustrates an exploded view of the extendable hand truck of FIG. **1**;

[0018] FIG. **8** illustrates a sectional view of the extendable hand truck of FIG. **1**;

[0019] FIGS. **9** and **10** illustrate perspective views of a frontend of the extendable hand truck;

[0020] FIGS. **11-13** illustrate sectional views of the frontend of the extendable hand truck of FIG. **9**; and

[0021] FIGS. **14-16** illustrate close-up sectional views of the frontend of the extendable hand truck of FIG. **9**.

[0022] Corresponding reference characters indicate corresponding parts throughout the several views. The exemplification set out herein illustrates an exemplary embodiment of the invention and such exemplification is not to be construed as limiting the scope of the invention in any manner.

DETAILED DESCRIPTION OF THE DRAWINGS

[0023] For the purposes of promoting an understanding of the principles of the present disclosure, reference is now made to the embodiments illustrated in the drawings, which are described below. The embodiments disclosed herein are not intended to be exhaustive or limit the present disclosure to the precise form disclosed in the following detailed description. Rather, the embodiments are chosen and described so that others skilled in the art may utilize their teachings. Therefore, no limitation of the scope of the present disclosure is thereby intended. Corresponding reference characters indicate corresponding parts throughout the several views.

[0024] The terms "couples," "coupled," "coupler" and variations thereof are used to include both arrangements wherein the two or more components are in direct physical contact and arrangements wherein the two or more components are not in direct contact with each other (e.g., the components are "coupled" via at least a third component), but yet still cooperate or interact with each other.

[0025] In some instances throughout this disclosure and in the claims, numeric terminology, such as first, second, third, and fourth, is used in reference to various components or features. Such use is not intended to denote an ordering of the components or features. Rather, numeric terminology is used to assist the reader in identifying the component or features being referenced and should not be narrowly interpreted as providing a specific order of components or features.

[0026] Referring to FIGS. **1-8**, an extendable hand truck **100** is shown. Extendable hand truck **100** includes a chassis **102**, a nose plate **104**, a handle **106**, a plurality of wheels **108**, and a fastener **110**. Chassis **102** includes one or more frame members **111** made of any suitable material (e.g., steel, aluminum, plastic, etc.) secured together using any suitable fastening technique (e.g., welding, bolting, adhesive bonding, etc.). Chassis **102** also includes a first section **112** that is moveable relative to a second section **114**. The first section **112** and the second section **114** cooperate to form a cargo support surface **116** on which a cargo or load can be placed.

[0027] Nose plate **104** is disposed at a lower end **118** of chassis **102** and attached to chassis **102** in any suitable manner. In one embodiment, nose plate **104** is a planar support plate. In one example, nose plate **104** is foldable.

[0028] Handle **106** is disposed at an upper end **120** of chassis **102** and attached to chassis **102** in any suitable manner. Handle **106** includes a connecting member **122**, a first handle **124**, and second handles **126**. In one embodiment, first handle **124** is fitted around connecting member **122** such that first handle **124** is rotatable about a longitudinal axis of connecting member **122**. Second handles **126** are fixedly attached to connecting member **122**.

[0029] Wheels **108** include wheels **108***a*, **108***b* (e.g., solid rubber wheels) which are disposed adjacent nose plate **104**, and wheels **108***c*, **108***d* (e.g., swivel caster wheels) which are disposed adjacent handle **106**. Each of wheels **108***a*-**108***d* is coupled to second section **114** independent of first section **112**. Each of wheels **108***a*-**108***d* extends away from a side of chassis **102** opposite cargo support surface **116**. Wheels **108** are adapted to facilitate movement of hand truck **100** relative to a surface (e.g., ground). In a hand truck orientation (where chassis **102** is substantially vertical), wheels **108***a*, **108***b* are in contact with the surface to roll over the surface while wheels **108***c*, **108***d* are not in contact with the surface. In a cart orientation (where chassis **102** is horizontal), wheels **108***a*-**108***d* are in contact with the surface to roll over the surface. In one example, hand truck **100** is capable of holding up to 800 lbs. of cargo in both the hand truck orientation and the cart orientation.

[0030] For hand truck **100** to be extendable, first section **112** includes one or more extension members **130** mounted in a telescoping relationship with second section **114**. As such, one or more extension members **130** allow an operator to adjust a distance between nose plate **104** and handle **106** to thereby vary a length of chassis **102** and modify the surface area of cargo support surface **116**. In one embodiment, first section **112** includes a first extension member **132** mounted in a telescoping relationship with second section **114** and a second extension member **134** mounted in a telescoping relationship with second section **114**. First and second extension members **132**, **134** can extend relative to second section **114** to provide a first area of cargo support surface **116** and retract relative to second section **114** to provide a second area of cargo support surface **116**, where the second area is smaller than the first area. In this manner, cargo support surface **116** can be adapted to hold cargos of varying sizes. Accordingly, when compared to conventional hand trucks, extendable hand truck **100** is able to accommodate different sized cargos and transport them safely.

[0031] Fastener **110** includes an operator input **136**, one or more biasing members **138**, and one or more retractable pins **140**. Fastener **110** operates to lock or release extension members **132**, **134** with respect to second section **114**. In a first arrangement of fastener **110**, fastener **110** locks first section **112** relative to second section **114**. In a second arrangement of fastener **110**, fastener **110** permits movement of first section **112** relative to second section **114**. In both the first and second arrangements, fastener **110** is carried by one of first section **112** and second section **114**.

[0032] Operator input **136** is positioned between first and second extension members **132**, **134**, and on the side of chassis **102** that is opposite cargo support surface **116**. In one embodiment, operator input **136** is positioned along a longitudinal centerline plane of hand truck **100**. In one example, operator input **136** is a rotatable knob that the operator can manipulate.

[0033] In FIG. **9**, first and second extension members **132**, **134** are shown to be extended relative to second section **114**. In FIG. **10**, first and second extension members **132**, **134** are shown to be retracted relative to second section **114**.

[0034] Referring to FIGS. **11** and **12**, one or more biasing members **138** include a first biasing member **138***a* and a second biasing member **138***b*. Similarly, one or more retractable pins **140** include a first retractable pin **140***a* and a

second retractable pin **140***b*. Retraction and extension of retractable pins **140***a*, **140***b* are supported by respective springs **142***a*, **142***b*.

[0035] In one embodiment, first and second biasing members **138***a*, **138***b* are hooking elements (e.g., S-hooks). As such, hooking elements **138***a*, **138***b* are coupled to operator input **136** (via an actuation nut **144**) and to respective retractable pins **140***a*, **140***b*. In operation, an actuation from operator input **136** moves hooking elements **138***a*, **138***b* which in turn move retractable pins **140***a*, **140***b*. This enables retractable pins **140***a*, **140***b* to be received in or removed from respective openings **150**, **152** in extension members **132**, **134**.

[0036] Referring to FIGS. **13** and **14**, first handle **124** can be moved between two positions by using a pin **160** (e.g., Valco pin). In a folded position (e.g., when hand truck **100** is in the cart orientation), first handle **124** is aligned parallel to chassis **102**. That is, first handle **124** folds down along a backside of first section **112** and second section **114**. As such, the operator can move hand truck **100** by pushing on second handles **126**. In the cart orientation, nose plate **104** may also serve as a cargo support surface. In an upright position (e.g., when hand truck **100** is in the hand truck orientation), first handle **124** is aligned perpendicular to chassis **102**. As such, the operator can move hand truck **100** by pushing or pulling on first handle **124**.

[0037] Referring to FIG. **15**, the first arrangement of fastener **110** is shown. In the first arrangement, operator input **136** is not actuated. As such, first and second biasing members **138***a*, **138***b* bias first and second retractable pins **140***a*, **140***b* into respective openings **150**, **152**. In other words, first retractable pin **140***a* is received in opening **150** in first extension member **132** and second retractable pin **140***b* is received in opening **152** in second extension member **134**.

[0038] Referring to FIG. **16**, the second arrangement of fastener **110** is shown. In the second arrangement, operator input **136** is actuated. For example, the operator rotates operator input **136** in a clockwise direction. This in turn moves actuation nut **144** which pulls on first and second biasing members **138***a*, **138***b*. Pulling of first and second biasing members **138***a*, **138***b* causes first and second retractable pins **140***a*, **140***b* to move out of respective openings **150**, **152**. In other words, first retractable pin **140***a* is removed from opening **150** in first extension member **132** and second retractable pin **140***b* is removed from opening **152** in the second extension member **134**.

[0039] While this disclosure has been described as having exemplary designs, the present embodiments can be further modified within the spirit and scope of this disclosure. This application is therefore intended to cover any variations, uses, or adaptations of the disclosure using its general principles. Further, this application is intended to cover such departures from the present disclosure as come within known or customary practice in the art to which this disclosure pertains.

What is claimed is:

1. A hand truck comprising:

a chassis having a first section and a second section, the first section being moveable relative to the second section, the first section and the second section cooperating to form a cargo support surface;

a nose plate disposed at a lower end of the chassis;

a handle disposed at an upper end of the chassis;

a plurality of wheels including a first wheel and a second wheel each disposed adjacent the nose plate and a third wheel disposed adjacent the handle; and

a fastener having a first arrangement wherein the fastener locks the first section of the chassis relative to the second section of the chassis and a second arrangement wherein the fastener permits movement of the first section of the chassis relative to the second section of the chassis, the fastener being carried by one of the first section of the chassis and the second section of the chassis in both the first arrangement of the fastener and the second arrangement of the fastener.

2. The hand truck of claim **1**, wherein the first section of the chassis includes an extension member mounted in a telescoping relationship with the second section of the chassis, the extension member allowing an operator to adjust a distance between the nose plate and the handle.

3. The hand truck of claim **2**, wherein the fastener includes an operator input, a retractable pin and a biasing member;

wherein:

in the first arrangement of the fastener, the retractable pin is received in an opening in the extension member; and

in the second arrangement of the fastener, the retractable pin is removed from the opening in the extension member, the biasing member absent an actuation of the operator input biases the retractable pin into the opening in the extension member.

4. The hand truck of claim **3**, wherein the fastener further includes a hooking element coupled to the operator input and the retractable pin;

wherein to move the retractable pin from being received in the opening of the extension member to being removed from the opening in the extension member, the hooking element is moved in response to the actuation of the operator input and in turn moves the retractable pin.

5. The hand truck of claim **1**, wherein the first section of the chassis includes a first extension member mounted in a telescoping relationship with the second section of the chassis and a second extension member mounted in a telescoping relationship with the second section of the chassis, the first and second extension members being extended relative to the second section of the chassis to provide a first area of the cargo support surface and retracted relative to the second section of the chassis to provide a second area of the cargo support surface, the second area being smaller than the first area.

6. The hand truck of claim **5**, wherein the fastener includes an operator input positioned between the first extension member and the second extension member.

7. The hand truck of claim **6**, wherein the operator input is positioned on a first side of the chassis opposite the cargo support surface.

8. The hand truck of claim **7**, wherein each of the plurality of wheels extends away from the first side of the chassis opposite the cargo support surface.

9. The hand truck of claim **8**, wherein each of the plurality of wheels is coupled to the second section of the chassis independent of the first section of the chassis.

10. The hand truck of claim **6**, wherein the fastener includes a pair of retractable pins and a pair of biasing members;

wherein:

in the first arrangement of the fastener, a first retractable pin of the pair of retractable pins is received in an opening in the first extension member and a second retractable pin of the pair of retractable pins is received in an opening in the second extension member; and

in the second arrangement of the fastener, the first retractable pin of the pair of retractable pins is removed from the opening in the first extension member and the second retractable pin of the pair of retractable pins is removed from the opening in the second extension member, the pair biasing members absent an actuation of the operator input biases the pair retractable pins into the respective opening in the first and second extension members.

11. The hand truck of claim **3**, wherein the operator input is a rotatable knob.

12. The hand truck of claim **3**, wherein the operator input is positioned along a longitudinal centerline plane of the hand truck.

13. The hand truck of claim **1**, wherein the hand truck is configured to move between:

a first orientation where the first wheel and the second wheel are in contact with a surface to roll over the surface and the third wheel is not in contact with the surface; and

a second orientation where the first wheel, the second wheel and the third wheel are in contact with the surface to roll over the surface.

14. The hand truck of claim **13**, wherein the handle is movable between:

a folded position aligned parallel to the chassis when the hand truck is configured in the first orientation; and

an upright position aligned perpendicular to the chassis when the hand truck is configured in the second orientation.

15. The hand truck of claim **1**, wherein the nose plate is movable between:

a folded position wherein the nose plate is parallel to the chassis; and

an upright position wherein the nose plate is perpendicular to the chassis.

16. The hand truck of claim **15**, wherein the nose plate in the upright position forms a second cargo support surface.

17. The hand truck of claim **1**, wherein the handle comprises a connector for coupling the handle to the upper end of the chassis.

18. The hand truck of claim **17**, wherein the handle further comprises a first handle rotatably coupled to the connector.

19. The hand truck of claim **18**, wherein the first handle comprises a pin configured to permit the first handle to rotate about the connector.

20. The hand truck of claim **17**, wherein the handle further comprises a second handle fixedly coupled to the connector.

* * * * *