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CN 206985639 U
DE 102017214711 A1
SE 7503943 A

(57) Sammendrag:
The present invention discloses a system comprising a lifting apparatus (100) and a number of objects (104) to be lifted by the lifting apparatus (100). The apparatus (100) comprises a rigid frame (106) having two beams with their lower ends spaced apart and their upper ends touching each other forming a triangular structure. Each beam comprises a lance (108, 110) extending perpendicularly from the lower end of the beam. Each lance (108, 110) is non-displaceably connected to a lower portion of its respective beam, thereby the lances are configured to detachably support an object (104) therebetween. The apparatus further comprises a lifting gear (105) configured for lifting and lowering the apparatus (100). The object (104) includes grooves (114) on two opposite sides and each lance comprises flaps (112). The flaps (112) are configured to detachably engage to the grooves (114) of the object (104) via a spring mechanism.

Fortsættes...

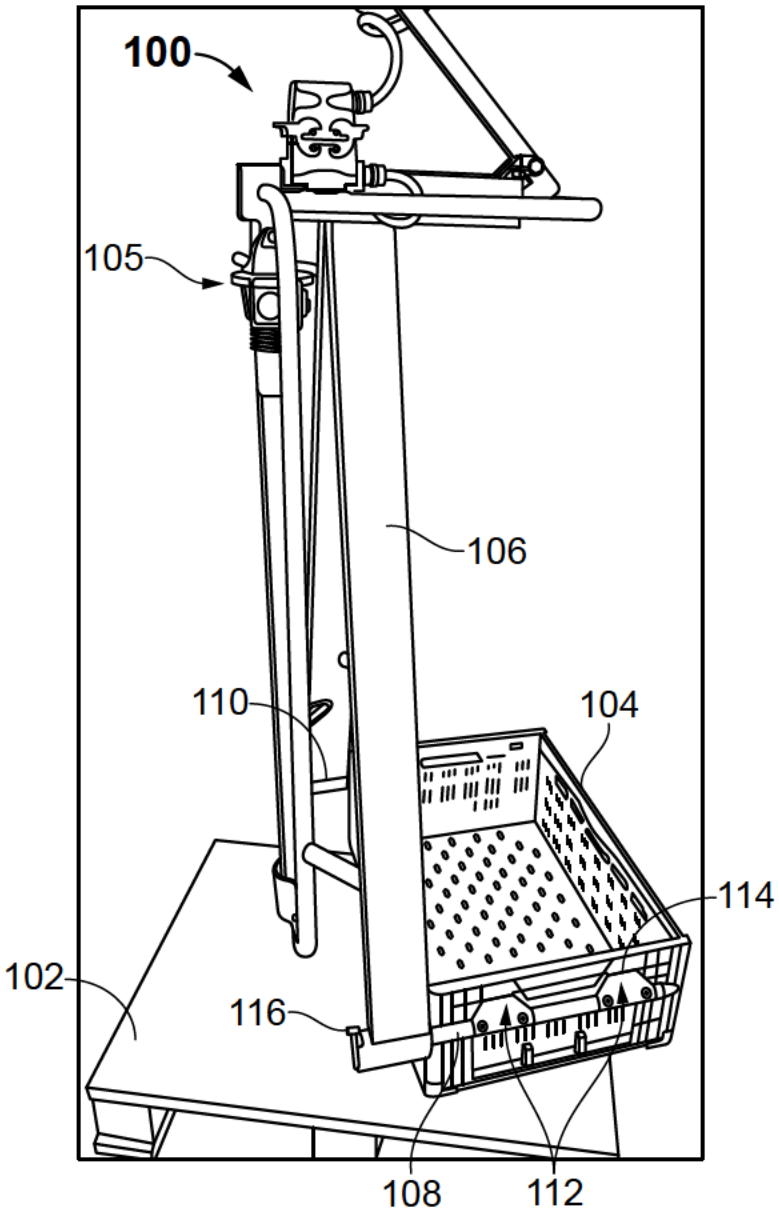

FIG. 1

LIFTING APPARATUS

TECHNICAL FIELD OF THE INVENTION

The invention disclosed herein generally relates to system comprising a lifting apparatus and a number of objects to be lifted by the lifting apparatus. More particularly, the present invention relates to a lifting apparatus used for raising, transporting, lowering and safely placing an object or stacked objects, for example, boxes.

BACKGROUND

Material lifting equipment is probably required in many industries for handling objects, for example, boxes. The boxes are used for storing and transporting materials from one place to another using lifting equipment. Handling a large number of boxes is too heavy for personnel to carry and maneuver around by hand. Currently, many industries use different types of lifting or logistic equipment such as, lifting gears, cranes, and lift trucks. The existing lifting equipment, cranes, and lift trucks have long been used in industries for handling stacked boxes and containers. The cranes and lift trucks are manually operated by one or more operators to raise, transport, and lower the stacked objects, for example, boxes.

However, handling stacked boxes using the existing lifting equipment, cranes, and lift trucks is difficult and cumbersome. If the lift truck is used for handling the stacked boxes, then the jaws or claws of the lift truck could damage the side portions of the boxes due to tightness. The lift truck frequently cannot gain access to the bottom portion of the stacked boxes, thereby additional equipment and workers are required. The existing lifting equipment and the lift trucks are in need of regular maintenance, which incurs additional cost.

A prior art, US 7080824 B1 of *George David W* et al., discloses a chain motor drive controller for a chain hoist. The system employs a position encoder including a position sensor located within the casing of the chain hoist to producing encoded electrical position signals. Another prior art, CN 206985639 U of Wuxi Aiyili Machinery Co Ltd., discloses a pallet fork with two lances for carrying turnover box. However, the prior arts lack to describe a lifting apparatus with entire gripping means and lifting gear enabling it to be self-hoisting, for securely handling box-shaped loads.

In the light of above-mentioned problems, there is a need for an efficient lifting apparatus for raising, transporting, and lowering objects. Further, there is also a need for providing an inexpensive and simple lifting apparatus for handling the stacked objects, for example, boxes.

SUMMARY OF THE INVENTION

This summary is provided to introduce a selection of concepts in a simplified form that are further disclosed in the detailed description of the invention. This summary is not intended to identify key or essential inventive concepts of the claimed subject matter, nor is it intended for determining the scope of the claimed subject matter.

The present invention discloses a system comprising a lifting apparatus and a number of objects to be lifted by the lifting apparatus. The apparatus comprises a rigid frame having two beams with their lower ends spaced apart and their upper ends touching each other forming a triangular structure. Each beam comprises a lance extending perpendicularly from the lower end of the beam. Each lance is non-displaceably connected to a lower portion of its respective beam, thereby the lances are configured to detachably support an object therebetween. The apparatus further comprises a lifting gear configured for lifting and lowering the apparatus. The object includes grooves on two opposite sides and each lance comprises flaps. The flaps are configured to detachably engage to the grooves of the object via a spring mechanism. The spring mechanism is

configured to tilt the lances, thereby detachably engaging the flaps of the lances to the grooves of the object for raising and lowering the object from a platform by the operator and transporting the objects to a desired place by means of the lifting gear.

Other objects, features and advantages of the present invention will become apparent from the following detailed description. It should be understood, however, that the detailed description and the specific examples, while indicating specific embodiments of the invention, are given by way of illustration only, since various changes and modifications within the scope of the invention will become apparent to those skilled in the art from this detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing summary, as well as the following detailed description of the invention, is better understood when read in conjunction with the appended drawings. For illustrating the invention, exemplary constructions of the invention are shown in the drawings. However, the invention is not limited to the specific methods and structures disclosed herein. The description of a method step or a structure referenced by a numeral in a drawing is applicable to the description of that method step or structure shown by that same numeral in any subsequent drawing herein.

FIG. **1** exemplarily illustrates a side perspective view of a lifting apparatus used for raising at least one object from a platform in an embodiment of the present invention.

FIG. **2** exemplarily illustrates a side perspective view of the lifting apparatus used for raising at least three objects from the platform in one embodiment of the present invention.

FIG. **3** exemplarily illustrates a side perspective view of the lifting apparatus used for raising at least five objects from the platform in one embodiment of the present invention.

FIG. **4** exemplarily illustrates a rear perspective view of the lifting apparatus used for raising at least three objects from the platform in one embodiment of the present invention.

FIG. **5** exemplarily illustrates a perspective view of the lifting apparatus in an embodiment of the present invention.

FIG. **6** exemplarily illustrates a side perspective view of the lifting apparatus used for raising objects from stacked objects on the platform in one embodiment of the present invention.

FIG. **7** exemplarily illustrates an enlarged view of the lifting apparatus used for raising objects from the platform in one embodiment of the present invention.

FIG. **8** exemplarily illustrates an enlarged view of flaps affixed to a lance of the lifting apparatus in one embodiment of the present invention.

FIG. **9** exemplarily illustrates an enlarged view of an indicator positioned at a bottom portion of the lifting apparatus in one embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. **1**, a system comprising a lifting apparatus **100** and a number of objects **104** to be lifted by the lifting apparatus **100** from a platform **102** is shown. In one embodiment, the object **104** could be a box and a euro pallet box. In one embodiment, the apparatus **100** could be used in different industries for raising and transporting the objects **104** from one place to another. The apparatus **100** comprises a rigid frame **106** having two beams with their lower ends spaced apart and their upper ends touching each other forming a triangular structure. Each beam comprises a lance (**108, 110**) extending perpendicularly from the lower end of the beam. Each lance (**108, 110**) is non-displaceably connected to a lower portion of its respective beam, thereby the lances are configured to detachably support an object **104** therebetween. The apparatus further comprises a lifting gear **105** configured for lifting and lowering the apparatus **100**. The object **104** includes grooves **114** on two opposite sides and each lance comprises flaps **112**. The flaps **112** are configured to detachably engage to the grooves **114** of the object **104** via a spring mechanism.

In one embodiment, one or more flaps **112** are affixed to the lances (**108** and **110**) (shown in FIG. **5**) for holding the object **104**. In one embodiment, the flaps **112** are configured to engage to the grooves **114** of the object **104** via the spring mechanism. In one embodiment, the spring mechanism is incorporated at the bottom portion of the rigid frame **106**. In one embodiment, the spring mechanism is configured to tilt the flaps **112** into the grooves **114** of the object **104**, thereby the operator could raise and transport the object **104** from a platform **102** and lower it at the desired place or on a floor via the lifting gear **105**.

Referring to FIG. **2**, the lifting apparatus **100** is used to raise at least three objects **104** from a platform **102** and transporting the objects **104** from one place to other. Referring to FIG. **3**, the lifting apparatus **100** is used to raise at least two stacked objects **104** from the platform **102**. The lances (**108** and **110**) (shown in FIG. **5**) could be placed

on both sides of the object **104**, thereby the flaps **112** could detachably engage to the grooves **114** of the object **104** for holding.

Referring to FIG. **4**, the apparatus **100** further comprises an indicator **116**. In one embodiment, the indicator **116** is located at a bottom portion of the rigid frame **106**. In one embodiment, the indicator **116** is configured to represent the position of the flaps **112** of the apparatus **100**. In one embodiment, the indicator **116** is further connected to the spring mechanism within the rigid frame **106**.

Referring to FIG. **5**, the lances (**108** and **110**) are placed on both sides of the objects **104**. The operator or user could place the lances (**108** and **110**) on both sides of the object **104**, thereby the flaps **112** could detachably engage to the grooves **114** of the object **104** for holding. Further, the operator could operate the apparatus **100** (shown in FIG. **1**) for raising, transporting, and lowering the stacked objects from the platform **102** to position on the desired place or a floor.

Referring to FIG. **6**, the apparatus **100** (shown in FIG. **1**) is used to raise the objects **104** from the stacked objects. In one embodiment, the apparatus **100** (shown in FIG. **1**) is further configured to raise and transport the objects **104** anywhere from the stacked objects. The operator could place the lances (**108** and **110**) (shown in FIG. **5**) of the apparatus **100** (shown in FIG. **1**) on both sides of any one of the objects **104** in the stacked objects, thereby the flaps **112** could detachably engage to the grooves **114** of the object **104** for holding.

Referring to FIG. **7**, the apparatus **100** (shown in FIG. **1**) further comprises at least two indicators **116**. In one embodiment, the indicators **116 c**ould be positioned on both sides of the rigid frame **106**. In one embodiment, the indicators **116** are configured to indicate or represent the position of the flaps **112**.

Referring to FIG. **8**, the flaps **112** are affixed to the lance **108**. In one embodiment, the flaps **112** are further configured to automatically disengage from the grooves **114** of the object via the spring mechanism when the objects **104** are placed on a floor. In one embodiment, the flaps **112** further comprise a sanded surface.

Referring to FIG. **9**, the indicator **116** of the apparatus **100** (shown in FIG. **1**) is configured to move to vertical or horizontal positions. In one embodiment, if the indicator **116** moves to vertical position, the operator or user can easily identify the position of the flaps **112** that automatically disengages from the grooves **114** of the object **104**. In one embodiment, if the indicator **116** moves to horizontal position, the user can identify the position of the flaps **112** that engages to the grooves **114** of the object **104**.

The advantages of the present invention include: the lifting apparatus **100** is simple in construction and operation, where the operator or user could easily operate the apparatus **100**. The apparatus **100** is an inexpensive lifting equipment and maintenance free. The apparatus **100** could be made of steel, iron, and plastic based upon the end use. The apparatus **100** could be used in different industries without any modification for logistics and shipping applications.

The foregoing examples have been provided merely for the purpose of explanation and are in no way to be construed as limiting of the present concept disclosed herein. While the concept has been described with reference to various embodiments, it is understood that the words, which have been used herein, are words of description and illustration, rather than words of limitation. Further, although the concept has been described herein with reference to particular means, materials, and embodiments, the concept is not intended to be limited to the particulars disclosed herein; rather, the concept extends to all functionally equivalent structures, methods and uses, such as are within the scope of the appended claims. Those skilled in the art, having the benefit of the teachings of this specification, may affect numerous modifications thereto and changes may be made without departing from the scope of the concept in its aspects.

KRAV

1. Et system omfattende et løfteapparat (**100**) og et antal objekter (**104**) der skal løftes af løfteapparatet (**100**), nævnte apparat (**100)** kendetegnet ved:

en stiv ramme (**106**) med to bjælker hvor deres nedre ender er adskilt fra hinanden og deres øvre ender berører hinanden og danner en trekantet struktur, hvor hver bjælke omfatter en lanse (**108, 110**) der strækker sig vinkelret på den nedre ende af bjælken, hvor hver lanse (**108**, **110**) er ikke-forskydelig forbundet til en nedre del af dens respektive bjælke, derved er lanserne (**108**, **110**) konfigureret til at aftageligt understøtte et objekt (**104**) derimellem;

et løfteapparat (**105**) konfigureret til at løfte og sænke apparatet (**100**) i samarbejde med en struktur, der ikke er en del af apparatet (**100**), hvor objektet (**104**) inkluderer en eller flere riller (**114**) på to modsatte sider; og hver lanse omfatter en eller flere flapper (**112**), hvor flapperne (**112**) er konfigureret til aftageligt at gå i indgreb med rillerne (**114**) af objektet (**104**) via en fjedermekanisme,

hvor fjedermekanismen er konfigureret til at vippe lanserne (**108**, **110**), derved aftageligt gribe med flapperne (**112**) af lanserne (**108** and **110**) til rillerne (**114**) af objektet (**104**) til at hæve og sænke objektet (**104**) fra en platform (**102**) af operatøren og transportere genstande (**104**) til et ønsket sted ved hjælp af løfteudstyret (**105**).

2. Apparatet (**100**) ifølge krav 1, yderligere omfatter en indikator (**116**) placeret i en bunddel af den stive ramme (**106**).

3. Apparatet (**100**) ifølge krav 2, hvor indikatoren (**116**) er konfigureret til at repræsentere flappernes placering (**112**).

4. Apparatet (**100**) ifølge krav 1, hvor fjedermekanismen er inkorporeret i bunddelen af den stive ramme (**106**).

5. Apparatet (**100**) ifølge krav 1, hvor flapperne (**110**) er yderligere konfigureret til at løsne sig fra rillerne (**114**) af objektet (**104**) via fjedermekanismen, når objektet (**104**) placeres på et gulv.

6. Apparatet (**100**) ifølge krav 1, hvor flapperne (**112**) omfatter en sleben overflade.

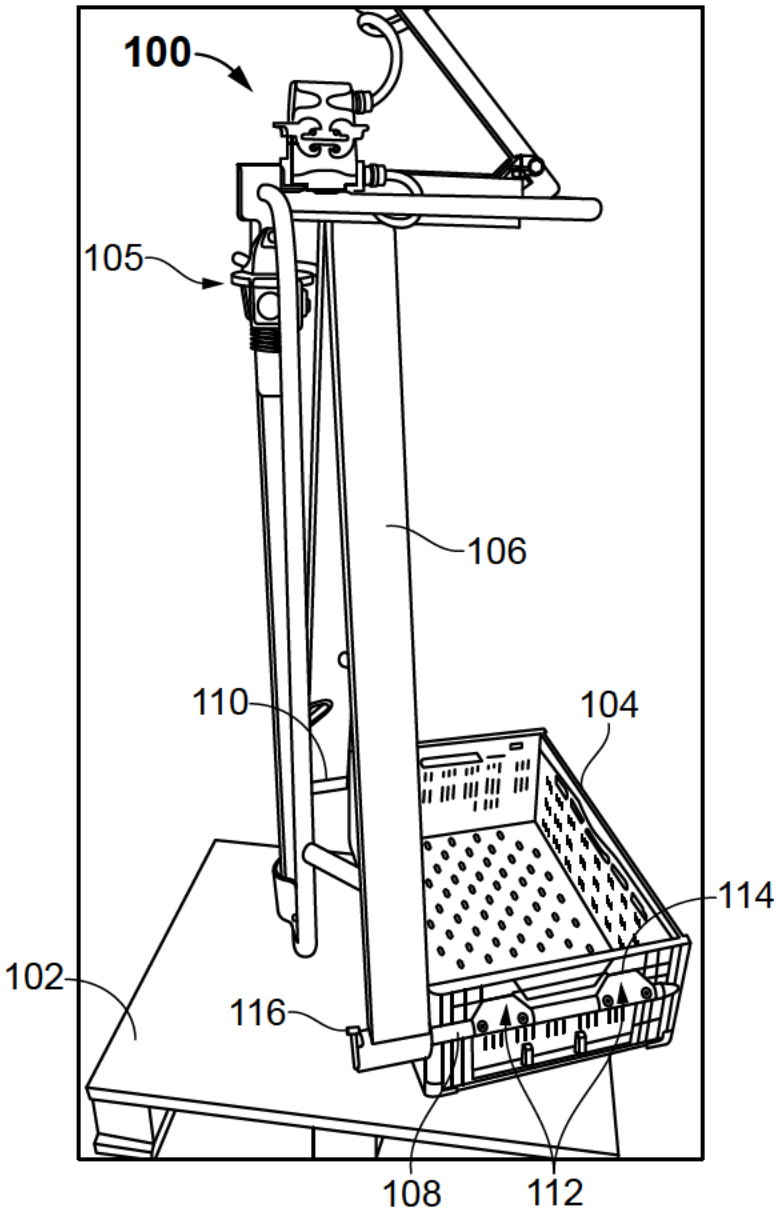

FIG. 1

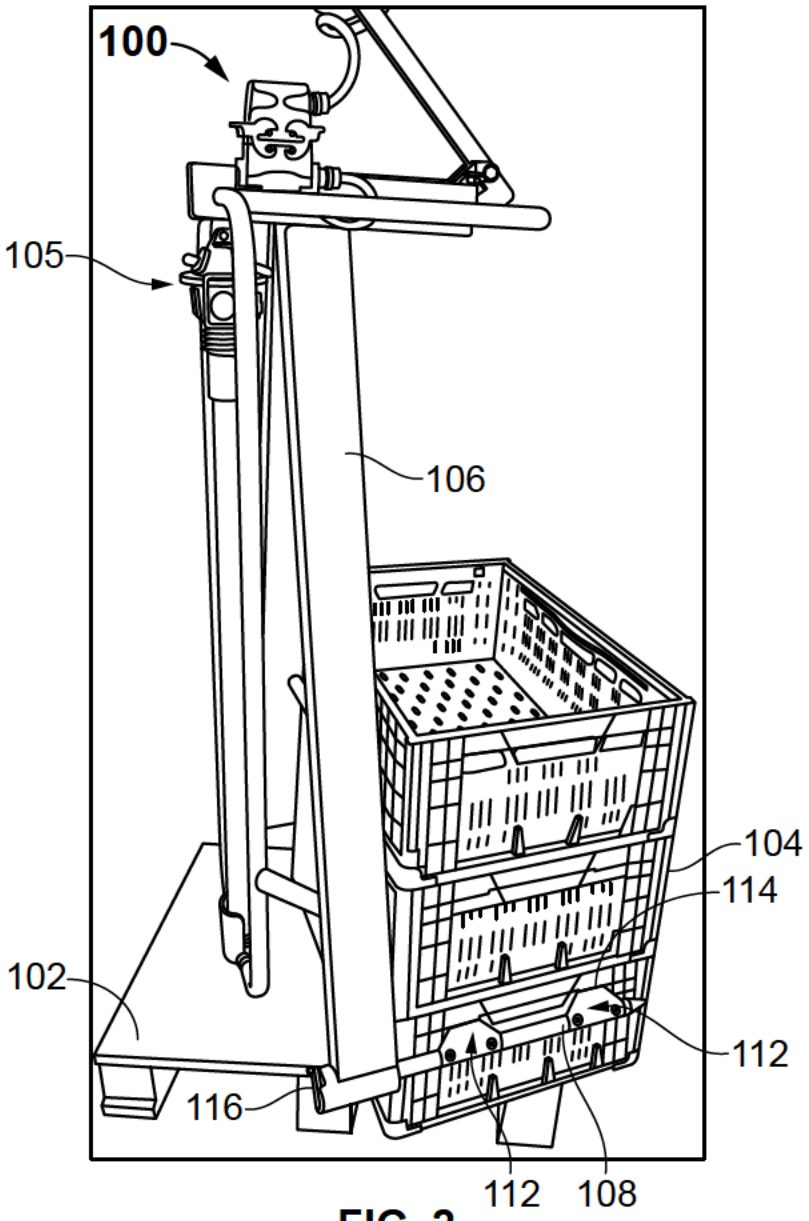

FIG. 2

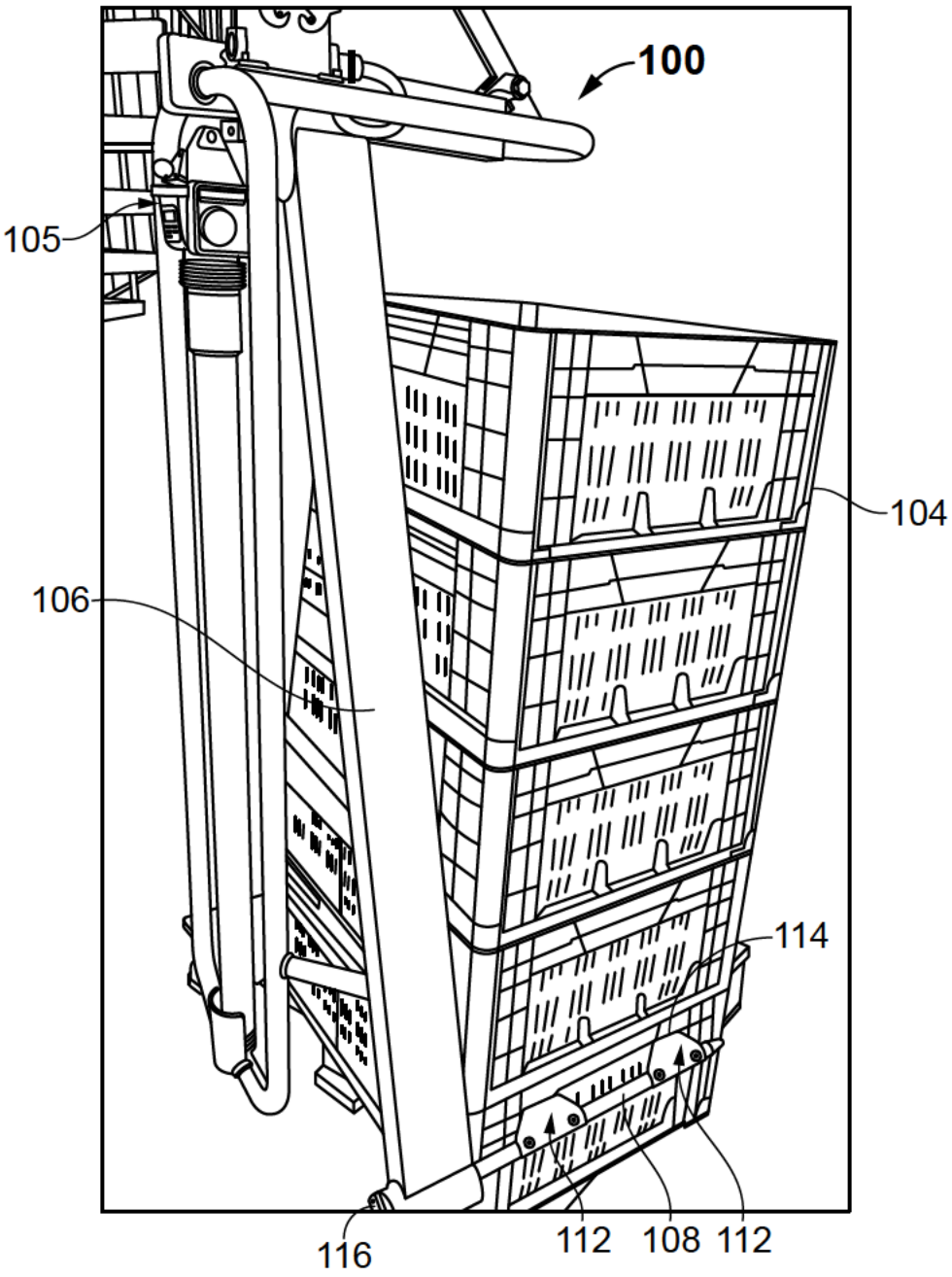

FIG. 3

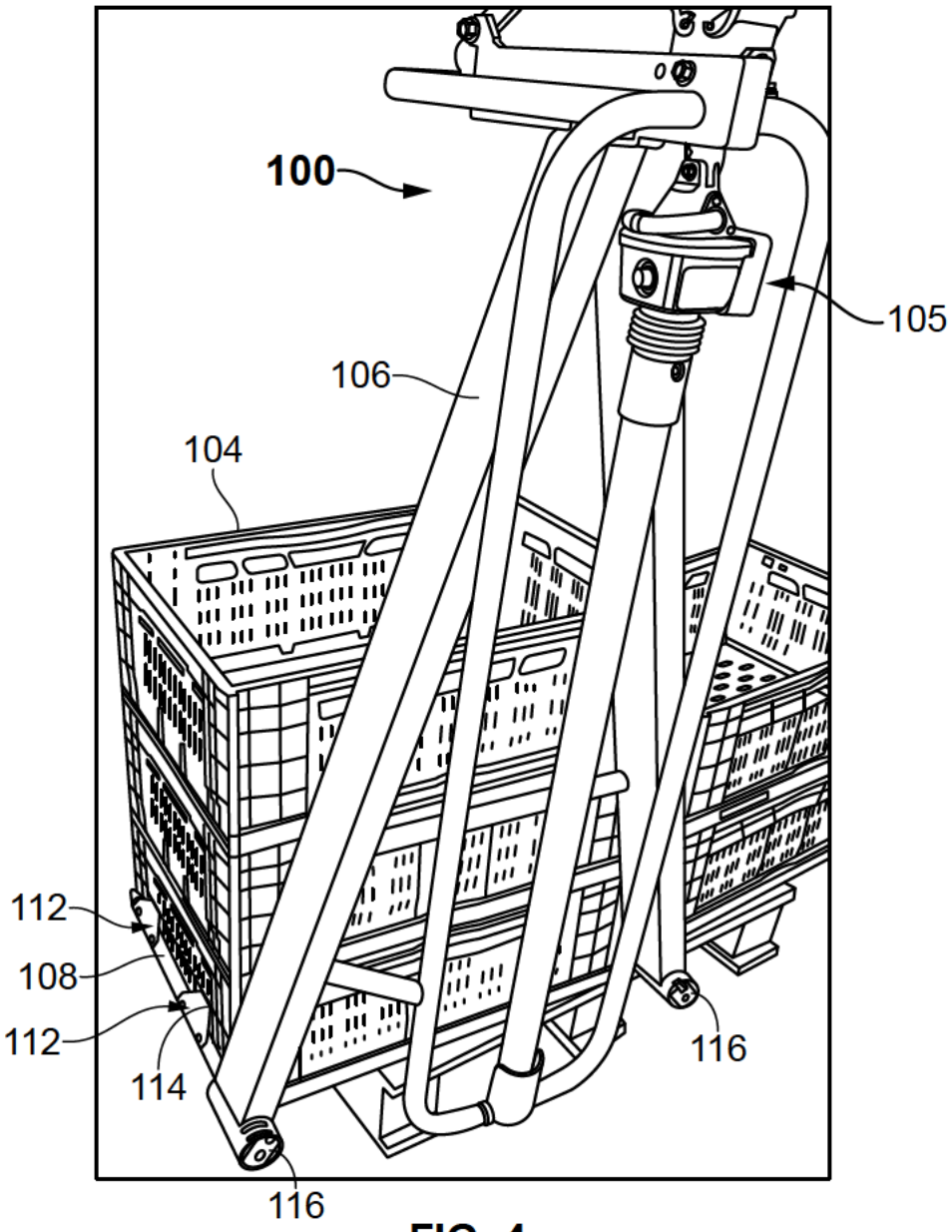

FIG. 4

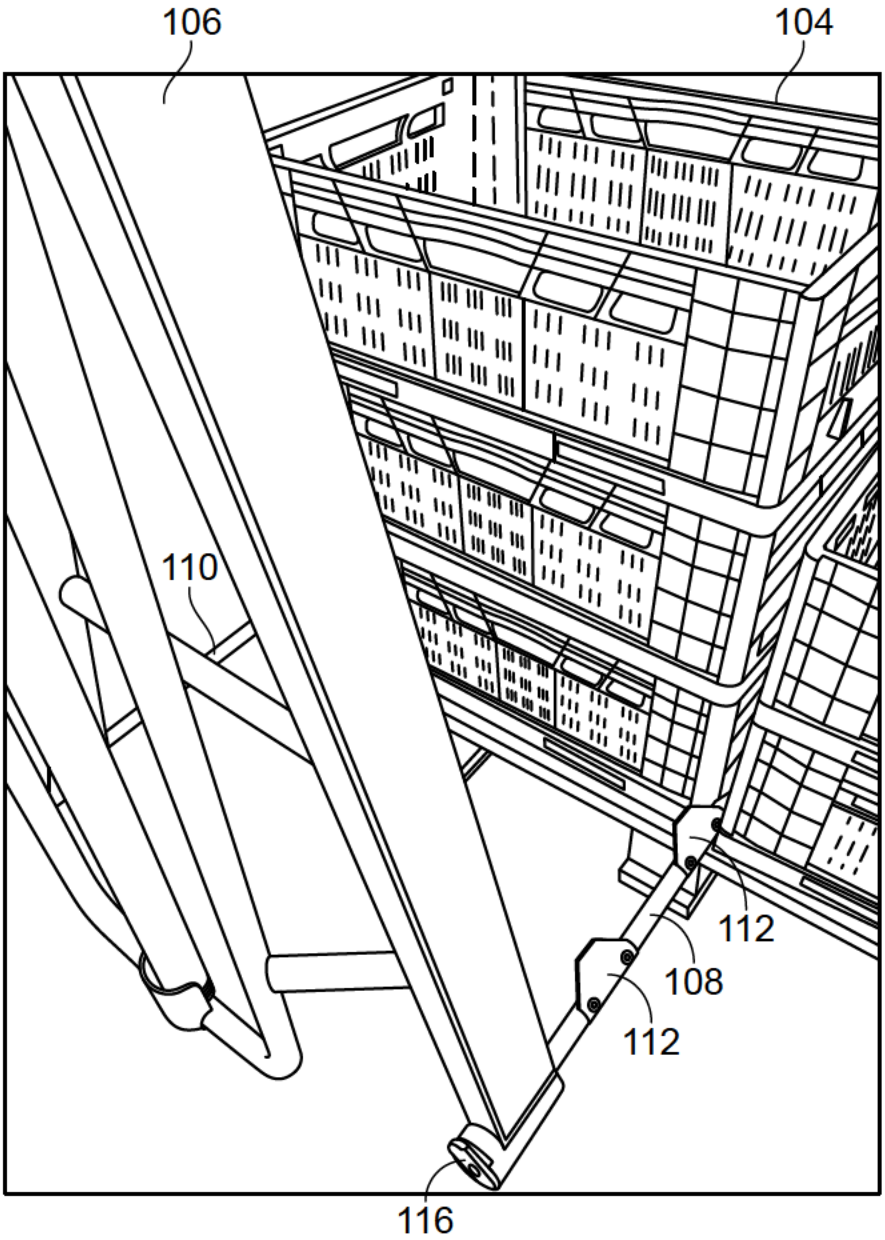

FIG. 5

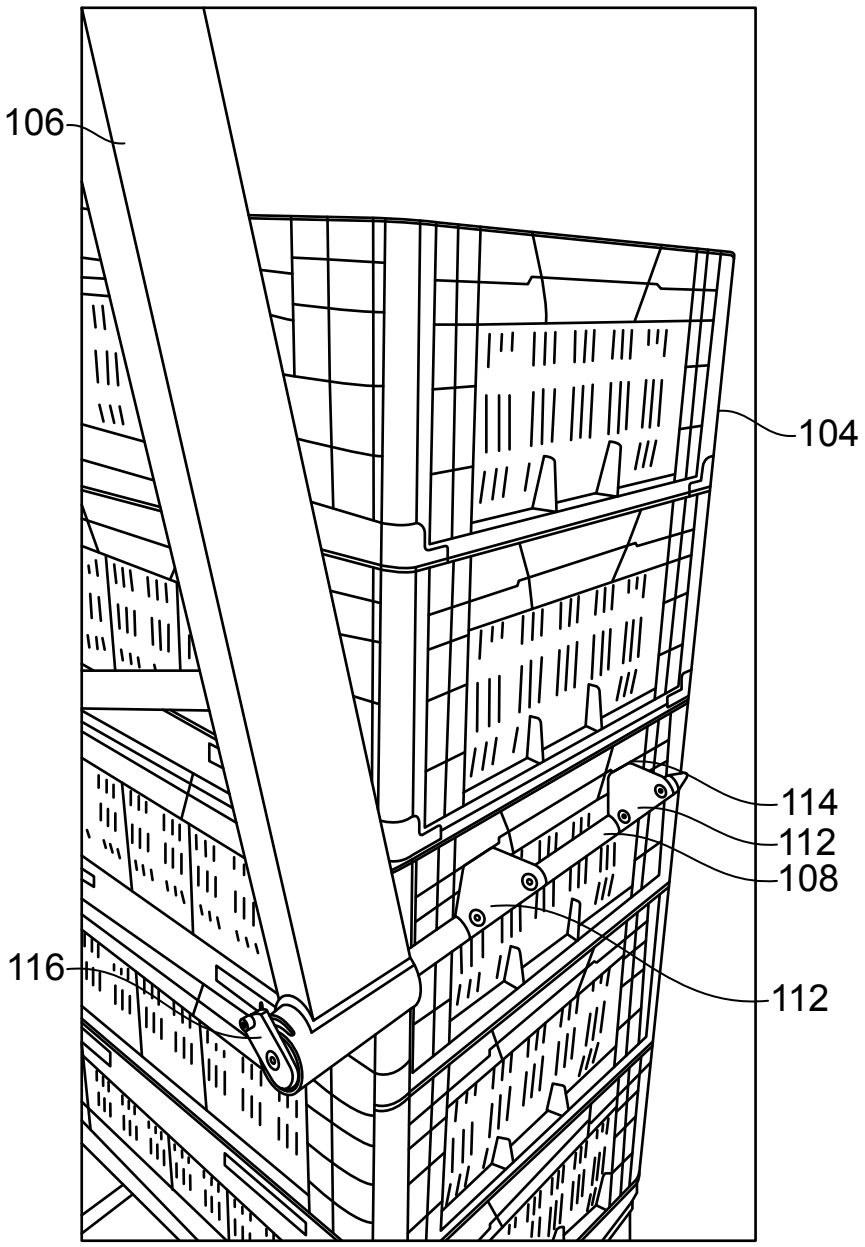

FIG. 6

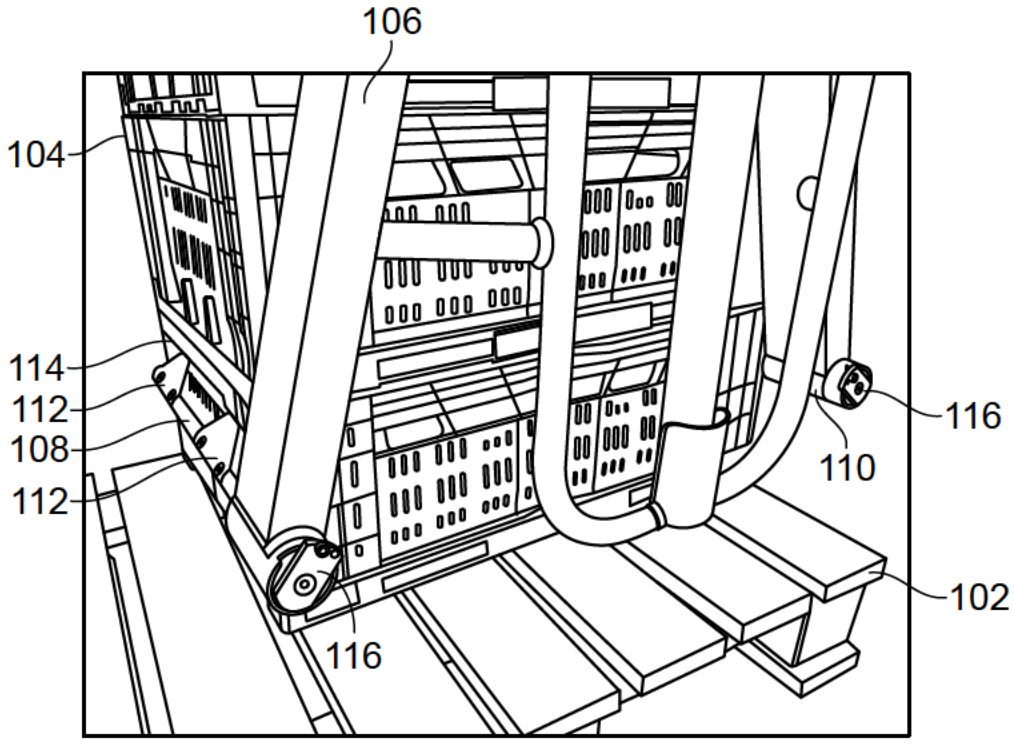

FIG. 7

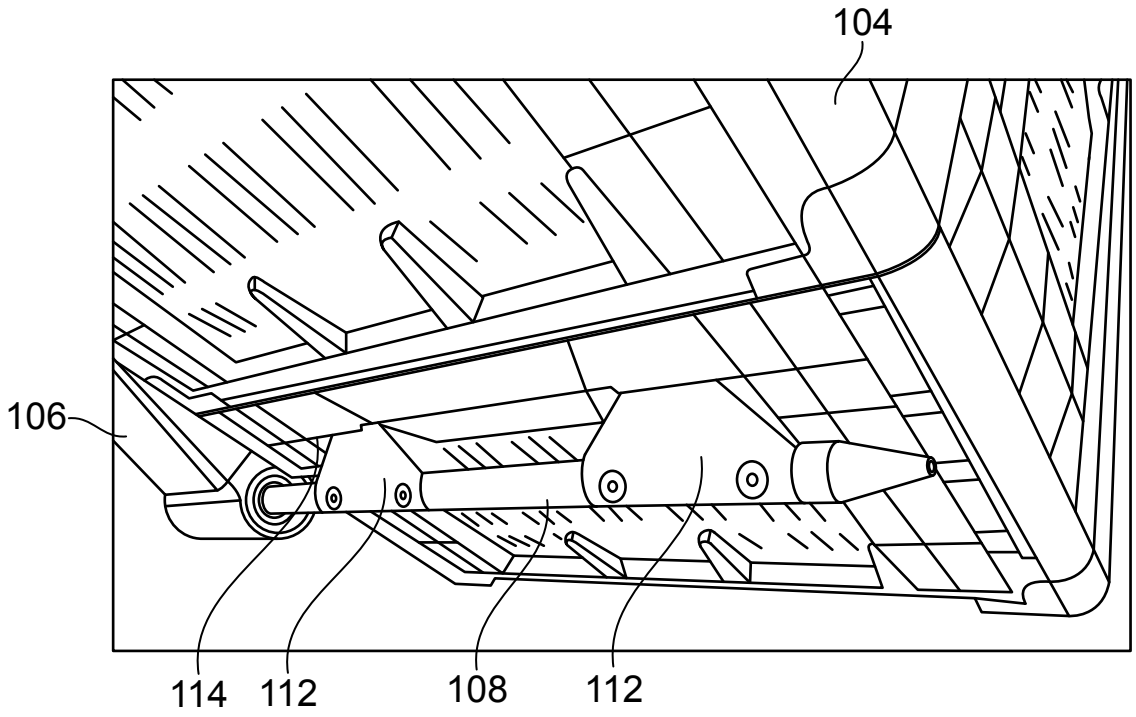

FIG. 8

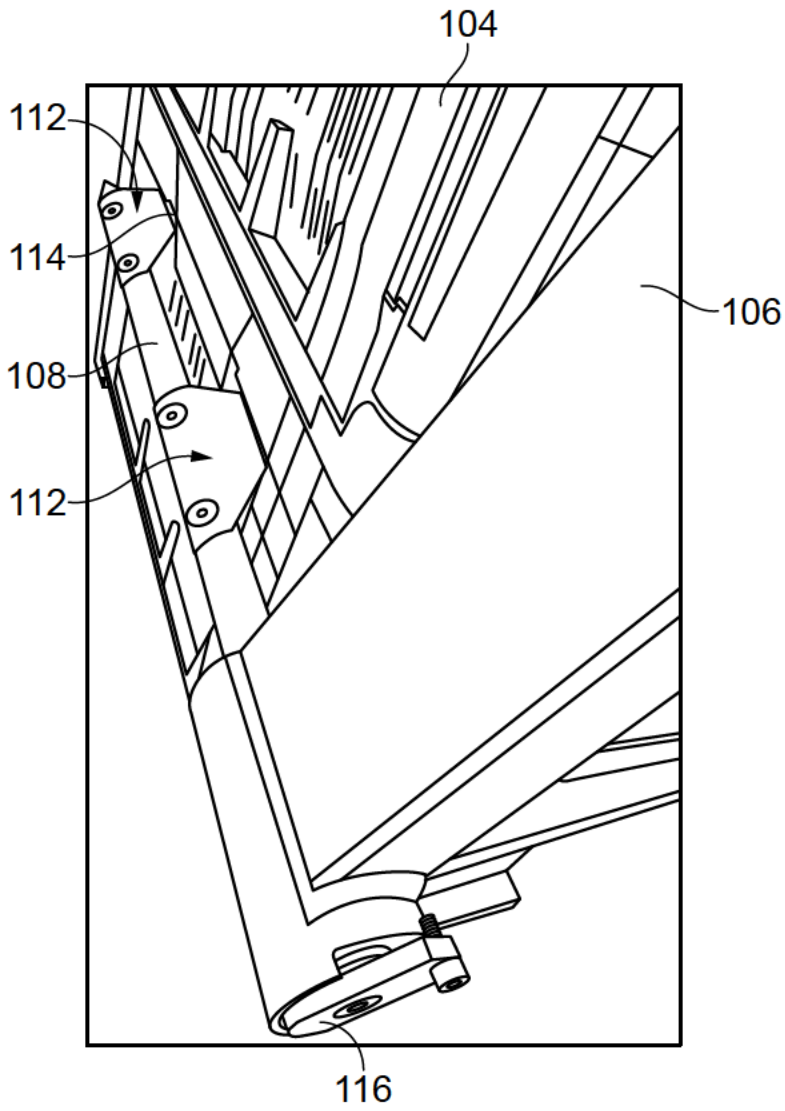

FIG. 9