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Janick et al.

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(54) **SECTIONAL DOOR BRAKING SYSTEM**

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(52) **U.S. Cl.**
CPC ***E05D 13/1238*** (2013.01)

(58) **Field of Classification Search**
CPC E05D 13/003; E05D 13/006; E05Y 2900/106; E06B 9/0676
See application file for complete search history.

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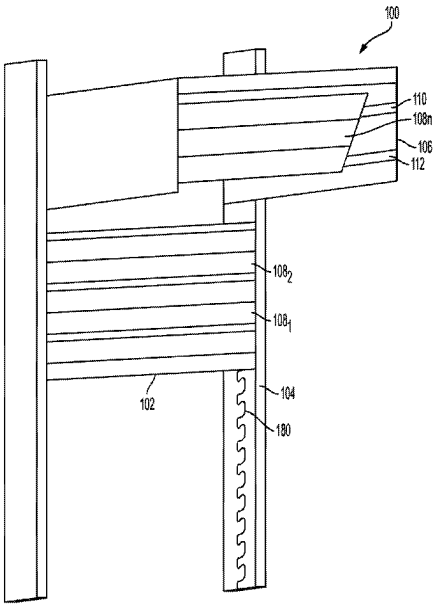
Primary Examiner — Abe Massad

(57) **ABSTRACT**

In example implementations, a braking system for a vertical stacking panel door is provided. The braking system includes a first rod, a strap coupled to the first rod, a second rod movably coupled to the first rod, wherein the second rod is to engage a linear ratchet when moved from a disengaged position to an engaged position, and a torsion spring coupled to the first rod and the second rod, wherein tension from the strap moves the second rod into the disengaged portion and the torsion spring moves the second rod into the engaged position when tension is lost on the strap.

20 Claims, 10 Drawing Sheets



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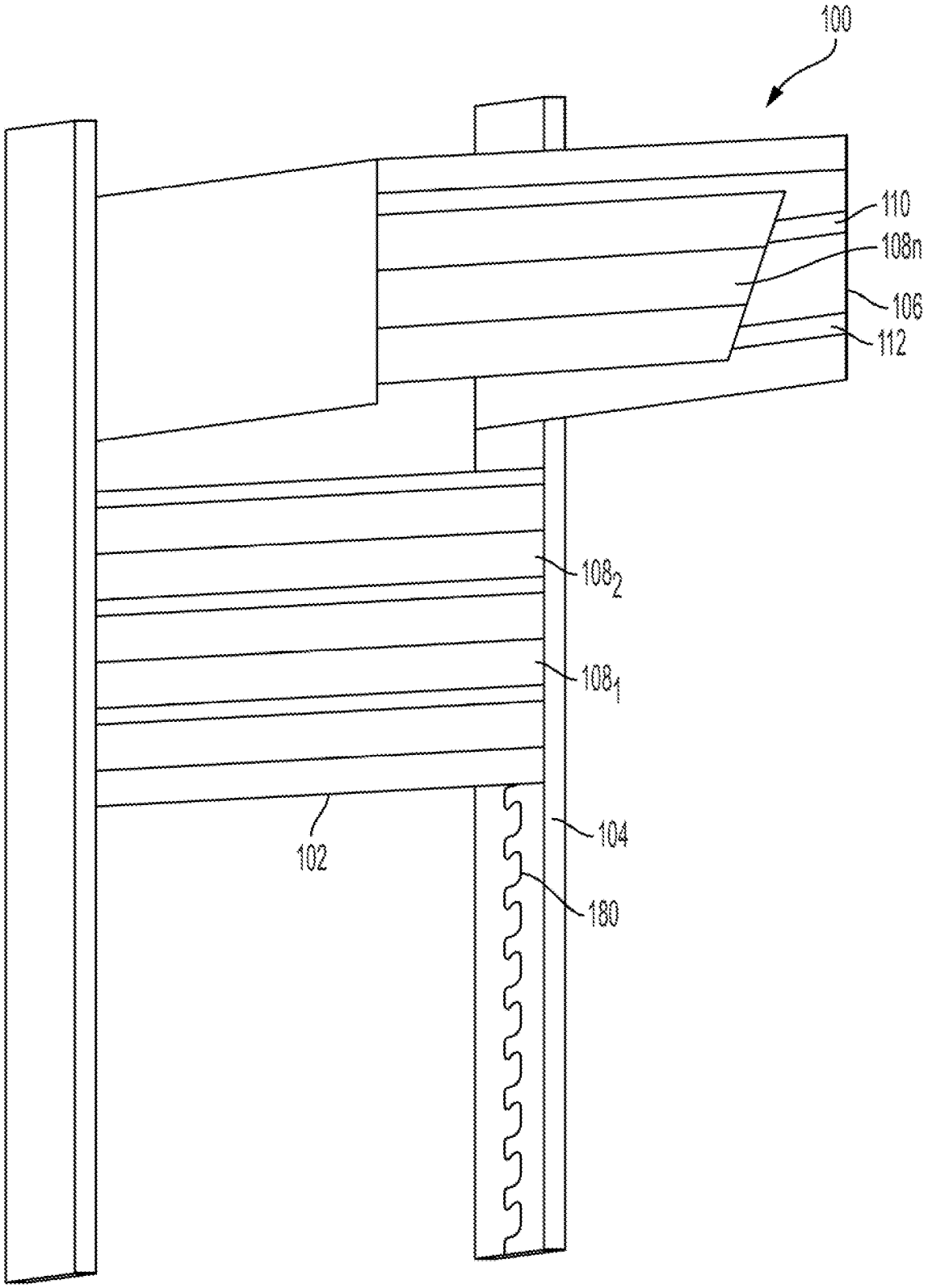

FIG. 1

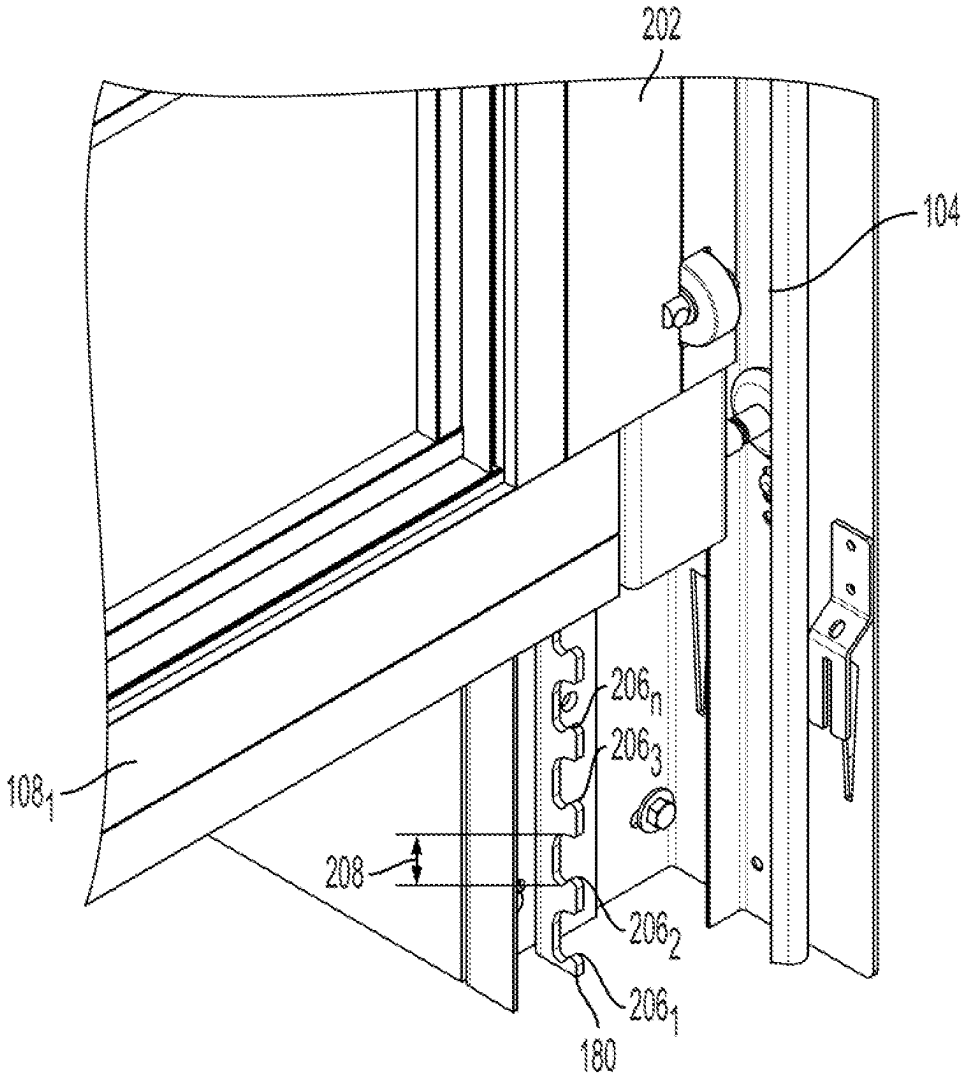

FIG. 2

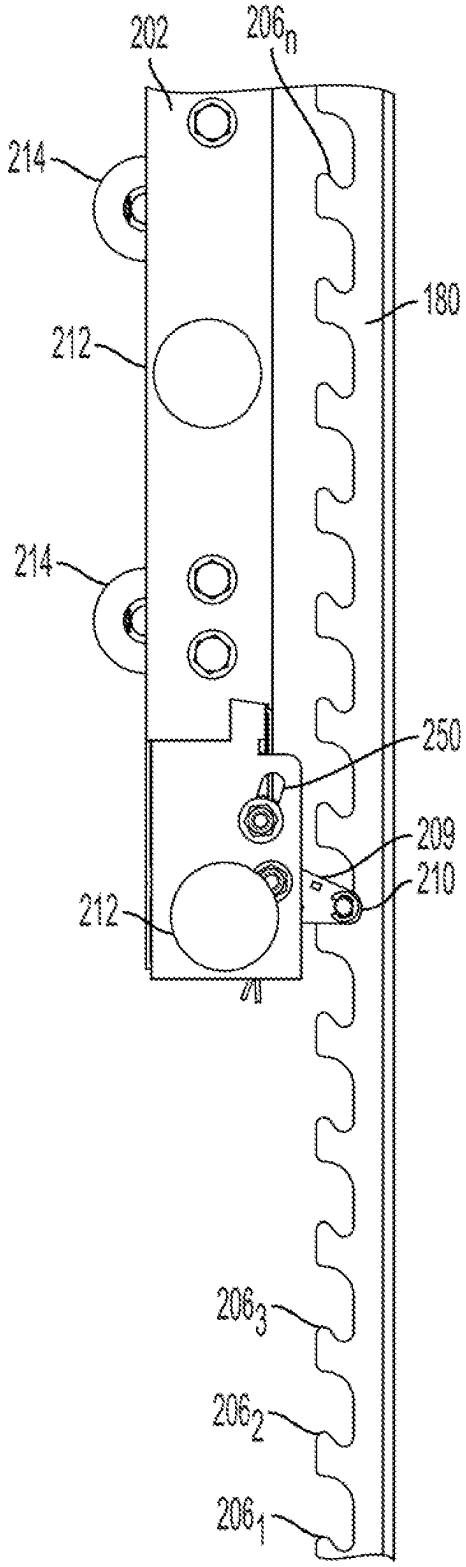

FIG. 3

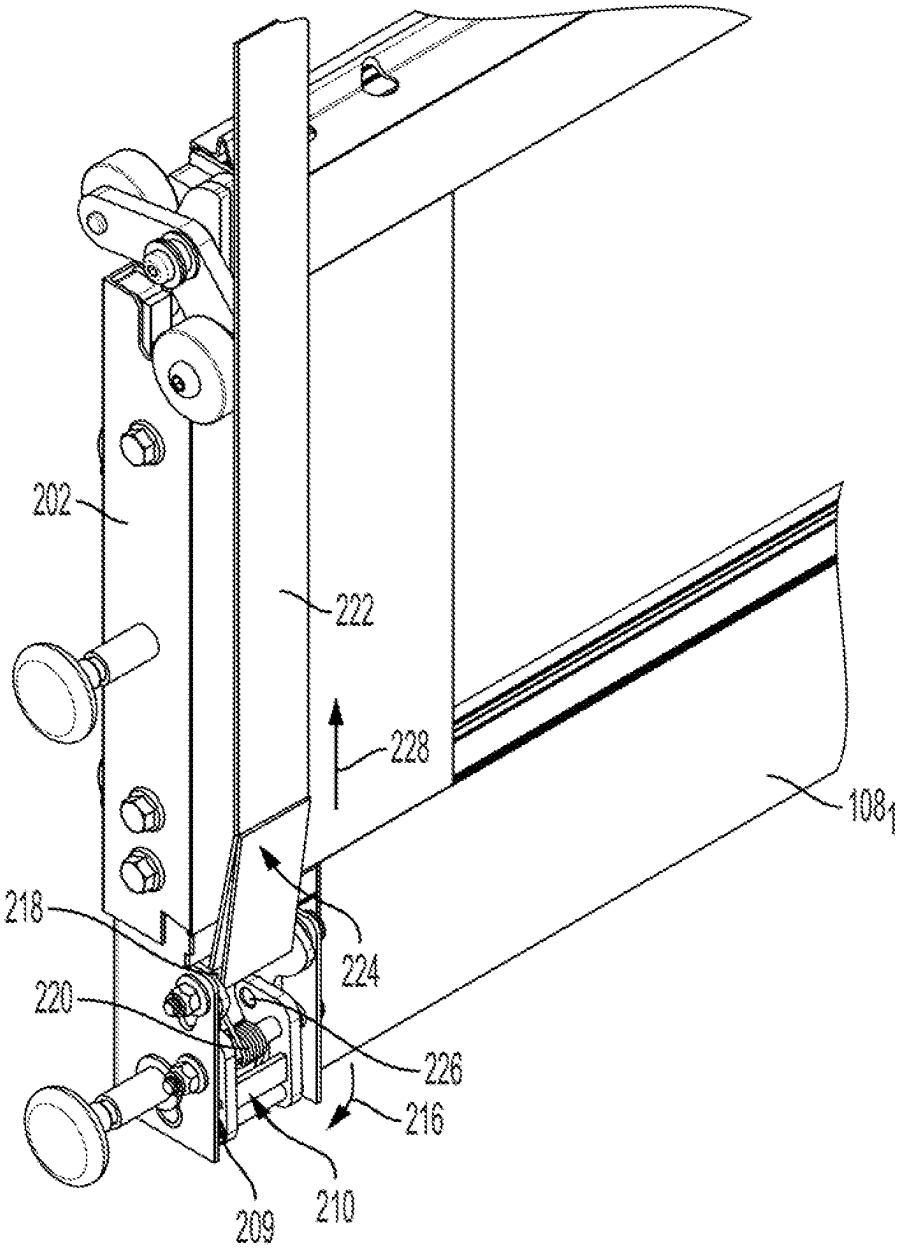

FIG. 4

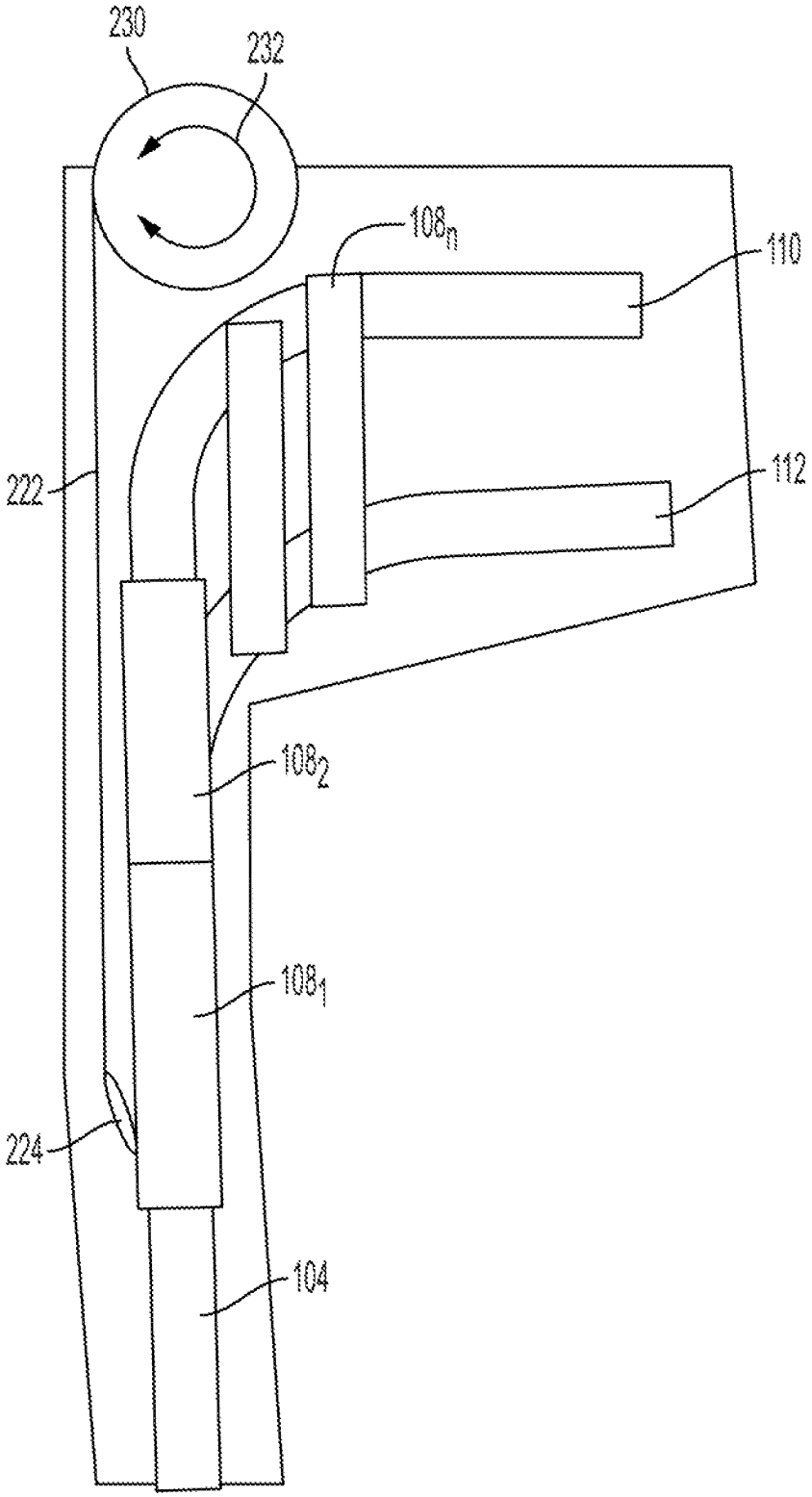

FIG. 5

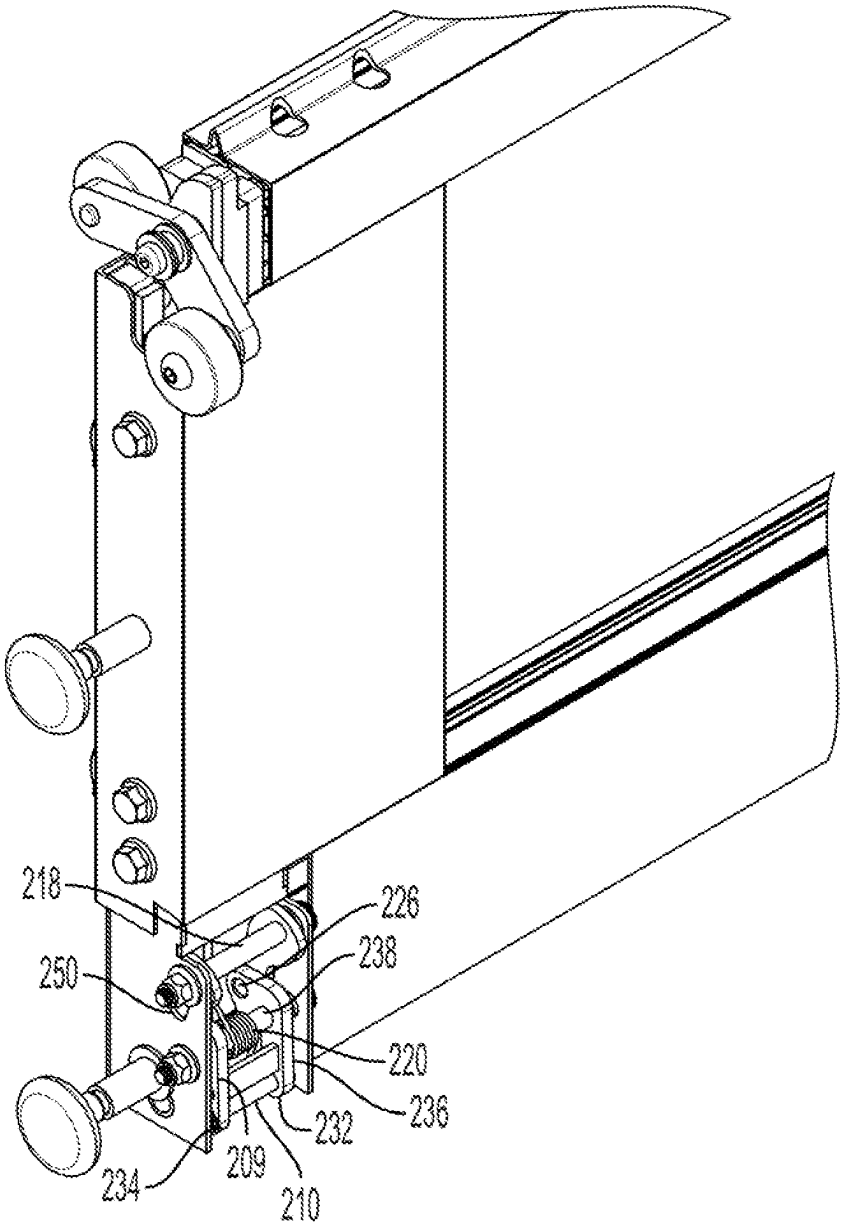

FIG. 6

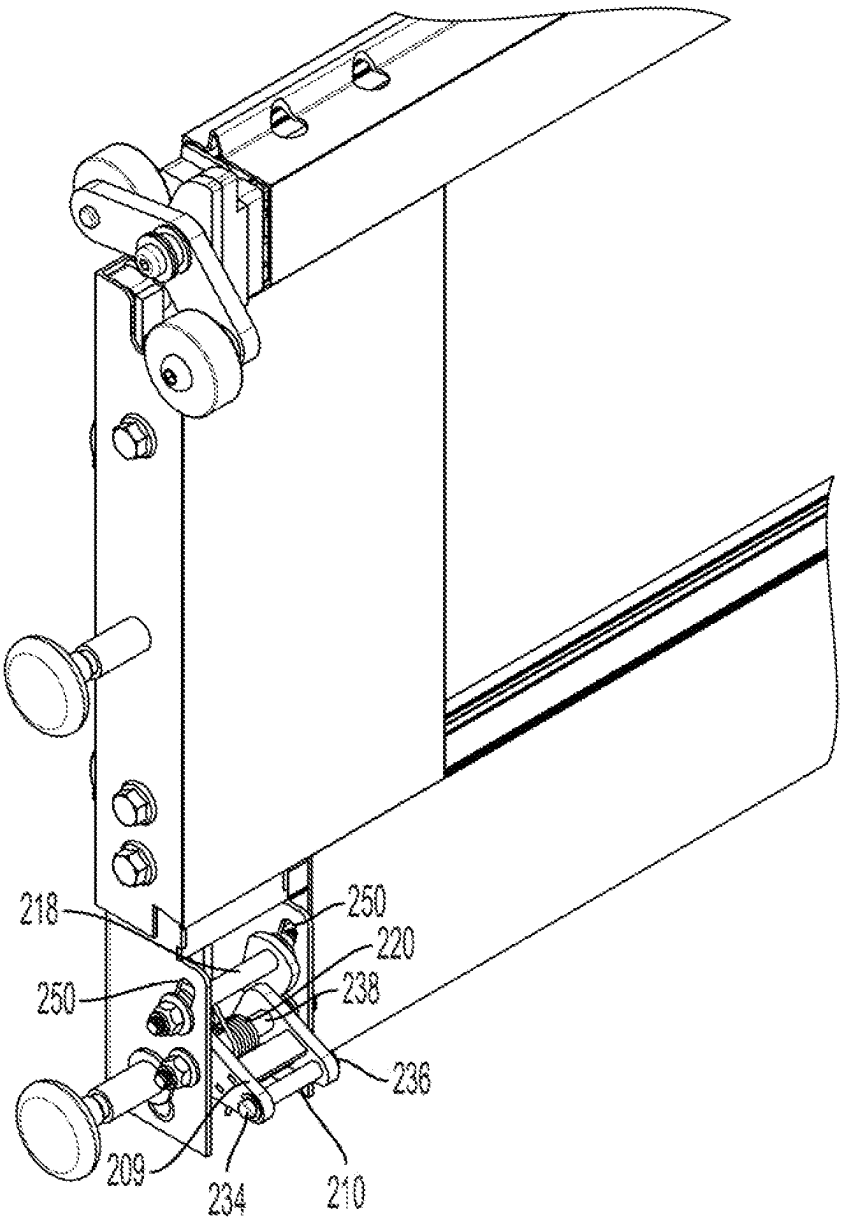

FIG. 7

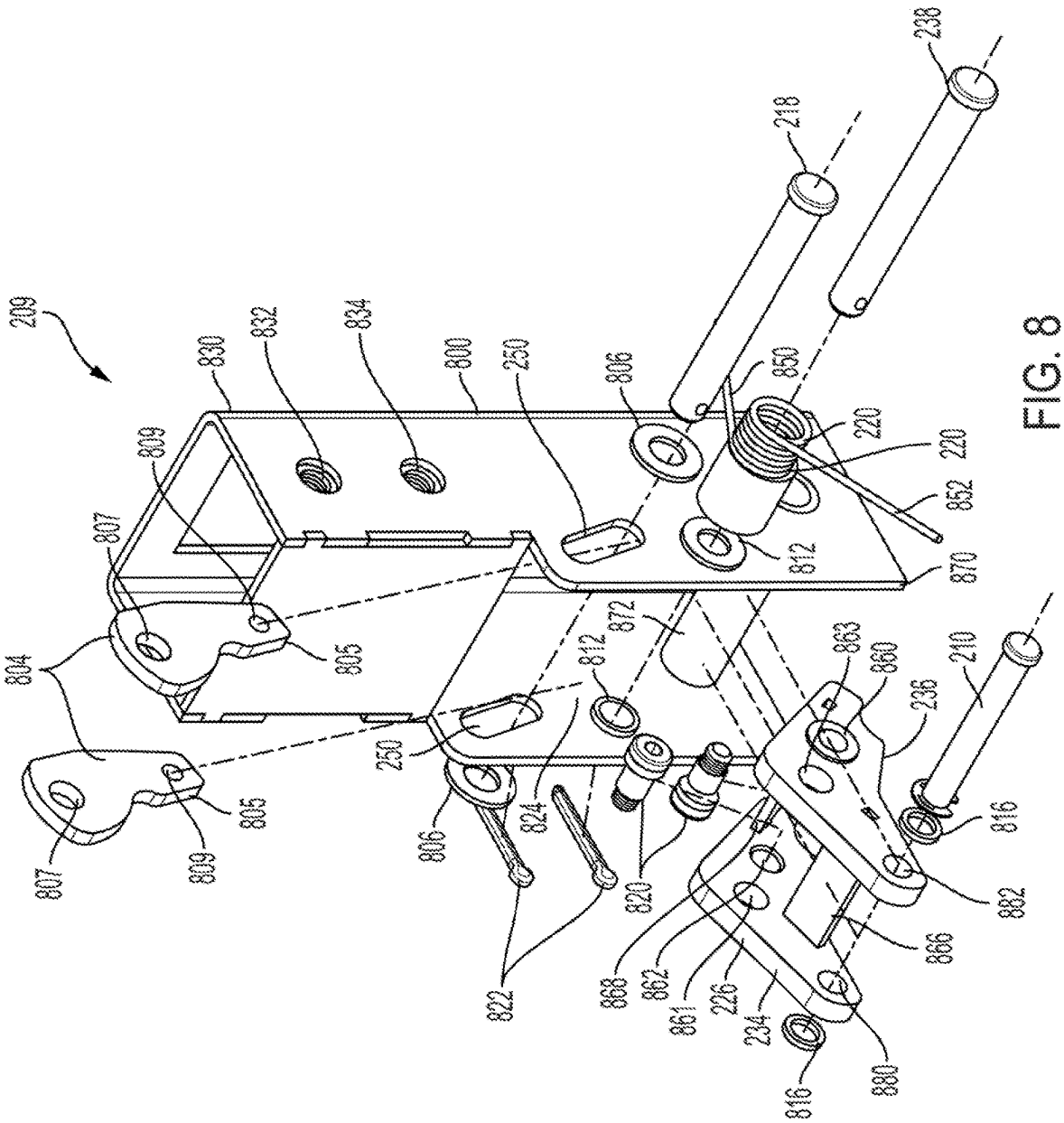
209
830
832
834
800
250
806
850
218
238
220
220
852
812
870
809
807
804
805
872
812
863
860
236
210
816
882
866
880
816
234
226
861
862
868
822
820
824
806
250
805
809
807

FIG. 8

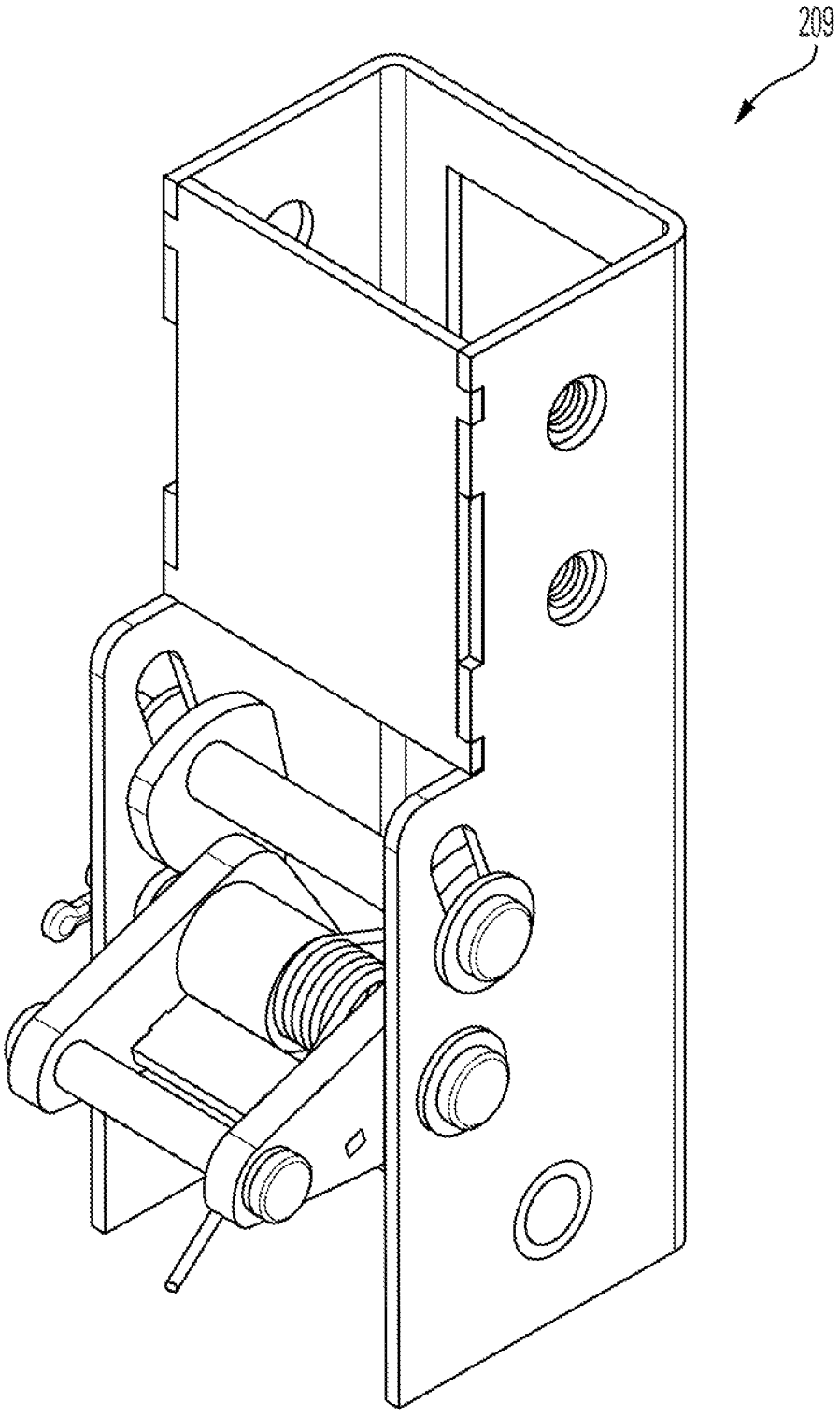

FIG. 9

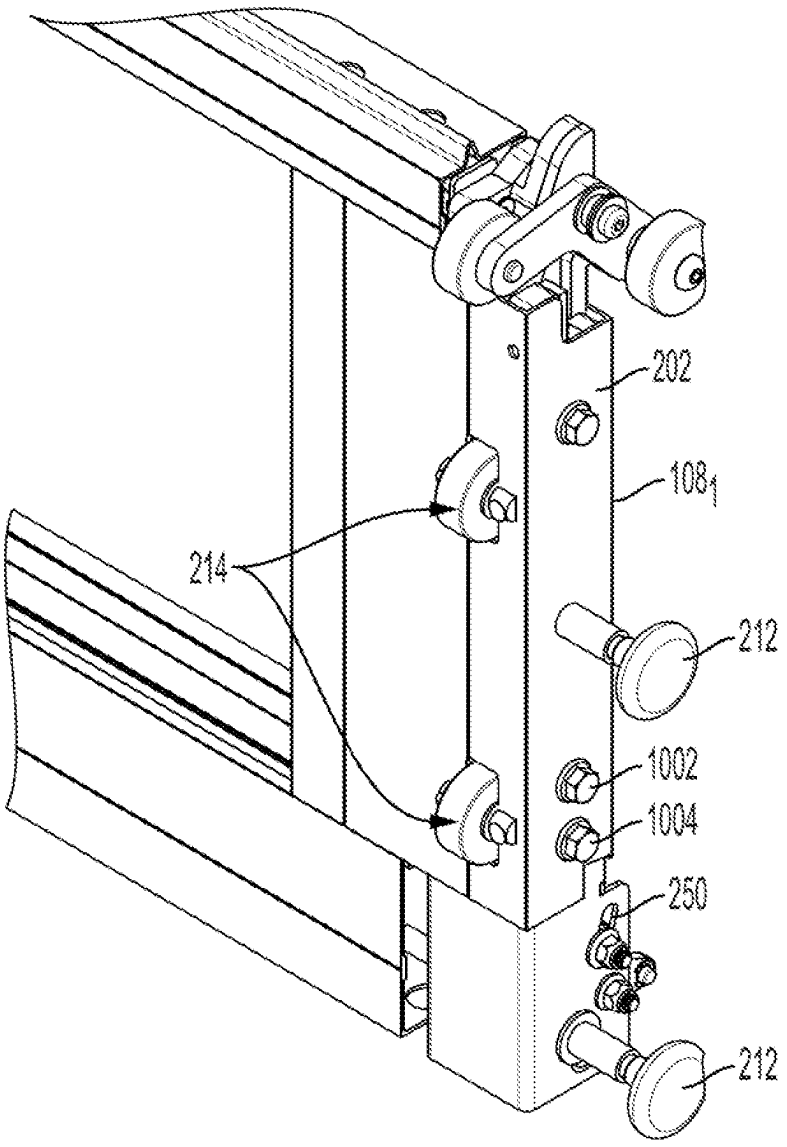

FIG. 10

SECTIONAL DOOR BRAKING SYSTEM

BACKGROUND

Vertically moving doors can be used for a variety of applications. For example, vertically moving doors can be used as garage doors in residential locations or doors for bays and entrances to warehouses in commercial locations.

Some vertically moving doors can be pulled open through a counterbalance system that includes a motor, a torsion spring, a rotating shaft connected to the motor and torsion spring, and a cable/strap system that connects the bottom section of a door to the rotating shaft. Through the movement of the counterbalance system, the door moves along a track. Typically the moving doors can be moved along a track as a single piece to lie horizontally with the floor along the track as the sections of the door are connected by hinges. If a door has door sections that are connected by hinges to assist in moving the door along the track, then the design of the counterbalance system and the track alone provide the mechanism to open and close the door section.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates an isometric view of an example of the vertically stacking panel door of the present disclosure;

FIG. **2** is a zoomed in view of an example linear ratchet of the braking system of the present disclosure;

FIG. **3** is a side view of an example braking system of the present disclosure;

FIG. **4** is an isometric front view of an example end cap of a bottom most panel with a brake and a strap of the present disclosure;

FIG. **5** is a side view of an example of the strap connected to a counterbalance system of the present disclosure;

FIG. **6** is an isometric front view of the example brake without the strap to illustrate an example disengaged position of the brake of the present disclosure;

FIG. **7** is an isometric front view of the example brake without the strap to illustrate an example engaged position of the brake of the present disclosure;

FIG. **8** is an exploded view of the example brake of the present disclosure;

FIG. **9** is an isometric view of the fully assembled example brake of the present disclosure; and

FIG. **10** is an isometric back view of an example end cap of the bottom most panel with rollers of the present disclosure.

DETAILED DESCRIPTION

Examples described herein provide examples of a braking system for a vertically stacking panel door that is without hinged connections between each panel. As discussed above, currently available vertically moving doors are moved along a track by a counterbalance system. The door lies horizontally or parallel with the floor.

However, there are some instances where customers would like to have less intrusion in the area above the floor where traditional sectional door would rest when opened. For example, the traditional sectional door may limit the amount of vertical clearance in the garage, commercial loading dock, and the like. In addition, with single piece doors, the entire door is replaced when damaged.

Since the panels are disconnected, there are portions during movement of the panels along a track where the panels can move freely. For example, when the door is being closed, the panels may transition from a horizontal track portion to a vertical track portion where gravity allows the panels to move freely and stack on top of one another to close.

There are certain instances where the door can close improperly, creating gaps between panels, or panels can get stuck. As a result, the panels may not move as intended, or undesirable gaps may form between panels as the door is trying to open or shut. In another example, the panels may be disrupted if machinery accidentally hits the door as the door is opening or closing.

The present disclosure provides a braking system for the vertically stacking panel door when a disruption occurs during movement of the panels. The braking system may allow the panels to hold a position when the brake is engaged. This may allow a technician to fix a disrupted panel, adjust the spacing between the panels, fix the vertically stacking panel door, and the like. Thus, potential dangerous situations may be avoided when a disruption occurs via the braking system. The braking system can be automatically engaged to stop movement of the vertically stacking panel door and prevent damage to the door or potential injuries.

FIG. **1** illustrates an isometric view of an example vertically stacking panel door system **100** of the present disclosure. The vertically stacking panel door system **100** may include a door **102** that is comprised of a plurality of panels $\mathbf{108}_1$ to $\mathbf{108}_n$ (hereinafter also referred to individually as a panel **108** or collectively as panels **108**). The door **102** may be opened by moving the panels **108** vertically along a track or track system. The track system may include different track portions that define a path along which the panels **108** may move to open and close the door **102**.

In one embodiment, the track may include a vertical door guide or track **104**, a panel interface zone comprising curved track portions, a first horizontal track portion **110** (also referred to herein as a first track **110**) and a second horizontal track portion **112** (also referred to herein as a second track **112**). The panel interface zone defines a transitional area between the vertical door guide **104** and a horizontal door guide or track **106**. The panel interface zone provides the means for lifting and separating the plurality of panels **108** when the door **102** is opening and to align and place the plurality of panels **108** in tangential connection when the door **102** is closing. As the panels **108** are separated, the panels **108** can be stacked along the horizontal door guide **106**. As the panels **108** are aligned and tangentially connected, the panels **108** can be stacked in a vertical orientation along the vertical door guide **104**.

In one embodiment, the panels **108** may include end caps (illustrated and discussed in further details below) that include wheels that can move within a first track **110** and a second track **112**. The first track **110** and the second track **112** may also be referred to as a top track **110** and a bottom track **112**. The first track **110** and the second track **112** may be parallel and may be positioned at a slight angle to allow for gravity assist when the door **102** is closing.

In one embodiment, the door **102** may be closed by moving the panels **108** towards the vertical door guide **104** one-by-one. The panels **108** may be stacked on top of one another as the door **102** is closed.

In one embodiment, the vertical stacking panel door system **100** may include a linear ratchet **180** that is part of a braking system described herein. The linear ratchet **180** may be located inside of the vertical door guide **104** on each

side of the door **102**. In one embodiment, a single linear ratchet **180** may be deployed adjacent to the vertical door guide **104**.

In one embodiment, two linear ratchets **180** may be deployed on opposite sides of the door **102**. That is, a first linear ratchet **180** may be located on a first side of the door **102** and a second linear ratchet **180** may be located on a second side of the door **102** that is opposite the first side.

FIG. **2** illustrates a zoomed in view of a section of the linear ratchet **180** coupled adjacent to the vertical guide **104**. The linear ratchet **180** may be fabricated from steel or sheet metal.

The linear ratchet **180** may run along a length of the vertical guide **104** and may include a plurality of teeth $\mathbf{206}_1$ to $\mathbf{206}_n$ (also referred to herein individually as a tooth **206** or collectively as teeth **206**). The teeth **206** may be spaced apart evenly along a length of the linear ratchet **180**. For example, the teeth **206** may be spaced evenly apart by a distance **208**.

In one embodiment, the teeth **206** may each have a raised lip that can be used to "catch" and "hold" a bar or pin on a brake attached to a bottom most panel $\mathbf{108}_1$, as described in further details below.

FIG. **3** illustrates a side view of a brake **209** that is coupled to the bottom most panel $\mathbf{108}_1$ and how the brake **209** interacts with the linear ratchet **180**. In one embodiment, the brake **209** may be coupled to an endcap **202** of the panel $\mathbf{108}_1$. In one embodiment, the brake **209** may be formed as an integral part of the endcap **202** of the panel $\mathbf{108}_1$. As discussed above, the brake **209** may be deployed on one side of the panel $\mathbf{108}_1$ or on both sides (e.g., opposite sides) of the panel $\mathbf{108}_1$.

In one embodiment, the endcap **202** may include one or more track wheels **212**. The track wheels **212** may move within the vertical guide **104**, the panel interface zone, the first horizontal track portion **110** and the second horizontal track portion **112**. In one embodiment, the endcap **202** of the bottom most panel $\mathbf{108}_1$ may also include one or more rollers **214**. The rollers **214** may help prevent panels **108** above the panel $\mathbf{108}_1$ from rotating when the above panels **108** are in the horizontal door guide **106**.

As discussed above, there may be instances where the door **102** may not shut properly. As a result, the interaction between the brake **209** and the linear ratchet **180** may hold the panels **108** when trying to close, if the panels **108** are not moving properly.

In one embodiment, when the brake **209** is engaged, a rod **210** or brake rod **210** may extend upwards and outwards away from the panel $\mathbf{108}_1$ and towards the linear ratchet **180**. The rod **210** may slide vertically along a slot **250** within the endcap **202** and rotationally outward, as described in further detail below. The rod **210** may engage one of the teeth **206** and prevent the panel $\mathbf{108}_1$ and other panels above the panel $\mathbf{108}_1$ from moving.

FIG. **4** illustrates an isometric view of the endcap **202** of the bottom most panel $\mathbf{108}_1$ with the brake **209** and a strap **222** of the present disclosure. In one embodiment, the strap **222** may have a loop **224** on a first end that is coupled to a rod **218** or control rod **218** of the brake **209**. For example, the rod **218** may be slipped through the loop **224** before being coupled to the brake **209**. The strap **222** may have a second end that is coupled to a counter balance system, as shown in FIG. **5**. Thus, when a proper amount of tension is applied to the strap **222**, the strap **222** may provide an upward force that pulls the rod **218** upwards in a direction shown by an arrow **228** and acts against the torsion spring **220** that illustrates upward and downward directions.

The upward pull of the rod **218** may pull the rod **210** inwards towards the brake **209** and away from the linear ratchet **180**. For example, the first rod **218** coupled to the strap **222** and the second rod **210** may be coupled together via a torsion spring **220** and a bracket **226**. As the rod **218** is pulled upwards, the upward movement of the rod **218** may cause the torsion spring **220** to rotate clockwise in a direction shown by an arrow **216**. The rotation of the torsion spring **220** may pull the rod **210** inwards and away from the linear ratchet **180**. Thus, the rod **210** is moved clear from the path of the linear ratchet **180** as the door **102** is opened and closed.

Said another way, the torsion spring **220** may have a first force and the strap may have a second force created by the tension in the strap **222**. When the second force of the strap **222** is greater than the first force of the torsion spring **220**, the strap **222** may provide an upward force on the control rod **218** to act against the first force of the torsion spring **220** and pull the brake rod **210** in a downward and inward direction when the brake rod **210** is disengaged.

When tension is reduced or lost on the strap **222** (e.g., due to the door **102** improperly closing or gaps between panels **108** being created due to a malfunction), the torsion spring **220** may unwind in a counter clockwise direction (e.g., a direction opposite the rotating arrow **216**). Thus, the rod **218** may move downward (e.g., in a direction opposite the arrow **228**) and the rod **210** may move in a direction outward and upward away from the brake **209** and towards the linear ratchet **180** to engage the brake **209**, as illustrated in FIG. **3**.

Said another way, when the tension in the strap **222** is reduced or lost, the second force of the strap **222** is less than the first force of the torsion spring **220**. As a result, the torsion spring **220** acts against the brake rod **210** to move the brake rod **210** in an upward and outward direction when the brake rod **210** is engaged.

FIG. **5** illustrates a side view of the strap **222** connected to a counterbalance system **230** of the present disclosure. The counterbalance system **230** may include a motor and a rod that rotates, as shown by the arrow **232**. The counterbalance system **230** may help open the door **102**. For example, as the counterbalance system **230** rotates in a clockwise direction, the counterbalance system **230** may provide lift force to open the door **102**.

As noted above, a first end of the strap **222** may be coupled to the rod **218** via the loop **224**. A second end of the strap **222** may be coupled to the counterbalance system **230**. When the door **102** is closing, the counterbalance system **230** may rotate in a counter-clockwise direction. The tension on the strap **222** may be applied by the weight of each panel **108** that moves into the vertical door guide **104** and rests against the bottom most panel $\mathbf{108}_1$ when the door **102** is being closed.

While closing, one of the panels **108** may get stuck in the panel interface zone or horizontal door guide **106**. As a result, a gap may form between panels **108**, reducing the amount of weight on the bottom most panel $\mathbf{108}_1$ and reducing the tension in the strap **222**. When the tension in the strap **222** is lost or reduced, the brake **209** may engage the linear ratchet **180**, as described above.

FIGS. **6** and **7** illustrate example isometric front views of the brake **209** without the strap **222**. FIG. **6** illustrates an example view of the brake **209** in a disengaged position. FIG. **7** illustrates an example view of the brake **209** in an engaged position.

FIG. **6** illustrates the brake **209** having slots **250** on opposite sides. The slots **250** may each have an elongated opening that defines a movement path of the rod **218**. The

slots **250** may be formed at an angle (e.g., approximately 45 degrees) to allow the rod **218** to move from a bottom left position to an upper right position. When tension is applied to the strap **222**, the strap **222** may pull the rod **218** to the top part of the slots **250** (e.g., the upper right position).

The movement of the rod **218** along the slots **250** may cause the torsion spring **220** to rotate in a clockwise direction. The torsion spring **220** may be wrapped around a third rod **238**. The third rod **238** may be part of a bracket **226**. The bracket **226** may include a first bracket plate **234** and a second bracket plate **236**. The rod **210** may be coupled to the bracket **226** between the first bracket plate **234** and the second bracket plate **236**. The clockwise rotation of the torsion spring **220** may cause the bracket **226** to rotate and move the rod **210** downwards and inwards and away from the linear ratchet **180**. In other words, the rods **210** and **218** may be moved in opposite directions away from one another in the disengaged position.

FIG. **7** illustrates how the rod **218** is moved to the bottom part of the slots **250** when the tension in the strap **222** is lost. The torsion spring **220** may rotate in a counter-clockwise direction or coil around the rod **238** when the tension is lost in the strap **222**. The counter-clockwise rotation of the torsion spring **220** may cause the bracket **226** to rotate and move the rod **210** away from the brake **209** and towards the linear ratchet **180** into the engaged position.

FIG. **8** illustrates a detailed exploded view of the brake **209**. In one embodiment, the brake **209** may include a housing **800**. The housing **800** may be fabricated from steel or sheet metal. The housing **800** may include a top portion **830** that is inserted into the endcap **202** of the bottom most panel 108_1. The brake **209** can be secured the endcap **202** using mechanical fasteners (e.g., a nut and bolt, screw, rivet, a bolt and pin, and the like) that are fed through threaded openings **832** and **834** and corresponding openings in the endcap **202**.

In one embodiment, the housing **800** may include the slots **250**, as described above. The slots **250** may have a generally rectangular shape with curved ends. The slots **250** may be formed at an angle (e.g., approximately 45 to 70 degrees) to define a path for movement for the rod **218** as tension is applied or lost to the strap **222**. The slots **250** may provide enough space for the rod **218** to move approximately 0.5 inches to 0.75 inches.

In one embodiment, the rod **218** may be fitted through the openings formed by the slots **250** and corresponding openings **807** of opposing slide arms **804**. The rod **218** may be any type of bolt or rotational screw. FIG. **8** illustrates an example in which the rod **218** is a bolt and pin combination. For example, a bolt may be fitted through washers **806** and secured via a locking clip **822**.

The slide arms **804** may be located within an interior volume **824** (e.g., on the inner sides) of the housing **800**. The slide arms **804** may rotate as the bolt **218** moves along the slots **250**. The slide arms **804** may include arm portions **805** that interact with the bracket **226** to move the rod **210** into an engaged and disengaged position. The slide arms **804** may be movably coupled to the bracket **226** via screws **820**. The screws **820** may be inserted from an interior side of the bracket **226** through openings **862** and **860** to be coupled to the openings **809** of the slide arms **804**.

In one embodiment, the housing **800** may include a second set of openings **812**. The second set of openings **812** may be aligned with an opening **861** in the first bracket plate **234** and an opening **863** in the second bracket plate **236**. The rod **238** may be fed through the openings **812**, **861**, and **863** to position the rod **238** between the first bracket plate **234** and the second bracket plate **236**. The rod **238** secures the torsion spring **220** and the bracket **226** within an interior volume **824** of the housing **800**. It should be noted that FIG. **8** illustrates the torsion spring **220** outside of the housing **800** for illustrative purposes to allow the details of the torsion spring **220** to be seen. However, the torsion spring **220** will be located within the interior volume **824** and around the rod **238** when the brake **209** is assembled, as shown in FIGS. **4**, **6**, **7**, and **9**.

A first end **850** of the torsion spring **220** may be positioned against a member **872**. The member **872** may be a cylindrical member that is fixably coupled to the interior volume **824** of the housing **800**, as shown in FIG. **8**. A second end **852** of the torsion spring **220** may interact with the braking rod **210**. Thus, as the torsion spring **220** rotates clockwise and counter-clockwise, the first end **850** may interact with the member **872** when the brake rod **210** is disengaged and the second end **852** may interact with the brake rod **210** to move the brake rod **210** to an engaged position when tension is lost or reduced on the strap **222**.

For example, when tension is applied to the strap **222** and the rod **218** is pulled to a top position of the slots **250**, the slide arms **804** may be rotated further inwards within the interior volume **824**. The torsion spring **220** may be rotated, and rotation of the torsion spring **220** may cause the first end **850** to rest against the member **872** in a disengaged position. Said another way, the bracket **226** may be rotated such that the rod **210** is behind a front edge **870** of the housing **800** or does not extend beyond the front edge **870** of the housing **800**.

When tension is reduced or lost in the strap **222**, the torsion spring **220** may be allowed to rotate freely in an opposite direction such that the second end **852** of the torsion spring **220** may act against the rod **210** via the slide arms **804**. As a result, the rod **218** falls to a bottom position of the slots **250**. Movement of the rod **218** causes the slide arms **804** to rotate such that the arm portions **805** move towards the front edge **870** of the housing **800**. The arm portions **805** may cause the bracket **226** to rotate about the rod **238**, and the second end **852** of the torsion spring **220** may move the rod **210** out of the interior volume **824**. Said another way, the rod **210** is moved beyond the front edge **870** of the housing **800**.

In one embodiment, the rod **210** may be fed through an opening **880** on the first bracket plate **234** and an opening **882** on the second bracket plate **236** to position the rod **210** between the first bracket plate **234** and the second bracket plate **236**. In one embodiment, shims **816** may be used to fit the rod **210** between the first bracket plate **234** and the second bracket plate **236**. The rod **210** may be secured between the first bracket plate **234** and the second bracket plate **236** with a pin or nut and bolt combination. Members **866** and **868** may be located between the first bracket plate **234** and the second bracket plate **236** to provide additional stability and proper spacing between the first bracket plate **234** and the second bracket plate **236**. FIG. **9** illustrates an isometric fully assembled view of the brake **209**.

FIG. **10** illustrates an isometric back view of the end cap **202** with the rollers **214**. FIG. **10** illustrates the mechanical fasteners **1002** and **1004** that can be used to secure the top portion **830** of the housing **800** to the endcap **202**, as described above.

In addition, FIG. **10** illustrates the rollers **214** of the endcap **202**. As discussed above, the rollers **214** may help prevent panels **108** above the panel 108_1 from rotating when the above panels **108** are in the horizontal door guide **106**.

Thus, the present disclosure provides a unique braking system for a vertically stacking panel door system. The braking system provides a mechanical solution to stopping movement of disconnected panels from closing when a gap is created between panels while closing or when a panel gets stuck while closing. The brake may be engaged until the gap is removed or the panels are freed.

It will be appreciated that variants of the above-disclosed and other features and functions, or alternatives thereof, may be combined into many other different systems or applications. Various presently unforeseen or unanticipated alternatives, modifications, variations, or improvements therein may be subsequently made by those skilled in the art which are also intended to be encompassed by the following claims.

The invention claimed is:

1. A braking system for a vertical stacking panel door, comprising:

a housing, wherein the housing comprises angled slots;

a first rod coupled to the angled slots of the housing in an interior volume of the housing;

a strap comprising a loop on an end of the strap, wherein the strap is coupled to the first rod via the loop;

a second rod movably coupled to the housing, wherein the second rod is to engage a linear ratchet when moved from a disengaged position to an engaged position; and

a torsion spring, wherein an end of the torsion spring interacts with the second rod, wherein tension from the strap moves the first rod within the angled slots and causes the torsion spring to rotate in a first rotational direction to cause the second rod to move into the disengaged position, and the torsion spring rotates in a second rotational direction to allow the first rod to move within the angled slots of the housing such that the end of the torsion spring and the movement of the first rod cause the second rod to move into the engaged position when tension is lost on the strap.

2. The braking system of claim **1**, wherein the strap is coupled to a counter balance system of the vertical stacking panel door system.

3. The braking system of claim **1**, wherein the tension on the strap causes the first rod to move in a first direction within the angled slots and causes the second rod to move in a second direction that is opposite to the first direction.

4. The braking system of claim **3**, wherein the first direction is an upward direction and the second direction is a downward direction.

5. The braking system of claim **1**, wherein when the tension is lost on the strap, rotation of the torsion spring in the second rotational direction causes the first rod to move in a downward direction within the angled slots to cause the second rod to move in an upward and outward direction.

6. The braking system of claim **1**, further comprising:

a third rod coupled to the housing in the interior volume of the housing, wherein the torsion spring is wrapped around the third rod.

7. The braking system of claim **6**, further comprising:

a first bracket plate; and

a second bracket plate, wherein the first bracket plate and the second bracket plate are rotatably coupled to the housing, wherein the second rod and the third rod are positioned between the first bracket plate and the second bracket plate.

8. The braking system of claim **1**, further comprising:

opposing slide arms, wherein the first rod is coupled to the housing via the opposing slide arms that are coupled to the angled slots of the housing, wherein the first rod is coupled between the opposing slide arms.

9. The braking system of claim **8**, wherein each one of the opposing slide arms comprises an arm portion, wherein the arm portion interacts with a bracket coupled to the second rod to move the second rod into the engaged position when the tension is lost on the strap.

10. The braking system of claim **1**, wherein the braking system is located on each side of a bottom most panel of the vertical stacking panel door system.

11. An end cap for a bottom most panel of a vertical stacking panel door, comprising:

at least one track wheel located along an outer side to move along a track system of the vertical stacking panel door system;

at least one roller located on a back side;

a brake located on a bottom end of the end cap, wherein the brake comprises:

a housing, wherein the housing comprises angled slots;

a control rod coupled to the angled slots of the housing in an interior volume of the housing;

a strap comprising a loop on an end of the strap, wherein the strap is coupled to the control rod;

a brake rod, wherein the brake rod is to move between a disengaged position and an engaged position; and

a torsion spring, wherein an end of the torsion spring applies a first force to the brake rod and the strap applies a second force to the control rod,

wherein the brake rod is in the disengaged position when the second force of the strap is greater than the first force of the torsion spring, and the strap provides an upward force on the control rod that moves the control rod within the angled slots to allow the torsion spring to rotate in a first rotational direction such that the brake rod moves in a downward and inward direction, and the brake rod is in the engaged position when the second force of the strap is less than the first force of the torsion spring to allow the torsion spring to rotate in a second rotational direction such that the end of the torsion spring acts against the brake rod to move the brake rod in an upward and outward direction.

12. The end cap of claim **11**, wherein the end cap is integrated into the bottom most panel of the vertical stacking panel door.

13. The end cap of claim **11**, wherein the end cap is located on a side opposite a second end cap on a second side of the bottom most panel of the vertical stacking panel door.

14. The end cap of claim **11**,

wherein the angled slots are located on opposite sides of the bottom end of the end cap, wherein ends of the control rod are movably coupled to the slot on opposite sides of the bottom end of the end cap and the slot is to guide movement of the control rod.

15. A vertical stacking panel door system with a braking system, comprising:

a track system;

a linear ratchet coupled to a door jamb adjacent to the track system; and

a vertical stacking panel door movably coupled to the track system, wherein the vertical stacking panel door comprises a plurality of disconnected panels, wherein a bottom most panel of the plurality of disconnected panels comprises a brake, the brake comprising:

a housing, wherein the housing comprises angled slots;

a first rod coupled to the angled slots of the housing in an interior volume of the housing;

a strap comprising a loop on an end of the strap, wherein the strap is coupled to the first rod via the loop;

a second rod movably coupled to the housing, wherein the second rod is to engage the linear ratchet when moved from a disengaged position to an engaged position; and

a torsion spring, wherein an end of the torsion spring interacts with the second rod, wherein tension from the strap moves the first rod within the angled slots and causes the torsion spring to rotate in a first rotational direction to cause the second rod to move into the disengaged position, and the torsion spring rotates in a second rotational direction to allow the first rod to move within the angled slots of the housing such that the end of the torsion spring and the movement of the first rod cause the second rod to move into the engaged position when tension is lost on the strap.

16. The vertical stacking panel door system of claim **15**, wherein the linear ratchet comprises a plurality of notches, each notch of the plurality of notches including a respective lip along a length of the linear ratchet.

17. The vertical stacking panel door system of claim **16**, wherein the second rod is positioned within one notch of the plurality of notches and retained by the respective lip when moved into the engaged position.

18. The vertical stacking panel door system of claim **15**, further comprising:

a counter balance system, wherein the strap is coupled to the counter balance system, and movement of the strap is controlled by counter balance system.

19. The vertical stacking panel door system of claim **15**, wherein a change in the tension on the strap causes the first rod to move in an upward position within the angled slots to move the second rod in a downward and inward position such that the second rod is moved away from the linear ratchet.

20. The vertical stacking panel door system of claim **15**, wherein when the tension is lost on the strap, a force of the torsion spring is greater than the tension on the strap such that the torsion spring rotates to allow the first rod to move in a downward direction within the angled slots to cause the second rod to move in an upward and outward direction such that the second rod catches a notch in the linear ratchet.

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