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Security Gate

Abstract

An example security gate can include: an outer frame; an outer gate disposed within the outer frame, the outer gate defining a plane and having a plurality of outer gate vertical members, and the outer gate defining an inner gate opening; an inner gate disposed within the outer gate, the inner gate defining a plurality of inner gate vertical members, wherein the inner gate is configured to move vertically within the plane to control access through the inner gate opening, and wherein the plurality of inner gate vertical members are sized to telescope within the plurality of outer gate vertical members as the inner gate is moved; and a locking mechanism to lock the inner gate at a vertical position relative to the outer gate to define an accessible size of the inner gate opening.

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Background/Summary

RELATED APPLICATION(S) [0001] This patent application is related to U.S. patent application Ser. No. 15/229,325 filed on Aug. 5, 2016, the entirety of which is hereby incorporated by reference.

BACKGROUND
[0002] Security gates are commonly used to lock or close passageways such as conventional doorways and entrances to stairwells. The purpose of such gates is primarily security, such as keeping small children from accessing stairwells that could present a hazard, and also confinement, such as confining a pet to a particular room during the night.
[0003] A typical security gate is formed from one or more panels, each panel including a frame surrounding a lattice structure (e.g., a mesh) or series of bars formed therebetween so that one can see through the gate when the gate is in place.
[0004] Typically, the outer frame of a security gate is manually positioned between two stationary elements, such as a doorjamb. The security gate is then locked in place by a locking mechanism.
[0005] There is a need for user friendly security gates with multiple or compound passageways to allow selective access therethrough by different pets, children, and so forth.
SUMMARY
[0006] In one aspect, an example security gate includes: an outer frame; an outer gate disposed within the outer frame, the outer gate defining a plane and having a plurality of outer gate vertical members, and the outer gate defining an inner gate opening; an inner gate disposed within the outer gate, the inner gate defining a plurality of inner gate vertical members, wherein the inner gate is configured to move vertically within the plane to control access through the inner gate opening, and wherein the plurality of inner gate vertical members are sized to telescope within the plurality of outer gate vertical members as the inner gate is moved; and a locking mechanism to lock the inner gate at a vertical position relative to the outer gate to define an accessible size of the inner gate opening.

Description

DESCRIPTION OF THE DRAWINGS
[0007] FIG. **1** is a view of an example security gate in accordance with the present disclosure.
[0008] FIG. **2** is a cross-sectional view of a portion of the security gate of FIG. **1**.
[0009] FIG. **3** is another cross-sectional view of the portion of the security gate of FIG. **1**.
[0010] FIG. **4** is another view of the security gate of FIG. **1** with the inner gate in the partially opened position.
[0011] FIG. **5** is a cross-sectional view of a portion of the security gate of FIG. **4**.
[0012] FIG. **6** is another view of the security gate of FIG. **1** with the inner gate in the partially opened position.
[0013] FIG. **7** is an enlarged view of a portion of the security gate of FIG. **6**.
[0014] FIG. **8** is a cross-sectional view of a portion of the security gate of FIG. **6**.
[0015] FIG. **9** is another cross-section view of a portion of the security gate of FIG. **6**.
[0016] FIG. **10** is an enlarged view of a portion of the security gate of FIG. **9**.
DETAILED DESCRIPTION

[0017] The present disclosure is directed towards a security gate. Various embodiments will be described in detail with reference to the drawings, wherein like reference numerals represent like parts and assemblies throughout the several views. Reference to various embodiments does not limit the scope of the claims attached hereto. Additionally, any examples set forth in this specification are not intended to be limiting and merely set forth some of the many possible embodiments for the appended claims.
[0018] FIG. **1** is a front view of an example security gate **100** in accordance with the present disclosure. The security gate **100** has a top **102**, a bottom **104**, a first side **106**, and a second side **108**, and includes an outer frame **110**, an outer gate **112**, and an inner gate **114**. The outer frame **110** includes a first vertical member **116**, a second vertical member **118**, and a horizontal member **120**.
[0019] The outer gate **112** includes a first outer rail **122** and a second outer rail **124** that define a height of the outer gate **112**. The outer gate **112** includes one or more complete inner rails **126** and one or more partial inner rails **128** that terminate at a member **130**. The one or more complete inner rails **126** and one or more partial inner rails **128** span a width of the outer gate **112**.
[0020] The outer gate **112** also includes one or more connectors **135** disposed towards a proximal side **131** of the outer gate **112**, a latch **132** disposed towards a distal side **133** of the outer gate **112**, the distal side **133** being opposite the proximal side **131**, and a stop mechanism **134**. The inner gate **114** includes vertical members **142** and a locking mechanism **144**. More or fewer vertical members **142** can be provided in alternative embodiments.
[0021] The outer frame **110** houses the outer gate **112** and interfaces with one or more other elements of an enclosure to secure the security gate **100** in place. The security gate **100** may be used as a pressure-mounted gate, e.g., by placing the security gate **100** between stationary objects (such as a doorjamb) such that frictional pressure between the security gate **100** and the stationary objects keeps the security gate **100** upright. It should be appreciated that the security gate **100** may include one or more elements that apply pressure to stationary objects; in addition or alternatively, the security gate **100** may be coupled to one or more elements that apply such pressure (e.g., by expanding into the doorjamb). Alternatively, the security gate **100** may be coupled to a larger portable enclosing structure, such as a fence structure that spans an opening wider than the security gate **100**. Similarly, the security gate **100** may be coupled to one or more elements of a portable enclosure (e.g., a play yard) having multiple fence panels which, when coupled to the security gate **100**, form a self-contained enclosure for pets and/or children.
[0022] In some examples the complete inner rails **126** and the partial inner rails **128** are spaced sufficiently close to one another and sufficiently close to the first vertical member **116** and the second vertical member **118** to prevent a pet and/or child from moving through or getting caught between adjacent rails (**126**, **128**), and/or between a rail (**126**, **128**) and the first vertical member **116** or the second vertical member **118**.
[0023] The connectors **135** movably connect the proximal side **131** of the outer gate **112** to the outer frame **110**. In some examples the connectors **135** are pivoting connectors, allowing the outer gate **112** to swing or rotate about the connectors **135** relative to the outer frame **110**. Non-limiting examples of the connectors **135** include hinges, pin-socket connections, and so forth.
[0024] The latch **132** detachably connects the distal side **133** of the outer gate **112** to the outer frame **110**, enabling the outer gate **112** to be opened (i.e., when the latch **132** is detached from the outer frame **110**) and closed (i.e., when the latch **132** is connected to the outer frame **110**). In general terms, the outer gate **112** is an opened position when a first plane defined by the first outer rail **122** and the second outer rail **124** does not coincide with a second plane defined by the first vertical member **116** and the second vertical member **118** of the outer frame **110** and/or when both the latch **132** is detached from the outer frame **110**; the outer gate **112** is in a closed position when the aforementioned first plane does coincide with the aforementioned second plane and one or both of the first locking mechanism is locked and the latch **132** is connected to the outer frame **110**.
[0025] In some examples, the latch **132** includes an extendable and retractable projection operated

by a spring biased button that extends the protrusion into (when the button is released), and retracts the protrusion from (when the button is pressed), a recess in the outer frame **110** that frictionally mates with the protrusion.

[0026] The stop mechanism **134**, when engaged, only allows the outer gate **112** to swing in one direction. The stop mechanism **134** can be disposed anywhere on the outer gate **112** suitable for this purpose. In the example shown in FIG. **1**, the stop mechanism **134** is disposed towards the distal end **133** of the outer gate **112** and reversibly engages the outer frame **110** to stop swinging (i.e., when the first locking mechanism engages the outer frame **110**) and allow swinging (i.e., when the stop mechanism **134** does not engage the outer frame **110**) of the outer gate **112**.

[0027] The outer gate **112** is larger than the inner gate **114**. Thus, the latch **132** may be operated to selectively allow or disallow large animals or children to pass through the security gate **100**, while operation of the inner gate **114** (discussed in more detail below), selectively allows relatively smaller animals or objects to pass through the security gate **100**.

[0028] When in the closed position shown in FIGS. **1**-**3** with the locking mechanism **144** abutting the second outer rail **124**, the inner gate **114** acts as a barrier within an opening **111** formed by the outer gate **112**. When in a partially opened position (FIGS. **4**-**5**) and/or a fully opened position (FIGS. **6**-**10**), the inner gate **114** generally provides access to the opening **111** through which relatively small pets or other objects may be selectively allowed to pass, regardless of whether the outer gate **112** is closed or opened.

[0029] The inner gate **114** generally moves vertically in substantially the same plane as defined by the outer gate **112** between a closed position (FIGS. **1**-**3**) to an opened position (FIGS. **6**-**10**). The inner gate **114** can also define one or more intermediate or partially opened positions (FIGS. **4**-**5**) between the closed position and the opened position.

[0030] As described further below, the vertical members **142** of the inner gate **114** extend through the member **130** and are sized to fit within the hollow interiors of the partial inner rails **128** as the inner gate **114** is moved from the closed to the opened positions. Specifically, the vertical members **142** and a corresponding bottom member **510** form a U-shaped design so that the vertical members **142** telescope into and out of the partial inner rails **128** as the inner gate **114** is opened (lifted in a direction A) and closed (lowered in a direction B). See FIGS. **5** and **8**-**9**.

[0031] An inner diameter **532** of each of the partial inner rails **128** is therefore greater than an outer diameter **530** of each of the vertical member **142** to allow the vertical members **142** to be received in and moved upwards within the partial inner rails **128**. In the opened position of FIGS. **6**-**10**, the vertical members **142** are fully received (telescoped) within the partial inner rails **128** so that only the locking mechanism **144** is visible. In an alternative embodiment, the partial inner rails are instead sized to telescope within the vertical members. Other configurations are possible.

[0032] In some examples, a width w.sub.1 of the opening **111** defined by the outer gate **112**, which approximately corresponds to the width of the inner gate **114**, is in a range from about 6 inches to about 12 inches. In a specific example, the width w.sub.1 is approximately 8 inches. Widths w.sub.1 outside of these values would also be suitable. In some examples, the maximum height h.sub.1 of the opening **111** defined by the outer gate **112**, which approximately corresponds to the maximum height of the inner gate **114**, is in a range from about 8 inches to about 15 inches. In a specific example, the maximum height h.sub.1 is approximately 11 inches. Maximum heights h.sub.1 outside of these values would also be suitable.

[0033] The locking mechanism **144** is mounted to the inner gate **114**. More specifically, the locking mechanism **144** is formed of two pieces, with a first piece positioned on one side of the inner gate **114** and a second piece positioned on another side of the inner gate **114**. The two pieces capture one another in a clamshell arrangement, such as through complementary snaps or by using fastening members like screws.

[0034] As shown in FIGS. **2**-**3**, **5**, and **8**-**10**, the locking mechanism **144** captures a lower portion of the partial inner rails **128** and the bottom member **510** of the inner gate **114**. In this configuration,

the locking mechanism **144** is fixed relative to the vertical members **142** and the bottom member **510** and moves with the inner gate **114**.
[0035] The locking mechanism **144** also captures the inner-most complete inner rails **126** coupled to the member **130**. The locking mechanism **144** slides along the inner rails **126** to lock the inner gate **114** in the closed, partially opened, and opened positions.
[0036] Specifically, the locking mechanism **144** defines openings **520** sized to received fingers (e.g., thumb and index finger of a single hand and/or thumb/index finger of opposite hands) to move the locking mechanism **144** between a locked and an unlocked position. Positioned within the openings are opposing actuators **514** that move horizontally within channels **502** formed by the locking mechanism **144** towards and away from one another.
[0037] Springs **512** force the opposing actuators **514** towards each respective complete inner rail **126**. In the closed position of FIG. **1-3**, an engagement member **518** formed by each of the opposing actuators **514** is received in an opening **210** formed in an inner surface **522** of each respective complete inner rail **126**. The positioning of the engagement member **518** within the openings **210** when the locking mechanism **144** is in the locked position holds the inner gate **114** in the closed position.
[0038] When the opposing actuators **514** are moved horizontally against the springs **512** towards one another into the unlocked position for the locking mechanism **144** (see, e.g., FIG. **3**), each respective engagement member **518** is moved out of the respective opening to allow the inner gate **114** to move vertically from the closed position. Specifically, the user places a finger into each of the openings **520** of the locking mechanism **144** and forces the opposing actuators **514** towards one another (against the springs **512**) to move the locking mechanism **144** to the unlocked position.
[0039] Once the inner gate **114** is at the desired vertical position, which defines a size of the opening **111** through the outer gate **112**, the fingers are removed. This allows the springs **512** to move the opposing actuators **514** to again contact the inner surface **522** of the respective complete inner rail **126** to lock the vertical position of the inner gate **114**.
[0040] When the inner gate **114** is moved to any partially opened position and the locking mechanism **144** is released to allow the engagement members **518** to be biased by the springs **512** to the locked position shown in FIGS. **4-5**, each engagement member **518** contacts the inner surface **522** of the respective complete inner rail **126**. A frictional engagement is formed by the interface between each engagement member **518** and the inner surface **522** of each respective complete inner rail **126** to hold the locking mechanism **144** vertically relative to the outer gate **112**. In the example shown, the inner gate **114** can be moved vertically to an infinite number of partially opened positions and locked in place by the locking mechanism **144**.
[0041] When the inner gate **114** is moved to the opened position (with the locking mechanism **144** abutting the member **130**) and the locking mechanism **144** is released, the engagement members **518** are to be biased by the springs **512** to the locked position so that each engagement member **518** is received in another opening **710** formed in the inner surface **522** of each respective complete inner rail **126**, as shown in FIGS. **6-10**. This locks the inner gate **114** in the opened position.
[0042] In an alternative embodiment, no holes are formed in the inner surface **522** of the complete inner rails **126**. Instead, the engagement members **518** forms a frictional connection with each inner surface **522** to define all closed, partial, and opened positions. In another example, more than two openings are formed along the inner surface **522** of each complete inner rails **126** to define specific partially opened positions between the closed and open positions. Other configurations are possible.
[0043] In some examples, actuation of the locking mechanism **144** (e.g., the amount of force required to overcome the springs and/or the dexterity required to actuate the locking mechanism **144** against the springs **512**) can be performed by adults, but not by small children or animals.
[0044] The various components of the security gates of the present disclosure can be manufactured from a variety of materials or combinations of materials. In one example, the outer frame **110**, the

outer gate **112**, and the inner gate **114** are all made from metal. In some examples, immobilized junctions between component parts of the outer gate **112** are welded together, such as: the respective junctions between the first outer rail **122** and each of the complete inner rails **126** and the partial inner rails **128**. Other materials, such as a relatively strong and rigid thermoplastic polymer (e.g., acrylonitrile butadiene styrene (ABS)) can also be used. The various components and aspects of the security gates of the present disclosure alternatively can be manufactured from other materials or combinations of materials.

[0045] In some examples, one or more components of the outer frame **110** and the outer gate **112** (e.g., the first vertical member **116**, the second vertical member **118**, the horizontal member **120**, the first outer rail **122**, the second outer rail **124**, the one or more complete inner rails **126**, the one or more partial inner rails **128**) are at least substantially hollow to reduce weight and manufacturing and/or shipping costs. In other examples, one or more components of the outer frame **110** and the outer gate **112** are solid (i.e., not hollowed out).

[0046] There are various advantages associated with the gates described herein. The telescoping nature of the vertical members of the inner gate with the vertical members of the outer gate allows for a cleaner look and less pinch points for children and pets as the inner gate is opened and closed. The locking mechanism allows the inner gate to be opened at nearly an unlimited number of positions, thereby creating great flexibility of the vertical size of the resulting opening. Further, the locking mechanism for the inner gate can be actuated with a single hand, thereby allowing for greater ease as the inner gate is moved to modify the size of the opening.

[0047] Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims.

Claims

1-20. (canceled)

21. A security gate, comprising: an outer frame; an outer gate disposed within the outer frame, the outer gate defining a plane and having outer gate vertical members including complete vertical members and partial vertical members, and the outer gate defining an inner gate opening; an inner gate disposed within the outer gate, the inner gate including inner gate vertical members, wherein the inner gate is configured to move vertically within the plane to control access through the inner gate opening, and wherein the inner gate vertical members are sized to telescope within the partial vertical members as the inner gate is moved; and a locking mechanism to lock the inner gate at a vertical position relative to the outer gate to define an accessible size of at least a portion of the inner gate opening, the locking mechanism including opposing actuators that are biased with springs into locked positions to hold the inner gate relative to the outer gate, the locking mechanism further including a first piece and a second piece forming a clamshell arrangement, the first piece and the second piece being positioned on different sides, respectively, of two of the complete vertical members, the first piece and the second piece being coupled to each other with fastening members or complementary snaps to fully surround, together: (i) the two of the complete vertical members; (ii) the opposing actuators; and (iii) two of the inner gate vertical members, wherein portions of the inner gate vertical members extend through openings in the locking mechanism into an interior of the locking mechanism.

22. The security gate of claim 21, wherein the inner gate defines a closed position wherein the inner gate blocks access through the inner gate opening.

23. The security gate of claim 21, wherein the two of the complete vertical members define other openings spaced apart from each other along the two of the complete vertical members, the openings being sized to receive engagement members of the locking mechanism.

24. The security gate of claim 21, wherein the inner gate vertical members are fixed within the locking mechanism.
25. The security gate of claim 21, wherein another member extends within the interior of the locking mechanism from one of the two of the inner gate vertical members to another of the two of the inner gate vertical members.
26. The security gate of claim 25, wherein the two of the inner gate vertical members and the another member form a U-shape.
27. The security gate of claim 21, wherein a vertical height of the inner gate opening is in a range from about 8 inches to about 15 inches, and wherein a horizontal width of the inner gate opening is in another range from about 6 inches to about 12 inches.
28. The security gate of claim 21, wherein there are exactly two of the inner gate vertical members; and wherein there are exactly two of the partial vertical members.
29. The security gate of claim 21, wherein there are exactly six of the complete vertical members.
30. The security gate of claim 21, wherein the inner gate defines a plurality of partially open positions that provide at least partial access through the inner gate opening.
31. The security gate of claim 21, wherein the opposing actuators are configured to be forced towards each other against the springs.
32. The security gate of claim 21, wherein the locking mechanism defines other openings for receiving fingers.
33. The security gate of claim 21, wherein the first piece and the second piece are coupled to each other with the fastening members.
34. The security gate of claim 21, wherein the first piece and the second piece are coupled to each other with the complementary snaps.