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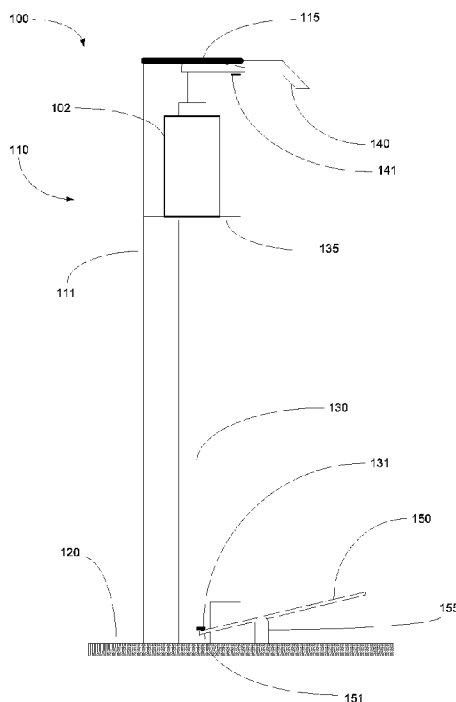
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(54) Titre : SYSTEMES, METHODES ET APPAREILS POUR DISTRIBUER UN LIQUIDE DE NETTOYANT POUR LES
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(54) Title: SYSTEMS, METHODS, AND APPARATUS FOR DISPENSING A HAND CLEANING LIQUID



(57) **Abrégé/Abstract:**

Apparatus and methods for dispensing a liquid from a pump bottle are provided. One such method includes exerting a force to push down on one end of a pedal pivotably coupled to a support where the support may be coupled to a bearing surface and a lifting end of the pedal may be coupled to an inner frame of the dispenser. The method also includes lifting the inner frame by converting the downwards force at the pedal to an upwards force at the lifting end through a pivot point at the support. The method further includes actuating a pump bottle to pump liquid from inside the pump bottle by holding an actuator of the pump bottle in position against a top cover of the dispenser while pushing the bottom of the pump bottle upwards by raising a platform coupled to the inner frame and upon which the pump bottle sits.

ABSTRACT

Apparatus and methods for dispensing a liquid from a pump bottle are provided. One such method includes exerting a force to push down on one end of a pedal pivotably coupled to a support where the support may be coupled to a bearing surface and a lifting end of the pedal may be coupled to an inner frame of the dispenser. The method also includes lifting the inner frame by converting the downwards force at the pedal to an upwards force at the lifting end through a pivot point at the support. The method further includes actuating a pump bottle to pump liquid from inside the pump bottle by holding an actuator of the pump bottle in position against a top cover of the dispenser while pushing the bottom of the pump bottle upwards by raising a platform coupled to the inner frame and upon which the pump bottle sits.

SYSTEMS, METHODS, AND APPARATUS FOR DISPENSING A HAND CLEANING LIQUID

TECHNICAL FIELD

[0001] The present disclosure relates to dispensers, and in particular, dispensers for hand sanitizers and hand soaps.

BACKGROUND

[0002] Hand sanitizers are widely used to quickly sanitize one's hands in locations where soap and water might not be convenient to use or may be unavailable. The use of hand sanitizers to kill germs and pathogens is often encouraged by medical and government authorities, especially to combat the spread of infectious diseases.

[0003] Dispensers containing hand sanitizer may be found in most places accessible to the public, such as lobbies, malls, schools, stores, hospitals and offices. The dispensers may simply be a pump bottle or a squeeze bottle placed on a table. In some instances, dispensers may be attached to walls. They may be activated by pushing a button or lever and causing a small amount of sanitizing liquid to be squirted down onto one's other hand.

[0004] There exists a continuing desire to advance and improve technology related to hand sanitizer dispensers.

SUMMARY

[0005] According to one aspect, there is provided an apparatus for dispensing a liquid from a pump bottle. The apparatus may include an outer frame with sidewalls coupled to a top cover and a base and having a hatch for receiving the pump bottle. The apparatus may also have a liftable inner frame coupled to the base and positioned inside the outer frame to extend from the base to a position below the top cover where a bottom of the pump bottle may extend to when the pump bottle is positioned for an actuator at the top of the pump bottle to touch the top cover without actuating the pump bottle. The apparatus may further include a guide coupled to the inner frame for guiding motion of the inner frame inside the outer frame. A platform for supporting the pump bottle may be coupled to a top end of the inner frame. The apparatus may also include an output

nozzle coupled to the outer frame for coupling to the pump bottle and allowing the liquid to flow out. The output nozzle may be positioned and shaped to receive liquid from the pump bottle when the pump of the pump bottle is activated and dispensing the liquid to a user. The apparatus may also have a pedal for activating the apparatus. The pedal may be pivotably coupled to a support and the support may be couplable to a bearing surface. The pedal may also be coupleable at a lifting end of the pedal to the inner frame for raising the inner frame. Pressing down on the pedal may lift the inner frame and the platform, causing the pump bottle to bear against the top cover such that the actuator of the pump bottle is pressed down into the pump bottle thereby activating the pump bottle to dispense the liquid to the output nozzle.

[0006] The platform may be the guide.

[0007] The guide may comprise a projection extending up from the base and that is slidably coupleable to the inner frame for guiding the inner frame in its movement up and down relative to the outer frame.

[0008] The top cover may be the hatch. Additionally, the inner frame may adjustable to increase or decrease its height to accommodate different sizes of pump bottles.

[0009] The apparatus may also include a spring coupled to the inner frame and the base for exerting a force to return the inner frame to a resting position when the inner frame has been lifted.

[0010] The outer frame may also include an opening positioned for viewing of a level of contents of the pump bottle.

[0011] The support may be coupled to the base, the base being the bearing surface.

[0012] According to another aspect, there is provided a method for dispensing a liquid from a foot operated dispenser. The method may include exerting a force to push down on one end of a pedal pivotably coupled to a support where the support may be coupled to a bearing surface and a lifting end of the pedal may be coupled to an inner frame of the dispenser. The method may also include lifting the inner frame by converting the downwards force at the pedal to an upwards force at the lifting end through a pivot point at the support. The method may further

include actuating a pump bottle to pump liquid from inside the pump bottle by holding an actuator of the pump bottle in position against a top cover of the dispenser while pushing the bottom of the pump bottle upwards by raising a platform coupled to the inner frame and upon which the pump bottle sits. The method may also include dispensing liquid pumped from the pump bottle through a tube coupled to the dispenser and positioned for receiving the liquid from the pump bottle.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] In the accompanying drawings, which illustrate one or more example embodiments,

[0014] FIG. 1 is a perspective view of an apparatus, according to one embodiment;

[0015] FIG. 2 shows a cross-sectional side view of an apparatus, according to one embodiment; and

[0016] FIG. 3 shows a method for dispensing a liquid from a foot operated dispenser according to one embodiment.

DETAILED DESCRIPTION

[0017] Directional terms such as “top”, “bottom”, “upper”, “lower”, “left”, “right”, and “vertical” are used in the following description for the purpose of providing relative reference only, and are not intended to suggest any limitations on how any article is to be positioned during use, or to be mounted in an assembly or relative to an environment. Additionally, the term “couple” and variants of it such as “coupled”, “couples”, “coupling”, and “couplable” as used in this description are intended to include indirect and direct connections unless otherwise indicated. For example, if a first device is coupled to a second device, that coupling may be through a direct connection or through an indirect connection via other devices and connections. Similarly, if the first device is communicatively coupled to the second device, communication may be through a direct connection or through an indirect connection via other devices and connections. The term “couplable”, as used in the present disclosure, means that a first device is capable of being coupled to the second device. A first device that is communicatively couplable to a second device has the ability to communicatively couple with the second device but may not always be communicatively coupled.

[0018] Various types of dispensers are available for dispensing liquids such as hand sanitizer and liquid soap. These dispensers are generally hand operated and may typically hold a liter or less of liquid. Many of these dispensers are fixed to walls. Changing their location may require affixing attachment apparatus to another wall and possibly patching up the wall in the previous location.

[0019] Dispensers that are relatively portable and not affixed to any structure are also available. Some of these are foot operated. For example, they may have a pedal. The dispensing action of the dispenser may be activated by pushing down on the pedal with one's foot. Some of these dispensers use a linkage system linking the pedal to an extension attached to the pump portion of a pump bottle. Pressing down on the pedal causes the extension to activate the pumping action of the pump bottle. These types of dispensers generally employ a more complex, and more expensive, mechanism than the hand operated dispensers.

[0020] The present disclosure provides a portable apparatus for dispensing liquids such as hand sanitizers and liquid soap. The apparatus is foot operable with a pedal. The dispenser uses a simple mechanism that raises a pump bottle inside the dispenser whenever the pedal is depressed. The pump bottle is raised so that the actuator or pump head hits the ceiling of the dispenser. The actuator and piston that it is attached to it are pressed down as the bottle moves up, causing the liquid in the pump bottle to be dispensed through a nozzle attached to the pump bottle and out of a spout or nozzle attached extending through an exterior wall of the dispenser.

[0021] The dispenser of the present disclosure is portable and may be moved to various locations as needed. It may be easily refilled using standard pump bottles and, in some embodiments, may be adjustable to fit various sizes of pump bottles. Larger size pump bottles may be used as the exterior size of the dispenser may be larger than hand operated dispensers. The larger size of the dispenser may be due to the dispenser extending from ground level, where the pedal may be located, to two to four feet above the ground to accommodate children and adults.

[0022] The dispensing mechanism of the dispenser of the present disclosure is simple and robust in comparison to other dispensers currently available. The mechanism raises the pump bottle, with the pedal directly pushing the lifting mechanism up. Other types of dispensers may use linkages that press down on the pump actuator rather than lifting the bottle up to actuate the

pump actuator. Lifting the bottle up may use less parts and a simpler mechanism, making it easier to produce and maintain.

[0023] Referring to FIG. 1 and FIG. 2, an apparatus 100 for dispensing a liquid from a pump bottle 102 is shown in accordance with some embodiments. The apparatus 100, a dispenser, includes an outer frame 110. The outer frame includes side walls 111, a top cover 115, a base 120 and a hatch 116 for receiving the pump bottle 102.

[0024] The outer frame 110 may be of any suitable shape and size. In some embodiments, the outer frame 110 may be about 24 inches in height. In certain embodiments, the outer frame 110 may be between about 24 inches to about 72 inches in height. In some embodiments, the outer frame 110 may have a height less than 24 inches. The height may be selected by the expected average height of the users.

[0025] The outer frame 110 may have any suitable cross-sectional width and length. For example, in some embodiments, the cross-sectional width and length may be about 4 inches. In some embodiments, the cross-sectional width and length may be between about 2 inches to 6 inches. In certain embodiments, the cross-sectional width and length may be between about 6 inches and 12 inches.

[0026] The outer frame 110 may have any suitable cross-sectional shape. For example, in some embodiments, the cross-sectional shape may be circular. In certain embodiments, the cross-sectional shape may be quadrilateral, such as square or rectangular.

[0027] The side walls 111 of the outer frame 110 may have any suitable structure. For example, in some embodiments, the side walls 111 may be solid. In certain embodiments, the side walls 111 may have portions cut-out of them.

[0028] In some embodiments, the outer frame 110 may include an opening positioned to allow viewing of a level of the contents of the pump bottle 102. For example, the outer frame 110 may have an opening cut out in the sidewalls 111 positioned to view a level of the contents of the pump bottle 102. The opening may, in some embodiments, be covered with a transparent material, such as glass or a transparent plastic. The opening may be of any suitable size and shape. In some

embodiments, the shape may be rectangular or an elongated oval. In certain embodiments, the shape of the opening may be a curved line.

[0029] The side walls 111 may be coupled to the base 120. Any suitable coupling may be used. For example, in some embodiments, the side walls 111 may be welded to the base 120. In certain embodiments, the side walls 111 may be bolted or screwed to the base 120. In some embodiments, only a portion of the side walls 111 may extend to the base 120. In certain embodiments, the side walls 111 may not extend from the top cover 115 to the base 120 along a continuous plane.

[0030] The base 120 may support the dispenser in standing upright and reduce the possibility of the dispenser tipping over. Any suitable type of base 120 may be used. In some embodiments, legs may extend from the sidewalls 111 and act as a base. The legs may extend out laterally to form a stable base for the dispenser. In certain embodiments, a plate may be used as the base 120. Any suitable size and shape of plate may be used as a base 120. For example and without limitation, a circular disc, a rectangular plate, or a square plate may be used. The plate may have portions cut out from it. The plate may have any dimensions suitable for providing stability to the dispenser. For example, in some embodiments, the plate may be between about 8 inches to 15 inches wide and about 8 inches to 16 inches long. The thickness of the plate may be, in some embodiments, between 3 mm to 12 mm.

[0031] The base 120 may be made of any suitable materials. For example, in some embodiments, the base 120 may be formed of, without limitation, plastic, composite, wood, ceramic, or metals such as, without limitation, steel or aluminum. The base 120 may, in some embodiments, rely on its weight in addition to its footprint to provide stability. For example, in embodiments where the base 120 is a plate, the size and thickness of the plate may be determined based on a desired weight of the base 120. Similarly, the materials used may be based on a desired weight and size of the base 120. In some embodiments, the base 120 may include a cavity that may be fillable with water or sand to increase the weight of the base 120.

[0032] In some embodiments, the base 120 may be fixable to the ground or surface that the base 120 sits on. For example, the base 120 may include bolt holes for affixing the base to the ground using bolts or screws.

[0033] The top cover 115 may, in some embodiments, be coupled to the side walls 111 and cover the top opening between the side walls 111. The top cover 115 may be insertable into the opening and may be of the same shape as the opening formed by the sidewalls 111.

[0034] The apparatus 100 includes a hatch 116 for placing the pump bottle 102 inside the apparatus 100. Any suitable type of hatch 116 may be used. For example, in some embodiments, the hatch 116 may be a door in a sidewall 111. It may be lockable or may be secured in a closed position using a screw or bolt.

[0035] In certain embodiments, the top cover 115 may be the hatch 116. A pump bottle 102 may be placed in the dispenser through the opening at the top of the dispenser. In some embodiments, the top cover 115 may be hinged for opening. The top cover 115 may be secured in place using, for example, a lock. The lock may be integrated into the top cover 115 or may be a padlock style lock. Any suitable locking mechanism, as may be known in the existing art, may be used. In some embodiments, a screw or bolt through a sidewall 111 and a tab or extension of the top cover 115 extending down from the top cover 115 may be used to secure the top cover 115.

[0036] In some embodiments, the top cover 115, as the hatch 116, may simply be lifted off for placing the pump bottle 102 into the dispenser and secured in place by screws or bolts.

[0037] The apparatus 100 may also include a liftable inner frame 130 coupled to the base 120 and positioned inside the outer frame 110. The inner frame 130 may be liftable inside the outer frame 110 to raise the pump bottle 102. The inner frame 130 may be positioned such that it extends from the base 120 to a position below the top cover 115 where a bottom of the pump bottle 102 will extend to when the pump bottle 102 is positioned for an actuator at the top of the pump bottle 102 to touch the top cover 115 without actuating the pump bottle 102. A top end of the inner frame 130 may be coupled to a platform 135 for supporting the pump bottle 102. Additionally, a guide may be coupled to the inner frame 130 for guiding movement of the inner frame 130 inside the outer frame 110.

[0038] Any suitable type of inner frame 130 may be used to lift the pump bottle 102 inside the outer frame 130. For example, in some embodiments, the inner frame 130 may comprise a tube along a majority of its length. In certain embodiments, the inner frame 130 may be formed

of, without limitation, bars, rods, or plates or any combination of bars, rods or plates. For example, the inner frame 130 may be formed of a C-shaped or I-shaped beam.

[0039] The inner frame 130 may be sized to any suitable dimensions. The cross-sectional dimensions may be sized to fit within the outer frame 110 and to maintain sufficient strength and rigidity to support the pump bottle 102 during dispensation of the liquid in the pump bottle 102.

[0040] The inner frame 130 may have any suitable height for extending from the base 120 or a lifting mechanism at the base 120 to the platform 135. The platform 135 may be positioned so that a pump bottle 102 placed on the platform 135 will have its pump head or actuator just touching the bottom of the top cover 115. In some embodiments, if the height of the outer frame 110 is 30 inches, the inner frame 130 may have a height of 24 inches, allowing for a 6-inch-high pump bottle 102.

[0041] In certain embodiments, the height of the inner frame 130 may be adjustable to accommodate pump bottles 102 of different sizes. Any suitable mechanism for adjusting the length of the inner frame 130 may be used. For example, in some embodiments, a sliding mechanism may be used with an upper portion sliding relative to a lower portion to extend or shorten the length of the inner frame 130. For example, and without limitation, the upper portion may slide into or out of a lower portion. A suitable securing mechanism may be used to secure the inner frame 130 at the chosen height. Such securing mechanisms may include, without limitation, screws, bolts, pins, and clamps.

[0042] In certain embodiments, the screw mechanism may be used to adjust the height of the inner frame 130. The inner frame 130 may move up or down by rotation of first threaded portion into or out of a second threaded portion.

[0043] In some embodiments, the outer frame 110 may allow access to the inner frame 130 for adjusting the height of the inner frame 130. Any suitable access may be used. In some embodiments, the side walls 111 of the outer frame 110 may comprise removable panels or opening panels. The panels may be hinged for swinging open or may be completely detachable. In certain embodiments, the side walls 111 of the outer frame 110 may be detachable from the base 130 for lifting the side walls 111 clear of the inner frame 130.

[0044] The top end of the inner frame 130 may be coupled to a platform 130. Any suitable coupling may be used. For example and without limitation, the inner frame 130 and the platform 130 may be coupled using welds, friction fitting techniques, bolts, screws, and adhesives.

[0045] The platform 135 may hold the pump bottle 102 in position. Any suitable type of holder may be used as the platform 135. In some embodiments, the platform 135 may be a disc or a plate and the pump bottle 102 may sit on the platform 135. The disc or plate may be, without limitation, solid or it may have openings or holes. In certain embodiments, the platform 135 may comprise a basket for holding the pump bottle 102. In some embodiments, the platform 135 may include straps for securing a pump bottle 102 against a back support extending from the inner frame 130.

[0046] In some embodiments, a guide may be coupled to the inner frame 130 for guiding movement of the inner frame 130 inside the outer frame 110. The movement may be a movement along a portion of the height of the outer frame 110. In some embodiments, the platform 135 may act as the guide. The platform 135 may be sized to fit the internal dimensions of the outer frame. The platform 135 may have a thickness along its edges sufficient to reduce the chance of the platform 135 tipping in any direction. In some embodiments, extensions may extend down from the edges of the platform 135 to bear against the side walls 111 of the outer frame 110 and prevent tipping of the platform. In certain embodiments, any part of the platform 135 that contacts the side walls 111 may be formed of materials and to reduce friction and may have surface treatments to reduce friction.

[0047] To further reduce the possibility of the platform 135 tipping, the inner frame 130 may be coupled to the platform 135 using a flexible coupling. Any suitable type of flexible coupling that allows sufficient freedom of movement to allow the platform 135 to remain level if the inner frame 130 pivots while moving up or down may be used. For example, a hinged coupling may be used in some embodiments. In certain embodiments, a ball and socket type of coupling may be used. Couplings with springs to allow flexibility may also be used in some embodiments.

[0048] In certain embodiments, the guide may be a projection extending from the base 120 for slidably coupling with and supporting the inner frame 130 during its vertical movement relative to the outer frame 110. The projection may be sized and shaped to allow the inner frame 130 to

ride up and ride down the projection. For example, in some embodiments, the inner frame 130 may be a tube. The projection may be a cylindrical projection sized to fit inside the tube of the inner frame 130. When the inner frame 130 is raised, the inner frame 130 may ride up along the cylindrical projection so that it rises in a straight line.

[0049] The apparatus 100 may also comprise an output nozzle 140 coupled to the outer frame 110. The output nozzle 140 may be for coupling to the pump bottle 102 and allowing the liquid from the pump bottle 102 to flow out. The output nozzle 140 may be positioned and shaped to receive liquid from the pump bottle 102 when the pump of the pump bottle 102 is activated and to dispense the liquid to a user. In some embodiments, the output nozzle 140 may be located close to a top part of the sidewalls 111 and at about the same vertical level as an output portion of the pump bottle 102.

[0050] In some embodiments, the output nozzle 140 may include a mating portion for mating with an output portion of the pump bottle 102. Any suitable mating technique or mechanism may be used. For example, and without limitation, the mating portion of the output nozzle 140 may be sufficiently large enough to allow insertion of the output portion of the pump bottle 102. In certain embodiments, a lip 145 may extend from the output nozzle 140 into an interior of the apparatus 100 to catch liquid from the pump bottle 102 that is not deposited directly into the output nozzle 140. The lip 145 may be angled down towards the output nozzle 140.

[0051] In certain embodiments, the output nozzle 140 may be coupled to the pump bottle 102 with a flexible tube such as a hose. Using a flexible tube for the coupling may allow greater movement of the pump bottle 102 relative to the output nozzle 140 than not using a flexible tube.

[0052] Any suitable type of output nozzle 140 may be used. In some embodiments, a tube may be used. The tube may have any suitable length, such, for example, about 1 inch to 6 inches. A portion of the tube may be bent or curved down so that the exit portion of the output nozzle 140 is pointed down to direct liquid down.

[0053] The output nozzle 140 may, in some embodiments, be sloped for letting liquid flow down from the pump bottle 102 to the exit portion of the output nozzle 140. In certain embodiments, the output nozzle 140 may be sized for letting pressure from the pump bottle 102

move liquid through the output nozzle 140. In some embodiments, the output nozzle 140 may have sufficiently large dimensions and be positioned to facilitate liquid being pulled along by gravity. Any suitable type of nozzle or spout may be used and suitable positions and sizes will be determinable by skilled technicians familiar to the field.

[0054] The apparatus 100 may also comprise a pedal 150 for activating the apparatus 100. The pedal 150 may be pivotably coupled to a support 155 and the support 155 may be coupleable to a bearing surface, such as the base 120. The pedal 150 may also be coupleable at a lifting end 151 of the pedal 150 to the inner frame 130 for raising the inner frame 130.

[0055] The pedal 150 may be pivotably coupled to the support 155 using any suitable pivoting mechanism. In some embodiments, the support 155 may be coupled to either side across the width of the pedal 150 using, for example and without limitation, pins or a rod.

[0056] The supports 155 may be coupled to the base 120. Any suitable coupling may be used, such as, without limitation, welds, bolts, or screws. In certain embodiments, the support 155 may be integrally formed as part of the base 120. The support 155, in certain embodiments, may be coupled to a bearing surface other than the base 120. For example, a bar may extend from the outer frame 110 and be coupled to the support 155.

[0057] The pedal 150 may have any suitable size and shape. For example, the pedal 150 may be about 9 inches long and 4 inches wide. Smaller or larger dimensions may be selected as suited to the user conditions. The pedal 150 may be formed of a solid piece, such as a plate, or it may be formed with cut-outs or using pieces separated with gaps. Pedal design is well known and a suitable pedal 150 may be selected or designed by a skilled technician or engineer using techniques known in the prior art. Similarly, the pivot position of the support 155 relative to the pedal 150 and relative to the bearing surface may be selected as suitable. For example, in some embodiments, the support 155 may be located about $\frac{1}{4}$ of the length along the pedal 150 and may be coupled to the pedal 150 between about 1 inch and 3 inches from the top surface of the base 120.

[0058] As seen in FIG. 1 and FIG. 2, the outer frame 110 may include a space in the sidewalls 111 where the pedal 150 passes through to the inner frame 130. The space may be sized

based on the size of the portion of the pedal passing through. In some embodiments, where the pedal 140 is wider at the activation portion and narrow at the lifting end 151, the space may be relatively small. In certain embodiments, most of the side wall 111 may be raised from the base or the ground.

[0059] In some embodiments, a shroud or other covering may cover the space between the pedal 150, the sidewalls 111 and the base 120 or ground. Such a covering may reduce the possibility of a user inserting anything into the space, thereby increasing safety for the user and the apparatus 100.

[0060] The pedal 150 may be coupled to the inner frame 130 using any suitable coupling, as will be known in the existing art. In some embodiments, a lip 131 may extend out from the inner frame 130 for engagement with the pedal 150. In certain embodiments, a lip may be formed by a groove or cut out in a bottom portion of the inner frame 130. The pedal 150 may be inserted into the groove. In some embodiments, the inner frame 130 may be positioned above the lifting end 151 of the pedal 150 so that the lifting end 151 sits underneath the inner frame 130.

[0061] In some embodiments, the pedal 150 may be coupled to the inner frame 130 using any suitable couplers, such as and without limitation, welds, bolts, adhesives, and screws. In certain embodiments, the coupling may allow some freedom of movement of the inner frame 130 relative to the lifting end 151 of the pedal 150 to allow movement of the lifting end 151 relative to the inner frame 130 as the pedal 150 pivots. For example, and without limitation, the lifting end 151 may be bolted to the inner frame 130 using slots to allow sliding. Vertical movement may also be allowed by not having the bolts compress the lifting end 151 against the lip 131 but leaving space for vertical movement.

[0062] In certain embodiments, the lifting end 151 may be coupled to the inner frame 130 through contact with the inner frame 130 or the lip 131 of the inner frame 130 sitting on the lifting end 151 of the pedal 150. There may be no securing mechanism and gravity may provide the force for keeping the inner frame 130 in contact with the lifting end 151 during lifting.

[0063] In some embodiments, the apparatus 100 may include a spring coupled to the inner frame 130 and the base 120 for exerting a force to return the inner frame 130 to a resting position

when it has been lifted by the lifting end 151. Lifting the upper frame 130 may bring the spring under tension, biasing it to pull the upper frame 130 back down.

[0064] During use, pressing down on the pedal 150 lifts the inner frame 130 and the platform 135, causing the pump bottle 102 to bear against the top cover 115 such that the actuator of the pump bottle 102 is pressed down into the pump bottle 102 thereby activating the pump bottle 102 to dispense the liquid to the output nozzle 140 and out to the user.

[0065] The components of the apparatus 100 may be formed of any suitable materials or combination of suitable materials. Materials such as, for example and without limitation, metals including aluminum and steel, plastic, wood and composites, including carbon-fiber based materials and fibreglass, may be used.

[0066] Referring to FIG. 3, an embodiment of a method 300 for dispensing a liquid from a foot operated dispenser, is provided. At box 310, a force is exerted to push down on one end of a pedal pivotably coupled to a support. The support may be coupled to a bearing surface and a lifting end of the pedal may be coupled to an inner frame of the dispenser.

[0067] At box 320, the inner frame may be lifted by converting the downwards force at the pedal to an upwards force at the lifting end through a pivot point at the support. At box 330, a pump bottle may be actuated to pump liquid from inside the pump bottle by holding an actuator of the pump bottle in position against a top cover of the dispenser while pushing the bottom of the pump bottle upwards by raising a platform coupled to the inner frame and upon which the pump bottle sits. The platform is raised due to the lifting of the inner frame as provided in box 320.

[0068] At box 340, liquid pumped from the pump bottle may be through a tube or output nozzle coupled to the dispenser and positioned for receiving the liquid from the pump bottle.

[0069] The components described in the method above may be similar to the components of the apparatus 100 discussed earlier.

[0070] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting. Accordingly, as used herein, the singular forms "a", "an" and "the" are intended to include the plural forms as well, unless the context clearly

indicates otherwise. It will be further understood that the terms "comprises" and "comprising," when used in this specification, specify the presence of one or more stated features, integers, steps, operations, elements, and components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and groups.

[0071] It is contemplated that any part of any aspect or embodiment discussed in this specification can be implemented or combined with any part of any other aspect or embodiment discussed in this specification.

[0072] While particular embodiments have been described in the foregoing, it is to be understood that other embodiments are possible and are intended to be included herein. It will be clear to any person skilled in the art that modifications of and adjustments to the foregoing embodiments, not shown, are possible.

CLAIMS

1. An apparatus for dispensing a liquid from a pump bottle, the apparatus comprising:
 - (a) an outer frame with sidewalls coupled to a top cover and a base and having a hatch for receiving the pump bottle;
 - (b) a liftable inner frame coupled to the base and positioned inside the outer frame to extend from the base to a position below the top cover where a bottom of the pump bottle will extend to when the pump bottle is positioned for an actuator at the top of the pump bottle to touch the top cover without actuating the pump bottle;
 - (c) a guide coupled to the inner frame for guiding motion of the inner frame inside the outer frame;
 - (d) a platform for supporting the pump bottle, the platform coupled to a top end of the inner frame;
 - (e) an output nozzle coupled to the outer frame for coupling to the pump bottle and allowing the liquid to flow out, the output nozzle positioned and shaped to receive liquid from the pump bottle when the pump of the pump bottle is activated and dispensing the liquid to a user; and
 - (f) a pedal for activating the apparatus, the pedal pivotably coupled to a support wherein the support is couplable to a bearing surface, the pedal also coupleable at a lifting end of the pedal to the inner frame for raising the inner frame;

wherein pressing down on the pedal lifts the inner frame and the platform, causing the pump bottle to bear against the top cover such that the actuator of the pump bottle is pressed down into the pump bottle thereby activating the pump bottle to dispense the liquid to the output nozzle.
2. The apparatus of claim 1 wherein the platform is the guide.

3. The apparatus of claim 1 or claim 2 wherein the guide comprises a projection extending up from the base and slidably coupleable to the inner frame for guiding the inner frame in its movement up and down relative to the outer frame.
4. The apparatus of any of claim 1 to claim 3 wherein the top cover is the hatch.
5. The apparatus of any of claim 1 to claim 4 wherein the inner frame is adjustable for extending or shortening the length of the inner frame to accommodate different sizes of pump bottles.
6. The apparatus of any of claim 1 to claim 5 further comprising a spring coupled to the inner frame and the base for exerting a force to return the inner frame to a resting position when it has been lifted.
7. The apparatus of any of claim 1 to claim 6 wherein the outer frame further comprises an opening positioned for viewing of a level of contents of the pump bottle.
8. The apparatus of any of claim 1 to claim 7 wherein the support is coupled to the base, the base being the bearing surface.
9. A method for dispensing a liquid from a foot operated dispenser, the method comprising:
 - (a) exerting a force to push down on one end of a pedal pivotably coupled to a support, the support coupled to a bearing surface and a lifting end of the pedal coupled to an inner frame of the dispenser;
 - (b) lifting the inner frame by converting the downwards force at the pedal to an upwards force at the lifting end through a pivot point at the support;
 - (c) actuating a pump bottle to pump liquid from inside the pump bottle by holding an actuator of the pump bottle in position against a top cover of the dispenser while pushing the bottom of the pump bottle upwards by raising a platform coupled to the inner frame and upon which the pump bottle sits;

- (d) dispensing liquid pumped from the pump bottle through a tube coupled to the dispenser and positioned for receiving the liquid from the pump bottle.

ABSTRACT

Apparatus and methods for dispensing a liquid from a pump bottle are provided. One such method includes exerting a force to push down on one end of a pedal pivotably coupled to a support where the support may be coupled to a bearing surface and a lifting end of the pedal may be coupled to an inner frame of the dispenser. The method also includes lifting the inner frame by converting the downwards force at the pedal to an upwards force at the lifting end through a pivot point at the support. The method further includes actuating a pump bottle to pump liquid from inside the pump bottle by holding an actuator of the pump bottle in position against a top cover of the dispenser while pushing the bottom of the pump bottle upwards by raising a platform coupled to the inner frame and upon which the pump bottle sits.

CLAIMS

1. An apparatus for dispensing a liquid from a pump bottle, the apparatus comprising:
 - (a) an outer frame with sidewalls coupled to a top cover and a base and having a hatch for receiving the pump bottle;
 - (b) a liftable inner frame coupled to the base and positioned inside the outer frame to extend from the base to a position below the top cover where a bottom of the pump bottle will extend to when the pump bottle is positioned for an actuator at the top of the pump bottle to touch the top cover without actuating the pump bottle;
 - (c) a guide coupled to the inner frame for guiding motion of the inner frame inside the outer frame;
 - (d) a platform for supporting the pump bottle, the platform coupled to a top end of the inner frame;
 - (e) an output nozzle coupled to the outer frame for coupling to the pump bottle and allowing the liquid to flow out, the output nozzle positioned and shaped to receive liquid from the pump bottle when the pump of the pump bottle is activated and dispensing the liquid to a user; and
 - (f) a pedal for activating the apparatus, the pedal pivotably coupled to a support wherein the support is couplable to a bearing surface, the pedal also coupleable at a lifting end of the pedal to the inner frame for raising the inner frame;

wherein pressing down on the pedal lifts the inner frame and the platform, causing the pump bottle to bear against the top cover such that the actuator of the pump bottle is pressed down into the pump bottle thereby activating the pump bottle to dispense the liquid to the output nozzle.
2. The apparatus of claim 1 wherein the platform is the guide.

3. The apparatus of claim 1 or claim 2 wherein the guide comprises a projection extending up from the base and slidably coupleable to the inner frame for guiding the inner frame in its movement up and down relative to the outer frame.
4. The apparatus of any of claim 1 to claim 3 wherein the top cover is the hatch.
5. The apparatus of any of claim 1 to claim 4 wherein the inner frame is adjustable for extending or shortening the length of the inner frame to accommodate different sizes of pump bottles.
6. The apparatus of any of claim 1 to claim 5 further comprising a spring coupled to the inner frame and the base for exerting a force to return the inner frame to a resting position when it has been lifted.
7. The apparatus of any of claim 1 to claim 6 wherein the outer frame further comprises an opening positioned for viewing of a level of contents of the pump bottle.
8. The apparatus of any of claim 1 to claim 7 wherein the support is coupled to the base, the base being the bearing surface.
9. A method for dispensing a liquid from a foot operated dispenser, the method comprising:
 - (a) exerting a force to push down on one end of a pedal pivotably coupled to a support, the support coupled to a bearing surface and a lifting end of the pedal coupled to an inner frame of the dispenser;
 - (b) lifting the inner frame by converting the downwards force at the pedal to an upwards force at the lifting end through a pivot point at the support;
 - (c) actuating a pump bottle to pump liquid from inside the pump bottle by holding an actuator of the pump bottle in position against a top cover of the dispenser while pushing the bottom of the pump bottle upwards by raising a platform coupled to the inner frame and upon which the pump bottle sits;

- (d) dispensing liquid pumped from the pump bottle through a tube coupled to the dispenser and positioned for receiving the liquid from the pump bottle.

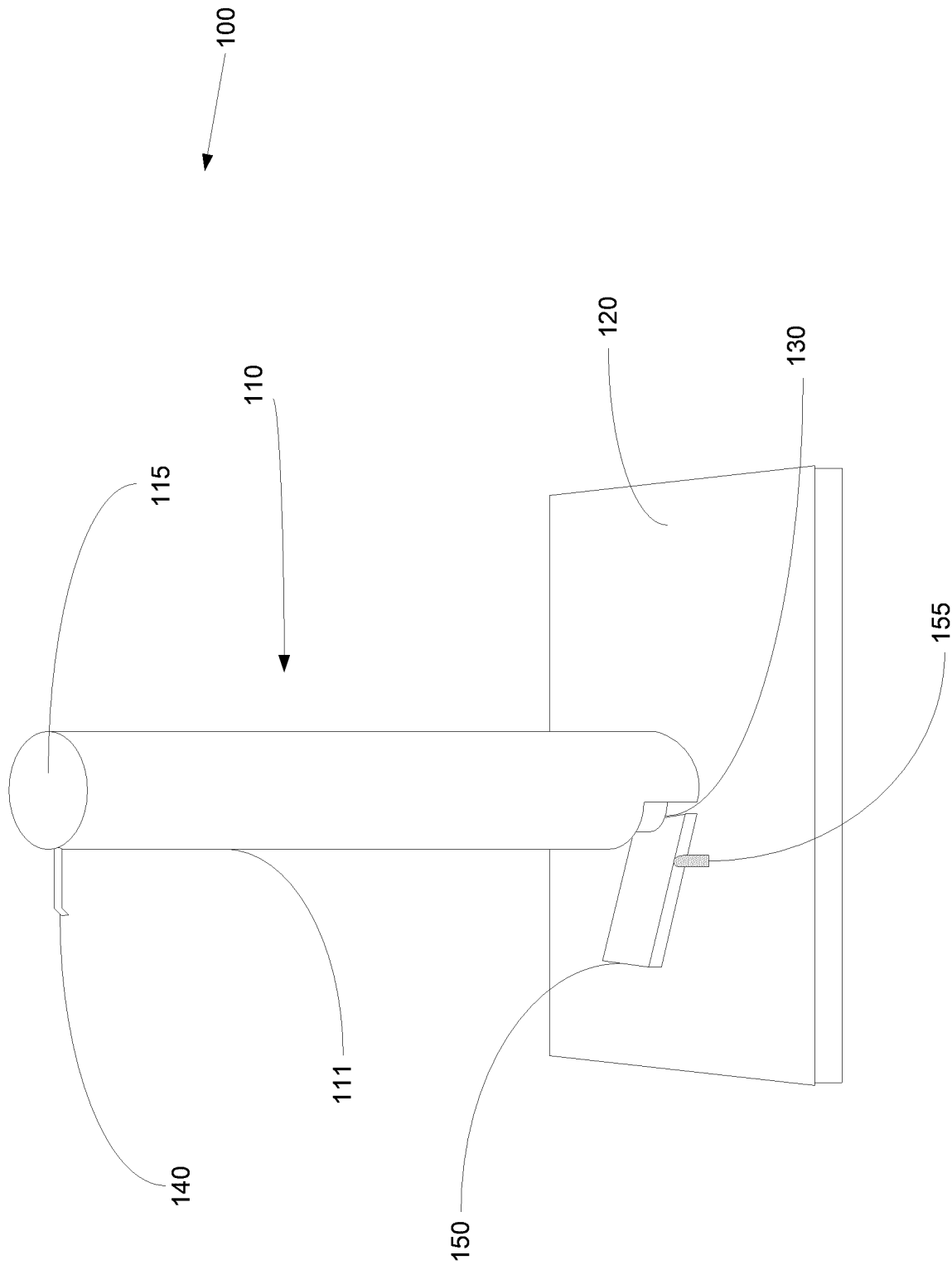


FIG. 1

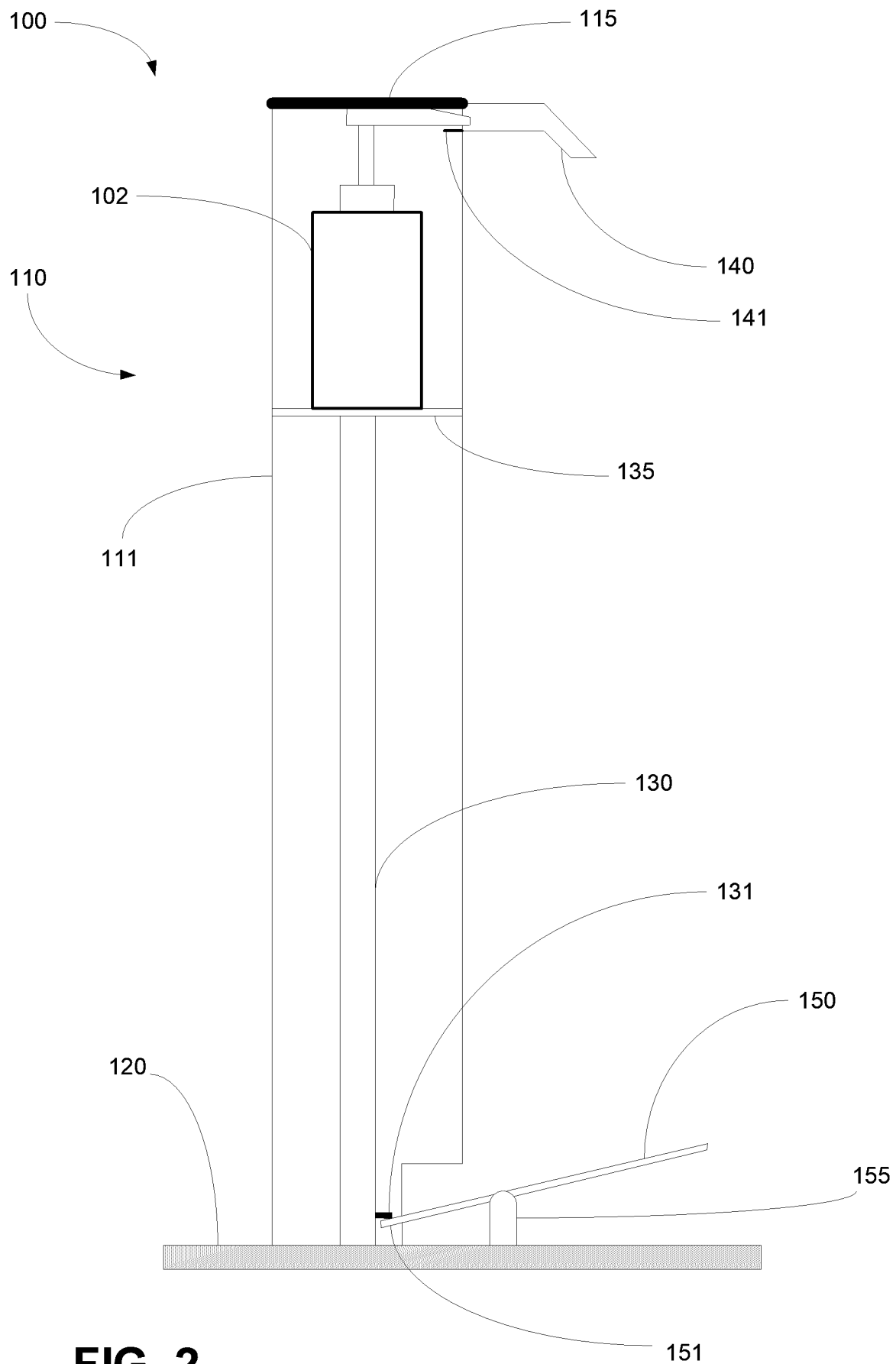


FIG. 2

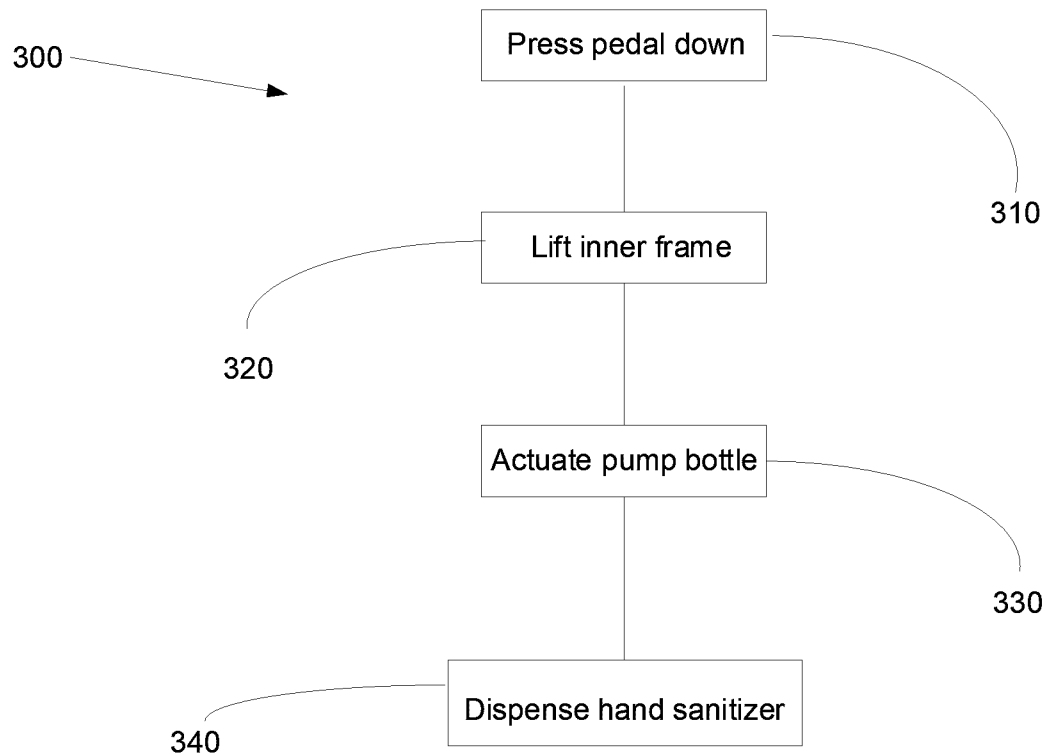


FIG. 3

