PRODUCT DISPENSING SYSTEM WITH TAPERED CATCH ELEMENT

Inventors: Matthew E. Zacherle, Richmond, VA (US); Aaron L. Bates, Moseley, VA (US); Caleb S. Loftin, Richmond, VA (US)

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ABSTRACT

A product dispensing system including a dispenser having a front end longitudinally opposed from a rear end, the dispenser including a first support deck extending at least partially between the front end and the rear end, a catch element proximate the first support deck, the catch element including a front edge, wherein the front edge is tapered to a forward-most end, and a second support deck positioned below the first support deck, the second support defining a product display area.
PRODUCT DISPENSING SYSTEM WITH TAPERED CATCH ELEMENT

FIELD

[0001] This application relates to the dispensing of products from packaging containers and, more particularly, to product dispensers configured to cooperate with packaging containers to dispense products.

BACKGROUND

[0002] Products are typically shipped to retailers in bulk by enclosing multiple individual product units in a container, such as a carton or box. For example, canned foods may be shipped to a retailer in a box containing twenty-four individual cans. Then, it is typically the retailer’s obligation to remove the individual product units from the container and present them to consumers.

[0003] Alternatives to the traditional package-ship-unpack display model are being developed in an effort to improve operating efficiency. For example, U.S. Pat. No. 7,922,457 to Loften et al. discloses a new system for dispensing and displaying products packaged in a container. Specifically, the system includes a frame having a support structure, a product display area and an opening tool. The frame may be positioned on a retailer’s shelf and loaded with product simply by placing a container comprising multiple units of product onto the support structure of the frame. As the container is being placed onto the support structure, the opening tool of the frame opens the container in such a manner that products roll from the container and down to the product display area of the frame under the force of gravity.

[0004] As another example, U.S. Patent application Ser. No. 13/032,734 filed by Gelardi et al. discloses a product dispensing system that utilizes an opening tool having a catch element that engages and opens a container as the container is loaded onto the dispenser, and then guides the container to avoid interference between the dispensing products and the open container.

[0005] Despite advances already made in the field, those skilled in the art continue with research and development efforts directed to apparatus and systems for dispensing products from packaging containers.

SUMMARY

[0006] In one aspect, the disclosed product dispensing system may include a dispenser having a front end longitudinally opposed from a rear end, the dispenser including a first support deck extending at least partially between the front end and the rear end, a catch element connected proximate the first support deck, the catch element including a forward-most end longitudinally opposed from the rear end of the catch element, wherein the rear end of the catch element has a first lateral width and the forward-most end has a second lateral width, the second lateral width being substantially less than the first lateral width, and a second support deck positioned below the first support deck, the second support defining a product display area.

[0007] In another aspect, the disclosed product dispensing system may include a dispenser having a front end longitudinally opposed from a rear end, the dispenser including a first support deck extending at least partially between the front end and the rear end, a catch element connected proximate the first support deck, the catch element including a front edge, wherein the front edge is tapered to a forward most end, and a second support deck positioned below the first support deck, the second support defining a product display area.

[0008] In another aspect, the disclosed product dispensing system may include a dispenser frame having a front end longitudinally opposed from a rear end, the dispenser frame including a support deck extending at least partially between the front end and the rear end, the support deck having an upper surface and defining a channel below the upper surface, the channel having an entrance opening and an exit opening, a catch element connected to the dispenser frame proximate the entrance opening, and a container positioned on the support deck, wherein a portion of the container is engaged with the catch element.

[0009] In another aspect, the disclosed product dispensing system may include a dispenser frame having a front end longitudinally opposed from a rear end, the dispenser frame including an upper support deck extending at least partially between the front and rear ends and having an upper surface and defining a channel below the upper surface, the channel having an entrance opening and an exit opening, wherein the exit opening opens toward the rear end of the dispenser frame, a lower support deck positioned below the upper support deck, wherein the dispenser frame defines an opening sized to allow product passage from the upper support deck down to the lower support deck, a catch element connected to the dispenser frame proximate the entrance opening of the channel, and a container that defines a weakening feature, the container being positioned on the upper support deck such that the catch element engages the weakening feature, wherein the catch element pierces and separates the weakening feature to define an opening into the container.

[0010] In yet another aspect, disclosed is a method for dispensing products from a container using a dispenser. The method may include the steps of (1) providing a dispenser including a frame having a front end longitudinally opposed from a rear end, the frame including an upper support deck having an upper surface and extending at least partially between the front end and the rear end, and a lower support deck positioned below the upper support deck, the lower support deck defining a product display area, wherein the frame defines a first opening, and a catch element connected to the frame; (2) providing a container that defines a weakening feature and initially houses a plurality of products; (3) urging the container along the upper support deck from the front end toward the rear end such that the catch element engages the weakening feature and separates an access panel from the container to form a second opening, the separated access panel being directed below the upper surface and toward the rear end; and (4) aligning the second opening with the first opening such that at least one product of the plurality of products moves from the container to the product display area, wherein the product interacts with the separated access panel as the product moves to the product display area.

[0011] Other aspects of the disclosed product dispensing system will become apparent from the following detailed description, the accompanying drawings and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a front and side perspective view of one aspect of the disclosed product dispensing system.
FIG. 2A is a bottom and side perspective view of the container of the product dispensing system of FIG. 1.

FIG. 2B is a bottom and side perspective view of the container of FIG. 2A, shown with a force applied to pierce perforations.

FIG. 3 is a side and bottom perspective view of the container of FIG. 2B, shown in an opened configuration.

FIG. 4 is a top plan view of a container blank that may be used to form the container of FIG. 2A.

FIG. 5 is a side elevational view, in section, of the dispenser of the product dispensing system of FIG. 1.

FIG. 6A is a top plan view of the catch element of the dispenser of FIG. 5.

FIG. 6B is a top plan view of an alternative embodiment of the disclosed catch element.

FIG. 7A is a side elevational view, in section, of an alternative embodiment of the disclosed dispenser.

FIG. 7B is a detailed side elevational view, in section, of a portion of the dispenser shown in FIG. 7A.

FIG. 8 is a side elevational view, in section, of the dispenser of FIG. 5, shown with a container in a first, partially loaded configuration.

FIG. 9 is a side elevational view, in section, of the dispenser of FIG. 8, shown with a container in a second, fully loaded configuration.

FIG. 10 is a side elevational view, in section, of the dispenser of FIG. 9, shown dispensing products.

DETAILED DESCRIPTION

Referring to FIG. 1, one aspect of the disclosed product dispensing system, generally designated 10, may include a dispenser 12 and a container 14. The container 14 may house multiple units of product 16. The container 14 may be loaded onto the dispenser 12 by urging the container 14 generally horizontally along the dispenser 12. As the container 14 is urged along the dispenser 12, the dispenser 12 may engage and open the container 14, thereby releasing the products 16 from the container 14 to the dispenser 12 without the container 14 interfering with movement of the products 16 from the container 14 and through the dispenser 12.

The container 14 may be any container capable of housing products 16 and beneficially interacting with the disclosed dispenser 12. For example, the container 14 may be a paperback carton or a corrugated box.

Referring to FIG. 2A, the container 14 may be a generally rectangular container having six walls 18, 20, 22, 24, 26, 28 that define an internal volume 30 for receiving the products 16 (FIGS. 9 and 10). Opposed walls 18 and 20 may define the front and rear walls, respectively, of the container 14. Opposed walls 22 and 24 may define the first (e.g., left) and second (e.g., right) side walls, respectively, of the container 14. Opposed walls 26 and 28 may define the base and upper walls, respectively, of the container 14.

A first weakening feature 34 may generally horizontally extend from the edge 52 between the base wall 26 and the left side wall 22 toward the edge 56 between the base wall 26 and the right side wall 24 of the container 14. The first weakening feature 34 may be formed in the base wall 26 proximate the edge 44 between the base wall 26 and the rear wall 20.

The first weakening feature 34 may facilitate the separation of a portion of the base wall 26 from the rest of the container 14, as shown in FIG. 3. In a first implementation, the first weakening feature 34 may be formed as a row of standard perforations, as a row of micro perforations or as a row of zipper-like cuts. In a second implementation, the first weakening feature 34 may be formed by scoring the container 14. In a third implementation, the first weakening feature 34 may be formed by creasing the container 14. Other techniques useful for forming the second and third weakening features 50, 54 will become apparent to those skilled in the art.

A second weakening feature 50 may generally longitudinally extend from the first weakening feature 34 toward the front wall 18 of the container 14. The second weakening feature 50 may be formed in the base wall 26 proximate the edge 52 between the base wall 26 and the left side wall 22.

A third weakening feature 54 may generally longitudinally extend from the first weakening feature 34 toward the front wall 18 of the container 14, and may be laterally spaced from the second weakening feature 50. The third weakening feature 54 may be formed in the base wall 26 proximate the edge 56 between the base wall 26 and the right side wall 24.

The longitudinal length of the second and third weakening features 50, 54 may be dictated by the size (e.g., the diameter) of the products 16 housed in the container 14. As one example, the second and third weakening features 50, 54 may extend along at least 5 percent of the length of the edge 52. As another example, the second and third weakening features 50, 54 may extend along at least 10 percent of the length of the edge 52. As another example, the second and third weakening features 50, 54 may extend along at least 20 percent of the length of the edge 52. As yet another example, the second and third weakening features 50, 54 may extend along at least 30 percent of the length of the edge 52.

The second and third weakening features 50, 54 may facilitate the separation of a portion of the base wall 26 from the rest of the container 14, as shown in FIG. 3. In a first implementation, the second and third weakening features 50, 54 may be formed as rows of perforations. For example, the second and third weakening features 50, 54 may be formed as rows of standard perforations, as rows of micro perforations or as rows of zipper-like cuts. In a second implementation, the second and third weakening features 50, 54 may be formed by scoring the container 14. Other techniques useful for forming the second and third weakening features 50, 54 will become apparent to those skilled in the art.

Thus, a force F (FIG. 2B) applied to the base wall 26 at the first weakening feature 34 may separate the base wall 26 along the length of the weakening feature, and then partially separate a portion of the base wall 26 from the container 14 along the second and third weakening features 50, 54 to form an access panel 58, as shown in FIG. 3. As the first weakening feature 34 facilitates the separation of the access panel 58 from the remainder of the container 14, the size of the access panel 58 may be significantly increased, thereby forming an access opening 60 in the container 14. The access opening 60 may allow the products 16 housed in the container 14 to be dispensed from the container 14 and, ultimately, into the dispenser 12 when the container 14 is loaded on the dispenser 12.

Optionally, one or more preformed fold lines 62 (FIG. 3) may laterally extend across the base wall 26 to encourage the access panel 58 to pivot relative to the base wall 26 of the container 14. Preformed fold lines 62 may reduce or
eliminate the possibility that the access panel 58 will randomly fold or bunch-up as the access panel 58 is formed.  

[0036] The container 14 may be formed from a paperboard container blank, such as the paperboard container blank 70 shown in FIG. 4. The container blank 70 may include a plurality of pre-formed fold lines 72, 73, 75, 77, 78, 79 that define the front wall 18 (comprised of front wall panels 18A, 18B, 18C and 18D), the rear wall 20 (comprised of rear wall panels 20A, 20B, 20C and 20D), the right side wall 22, the left side wall 24, the base wall 26, the upper wall 28 and sealing panel 71.  

[0037] The container 14 may be assembled by folding the container blank 70 along the longitudinal fold lines 72, 73, 75, 78 and connecting the upper wall 28 to the sealing panel 71 to form the three-dimensional body of the container 14. Then, the front wall panels 18A, 18B, 18C, 18D may be assembled to form the front wall 18 of the container 14. Finally, the rear wall panels 20A, 20B, 20C, 20D may be assembled to form the rear wall 20 of the container 14.  

[0038] The container blank 70 may be formed from a paperboard-based material, such as C1S paperboard, which may have a coating (e.g., clay) on a first major surface thereof, which may form the outer surface 74 (FIG. 1) of the container 14, and an uncoated second major surface. As another example, the paperboard-based material may be C2S paperboard, which may have a coating (e.g., clay) on both major surfaces thereof. Optiona, at least one major surface of the container blank may be marked with various indicia 76 (FIG. 1), such as printed text and/or graphics.  

[0039] While a specific paperboard container blank 70 is shown and described, those skilled in the art will appreciate that various techniques and materials may be used to form the container 14. Folded paperboard containers are only one specific and non-limiting example of the disclosed container 14.  

[0040] Various products 16 having various shapes and configurations may be housed in the container 14 and dispensed by the disclosed product dispensing system 10. Suitable products 16 include cans (e.g., canned soup or pet food), jars (e.g., jammed sauce) or bottles (e.g., bottled soft drinks).  

[0041] Referring to FIG. 5, the dispenser 12 may include a frame 80 and a catch element 82. The frame 80 of the dispenser 12 may support the container 14 in a desired configuration, such as a slightly declined, but generally horizontal configuration, as shown in FIGS. 1, 9 and 10. As the container 14 is generally horizontally urged along the dispenser 12 to the configuration shown in FIGS. 1, 9 and 10, the catch element 82 may engage the first weakening feature 34 (FIG. 2B) in the container 14 to separate the access panel 58 (FIG. 2B) from the container 14, as is described in greater detail herein.  

[0042] The frame 80 may include a first (e.g., right) side wall 84, a second (e.g., left) side wall 86, a first (e.g., upper) support deck 88 and a second (e.g., lower) support deck 90. The right side wall 84 may be laterally spaced from the left side wall 86, and may be generally parallel with the left side wall 86. The frame 80 may include a first (e.g., front) end 92 and a second (e.g., rear) end 94 longitudinally opposite from the first end 92.  

[0043] The lower support deck 90 may laterally extend between the right side wall 84 and left side wall 86, and may include a front end 96 that longitudinally extends toward the front end 92 of the frame 80 and a rear end 98 that longitudinally extends toward the rear end 94 of the frame 80. Therefore, the lower support deck 90 and the side walls 84, 86 may define a lower level 100 of the frame 80.  

[0044] The lower support deck 90 may be inclined from the front end 96 to the rear end 98 (i.e., the rear end 98 may be elevated relative to the front end 96) such that products 16 deposited proximate the rear end 98 of the lower support deck 90 roll down to the front end 96 of the lower support deck 90 under the force of gravity. The extent of the incline of the lower support deck 90 may be dictated by, among other things, the coefficient of friction of the material used to form the frame 80 and the shape of the products 16 to be dispensed by the dispenser 12.  

[0045] A stop 102 may be positioned proximate the front end 96 of the lower support deck 90 to prevent products 16 from rolling beyond the front end 96 of the lower support deck 90. For example, the stop 102 may be connected to (e.g., integral with) the lower support deck 90, and may form an upward curve at the front end 96 of the lower support deck 90. Therefore, the stop 102 may collect products 16 at the front end 96 of the lower support deck 90, thereby defining a product display area 104 at the front end 96 of the lower support deck 90.  

[0046] The upper support deck 88 may laterally extend between the right side wall 84 and left side wall 86, and may include a front end 106 that longitudinally extends toward the front end 92 of the frame 80 and a rear end 108 that longitudinally extends toward, but not to, the rear end 94 of the frame 80. Therefore, the upper support deck 88 and the side walls 84, 86 may define an upper level 110 of the frame 80.  

[0047] The spacing between the rear end 108 of the upper support deck 88 and the rear end 94 of the frame 80 may define an opening 112, which may function as a chute to allow products 16 to move from the upper level 110 to the lower level 100 of the frame 80. When the container 14 is in the fully loaded configuration on the dispenser 12, as shown in FIGS. 9 and 10, the access openings 60 (FIG. 3) in the container 14 may be aligned with the opening 112 (FIG. 5) defined by the frame 80.  

[0048] The upper support deck 88 may be declined from the front end 106 to the rear end 108 (i.e., the front end 106 may be elevated relative to the rear end 108). Therefore, products 16 supported on the upper support deck 88 may roll under the force of gravity down to the rear end 108 of the upper support deck 88, through the opening 112, to the lower level 100 of the frame 80 and, ultimately, to the product display area 104.  

[0049] An optional rear wall 114 may be positioned proximate the rear end 94 of the frame 80 between the right side wall 84 and left side wall 86. The rear wall 114 may serve as a stop that inhibits rearward horizontal movement of the container 14 (FIG. 1) along the upper support deck 88 beyond the rear wall 114.  

[0050] An optional guide 116 may be connected to the rear wall 114 of the frame 80, and may extend through the opening 112 in the frame 80, from the upper level 110 to the lower level 100. The guide 116 may be a ramp-like structure, and may be positioned to receive products 16 exiting the container 14 and passing through the opening 112 in the frame 80, and may guide the products 16 to the rear end 98 of the lower support deck 90.  

[0051] The catch element 82 may be positioned between the front end 106 and the rear end 108 of the upper support deck 88. For example, the catch element 82 may be positioned proximate the rear end 108 of the upper support deck 88.
The catch element 82 may laterally extend between the side walls 84, 86 of the frame 80, and may longitudinally protrude toward the front end 92 of the frame 80. The specific size and shape of the catch element 82 may depend on, among other things, the size and shape of the first weakening feature 34 in the container 14.

Referring to FIGS. 6A and 6B, the catch element 82 may include a rear end 83 and a forward-most end 85, and the forward-most end 85 may be longitudinally spaced from the rear end 83. The rear end 83 of the catch element 82 may have a lateral width Wₓ, which may laterally extend between the side walls 84, 86 of the frame 80, and the forward-most end 85 may have a lateral width Wᵧ (FIG. 6B), which may laterally extend between the side walls 84, 86 of the frame 80. The lateral width Wₓ of the forward-most end 85 may be substantially less than the lateral width Wᵧ of the rear end 83.

In one expression, the lateral width Wₓ of the forward-most end 85 may be at most 50 percent of the lateral width Wᵧ of the rear end 83. In another expression, the lateral width Wₓ of the forward-most end 85 may be at most 25 percent of the lateral width Wᵧ of the rear end 83. In another expression, the lateral width Wₓ of the forward-most end 85 may be at most 10 percent of the lateral width Wᵧ of the rear end 83. In another expression, the lateral width Wₓ of the forward-most end 85 may be at most 5 percent of the lateral width Wᵧ of the rear end 83. In yet another expression, the lateral width Wₓ of the forward-most end 85 may be at most 1 percent of the lateral width Wᵧ of the rear end 83.

In one construction, shown in FIG. 6A, the catch element 82 may have a generally pentagonal (or, alternatively, a generally triangular) shape in plan view, and may include the rear end 83 and front edges 87, 89. The rear end 83 of the catch element 82 may be positioned proximate to the rear end 108 of the upper support deck 88, as shown in FIG. 5. The front edges 87, 89 of the catch element 82 may be tapered from the rear end 83, and may terminate at a generally pointed forward-most end 85 that longitudinally protrudes toward the front end 92 of the frame 80 (FIG. 5).

The pointed forward-most end 85 may be generally sharp or sufficiently pointed so as to pierce and separate the first weakening feature 34 of the container 14 when it is positioned according to FIGS. 1, 9 and 10, as described herein. Optionally, the front edges 87, 89 may also be sharpened so as to facilitate separation of the first weakening feature 34 of the container 14 as it advances towards the rear end 94 of the frame 80, as described in greater detail herein.

In an alternative construction, the forward-most end 85 of the catch element 82 may be rounded, as shown in FIG. 6B.

While two specific catch elements 82, 82' (FIGS. 6A and 6B) are shown and described as being tapered, those skilled in the art will appreciate that various techniques may be used to provide the catch element 82 with a laterally narrower forward-most end without departing from the scope of the present disclosure.

Referring back to FIG. 5, in an effort to minimize interference between the catch element 82 and the container 14 during loading, the catch element 82 may be substantially co-planar with the upper surface 118 of the upper support deck 88. However, those skilled in the art will appreciate that slight displacement and/or a slight angle of the catch element 82 relative to the upper surface 118 of the upper support deck 88 may encourage engagement of the first weakening feature 34 in the container 14 by the catch element 82 during loading of the container 14 onto the dispenser 12.

The upper support deck 88 may define a channel 120 positioned to guide the access panel 58 below the upper surface 118 of the upper support deck 88 as the access panel 58 is separated from the container 14 by the catch element 82. The channel 120 may extend from an entrance opening 122 proximate the catch element 82, down below the catch element 82 and, ultimately, to an exit opening 124. The exit opening 124 may open toward the rear end 94 of the frame 80. The channel 120 may laterally extend between the side walls 84, 86 of the frame 80, and may have a lateral width sufficient to allow the access panel 58 (FIG. 3) to pass therethrough.

Thus, the catch element 82, particularly the forward-most end 85 of the catch element 82, may pierce the first weakening feature 34 (FIG. 2B) in the container 14 and may separate the access panel 58 (FIG. 3) from the container 14 as the container 14 is moved horizontally along the upper support deck 88 toward the rear end 94 of the frame 80.

The shape and position of the catch element 82 may be configured such that a portion of the catch element 82 extends through the first weakening feature 34 (FIG. 2B) in the container 14. Therefore, as the container 14 moves relative to the catch element 82, the catch element 82 may urge the base wall 26 downward through the opening 122 and into the channel 120, thereby causing separating of the access panel 58 (FIG. 3) from the container 14 along the second and third weakening features 50, 54 (FIG. 2B) and, ultimately, the formation of the access opening 60 (FIG. 3) in the container 14.

FIGS. 7A and 7B depict an alternative embodiment of the catch element 82". As shown in FIG. 7A, the catch element 82" may have a forward-most end 85" and may define an alternative opening 122" and channel 120". The catch element 82" may further be attached to an access panel guide element 143 that defines a guide channel 154, as described in greater detail herein.

As shown in FIG. 7B, the catch element 82" may protrude a distance D₁ that is long enough to ensure that the access panel 58 (FIG. 3) is capable of being separated before it is redirected by a redirection channel 154 as discussed in more detail herein. The distance D₁ may generally be less than or equal to 0.25 inches, less than or equal to 0.5 inches, less than or equal to 0.75 inches, or less than or equal to 1.0 inch.

In an effort to minimize interference between the catch element 82" and the container 14 during loading, the extended distance D₁ may allow for an engagement of the catch element 82" with the initiation opening 34 when the container 14 is inserted into the frame 80 as described herein may result in engagement at a point that is sooner than engagement of the catch element 82 described in FIGS. 5, 6A and 6B. Those skilled in the art will appreciate that the extended distance D₁ may prevent the access panel 58 from becoming crumpled and/or caught in the catch element 82" as the container 14 is inserted into the frame 80. This is due to the ability for the catch element 82" to interact with the container 14 in stages (i.e., as the container 14 generally longitudinally moves along the upper support deck 88, initial separation of the access panel 58 may occur prior to the redirection of the access panel 58 by the access panel guide element 143), thereby providing the access panel 58 ample room to move
laterally through the opening 122 before being diverted and/or redirected by the channel 120', as described in greater detail herein.

The upper support deck 88 may define a guide channel 154 positioned to guide the access panel 58 below the upper support deck 88 as the access panel 58 is separated from the container 14 by the catch element 82". The guide channel 154 may extend from the channel 120' proximate the catch element 82", down below the catch element 82" and, ultimately, to an exit opening 124'. The channel 120' may extend along a passage axis P that is generally parallel with the longitudinal axis L of the upper support deck 88. The guide channel 154 may be curved (e.g., generally C-shaped) from the channel 120' such that the channel 120' opens toward the front end 92 of the dispenser frame 80 above the upper support deck 88 and the exit opening 124' opens toward the front end 92 of the dispenser frame 80 below the upper support deck 80. The guide channel 154 may laterally extend between the side walls 84, 86 of the dispenser frame 80, and may have a lateral width sufficient to allow the access panel 58 (FIG. 3) to pass therethrough.

The access panel guide element 143 may laterally extend between the right and left side walls 84, 86, and may include a front end 145 that longitudinally extends toward the front end 92 of the dispenser frame 80. Therefore, the access panel guide element 143 and the side walls 84, 86 may define the exit opening 124'. The exit opening 124' may laterally extend between the side walls 84, 86 of the frame 80, and may have a lateral width sufficient to allow the access panel 58 (FIG. 3) to pass from the guide channel 154 therethrough.

The access panel guide element 143 may define the exit opening 124' positioned to further guide the access panel 58 below the upper support deck 88 as the access panel 58 is further separated from the container 14 by the catch element 82" and passes through the guide channel 154. While the access panel guide element 143 shown and described herein is a generally curved (e.g., C-shaped), laterally elongated and forwardly extending protrusion, those skilled in the art will appreciate that various alternative structures may be used as the disclosed access panel guide element 143 without departing from the scope of the present disclosure. For example, the access panel guide element 143 may extend in such a way that it does not come into contact with products 16 moving along the lower support deck 90 as described in more detail herein.

Thus, the catch element 82" may pierce the first weakening feature 34 (FIG. 2B) in the container 14 and may separate the access panel 58 (FIG. 3) from the container 14 as the container 14 is moved horizontally along the upper support deck 88 toward the rear end 94 of the dispenser frame 80. The shape and position of the catch element 82" may be configured such that a portion of the catch element 82" extends through the initiation opening 34 (FIG. 2B) in the container 14, and extends further into a portion of the container.

Therefore, as the container 14 moves relative to the catch element 82", the product 16 may urge the first weakening feature 34 downward so that the first weakening feature 34 is properly caught by the catch element 82", which then may urge the base wall 26 of the container 14 through the opening 122' thereby causing separation of the first weakening feature 34 (FIG. 3) from the container 14, and further along the second and third weakening features 50, 54 (FIG. 2B) and, ultimately, the formation of the access opening 60 (FIG. 3) in the container 14. As the container 14 is urged further, the access panel 58 may continue to longitudinally extend through the opening 122' and the channel 120' until it reaches the curved portion of the guide channel 154. The curved shape of the guide channel 154 may direct the separated access panel 58 backwards (i.e., a U-turn) into the exit opening 124' defined by the access panel guide element 143 such that the separated access panel 58 does not interact with products 16 moving along the lower support deck 90.

FIGS. 8-10 illustrate the container 14 being loaded onto the dispenser 12 such that the catch element 82 of the dispenser 12 engages and opens the container 14, thereby releasing the products 16 initially housed in the container 14 to the dispenser 12. Specifically, FIGS. 8-10 illustrate the container 14 being urged generally horizontally along the upper support deck 88 (i.e., along the longitudinal axis A of the upper support deck 88) toward the rear end 94 of the dispenser frame 80, thereby automatically opening the container 14 and dispensing the products 16 from the container 14 to the dispenser 12.

As shown in FIG. 8, as the first weakening feature 34 in the container 14 approximates the catch element 82 of the dispenser 12, the catch element 82 may pierce, separate and pass through the first weakening feature 34. With the catch element 82 extending through the first weakening feature 34, the rear edge 66 of the base wall 26 of the container 14 may be directed downward through the entrance opening 122 of the channel 120.

As shown in FIG. 9, as the container 14 continues to longitudinally move along the upper support deck 88 toward the rear end 94 of the dispenser 12, the base wall 26 of the container 14 may pass through the channel 120, thereby separating the access panel 58 from the base wall 26. Since the exit opening 124 of the channel 120 opens toward the rear end 94 of the dispenser 12, the separated access panel 58 may be directed toward the rear end 94 of the dispenser 12, thereby partially covering the access opening 60 that has been formed in the container 14.

As shown in FIG. 10, with the container 14 fully loaded onto the dispenser 12, the access opening 60 formed in the container 14 may be aligned with the opening 112 between upper 110 and lower 100 levels of the frame 80. Therefore, the force of gravity may urge the products 16 initially housed in the container 16 through the access opening 60 in the container 14, through the opening 112 in the frame 80, down to the lower support deck 90 and, ultimately, to the product display area 104. The weight of the products 16 passing through the openings 60, 112 may urge the access panel 58 from the configuration shown in FIG. 9 to the configuration shown in FIG. 10.

As the products 16 exiting the container 14 interact with the access panel 58, the access panel 58 may become “hooked” onto the upper support deck 88 of the dispenser 12. Specifically, as the products 16 exiting the container 14 interact with the access panel 58, a first portion of the access panel 58 (i.e., the portion of the access panel 58 within the channel 120) may extend toward the rear end 94 of the dispenser frame 80 while a second portion of the access panel 58 (i.e., the portion of the access panel 58 that includes the rear edge 66) may extend toward the front end 92 of the dispenser frame 80, thereby inhibiting separation of the container 14 from the dispenser 12.

Accordingly, the engagement between the products 16 and the access panel 58 that facilitates “hooking” of the access panel 58 onto the dispenser 12 may function as a theft prevention feature 60 that prevents the products 16 from being removed from the container 14 without the container 14 being opened to the dispenser 12.
deterrent by inhibiting the quick and easy separation of a loaded container 14 from the dispenser 12.

Although various aspects of the disclosed product dispensing system have been shown and described, modifications may occur to those skilled in the art upon reading the specification. The present application includes such modifications and is limited only by the scope of the claims.

What is claimed is:

1. A product dispensing system comprising:
   a dispenser having a front end longitudinally opposed from a rear end, said dispenser comprising:
   a first support deck extending at least partially between said front end and said rear end;
   an opening tool proximate said first support deck, said opening tool comprising a rear end and a forward-most end longitudinally opposed from said rear end of said opening tool, wherein said rear end of said opening tool has a first lateral width and said forward-most end has a second lateral width, said second lateral width being less than said first lateral width; and
   a second support deck proximate said first support deck, said second support deck defining a product display area.

2. The product dispensing system of claim 1 wherein said second lateral width is at most 25 percent of said first lateral width.

3. The product dispensing system of claim 1 wherein said second lateral width is at most 10 percent of said first lateral width.

4. The product dispensing system of claim 1 wherein said second lateral width is at most 5 percent of said first lateral width.

5. A product dispensing system comprising:
   a dispenser having a front end longitudinally opposed from a rear end, said dispenser comprising:
   a first support deck extending at least partially between said front end and said rear end;
   an opening tool proximate said first support deck, said opening tool comprising a front edge, wherein said front edge is tapered to a forward-most end, and
   a second support deck proximate said first support deck, said second support deck defining a product display area.

6. The product dispensing system of claim 5 wherein said first support deck comprises a front end and a rear end, and wherein said opening tool is connected to said first support deck proximate said rear end of said first support deck and protrudes toward said front end.

7. The product dispensing system of claim 5 wherein said forward-most end is pointed or rounded.

8. The product dispensing system of claim 5 wherein dispenser further comprises a first side wall and a second side wall, said second side wall being laterally opposed from said first side wall.

9. The product dispensing system of claim 8 wherein said opening tool laterally extends between said first side wall and said second side wall.

10. The product dispensing system of claim 8 wherein said forward-most end is substantially centered between said first side wall and said second side wall.

11. The product dispensing system of claim 5 wherein said opening tool defines a first upper surface and said first support deck defines a second upper surface, and wherein said first upper surface is substantially parallel to said second upper surface.

12. The product dispensing system of claim 5 further comprising a container positioned on said first support deck.

13. The product dispensing system of claim 12 wherein said first support deck defines an upper surface and a channel that extends below said upper surface, said channel having an entrance opening and an exit opening.

14. The product dispensing system of claim 13 wherein said exit opening opens toward said front end.

15. The product dispensing system of claim 13 wherein a portion of said container is received in said channel.

16. The product dispensing system of claim 12 further comprising a plurality of products initially housed in said container.

17. The product dispensing system of claim 5 wherein said product display area is proximate said front end.

18. The product dispensing system of claim 12 wherein said first support deck defines an upper level of said dispenser and said second support deck defines a lower level of said dispenser, and wherein said first support deck further defines an opening between said upper level and said lower level.

19. The product dispensing system of claim 18, wherein said container defines an internal volume and an access opening into said internal volume.

20. The product dispensing system of claim 19 wherein said access opening is aligned with said opening defined by said first support deck.