APPARATUS AND METHOD FOR HOLDING AND PROTECTING DRUG DELIVERY DEVICES

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ABSTRACT

Taught herein is a package for holding and storing articles such as drug delivery devices. An inner slide card with tray (12, 100) is loaded with drug delivery devices and inserted into an outer sleeve (200). Receiving slots (34, 114) and apertures (36, 38, 118) secure the drug delivery devices in a tray. Elements such as catches (40, 42) associated with the slide card or tray cooperatively engage elements such as catches (240) associated with the outer sleeve (200). The cooperative engagement of the respective catches provides a child-resistant feature and a spill-resistant feature. A release button (224) disengages the child-resistant feature. In addition, the horizontal orientation of the injectables provides easy access for a user who has limited dexterity as well as sufficient area to apply graphics.
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CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to co-pending U.S. Provisional Application No. 60/591,677, filed on Jul. 28, 2004, which is entirely incorporated herein by reference.

FIELD OF THE INVENTION

[0002] This invention relates to packaging, and more specifically to a two-piece apparatus that houses one or more drug delivery devices on an internal slide card within an outer shell. This apparatus may have one or more internal or external locks that prevent the slide card from being pulled out without triggering a related lock release.

BACKGROUND OF THE INVENTION

[0003] Conventional pharmaceutical packaging has shortcomings with regard to injectables, which create problems for both the manufacturer and end user. For example, there is known to distribute syringes, vials, and parts thereof in packaging that incorporate foam or plastic elements to protect the product. Such conventional packaging normally holds the product in a vertical position. Where conventional packaging holds the product in a horizontal position, the products are typically stacked on top of each other. There is also known to distribute syringes, vials, and parts thereof loose—or loose, but individually wrapped—in conventional boxes without any means for holding or protecting the products.

[0004] The conventional manufacturer that incorporates foam or plastic elements in its packaging to protect the product carries an increased inventory and employs a more complicated manufacturing system to produce its packaging. Further, the conventional manufacturer typically produces one kind of package to be filled by automated means and another kind to be filled by hand, which also increases inventory and the number of product lines.

[0005] Conventional manufacturers of injectable holding packaging typically do not provide a child-resistant feature to prevent unauthorized access, or a stopping feature to prevent accidental spillage. Where these features do exist, they exist at the expense of easy access for the end user with limited dexterity. Neither does the known injectable packaging provide ample space to place appropriately sized graphics, such as dose compliance instructions and warnings, for the end user with limited sight.

[0006] In addition, conventional manufacturers pack injectables tightly and in the most efficient manner possible—from the perspective of shipping cost savings—but, again, at the expense of the end user who has limited physical mobility, such as an end user with arthritis of the fingers. Also conventional manufacturers are known to distribute only wholly-assembled syringes together, parts of syringes together, or vials together, but not whole syringes or parts or vials mixed together. This convention requires the end user to create and maintain an inventory of injectables to fill their individual needs.

[0007] End users are familiar with the disposal problems created by the use of injectables. Typically, spent vials, needles, syringes, barrels, and other injectables or parts thereof must be sealed or otherwise protected in order to be disposed of safely. While it is known to dispose of injectables in a separate device, such as a sealable plastic container, there remains a need for an injectable packaging that also serves as a safe means of disposal.

[0008] It is apparent from a survey of the pharmaceutical arts that there exists a need for an apparatus that holds and protects all types of drug delivery devices and parts thereof, allows for improved manufacturing processes, includes child-resistant and spill-prevention features, stores a variety of objects in response to the end user's needs, is fitted for easy access by the end user who has limited dexterity, has sufficient area to receive graphics, and provides a means for safe disposal.

SUMMARY OF THE INVENTION

[0009] Generally speaking, the present invention fulfills the needs identified above by providing packaging embodiments comprising an outer sleeve and an inner slide card retained within the outer sleeve and with embodiments that releasably lock the inner slide card within the outer sleeve. In lockable embodiments, the outer sleeve includes at least one panel with an inner slide card means for locking, an inner slide card means for releasing, and an optional inner slide card means for stopping. The inner slide card includes a tray and at least one panel configured to cooperatively engage the outer sleeve means for locking, means for releasing, and optional means for stopping.

[0010] In exemplary embodiments the inner slide card means for locking include extension panels or tabs integral to the inner card or, optionally, attachments extending therefrom, configured to releasably engage the outer sleeve. Also the inner card means for releasing includes a catch and a release on an outer sleeve panel, or an attachment extending therefrom, configured to releasably engage said means for locking. The inner slide card means for locking or retaining comprises inner card and outer sleeve extension panels or tabs configured to engage, or attachments or catches associated with the card and sleeve that are configured to engage. Thus the present invention provides an optional child-resistant feature.

[0011] In exemplary embodiments, the inner card means for stopping comprises inner card and outer sleeve extension panels or tabs configured to engage, or attachments or catches associated with the card and sleeve that are configured to engage. Thus the present invention provides an optional spill-resistant feature to prevent the user from pulling the inner card completely away from the outer sleeve, but which can be opened and closed numerous times to access the drug delivery devices.

[0012] Alternative embodiments include an apparatus and method for holding and storing drug delivery devices by providing an inner tray configuration that, by way of example and not limitation, protects a plunger from inadvertent activation; shields a needle from inadvertent exposure; allows easy access to a drug-filled container for removal and replacement; and collects and stores the spent devices. Accordingly, embodiments of the present invention provide an apparatus and system that is able to safely ship drug delivery devices for transdermal, oral, and hypodermic administration, including pre-filled syringes, needles, vials, ampoules, protective shields, and accessories, safely store the unused devices, and safely store the used devices until all can be safely disposed as a unit.
Alternative embodiments include an apparatus and method for providing compliance directions or information directed to therapy management. In one embodiment, indicia such as, but not limited to, time of day, days of the week, numerical sequence, or dosage amounts are positioned adjacent to the devices. In another embodiment, compliance information or general information related to the medication or therapy is positioned on or with the inner slide card or outer sleeve in a manner easily visible by the user.

Further embodiments include an apparatus for use with a high volume pick-and-pack manufacturing process. The same embodiments provide an apparatus for use with a hand pick-and-pack manufacturing process. Another embodiment includes an apparatus and method for protecting and storing spent drug delivery devices within a secure container until they can be disposed of in a controlled fashion.

Embodiments according to this invention offer at least the following advantages: lightness in weight, resistance to tampering, child-resistance, ease of access, excellent durability, ease of assembly, device protection, ease of storage, ease of disposal, the ability to present devices of different and unusual shapes, and excellent economy.

It is also contemplated that the present invention is not limited to pharmaceutical-related goods, but is applicable to a plethora of delicate, sensitive, or unique portable articles. Small electronic components, jewelry, foods, expensive and precious goods, and any other item which requires a safe, stable, and portable environment in which to be shipped and stored may find an application with the present invention. Other advantages of the present invention will be apparent from the following description, the accompanying drawings, and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of an embodiment of a combined slide card and tray blank, according to the present invention.

FIG. 2 is a perspective view of the completely constructed blank of FIG. 1.

FIG. 3 is a perspective view of an alternative embodiment of a slide card and tray, according to the present invention.

FIG. 4 is a plan view of an embodiment of an outer sleeve blank, according to the present invention.

FIG. 5 is a perspective view of the completely constructed blank of FIG. 4.

DETAILED DESCRIPTION OF THE INVENTION

As required, detailed embodiments of the present invention are disclosed herein. It will be understood that the disclosed embodiments are merely exemplary of the invention that may be embodied in various and alternative forms. The figures are not necessarily to scale, and some features may be exaggerated or minimized to show details of particular components. In other instances, well-known materials or methods have not been described in detail in order to avoid obscuring the present invention. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but as a basis for the claims and for teaching one skilled in the art to variously employ the present invention.

Referring now to the drawings, wherein like numerals represent like features throughout, there are illustrated embodiments of the present invention. Turning first to FIG. 1 and FIG. 2, there is shown an internal slide card blank 10 configured to form an inner tray 12 for holding articles such as drug delivery devices. Herein, the term “drug delivery devices,” whether in the singular or plural, is used broadly to refer to all apparatus and parts thereof used in conjunction with transferring solids, fluids, or gases into or out of a body. By way of example and not limitation, a drug delivery device may be in the form of an injectable device comprising a needle, plunger, and cap used by a medical professional to treat a patient with a pharmaceutical drug in liquid form. The same term is applicable herein to refer to all parts of the device as well as the vial(s) used to hold or receive the drug. For purposes of teaching and not limitation, the illustrated embodiments are directed to packaging for articles such as a drug delivery device in the form of an injectable device.

As best shown in FIG. 1, the illustrated blank 10 includes a base panel 14, spine panel 16, and top panels 18, 20. The top panel 20 comprises an integral spine support panel 22, formed by cuts 23 and fold lines 24. Blank 10 further includes extension panels 25.

An extension panel 25 comprises an outside sidewall panel 26, top panel 28, inside sidewall panel 30, and securing panel 32. Further, panel 25 comprises a plunger-receiving slot 34, formed by cuts 23 and fold lines 24, and a needle-receiving aperture 36, 38. Alternative aperture designs are shown to illustrate a means for securing syringe ends with or without a protective cap. As understood by one skilled in the art, in certain embodiments the aperture 36 may be formed by cuts 23 in the form of an “X” while in other embodiments the aperture 38 may be formed by cuts 23 that create a void.

Blank 10 further includes locking tab 40 and stopping tabs 42. As described in detail below, locking tab 40 cooperatively engages with another element to create a child-resistant feature. Also as described below, stopping tabs 42 cooperatively engage with another element to create a pull-out stop that also functions as a spill-resistant feature. With the explanation below, one skilled in the art will understand that the child-resistance feature and stopping feature can both be created, alternatively, with either tabs 40, 42 individually or together. Accordingly, both tabs 40, 42 are a means for locking and a means for stopping.

With respect to assembly, blank 10 is folded and connected, using conventional techniques, to create the combined internal slide card and inner tray 12. Best shown in FIG. 2. One sequence of folding and connecting the blank 10 to form the tray 12, described merely for the purpose of teaching and not limitation, with reference to the visible side of the illustrated blank 10 as the face and the opposite side as the back, is as follows: The face of top panel 20 is folded and affixed to the face of top panel 18 so that the face of spine support panel 22 overlaps the face of spine panel 16. The face of each of the outside wall panels 26, top panel 28, and inside wall panel 30 are folded toward each other to form an open-end channel. With the faces of panels 26, 28, and 30 oriented toward each other, the face of securing panel 32 is attached to the face of base panel 14. In addition, as described below, locking tab 40 will be folded so that the back of locking tab 40 is orientated toward the back of base panel 14. Similarly, stopping tabs 42 will be folded so that the backs of stopping tabs 42 are orientated toward the backs of the respectively adjacent outside sidewall panels 26.

After assembly, the inner tray 12 is configured to receive and store an injectable device (not shown). In the
illustrated embodiment of FIG. 2, a plunger handle may be received and secured by the plunger-receiving slot 34 while a needle may be received and secured by the needle-receiving apertures 36, 38. By way of illustration and not limitation, the receiving slot 34 and cutouts 36, 38 include features for securing the injectables. Here, the receiving slot 34 is shaped as an hourglass because this shape holds a plunger handle in a particular position while allowing easy access. Those skilled in the art will understand that receiving slot 34, as a means for securing an injectable, may be configured in various shapes, depending on the injectable and ease or complexity of access desired. For example, a receiving slot 34 in the shape of a “J,” “L,” “G,” and “H” all provide varying levels of security and access for the injectable. In addition, the means for securing may comprise inserts of different materials, such as plastic or rubber yokes, to further secure or removably lock the injectables in position.

Similarly, here apertures 36, 38 are shaped as an “X” and as an oval because these shapes can hold a bare needle, capped needle, or the neck of a vial in a particular position while allowing easy access. Those skilled in the art will understand that apertures 36, 38, as a means for securing an injectable, may be configured in various shapes depending on the injectable and ease or complexity of access desired. For example, an injectable comprising a plunger handle, barrel, and needle may be stored by placing the plunger handle in receiving slot 34 and the needle in the aperture 36, 38 located in the opposite inside sidewall panel 30, with the barrel spanning the space in between. In this manner the plunger of a pre-filled injectable is protected from inadvertent pressure, and the user is protected from inadvertent contact with the needle.

FIG. 3 shows an alternative embodiment of an inner card 100 for receiving and holding injectables, according to the present invention. The illustrated inner card 100 includes an internal slide 102 that comprises a base panel 104, spine panel 106, and top panel 108. Here, rather than using paperboard to monolithically form the inner tray and slide card as described above, the inner tray 110 is thermoformed separately and then affixed to the slide card 102. The inner tray 110 comprises a means for securing and holding injectables, such as the plunger 112 in the plunger-receiving recess 114 and the barrel 116 in the barrel-receiving recess 118. The recesses 114, 118 may be configured to lock in or otherwise secure the injectable by including a means for resisting removal of the injectable, such as fold-over locking tabs, indentions, or inserts. Accordingly, a means for holding and storing a drug delivery device includes a tray constructed in a variety of ways.

Here the inner tray 110 is also configured to allow for easy access to the injectables. By way of illustration and not limitation the injectables are arranged alternately so that the end user, who may have limited physical mobility such as that resulting from arthritis, can retrieve one injectable without affecting another. As illustrated, purposefully orientating the widest portion of the injectable, in this example the finger guard 120, to take the most space to provide the greatest accessibility is a desirable feature of this embodiment. Such horizontal orientating also provides easy viewing of the products so the user may easily distinguish between them. Further, such orientating provides ample area to receive graphics. Patient and healthcare provider information, such as dose compliance, can be made easily visible to the user.

The embodiment of FIG. 3 further includes tab 122 which may function as a means for locking and/or as a means for stopping, like the locking tab 40 and stopping tab 42 described herein.

Turning now to FIGS. 4 and 5, there is shown an outer sleeve 200, for receiving an inner card 12, 100 and the related outer sleeve blank 202. As best shown in FIG. 4, the illustrated blank 202 includes side panels 204, 206, 208, spine panels 210, end panels 216, 218, and extension panels 220.

With regard to assembly, the blank 202 is folded and connected, using conventional techniques, to create the outer sleeve 200, best shown in FIG. 5 as a slip case. One sequence of folding and connecting the blank 202 is as follows, with reference to the visible side of the illustrated blank 202 as the face and the opposite side as the back: Side panel 204 is folded along fold lines 24 under the side panels 206, 208 and positioned over panel 208 so that the back of panel 204 may be affixed to the face of panel 208. In this embodiment, panel 204 is overlaid and affixed to panel 208 so that the cutout 222 of panel 208 surrounds the release button 224. In other words, the release button 224 is unobstructed by panel 208.

Tabs 226 are folded inwardly to create a closed endwall, such that the backs of tabs 226 are orientated toward the interior case created by the side panels 204, 206 and spine panels 210. End panels 216, 218 are then folded inwardly so that the face of tabs 226 may be affixed to the back of panel 216 and the face of panel 216 may be affixed to the back of panel 218, to complete the closed endwall.

In addition, extension panels 222 are folded inwardly so that the back of panels 222 may be affixed to the backs of respectively adjacent side panels 206, 208. Similarly, extension tabs 228 are folded inwardly so that the backs of tab 228 may be affixed to the respectively adjacent spine panels 210. The folding of panels 220 form finger-access areas at the cutouts 230.

Generally speaking, injectables are placed within inner tray 12, 100 and then the inner tray 12, 100 is inserted into outer sleeve 200. The apparatus holds and protects the injectables until they are retrieved for use. In practice, and with reference to FIGS. 1 and 2, injectables are placed within the inner tray 12 and then several panels or tabs are folded before the internal card and inner tray 12 is inserted into the outer sleeve 200. For purposes of teaching and not limitation, the following folding sequence is described. Top panel 20 is folded so as to cover the injectables and orientate the spine support panel 22 so as to provide support for the spine 16. In the illustrated embodiment, the back of top panel 20 is now adjacent to the injectables and panel 22 is now substantially parallel to panel 16. Further, locking tab 40 is folded outwardly, so that the back of tab 40 is close to or touching the back of base panel 14 and stopping tabs 42 are folded outwardly so that the backs of tabs 42 are close to or touching the back of the respectively adjacent sidewall panel 26.

With the internal card and inner tray 12 loaded with injectables and folded as described immediately above, the tray 12 is inserted, starting with the edge comprising the tabs 40, 42 and with tab 40 receivingly aligned with the catch formed by cutout 222 and release button 224 into the void of outer sleeve 200. The internal card and inner tray 12 is fully inserted into the outer sleeve 200, to a fully closed position. As understood by those skilled in the art, the spring tension created by the outwardly folded tabs 40, 42 causes the leading edge of the tabs 40, 42 to press against the interior side of the panels 204, 208, 210. The position of the tab 40 provides a
locking feature and the tab(s) 42 provide a stopping feature. For purposes of teaching and not limitation, the locking feature is described with regard to tab 40, and the stopping feature is described with regard to tab 42. It will be understood that either tabs 40 or 42 could interchangeably perform either the locking or stopping features.

[0039] In this illustration the locking feature includes the catch formed by the cutout 222, the release button 224 and cooperatively interlocking tab 40. The spring tension created by the compressed tab 40 causes the leading edge of tab 40 to engage the internal edge 240 of the panel 208. With the tab 40 and leading edge 240 engaged, the inner tray 12 is locked and cannot be opened. This means for locking creates a child-resistant feature. To unlock the child-resistant feature of this embodiment and thereby open the tray 12, the user depresses the release button 224, created by the cut 23, which in turn depresses the tab 40 to disengage the leading edge of the tab 40 from the internal edge 240. It will be understood that another means for locking may be created by placing one or more release buttons in panel(s) 210 to releasably engage tab(s) 42.

[0040] After releasing the option locking feature, the inner card 12 may be pulled out, until the stopping tabs 42 engage the extension tabs 228, to a fully open position. As will be understood by those skilled in the art, the spring tension created by the compressed tabs 42 causes the leading edge of the tabs 42 to engage the tabs 228. Once engaged, the tray 12 cannot be further removed from the outer sleeve 200 but may be reinserted to a fully closed position if desired. In this manner, tabs 42, 228 act as a stopping device to prevent inner card 12 from being pulled completely out of outer sleeve 100. It will be understood that another means for stopping can be created by allowing tab 40 to engage extension tabs 220.

[0041] The user may open and close the apparatus by withdrawing and replacing the inner tray 12 within the outer sleeve 200 as often as desired. In the fully open position, the user may fold back the top panel 20 to access an injectable. After accessing the desired injectable, the user replaces the top panel 20 and reinserts the inner tray 12 within the outer sleeve 200 for future use.

[0042] Alternatively, an embodiment designed to be disposed of, together with used injectables, may be placed within a red plastic bag (not shown but provided with the embodiment) thereby giving notice of the contents. By way of illustration and not limitation, additional means for protecting and sealing an embodiment to be disposed of, together with used injectables, include sealable bags, a self-sealing outer sleeve, a sealable outer sleeve large enough to receive the inner tray 12 and outer sleeve 200. Similarly, taping the inner tray 12 within the outer sleeve 200 with red tape giving notice of the contents is a means for protecting and sealing.

[0043] With regard to the materials of construction, the illustrated embodiments comprise cardboard as a substrate for blanks 10, 202, which is typically constructed from a sheet of bleached sulphate, solid bleached sulphate, or clay-coated kraft. Compositonally the cardboard coating is a fluidized blend of materials, such as coating clay, calcium carbonate, and/or titanium dioxide, with starch or adhesive that is smoothly applied to the traveling surface. Successive densification and polishing finish the mineral-coated surface to a superior, graphic-print surface. Other embodiments may comprise vacuum-formed plastic or paper, press-formed paperboard, cardboard, or combinations thereof.

[0044] It must be emphasized that the law does not require and it is economically prohibitive to illustrate and teach every possible embodiment of the present claims. Hence, the above-described embodiments are merely exemplary illustrations of implementations set forth for a clear understanding of the principles of the invention. Variations, modifications, and combinations may be made to the above-described embodiments without departing from the scope of the claims. All such variations, modifications, and combinations are included herein by the scope of this disclosure and the following claims.

We claim:

1. A package for holding articles, comprising:
   a. a slide card (102) comprising:
      a. a base panel (104) configured to mount an article receiving tray; and
      b. a first tab (122) hingedly connected to the base panel or tray, and configured to engage a catch associated with an outer sleeve;
   an article receiving tray (110) mounted on the base panel;
   an outer sleeve (200) comprising:
      a. a first panel (204);
      b. a second panel (206) opposite the first panel;
      c. opposite sidewall panels (210) connected to the first and second panels and
      d. an end wall (216, 218) connected to the panels or the sidewalls;
   wherein the panels and walls define a void that includes a catch (222) configured to receive and releasably engage the slide card and tray.

2. The package of claim 1, wherein the outer sleeve further includes a release (224) configured to disengage the catch.

3. The package of claim 1, wherein the tray further comprises at least one article securing element (114, 118).

4. The package of claim 1, further comprising a spine panel (106) hingedly connected to the base panel or the tray.

5. The package of claim 4, further comprising a top cover (108) hingedly connected to the spine cover and configured to cover at least a portion of the tray.

6. A blank for forming an integrated slide card and tray, comprising:
   a. a base panel (14);
   b. a first extension panel (25) hingedly connected to the base panel along a first side;
   c. a second extension panel (25) hingedly connected to the base panel along a second side; and
   d. a first tab (40) hingedly connected to the base panel along a third side;
   wherein the extension panels are folded and connected to form the sidewalls of a slideable tray configured to insert within an outer sleeve (200), and the first tab is configured to engage a catch (222) associated with the outer sleeve.

7. The blank of claim 6, further comprising a spine panel (16) hingedly connected to the base panel and to a first cover panel (18).

8. The blank of claim 7, wherein the first cover panel is hingedly connected to a second cover panel (20) that comprises a spine support panel (22).

9. The blank of claim 6, where each extension panel further comprises:
   a. an outside sidewall panel (26);
   b. a top panel (28);
   c. an inside sidewall panel (30); and
   d. a securing panel (32);
wherein the top and sidewall panels are folded and the securing panel is secured to the base panel to form an open-channel sidewall.

10. The blank of claim 9, wherein the open-channel sidewall further includes at least one article receiving element (36, 38).

11. The blank of claim 9, wherein the open-channel sidewall further comprises a second tab (42) configured to engage a catch associated with the outer sleeve.

12. A carton blank for forming an outer sleeve, comprising:
   a first sleeve panel (204), including a release (224) at a first location, hingedly connected to a first sidewall panel (210);
   a second sleeve (206) hingedly connected to the first sidewall panel and a second sidewall panel (210);
   a third sleeve panel (208), including a cutout section (222) that extends to include the first location, hingedly connected to the second sidewall; and,
   at least one end wall panel (216, 218) hingedly connected to one of the sleeve panels;

therein the panels are folded and connected to form the outer sleeve (200) having a top side, an opposite bottom side, opposite sidewall panels, an end wall that defines a void, and a catch (240) defined by the cutout section, all configured to receive and releasably engage a slide card and tray (12, 100).

13. The carton blank of claim 12 wherein at least one of the sidewall panels include a tab (220), hingedly connected to the end opposite the end wall.

14. The carton blank of claim 13 wherein the tab is positioned within the void to form a catch that engages with either the slide card or tray.

15. The carton blank of claim 12 wherein at least one of the sleeve panels include an extension panel (220), hingedly connected to the end opposite the end wall.

16. The carton blank of claim 15 wherein the extension panel is positioned within the void to form a catch that engages with either the slide card or tray.

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