This invention is a tamper proof, child-resistant liquid dispensing container for single hand operation of unitized construction consisting of a top cap, a canister and a bottom cap. When operated, a prescribed amount of liquid contained in the canister is made to squirt out of the nozzle in response to the button located in the bottom cap being pressed.
Figure 1 A view of the complete invention.
Figure 2a An exploded view of the invention showing the complete Top Cap Assembly (10).
Figure 2b An exploded view of the invention showing the complete Bottom Cap Assembly (16).
Figure 3 A view of the invention showing the Canister(14) and its connection point detail.
Figure 4a A view of the invention showing the push to release child resistant Top Cap, closed.

Figure 4b A view of the invention showing the push to release child resistant Top Cap, opened.
Figure 5 A view of the invention showing the Bottom Cap.

Figure 6 A view of the invention showing the Bottom Cap Retainer.
Figure 7 A view of the invention showing the Button.

Figure 8 A view of the invention showing the Nozzle.
Figure 9 A view of the invention showing the Logo/Color Badge.

Figure 10a A view of the invention showing the Large O-ring set.
Figure 10b A view of the invention showing the Small O-ring.

Figure 10c A view of the invention showing the Seal Disk.
Figure 11 A view of the invention showing the Spring.
TEMPER PROOF CHILD-RESISTANT LIQUID DISPENSING CONTAINER FOR SINGLE HAND OPERATION

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] None

STATEMENT REGARDING FEDERAL SPONSORED R & D

[0002] None

REFERENCE TO A "MICROFICHE APPENDIX"

[0003] None

BACKGROUND OF THE INVENTION

Field of the Invention

[0004] Electronic cigarettes are quickly becoming a popular alternative to traditional cigarettes. With far fewer chemicals in the vapor produced by an electronic cigarette than the smoke of its more traditional counterpart and fewer restrictions regarding its use, their popularity is growing at a staggering rate.

[0005] The electronic cigarette acts as an inhaler that vaporizes a liquid solution, commonly known as an e-liquid, into an aerosol mist. This simulates the act of smoking when inhaled. This aerosol mist may appear to be smoke but is in fact just vapor. This means that the electronic cigarette can be enjoyed in many public areas.

[0006] It is common to customize the electronic cigarette sensation by using various liquids, often called e-liquids or juice. E-liquids are available in a wide range of different flavors, chemicals and strengths allowing the vapor to create different vaping experiences.

[0007] Of the various e-liquids available, many contain substances dangerous to children such as nicotine, Marijuana, or other toxic chemicals. Even though less than 3% of the public use e-cigarettes, they account for over 20% of poison center calls involving children under 5 years old according to the US Centers for Disease Control. E-cigarettes use is for adults, but the responsibility to protect children from their danger is up to the users. All containers holding e-cigarette components, including e-liquids, should include child-resistant closures.

[0008] Electronic cigarettes are made up of three major components: the battery, the atomizer, and the cartridge. The battery takes up a large portion of the unit and serves to power the electronic cigarette. The atomizer contains a heating coil which serves to vaporize liquid. It is usually set in the center of the electronic cigarette and consists of a wick which draws the liquid in. And finally, the cartridge serves as both the housing for the e-liquid and as the mouthpiece. The cartridge allows the passage of the liquid to the atomizer and subsequently the vapor from the atomizer to the user’s mouth. The cartridge is designed to stop any liquid from leaking into the mouth.

[0009] This product improves other similar products. It is easier to use because it may be used with one hand while the other hand holds the vaping device. It has a non-removable child-resistant lid and is tamper proof. The product is smaller and thinner that similar products on the market.

[0010] Extensive research does not reveal any liquid container and dispenser specifically designed for vaping and e-cigarette use that combines the safety of unit construction (non-refillable), child-resistant containment, and ease of use. The product described herein is new and novel, and advances the state of the art in this field.

DESCRIPTION OF RELATED ART

Review of Current Art

[0011] Commercial Products
[0012] Innokin Ucan V2.0 —Stainless Steel E-Liquid Flask
[0013] Innokin Technology Co., LTD
[0015] KangYiCheng Biotech Co. LTD
[0016] Issued Patents
[0017] U.S. Pat. No. 7,861,873 B1
[0018] Flip-Top Dispensing System With A Child Resistant Latch Mechanism
[0020] Bragg et al.
[0021] U.S. Pat. No. 5,328,058
[0022] Dropper Bottle Assembly With Squeeze Cap
[0023] Jul. 12, 1994
[0024] Leoncavallo et al.
[0025] U.S. Pat. No. 5,246,145
[0026] Liquid Dropper Spout Having Lockable Pivoted Closure Cap
[0027] Sep. 21, 1993
[0028] Leoncavallo et al.
[0031] Dispensing Package Having Non-Removable And Non-Rotatable Dispensing Closure
[0032] Nov. 22, 2005
[0033] Wing-Kwong Keung

DISCUSSION OF CURRENT ART

[0034] Innokin Ucan V2.0 literature describes a Stainless Steel E-Liquid Flask with a metal tip and a push button in the base to dispense liquid. Although specifically used for filling e-cigarettes with e-liquid, the flask does not include a child-resistant cap. The flask is not a sealed unit construction and therefore may be refilled thereby leaving its contents to be in question. Furthermore, the product is not easily used with one hand. Furthermore, the product is not easily used with one hand.

[0035] KangYiCheng KYC-C-K-5-55392 describes an e-liquid Refill Liquid Bottle with a metal tip and a pliable body that allows dispensing liquid. Although specifically used for filling e-cigarettes with e-liquid, the bottle does not include a child-resistant cap. The bottle is not a sealed unit construction and therefore may be refilled thereby leaving its contents to be in question. Furthermore, the product is not easily used with one hand.

[0036] Bragg et al. describes in U.S. Pat. No. 7,861,873 B1, a child resistant dispensing system having a flip-top closure. The flip-top closure has a push button positioned in the skirt of the flip-top lid wherein an opposed squeeze disengages the child resistant latch mechanism. The child resistant latch mechanism includes a latch projecting from...
the flip-top lid and engaging a projection of the closure body. The cap features a wide mouth and is more suitable for dispensing tablets or powders, and does not have a tip for filling e-cigarette cartridges. The container is not a sealed unit construction and therefore may be refilled thereby leaving its contents to be in question. Furthermore, the product is not easily used with one hand.

[0037] Leonecavallo et al. describes in U.S. Pat. No. 5,328,058 a dropper bottle assembly with a dispensing, an elongated dropper, and a cavity sized to receive the spout when closed. The cap is unlatched by squeezing the sides together. Although a dropper bottle, the cap is not claimed to be child-resistant. Furthermore, the cap is detachable from the bottle and thereby may be refilled.

[0038] Leonecavallo et al. describes in U.S. Pat. No. 5,246,145 a dropper bottle assembly with a dispensing, an elongated dropper, and a cavity sized to receive the spout when closed. The lock mechanism includes cooperating teeth and an index finger or a cooperating spring arm and a grip bar. The spout is sealed by a surface of the cap or a compliant mat on that surface, the latter being held in place by a rib within the cap. The cap is unlatched by squeezing the sides together. Although a dropper bottle, the cap is not claimed to be child-resistant.

[0039] Wing-Kwong Keung describes in published US Patent Application US2007/0114201 a dispensing package includes a container having a rather large diameter neck suitable for dispensing solid tablets or capsules, but not liquid. This patent describes a product that is not suitable for dispensing e-liquids for use in vaping or e-cigarettes. The product, although not easily disassembled, may be disassembled with effort and is not suitable for assurance that the label correctly identifies what is contained within.

SUMMARY OF THE INVENTION

Objectives and Advantages

[0040] The present invention provides a safe container of a unitized construction made of plastic or metal and whereby all components are a permanent part of the assembly, provides for child-resistant packaging suitable to carrying liquids and dispensing said liquids quickly and conveniently with the use of one hand. This container is particularly suitable for use by, but not limited to, filling the cartridge of an e-cigarette or similar device with e-liquid. The container is designed for a single use and cannot be refilled. When properly labeled, the container’s contents are clearly identified.

[0041] In the preferred embodiment, the central element is the liquid container holding up to, but not limited to, 30 mL of liquid to be dispensed. An elastomeric button is affixed to the bottom of the container whereby liquid may be forced through the tip and out of the container when the button is pressed. The tip is sealed by an integral child-resistant cap when liquid is not being dispensed.

[0042] Components are fabricated using injection molded FDA approved plastic with FDA approved elastomeric seals, and a stainless steel spring. All components are sealed with gaskets or O-rings, and joints are snapped together rather than depending on adhesives which are intrinsically less reliable.

[0043] In alternative embodiments, the components are fabricated from all FDA approved stainless steel or FDA approved glass with FDA approved elastomeric seals, and a stainless steel spring.

DESCRIPTION OF THE DRAWINGS

[0044] The details and many advantages provided by this invention will become clear and will be better understood by reviewing the following description and accompanying drawings.

List of Figures

[0045] FIG. 1 is a view of the complete invention.
[0046] FIG. 2a is an exploded view of the invention showing the complete Top Cap Assembly.
[0047] FIG. 2b is an exploded view of the invention showing the complete Bottom Cap Assembly.
[0048] FIG. 3 is a view of the invention showing the top of the Canister with detail of the connection point hub.
[0049] FIG. 4a is a view of the invention showing the push to release child resistant Top Cap, closed.
[0050] FIG. 4b is a view of the invention showing the push to release child resistant Top Cap, open.
[0051] FIG. 5 is a view of the invention showing the Bottom Cap.
[0052] FIG. 6 is a view of the invention showing the Bottom Cap Retainer.
[0053] FIG. 7 is a view of the invention showing the Button.
[0054] FIG. 8 is a view of the invention showing the Nozzle.
[0055] FIG. 9 is a view of the invention showing the Logo/Color Badge.
[0056] FIG. 10a is a view of the invention showing the Large O-ring set.
[0057] FIG. 10b is a view of the invention showing the Small O-ring.
[0058] FIG. 10c is a view of the invention showing the Seal Disk.
[0059] FIG. 11 is a view of the invention showing the Spring.

LIST OF COMPONENTS

[0060] 10 Top Cap Assembly
[0061] 14 Canister
[0062] 16 Bottom Cap Assembly
[0063] 21 Top Cap
[0064] 22 Nozzle
[0065] 23 Logo/Color Badge
[0066] 24 Seal Disk
[0067] 25 Bottom Cap
[0068] 26 Button
[0069] 27 Spring
[0070] 28 Button Retainer
[0071] 29 Small O-ring
[0072] 30 Large O-ring
[0073] 31 Side
[0074] 33 Small O-ring Groove
[0075] 35 Non-spin Rib
[0076] 37 Hole
[0077] 41 Living Hinge
[0078] 43 Child-resistant Latch
[0079] 45 Seal Disk Cutout
The present invention provides a canister or bottle or container, hereinafter called canister, with an integral child-resistant cap for dispensing liquid and a button to force a prescribed amount of liquid each time the button is pushed. As described in the present invention, all components except the O-rings, the button and the spring are injection molded plastic. The container may also be made of metal, glass or any material suitable for contact with food, whereby all components are a permanent part of the sealed assembly and not intended for reuse.

FIG. 1 shows the unitized assembly of the invention consisting of a Canister (14), on top of which a Top Cap Assembly (10) is affixed and below which a Bottom Cap Assembly (16) is affixed.

As shown in FIG. 2a, the Top Cap Assembly (21) consists of a Nozzle (22), a Logo/Color Badge (23), a Seal Disk (24), and a single Small O-ring (29). The Logo/Color Badge (23) snaps into the Top Cap (21) and through the use of various colors is used to identify the canister's contents. Below the Logo/Color Badge (23), the Seal Disk (24) sits in a recessed cutout and is held in place by the Logo/Color Badge (23).

On the underside of the Top Cap (21), the Nozzle (22) is permanently snapped into place. A single Small O-ring (29) is inserted in the cutout on the bottom of the Nozzle (22) and used to provide a leak tight seal between the Top Cap Assembly (21) to the Canister (14).

As shown in FIG. 2b, the Bottom Cap Assembly (21) consists of a Bottom Cap (25), a Button (26), a Spring (27), and a Button Retainer (28) and two Large O-rings (30). The Button (26) and Spring (27) are placed in the Bottom Cap (25) as shown. The Button Retainer (28) is placed over the Button (26) and Spring (27), thereby compressing the Spring (27), and is snapped into the Bottom Cap (25). Two Large O-rings (30) seal the Bottom Cap (25) to the Canister (14) when the Bottom Cap (25) is snapped into the bottom of the Canister (14). The Spring (27) is used to assist the Button (26) returning to its original shape, allowing it to be pressed again and squirl a known volume of liquid each time.

The Canister (14) is shown in FIG. 3. It is made of FDA approved injection molded plastic and shows in detail a hub on top of the Canister (14) where the connection is made to the Top Cap (21). The Side (31) of the cylindrical shaped Canister (14) is clear to allow placement of graphics and labels. The hub has a Small O-ring Grove (33) to seal the connection, and a Non-Spin Rib (35) to keep the Top Cap (21) aligned with the graphics and labels. The Hole (37) in the top of the hub allows liquid to flow from the Canister (14) to the Nozzle (22) located in the Top Cap (21).

The Top Cap (21) is shown in FIG. 4 in both a closed view and an open view. It is made of FDA approved injection molded plastic. Shown are the Living Hinge (41) and the push to release, adjustable Child-Resistant Latch (43). The Seal Cutout (45) is shown on the underside of the lid and receives the Seal Disk (24) and the Logo/Color Badge Cutout (47) is shown on the top side of the lid and receives the Logo/Color Badge (23).

FIG. 5 details the Bottom Cap (25) showing the two Large O-ring Groves (51) that seal the Bottom Cap (25) to the Canister (14), and the Locking Tabs (53) that lock the Bottom Cap (25) into the Canister (14) and prevent it from turning. It is made of FDA approved injection molded plastic. The Bottom Cap (25) snaps into the bottom of the Canister (14) and is not removable. The Button (26) slips into the center of the Bottom Cap (25).

The Button Retainer (28), FIG. 6, snaps into the Bottom Cap (25) and holds the Button (26) in place. It is made of FDA approved injection molded plastic. The Button (26) creates a seal between the retainer and the Bottom Cap (25) when both are snapped into the Canister (14). The Spring (27) is placed inside the Button (26) before the Bottom Cap Assembly (16) is snapped into the bottom cap and is not meant to be disassembled.

FIG. 7 shows the Button (26) made of FDA approved elastomeric material such as rubber.

When pressed, the Button (26) forces an amount of liquid through the tip. The Spring (27) helps the button to return to its original shape when released.

The Nozzle (22) is shown in FIG. 8. The Nozzle (22) is made of FDA approved injection molded plastic and is snapped into the Top Cap (21) and directs the liquid out of the Canister (14) and into the receiving device. The Nozzle (22) and Top Cap (21) assembly are not meant to be disassembled.

The Logo/Color Badge (23) is shown in FIG. 9. The Logo/Color Badge (23) is made of FDA approved injection molded plastic and snaps into the Top Cap (21) and may be used to identify the product, date, lot, expiration, manufacturer, contents, etc. The Logo/Color Badge (23) is used to hold the Seal Disk (24) in place. The Logo/Color Badge (23) is not meant to be disassembled.

FIG. 10a shows the Large O-rings (30) which are made of FDA approved elastomeric material such as rubber and are used to seal the Bottom Cap (25) to the Canister (14).

FIG. 10b shows the Small O-ring (29) which is made of FDA approved elastomeric material such as rubber and is used to seal the Top Cap (21) to the Canister (14).

FIG. 10c shows the Seal Disk (24) which is made of FDA approved elastomeric material such as rubber and is used to seal the Nozzle (22) and prevent spillage when the Top Cap (21) is closed.

FIG. 11 shows the Spring (27) which is made of FDA approved stainless steel and is used to return the Button (26) to its normal position after being pressed.

What is claimed is:

1. A Tamper Proof, Child-Resistant Liquid Dispensing Container For Single Hand Operation consisting of:
   a. top cap assembly, a container, and a bottom cap assembly; said top cap assembly consisting of a top surface having a round cutout for receiving the tip seal and the badge/logo, a upper inner surface and a lower inner surface, an outer surface having a child-resistant lock that is adjustable and a unit hinge, and a bottom surface having a round cutout for receiving a nozzle: said nozzle consisting of a top surface having a drip tip, an outer surface having tabs for attaching, and a bottom surface having a round cutout for receiving a small O-ring;
   b. a container consisting of a top surface, an inner cavity, an inner surface, and an outer surface; said top surface having a round extension protruding upward from the
surface having an outer surface and a top surface; said outer surface have a perimeter groove around the surface for receiving the small O-ring and non-spin ribs preventing the top cap assembly from rotating with respect to the container; said top surface have a hole to allow liquid to pass from the inner cavity to the nozzle; said outer surface for receiving labeling and identification; said inner surface having a perimeter groove for receiving tabs;

a bottom cap assembly consisting of a top surface, an outer surface and a bottom surface; said top surface having a round cutout for receiving a button, a spring, and a retainer; said retainer having a top surface, an outer surface and a bottom surface; said top surface having a hole for liquid transfer; said outer surface having tabs for attaching; said bottom surface being flat for receiving the button; said outer surface having perimeter groves for receiving two large O-rings, tabs for attaching, and tabs for locking; and said bottom surface having a round cutout providing access for pushing said button.

2. The Liquid Dispensing Container as set forth in claim 1 wherein said top cap assembly includes a small light that is activated by said button.

3. The Liquid Dispensing Container as set forth in claim 1 wherein said bottom cap assembly includes a metering check valve.

4. The Liquid Dispensing Container as set forth in claim 1 wherein said top cap assembly is detachable from said container.

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