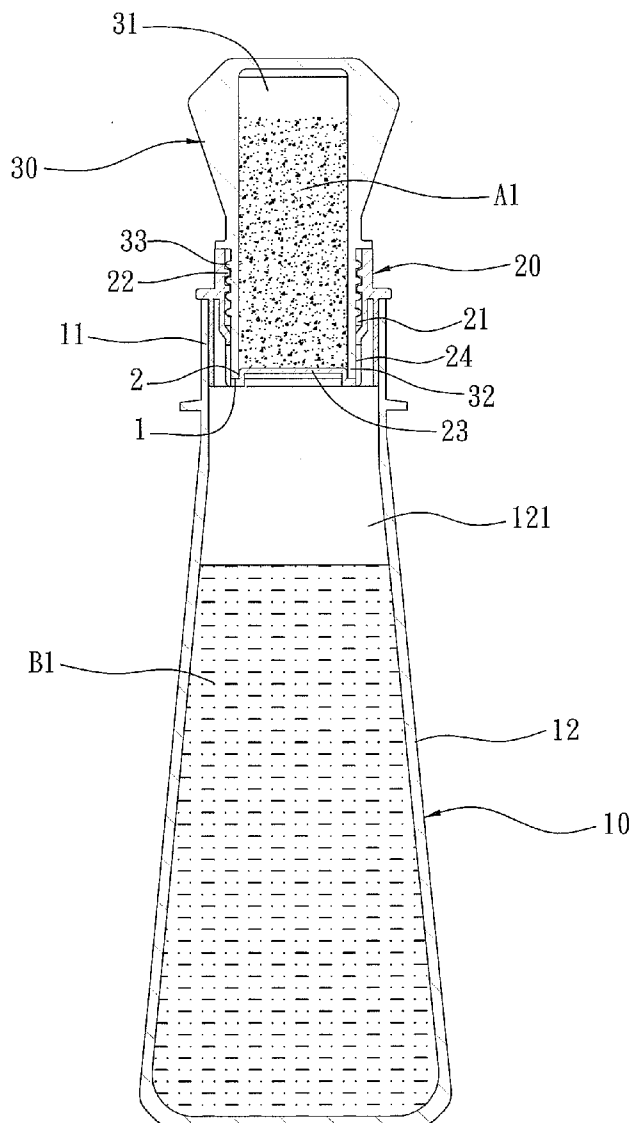




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(19) **United States**(12) **Patent Application Publication**
Chen(10) **Pub. No.: US 2014/0110281 A1**(43) **Pub. Date: Apr. 24, 2014**(54) **CAP ASSEMBLY RELEASING DOSE UPON
OPENING AND A CONTAINER INCLUDING
THE SAME**(52) **U.S. Cl.**
USPC 206/219(57) **ABSTRACT**

A cap assembly releasing dose upon opening is mounted to a bottle to perform a container with two doses mixing upon opening. The cap assembly comprises a collar and a cap. The collar has an engaging recess, an inner threaded section defined at an opening of the engaging recess, a sealing surface defined at a bottom of the engaging recess, and multiple passages formed between the sealing surface and the inner threaded. The cap has a filling space, a cap opening communicated with the filling space to combine with the sealing surface, and an outer threaded section defined on an outer periphery of the cap opening to engage with the inner threaded section of the collar. Because the cap assembly has a simple structure, the cap assembly with the container is fully assembled by automatic operation to be made store two doses in a cost-effective way.

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B65D 25/08 (2006.01)

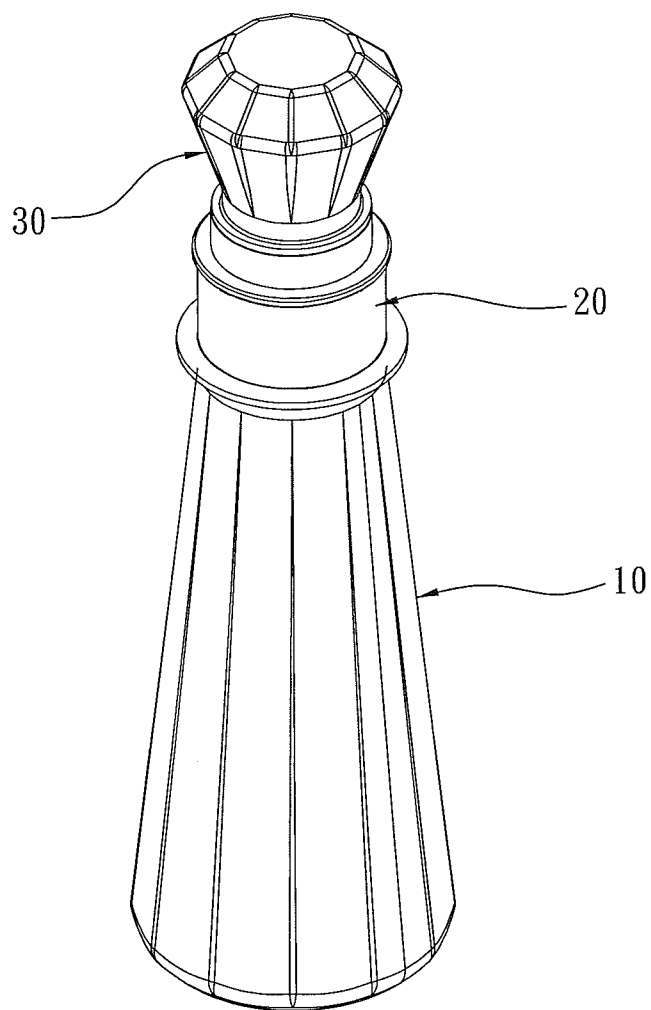


FIG. 1

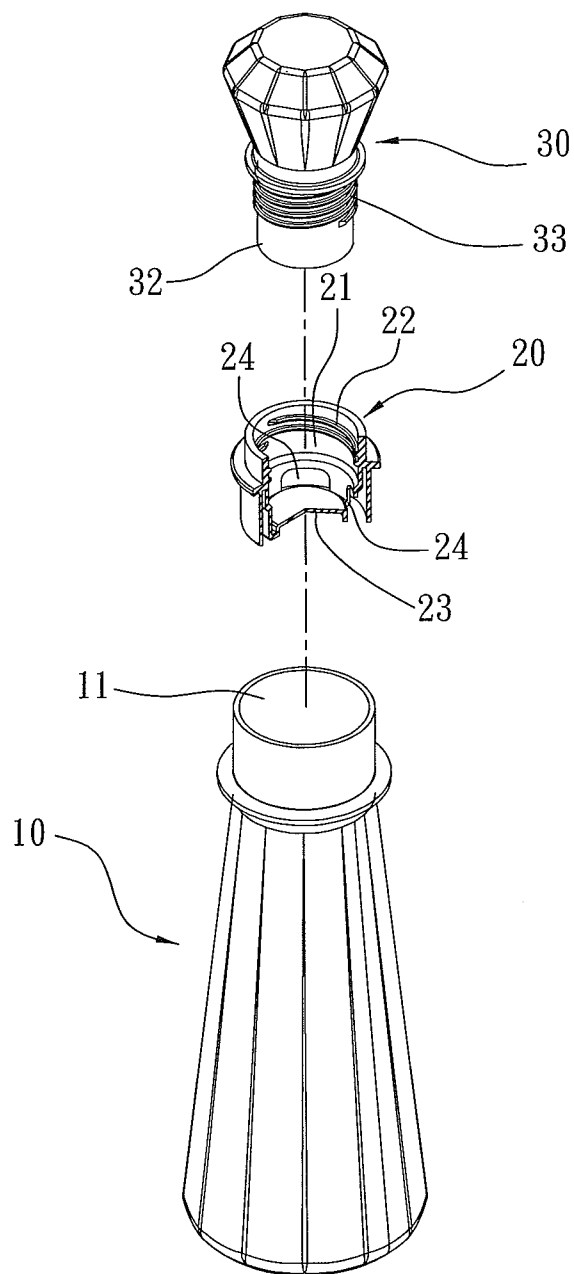


FIG. 2

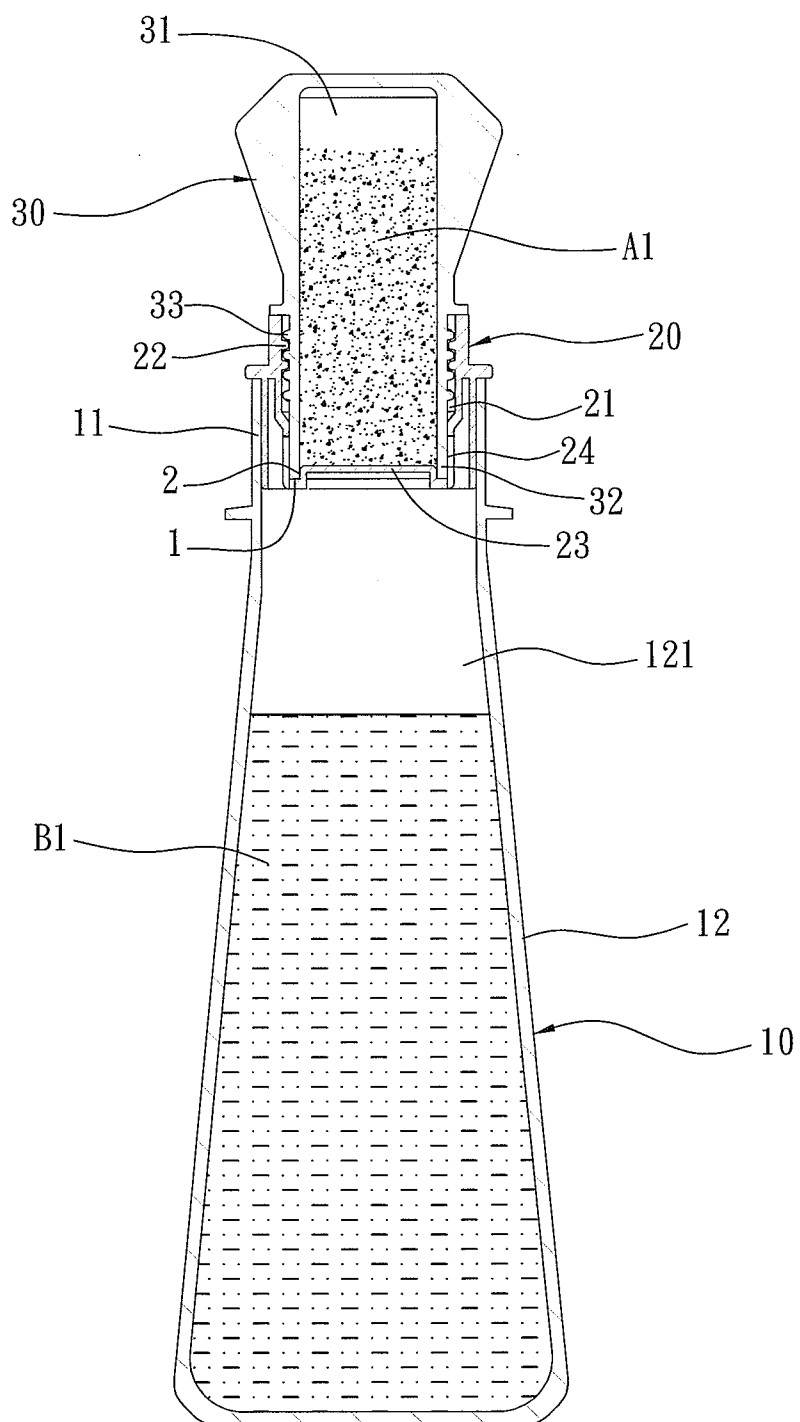


FIG. 3

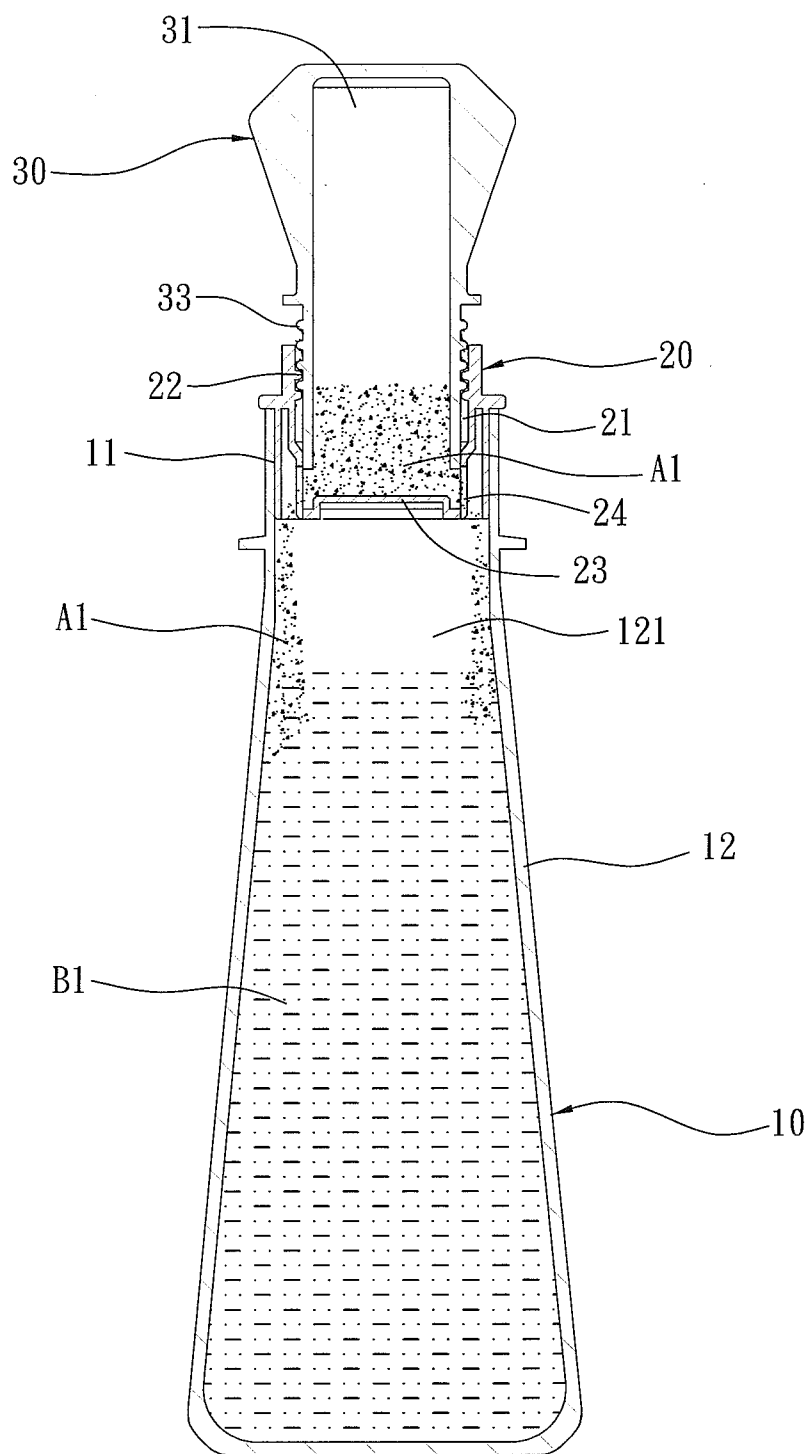


FIG. 4

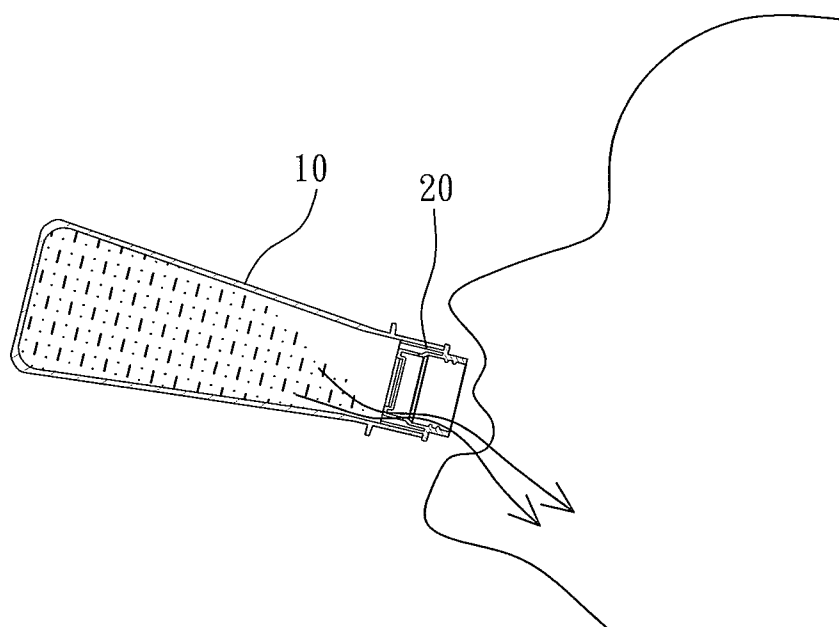


FIG. 5

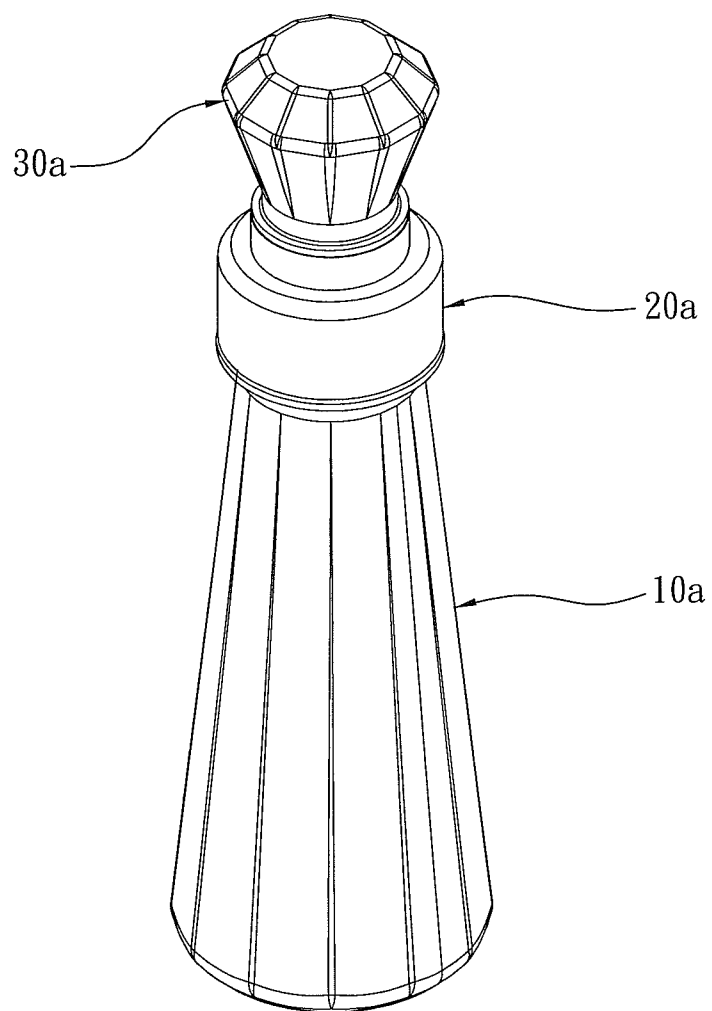


FIG. 6

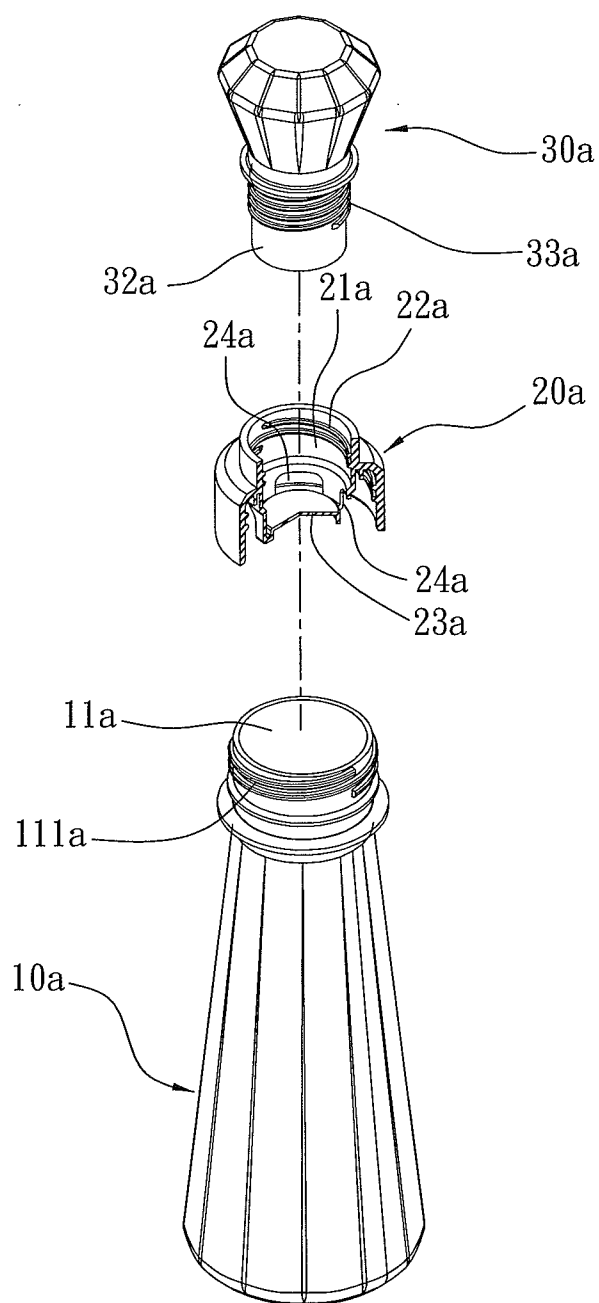


FIG. 7

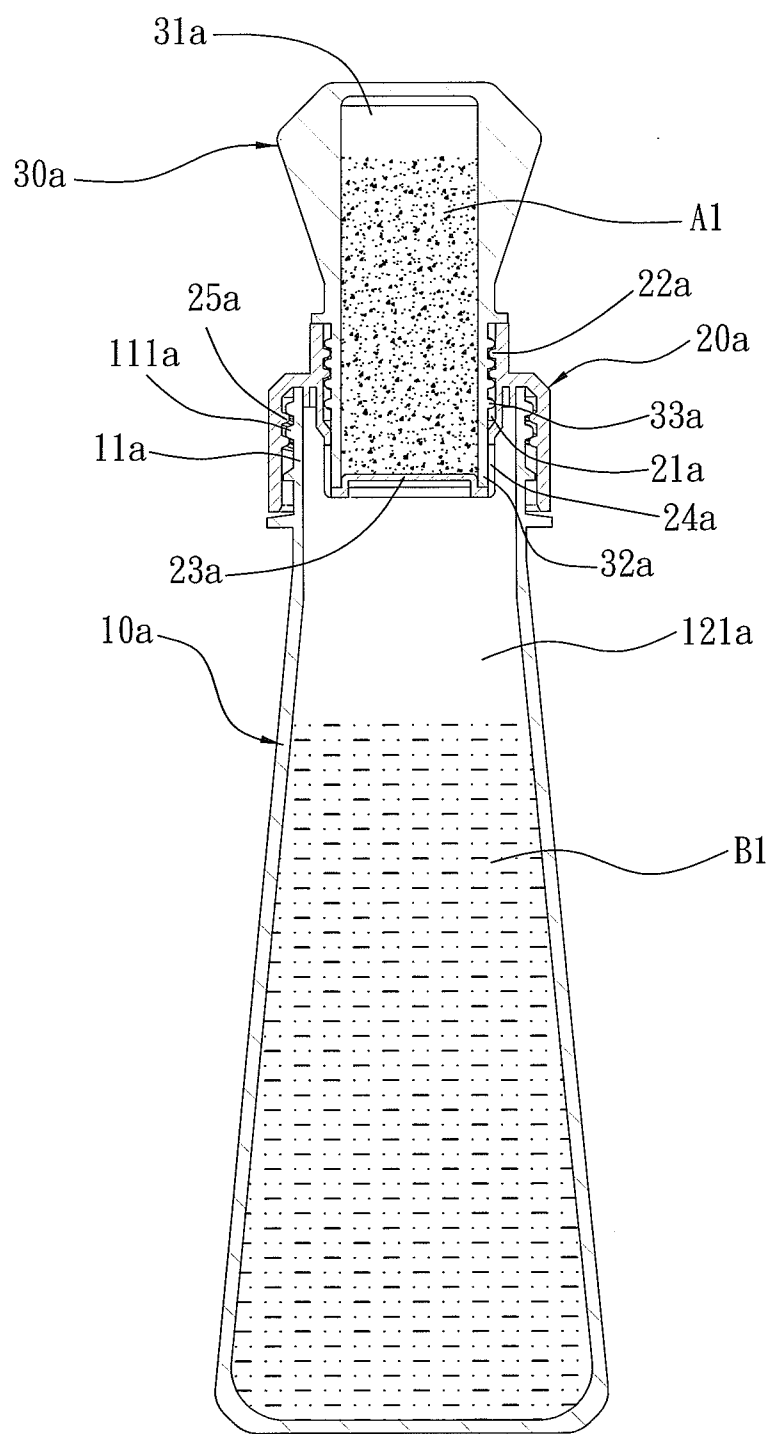


FIG. 8

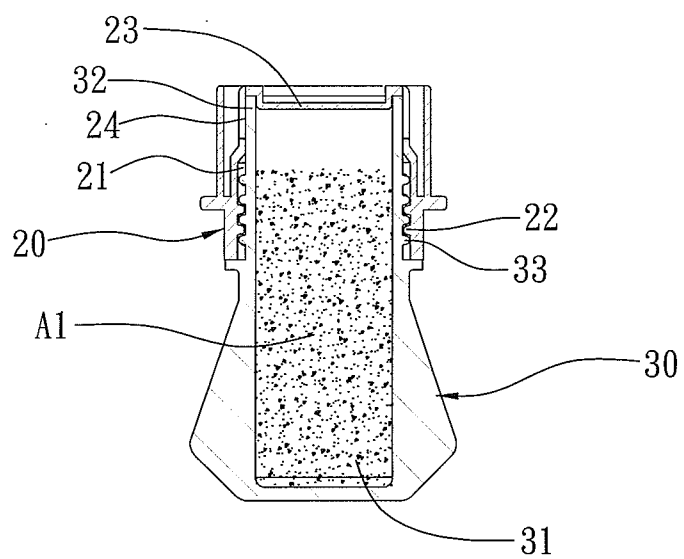


FIG. 9

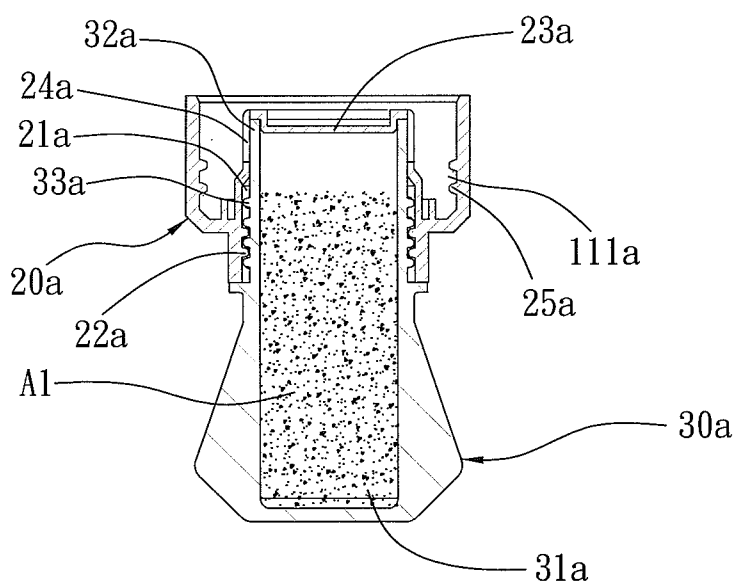


FIG. 10

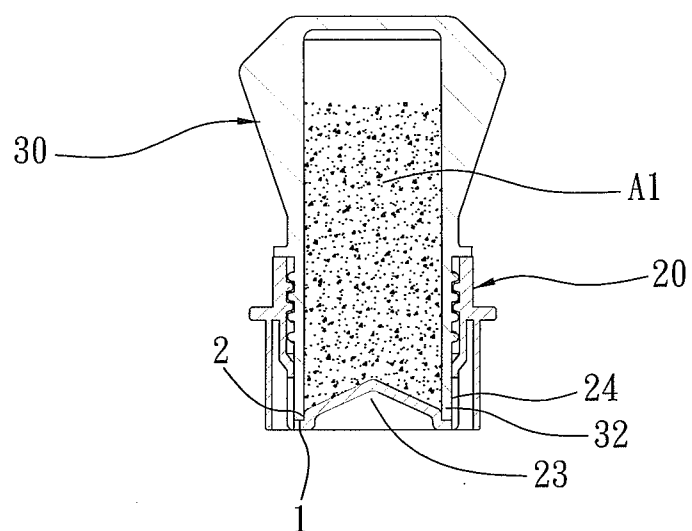


FIG. 11

CAP ASSEMBLY RELEASING DOSE UPON OPENING AND A CONTAINER INCLUDING THE SAME

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a cap assembly and a container including the cap assembly to store two doses separately and mixing the two doses upon opening, and more particularly to have a structure design to achieve the mixing upon opening.

[0003] 2. Description of Related Art

[0004] Beverages or medicine doses available on the market are mostly premixed for sale, chemical additives such as clouding agents, emulsifiers or anti-oxidants are added into the beverages or medicine doses to extend the expiration date to avoid degradation, flavor change or oil precipitation. However, the chemical additives may cause health problem to human body if people constantly take them for long duration.

[0005] To avoid the premixing by using the clouding agents, emulsifiers, or other chemical additives, many containers or bottles are designed to make the ingredients to mix with solvent before drinking to keep the beverages or medicine doses fresh.

[0006] However, the conventional containers or bottles to mix before drinking usually have high costs in molds casting, shaping by injection molding, and material and have multiple components with complicated structures so that the assembly of conventional containers and bottles is troublesome and the components thereof are unrecyclable or not to reused. Moreover, the beverages or medicine doses packaged in each type of conventional containers and bottles have the same drawback that it cannot be fully manufactured by automatic mass production but only by hand-made or semi-automatic system, therefore, production efficiency cannot be improved and processing cost is high. Because of the aforementioned drawbacks, the beverages or medicine doses packaged in each type of conventional containers and bottles are not cost-effective in production and thus have high prices.

SUMMARY OF THE INVENTION

[0007] A main objective of the present invention is to provide a cap assembly for a container, which has a simple structure to keep the manufacturing process quick and low-cost.

[0008] Another main objective of the present invention is to provide a container including the cap assembly to make two doses mixed upon opening, wherein the cap assembly contains a first dose (solute) in air-tight environment and can be sold separately without other components and can be reused.

[0009] Further main objective of the present invention is to provide a container including the cap assembly releasing dose upon opening, which is fully manufactured and processed by automatic systems to fill in the doses in hygiene environment for mass production.

[0010] To achieve the foregoing objectives, the cap assembly releasing dose upon opening comprises:

[0011] a collar adapted to mount on a bottle and having

[0012] an engaging recess inside the collar;

[0013] an inner threaded section defined at an opening of the engaging recess;

[0014] a sealing surface defined at a bottom of the engaging recess; and

[0015] at least one passage formed between the sealing surface and the inner threaded section to communicate with the bottle; and

[0016] a cap for accommodation of a dose and having:

[0017] a filling space inside the cap;

[0018] a cap opening communicated with the filling space to engage with the sealing surface of the collar; and

[0019] an outer threaded section defined on an outer periphery of the cap opening to engage with the inner threaded section of the collar so that the cap opening is completely sealed by the sealing surface to block the at least one passage of the engaging recess so that the dose is stored in the filling space.

[0020] To achieve the foregoing objectives, the container including the cap assembly releasing dose upon opening comprises:

[0021] a bottle for accommodation of a second dose;

[0022] a collar mounted on the bottle and having

[0023] an engaging recess inside the collar;

[0024] an inner threaded section defined at an opening of the engaging recess;

[0025] a sealing surface defined at a bottom of the engaging recess; and

[0026] at least one passage formed between the sealing surface and the inner threaded section to communicate with the bottle; and

[0027] a cap for accommodation of a first dose and having:

[0028] a filling space inside the cap;

[0029] a cap opening communicated with the filling space to engage with the sealing surface of the collar; and

[0030] an outer threaded section defined on an outer periphery of the cap opening to engage with the inner threaded section of the collar so that the cap opening is completely sealed by the sealing surface to block the passage of the engaging recess to the accommodating space so that the first dose is stored in the filling space.

[0031] Further benefits and advantages of the present invention will become apparent after a careful reading of the detailed description with appropriate reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] FIG. 1 is a perspective view of one embodiment of a container with two doses mixing upon opening in accordance with the present invention, which includes a cap assembly releasing dose upon opening;

[0033] FIG. 2 is an exploded perspective view of the container with two doses mixing upon opening in FIG. 1;

[0034] FIG. 3 is a cross-sectional side view of the container with two doses mixing upon opening in FIG. 1;

[0035] FIG. 4 is an operational cross-sectional side view of the container with two doses mixing upon opening in FIG. 1;

[0036] FIG. 5 is another operational cross-sectional side view of the container, wherein a user drinks the mixture liquid in the container;

[0037] FIG. 6 is a perspective view of the other embodiment of a container with two doses mixing upon opening in accordance with the present invention, which includes a cap assembly releasing dose upon opening;

[0038] FIG. 7 is an exploded perspective view of the container with two doses mixing upon opening in FIG. 6;

[0039] FIG. 8 is a cross-sectional side view of the container with two doses mixing upon opening in FIG. 6;

[0040] FIG. 9 is a cross-sectional side view of one embodiment of a cap assembly in accordance the present invention;

[0041] FIG. 10 is a cross-sectional side view of another embodiment of a cap assembly in accordance the present invention; and

[0042] FIG. 11 is a cross-sectional side view of still another embodiment of a cap assembly in accordance the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0043] A cap assembly releasing dose upon opening in accordance with the present invention is mounted to a bottle to perform a container with two doses mixing upon opening. The cap assembly comprises a collar and a cap. The collar has an engaging recess, an inner threaded section defined at an opening of the engaging recess, a sealing surface defined at a bottom of the engaging recess, and multiple passages formed between the sealing surface and the inner threaded. The cap has a filling space, a cap opening communicated with the filling space to engage with the sealing surface, and an outer threaded section defined on an outer periphery of the cap opening to engage with the inner threaded section of the collar. Because the cap assembly has a simple structure, the cap assembly has following advantages such as low manufacturing cost of the molds, low shaping cost by injection molding, low manufacturing cost, and easy assembling process and fully assembled by automatic operation to be made in a cost-effective way.

[0044] As shown in FIGS. 1 to 3, a first preferred embodiment of a container with two doses mixing upon opening in accordance with the present invention comprises a bottle 10 and a cap assembly composed of a collar 20 and a cap 30.

[0045] The bottle 10 is provided for accommodation of a second dose B1 which is usually a liquid (solution) and has a bottle opening 11 and a body 12 with an accommodating space 121 to store the second dose B1 inside the accommodating space 121.

[0046] The collar 20 is engaged with the bottle opening 11 by wedging to replace the bottle opening 11 to further engage with the cap 30. The collar 20 has an engaging recess 21 and an inner threaded section 22 defined at an opening of the engaging recess 21. The engaging recess 21 has a sealing surface 23 defined at a bottom of the engaging recess 21 and has at least one or multiple passages 24 formed between the sealing surface 23 and the inner threaded section 22 (multiple passages 24 are preferred as shown in FIG. 2). When the collar 20 combines with the bottle opening 11, the engaging recess 21 communicates with the accommodating space 121 via the passages 24.

[0047] The cap 30 is provided for accommodation of a first dose A1 which is selectively liquid, granulates or powder (solute) and has a filling space 31 and a cap opening 32 communicated with the filling space 31 to engage with the sealing surface 23 of the collar 20. An outer threaded section 33 defined on an outer periphery of the cap opening 32 to engage with the inner threaded section 22 of the collar 20 so that the cap opening 32 is completely sealed by the sealing surface 23 to block the passages 24 of the engaging recess 21 to communicate to the accommodating space 121 so that the first dose A1 is stored in the filling space 31.

[0048] When the container is opened, as shown in FIG. 4, the cap 30 is rotated to make the outer threaded section 33 move oppositely to inner threaded section 22 and then move the cap 30 upward to make the sealing surface 23 disengage from the cap opening 32 so that the passages 24 are opened to allow the first dose A1 inside the filling space 31 dripping into the accommodating space 121 of the bottle 10. Thereby, the first dose A1 and the second dose B1 are mixed upon opening before drinking as shown in FIG. 5.

[0049] Regarding to loading of the second dose B1, the second dose B1 is directly injected into the accommodating space 121 via the bottle opening 11 of the bottle 10. The bottle opening 11 is selectively sealed by a membrane (not shown).

[0050] Regarding to loading of the first dose A1, the cap 30 is placed with the cap opening 32 upward to allow filling of the first dose A1 into the filling space 31 and then the collar 20 are engaged with the cap 30 by interlocking the inner threaded section 22 and the outer threaded section 33 to engage the cap opening 32 with the sealing surface 23 and thus block the passages 24 of the collar 20. Thereby, the first dose A1 is kept inside the filling space 31.

[0051] Because both bottle opening 11 and the cap opening 32 are wide open, the filling and injection of the first dose A1 and the second dose B1 are convenient and direct into the cap 30 and the bottle 10 respectively and suitable for automatic mass production in hygienic environment.

[0052] A second preferred embodiment of the container with two doses mixing upon opening is illustrated, as shown in FIGS. 6 to 8, the container comprises a bottle 10a, and a cap assembly composed of a collar 20a and a cap 30a.

[0053] The bottle 10a is provided for accommodation of a second dose B1 which is usually a liquid (solution) and has a bottle opening 11a and a body 12a with an accommodating space 121a to store the second dose B1 inside the accommodating space 121a. An outer locking section 111a is formed on an outer periphery of the bottle opening 11a.

[0054] The collar 20a is engaged with the bottle opening 11a to replace the bottle opening 11a to further engage with the cap 30a. The collar 20a has an engaging recess 21a and an inner threaded section 22a defined at an opening of the engaging recess 21a. The engaging recess 21a has a sealing surface 23a defined at a bottom of the engaging recess 21a and has at least one or multiple passages 24a formed between the sealing surface 23a and the inner threaded section 22a. The collar 20a has an inner locking section 25a on an outer periphery of the collar 20a to correspondingly engage with the outer locking section 111a of the bottle opening 11a. When the collar 20a combines with the bottle opening 11a, the inner locking section 25a locks to the outer locking section 111a to achieve sealing and fixing and meanwhile the engaging recess 21a communicates with the accommodating space 121a via the passages 24a.

[0055] The cap 30a is provided for accommodation of a first dose A1 which is selectively liquid, granulates or powder (solute) and has a filling space 31a and a cap opening 32a communicated with the filling space 31 to engage with the sealing surface 23a of the collar 20a. An outer threaded section 33a defined on an outer periphery of the cap opening 32a to engage with the inner threaded section 22a of the collar 20a so that the cap opening 32a is completely sealed by the sealing surface 23a to block the passages 24a of the engaging recess 21a to the accommodating space 121a so that the first dose A1 is stored in the filling space 31a.

[0056] The cap 30, 30a further has a security ring (not shown) which provides the breaking identification to the cap 30, 30a.

[0057] A membrane is selectively mounted between the bottle opening 11, 11a and the cap 30, 30a to provide the breaking identification to the cap 30, 30a and the collar 20, 20a.

[0058] The cap assembly can be independently merchandised after filling the first dose A1 into the cap 30, 30a and sealing the cap 30, 30a with the collar 20, 20a as shown in FIGS. 9 and 10. A consumer is able to purchase the cap assemblies with different doses for more variety and more fun in selection and more environmental because the bottle 10, 10a can be reused by simply changing the cap assembly.

[0059] Moreover, the sealing surface 23, 23a of the collar 20, 20a is flat as shown in FIGS. 1 to 10 or is convex (as shown in FIG. 11) or tapered to make the dose A drip smoothly and completely.

[0060] The cap 30, 30a is sealed by engagement of the cap opening 32, 32a and the sealing surface 23, 23a of the collar 20, 20a. A first blocking 1 is performed at an end of the cap opening 32, 32a and the sealing surface 23, 23a and a second blocking 2 is performed at an inner periphery of the cap opening 32, 32a and the sealing surface 23, 23a, as shown in FIGS. 3 and 11 to efficiently avoid leaking of the first dose A1.

[0061] According to above description, the container with two doses mixing upon opening in accordance with the present invention has the following advantages:

[0062] 1. The container has only three components, the bottle 10, 10a, the collar 20, 20a and the cap 30, 30a to achieve the purpose of mixing upon opening. Thus, processing and stock costs of the components and the container are low.

[0063] 2. The components of the container are simple in structure and can be manufactured quickly and easily by injection molding. Moreover, the molds for the components are easily casted and cheap in cost.

[0064] 3. The cap assembly contains the first dose A1 in the cap 30, 30a sealed with the collar 20, 20a in an airtight environment and can be distributed solely with different doses for more selection.

[0065] 4. The bottle 10, 10a, the collar 20, 20a and the cap 30, 30a are all re-useable so that the container is environmental friendly.

[0066] 5. Because both bottle opening 11, 11a of the bottle 10, 10a and the cap opening 32, 32a of the cap 30, 30a are wide open, automatic filling of the first dose A1 and the second dose B1 is applicable. After filling the cap 30, 30a with the dose A1, the cap 30, 30a and the collar 20, 20a are also mounted to the bottle 10, 10a for sealing by automatic operation so that all process for suitable for automatic mass production in hygienic environment.

[0067] Although this invention has been described in its preferred form with a certain degree of particularity, it is understood that the present invention of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts any be resorted to without departing from the spirit and scope of the invention.

What is claimed is:

1. A cap assembly releasing dose upon opening comprises:
a collar adapted to mount on a bottle and having
an engaging recess inside the collar;

an inner threaded section defined at an opening of the engaging recess;

a sealing surface defined at a bottom of the engaging recess; and

at least one passage formed between the sealing surface and the inner threaded section to adapt to communicate with the bottle; and

a cap for accommodation of a dose and having:

a filling space inside the cap;

a cap opening communicated with the filling space to engage with the sealing surface of the collar; and

an outer threaded section defined on an outer periphery of the cap opening to engage with the inner threaded section of the collar so that the cap opening is completely sealed by the sealing surface to block the at least one passage of the engaging recess so that the dose is stored in the filling space.

2. The cap assembly as claimed in claim 1, wherein the sealing surface of the collar is flat, convex or tapered.

3. The cap assembly as claimed in claim 1, wherein a first blocking is performed at an end of the cap opening abutting the sealing surface.

4. The cap assembly as claimed in claim 3, wherein a second blocking is performed at an inner periphery of the cap opening abutting the sealing surface.

5. A container including a cap assembly, which comprising:

a bottle for accommodation of a second dose;

a collar mounted on the bottle and having

an engaging recess inside the collar;

an inner threaded section defined at an opening of the engaging recess;

a sealing surface defined at a bottom of the engaging recess; and

at least one passage formed between the sealing surface and the inner threaded section to communicate with the bottle; and

a cap for accommodation of a first dose and having:

a filling space inside the cap;

a cap opening communicated with the filling space and engaging with the sealing surface of the collar; and

an outer threaded section defined on an outer periphery of the cap opening to engage with the inner threaded section of the collar so that the cap opening is completely sealed by the sealing surface to block the at least one passage of the engaging recess to the accommodating space so that the first dose is stored in the filling space.

6. The container as claimed in claim 5, wherein the bottle has a bottle opening and a body with an accommodating space to store the second dose;

wherein the collar is mounted at the bottle opening of the bottle to make the at least one passage communicated with the accommodating space.

7. The container as claimed in claim 5, wherein the collar is combined with the bottle by wedging.

8. The container as claimed in claim 6, wherein the bottle opening has an outer locking section defined on an outer periphery of the bottle opening;

wherein the collar has an inner locking section defined on an inner periphery of the collar to correspondingly engage with the outer locking section of the bottle.

9. The container as claimed in claim 5, wherein the sealing surface of the collar is flat, convex or tapered.

10. The container as claimed in claim **5**, wherein a first blocking is performed at an end of the cap opening abutting the sealing surface.

11. The container as claimed in claim **10**, wherein a second blocking is performed at an inner periphery of the cap opening abutting the sealing surface.

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