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LIANG(10) **Pub. No.: US 2016/0088960 A1**(43) **Pub. Date: Mar. 31, 2016**(54) **TUMBLER WITH A BI-LAYER STRUCTURE**(71) Applicant: **Hsiao-Chen LIANG**, Chang Hua Hsien
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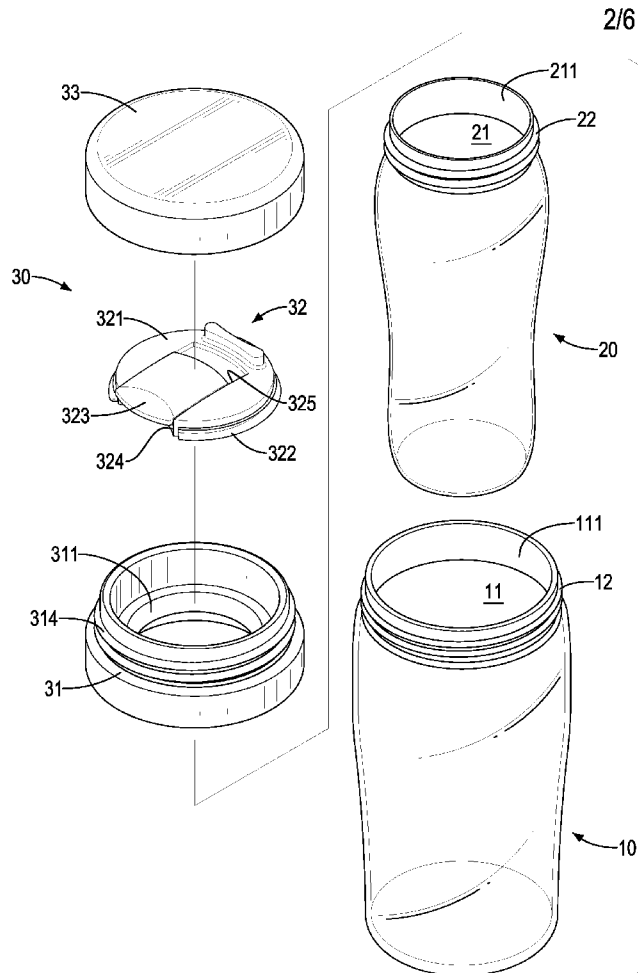
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ABSTRACT

A tumbler with a bi-layer structure has a collision-resistant outer tumbler body, a glass inner container and a lid. The collision-resistant outer tumbler body is made of plastic. The glass inner container is made of glass, is mounted in the collision-resistant outer tumbler body to form a bi-layer structure, and has a container space. The lid is mounted on the collision-resistant outer tumbler body and the glass inner container and has a combining base combined with the collision-resistant outer tumbler body and the glass inner container, an opening unit mounted in the combining base and communicating with the container space, and a closing cap combined with the combining base and selectively closing the opening unit.



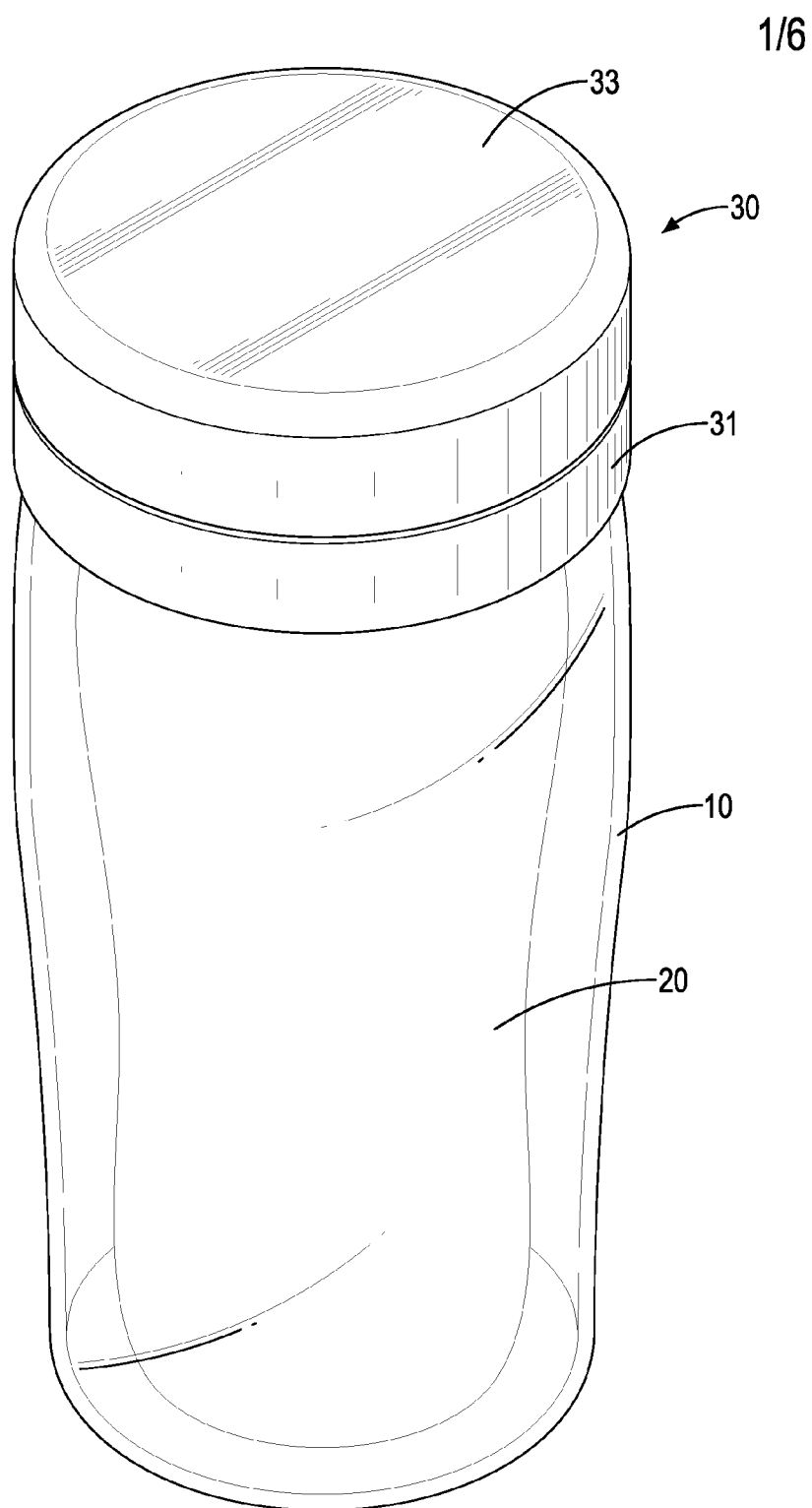
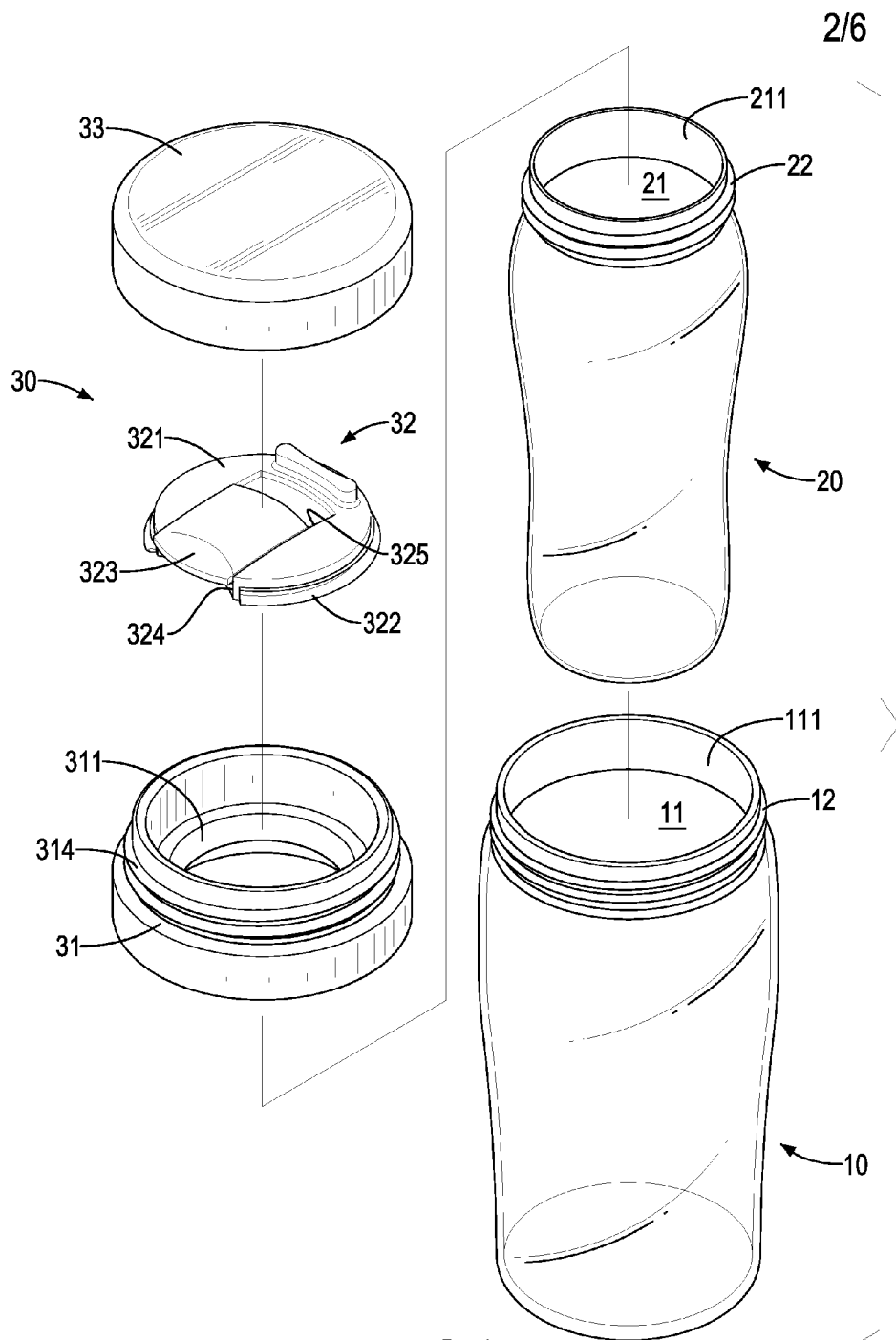


FIG.1



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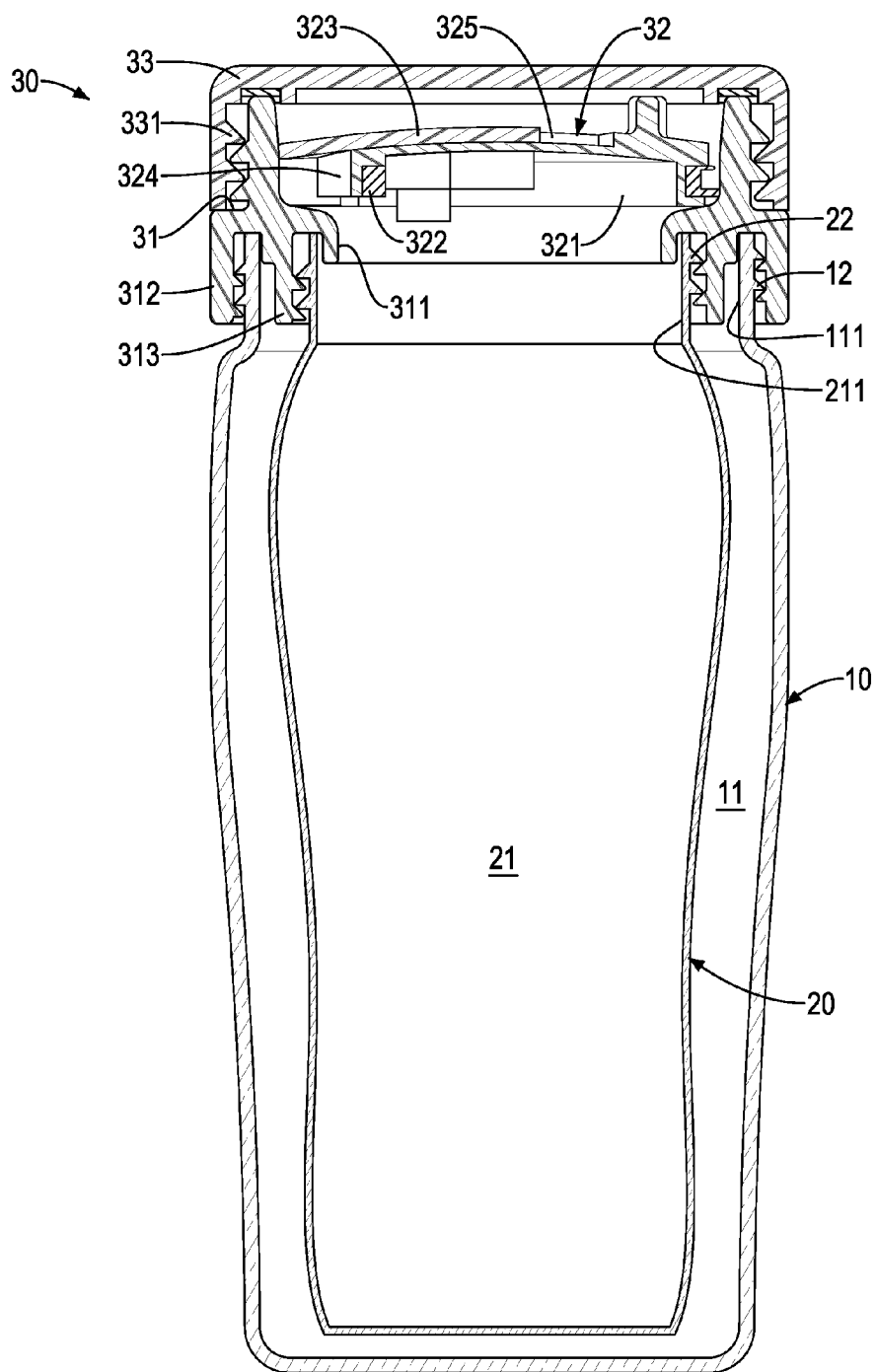


FIG.3

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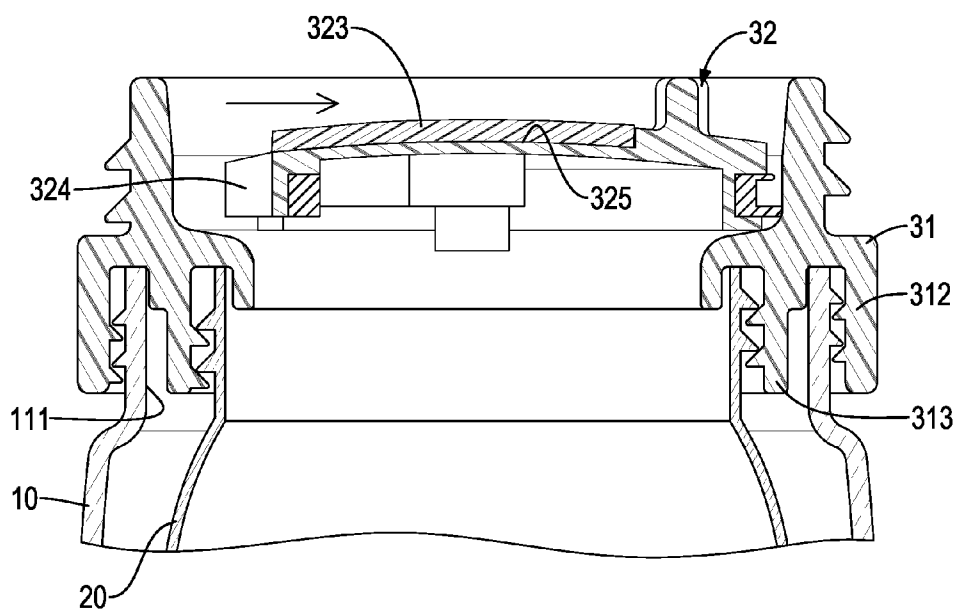
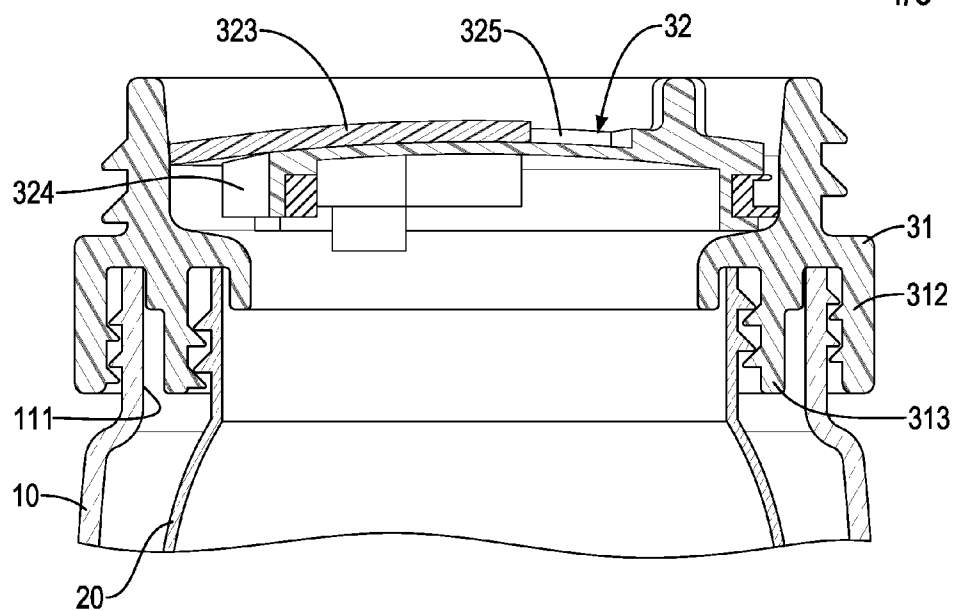


FIG.4

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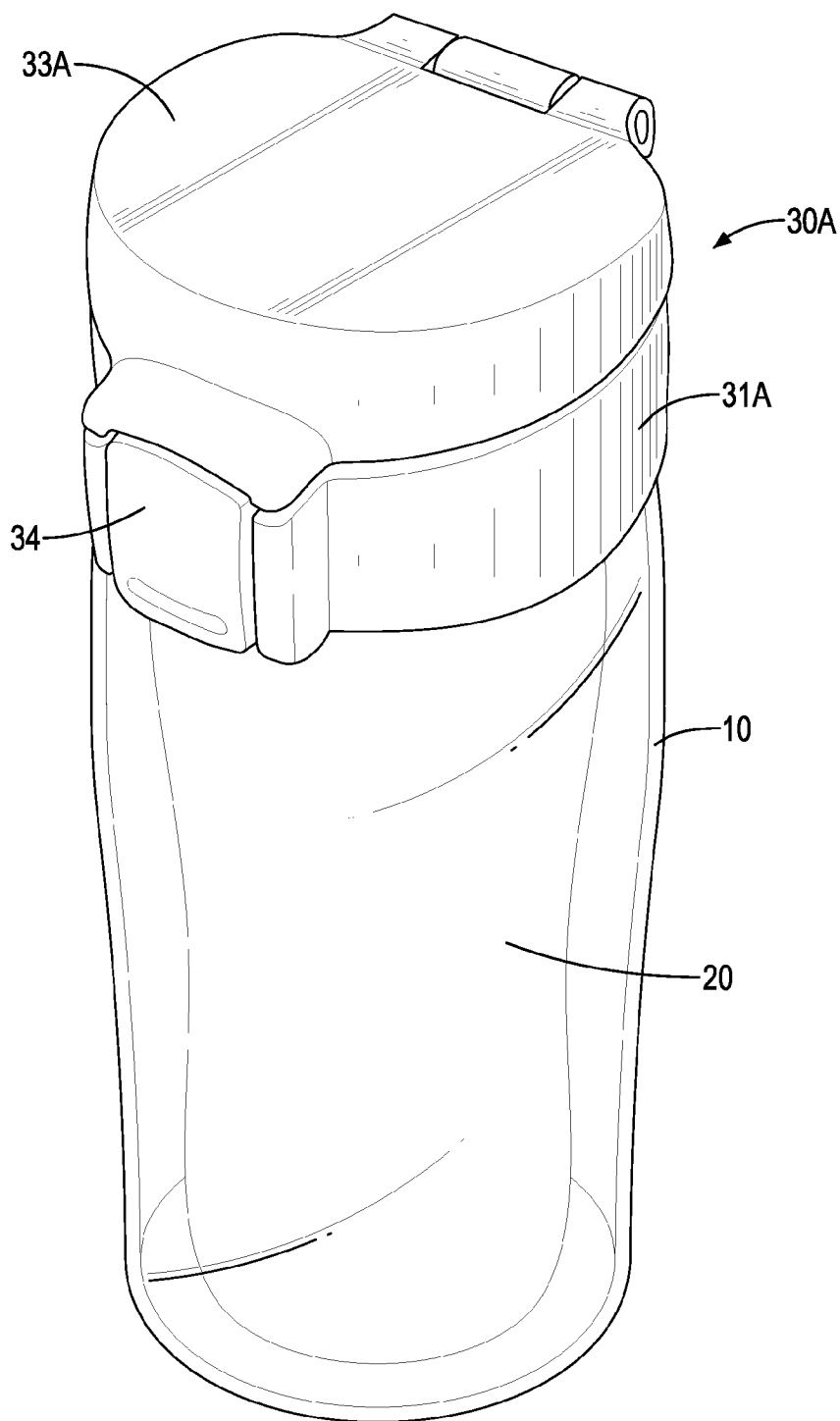


FIG.5

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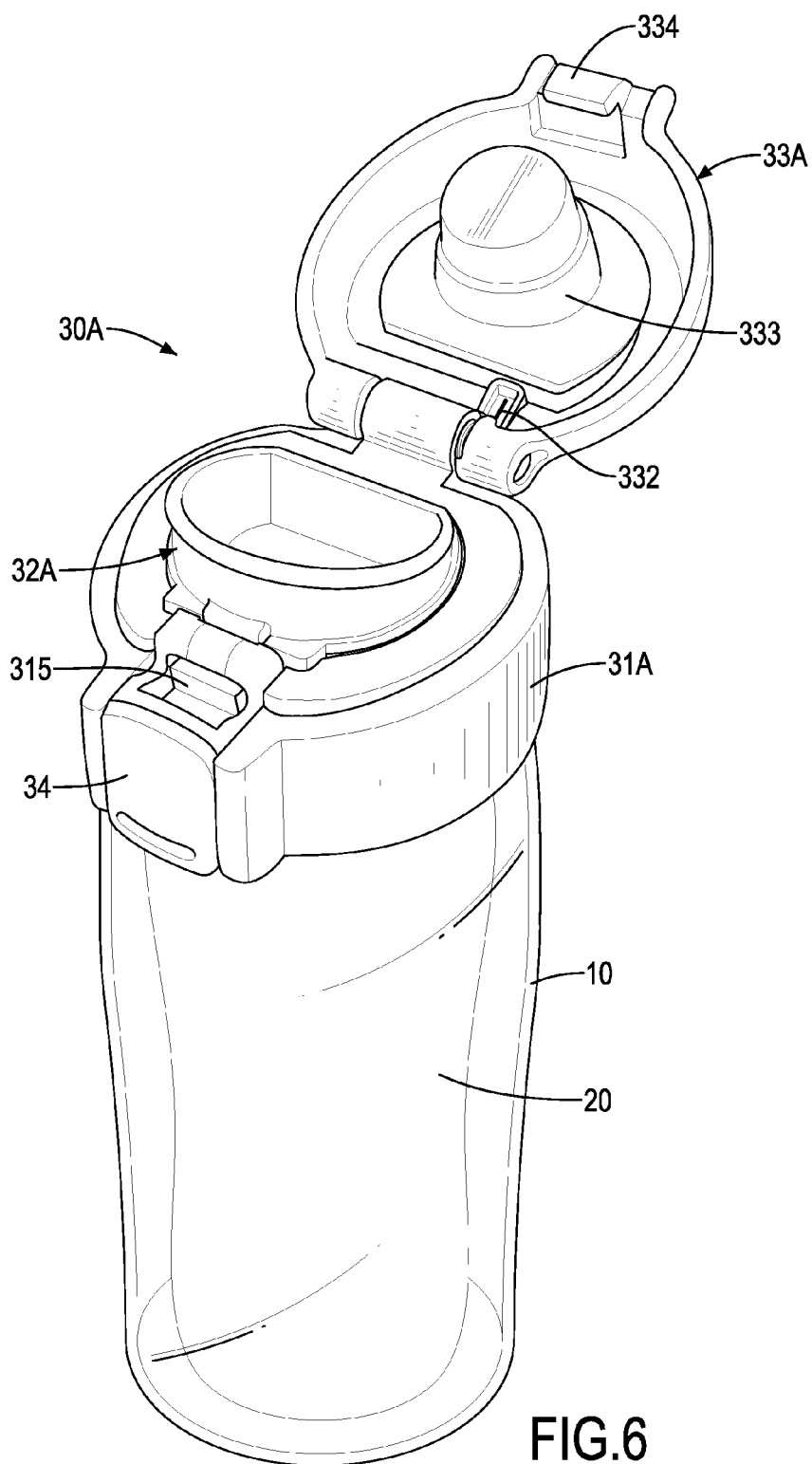


FIG. 6

TUMBLER WITH A BI-LAYER STRUCTURE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a tumbler, and more particularly to a drinking tumbler with a bi-layer structure.

[0003] 2. Description of Related Art

[0004] A conventional tumbler may be made of stainless steel, plastic, or glass. The tumbler made of stainless steel has excellent heat-insulation but high price. Further, scratches are formed on a surface of the tumbler made of stainless steel easily during cleaning, such that when the tumbler contains a hot drink, heavy metals may be released.

[0005] A plastic tumbler can sustain little heat, such that when the plastic tumbler contains a hot drink, toxic solvents may be released. A glass tumbler is suitable for containing a hot drink, and scratches are not formed on a surface of the glass tumbler easily, either. However, the glass tumbler may be broken upon impact. Further, when the tumbler contains a cold drink, drops may condensate on a surface of the tumbler, such that a moist state happens to a surface of a desk that the tumbler is held on. Therefore, how to provide a low cost, safe, and collision-resistant tumbler is a problem to be resolved.

SUMMARY OF THE INVENTION

[0006] The main objective of the present invention is to provide a tumbler with a bi-layer structure to resolve the afore-mentioned problems.

[0007] The tumbler with a bi-layer structure has a collision-resistant outer tumbler body, a glass inner container, and a lid.

[0008] The collision-resistant outer tumbler body is made of plastic and has a tumbler body space formed in the collision-resistant outer tumbler body and having an opening.

[0009] The glass inner container is made of glass, is mounted in the tumbler body space to form a bi-layer structure, and has a container space formed in the glass inner container and having an opening.

[0010] The lid is mounted on the collision-resistant outer tumbler body and the glass inner container, and closes the openings of the container space and the tumbler body space. The lid has a combining base combined with the collision-resistant outer tumbler body and the glass inner container, an opening unit mounted in the combining base and communicating with the container space, and a closing cap combined with the combining base and selectively closing the opening unit.

[0011] Other objectives, advantages and novel features of the present invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a perspective view of a first preferred embodiment of a tumbler with a bi-layer structure in accordance with the present invention;

[0013] FIG. 2 is an exploded perspective view of the tumbler in FIG. 1;

[0014] FIG. 3 is a cross sectional side view of the tumbler in FIG. 1;

[0015] FIG. 4 shows enlarged operational side views of the tumbler in FIG. 1;

[0016] FIG. 5 is a perspective view of a second preferred embodiment of a tumbler with a bi-layer structure in accordance with the present invention; and

[0017] FIG. 6 is an operational perspective view of the tumbler in FIG. 5.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0018] With reference to FIGS. 1 to 3, a first preferred embodiment of a tumbler with a bi-layer structure in accordance with the present invention has a collision-resistant outer tumbler body 10, a glass inner container 20, and a lid 30.

[0019] The collision-resistant outer tumbler body 10 may be made of plastic and has a tumbler body space 11 and a tumbler body combining portion 12. The tumbler body space 11 is formed in the collision-resistant outer tumbler body 10 and has an opening 111 formed in a top of the collision-resistant outer tumbler body 10. The tumbler body combining portion 12 is annularly formed on an outer side of the top of the collision-resistant outer tumbler body 10. Preferably, the tumbler body combining portion 12 is a threaded structure.

[0020] The glass inner container 20 is made of glass, and is mounted in the collision-resistant outer tumbler body 10 to form a bi-layer structure. The glass inner container 20 has a container space 21 and a container combining portion 22. The container space 21 is formed in the glass inner container 20 and has an opening 211 formed in a top of the glass inner container 20. The container combining portion 22 is annularly formed on an outer side of the top of the glass inner container 20. Preferably, the container combining portion 22 is a threaded structure.

[0021] The lid 30 is combined on the tops of the collision-resistant outer tumbler body 10 and the glass inner container 20 and closes the openings 111, 211 of the collision-resistant outer tumbler body 10 and the glass inner container 20. The lid 30 has a combining base 31, an opening unit 32 and a closing cap 33.

[0022] The combining base 31 is combined with the collision-resistant outer tumbler body 10 and the glass inner container 20 by threads and has a drink channel 311, an outer combining portion 312, an inner combining portion 313, and a closing cap combining portion 314. The drink channel 311 is formed through the combining base 31, such that the combining base 31 is hollow. The drink channel 311 communicates with the container space 21. The outer combining portion 312 is inwardly formed on a bottom of the combining base 31 and is combined with the tumbler body combining portion 12. The inner combining portion 313 is inwardly formed on the bottom of the combining base 31, is located at an inner side of the outer combining portion 312, and is combined with the container combining portion 22. The closing cap combining portion 314 is outwardly formed on a top of the combining base 31.

[0023] The opening unit 32 is mounted on the combining base 31, is located in the drink channel 311, and has a body 321, a sealing ring 322 and a sliding cap 323. The body 321 is mounted in the drink channel 311 and has a recess 324 and a slide notch 325. The recess 324 is formed in a side of the body 321. The container space 21 communicates with an external environment via the recess 324 and the drink channel 311. The slide notch 325 is formed in a top of the body 321 and communicates with the recess 324. The sealing ring 322 is mounted around the opening unit 32 and partially closes a segment formed between the opening unit 32 and the com-

binning base 31. The sliding cap 323 is slidably mounted in the slide notch 325 and selectively closes the recess 324.

[0024] The closing cap 33 is combined with the combining base 31 by threads, closes the drink channel 311, and has a cap combining portion 331 inwardly formed on a bottom of the closing cap 33 and combined with the closing cap combining portion 314.

[0025] With reference to FIGS. 3 and 4, in use, the glass inner container 20 is combined with the inner combining portion 313 of the combining base 31. Then, the glass inner container 20 is mounted in the collision-resistant outer tumbler body 10 from the opening 111 of the collision-resistant outer tumbler body 10. The collision-resistant outer tumbler body 10 is then combined with the outer combining portion 312 of the combining base 31.

[0026] A drink is poured into the glass inner container 20. The opening unit 32 and the closing cap 33 are mounted on the combining base 31. The closing cap 33 is detached from the combining base 31 by a user. Then, the sliding cap 323 is slid relative to the slide notch 325 to expose the recess 324, such that the user can drink the drink contained in the glass inner container 20 from the recess 324. Finally, the sliding cap 323 is slid relative to the slide notch 325 to close the recess 324, such that the drink in the glass inner container 20 can be kept from leakage.

[0027] With reference to FIGS. 5 and 6, a lid 30A is combined with the collision-resistant outer tumbler body 10 and the glass inner container 20. A combining base 31A of the lid 30A further has a button 34. The button 34 is pivotally mounted on the combining base 31A of the lid 30A. The button 34 has an engagement portion 315. An opening unit 32A of the lid 30A is mounted in the combining base 31A and communicates with the glass inner container 20. A closing cap 33A of the lid 30A is pivotally mounted on the combining base 31A by a spring 332 and has a closure body 333 and a closing cap engagement portion 334. The closure body 333 is mounted on a bottom of the closing cap 33A and selectively closes the opening unit 32A. The closing cap engagement portion 334 is formed on the bottom of the closing cap 33A and is located distal from a connection position between the closing cap 33A and the combining base 31A. The closing cap engagement portion 334 is selectively engaged with the engagement portion 315 of the combining base 31A.

[0028] In use, the button 34 is pressed, such that the engagement portion 315 of the button 34 is detached from the closing cap engagement portion 334. Then, the closing cap 33A is bounced off by the spring 332 to expose the opening unit 32A. Therefore, the user can drink the drink contained in the glass inner container 20 from the opening unit 32A. Finally, the closing cap 33A is covered on the combining base 31A again to close the opening unit 32A, wherein the closing cap engagement portion 334 is engaged with the engagement portion 315 of the combining base 31A again.

[0029] From the above description, it is noted that the present invention has the following advantages:

[0030] The glass inner container 20 is made of glass, and the collision-resistant outer tumbler body 10 is made of plastic. Costs of glass and plastic are lower than that of stainless steel. Therefore, the cost of the tumbler with a bi-layer structure can be decreased. Then, the glass inner container 20 is suitable for containing both cool and hot drinks. Scratches are not formed on a surface of the glass inner container 20 easily. Furthermore, the collision-resistant outer tumbler body 10 can protect the glass inner container 20 from collision. Air in

the collision-resistant outer tumbler body 10 can further provide a heat-insulation effect for the glass inner container 20. When the glass inner container 20 contains a cold drink, drops do not condensate on a surface of the outer tumbler body 10, such that a moist state does not happen to a surface of a desk that the tumbler is held on.

[0031] Even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

What is claimed is:

1. A tumbler with a bi-layer structure having:
 - a collision-resistant outer tumbler body made of plastic and having a tumbler body space formed in the collision-resistant outer tumbler body and having an opening;
 - a glass inner container made of glass, mounted in the tumbler body space to form a bi-layer structure and having a container space formed in the glass inner container and having an opening; and
 - a lid mounted on the collision-resistant outer tumbler body and the glass inner container and closing the openings of the container space and the tumbler body space, the lid having
 - a combining base combined with the collision-resistant outer tumbler body and the glass inner container;
 - an opening unit mounted in the combining base and communicating with the container space; and
 - a closing cap combined with the combining base and selectively closing the opening unit.
2. The tumbler with a bi-layer structure as claimed in claim 1, wherein
 - the combining base has a drink channel formed through the combining base and communicating with the container space;
 - the opening unit is mounted in the drink channel and has a body mounted in the drink channel and having
 - a recess formed in a side of the body and communicating with the drink channel and the container space; and
 - a slide notch formed in the body and communicating with the recess;
 - a sealing ring mounted around the opening unit and partially closing a segment formed between the opening unit and the combining base; and
 - a sliding cap slidably mounted in the slide notch and selectively closing the recess.
3. The tumbler with a bi-layer structure as claimed in claim 2, wherein the combining base is combined with the glass inner container by threads.
4. The tumbler with a bi-layer structure as claimed in claim 3, wherein the combining base is combined with the collision-resistant outer tumbler body by threads.
5. The tumbler with a bi-layer structure as claimed in claim 4, wherein the closing cap is combined with the combining base by threads.
6. The tumbler with a bi-layer structure as claimed in claim 1, wherein

the combining base further has a button pivotally mounted on the combining base and having an engagement portion; and
the closing cap is pivotally mounted on the combining base by a spring and has
a closure body mounted on a side of the closing cap and selectively closing the opening unit; and
a closing cap engagement portion selectively engaged with the engagement portion of the combining base.

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