



US 20130221006A1

(19) **United States**

(12) **Patent Application Publication**
Charnetskiy

(10) **Pub. No.: US 2013/0221006 A1**

(43) **Pub. Date: Aug. 29, 2013**

(54) **BOTTLE STOPPER**

(76) Inventor: **Aleksandr Charnetskiy**, Himki (RU)

(21) Appl. No.: **13/882,214**

(22) PCT Filed: **Dec. 5, 2011**

(86) PCT No.: **PCT/RU2011/000957**

§ 371 (c)(1),
(2), (4) Date: **May 13, 2013**

(30) **Foreign Application Priority Data**

Mar. 17, 2011 (RU) 2011110146

Publication Classification

(51) **Int. Cl.**
B65D 51/20 (2006.01)

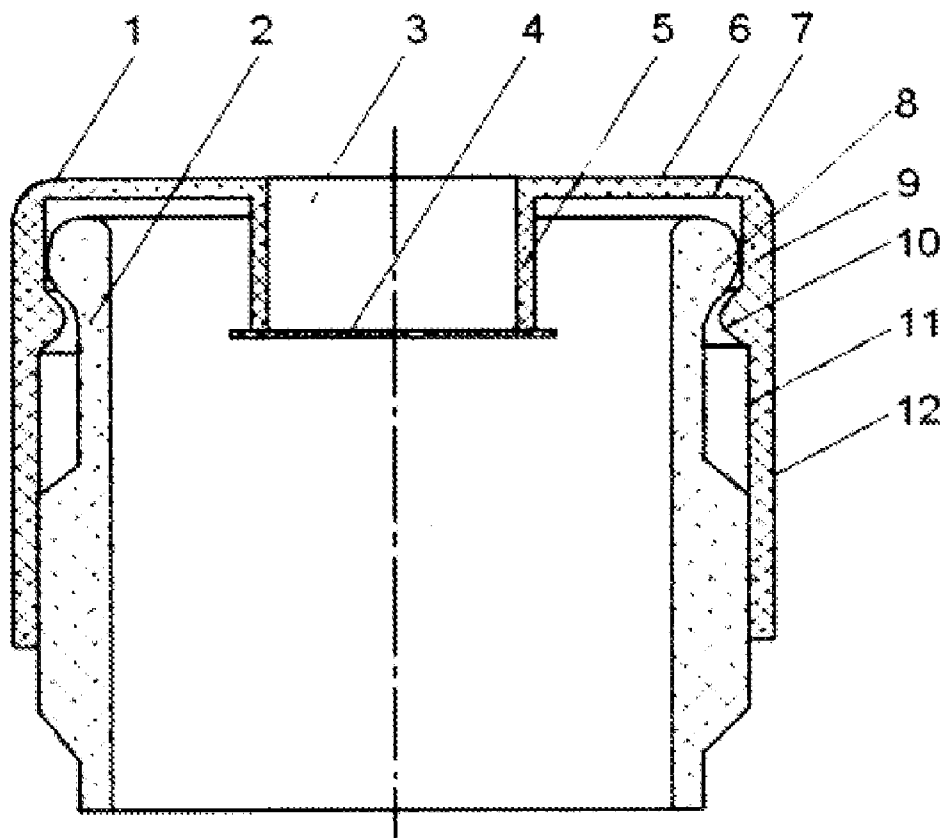
(52) **U.S. Cl.**
CPC **B65D 51/20** (2013.01)
USPC **220/258.3; 220/259.5**

(57) **ABSTRACT**

The useful model is related to devices for temporary overlapping of access to a container, in order to prevent penetration of various substances from outside, and to prevent spillage of liquid from the container, particularly to plugs for bottles.

The purpose of the useful model is to reduce materials consumption.

The useful model is implemented as follows. The user overturns the bottle, with its neck facing the bottom, and sets it in a bottling system. In such case, the bottling system is equipped with an opposite part, e.g. a tube with edge, which is not perpendicular to the tube axis. The tube is inserted in hole and breaks the diaphragm under the effect of the weight of the bottle with liquid. Liquid is thus supplied to the bottling system. Therefore, if the device consists of a side wall, edge wall, the first lip and diaphragm, such a design ensures saving of the expensive material required to make the device (side wall, edge wall and the first lip), since the diaphragm is made from another material. It is also helpful when bottles with liquid are installed in a bottling system, due to opening the hole, i.e. by breaking the diaphragm under the effect of the weight of the bottle with liquid without the use of any additional load, i.e. by lesser efforts on the part of the user.



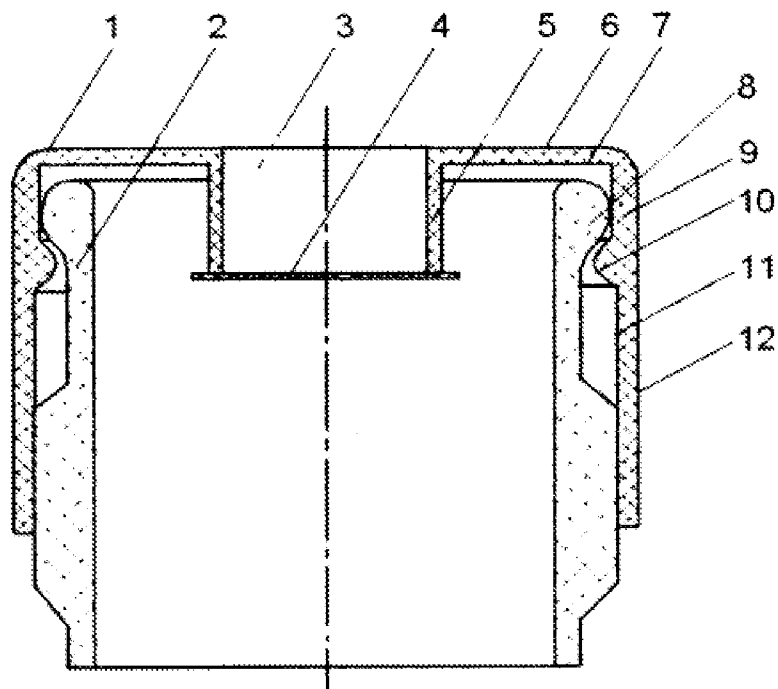


Fig. 1

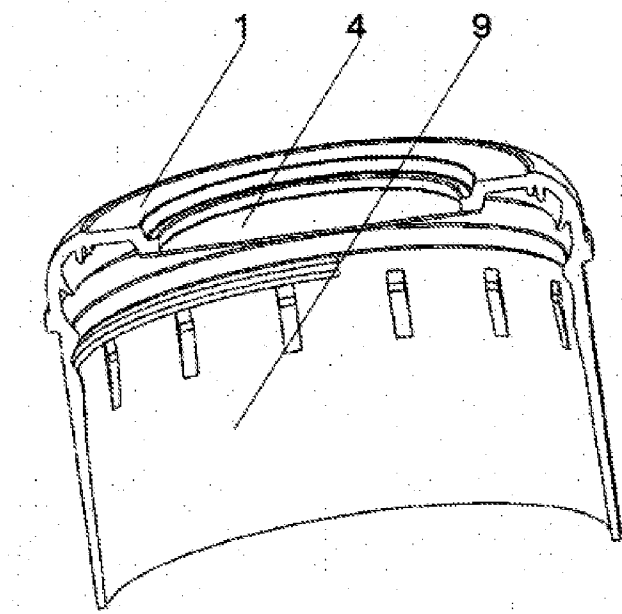


Fig. 2

BOTTLE STOPPER

FIELD OF THE INVENTION

[0001] The useful model refers to devices for a temporary blocking of the passage to a container in order to prevent access of various substances from the environment, and to prevent drinking of liquid from the container, including plugs for bottles, plugs for canisters and plugs for other containers.

BACKGROUND

[0002] A plug is known as a device (<http://viaton.com.ua/combo.html>). The device includes a body, which is an empty cylinder, with lips on the internal surface and a thinning in the edge part. The body consists of a side wall and the edge part. The thinning is made at the central part of the edge wall.

[0003] Shortcomings of the device are as follows: a considerable weight of the product, an excessive materials consumption, inability to ensure a constant breaking force of a membrane when installing a bottle with water in the water-receiving center, and high cost of outfits for pouring products with thin-wall components, since the edge part cannot be made thin enough.

[0004] The closest technical solutions (prototypes) are a plug for a bottle (RF patent No. 70878) and a plug for a bottle (<http://www.bericap.com/index.php?id=55&L=2&id=55>).

[0005] The plug for a bottle (RF patent No. 70878) contains a cylinder part, the edge part, a cylinder cavity, side wall, bottom, step, undercut and sealing. The cylinder part is made as a hollow cylinder and is linked by one of its bases with the edge part made as a disc. A cylinder cavity is made in the center of the edge part, which is formed by the side wall connected with the edge part by one of its bases. The side wall has the shape of a hollow cylinder. The bottom is connected with the side wall opposite to the edge part. The bottom is made as a disc. The internal part of the side wall, between the bottom and the edge part, has a step inclined towards the edge part. An undercut, located at the step from the edge part, is made near the step, from the side of cylinder cavity. A sealing is made at the edge part, near its edge, from the side of the side wall. The side wall and the cylinder part are located at one side of the edge part.

[0006] Shortcomings of the prototype include a considerable materials consumption, since the device cannot have a lesser thickness.

[0007] The plug for a bottle (<http://www.bericap.com/index.php?id=55&L=2&id=55>) consists of a body with a hole, an O-ring and a small internal plug closing the hole in the body.

[0008] Shortcomings of the prototype include an excessive number of components, an excessive materials consumption and lack of tightness at the point where the body is connected with the small plug.

[0009] The purpose of this useful model is to reduce the materials consumption.

[0010] The purpose is achieved by the design where plug for a bottle contains a side wall, an edge wall and a diaphragm, with the edge wall made as a disc having the first external surface and the first internal surface, the edge wall having a hole coaxial with the edge wall, the edge wall connected along the perimeter with an edge of the side wall made as a cylinder, the side wall made with an opportunity of being fixed on the bottle neck, with the first internal surface facing the side wall, diaphragm connected with the edge wall from

the side of the first internal surface, blocking the hole, with its distinct feature being that the diaphragm is made from film, and, particularly, the edge wall is complemented with the first lip made as a ring, with the first lip connected by one of the edges with the edge wall from the side of the first internal surface along the perimeter of the hole, and the diaphragm connected with the first lip from the side of the first lip opposite to the first internal surface.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The useful model is explained by drawings (FIG. 1, 2), where FIG. 1 is demonstrating the cross-section of the device with the first lip, and FIG. 2 portrays the device without the first lip.

DETAILED DESCRIPTION

[0012] The drawing portrays: edge wall 1, neck 2, hole 3, diaphragm 4, the first lip 5, the first external surface 6, the first internal surface 7, the third lip 8, side wall 9, the second lip 10, the second internal surface 11, the second external surface 12.

[0013] The principal components of the device are the side wall 9, edge wall 1 and diaphragm 4.

[0014] On the whole, the device is a cap (plug), which consists of a cylinder body with hole 3 and a membrane (diaphragm 4) tightly closing this hole 3. The body is a hollow cylinder open from one edge (including side wall 9 and edge wall 1) with the second lips 10 on the second internal surface 11 and hole 3 at the opposite edge (edge wall 3). Hole 3 is tightly closed by a film membrane (diaphragm 4). The plug is made as fixed on neck 2 of the bottle with the use of second lips 10 at the second internal surface 11 of the plug. The fixing is ensured by linkage with opposite lips (the third lips 8) on neck 2 of the bottle. And the edge (edge wall 1) with hole 3 and diaphragm 4 ensure a tight closing of neck 2 of the bottle.

[0015] The device is symmetric with respect to an imaginary axis of the device crossing edge wall 1 and diaphragm 4.

[0016] Side wall 9 is made as a cylinder surface of a straight circular cylinder. Side wall 9 has the second external surface 12 and the second internal surface 11. The second external surface 12 is facing to inside of side wall 9, i.e. towards the imaginary axis of the device. The second external surface 12 is facing to outside of side wall 9, i.e. outside the imaginary axis of the device. Side of stack 9 is connected along one of the edges with edge wall 1. Side wall 9 is made with a opportunity of fixing the device at the neck 2 of the bottle.

[0017] Edge wall 1 is made as a disc or a round plate. Edge wall 1 is connected along the perimeter with an edge of side wall 9 coaxially with side wall 9. Edge wall 1 has the first internal surface 7 and the first external surface 6. The first internal surface 7 is facing to inside of the device, i.e. the second internal surface 11 of side wall 9. The first external surface 6 is facing to outside, i.e. outside side wall 9. The central part of edge wall 1 has hole 3. Hole 3 is coaxial with edge wall 1. Hole 3 is a round hole. Hole 3 is a through hole, i.e. passing from the first external surface 6 to the first internal surface 7. Edge wall has first lip 5.

[0018] The first lip 5 is made as a cylinder surface of a straight circular cylinder. Diameter of the first lip 5 is less than the diameter of side wall 9. The first lip 5 is connected along one of the edges with edge wall 1 along the perimeter of hole 3 in edge wall 1. The first lip 5 continues hole 3 in edge wall 1. The first lip 5 is connected with edge wall 1 from the side of the first internal surface 7. The first lip 5 is coaxial with

imaginary axis of the device. The first lip 5 is connected with diaphragm 4 along the edge opposite to the edge connected with edge wall 1.

[0019] Side wall 9, edge wall 1 and the first lip 5 are made as an integral component. Side wall 9, edge wall 1 and the first lip 5 may be made from different polymers and plastics.

[0020] The device may be made without the first lip 5. In such case, diaphragm 4 is connected to the first internal surface 7 of edge wall 1.

[0021] Diaphragm 4 is made from thin durable material, such as film. Diaphragm 4 may have one or more layers, depending on the required consumer/strength properties (puncture resistance, availability of a barrier layer, the need to apply image and text, preset breaking force when installed in a bottling system, etc.). In a particular case, diaphragm 4 may be made as a multilayer film consisting of low density polyethylene laminated with mylar film (for an example see <http://www.artplast.ru/productiontoorder/flexiblewrapper/multilayer/>). If appropriate, a text or an image may be printed on the diaphragm, and it may be used as a label.

[0022] Diaphragm 4 is made in a manner ensuring overlapping hole 3. Diaphragm 4 is required to prevent spillage of liquid from container, and to prevent penetration of outside matters to container. Diaphragm 4, if used in bottles with potable water, may be made with ensuring its break opportunity under the effect of weight of the filled bottle, when the filled bottle is installed in a bottling system.

[0023] Diaphragm 4 may be fixed along the perimeter of the first lip 5 or along the perimeter of hole 3 from the first internal surface 7, e.g., by contact welding or ultrasound welding, or using any other method available, which ensures relevant strength and tightness of joint. Diaphragm 4 may also be fixed on the device when molding (die forming) of the device. In such case, diaphragm 4 is set in the die before the molding (die forming), and then the diaphragm is integrated with the product in the molding (die forming) process.

[0024] The device is fixed on neck 2 using a connecting component. The connecting components may include: thread on the second internal surface 11 (in such case, opposite thread is made on neck 2); or the device may be connected with neck 2 in a heated state, with connection ensured after cooling (soldering or thermal fitting); or connection using an adhesive; or using heavy-shrink fitting; or any other method.

[0025] The drawing is demonstrating an example of a connecting component made as the second lip 10. In such case, connection of the device with neck 2 is made by an interlocking arrangement between the second lip 10 and the third lip 8. The second lip 10 is located at the second internal surface 11 of side wall 9. The second lip 10 is made as a ring. The second lip 10 is coaxial with the device. The third lip 8 is located on neck 2 of the bottle, near the free edge of neck 2. The third lip 8 is made as a ring. The third lip 8 is coaxial with neck 2 of the bottle, and coaxial with the device, when the device is fixed on neck 2.

Implementation of the Useful Model

[0026] The useful model is implemented as follows.

[0027] The user makes the body (side wall 9, edge wall 1 and the first lip 5), as described above, e.g. by molding in an injection-molding machine. The user fixes diaphragm 4 along the perimeter of the first lip 5 or along the perimeter of hole 3 from the side of the first internal surface 7, if the device is made without the first lip 5. The user fills the bottle with a liquid, e.g. water. Then the user fixes the device on neck 2 of the bottle. The second lip 10 engages with the third lip 8. In such case, dropping of the device from neck 2 is prevented due to engagement of the second lip 10 with the third lip 8.

[0028] The user overturns the bottle, with neck 2 facing the bottom, and sets it in the bottling system. In such a case, the bottling system is equipped with an opposite part, e.g. a tube with edge, which is not perpendicular to the tube axis. The tube is inserted in hole 3 and breaks diaphragm 4 under the effect of the weight of the bottle with liquid. Liquid is thus supplied to the bottling system.

[0029] Therefore, if the device consists of a side wall, edge wall, the first lip and diaphragm, such a design ensures saving of the expensive material required to make the device (side wall, edge wall and the first lip), since the diaphragm is made from another material. It is also helpful when bottles with liquid are installed in a bottling system, due to opening the hole, i.e. by breaking the diaphragm under the effect of the weight of the bottle with liquid without the use of any additional load, i.e. by lesser efforts on the part of the user.

- 1. A plug for a bottle, comprising:
 - a side wall, edge wall and a diaphragm,
 - with the edge wall made as a disc with the first external surface and the first internal surface,
 - the edge wall having a hole coaxial with the edge wall,
 - the edge wall being connected along the perimeter with an edge of the side wall made as a cylinder,
 - the side wall ensuring an opportunity of fixing on neck of the bottle, with the first internal surface facing the side wall, the diaphragm connected with the edge wall from the side of the first internal surface,
 - thus ensuring overlapping of the hole,
 - further characterized in that the diaphragm is made from a film.

2. The plug for a bottle according to claim 1, further characterized in that

- the edge wall is supplemented with the first lip made as a ring,
- the first lip is connected by one of the edges with the edge wall from the side of the first internal surface along the perimeter of the hole, and
- the diaphragm connected with the first lip from the side of the first lip opposite to the first internal surface.

* * * * *