LID FOR BEVERAGE CAN

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ABSTRACT

The invention relates to a lid (2) for a container (1), where the lid is made from a thin plate-shaped material and adapted to be mounted on and hermetically close the container (1). Moreover, the lid comprises score lines (3) where the thin material can be torn to form a discharge opening (12) in the lid, where the starting points (4) for tearing the score lines are located at the brim (5) of the lid. The lid further comprises an area bulging out from the brim between the score lines to form a gripping device (6) and the lid is made from metal.
LID FOR BEVERAGE CAN

[0001] The invention relates to a lid for a container, where the lid is made from a thin plate shaped material and adapted to be mounted on and hermetically close the container, said lid comprises score lines where the thin material can be torn to form a discharge opening in the lid.

[0002] Containers, such as cans for beverage are presently opened by a stay-on-tab which can provide a discharge opening in the lid of the can.

[0003] However, early metal beverage cans had no tabs; they were opened by a can-piercer or churchkey, a device resembling a bottle opener with a sharp point. The can was opened by punching two triangular holes in the lid—a large one for drinking, and a second smaller one to admit air to enter the can.

[0004] As early as 1922, inventors were applying for patents on cans with tab tops, but the technology of the time made these inventions impractical.

[0005] Mikola Kondakov, Ontario, Canada, invented the pull tab version for bottles in 1956 (Canadian patent 476789). Then, in 1962, Ermal Cleon Fraze invented the similar integral rivet and pull-tab version (also known as ring pull, which had a ring attached at the rivet for pulling, and which would come off completely to be discarded). U.S. Pat. No. 3,349,949 was granted for this pull-top can design.

[0006] The early pull-tabs detached easily. The New England Journal of Medicine reported a case of one person ingesting a pull-tab that had broken off and dropped into the can. The design of the pull-tabs was addressed by Daniel F. Cudzik who in 1975 developed stay-on-tabs.

[0007] The stay-on-tab was designed by Daniel F. Cudzik for a Reynolds Metals Co. aluminum can. This design reduced injuries and reduced litter caused by removable tabs. The mechanism uses a separate tab attached to the upper surface as a lever to depress a scored part of the lid, which folds underneath the top of the can and out of the way of the resulting opening. Such “retained ring-pull” cans are widely used today. In fact it is one of the most, if not the most used container for beverage today.

[0008] However, when using cans that are opened with stay-on-tabs there is a risk of contaminating the content of the can when the can is opened. This is due to the fact that the scored part of the outer surface of the lid is forced into the can when opened. The outer surface may be contaminated with bacteria and virus and other hazard particles. In fact the contamination may be lethal for a consumer, and some cases of seriously illness and death caused by beverages that has been contaminated by the lid have actually been reported.

[0009] Although, the above problem has been addressed and several solutions including covers and stickers have been suggested, like in e.g. the patent documents US 2004/134913 and KR 20030041403, there is still a need for lids for containers and cans with an opening mechanism that does inherent provide a risk of contaminating the content of the container or can.

[0010] The object of the present invention is to provide a lid for a container or can having a discharge opening that can be opened for access to the content of the container or can without risk of contamination.

[0011] Furthermore, it is desired to provide a can for beverage with a discharge opening that can be kept free of bacteria and other harmful substances.

[0012] It is also an object of the present invention to provide a reliable lid (for a container) having the required mechanical strength.

[0013] Consequently, the present invention aims for providing a lid for a container or can which is easy to open and when it is opened, the discharge opening from which the consumer consumes the content is clean and free of bacteria.

[0014] The object of the present invention can be achieved by a lid for a container or can which having the features defined in claim 1. Preferred embodiments are defined in the dependant sub claims and explained in the following description and illustrated in the accompanying drawings.

[0015] The lid for a container according to the invention is made from a thin plate-shaped material and adapted to be mounted on and hermetically close the container, said lid comprises score lines where the thin plate-shaped material can be torn to form a discharge opening in the lid, where the starting points for tearing the score lines are located at the brim of the lid and where the lid further comprises an area bulging out from the brim between the score lines to form a gripping device, wherein the lid is made from metal, preferably the metal is aluminum.

[0016] By having the starting points for tearing the score lines located at the brim of the lid is possible to open the lid from the brim towards, e.g. the centre of the lid and a convenient large opening in the lid can be made. Such a large opening is very suitable for e.g. drinking from the can.

[0017] Moreover, by having the starting points for tearing the score lines located at the rim or edge of the lid the score lines will also run in the area where the lid closes and seals container, i.e. the rim of the container. Thus, when the scores lines are torn to provide a discharge opening the lid material constituting the discharge opening will be removed from the edge of the container and, thereby, expose the edge of the container which is free of contamination, as it until the opening of the discharge opening has been covered and protected by the lid.

[0018] The discharge opening is provided in an area between two score lines, and when the score lines are torn only the area between the score lines is affected. Thus, in most cases the main part of the lid remains attached to the container.

[0019] A lid made from metal is reliable lid and have the required mechanical strength. The metal is preferable aluminum; however, it is also possible to apply another metal.

[0020] To facilitate the tearing or the score lines it is preferred that the lid further comprises an area bulging out from the brim between the score lines to form a gripping device. The gripping device may be a sort of flap extending from the rim of the lid and preferably the gripping device has a sufficient size that allows for a proper grip to tear the score lines.

[0021] Alternatively, the gripping device may be equipped with a pull-ring, although this solution is more expensive. A solution with a pull-ring may also require that the pull-ring is mounted with a rivet through the lid, which makes the solution even more costly. Consequently, one of the advantages of the present invention is that a pull-ring is not required.

[0022] The lid according to the invention can be made from any suitable material, such as plastic or metal, e.g. stainless steel and aluminum. To make it possible to use machinery that presently is in use for mounting lids on containers, the lid is preferably made from aluminum.
The container may be made from any desirable material, however, for many embodiments it is preferred that the container is made from stainless steel or aluminum or in the same material as the lid.

The lid preferably has a thickness in the range of 70 to 110 microns, more preferably a thickness in the range 80 to 100 microns. Such thickness allows for a sufficient strength of the lid with minimum use of material. Moreover, a thickness in the range of 70 to 110 microns makes it possible to press score lines in the lid material that can be torn relatively easily. A suitable thickness of the lid is e.g. 90 microns.

For the purpose of making the opening of the discharge opening in the lid easier it is preferred that at least a part of the lid comprises one or more reinforcements. The reinforcements are conveniently pressed out ribs, which may be easily pressed into the lid material.

To obtain a discharge opening with good properties for emptying or drinking from the container closed by the lid it is preferred that the score lines forms a substantially frustum shaped area on the surface of the lid. Thus, the discharge opening will also become substantially frustum shaped or tapering towards the centre of the lid and, thereby, make it easy to e.g. drink the content of the container.

It is desirable that the lid according to the invention can form part of the process normally used for closing and sealing containers. Such a process normally includes a crimping operation and preferably the lid is adapted to be mounted on a container by a crimping operation. During the process of mounting the lid further grooves and indentations may be formed in the lid. Moreover, in a preferred embodiment a part of the score lines are crimped around the rim of the container in the crimping operation. In this manner it is possible to open the container and expose a part of the rim of the container, which has been covered by the lid.

Although the lid according to invention may be useful for a large variety of containers, such as containers for food, drugs and liquid, the lid is very suitable for closing and sealing container that are cans for beverage.

In a preferred embodiment the part of the lid forming a discharge opening remains attached to the lid after the score lines have been torn. In this manner the lid according to the invention provides the same advantages as the stay-on-tab, but does not have the drawbacks of the stay-on-tab, i.e. the inherent risk of contaminating the content in the container. Consequently, the lid according to the invention is very environmentally friendly and hygienic in use. The discharge opening part of the lid may remain attached to the lid in a special adapted area, e.g. an area with a pressed indentation or groove. This may further facilitate the opening of the discharge opening. The pressed indentation or groove is suitable located near the centre of the lid.

The invention will now be explained in further details with reference to drawings in which:

FIG. 1 shows an embodiment of a lid according to the invention mounted on a can,
FIG. 2 shows a 3-D view of the embodiment of FIG. 1,
FIG. 3 shows the lid mounted on a can where the discharge opening has been opened,
FIG. 4 shows a 3-D view if of the lid and can of FIG. 3,
FIG. 5 shows the lid according to the invention and how the discharge opening is opened,
FIG. 6 shows alternative embodiments of the lid according to the invention.

The lid according to the invention provides a solution for closing and sealing a container which is cost-effective as a pull-ring and rivet for mounting the pull-ring is not required. In particular in case of closing and sealing cans for beverage the lid provides a solution that improves the hygiene due to the fact that the lid covers the areas of the can that will come into contact with the consumer until the discharge opening is opened. In this manner the areas are kept clean and free of bacteria until opening and consumption of the content in the can. This is a huge advantage in comparison with the well-known stay-on-tabs, which have an inherent risk of contaminating the content of the can.

In the following the same reference numbers refer to the same parts in the figures.

FIG. 1a shows an embodiment where the lid is mounted on a can suitable for containing beverage.
FIG. 1b shows the can 1 with the lid 2 seen from the front. FIG. 1c is a top view of the can 1 with the lid 2. From this view it can be seen that the score lines 3 together with the part of the rim 4 including the gripping device 5 and surrounds an area 7 on the lid, which when the score lines 3 are torn become a discharge opening. In the centre part of the lid 2 there is formed and indentation 8 which the area 7 can bend over when the score lines 3 are torn and the area 7 forms the discharge opening. The area 7 remains attached to the lid along the indentation 8 when the score lines 3 are torn. In this embodiment the lid 2 is further equipped with reinforcement ribs that have been pressed in the lid 2. The ribs 9 facilitate the tearing of the score lines 3 to achieve the discharge opening.

FIG. 2 is a three-dimensional view of the can 1 with the lid 2 according to the invention. The lid 2 has been mounted on the can 1 by use of commonly used crimping tool. The lid 2 has been crimped on the edge 10 of the can 1, and the crimping tool has made and indentation 11 in the lid 2 along the edge 10 of the can 1 to ensure the lid 2 is in a tight and sealed connection with the can 1.

In FIG. 2 it can be seen that the score lines 3 are part of the crimped lid 2, and that the area 7 to form a discharge opening is also part of the crimped lid 2.

FIG. 3 shows a can 1 with a lid 2 where the score lines have been torn and a discharge opening 12 has been formed by lifting the area 7 free of the part of the lid 2 that remains attached to the can 1.

Corresponding to FIG. 1, FIG. 3a is a front view of the can 1 with lid 2, in FIG. 3b the can 1 has been rotated 90 degrees and FIG. 3c is a top view of the can 1 and lid 2.

As it can be seen in FIG. 3a the area 7 is substantially frustum shaped and at the lower end 8 attached to the lid. The approximate frustum shape of the area 7 provides a corresponding approximate frustum shaped discharge opening 12 in the lid 2. Such a frustum shaped discharge opening is very suitable for drinking from the can 1. Moreover, lid part forming the area 7 remains attached to lid at the fastening area 8. In this manner the lid part 7 will not be separated from the lid
2 and the can 1 and end up as e.g. road litter and cause environmental problems. Moreover, in FIG. 3b the indentation 11 formed by the crimping tool can be seen on the lid part 7.

Furthermore, it can be seen that when the lid part 7 is opened to form a discharge opening 12 it will expose an area 13 on the edge of the can 1, which has been covered by the lid 2 until the opening. Consequently, this area 13 can be kept free of bacteria and other harmful substances that the can 1 and the lid 2 may be exposed to during storage and the present invention provides a very safe and hygienic solution for storing and consuming e.g. beverage.

FIG. 4 is a three-dimensional view of the can 1 with lid 2 where the discharge opening 12 has been opened by tearing up the lid part 7.

The FIGS. 5a, 5b and 5c show how the discharge opening 12 in the lid 2 of the can 1 is opened.

In FIG. 5a the lid 2 is closing and sealing the can 1.

In FIG. 5b the lid part 7 has been opened by use of the gripping device 6 and, thereby, giving access to the interior of the can 1 via the discharge opening 12. The lid part 7 is attached to the lid 2 by the area 8 forming an indentation in the lid 2.

In FIG. 5c the lid part 7 is turned over and laying substantially flat on the lid 2. When the lid part 7 is in this position it is very convenient to e.g. drink a beverage from the can using the opening 12 in the lid 2. The lid part 7 may be tilted back to close the can 1, e.g. to avoid insects entering the can. The tilting is done over the area 8.

FIG. 6 shows three different embodiments of the lid according to the invention.

FIG. 6a shows a lid 2 with a substantially circular cross-section. The lid 2 is equipped with score lines 3 from which an opening in the lid 2 can be formed by tearing the score lines 3 from the starting points 4 at the brim 5 of the lid 2.

At the brim 5 of the lid 2 between the score lines 3 a gripping device 6 is formed. The gripping device 6 is formed pull-ring like and is convenient to use.

FIG. 6b shows an embodiment where the score lines 3 are made in the lid 2 in such a way the lid part 7 intended to form an opening in the lid 2 becomes substantially rectangular. In this embodiment the gripping device 6 has the shape of a half-circle.

FIG. 6c shows a lid 2 that is substantially rectangular. At one end the score lines 3 and a gripping device 6 are formed. Such a lid may e.g. be suitable for cans containing powdered food or spices e.g. mustard powder.

Although the invention has been described with reference to only a few embodiments it is to be understood that the invention comprises several other embodiments, which are all within the scope of the present invention. The present invention has mainly been described with reference to a can in particular for beverage. However, the lid according to the invention is equally useful for other containers, such as containers for powdered food, e.g. powdered milk or spices.

1. A lid for a container, said lid being made from a thin plate-shaped material and adapted to be mounted on and to hermetically close the container, said lid comprising:
   - score lines where the thin plate-shaped material is adapted to be torn to form a discharge opening in the lid, where starting points for tearing the score lines are located at a brim of the lid; and
   - an area bulging out from the brim between the score lines to form a gripping device.

2. A lid according to claim 1, wherein the lid has a thickness in the range of 70 to 110 microns.

3. A lid according to claim 1, wherein at least a part of the lid comprises one or more reinforcements.

4. A lid according to claim 3, wherein the one or more reinforcements comprises pressed out ribs.

5. A lid according to claim 1, wherein the score lines forms a frustum shaped area on the surface of the lid.

6. A lid according to claim 1, wherein the lid is adapted to be mounted on the container by a crimping operation.

7. A lid according to claim 6, wherein a part of the score lines are crimped around rim of the container in the crimping operation.

8. A lid according to claim 1, wherein the container closed by the lid is a beverage can.

9. A lid according to claim 1, wherein the part of the lid forming the discharge opening remains attached to the lid after the score lines have been torn.

10. A lid according to claim 1, wherein the lid is adapted to be mounted on the container by a crimping operation and a part of the score lines are crimped around rim of the container in the crimping operation, such that the part of the lid forming the discharge opening remains attached to the lid after the score lines have been torn.

11. A lid according to claim 1, wherein the lid is made of metal.

12. A lid according to claim 11, wherein the metal is aluminum.