ABSTRACT

A lid for a container of the type having a peripheral lip at an open end, comprising a cover panel for generally covering the open end of the container. A peripheral wall is provided on the periphery of the cover panel. The peripheral wall is adapted to cooperate with the peripheral lip of the container for releasably securing the lid to the container. The peripheral wall has a tamper indicator tab defined by a slit through the peripheral wall, a frangible membrane intersecting the slit, and a protrusion cooperating with the peripheral lip of the container such that the frangible membrane is adapted to break upon removal of the lid from the container. An end of the tamper indicator lid is detached from a remainder of the lid to indicate that the lid has been removed from the container.
TAMPER INDICATOR LID FOR CONTAINER

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention generally relates to plastic-molded lid and containers and, more particularly, to a lid configuration that indicates tampering/pilfering of the contents of a container associated with the lid.

[0003] 2. Background Art

[0004] Plastic-molded container/lid assemblies represent an advantageous packing solution in some industries. Amongst the advantageous features of plastic-molded container/lid assemblies are the low cost of such assemblies (e.g., relatively low weight of material used), the resilience of the plastic they are made from, the ease of manufacturing such assemblies in various sizes and shapes. Plastic-molded lid/container assemblies are well suited for being used in production lines, due to their resilience, low weight and convenient shapes.

[0005] Plastic-molded container/lid assemblies are often used in the food industry, for instance in the packing of fresh foodstuff. These assemblies are conveniently usable on filing lines.

[0006] Plastic parts are vulnerable to tampering/pilfering, as they are often provided without any safety system to prevent such mischief. It would therefore be desired to provide a lid for plastic-molded lid/container assemblies configured to indicate marks of tampering, so as to indicate faulty products.

SUMMARY OF INVENTION

[0007] It is an aim of the present invention to provide a novel lid for a plastic-molded lid/container assembly.

[0008] It is a further aim of the present invention to provide a lid for a lid/container assembly, having a tamper indicator.

[0009] Therefore, in accordance with the present invention, there is provided a lid for a container of the type having a peripheral lip at an open end, comprising a cover panel for generally covering the open end of the container, and a peripheral wall on the periphery of the cover panel, the peripheral wall adapted to cooperate with the peripheral lip of the container for releasably securing the lid to the container, the peripheral wall having a tamper indicator tab defined by at least one slit through the peripheral wall, a frangible membrane intersecting the slit, and a protrusion cooperating with the peripheral lip of the container such that the frangible membrane is adapted to break upon removal of the lid from the container, whereby an end of the tamper indicator lid is detached from a remainder of the lid to indicate that the lid has been removed from the container.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Having thus generally described the nature of the invention, reference will now be made to the accompanying drawings, showing by way of illustration a preferred embodiment thereof and in which:

[0012] FIG. 1 is a perspective view of a lid in accordance with a preferred embodiment of the present invention;

[0013] FIG. 2 is a sectional view, enlarged, of the lid of FIG. 1, as mounted to a container, taken at a breaking tab;

[0014] FIG. 3 is an elevation view of the lid, illustrating the breaking tab;

[0015] FIG. 4 is a perspective view of the lid being removed from the container by a lift tab, whereby one of the breaking tabs is broken;

[0016] FIG. 5 is a perspective view of the lid mounted to the container, illustrating an attempt to remove the lid from the container by one of the breaking tabs; and

[0017] FIG. 6 is a sectional view, enlarged, of the lid of FIG. 1, as mounted to a container, taken at one of the lift tabs.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] Referring concurrently to FIGS. 1 and 2, a lid in accordance with a preferred embodiment of the present invention is generally shown at 10, as mounted to a container A (FIG. 2) having a lip B. The container A is a conventional plastic-molded container adapted for filling line applications.

[0019] The lid 10 is a recessed lid having a cover panel 12 of circular shape. A skirt 14 surrounds the periphery of the cover panel 12, so as to cooperate with the lip B of the container A whereby the lid 10 is held captive on the container A, and in sealing engagement therewith. Although the lid 10 is illustrated having a circular shape, it is pointed out that the lid 10 may also be provided in other shapes: rectangular, square, oval and the like. Moreover, a recess-type lid is illustrated in FIGS. 1 to 6 (e.g., for better leak resistance), but it is contemplated to provide the lid of the present invention in a non-recessed configuration.

[0020] Referring to FIG. 2, the skirt 14 of the lid 10 has an inner wall 20 at a junction of the skirt 14 and the cover panel 12. The skirt 14 also has an outer wall 21, connected to the inner wall 20 by a shoulder 22. The skirt 14 forms an annular cavity 23, in which a rim of the container A, bearing the lip B, will be accommodated when the lid 10 is secured to the container A.

[0021] More specifically, the outer wall 21 has an undercut 24 (i.e., or protrusion) in the annular cavity 23. The undercut 24 cooperates with the lip B of the container A, such that the
lid 10 is held captive onto the container A. A sealing abutment 29 projects from the shoulder 22 into the annular cavity 23, and will abut against the lip B when the lid 10 is secured to the container A.

[0022] As shown in FIG. 2, the configuration of the skirt 14 in relation to the geometry of the lip B of the container A provides three surfaces of contact to ensure a generally sealed engagement between the container A and the lid 10. Firstly, a portion of the inner wall 20 contacts an upper edge of the container A. Secondly, the sealing abutment 29 contacts the lip B of the container A. Thirdly, the undercut 24 contacts the free end of the lip B.

[0023] As shown concurrently in FIGS. 1 and 3, the outer wall 21 has a succession of tamper indicator breaking tabs 26 and lift tabs 28 on the periphery of the lid 10. In a preferred embodiment of the present invention, the breaking tabs 26 are each defined by a horizontal slit 25 and a pair of vertical frangible membranes 27 (or, alternatively, a single one of the membranes 27). On the other hand, the lift tabs 28 are portions of the outer wall 21 between the membranes 27, and without the horizontal slit 25. Although the lid 10 illustrated herein is provided with a plurality of breaking tabs 26, a single breaking tab 26 could be used, although use of such an embodiment would be suggested to indicate that the lid 10 has been fully removed from the container A.

[0024] The section view of FIG. 2 is taken at a section of the skirt 14 having a breaking tab 26. It is seen that the slit 25 extends into the annular cavity 23 of the skirt 14, such that the undercut 24 is separated into an upper protrusion portion 24A and a lower protrusion portion 24B. On the other hand, the section view of FIG. 6 is taken at a section of the skirt 14 having a lift tab 28, whereby the undercut 24 is not separated into two parts.

[0025] The membranes 27 each consist of a channel formed in the outer wall 21, resulting in a thinner strip of material. The membranes 27 each extend from a bottom edge of the outer wall 21 to an intersection with the slits 25, thereby defining the breaking tabs 26.

[0026] Therefore, the breaking tabs 26 define weaker portions of the outer wall 21, i.e., more likely to rupture due to the breakable connection between the breaking tabs 26 and the lift tabs 28. Accordingly, if the lip B of the container A exerts a pressure of the lower portion 24B of the undercut 24 as illustrated in FIG. 2, for instance by an attempt to force the lid 10 off the container A, one of the two membranes 27 of any one of the breaking tabs 26 will fracture, whereby the broken off breaking tab 26 will clearly show as having from one end to illustrate that the lid/container assembly has been tampered with. The broken-off breaking tab 26 is the tamper indicator of the lid 10.

[0027] Referring to FIG. 2, when the lid 10 is installed onto the container A, the lip B bends as a result of the action of the undercut 24 thereon, thereby enabling the lip B to be lodged in the annular cavity 23 of the skirt 14, without breaking the breaking tabs 26. The lid 10 is in a suitable position onto the container 10 when the sealing abutment 29 comes into contact with the lip B. It is pointed out that the lid 10 may be installed manually, or on automated equipment (e.g., of a conventional high-speed filling line), onto the container A.

[0028] In this position, the lip B is lodged in the annular cavity 23 defined by the skirt 14, and has its free end C held captive by the undercut 24. More specifically, as illustrated in FIG. 2, the free end C of the lip B abuts against the upper portion 24A of the undercut 24 opposite breaking tabs 26 in the skirt 14. As illustrated in FIG. 6, the free end C of the lip B abuts against the undercut 24 opposite the lift tabs 28, in addition to the other two contact surfaces between the lip B of the container A and the lid 10.

[0029] Referring to FIG. 2, when the lid 10 is removed from the container A, the free end C of the lip B catches the lower portion 24B of the undercut 24, such that the lid 10 cannot be removed unless additional force is exerted by the handler on the lid 10. The additional force will result in the break of at least one of the breaking tabs 26, due to the rupture of one of the vertical membranes 27 of the breaking tabs 26.

[0030] As illustrated in FIG. 4, in order to remove the lid 10 of the present invention from the container A, any one of the lift tabs 28 is lifted upwardly, whereby the adjacent breaking tab 26 will break as described previously. The lid 10 may thereafter be fully removed from the container A. Once breaking tabs 26 are broken, the lid 10 of the present invention may be reinstalled on the container A in scalable fashion. The above-mentioned surfaces of contact between the lid 10 and the container A ensure the sealing engagement therebetween.

[0031] As illustrated in FIG. 5, if pressure is exerted on one of the breaking tabs 26 in an attempt to remove the lid 10 from the container A, the cooperation between the lower portion 24B (FIG. 2) of the undercut 24 and the free end C of the lip B will prevent the removal of the lid 10 from the container A.

[0032] The lid 10 of the present invention may be advantageously molded in a single cycle, with a suitable polymeric material [e.g., polypropylene, polyethylene (LLDPE), polyethylene, and the like], to lower production costs. Alternatively, the lid 10 of the present invention may be subjected to a post-trimming step, wherein the horizontal slits 25 are cut according to the above-described configuration after the molding step. Various types of molding could be used to produce the lid 10 of the present invention, such as injection molding (e.g., thin-wall injection molding), thermoforming. The lid 10 may be printed, for instance, with conventional offset printing equipment. The lid 10 is configured so as to allow lid-to-lid stacking, for instance, using spin-bar or screw-type stacking equipment.

[0033] It is within the ambit of the present invention to cover any obvious modifications of the embodiments described herein, provided such modifications fall within the scope of the appended claims.

1. A lid for a container of the type having a peripheral lip at an open end, comprising:
   a cover panel for generally covering the open end of the container; and
   a peripheral wall on the periphery of the cover panel, the peripheral wall adapted to cooperate with the peripheral lip of the container for releasably securing the lid to the container, the peripheral wall having a tamper indicator tab defined by at least one slit through the peripheral wall, a frangible membrane intersecting the slit, and a protrusion cooperating with the peripheral lip of the
container such that the frangible membrane is adapted
to break upon removal of the lid from the container;
whereby an end of the tamper indicator lid is detached
from a remainder of the lid to indicate that the lid has
been removed from the container.
2. The lid according to claim 1, wherein the slit is
generally parallel to a bottom edge of the peripheral wall.
3. The lid according to claim 2, wherein the frangible
membrane is generally perpendicular to the slit.
4. The lid according to claim 2, comprising two of said
frangible membrane for each of the at least one slit, the
frangible membranes being positioned at opposed ends of
the at least one slit.
5. The lid according to claim 1, wherein the peripheral
wall is an outer wall of a skirt surrounding the cover panel.
6. The lid according to claim 5, wherein the skirt defines
an inner cavity adapted to accommodate the peripheral lip of
the container when the lid is mounted to the container, an
abutment being provided in the cavity and adapted to
sealingly abut against the peripheral lip.
7. The lid according to claim 1, wherein the peripheral
wall has an undercut adapted to support the peripheral lip of
the container such that the lid is releasably secured to the
container.
8. The lid according to claim 7, wherein the undercut is
separated by the at least one slit to define said protrusion at
a lower portion of the peripheral wall, and an upper portion
adapted to cooperate with the peripheral lip of the container
when the lid is secured to the container.
9. The lid according to claim 1, wherein the lid is
integrimed in a polymeric material.
10. The lid according to claim 1, comprising at least two
of the tamper indicator tab, the at least two tamper indicator
tabs being separated by pull tabs formed in the peripheral
wall.
11. A container assembly comprising:
a container having a peripheral lip at an open end; and
a lid having a cover panel for generally covering the open
end of the container, and a peripheral wall on the
periphery of the cover panel, the peripheral wall
adapted to cooperate with the peripheral lip of the
container for releasably securing the lid to the con-
tainer, the peripheral wall having a tamper indicator tab
defined by at least one slit through the peripheral wall,
a frangible membrane intersecting the slit, and a pro-
trusion cooperating with the peripheral lip of the con-
tainer such that the frangible membrane is adapted to
break upon removal of the lid from the container;
whereby an end of the tamper indicator lid is detached
from a remainder of the lid to indicate that the lid has
been removed from the container.
12. The container assembly according to claim 11,
wherein the slit is generally parallel to a bottom edge of the
peripheral wall.
13. The container assembly according to claim 12,
wherein the frangible membrane is generally perpendicular
to the slit.
14. The container assembly according to claim 12,
comprising two of said frangible membrane for each of the at
least one slit, the frangible membranes being positioned at
opposed ends of the at least one slit.
15. The container assembly according to claim 11,
wherein the peripheral wall is an outer wall of a skirt
surrounding the cover panel.
16. The container assembly according to claim 15,
wherein the skirt defines an inner cavity adapted to accom-
modate the peripheral lip of the container when the lid is
mounted to the container, an abutment being provided in the
cavity and adapted to sealingly abut against the peripheral
lip.
17. The container assembly according to claim 11,
wherein the peripheral wall has an undercut adapted to
support the peripheral lip of the container such that the lid
is releasably secured to the container.
18. The container assembly according to claim 17,
wherein the undercut is separated by the at least one slit to
define said protrusion at a lower portion of the peripheral
wall, and an upper portion adapted to cooperate with the
peripheral lip of the container when the lid is secured to the
container.
19. The container assembly according to claim 11,
comprising at least two of the tamper indicator tab, the at least
two tamper indicator tabs being separated by pull tabs
formed in the peripheral wall.

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