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(54) **Tamper evident seal**

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Sceau de garantie

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Description

This invention relates to a tamper evident inner seal for use on bottles, jars and other types of containers. More specifically, this invention provides a means for rendering a heat or adhesive sealed liner tamper evident by enabling the liner to tear upon removal or opening, while providing a peelable seal that does not leave seal residuals deposits attached to the container.

BACKGROUND OF THE INVENTION

A variety of "tamper proof", "tamper resistant" and "tamper evident" closures and seals have been disclosed and proposed for inhibiting improper or unauthorized opening of containers, or more importantly, to indicate to the ultimate consumer that such an opening has occurred. The main thrust behind this deluge of "tamper proof" or "tamper evident" closures is to protect consumers against third party tampering with the contents of the container, such as food or medicine, by placing them on notice or making it obvious to the consumers that such tampering may have occurred.

In U.S. Patent No. 4,555,037 to Rhees, a tamper evident seal is disclosed and claimed. The seal includes a sheet of material secured over the opening of the container with the peripheral portions of the material extending downwardly about and adhering to the exterior of the side walls of neck.

In U.S. Patent No. 2,016,936 to Waring, a re-seal type closure for a container is disclosed. The container closure comprises a re-seal cap and an inner disk seal as described in the preamble of appended claim 1, wherein a continuous uniform bond is formed within the edge of the material of the inner disk seal and the imperforate portion of this disk spans the mouth of the container. Application of a lifting stress to remove the disk from the top of the container results in the tearing of the disk to perforate or puncture the portion of the disk across the neck of the container.

In U.S. Patent No. 4,200,196 to Bashour, a cap for a bottle is disclosed which has a top portion for covering the open mouth of the bottle and two spaced rings extending therefrom to define a groove to receive an annular lip portion of the bottle. One of the rings can be angled toward the other and be flexible such that the lip of the bottle is fully grasped and maintained in the groove. The radially outer ring of the cap is provided with a plurality of circumferentially spaced weakened areas so that when the cap is removed from the bottle the outer ring will tear at at least one of the weakened areas to identify when a cap has become unsealed from its bottle.

Numerous attempts have been made over the years to provide tamper evident closures for packages which provide the consumer with some degree of comfort. The presently claimed invention provides such comfort by incorporating a means to render a heat or adhesive sealed liner more tamper evident by enabling the liner to tear upon removal while providing a seal which, upon

peeling, is totally removed from the container without leaving any seal residue which the consumer needs to remove prior to recycling of the container.

5 SUMMARY OF THE INVENTION

10 The present invention is related to a tamper evident, peelable seal with a peripheral portion which has a plurality of "V-shaped" notches for use on various containers such as bottles and jars, as claimed in claims 1 and 6. The seal comprises a sheet of directionally oriented material and the V-shaped notches are specifically designed so that one side of the V-shaped notch is cut on the perpendicular to the periphery of the seal. The unique combination of the V-shaped notches in directionally oriented material, in conjunction with the placement of the seal on the container provides for a means to render a heat or adhesive sealed liner tamper evident by enabling the liner to tear upon removal and also be fully peelable, so as not to leave any seal residue on the container.

DESCRIPTION OF THE DRAWINGS

25 Fig. 1 is a top plan view of the tamper evident seal.

Fig. 2 is a detailed drawing which shows the angle of each V-shaped notch and the preferred angle between the notches.

30 Fig. 3 is a perspective view of the tamper evident seal when it is partially adhered to a container.

DETAILS OF THE INVENTION

35 The present invention relates to a tamper evident seal which comprises a sheet of directionally oriented material with a peripheral portion having a plurality of V-shaped notches. The seal may be used on a variety of containers which are comprised of a hollow body for holding material, such as bottles or jars. The combination of the unique V-shaped notches in a directionally oriented material, in conjunction with the placement of the seal on the container, allows for a heat or adhesive sealed liner that tears upon removal and provides a fully peelable seal, which does not leave residual material on the container *i.e.*, no sealant or foil remains on the surface of the lip of the container.

40 Specifically, as shown in Fig.1, the tamper evident seal (1) of the present invention comprises a sheet of directionally oriented material with the peripheral portion (2) having a plurality of V-shaped notches (3) Fig. 1. One side or edge of the V-shaped notch (4) is cut on the perpendicular to the periphery of the seal, *i.e.*, the side of the notch with the edge of the seal forms a perpendicular or 90° angle. The second side of the V-shaped notch is then placed at an angle of from 40 to 50° from the perpendicular side, preferably 45° as shown in Figure 2. The perpendicular side of the V-shaped notch is critical to the proper working of the present invention to allow for the proper tearing or mutilation of the seal when force is

applied to remove the seal. The need for a perpendicular cut is directly related to the use of directionally oriented material, which can be defined as material which has a grain so that when pressure is applied, the material tears along or in the direction of the material grain.

In order to insure that a number of the perpendicular sides of the notches line up with or are co-directional with the grain of the material, the placement of the notches around the periphery is critical to the proper functioning of the tamper evident seal. The V-shaped notches are placed at specific set distances around the periphery of the seal. In a container with a round or circular opening, the optimum distance between the notches is 45° (7). If desired, it is possible to place the notches more closely together such as every 20 to 25° around the periphery, however the seal that is then formed with the container is not as strong as the optimum seal due to the increased number of non-contact points on the sealed periphery.

Additionally, this may also impact the economics of producing the tamper evident seal. As shown in Figure 2, the V-shaped notches must be placed so that the perpendicular side (4) of each V-shaped notch alternates from notch to notch. Specifically, looking downwardly at the seal as Fig. 1, if one V-shaped notch (9) has the perpendicular side on the left then the notch (10) to its left should have the perpendicular cut on the right side of the notch so that the two perpendicular cuts can be described as being side by side on the seal. This placement of the notches helps to insure that at least one, if not more, of the perpendicular sides of the notches fall along or in the direction of the grain on the tamper evident seal.

The tamper evident seal can be comprised of a variety of materials, provided that they are directionally oriented materials. An example of such a directionally oriented material and the preferred embodiment of the present invention is a combination of foil, polyolefin and mylar. This material provides the necessary barrier to protect the contents of the container while simultaneously allowing for an induction seal. Other examples of suitable directionally oriented materials include polypropylene, polystyrene, cellophane or the like.

The placement of the tamper evident seal on the container to be sealed is also critical to the proper performance of the seal (Fig. 3). The container (11) which is to be sealed can be any of a variety of containers provided it includes a hollow body (12) for holding material, a neck (13) at one end which extends from the body and terminates in a lip (14) which circumscribes an opening into which material is inserted and removed from the container. The container should also be comprised of a cap for placement over the opening onto the neck which covers the tamper evident seal, once it has been adhered to the container. Examples of containers which would benefit from this seal are glass or plastic bottles and jars which are used for holding food or pharmaceutical materials.

As shown in Figure 3, the tamper evident seal is placed on the lip (14) of the container to be sealed. The

seal is sized so that the outside circumference of the seal (2) is slightly larger than the outside circumference (15) of the lip of the container. The notches are cut so that the point or the tapered end just barely protrude into the sealing area and the tamper evident seal is adhered to the inside peripheral area of the lip (16) of the container. The sealing area is defined as that area of the lip of the container and that area of the tamper evident seal which come into direct contact with each other and which adhere to each other.

The optimal conditions, i.e., the optimal seal and the optimal peelability of the tamper evident seal occur when the tamper evident seal is adhered or sealed only to the inside periphery of the lip of the container, i.e., the tamper evident seal does not extend over the radii of the container. This critical placement of the seal in conjunction with the shape and placement of the notches on the seal provides for a unique tamper evident seal or liner in that the seal is easily peelable or removable from the container without leaving any adhesive or material residue on the container. This saves the ultimate consumer work in removing the seal and allows for easier recycling of the container.

Claims

1. A tamper evident seal (1) with a peripheral portion (2) having a plurality of V-shaped notches (3) each having two sides (4,5), characterized in that the seal (1) comprises a sheet of directionally oriented material and one side (4) of each V-shaped notch (3) is cut on the perpendicular to the periphery of the seal (1) and the second side (5) of the V-shaped notch (3) is placed at an angle of from about 40 to about 50° from the perpendicular side (4).
2. The tamper evident seal of claim 1 which is circular in shape and wherein the V-shaped notches (3) are spaced approximately every 45° around the periphery of the seal.
3. The tamper evident seal of claim 1 or claim 2, wherein the relative positions of the two sides of the V-shaped notches alternate from notch to notch.
4. The tamper evident seal of claim 1 wherein the directionally oriented material comprises foil, polyolefin and mylar.
5. The tamper evident seal of claim 1, wherein the second side (5) of the V-shaped notches (3) is at a 45° angle to the perpendicular side (4).
6. The tamper evident seal (1) of claim 1 for use on a container which includes a hollow body for holding material which has a neck at one end extending from the body to terminate in a lip and circumscribing an opening into which the material is inserted and removed from the container and a cap for placement

over the opening onto the neck, wherein the seal (1) includes a circular peripheral portion (2), the second side (5) of the V-shaped notch (3) is cut at an angle of 45° from the perpendicular cut, the V-shaped notches (3) are spaced approximately every 45° around the periphery of the seal (1) and the relative positions of the two sides (4,5) of the V-shaped notches (3) alternate from notch to notch.

Patentansprüche

1. Mißbrauch ersichtlich machende Versiegelung (1) mit einem Randteil (2) mit einer Mehrzahl von V-förmigen Kerben (3), die jeweils zwei Seiten (4,5) aufweisen, dadurch gekennzeichnet, daß die Versiegelung (1) eine Lage richtungsorientiertes Material umfaßt, und daß eine Seite (4) jeder V-förmigen Kerbe (3) senkrecht zum Umfang der Versiegelung (1) eingeschnitten ist, und die zweite Seite (5) der V-förmigen Kerbe (3) unter einem Winkel von etwa 40 bis etwa 50° von der senkrechten Seite (4) aus angebracht ist.
2. Mißbrauch ersichtlich machende Versiegelung nach Anspruch 1, welche eine kreisförmige Gestalt aufweist und bei welcher die V-förmigen Kerben (3) ungefähr alle 45° im Abstand um den Umfang der Versiegelung herum angebracht sind.
3. Mißbrauch ersichtlich machende Versiegelung nach Anspruch 1 oder Anspruch 2, bei welcher die Relativpositionen der beiden Seiten der V-förmigen Kerben von Kerbe zu Kerbe abwechseln.
4. Mißbrauch ersichtlich machende Versiegelung nach Anspruch 1, bei welcher das richtungsorientierte Material Folie, Polyolefin und Mylar umfaßt.
5. Mißbrauch ersichtlich machende Versiegelung nach Anspruch 1, bei welcher die zweite Seite (5) der V-förmigen Kerben (3) unter einem 45°-Winkel zur senkrechten Seite (4) angeordnet ist.
6. Mißbrauch ersichtlich machende Versiegelung (1) nach Anspruch 1 zur Verwendung auf einem Behälter, der einen hohlen Körper zur Aufnahme von Material umfaßt, welcher an einem Ende einen sich aus dem Körper erstreckenden Hals aufweist, der in einem Rand endet und eine Öffnung umschließt, durch welche das Material in den Behälter eingefüllt und daraus entnommen wird, sowie einen Deckel zum Anbringen über der Öffnung auf dem Hals, bei welchem die Versiegelung (1) einen kreisförmigen Randteil (2) umfaßt, die zweite Seite (5) der V-förmigen Kerbe (3) unter einem Winkel von 45° vom senkrechten Einschnitt aus eingeschnitten ist, die V-förmigen Kerben (3) ungefähr alle 45° im Abstand um den Umfang der Versiegelung (1) herum angeordnet sind, und die Relativpositionen der beiden

Seiten (4,5) der V-förmigen Kerben (3) von Kerbe zu Kerbe abwechseln.

Revendications

1. Dispositif d'étanchéité (1) protégé contre les manipulations comportant une portion périphérique (2) munie de plusieurs encoches (3) en forme de V, chacune comportant deux côtés (4, 5), caractérisé en ce que le dispositif d'étanchéité (1) comprend une feuille en une matière à orientation directionnelle, et un côté (4) de chaque encoche (3) en forme de V est découpé perpendiculairement à la périphérie du dispositif d'étanchéité (1), le second côté (5) de l'encoche (3) en forme de V étant placé en formant un angle d'environ 40 à environ 50° par rapport au côté perpendiculaire (4).
2. Dispositif d'étanchéité protégé contre les manipulations selon la revendication 1, qui est de forme circulaire et dans lequel les encoches (3) en forme de V sont espacées approximativement tous les 45° autour de la périphérie du dispositif d'étanchéité.
3. Dispositif d'étanchéité protégé contre les manipulations selon la revendication 1 ou 2, dans lequel les positions relatives des deux côtés des encoches en forme de V alternent d'encoche à encoche.
4. Dispositif d'étanchéité protégé contre les manipulations selon la revendication 1, dans lequel la matière à orientation directionnelle comprend une feuille mince, une polyoléfine et du Mylar.
5. Dispositif d'étanchéité protégé contre les manipulations selon la revendication 1, dans lequel le second côté (5) des encoches (3) en forme de V forme un angle de 45° par rapport au côté perpendiculaire (4).
6. Dispositif d'étanchéité (1) protégé contre les manipulations selon la revendication 1, à utiliser sur un récipient qui englobe un corps creux pour maintenir une matière, qui possède un col à une extrémité s'étendant à partir du corps pour se terminer en une lèvre et entourant une ouverture dans laquelle la matière est insérée et retirée du récipient, ainsi qu'un couvercle qui doit être placé par-dessus l'ouverture sur le col, dans lequel le dispositif d'étanchéité (1) englobe une portion périphérique circulaire (2), le second côté (5) de l'encoche (3) en forme de V est découpé en formant un angle de 45° par rapport à la découpe perpendiculaire, les encoches (3) en forme de V sont espacées approximativement tous les 45° autour de la périphérie du dispositif d'étanchéité (1) et les positions relatives des deux côtés (4, 5) des encoches (3) en forme de V alternent d'encoche à encoche.

FIG.1

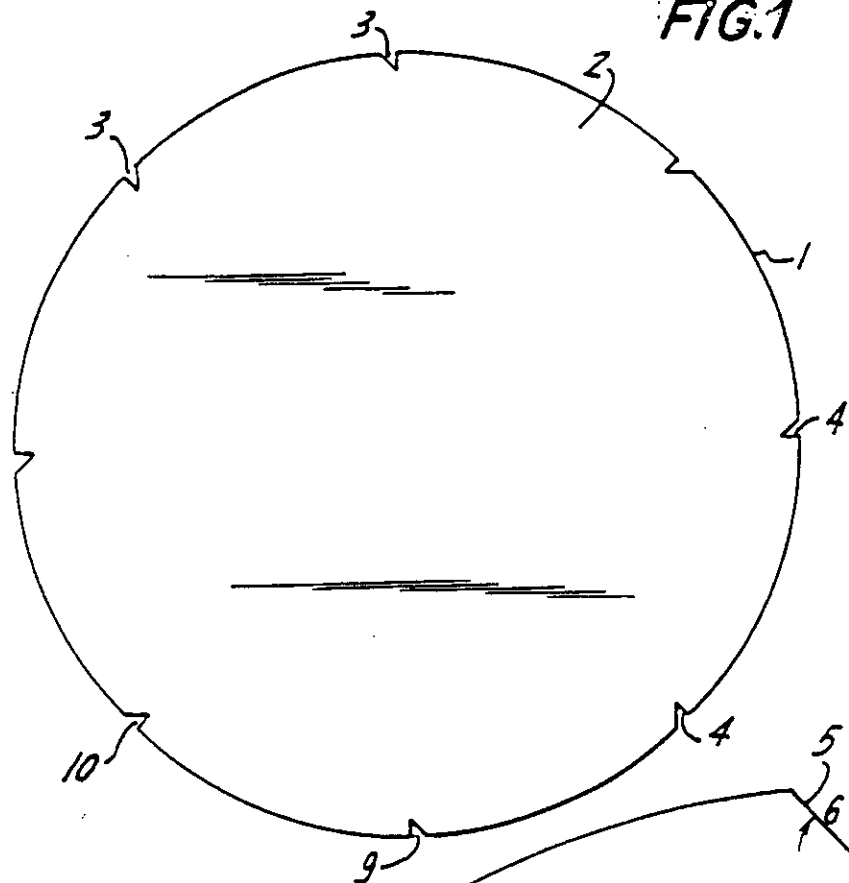


FIG.2

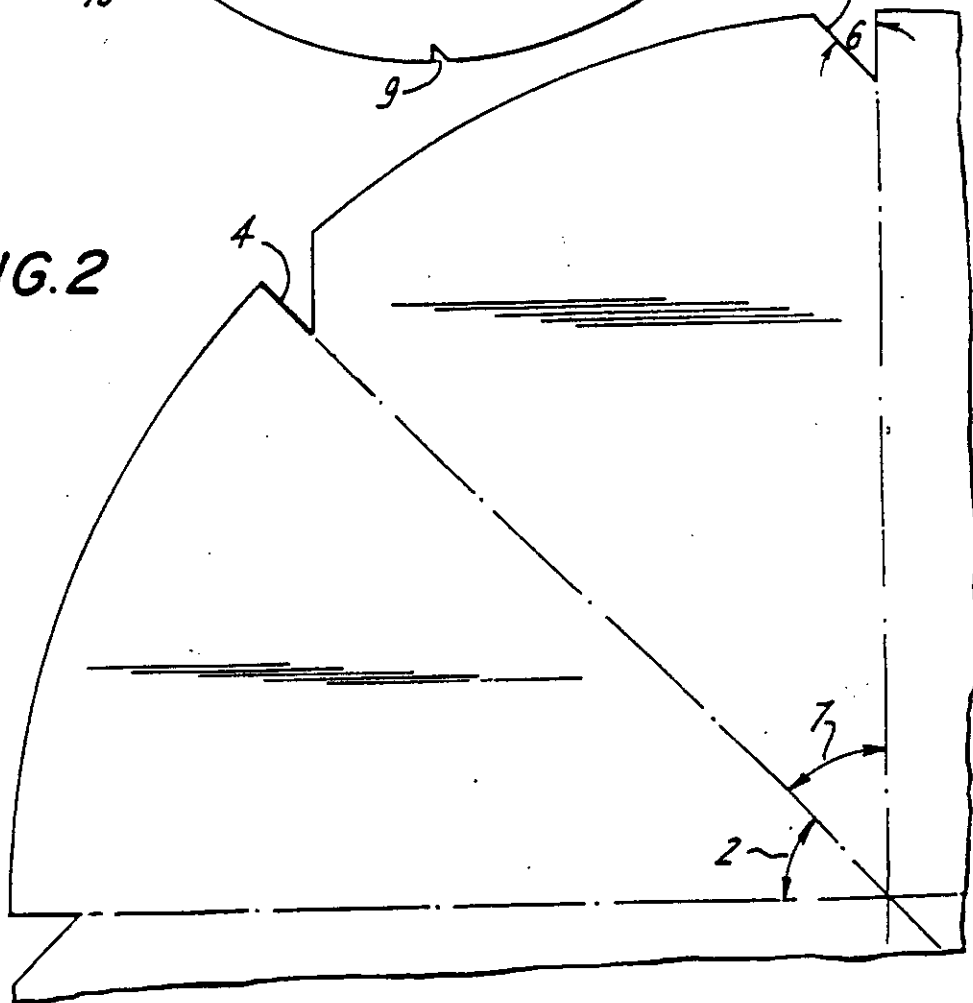
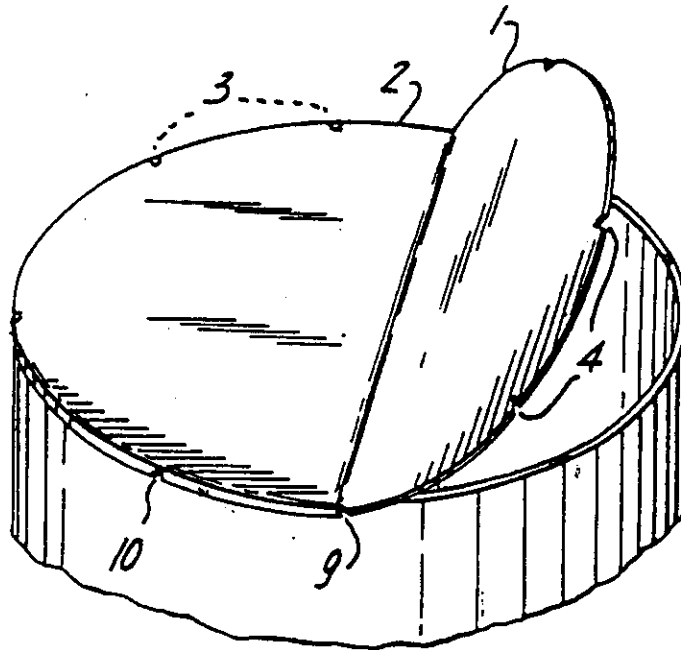


FIG.3



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