

Dec. 8, 1964

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3,160,325

TURN-TO-OPEN TAMPER-PROOF CLOSURE FOR CONTAINERS

Original Filed July 8, 1959

Fig. 1

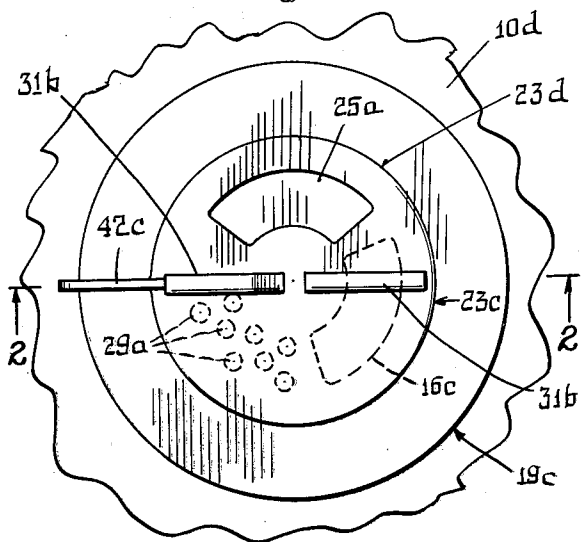


Fig. 3

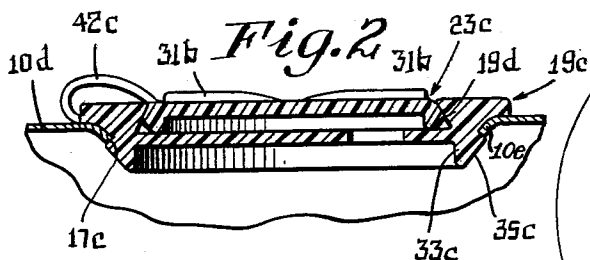
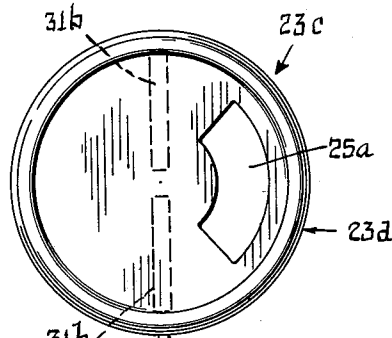
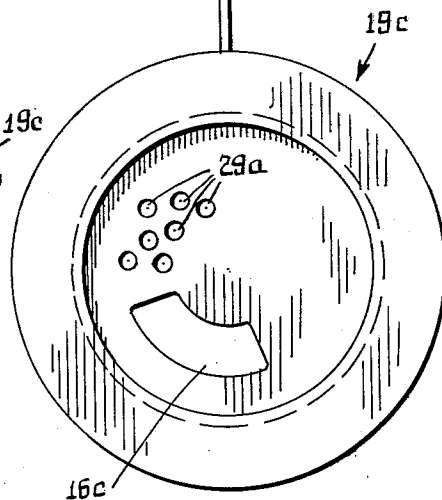


Fig. 2



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TURN-TO-OPEN TAMPER-PROOF CLOSURE FOR CONTAINERS

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 Original application July 8, 1959, Ser. No. 825,793, now Patent No. 3,081,011, dated Mar. 12, 1963. Divided and this application June 21, 1962, Ser. No. 206,124
 3 Claims. (Cl. 222-153)

This invention relates to closures for small containers such as cans, boxes and the like, and more particularly to closures which are turnably or rotatably mounted and which are actuated to open or close the container by a turning or rotary movement.

The invention embraces a closure construction originally disclosed and claimed in my copending application Serial No. 825,793 filed July 8, 1959 and entitled "Turn-To-Open Tamper-Proof Closure for Containers," now Patent No. 3,081,011, dated Mar. 12, 1963, of which the present application is a division.

In the past various types of turn-to-open closures have been proposed and produced. Generally these closures have consisted of a small disc of metal or other sheet material which was carried by a pivot secured to the container, the said disc having a dispensing opening or orifice which could be brought into registration with an opening of the containers, as by turning the closure disc, thereby to enable the contents of the container to be discharged. In some instances the closure disc had a plurality of small openings which were closely spaced, thereby to enable the closure to function as a sifting means or distributing device. Also, in some cases these rotary closures were provided with detent means such as stop lugs or the like to establish or fix their open and closed positions, and to retain the closures in desired positions or settings.

The use of these prior closures involved the provision of a pivot pin or rivet, and necessitated an assembly operation involving at least two parts in addition to the wall of the container. These parts, in the simplest type of closure, constituted the closure disc or body itself and the pivotal mounting means comprising the pin or rivet. Ordinarily it was not convenient or feasible to utilize automatic capping or assembling equipment in applying this type of closure to the container, due to the multiplicity of parts involved. Thus, the application or assembly of the closure often involved hand operations, which resulted in a somewhat costly procedure and end product.

Also, with these prior closures the container could be inadvertently opened due to accidental shifting of the closure to its open position, where conditions of rough handling were prevalent. And, what was still more important, there was no assurance when this prior type of closure was employed, that the contents of the container would not be tampered with or removed either in part or in whole.

The above disadvantages and drawbacks of prior-type rotary closures are obviated by the present invention, and one object of the invention is to provide a novel and improved turn-to-open closure which, when installed on a container, will provide an effective tamper-proof assembly, thereby discouraging and minimizing the likelihood of the container contents being removed or tampered with.

Another object of the invention is to provide a novel and improved rotary-type tamper-proof closure in accordance with the foregoing, which will be securely held and retained in its original closed condition despite rough handling and adverse conditions of use of the container prior to the actual authorized use of the contents.

Still another object of the invention is to provide an

improved tamper-proof turn-to-open closure for containers as above set forth, which is constituted of but a single integral piece or component and is so arranged that it may be readily applied to the container for automatic assembling or capping equipment.

A feature of the invention resides in the provision of an improved, one-piece wholly integral rotary-type closure which may be economically fabricated as a molded plastic part, by mass production techniques.

Another feature of the invention resides in the provision of a novel, one-piece molded tamper-proof rotary-type closure having cooperable friction-restrained portions adapted to constitute a friction grip or detent means, for holding the closure in any of various desired positions.

Still another feature of the invention resides in the provision of an improved tamper-proof closure as above set forth, which may be easily and quickly applied to the container by a simple pressing or snap-on operation.

In accomplishing the above objects and attaining the listed advantages there is provided in accordance with the invention a novel one-piece, wholly integral molded closure structure which is constituted essentially of an anchorage portion adapted to be fixed to the container, a closure portion which is manually turnable, and a thin frangible restraining web which is integral with and which connects the anchorage and closure portions to each other for the purpose of initially holding the latter portion against turning and in a position covering the opening of the container, said web being readily severable by the mere act of turning the closure portion with respect to the anchorage portion. Thus, the closure structure is truly tamper-proof since it is not possible or easily feasible to actuate the closure portion so as to open the container for discharge of the contents without fracturing or breaking the thin frangible web.

In the present embodiment of the invention only the anchorage portion is arranged to be secured to or mounted on the container wall, and the closure portion is so constituted that it is rotatably mounted on the anchorage portion itself and is cooperable therewith for purposes of dispensing the contents of the container. In this embodiment the imparting of any rotary movement to the closure portion for the purpose of uncovering the opening of the container will result in the connecting web being broken, thereby indicating that the closure was actuated in an unauthorized manner.

Other features and advantages of the invention will hereinafter appear.

In the drawings accompanying this specification, similar characters of reference have been used to designate like components or parts throughout the several views, in which:

FIG. 1 is a top plan view of a closure as provided by the invention, constituting an embodiment thereof. In this type of closure the anchorage portion is arranged to rotatably carry or mount the rotary closure portion, and such anchorage portion is therefore constituted as the part which is engaged with the container wall.

FIG. 2 is an axial sectional view, taken on the line 2-2 of FIG. 1.

FIG. 3 is a plan view of the closure shown in FIGS. 1 and 2 as it is received from the mold and prior to the portions of the closure structure being assembled to each other.

Referring to the figures, there is indicated by the numeral 10d a conventional type of can top or closure, which is constituted for example of sheet metal and may be provided with any suitable peripheral portion by which it is secured to the top edge of the container.

The container top 10 may have a depressed central edge portion 10e defining a large central opening indicated by the numeral 17c.

In accordance with the present invention there is provided, rotatably mounted on the top wall 10d of the container, a novel tamper-proof, rotary-type closure structure having a number of unique, desirable features and advantages. As shown, this closure structure comprises an anchorage portion of flexible or resilient plastic substance such as polyethylene or the like, carrying or mounting a closure portion of similar substance, the construction being characterized by the container top engaging and mounting only the anchorage portion of the construction, as distinguished from the disclosure of my copending application above identified wherein the anchorage and closure portions are individually mounted in separate openings in the container top.

As seen in FIG. 3, the anchorage portion of the structure is indicated at 19c, the closure portion is indicated at 23c, and there is provided by the invention a novel frangible connector in the form of a string-like loop which may be broken by merely turning the closure portion 23c with respect to the anchorage portion 19c, such connector being in the form of a thin, flexible, frangible restraining web indicated at 42c.

The anchorage portion 19c has a large discharge opening 16c, and has a plurality of small sifting discharge openings 29a as shown. Also, the closure portion 23c has a single large dispensing opening 25a which is of segmental shape, similar to the opening 16c in the anchorage portion 19c.

The closure portion 23c has a pair of radially extending finger-grip means comprising finger-engageable ribs 31b to enable the closure portion 23c to be easily turned or manipulated.

Referring to FIG. 2, the anchorage portion 19c has a mounting means comprising a depending flange 33c provided with a sloping, locking or detent shoulder 35c by which the anchorage portion will be retained in place upon its being pressed into the large central opening 17c of the container top 10d.

Also, the anchorage portion 19c is provided with a bearing means by which the closure portion 23c may be rotatably mounted thereon. This bearing means comprises a yieldable undercut shoulder 19d adapted to engage the sloping outer peripheral edge 23d of the closure portion, whereby the latter may be snapped in place on the anchorage portion and retained thereon against inadvertent removal.

The frangible restraining web 42c is shown as joining the peripheral edges of the anchorage portion 19c and the closure portion 23c of the closure construction.

Preferably, as provided by the invention, the organization is such that the anchorage portion, closure portion, and web may be completely formed and molded in a single molding operation, in the configuration illustrated in FIG. 3, wherein all said parts lie substantially in a single, common plane.

After the piece has been molded, the closure portion is swung upward and superposed on the anchorage portion, and pressed into place as illustrated in FIGS. 1 and 2, whereupon the closure construction is ready for application to the container top 10d.

The restraining web 42c will normally prevent the closure portion 23c from being turned to uncover the discharge opening 16c without detection, and accordingly the web 42c provides a tamper-proof means.

When it is desired to dispense the contents of the container, the closure portion 23c is merely forcibly turned to fracture or break the web 42c, which is made sufficiently thin and weak for this purpose whereupon the openings 16c and 25a may be aligned, or else the sifting openings 29a may be uncovered by bringing the opening 25a over them, thereby to enable the contents of the container to be dispensed.

The embodiment of the invention illustrated herein has the advantage of a tamper-proof construction, as with

the disclosure of my copending application identified, together with simplicity and economy in its fabrication. Also, it may be readily applied to container tops by automatic capping equipment, utilizing a suitable hopper feed.

It will be noted from FIG. 2 that the frangible web 42c constitutes a portion of a raised loop, and is positioned in a location by which it may be conveniently severed by a cutting instrument, if this should be desired.

Variations and modifications may be made within the scope of the claims, and portions of the improvement may be used without others.

I claim:

1. A turn-to-open tamper-proof closure structure comprising a one-piece entirely integral molded piece including an anchorage portion provided with means by which it may be secured to a container having a dispensing opening and by which it may be held thereon against movement, including a flat closure portion disposed on top of the anchorage portion and having finger-grip means enabling it to be forcibly turned, said closure portion being provided with a dispensing orifice and also with means for turnably mounting it on the anchorage portion whereby it may cover a dispensing opening of said container and, upon being turned, uncover such opening for discharge of the contents of said container, said molded piece further including a tensile holding means which is readily broken by finger power, said holding means comprising a tie member in the form of a thin frangible raised restraining string-like loop which is integral with and which connects the anchorage and the closure portions while these are in superposed relation for tensionally holding the closure portion against turning and in a position covering such opening, said loop being in full view and readily seen, and being readily severable by finger power when forcibly pulled by turning of the closure portion with the fingers, thereby to release said closure portion for subsequent free turning movement to its opening position, said closure portion being in the form of a disc, and said anchorage portion being larger than the closure portion and having bearing means for turnably mounting the closure portion thereon in overlapping relation thereto and said loop being readily accessible for cutting by a scissors inserted in part through it.

2. The invention as defined in claim 1, in which the anchorage portion has an annular bearing shoulder, and in which the means for turnably mounting the closure portion includes a cooperable annular bearing shoulder engageable with the shoulder of the anchorage portion, said closure portion being adapted to be pressed into a recess bounded by the annular bearing shoulder of the anchorage portion.

3. A closure as in claim 1, wherein the finger grip means comprises a finger-engageable rib which is disposed on the top of the closure portion and extends thereacross, said rib constituting a turn-handle for such portion, and wherein the said loop is connected to the closure portion at a location closely adjacent one end of the finger-engageable rib whereby breaking force for the loop is applied substantially directly from the rib as the closure portion is being turned by force applied to the rib.

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