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[11] 3,817,419

[45] **June 18, 1974**

- [54] **LATCH TO SECURE A CLOSURE ON A CONTAINER**
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- [22] Filed: **Feb. 22, 1972**
- [21] Appl. No.: **228,216**
- [52] **U.S. Cl.**..... **220/59, 220/60 R, 220/74**
- [51] **Int. Cl.**..... **B65d 43/10, B65d 45/18**
- [58] **Field of Search** **220/59, 60 R, 72, 74, 56**

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This disclosure is directed to a latch mechanism carried by a peripheral skirt of a container closure, the latch mechanism including a pair of spaced supporting straps of flexible material joined together by a bridging member, a latching hook disposed between the supporting straps and being carried by the bridging member, and the latching hook having a latching nose projecting toward the peripheral skirt whereby in the latched condition of the latch mechanism the latching nose is adapted for latching engagement against a container latching surface and is held thereat by the flexible nature of the and/or straps and/or a resilient gasket (compressed). Preferably the latch mechanism also includes an upright projection carried by the bridging member outboard of the latching nose and between the supporting straps against which pressure is applied to pivot the latching hook through the bridging member incident to latching and unlatching operations.

5 Claims, 2 Drawing Figures

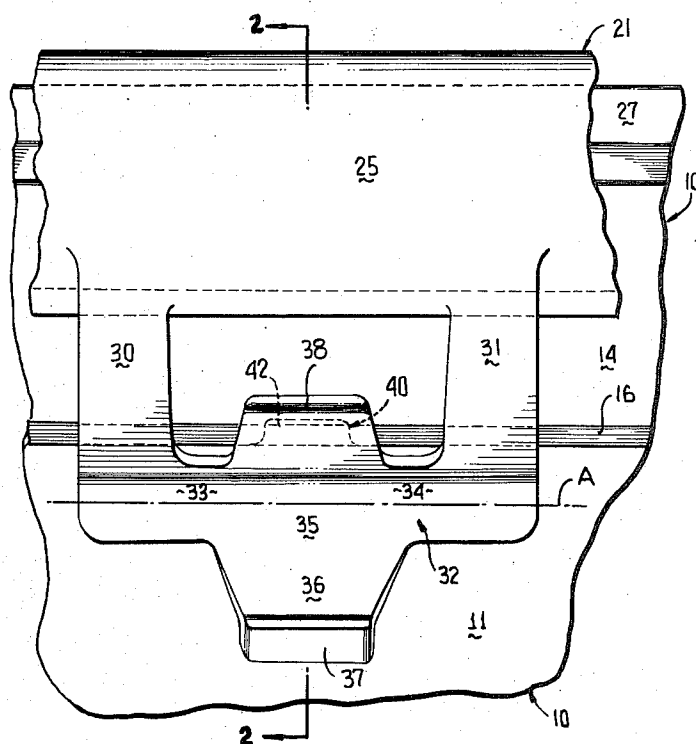


FIG. 1

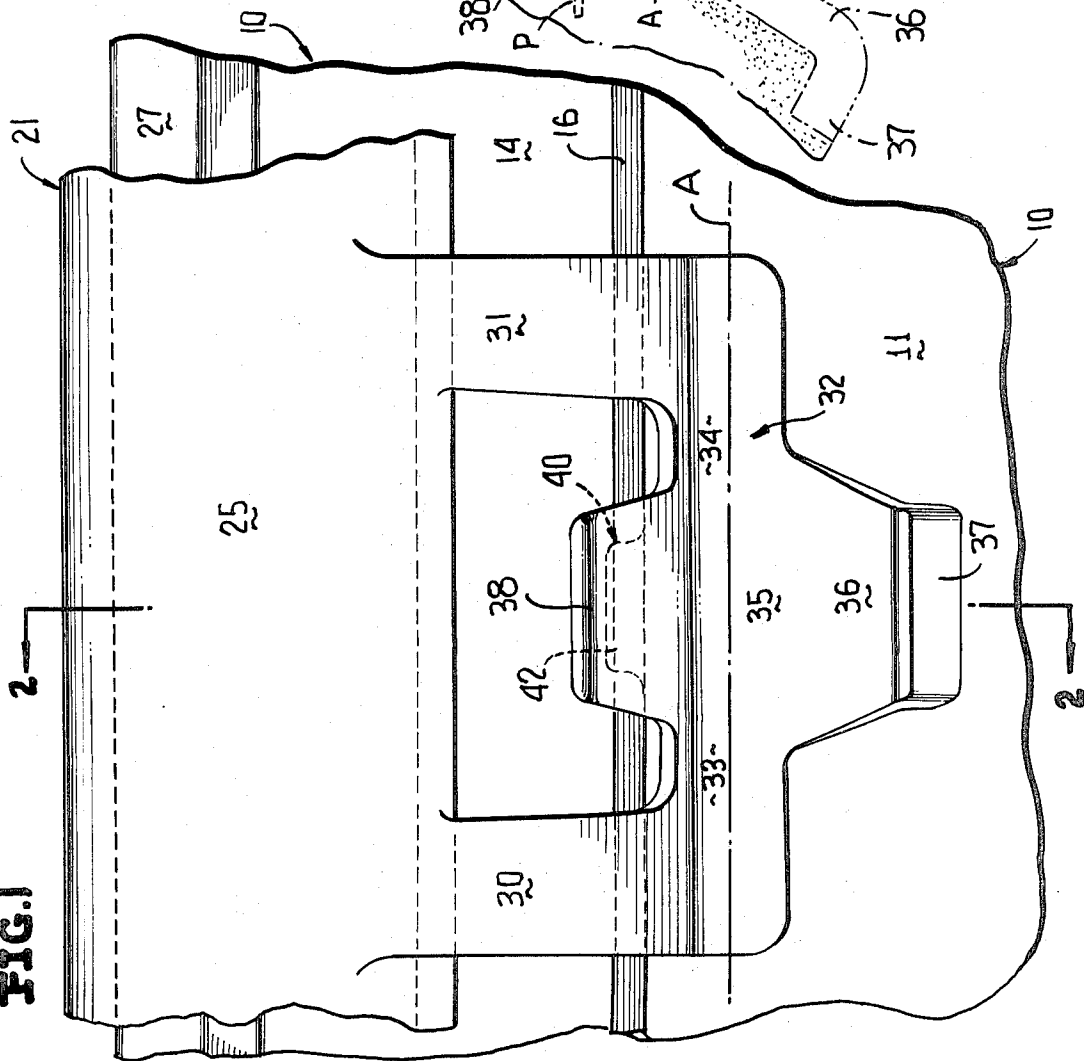
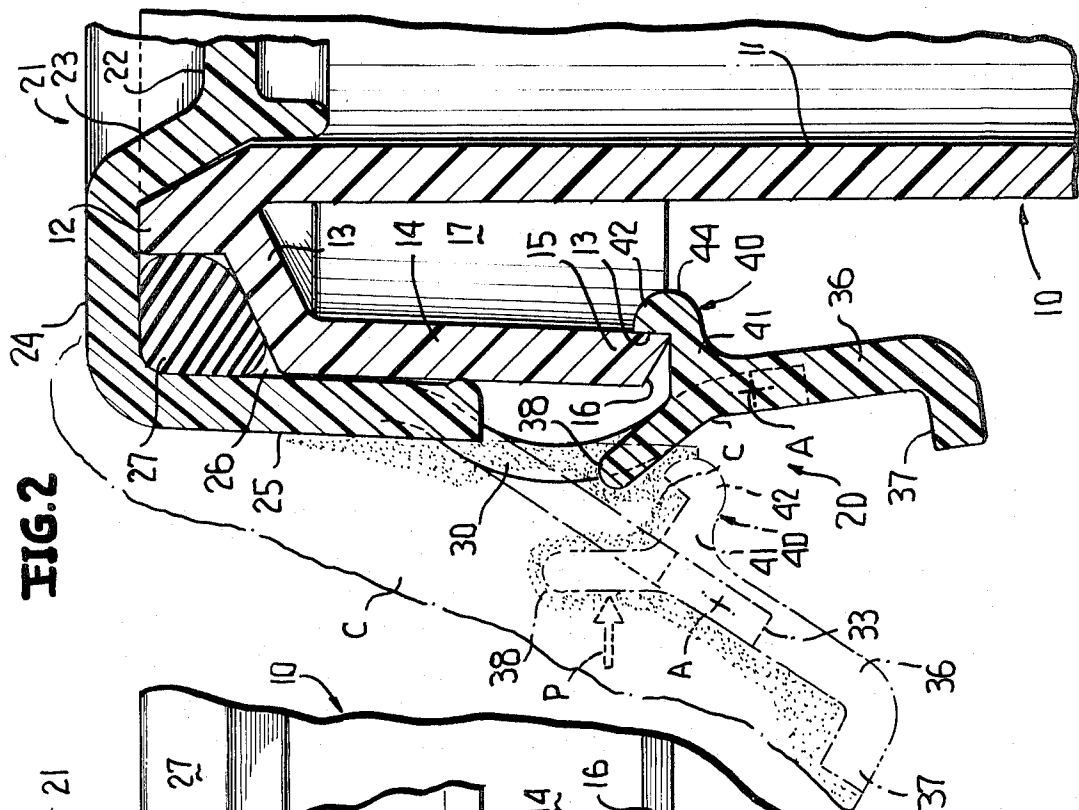


FIG. 2



LATCH TO SECURE A CLOSURE ON A CONTAINER

A primary object of this invention is to provide novel means for attaching or latching a closure to a container in order that the closure may be applied and sealed on a filling line, either automatically or manually, and may also be conveniently opened and resealed in use. The closure includes two or more latching mechanisms, each of which includes a pair of spaced supporting or suspending straps of flexible material joined together by a bridging member carrying a latching hook therebetween. By so suspending the latch mechanism by two straps the invention achieves the flexibility and adaptability necessary to function properly over a wide range of closure, container and gasket tolerances.

In further keeping with this invention, another object is achieved by the provision of an upright projection carried by the bridging member outboard of the latching hook and between the supporting straps against which pressure is applied to pivot the latching hook through the bridging member incident to latching and unlatching operations.

Yet another object of this invention is to provide a novel latching member of the type heretofore described wherein the latching hook includes a terminal latching nose having a leading surface adapted for sliding engagement against a beveled or cam surface of an associated container which reduces the resistance to closing and functions to draw the closure and container into sealing relationship.

Still another object of this invention is a novel method of molding the latching hook such that by its location between the supporting straps it is possible to injection mold the latching hook without undercuts by the latching hook projecting outwardly from the cavity of the mold thereby precluding mold ejection problems and avoiding alternate complicated and costly forming methods.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claimed subject matter, and the several views illustrated in the accompanying drawing.

IN THE DRAWING:

FIG. 1 is a fragmentary side elevational view of a container and closure in assembled and sealed relationship, and illustrates a latching mechanism suspended from a peripheral skirt of the closure by a pair of flexible supporting straps with their bridging member therebetween carrying a latching hook, a pressure-applying projection, and a handle.

FIG. 2 is a fragmentary sectional view taken generally along line 2—2 of FIG. 1, and more clearly illustrates the latching mechanism with its respective unlatched and latched positions being illustrated in phantom and solid outline, and with the cavity side of an injection mold being overlaid upon the unlatched and assembled position of the latching mechanism to illustrate the molding thereof.

A container 10 includes a body wall 11 which may be of a circular, rectangular or most any other shape having at an upper end thereof an upwardly directed rib 12. Projecting radially outwardly and downwardly therefrom is a flange 13 from which projects a peripheral skirt 14 having an inner latching or holding surface 15 and a beveled or camming surface 16 inclined radially outwardly and upwardly as viewed in FIG. 2. The body wall 11, the flange 13 and the peripheral skirt 14 define a downwardly opening annular chamber 17 extending about the entire upper exterior of the body wall 11. This permits a novel latching mechanism 20 of this invention to be latched to the peripheral skirt 14 irrespective of the precise manner in which a closure or cover 21 is seated thereupon.

The closure 21 includes a recessed end pannel 22, an upwardly and radially outwardly inclined wall 23, an annular wall 24 and a peripheral skirt 25. The wall 24 and the peripheral skirt 25 define with the rib 12 and the flange 13 a chamber 26 for receiving a gasket 27 of elastomeric or similar conventional sealing material. The gasket 27 is normally circular or oval-shaped in cross section but is distorted to the cross section illustrated in FIG. 2 when the closure 21 is drawn downwardly and the container 10 is drawn upwardly by the latch mechanism 20 during a latching operation, as will be described more fully hereinafter.

The latch mechanism 20 is one of two or more identical latch mechanisms spaced about the periphery of the closure 21 and suspended from the peripheral skirt 25 thereof by two straps 30, 31 joined together at ends (unnumbered) thereof remote from the peripheral skirt 25 by a bridging member 32. The bridging portion 32 has a pair of outboard portions 33, 34 of a reduced thickness and of a generally rectangular cross sectional configuration (FIG. 2), and a central enlarged portion 35. Projecting downwardly from the central enlarged portion 35 is a handle 36 having an outwardly directed end 37. Likewise, projecting from the central enlarged portion 35 of the bridging member 32 in an upward direction to assume a normally upright position is a projection 38. Also projecting from the central enlarged portion 35 of the bridging member 32 is a latching hook 40 defined by a shelf 41 and a latching nose 42 having a latching surface 43 and a leading or camming surface 44.

Assuming that the closure 21 has been loosely seated upon the container 10 with the latching mechanism 20 in the phantom outline or unlatched position of FIG. 2, as manual pressure is exerted against each projection 38, as indicated by the unnumbered broken arrow in FIG. 2, each latch mechanism 20 is rotated or bent toward the latched position during which time the lead surface 44 of each latching nose 42 contacts and rides on the beveled surface 16 of the container peripheral skirt 14. This action sets up forces that pull the closure 21 down while forcing the container 10 up thereby compressing the gasket 27 between the annular wall 24 and the flange 13 to bring the closure 21 and the container 10 into sealed relationship. Upon reaching the solid outline position in FIG. 2, each latching mechanism 20 seats with the latching surface 43 of the latching nose 42 contacting the latching surface 15 of the container peripheral skirt 14. At this point it will be noted that the straps 30, 31 are bowed and the inherent flexibility thereof continually urges the latching nose 42 to the left as viewed in FIG. 2 to maintain the latching surfaces 15, 43 in intimate latched relationship. The peripheral skirt 14 also bears against the shelf 41 to hold the gasket 27 in its compressed or sealed condition relative to the closure 21 and the container 10.

In order to minimize the forces necessary to perform the latching operation heretofore described, it is desirable to have the closing pressure P applied to each latching mechanism 20 at a point that would tend to force the latching hook 40 to pivot or rock around the beveled surface 16 of the container peripheral skirt 14 without depending exclusively on the reaction between the beveled surface 16 and the lead surface 44 to force the latching nose 42 into its latched position. This desired objective is accomplished by the projection 38 which permits the closing pressure P to be applied at a point well above the pivot axis A of the bridging member 32 which is, of course, the pivot axis of the latching hook 40. By applying the latching pressure P against the projection 38, as indicated in FIG. 2, the entire latch mechanism 20 will be urged toward its latched position and the pressure P will also tend to force the latching hook 40 to pivot or bend clockwise, as viewed in FIG. 2, about the pivot axis A so that it wedges or rides along the beveled surface 16 of the peripheral skirt 14 with a minimum of resistance. When the closing pressure P is thereafter released, the nose 42 snaps into the locked position against the latching surface 15, and this operation may be performed by an automatic closing machine or manually.

The cover may be conveniently unlatched by wedging a finger (or other tool) between the wall 11 of the container and the inner surface of the handle 36 and applying outward pressure, while applying inward pressure to projection 38 as indicated by the unnumbered broken arrow in FIG. 2. These forces will cause the latching mechanism to pivot clockwise and release the latch from the skirt.

The construction thus far described achieves the objectives earlier mentioned with respect to the mechanical operability of the latching mechanisms 20, but as important is the ease of constructing the closure 21 and the latching mechanisms 20 thereof by an injection molding operation performed in the complete absence of undercuts or other alternate methods of forming which are complicated, costly, and do not allow complete freedom of latching hook design. By referring to FIG. 2 the stippled area illustrates the cavity side C of an injection mold with the as-molded condition of the latching mechanism 20 being that illustrated in phantom outline. By in effect forming a space into which the projection 38 is disposed between the straps 30, 31 the latching nose 42 protrudes outwardly from the cavity of the mold and the latching hook 40 can thereby be molded as an integral part of the closure 21 without forming any undercuts that would lead to problems in ejecting the closures from the mold. If, for example, a

completely solid wall section were employed to in effect close the opening between the straps 30, 31 and the bridging member 32, the entire latching hook 40 could not be formed by a projection from the cavity side C, as is readily apparent from FIG. 2 which shows a portion C' of the cavity side C of the mold projecting through the opening between the straps 30, 31 and the bridging member 32 to form the latching hook 40.

While preferred forms and arrangements of parts have been shown in illustrating the invention, it is to be clearly understood that various changes in details and arrangements of parts may be made without departing from the spirit and scope of this disclosure.

We claim:

1. A closure comprising an end panel and a depending peripheral skirt, a latch mechanism carried by said skirt, said latch mechanism includes a pair of spaced supporting straps of flexible material joined together by a bridging member, a latching hook disposed between said supporting straps and being carried by said bridging member, said latching hook having a latching nose projecting toward said peripheral skirt whereby in the latched condition of said latch mechanism said latching nose is adapted for latching engagement against a container latching surface and is held thereat by the flexible nature of said supporting straps, and an upright projection carried by said bridging member outboard of said latching nose and between said supporting straps against which pressure is applied to pivot said latching hook through said bridging member incident to latching and unlatching operations.

2. The closure as defined in claim 1 wherein said latching nose includes a leading surface adapted for sliding engagement against a cam surface of an associated container for drawing the closure and container into sealing relationship.

3. The closure as defined in claim 1 including a handle joined to said bridging member and projecting therefrom in a direction away from said supporting straps.

4. The closure as defined in claim 1 including a handle joined to said bridging member and projecting therefrom in a direction away from said supporting straps, and said latching hook, upright projection and handle are positioned generally centrally of said support straps.

5. The closure as defined in claim 4 wherein said latching hook, upright projection and handle are of a generally Y-shaped cross-sectional configuration as viewed in a plane taken therethrough between and parallel to said supporting straps.

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