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DOUBLE HINGING CAP

The invention is generally concerned with the packaging and dispensing of flowable material, and more particularly relates to a cap construction which allows for selective and controlled access to and discharge of material through independently manipulable closure elements with cooperating components.

In the dispensing of a wide range of flowable products, for example flour, grated cheese, spices, and the like, is frequently desirable to provide for both a sprinkling discharge of the material and a bulk discharge thereof. This is accommodated by the provision of selectively accessible discharge ports, one of which may consist of a plurality of small sprinkling apertures, and another which may include one single enlarged opening through which the material can be poured or spoon fed.

In order to accommodate such diverse selectively usable discharge ports, it is known to provide a cap rotatably mounted on the container for a selective exposure of the ports.

Alternatively, the cap may incorporate dual closures or lids, each associated with a different port and selectively movable to expose the port. An example of such a construction will be noted in the spice container of Hidding, U.S. Patent No. 4,369,901, issued January 25, 1983. In Hidding, each of the closure elements is separately hingedly or pivotally mounted and includes a protuberance which snap-locks into a niche. A separate protuberance and niche combination is provided for each of the closure elements to selectively lock the closure elements in an open position.

A similar cover or cap with multiple pivoted closure elements will also be seen in U.S. Design Patent No. 200,270, issued to Waterman on February 9, 1965.

Such covers, as suggested in the Hidding patent, will advantageously be fabricated as a unitary structure from a suitable, molding grade thermoplastic resin, such as polyethylene, the particular nature of the material allowing for the formation of integral hinges along grooves or areas of reduced thickness formed therein. The formation of hinges in this manner is well known and will also be noted in the following patents:

U.S. 3,289,877	Wolf	December 6, 1966
U.S. 3,629,901	Wolf	December 28, 1971
U.S. 4,457,458	Heinol	July 3, 1984

It is an object of the invention to provide an improved double hinging container cap.

According to ~~one aspect of~~ the invention there is provided a container cap construction comprising first and second longitudinally spaced closure lids, first and second spaced parallel hinges respectively mounting said first and second lids for independent hinged movement of said lids about parallel axes spaced longitudinally between said lids and extending transversely of said cap, and a spring strip extending between said lids, said spring strip including first and second pivot axes respectively joining the spring strip and the first and second lids, said pivot axes alternatively defining proximal and distal pivot axes relative to the first and second closure lids, said first and second pivot axes paralleling said first and second hinges respectively in longitudinally outwardly spaced relation thereto, said first and second pivot axes in the position of the cap construction in which both lids are closed, lying on a first side of the common plane of said first and second hinges, and the arrangement being such that upon hinged movement of either closure lid towards an open position, the respective said proximal axis moves through and beyond the common plane of said first and second hinges to an overcenter position thereby biasing the moved lid to said open position with the distal pivot axis remaining to the first side of said common plane.

An embodiment of the invention is described below by way of example, with reference to the accompanying drawings, wherein:-

FIGURE 1 is a perspective view of the upper portion of a container with the cap of the present invention mounted thereon;

FIGURE 2 is an exploded perspective view of the cap and an associated container seal to which the cap cooperatively mounts;

FIGURE 3 is a perspective view of the cap with one closure thereof pivoted upward into its open position;

FIGURE 4 is a top plan view of the container mounted cap;

FIGURE 5 is a side elevational view of the container mounted cap;

FIGURE 6 is a longitudinal cross-sectional view taken substantially on a plane passing along line 6-6 in Figure 4;

FIGURE 7 is a transverse cross-sectional view taken substantially on a plane passing along line 7-7 in Figure 4;

FIGURE 8 is a transverse cross-sectional view taken substantially on a plane passing along line 8-8 in Figure 4;

FIGURE 9 is a view similar to Figure 5 with one of the closures in its upwardly pivoted open position;

FIGURE 10 is a longitudinal cross-sectional view with the closure upwardly pivoted as in Figure 9;

FIGURE 11 is a side elevational view with the second closure upwardly pivoted;

FIGURE 12 is a longitudinal cross-sectional view with the second closure upwardly pivoted as in Figure 11; and

FIGURE 13 is a schematic detail illustrating the hinge relationship whereby overcenter locking is achieved.

Referring now more specifically to the drawings, reference numeral 10 is used to generally designate a package for flowable material, such as spices. The package 10 comprises an open-topped container 12, a seal 14 mounted, normally by snap-fitting, to the upper mouth of the container 12, and a double hinging cap 16 snap-locked to the seal.

The seal 14 includes a peripheral depending skirt 18 configured to frictionally engage and snap-lock to the slightly flared peripheral upper edge portion 20 of the container 12. The seal 14, conforms with the container 12 and is generally oblong with a pair of opposed raised platforms 22 and 24. The platform 22 has an enlarged port or opening 26 therethrough

which can be used for pouring or spooning the product from the container 12, and might in fact also be used as a filling opening. The platform 24 presents a port in the form of multiple apertures 28 for a sprinkling or sifting discharge of the container contents.

A transverse mounting platform 30 is defined transversely across the seal between the material discharge platforms 22 and 24 and is recessed relative thereto. Centrally of the mounting platform 30 is a pair of spaced centrally apertured vertically projecting bosses 32 with a transverse reinforcing rib 34 therebetween. The bosses 32 project slightly above the level of the two discharge platforms 22 and 24.

The cap 16 is formed as a unitary member from an appropriate thermoplastic resin such as polyethylene or polypropylene, providing a construction which, while relatively rigid, includes a degree of resiliency and the inherent capability of withstanding repeated flexing, without breakage, at hinge areas defined therein.

The cap 16 includes a pair of aligned longitudinally spaced closures or lids 36 and 38 respectively aligned over the seal platforms 22 and 24. The lid 36 includes a depending

skirt 40 configured for frictional reception within the spooning opening 26 for a selective sealing thereof. The closure or lid 38 includes multiple depending protuberances 42 which nest within the sprinkling openings 28 and defined seals therefor. Two of the protuberances 42, preferably the outermost ones thereof, include depending posts 44 for a releasable snap-locking within a pair of the corresponding openings 28 as a closure retaining means. As an additional sealing feature, the cap 16 also includes a depending peripheral skirt 46 engagable peripherally about the platforms 22, 24 and 30. In order to provide both a tactile and a visual indication of the nature of the underlying port, the lid 38 can be provided with surface depressions 43 formed in conjunction with the protuberances 42.

The closures or lids 36 and 38 are integrally interconnected by an inboard hinge strip 48 and a pair of opposed outboard spring or positioning strips 50, each separated from the inboard hinge strip by an elongate slot 52.

The inboard hinge strip 48 comprises a central hinge plate 54 integrally joined to the closures or lids 36 and 38 by a pair of integrally molded or formed hinges 56 in parallel

relation to each other spaced longitudinally of the cap 16 and extending transversely thereof.

5 The outboard spring strips or positioning strips 50
each include a central plate 58 integrally joined to the
opposed closures or lids 36 and 38 by a pair of hinges 60
paralleling the hinge strip hinges 56 in closely spaced
longitudinally outward relation thereto. The dimension
10 of each outboard strip central plate 58, in the longitudinal direction of the cap 16, is greater than that
of the central hinge plate 54. It will also be noted
that the oblong central portion of the cap 16 is elevated
relative to the peripheral portion, defining a platform
with the corresponding inboard hinge strip 48 in a plane
15 which is spaced upwardly from, but parallel with, the
plane of the two outboard positioning strips 50.

In each instance, the hinges 56 and 60 are formed
by an appropriate reduction in the thickness of the
20 material, normally effected in the molding process and in
a manner known in the art.

The actual mounting of the cap 16 on the seal 14 is
effected by a pair of depending lugs or studs 62
25 integrally formed with and depending from the hinge plate
54 for snap-locking within the apertured bosses 32 of the
seals 14. If a _____

permanent mounting of the cap 16 is desired, the lower ends of the studs 62 can be deformed after engagement through the apertured bosses 32. When mounted, the opposed closures 36 and 38 are individually manipulable between a port closing planar position and a port opening upwardly hinged position as will be noted in particular in Figures 9-12. Actual manipulation of the lids can be facilitated by an appropriate projecting edge lip or flange 64 at the longitudinally outer edge portion of each lid.

With regard to the manner of manipulation of the cap 16, and more particularly the dual closures or lids 36 and 38, it will initially be noted that the lids 36 and 38, in the closed positions thereof as illustrated in Figures 1, 5 and 6, are in a stable position with the inboard hinge strip 48 and outboard positioning or spring strips 50 in vertically offset parallel planes. Upon an upward pivoting of either lid, 36 or 38, to the open position thereof, as noted in Figures 9-12, the lid will hinge about an axis defined by the immediately adjacent hinge strip hinge 56. The central hinge plate 54, by which the cap 16 is mounted, remains in a stable fixed position paralleling the seal 14.

With continued reference to Figures 9-12, and with particular attention to Figure 13, as the lid, either 36 or 38, is upwardly hinged or pivoted about the axis of the proximal hinge strip hinge 56, each of the positioning strips, through the associated hinges 60 and the inherent resiliency of these hinges in particular, is upwardly offset to an overcenter position relative to the folded hinge strip hinge 56. In so moving, the hinges 60 of each of the spring strips or positioning strips 50 cooperate. The hinges 60 proximal to the moved lid fold at an angle substantially equaling the angle of the corresponding hinge strip hinge 56 with the common axis of these proximal positioning strip hinges 60 being upwardly offset above the axis of the corresponding hinge strip hinge 56. At the same time, the remote or distal hinges 60 of the positioning strips 50 cooperate to allow for a slight upward pivoting of the central plates 58 of the positioning strips 50 about an axis paralleling the axis of the proximal strip hinges 60. Noting Figure 13 in particular, in so folding about the parallel axes defined by the positioning strip hinges 60, the positioning strips 50 assume an upwardly angled overcenter position, designated by the dash line 66, which biases the folded lid to its upwardly swung open position whereby a

positive manual movement of the lid would be necessary to move the lid to its closed or at rest position.

It is considered of particular significance that the paired hinges 60 of each spring strip 50, laterally spaced from each other in a longitudinal direction along the cap, cooperatively function to provide for a biasing of each of the lids, alternatively functioning as either a primary hinge folding to conform to the full folding movement of the corresponding lid, or as a secondary hinge folding only sufficient to accommodate the upward movement of the fully folded hinge above the primary hinge strip hinge 56 to an upwardly offset overcenter position. Thus, the dual hinges 60 on each of the positioning strips 50 provide dual functions, in each instance in cooperation with each other with the particular function of the hinge determined by which of the two closures or lids 36 or 38 is being manipulated. As previously indicated, the actual spring-lock function of the positioning strips 50 is achieved by the provision of the strips 50 in a plane parallel to and below the plane of the hinge strip 48 with the positioning strip hinges 60 being parallel to and longitudinally outward of the corresponding hinge strip hinges 56. The slots 52 which separate the inboard hinge strip 48

from the outboard positioning strips 50 extend, in each instance, longitudinally beyond the hinge strip hinges 56 and terminate at the longitudinal outer extremities of the positioning strip hinges 60.

It is to also be appreciated that the relationship of the positioning strips 50 to the inboard hinge strip 48 is such whereby as each open closure or lid is moved toward the closed position, the axes of the associated primary or fully folded positioning strip hinges 60 will, through a pivoting of the corresponding central plates 58 of the positioning strips 50, move vertically downward below the corresponding hinge strip hinge 56 and thus assume a lower overcenter position which will result in a biasing of the pivoted lid to its horizontal or closed position on the container seal 14. In this manner, the inherent biasing action of the positioning strips 50 will enhance the engagement of the lids with the seal. Further, the parallel vertically offset relation between the inboard hinge strip and the outboard positioning strips tend to provide offset stabilizing forces which in turn result in a stable horizontal positioning of the cap 16 until physically manipulated.

From the foregoing, it will be appreciated that a unique dual lid cap has been defined wherein each lid is mounted for pivotal movement between open and closed positions and selectively biased into said positions by an overcenter arrangement of associated positioning strips. The positioning strips, through a pair of cooperating hinges, are operative to bias either lid through the dual functionality of the cooperating hinges and without necessitating duplicate single function components.

To summarise, the double hinging cap described with reference to the drawings of the present invention provides for dual independently manipulable closures or closure elements having shared components common to both closures and cooperatively arranged therewith to provide for a positive positioning and retention of each closure in either the open or closed position thereof.

The shared components, in the specific operation thereof, differ in accord with the particular closure being manipulated. In each instance, these shared components are closure positioning components which, through an overcenter alignment action, will selectively bias either closure in either the open or closed position thereof until a specific manual displacement of the closure to the other position. No mechanical interlock, for example of the type requiring engagement of protrusions within niches, is required. Rather, a pair of common or shared positioning strips 50, each provided with a pair of cooperating hinges, is jointly utilised by the two closure elements for the selective retention of either closure element upon a manual manipulation of the particular closure element. The arrangement of the positioning strips are such as to provide for the duplicating of the function thereof for sharing by the two

closure elements, without necessitating duplicate structure.

5 The cap includes a pair of longitudinally aligned
closures or lids 36, 38 each hingedly secured, by a separate transverse integral or living hinge 56, to a central hinge plate 54. The hinge plate 54 and associated hinges define an inboard hinge strip integrally joining the
10 strip, to each side thereof and spaced therefrom by narrow slots, are a pair of parallel outboard spring or positioning strips 50, each also joining the closures or lids. Each of the positioning strips includes a central panel which, at the opposite longitudinal ends thereof,
15 is integrally joined to the opposed closures or lids by a pair of outboard hinges paralleling the inboard hinges in longitudinally outwardly spaced relation thereto.

20 The outboard positioning strips 50 are defined in a plane parallel to and laterally spaced below the plane of the hinge strip and are formed in a manner whereby a stable relationship is effected upon a horizontal orientation and alignment of the closures hinge strip and positioning strips. Upon a raising of either of the
25 closures or lids, through a pivoting thereof about the hinge joining the chosen closure to the hinge plate, both positioning strips will be subjected to tension with the corresponding hinges, proximal the closure being manipulated, folding in accord with the primary closure
30 hinge and, through a related pivoting of the remote positioning strip hinges, moving upwardly to an over-center position above the primary hinge. As the proximal positioning strip hinges move overcenter beyond the
35 primary hinge, the inherent resilient memory thereof, and the release of manual pressure on the manipulated closure, will result in a tendency for the positioning strips to contract and fix the manipulated closure in its

moved or open position. Such action will be duplicated, with the function of the corresponding hinges reversing, upon manipulation of the other closure.



CLAIMS

1. A container cap construction comprising first and second longitudinally spaced closure lids, first and second spaced parallel hinges respectively mounting said first and second lids for independent hinged movement of said lids about parallel axes spaced longitudinally between said lids and extending transversely of said cap, and a spring strip extending between said lids, said spring strip including first and second pivot axes respectively joining the spring strip and the first and second lids, said pivot axes alternatively defining proximal and distal pivot axes relative to the first and second closure lids, said first and second pivot axes paralleling said first and second hinges respectively in longitudinally outwardly spaced relation thereto, said first and second pivot axes in the position of the cap construction in which both lids are closed, lying on a first side of the common plane of said first and second hinges, and the arrangement being such that upon hinged movement of either closure lid towards an open position, the respective said proximal axis moves through and beyond the common plane of said first and second hinges to an overcenter position thereby biasing the moved lid to said open position with the distal pivot axis remaining to the first side of said common plane.

2. The cap construction of claim 1 including a hinge strip between said first and second closure lids, said hinge strip including a central hinge plate and said first and second spaced hinges, said closure lids, spaced hinges and hinge plate being integrally formed.

3. A cap construction of claim 2 wherein said spring strip is spaced laterally outward of said hinge strip and integrally formed with said closure lids.

4. The cap construction of claim 3 including a second spring strip also extending between said lids, and having first and second pivot axes coincident with the first and second pivot axes respectively of the first spring strip, said hinge strip lying between the two hinge strips.

5. A cap construction substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.

6. A container having a cap according to any preceding claim.

