

Feb. 17, 1970

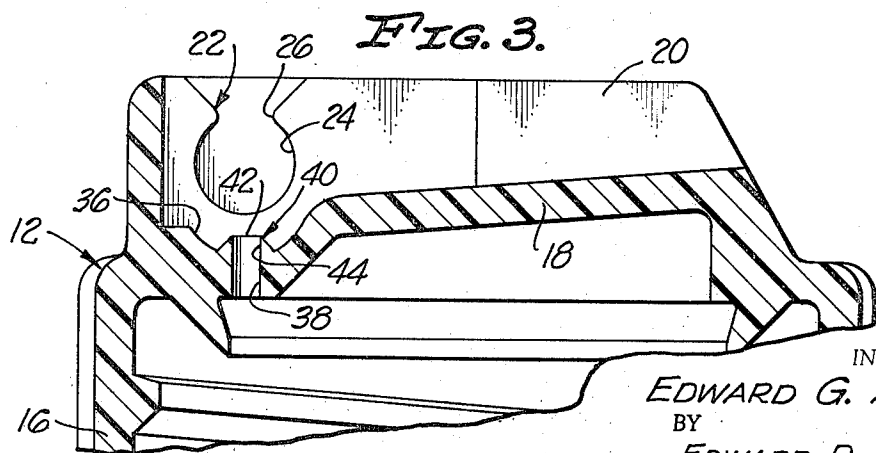
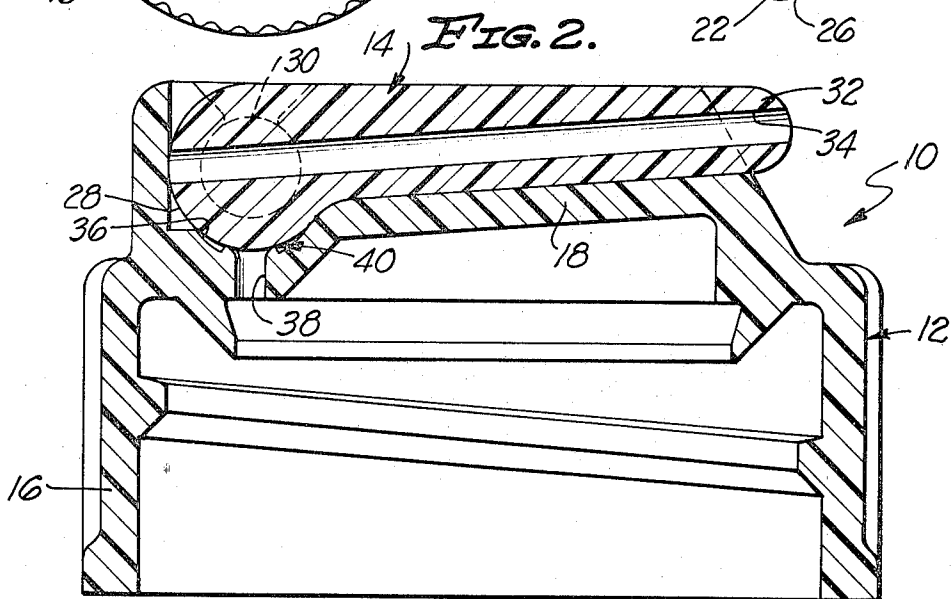
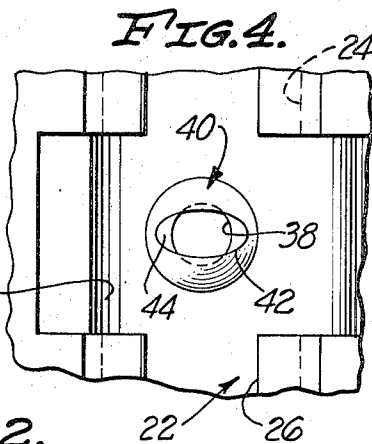
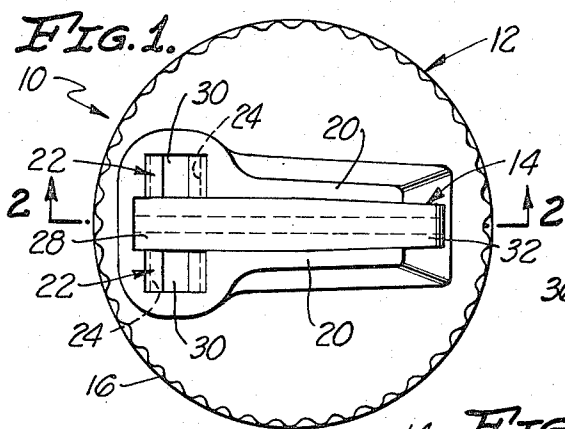
E. G. AKERS

3,495,745

SEALING STRUCTURES

Original Filed March 2, 1965

2 Sheets-Sheet 1



INVENTOR.  
EDWARD G. AKERS  
BY  
EDWARD D. O'BRIAN  
ATTORNEY

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E. G. AKERS

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2 Sheets-Sheet 2

FIG. 6.

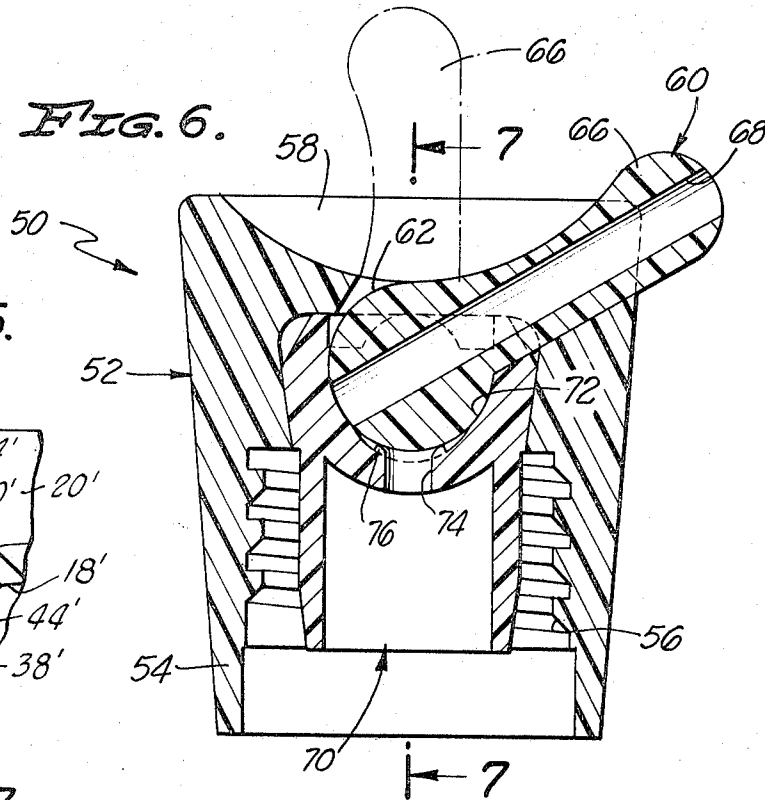


FIG. 5.

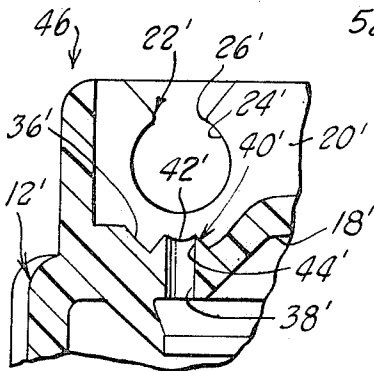
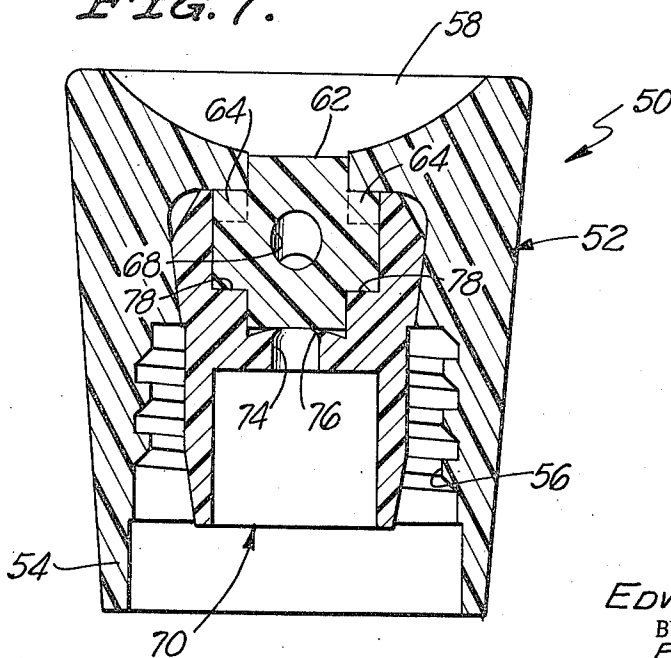


FIG. 7.



INVENTOR  
EDWARD G. AKERS  
BY  
EDWARD D. O'BRIAN  
ATTORNEY

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## SEALING STRUCTURES

Edward G. Akers, Downey, Calif., assignor to Polytop Corporation, Slatersville, R.I., a corporation of Massachusetts

Continuation of application Ser. No. 439,515, Mar. 2, 1965. This application Mar. 25, 1968, Ser. No. 715,930  
Int. Cl. B67d 3/00

U.S. Cl. 222—534

14 Claims

### ABSTRACT OF THE DISCLOSURE

Sealing structures for dispensing closures having a body part formed of a deformable resilient material are disclosed. In these closures a spout is rotatably held upon the body part in such a manner as to be capable of being rotated between open and closed positions. The sealing structure per se used with such a closure is a ring having a triangular cross-section prior to use. When such a ring is contacted by the spout as during assembly of the closure, the ring takes on a different deformed peripheral configuration.

### Cross reference to related applications

This application is a continuation of the Edward G. Akers application Ser. No. 439,515, filed Mar. 2, 1965 entitled "Sealing Structures," now abandoned.

### Background of the invention

This invention pertains to new and improved sealing structures such as sealing structures for use in dispensing closures as shown in U.S. Letters Patents No. 2,793,795, No. 3,163,337, and other related patents.

In all such dispensing closures a spout is rotatably held upon or with respect to a cap part in such a manner that the entire closure forms a cap, or in case the closure is used as an integral part of a container, a complete closure for the container. In such structures the cap part and the spout are formed so that the spout is capable of being rotated between open and closed positions. In such an open position a passage in the spout is aligned with an opening in the cap part so that a fluid may move through both the opening and the passage; in the closed position the spout is moved so as to seal off the opening through the cap part.

One major problem with respect to dispensing closures of this category is the problem of sealing. When the spout in such a structure is in a closed position it must serve to seal off the opening in the cap part so that there is substantially no danger of leakage between the two parts. A number of different structures have been proposed and in many cases utilized in order to form a seal between a cap part and spout in this type of structure.

For economic reasons it is normally not desired to utilize a separate sealing member such as a rubber washer or the like in this type of device. Indeed these same economic factors have caused practically all dispensing closures of the type referred to in the preceding to be manufactured at a comparatively low cost by injection molding techniques out of common low density, branched chain polyethylene. The use of this material has permitted the use of a number of different types of sealing pads, protrusions, rings or the like in the type of dispensing closure with which the present sealing structures are intended to be used. To varying extents these prior expedients can be considered to have been acceptable.

However, commercially the various types of sealing structures for use in dispensing closures as noted in the preceding are not considered satisfactory because with each of these types of structures there occasionally oc-

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curs in a production run a certain percentage of units which will tend to leak, particularly when used with comparatively "hard to seal" fluids such as lighter fluids, compositions for shoe cleaning or the like. The exact reasons for such periodic production of unacceptable closure which tend to leak are not known. It is believed, however, that the production of such leaking closures may be related to one of a variety of factors.

In certain circumstances defective units may be a result of the grade or quality of the material used in producing a dispensing closure. In other circumstances a contributing factor tending to cause the leakage may be inadequate or improper control of the molding conditions. In other circumstances the inherent properties of polyethylene or any other related material used in the production may be a significant factor. Although polyethylene has comparatively good toughness and durability over a comparatively wide temperature range, its density tends to decrease fairly rapidly above normal room temperatures. This results in comparatively large dimensional changes which could easily affect sealing characteristics. At comparatively low temperatures polyethylene tends to lose its pliability or resiliency and this could easily affect the sealing mechanism utilized in prior related structures as are indicated in the preceding.

It is considered that prior dispensing closures having a sealing member formed as an integral component of a cap part of a closure are not acceptable for commercial reasons in many instances because of the problem of leakage, and that this problem of leakage is related in some manner or another to one or more of the factors discussed in the preceding and perhaps to other factors which at present are not understood or even recognized. By such unacceptability it is not to be implied that satisfactory dispensing closures cannot and have not been constructed in accordance with various prior art teachings. The basic problem in connection with dispensing closures is one of maintaining the percentage of closures which will leak as small as possible while permitting the use of these closures under widely different temperature conditions with virtually any material and without extremely careful control of the manufacture of such closures.

### Summary of the invention

An object of the present invention is to provide new and improved sealing structures for use with dispensing closures of the category indicated in the preceding discussion. A related object of this invention is to provide such sealing structures, and closures using such structures which may be easily and conveniently produced at a comparatively nominal cost. A further related object is to provide sealing structures which can be manufactured as an integral part or component of a cap part in such dispensing closures with a minimum of difficulty. A further more important object of this invention is to provide sealing structures as described which are much less prone to leak than prior related structures.

As an aid to understanding this invention it can be stated in essentially summary form that it concerns sealing structures, each of which includes a body part and a spout, the body part being formed of a deformable, resilient material so as to include an opening leading through the body part and a sealing ring located around the opening, said sealing ring having a triangular cross-sectional configuration prior to its use, said spout being mounted so as to be rotatable with respect to said body part, said spout having a cylindrical surface engaging and deforming said sealing ring, said cylindrical surface of said spout being spaced from the portion of said body part immediately adjacent said sealing ring, so that there is only a restricted or limited amount of contact between the cylindrical surface

and the sealing ring, resulting in said sealing ring being deformed to only a limited extent necessary to form a continuous seal between it and the cylindrical surface without giving rise to amount of friction between these two points which will seriously impede rotation of the spout. The exact form the sealing ring will take on such contact will vary depending upon various factors such as the physical dimensions involved.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The invention is best more fully explained with reference to the accompanying drawings in which:

FIG. 1 is a top plan view of a dispensing closure embodying a sealing structure of the present invention;

FIG. 2 is a cross-sectional view taken at line 2—2 of FIG. 1;

FIG. 3 is a cross-sectional view corresponding to FIG. 2 of the cap part of this dispensing closure prior to assembly with a spout in this closure;

FIG. 4 is a partial top plan view of the sealing ring employed in the sealing structure utilized with the dispensing closure shown in FIG. 2 illustrating the configuration believed to be assumed by this sealing ring during the utilization of the closure;

FIG. 5 is a partial cross-sectional view corresponding to FIG. 3 of a modified cap part of a dispensing closure in accordance with this invention prior to the assembly with a spout.

FIG. 6 is a cross-sectional view corresponding to FIG. 1 of another dispensing closure of the present invention utilizing a sealing structure as herein described; and

FIG. 7 is a cross-sectional view taken at line 7—7 of FIG. 6.

From a careful consideration of this specification and of this drawing it will be realized by those skilled in the closure field that the sealing structures of this invention can be employed with a wide variety of differently appearing and/or differently constructed dispensing closures utilizing what may be referred to as a spout which is rotatably mounted on or with respect to a cap part, the spout being capable of being moved between open and closed positions with respect to an opening in the cap part. For this reason the accompanying drawing is not to be taken as limiting this invention except as specifically indicated in this specification.

#### Detailed description of the preferred embodiments

The actual details of this invention are best more fully described by referring directly to the accompanying drawing. In order to understand this invention it is of course necessary to describe the basic character of the dispensing closure with which it is used. The dispensing closure 10 shown in FIG. 1 of the drawing is constructed generally as indicated in the Wilson et al. U.S. Patent No. 2,793,795. The entire disclosure of this patent is incorporated herein by reference.

This closure 10 includes a cap part 12 and a spout 14. The cap part 12 is formed as an integral member out of a deformable material such as common low density or branched chain polyethylene, linear polyethylene, polypropylene or related polyolefins so as to include a dependent skirt 16 which is connected across its top by a body part 18. This body part 18 holds upstanding walls 20, two of which are parallel and are provided with bearing openings 22. It is noted that each of these openings 22 includes a cylindrical bottom 24 having a restricted top entrance 26. The spout 14 includes a cylindrical end 28 carrying axially aligned shafts or trunnions 30 and a probe-like extremity or spout 32. A passage 34 extends through this extremity 32 and the cylindrical end 28 across the axis of this end.

In the complete closure 10 the shafts or trunnions 30 are supported within the bottoms 24 of the bearing openings 22 so that the cylindrical end is located so that its principal part is spaced as hereinafter explained a com-

paratively small amount from a cylindrical surface 36 formed in the body part 18. An opening 38 is located so as to extend from the interior of skirt 16 into the central region of the cylindrical surface 36. With this construction the spout 14 is capable of being rotated from a substantially horizontal position as shown in FIG. 1 in which the closure 10 is closed to an open position in which the spout extends vertically so that the passage 34 is aligned with the opening 38.

The present invention concerns the construction of the closure 10 so that there is substantially no chance of leakage between the spout 14 and the cap 12 in this closed position. In order to achieve this result the present invention involves the use of a sealing ring 40 as shown in FIGS. 2, 3 and 4 of the drawing. This sealing ring 40 is formed integrally with the body part 18, and, of course, in the closure 10 with the entire cap part 12. All portions of this sealing ring 40 are triangular cross-sectional configuration. It is located upon the cylindrical surface 36 so as to extend around the edge of the opening 38. The configuration and dimensions of this sealing ring 40 are considered to be important in achieving the desired results obtained with this invention.

As the cap part 12 is created by conventional molding means the sealing ring 40 appears as shown in FIG. 3 of the drawing. It has an edge 42 which is located so as to be spaced from the surface 36 and the opening 38. Preferably this edge 42 is located so as to lie in a plane perpendicular to a line drawn between the axis of rotation of the spout 14 and through the center of the sealing ring 40 and the opening 38 because of factors related to the manufacture of a mold or die at a nominal cost. Preferably one side 44 of the sealing ring 40 constitutes an extension of the wall of the opening 38 as shown in the drawing.

Preferred results with this material are also achieved when the angle formed by the sides of this ring 40 leading away from the edge 42 within the range of from about 35 to 60 degrees, with optimum results believed to be achieved, when this angle is about 45 degrees. This angle of 45 degrees can be considered as "critical" inasmuch as tests have shown that the greater the difference between the angle employed and the angle of 45 degrees normally the higher the proportion of defective closures. At an angle of about 45 degrees substantially no defective closures are produced when normal manufacturing techniques are used provided the height of the sealing ring 40 and the contact of this ring 40 with the spout 14 are also controlled.

The height of the sealing ring 40 may be measured as the longest dimension of the side 44 of the sealing ring 40. This is the length of height of this sealing ring from the locus of the cylindrical surface 36 to the edge 42 along a plane passing through the center of the opening 38 and the sealing ring 40 and through the axis of rotation of the spout 14. When this distance in the closure 10 is less than about fifteen one-thousandths ( $15/1000$ ) of an inch unsatisfactory results tend to be obtained. This is believed to be primarily as a result of the sealing ring 40 not adequately forming or being filled in multi-cavity injection molding dies. A height of about fifteen one-thousandths ( $15/1000$ ) on the other hand provided excellent results.

With the particular dispensing closure 10, this height is preferably held to within the range of from fifteen one-thousandths ( $15/1000$ ) to twenty-five one-thousandths ( $25/1000$ ), and the forces exerted through the spout 14 with the type of closure 10 illustrated are sufficient to adequately seal the closure 10 in use. When, however, other means for holding the spout 14 are employed so that greater pressures can be exerted to deform the sealing ring 40 than can be obtained with the particular type of dispensing closure 10 illustrated, the height of the sealing ring 40 may be increased to any value desired.

However, the cylindrical end 28 of the spout 14 must always engage the sealing ring 40 to a sufficient extent so as to achieve a sealing action. This is related to the forces

employed so as to deform this sealing ring 40 in any particular dispensing closure. Presently preferred results are achieved when the amount of contact or interference between the end 28 and the sealing ring 40 as measured along the line extending through the center of the opening 38 and intersecting the axis of rotation of the spout 14 is about ten one-thousandths ( $\frac{10}{1000}$ ) of an inch. This value can, of course, be varied slightly so as to fall within the range of from about five one-thousandths ( $\frac{5}{1000}$ ) to about twelve one-thousandths ( $\frac{12}{1000}$ ) of an inch. If the contact or interference between the sealing ring 40 and the spout 14 is greater than as indicated the resulting friction will tend to seriously impede normal rotation of the spout 14. If, on the other hand there is less contact or interference than indicated the ring 40 may not be deformed to a sufficient extent to form an adequate seal. The principal portion of the spout 14 must always be spaced far enough from the surface 36 so as to permit the ring 40 to be deformed in order to achieve a sealing action.

The shape to which the particular sealing ring 40 is believed to be deformed after normal operation as it appears to microscopic examination is shown in FIGURE 4 of the drawing. After operational contact with the spout 14 this sealing ring 40 is deformed so as to have essentially an elliptical type of shape with its longest dimension located in the direction of rotation of the spout and with the shortest dimension being transverse to the direction of rotation of the spout. In the shortest dimension the sealing ring 40 appears to be folded over generally towards the opening 30, while its longest dimension with sealing ring 40 in use appears to be distended so as to lie back away from the opening 38 and the intermediate portion of the sealing ring 40, between these largest and shortest dimension, appears to be essentially crushed so as to assume a cylindrical surface shape.

The inherent deformability and resiliency of the material from which the sealing ring 40 is formed enables the sealing ring to be deformed in this manner. When, however, the sealing ring 40 is formed so that its edge 42 is centered or curved so as to fall with the locus of a cylindrical surface such as a surface having an axis coincident with the axis of rotation of the spout 14 it will be obvious that the configuration of this ring 42 in use will be different from the configuration shown in FIG. 4. It is important that the surface of the end 28 be spaced from the surface 36, or in a modified cap, from an analogous surface so that there is room between these two parts for the sealing ring 42 to deform to a sufficient extent that there is continuous contact and sealing between it and the end 28. Such contact tends to approximate "line" contact between the ring 42 and the end 38; as a consequence of this comparatively small amount of contact there is comparatively little friction tending to impede rotation of the spout 14.

Normally the body part 18 is sufficiently thick so as to be comparatively rigid when compared to the sealing ring 40 so that no deformation of it is observed, even though both the body part and the ring 40 are formed integrally from one another out of the same material. However, this material is sufficiently resilient so that even though under the conditions of use as it deforms it remains sufficiently flexible and resilient so as to always mate against the cylindrical end 22 in order to form a satisfactory seal.

The desired properties of the material from which body part 18 and the sealing ring 40 are formed are found in polyolefin polymers. Polymers falling within this generic class are well known. The most common of these polymers are common low-density branched chain polyethylene, high density linear polyethylene, polypropylene, including isotactic (essentially linear) polypropylene. Various other closely related polymers can, of course, be employed.

It will be recognized by those skilled in the art of dispensing closures that included within this list are polymers such as the linear polyethylene and the polypropylene which have previously not been used in the sealing

structures embodied within commercial dispensing closures of the type to which this invention pertains because of their physical properties. The fact that satisfactory dispensing closures using sealing means as herein described can be manufactured from such polymers is considered to be of material significance and to effectively demonstrate that the sealing action obtained in accordance with this invention is of an unexpected, unique character. The use of such polymers which are of a more rigid character than common low density, branched chain polyethylene is considered to be quite desirable for reasons which are unnecessary to an understanding of this invention.

In FIG. 5 there is shown a portion of a cap part 46 which is almost identical to the cap part 12 described in the preceding. For this reason various portions of the cap part 46 which are the same or substantially the same, or closely related to corresponding parts of the cap part 12, are not separately designated and described herein and in the drawings, but are indicated herein and in the drawings by the primes of the numerals previously used to designate subject parts.

In the cap part 46, the edge 42' illustrated differs from the edge 42 previously described so that it is centered or curved to fall within the locus of a cylindrical surface such as a surface having an axis coincident with the axis of rotation of a spout such as the spout 14 for use with the cap part 46. Because the spout for use when the cap part 46 would be identical with the spout 14 previously described, no such spout is illustrated in the drawing. In essence the cap part 46 differs from the cap part 12 solely in that the edge 42' of the sealing ring 40' is contoured to the curvature of the exterior of such a spout, whereas the edge 42 of the sealing ring 40 previously described is not so contoured.

In FIGS. 6 and 7 of the drawing there is shown a cross-sectional view of another dispensing closure 50 utilizing a sealing structure of the present invention. This other closure 50 is generally constructed as indicated in the Wilson U.S. Patent No. 3,163,337 so as to include an outer cap member 52 having a skirt 54 which is adapted to be attached by internal threads 56 to a container (not shown) and having a top 58 extending atop the skirt 54. The closure 50 also includes a spout 60 of the same construction as the spout 14 having a cylindrical end 62 supporting axially aligned shafts or trunnions 64 and a probe-like extremity or spout 66. In the spout 60 a passage 68 extends through the extremity 66 and the end 62 across the axis of this end.

The closure 50 also includes an insert or fitment 70 located within the interior of the cap member 52. This fitment or insert 70 may be referred to as a body part. It is provided with a cylindrical surface 72 corresponding with surface 36 previously described, with an opening 74 corresponding to the opening 38 previously described and with a sealing ring 76 corresponding to the ring 40 previously described. It is also provided with slots 78 having rounded bottoms. These slots 78 serve to support the shafts 64 so that these shafts are located generally between the top 58 and the fitment or inserts 70 in such a manner that pressure is exerted through the cap member 52 when the closure 50 is used so as to deform the sealing ring 76.

The entire disclosure of said Patent No. 3,163,337 is incorporated herein by reference in order to more fully describe the construction of the closure 50 and the manner in which this closure operates so as to obtain forces necessary for sealing purposes. It will be noted that in the closure 50 the ring 76 does not directly correspond to any structure shown in said patent, and that this ring 76 serves so as to achieve a seal of the type achieved in the closure 10. In order to achieve such a seal it is necessary that the fitment or insert 70 be formed integrally with the ring 76 out of materials as previously described and that the corresponding parts be formed in

the manner indicated in the preceding discussion. With this construction the cap member 52 and the spout 60 may be formed from any desired material.

Because of the nature of this invention those skilled in the construction of dispensing closures, and in particular sealing structures for such closures, will realize that the basic principles of this invention can be embodied with a number of differently appearing closures constructed so as to be capable of being assembled in a variety of different ways. Because of the fact that this invention is capable of such general use it is to be considered as being limited solely by the appended claims forming a part of this disclosure.

I claim:

1. A sealing structure which includes:
  - a body part and a spout;
  - said body part being formed of a polyolefin polymer;
  - said body part having an opening leading therethrough and a sealing ring located around said opening at one side of said body part;
  - said sealing ring having a triangular cross-sectional configuration and terminating in an edge spaced from said body part prior to its use;
  - the angle between the sides of said sealing ring leading from said edge being from about 35 to 60 degrees;
  - the height of said sealing ring from said body part being in excess of fifteen one-thousandths ( $\frac{15}{1000}$ ) of an inch;
  - said spout having a cylindrical surface and being rotatable about the axis of said surface;
  - said cylindrical surface being spaced from the portion of said body part adjacent to said sealing ring;
  - said cylindrical surface engaging from about five one-thousandths ( $\frac{5}{1000}$ ) to about twelve one-thousandths ( $\frac{12}{1000}$ ) of an inch of said sealing ring so as to deform said sealing ring to a shape in which the portions of said sealing ring most remote from a plane passing through the axis of rotation of said spout are distended so as to lay back away from said opening and in which the portions of said sealing ring closest to said opening in said plane are folded inwardly towards said opening and in which the remainder of said sealing ring between said folded and distended portions are crushed so as to assume the shape of said cylindrical surface;
  - said sealing ring forming a seal against said cylindrical surface.
2. A sealing structure as defined in claim 1 wherein said angle is about 45 degrees.
3. A sealing structure which includes:
  - a body part and a spout;
  - said body part being formed of a deformable, resilient material so as to have an opening leading therethrough and a circular sealing ring located around said opening;
  - said sealing ring having a triangular cross-sectional configuration and terminating in an edge spaced from said body part prior to its use;
  - said spout being rotatable with respect to said body part and having a cylindrical surface;
  - said cylindrical surface being spaced from the portion of said body part adjacent to said sealing ring;
  - said cylindrical surface engaging and deforming said sealing ring from a circular to a generally elliptical shape so as to form a seal between said cylindrical surface of said spout and said body part, in which the portions of said sealing ring most remote from a plane passing through the axis of rotation of said spout are distended so as to lay back away from said opening and in which the portions of said sealing ring closest to said opening in said plane are folded inwardly towards said opening and in which the remainder of said sealing ring between said folded and distended portions are crushed so as to assume the shape of said cylindrical surface.

4. A sealing structure as defined in claim 3 wherein said material is a polymer selected from the group consisting of low density, branched chain polyethylene, high density, linear polyethylene and isotactic polypropylene.

5. A sealing structure as defined in claim 4 wherein the angle between the sides of said sealing ring leading from said edge is from about 35 to 60 degrees.

6. A sealing structure as defined in claim 5 wherein said angle is about 45 degrees.

7. A sealing structure as defined in claim 3 wherein said sealing ring has a side appearing as an extension of said opening and wherein the height of said sealing ring is from about fifteen one-thousandths ( $\frac{15}{1000}$ ) to twenty-five one-thousandths ( $\frac{25}{1000}$ ) of an inch.

8. A sealing structure as defined in claim 3 wherein said cylindrical surface engages from about five one-thousandths ( $\frac{5}{1000}$ ) to about twelve one-thousandths ( $\frac{12}{1000}$ ) of an inch of said sealing ring located remote from said body part.

9. A sealing structure as defined in claim 8 wherein said cylindrical surface of said spout engages about ten one-thousandths ( $\frac{10}{1000}$ ) of an inch of said sealing ring located remote from said body part.

10. A sealing structure as defined in claim 3 in which said sealing ring has an inner wall which comprises an extension of the wall defining said opening, and an outer wall which extends at an acute angle to said inner wall, so that said sealing ring has the cross-sectional configuration of a right angle triangle prior to the insertion of said spout into said body.

11. A sealing structure which includes:

- a body part having a wall defining an opening therethrough;

- said body part having an opening which communicates with said opening;

- a sealing ring extending continuously around said opening directly adjacent to said opening, the inner wall of said sealing ring comprising an extension of the wall defining said opening, the outer wall of said sealing ring extending at an acute angle to said inner wall so that said sealing ring terminates in a pointed, laterally deformable upper edge which is spaced from said body part and which has the cross-sectional configuration of a right angle triangle prior to the insertion of said spout into said cavity;

- a spout having a passage extending therethrough;
- said spout being rotatable with respect to said body part between an open position in which the passage in said spout is aligned with the opening in said body part and a closed position in which the passage in said spout is aligned with the opening in said body part and a closed position in which the passage in said spout is moved out of alignment with said opening;

- said spout having a cylindrical surface, said cylindrical surface being spaced from the portion of said body part adjacent to said sealing ring;

- said cylindrical surface of said spout upon the insertion of said spout into said cavity engaging and laterally bending the upper edge of said sealing ring so that a substantial portion of at least one of the walls of said sealing ring is held in continuous sealing engagement with the cylindrical surface of said spout in all rotational positions of said spout and in both open and closed positions of said spout, to provide a continuous seal around said opening between said body and said spout;

- the upper edge of said sealing ring being laterally deformed so that a substantial portion of said inner wall and a substantial portion of said outer wall are simultaneously held in continuous sealing engagement with said spout, and so that said sealing ring is deformed to a substantially different peripheral configuration from that of said opening;

- approximately half of the inner wall and approximately

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half of the outer wall of said sealing ring being simultaneously held in continuous sealing engagement with the cylindrical surface of said spout;

the portions of said sealing ring most remote from a plane passing through the axis of rotation of said spout being distended to bring the inner wall of said portions into continuous engagement with said cylindrical surface and the portions of said sealing ring closest to said opening in said plane being folded inwardly toward said opening to bring said outer wall of said portions into continuous engagement with said cylindrical surface.

12. A structure as claimed in claim 11, in which the upper edge of said sealing ring is contoured so as to be substantially concentric with the cylindrical surface of said spout.

13. A structure as claimed in claim 11, in which the remainder of said sealing ring between said folded and distended portions is crushed so as to assume the shape of said cylindrical surface.

14. A sealing structure which includes:  
a body part and a spout;

said body part being formed of a deformable, resilient material so as to have an opening leading there-through and a circular sealing ring located around said opening;

said sealing ring having a triangular cross-sectional configuration and terminating in an edge spaced from said body part prior to its use;

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said spout being rotatable with respect to said body part and having a cylindrical surface;

said cylindrical surface being spaced from the portion of said body part adjacent to said sealing ring;

said cylindrical surface engaging and deforming said sealing ring from a circular to a generally elliptical shape so as to form a seal between said cylindrical surface of said spout and said body part, in which some diametrically opposite portions of said sealing ring are distended so as to lay back away from said opening and in which other diametrically opposite portions of said sealing ring are folded inwardly towards said opening and in which the remainder of said sealing ring between said folded and distended portions are crushed so as to assume the shape of said cylindrical surface.

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SAMUEL F. COLEMAN, Primary Examiner

F. R. HANDREN, Assistant Examiner

U.S. Cl. X.R.

222—542