

1

3,372,424

SEALING INSERT FOR CONTAINERS

Leo L. Kellett, 1605 W. 76th, Kansas City, Mo. 64114

Filed Dec. 12, 1966, Ser. No. 601,024

7 Claims. (Cl. 15—257.05)

This invention relates to improvements in sealing inserts of the general type disclosed in my U.S. Letters Patent No. 2,703,898, granted Mar. 15, 1955, and entitled, "Combination Brush Stripper and Liquid Seal for Containers."

The aforesaid patent relates to an attachment adapted for disposition within the neck of a bottle, for example, capable of performing a number of functions that assist the user of the liquid within the bottle. First, the attachment serves as a stripper which removes excess liquid from a brush after the latter has been dipped into the bottle through the neck thereof. Secondly, the attachment forms the brush into a particular desired cross-sectional configuration as the brush is removed from the bottle. Thirdly, the device seals the contents of the bottle from the atmosphere for a period of time after withdrawal of the brush. Additionally, accidental spilling of the contents of the bottle is prevented should inadvertent tipping of the bottle occur.

The attachment described in the aforesaid patent has proven to be quite satisfactory, particularly when used in conjunction with small bottles employed as containers for finger-nail polish and similar substances. However, the flexible lips depending from the tubular body portion of the attachment, which must flex outwardly to permit insertion of the brush, flex along hinge lines formed at the lowermost end of the tubular body portion, the latter being held throughout its length in constant compression by the friction fit between the tubular body and the neck of the bottle. Thus, in order for the lips to flex outwardly, the pressure exerted as a result of the friction fit must be offset by an opposing force (exerted by insertion of the brush). This inhibits natural flexure and restricts the ability of the lips to yield with the insertion of the brush applicator.

Another factor tending to inhibit natural flexure of the lips relates to the angular disposition of the lips with respect to the wall of the tubular body to which the lips are integrally joined. As viewed in longitudinal cross section, the external angle formed by each lip and the wall of the tubular body is considerably greater than 180°, requiring that the force of the applicator effectively decrease the angle to a value more nearly equal to 180° by pushing against the lip as it is inserted. This causes an opposing force to be developed as the normal angular disposition of the two components is distorted, such opposing force being proportionally greater than the force that would be produced if the external angle were normally less than 180 degrees.

It is, therefore, the primary object of this invention to provide an insert for the neck of a container which overcomes the disadvantages discussed above, while at the same time performing the four aforesaid functions which render the container more conveniently usable as a receptacle for storing and dispensing fingernail polish and other viscous liquids.

As a corollary to the foregoing object, it is an important aim of the instant invention to provide such an insert which operates without interference from the neck of the container and is constructed in a manner to minimize the opposing forces produced within the material of the insert during insertion of the applicator into the bottle.

In the drawing:

FIGURE 1 is a side elevational view of the insert;

FIG. 2 is an elevational view displaced 90° with respect to the view of FIG. 1;

2

FIG. 3 is a plan view;

FIG. 4 is a bottom view;

FIG. 5 is a vertical sectional view taken along line 5—5 of FIG. 1; and

FIG. 6 is a vertical sectional view taken along line 6—6 of FIG. 2 with the addition of the neck of the container and the cap therefor.

The numeral 10 denotes the externally threaded neck of a container such as a bottle, a screw-down cap 12 being threaded on neck 10 as illustrated in FIG. 6. An insert 14 includes a cylindrical body 16 having a continuous, out-turned flange 18 at the uppermost end thereof, body 16 being held in neck 10 by an interference fit with flange 18 overlying the neck and clamped between the latter and cap 12.

Insert 14 is composed of a flexible material, preferably a moldable synthetic resin such as polyethylene. A positive, double-seal is formed by the seating of flange 18 on the lip of neck 10 and the frictional, 360 degree fit of body 16 within neck 10. Flange 18 obviates the need to provide a liner or gasket for cap 12 and is sized to duplicate the thickness of a conventional liner so that cap screw-down is not affected. It should be understood that neck 10, cap 12 and insert 14 are shown larger than actual size for use of the assembly as a container and dispenser of fingernail polish, a commercial use for which insert 14 is particularly, but not exclusively, adapted.

The lower end of body 16 is externally beveled to present a band 20 having an inverted, frusto-conical, external face. The lowermost extremity 22 of band 20, therefore, is radially inwardly spaced with respect to the circumferential periphery of the unbevelled portion of body 16. As is particularly clear by comparing FIGS. 5 and 6, a pair of diametrically opposed, arcuate feathered edges 22a are formed by extremity 22.

A pair of elongated, diametrically opposed lips 24 of U-shaped cross section depend from extremity 22 between edges 22a and are integrally formed with band 20. Each lip 24 has an elongated, transversely arcuate bight 26, and a pair of inwardly extending, opposed, flat wings 28. Union of each lip 24 and band 20 is effected at the uppermost end of bight 26 where an arcuate line of flexure is formed at extremity 22.

Feathered edges 22a lie in a horizontal plane as is clear in FIG. 5. The upper end 30 of each wing 28 is coplanar with the ends 30 of the other wings 28, such plane being located slightly below the plane of feathered edges 22a in parallelism therewith. Each wing 28 of each lip 24 is also provided with a vertical edge 32 which is parallel to the vertical edge 32 of a corresponding wing 28 of the other lip 24. Additionally, corresponding wings of the two lips are coplanar and each wing 28 is slightly inclined since the bights 26 increase somewhat in width as extremity 22 of band 20 is approached. Bights 26 converge as their lowermost, arcuate edges 34 are approached to present a generally elliptical opening 36 in the plane defined by the edges 34. These edges 35 at the lowermost limit of insert 14 function as wiping edges when a brush applicator (not shown) is inserted into the bottle through neck 10 and subsequently removed, the inner, concave surfaces 38 of bights 26 assisting in the removal of excess liquid from the brush by a squeegee action.

A pair of curved lines of interruption 40 extend between proximal ends of the opposed feathered edges 22a as will be appreciated by a comparison of FIGS. 5 and 6. The lines of interruption 40 define the boundary between the cylindrical inner surface of body 16 and a pair of diametrically opposed, downwardly converging, internal surfaces 42 of body 16 formed within band 20. Surfaces 42 are linear in their direction of convergence and merge with corresponding concave, internal surfaces 38 of bights

26, surfaces 38 being longitudinally linear. Thus, a pair of uninterrupted surfaces 38, 42 extend from the lines of interruption 40 to respective wiping edges 34.

Although surfaces 42 are downwardly convergent, their slopes are steeper than the slope of the bevelled external face of band 20; therefore, the thickness of band 20 between each surface 42 and the corresponding opposed portion of its external face decreases as extremity 22 is approached. Additionally, the external face of band 20 forms an obtuse angle with each bight 26 as is clear in FIG. 6.

Insert 14 is utilized in the same manner as the attachment disclosed in my aforesaid patent, the latter being incorporated herein by reference as may be necessary for a complete understanding of the manner of utilization and the basic operational principles of insert 14. Therefore, the following is limited to a discussion of the improved manner in which insert 14 functions as compared with the attachment of the aforesaid patent.

It will be noted that the bevelled band 20 spaces the lines of flexure of bights 26 radially inwardly from the internal surface of neck 10. The natural resiliency of the material of insert 14 serves to restore lips 24 to their normal positions as illustrated after removal of the brush applicator from the bottle. When the applicator is inserted, it will be appreciated that flexure of each lip 24 at the union of its bight 26 with extremity 22 is impeded only by such restoring force and that, therefore, insertion of the applicator is readily effected, yet excess liquid is effectively stripped from the brush by the action of lips 24 as the applicator is removed.

Freedom of flexure of lips 24 is enhanced by the obtuse angle formed by band 20 and each bight 26. It will be appreciated that the line of flexure of bight 26 is substantially at the apex of the angle, resulting in a decrease in such angle as outward flexing is produced. Sufficient restoring force is available by virtue of the inherent memory of the material, but interference with insertion of the applicator is minimized.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. An insert of flexible material for a container neck, said insert comprising:
 - a cylindrical body adapted to be complementally received within said neck;
 - a continuous, outturned flange at the normally uppermost end of the body overlying the neck when the body is received therein,
 - said body having an externally bevelled band therearound at the opposite end thereof,
 - said band having a lowermost extremity disposed in radially inwardly spaced relationship to the circumferential periphery of said body, and a pair of diametrically opposed, arcuate featheredges at said extremity; and
 - a pair of spaced, elongated, diametrically opposed, transversely U-shaped lips each provided with a transversely arcuate bight and a pair of spaced, flat wings integral with the bight,
 - said lips extending downwardly from said band between said featheredges,
 - said bights being integral with the band at said extremity, thereby defining a line of flexure for each bight respectively at the union of the bight and the

band whereby, by virtue of the bevelled band, the lines clear the neck when the body is received therein to permit free flexure of the lips without interference from the neck when positioned for normal use therein,

said wings extending inwardly from the innermost, concave surfaces of corresponding bights and having uppermost ends spaced from said featheredges therebeneath,

each wing having an upright edge extending downwardly from said end thereof,

the upright edges of the wings of one of the lips being spaced from the upright edges of the corresponding wings of the other of said lips.

2. The invention of claim 1, each of said bights and said band being joined at an external angle of less than 180°, whereby said angles decrease upon outward flexing of the lips at the lines of flexure of the bights.

3. The invention of claim 2, said band decreasing in thickness as said extremity thereof is approached.

4. The invention of claim 3, said angles being obtuse.

5. The invention of claim 2, said body having diametrically opposed, internal surfaces at said opposite end of the body converging as said extremity of the band is approached, each of said internal surfaces of the body merging with the concave surface of a corresponding bight substantially at the line of flexure thereof.

6. The invention of claim 5, said concave surfaces of the bights being longitudinally linear,

each of said internal surfaces of the body extending upwardly away from the corresponding concave surface in colinear relationship thereto,

said band presenting an inverted, frusto-conical, external face,

the thickness of the band between said internal surfaces of the body and corresponding portions of said face decreasing as said extremity of the band is approached.

7. The invention of claim 6, said bights progressively increasing in width and diverging as said extremity of the band is approached, said featheredges being coplanar, said uppermost ends of the wings lying in a plane parallel to the plane of said featheredges, said upright edges of the wings of said one lip being parallel to the upright edges of the corresponding wings of said other lip, corresponding wings of said lips being coplanar.

References Cited

UNITED STATES PATENTS

252,603	1/1882	Kennish	220—90
610,103	8/1898	Taylor	15—257.05
2,644,183	7/1953	Kellett	15—257.05
2,627,619	2/1953	Gagen	15—257.05
2,703,898	3/1955	Kellett	15—257.05

CHARLES A. WILLMUTH, *Primary Examiner*.

R. I. SMITH, *Assistant Examiner*.