

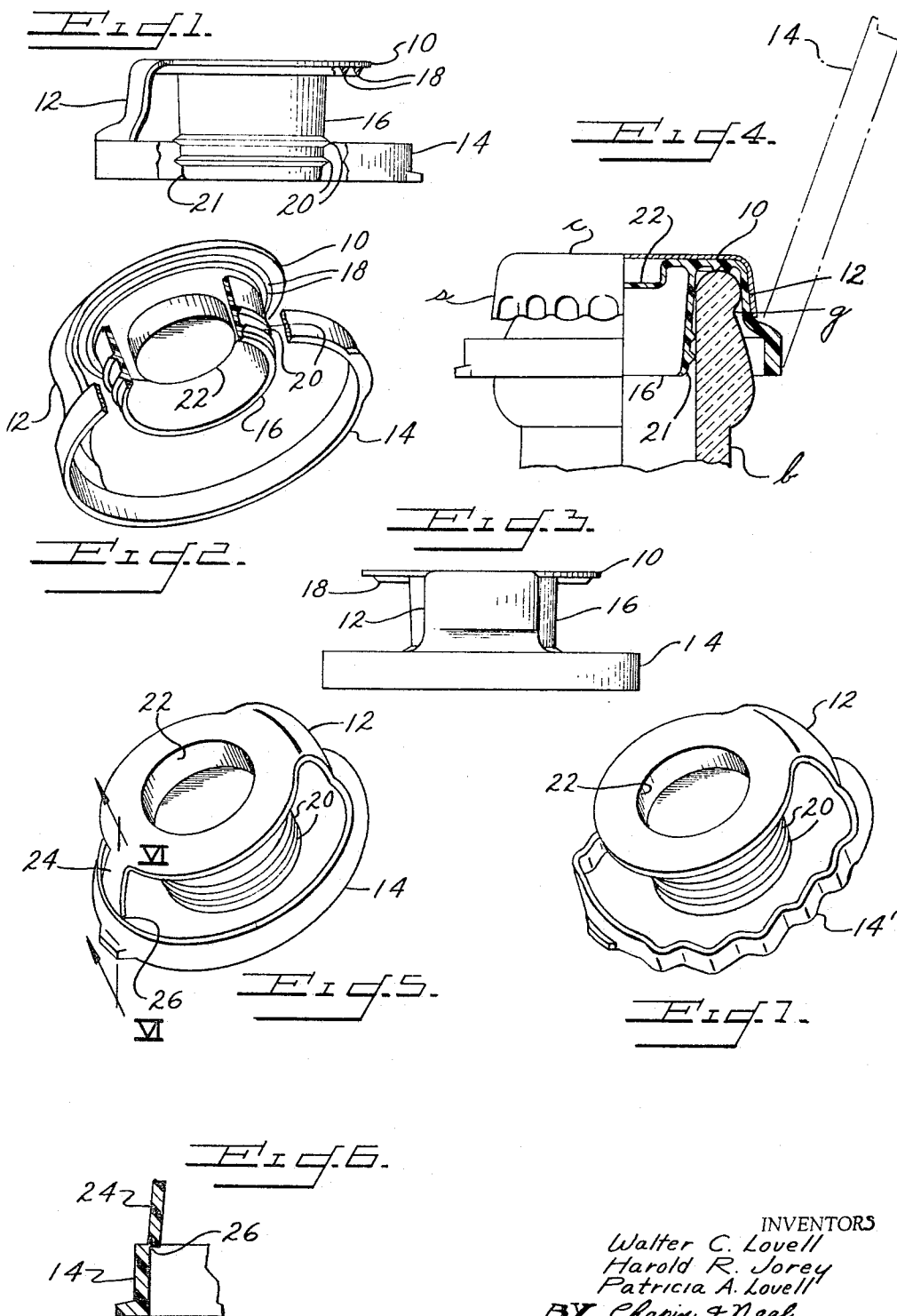
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SEALING GASKET USED WITH CROWN TYPE BOTTLE CAPS

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SEALING GASKET USED WITH CROWN TYPE BOTTLE CAPS

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The present invention relates to improvements in sealing gaskets to be used in combination with crown caps for bottles.

One object of the invention is to provide an improved sealing gasket which can serve as the means for removing a crown bottle cap.

Another object is to make practical the use of plastic materials, and particularly polyethylene, in sealing gaskets used with crown bottle caps.

A further object is to attain the above ends in a manner which is economically competitive with presently accepted sealing gaskets for crown caps and in this same vein to obviate the necessity of any fundamental change in the design of existing crown caps, bottles and bottle capping mechanisms.

Yet a further object is to attain the above ends and further provide an effective stopper for use after the metal crown cap is removed.

These ends are attained by an integrally molded plastic gasket comprising a disc portion which is compressed against the top of the bottle by a crown cap according to usual practice. A strap depends from the disc portion and is disposed between the outer surface of the bottle and the crimped skirt of a crown cap thereon. A ring connected to this strap is telescoped over the top of the bottle and disposed immediately beneath the cap. The ring is adapted to be swung over the cap so that an effective upward pull may be readily exerted thereon. The strap then serves as a lever to pry the cap off the bottle.

The present gasket obtains its full effectiveness as a seal by the provision of a thin walled tubular skirt depending from the disc portion and entering the throat of the bottle. There are thus two seals, one between the top of the bottle and the disc portion, and the other between the inner surface of the bottle and the tubular skirt. The effectiveness of these seals is preferably increased by the provision of thin ridges on the disc portion and skirt where engagement is made with the bottle.

It is also preferable to provide a depression in the upper surface of the disc portion to facilitate placing these gaskets on bottles with automatic machinery. This depression enables the gasket to be readily positioned on a punch which will place it in correct position on the bottle in an automatic machine after the bottle has been filled.

The above and other related objects and features of the invention will be apparent from a reading of the following description of the disclosure found in the accompanying drawing and the novelty thereof pointed out in the appended claims.

In the drawing:

FIG. 1 is an elevation partly in section of a gasket embodying the present invention;

FIG. 2 is a perspective view thereof;

FIG. 3 is a side elevation of the gasket shown in FIGS. 1 and 2;

FIG. 4 illustrates the gasket assembled on a bottle and held in place by a crown cap;

FIG. 5 is a perspective view of a modified embodiment of the invention;

FIG. 6 is a section taken on line VI-VI in FIG. 5; and

FIG. 7 is a perspective view of another modified embodiment of the invention.

The gasket seen in FIGS. 1-3 comprises a disc portion 10, a strap 12 depending from one side thereof and a ring 14 at the lower end of the strap. A tubular skirt 16 depends from the lower surface of the disc portion 10.

The various portions of this gasket are integrally connected and the gasket is advantageously and economically formed by injection molding. The material employed for the gasket is preferably high density polyethylene for purposes of strength and minimization of cost. A polyethylene density of approximately .95 is preferred.

This gasket is shown in FIG. 4 as it would be used on a capped bottle *b*. The skirt 16 is telescoped into the neck of the bottle with the lower marginal surface of the disc portion 10 clamped into sealing engagement with the mouth of the bottle by a conventional crown cap *c*. The skirt *s* of the cap *c* is crimped inwardly to grip the groove *g* conventionally provided on such bottles to thereby firmly secure the cap to the bottle and exert a sealing pressure on the disc portion 10.

When it is desired to remove the cap *c*, the ring 14 is lifted from its position immediately beneath the cap to the illustrated phantom position. A person's finger may then be inserted through the ring to pull it upwardly. The strap 12 then functions as a lever to pry the cap *c* from the bottle. The gasket is of course removed to pour out the contents of the bottle and then may be used as a stopper for subsequent storage of the bottle.

This gasket is highly effective in the sealing action which it provides and actually makes practical the use of polyethylene for this purpose. This sealing action is enhanced by the provision of a plurality of annular ridges 18 on the under surface of the disc portion 10 where sealing engagement is made with the mouth of the bottle. Of greater importance is the fact that the skirt 16 sealingly engages the interior throat of the bottle. Preferably one or more circumferential ridges 20 are formed on the skirt 16 to actually make sealing contact with the inner surface of the bottle. The ridges 20 are dimensioned to make an interference fit with the throat of the bottle so that an uninterrupted annular sealing contact is assured.

The lower end of the skirt 16 is inwardly flared at 21 to facilitate its insertion into the bottle. However, the skirt itself is preferably thin walled and not thickened at its lower end 21 so that any internal pressure in the bottle will most effectively force the ridges 20 into firmer sealing engagement. Thus, any pressure which would tend to cause leakage from the bottle increases the sealing pressure preventing such leakage. This feature is of importance in enabling the use of polyethylene and similar materials which tend to flow under pressure for prolonged periods. Experience has shown that the simple substitution of polyethylene for cork in a gasket will not give adequate sealing action for this reason. It is believed that at least 95% of the sealing action in the present instance is provided by the skirt 16. Even if there is some tendency of the material to deform the fact that internal pressure increases the sealing force, prevents any leakage.

It will further be pointed out that additional economies are obtained by permitting the use of caps having substantially shorter skirts. The thickness of the disc portion 10 is substantially less than that of a conventional cork gasket to account, in part, for this reduction. Second, the compressive force required on the disc portion 10 is less, since it functions as a secondary seal.

It would be pointed out that the portion of the skirt *s* overlying the strap 12 obviously cannot be crimped to the same extent as the remainder of the skirt. This is of benefit in facilitating displacement of the skirt in pry-

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ing off the cap. It does not, however, affect the sealing action, since the cap still functions effectively to compress the disc portion 10 against the mouth of the bottle and more important because of the sealing action of the gasket skirt 16, leakage pressures at the mouth are substantially reduced.

The present gasket is purposely formed for automatic handling and insertion into a bottle. While the gasket could be attached to the cap in the fashion of conventional gaskets, it is simpler to employ an inserting device between the bottle filler and the capping mechanism of conventional and existing machines. This is to further point out that a minimum of expense is required in adopting the gasket of the present invention into the high speed operation of existing bottling equipment. Thus, the bottle requires no modification; the metal cap can be unmodified, although there are advantages in doing so; the filling mechanism is unaffected; and the cap attaching mechanism requires little or no change. Only the addition of a simple device for inserting the gaskets is needed—presuming high production rates where manual insertion would be impractical.

For purposes of automatic handling, a recess 22 is formed in the upper surface of the disc portion 10 to receive a plunger which will properly locate and insert the gasket.

Also for these same purposes, it is preferable that the top and bottom surfaces of the gasket lie in parallel planes. The skirt 16 also terminates in the same plane as the lower surface of the ring 14 to minimize the possibility of the ring being deflected from this parallel relationship in handling. FIGS. 5 and 6 illustrate a modification which has advantages in more positively assuring this parallel relationship for automatic handling. A bridge 24 is provided between the disc portion 10 and ring 14 opposite the strap 12. This bridge positions the ring 14 in a given relation to the disc portion 10 both in automatic handling and when mounted on a capped bottle. A thin, easily rupturable section 26 is formed in the bridge 24 below the skirt of the cap so that the ring 14 may be readily freed for use in removing the cap as previously described.

FIG. 7 illustrates another modification wherein a skirt 14' is provided which has circumferential corrugations enabling the ring to fit more closely to the bottle and yet expand to permit it to be lifted, as previously described, to remove the cap.

Various modifications in the present disclosure are within the scope of the present teaching and the limitations thereof are to be measured solely by the following claims.

Having thus described the invention what is claimed as novel and desired to be secured by Letters Patent of the United States is:

1. A sealing gasket to be used in combination with a crown type bottle cap, said gasket comprising as integrally formed portions a disc portion adapted to overlie the mouth of the bottle and to be compressed thereagainst by the cap, a strap depending from one side of the disc portion and adapted to be confined between the bottle and the skirt of the cap and a ring connected to the lower end of the strap, said ring being generally parallel to said disc portion and large enough to be telescoped over the top of the bottle and adapted to be lifted over the cap so that an upward pull may be exerted on the strap to pry the cap from the bottle.

2. A sealing gasket to be used in combination with a crown type bottle cap, said gasket comprising as integrally formed portions a disc portion adapted to overlie the mouth of the bottle and to be compressed thereagainst by the cap, a tubular skirt depending from said disc portion and entering the throat of the bottle for sealing engagement therewith, a strap depending from one side of the disc portion and adapted to be confined between the bottle and the skirt by the cap and a ring connected to

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the lower end of the strap, said ring being generally parallel to said disc portion and large enough to be telescoped over the top of the bottle and adapted to be lifted over the cap so that an upward pull may be exerted on the strap to pry the cap from the bottle.

3. A sealing gasket to be used in combination with a crown type bottle cap, said gasket comprising as integrally formed portions a disc portion adapted to overlie the mouth of the bottle and to be compressed thereagainst by the cap, a tubular skirt depending from said disc portion and entering the throat of the bottle, said tubular skirt being relatively thin and expensible in response to internal pressures of the bottle, said skirt having at least one circumferential narrow ridge sealingly engaging the bottle, a strap depending from one side of the disc portion and adapted to be confined between the bottle and the skirt by the cap and a ring connected to the lower end of the strap, said ring being generally parallel to said disc portion and large enough to be telescoped over the top of the bottle and adapted to be lifted over the cap so that an upward pull may be exerted on the strap to pry the cap from the bottle.

4. A sealing gasket to be used in combination with a crown type bottle cap, said gasket comprising as integrally formed portions a disc portion adapted to overlie the mouth of the bottle and to be compressed thereagainst by the cap, a tubular skirt depending from said disc portion and entering the throat of the bottle for sealing engagement therewith, a strap depending from one side of the disc portion and adapted to be confined between the bottle and the skirt by the cap and a ring connected to the lower end of the strap, said ring being generally parallel to said disc portion and large enough to be telescoped over the top of the bottle and adapted to be lifted over the end of the cap so that an upward pull may be exerted on the strap to pry the cap from the bottle, the lower surface of said ring and the upper surface of said disc like portion lying in spaced parallel planes.

5. A sealing gasket as in claim 4 wherein the tubular skirt extends to and terminates in the plane of the lower surface of said ring.

6. A sealing gasket as in claim 4 wherein a bridge is provided to connect the disc like portion and the ring at a point opposite said strap, said bridge having an extremely thin, easily rupturable portion, at a point to be spaced beneath the skirt of the cap.

7. A sealing gasket to be used in combination with a crown type bottle cap, said gasket comprising as integrally formed portions a disc portion adapted to overlie the mouth of the bottle and to be compressed thereagainst by the cap, a strap depending from one side of the disc portion and adapted to be confined between the bottle and the skirt of the cap, and a ring connected to the lower end of the strap, said ring being generally parallel to said disc portion and large enough to be telescoped over the top of the bottle and adapted to be lifted over the cap so that an upward pull may be exerted on the strap to pry the cap from the bottle, said ring having circumferentially disposed corrugations enabling the ring to be expanded to facilitate its being lifted over the cap.

8. A sealing gasket to be used in combination with a crown type bottle cap, said gasket comprising as integrally formed portions a disc portion adapted to overlie the mouth of the bottle and to be compressed thereagainst by the cap, a tubular skirt depending from said disc portion and entering the throat of the bottle for sealing engagement therewith, said disc portion having a recess formed in its upper surface to enable it to be positioned on plunger mechanism for automatically placing said gasket on the bottle, a strap depending from one side of the disc portion and adapted to be confined between the bottle and the skirt by the cap and a ring connected to the lower end of the strap, said ring being generally parallel to said disc portion and large enough

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to be telescoped over the top of the bottle and adapted to be lifted over the cap so that an upward pull may be exerted on the strap to pry the cap from the bottle.

9. A sealing gasket to be used in combination with a crown type bottle cap, said gasket comprising as integrally formed portions a disc portion adapted to overlie the mouth of the bottle and to be compressed thereagainst by the cap, said disc portion having a plurality of thin concentric ridges on the undersurface thereof to accommodate any irregularities in the mouth of said bottle and to insure sealing engagement therewith, a thin walled, tubular skirt depending from said disc portion and entering the throat of the bottle, said skirt having at least one circumferential thin ridge for sealingly engaging the throat of the bottle and said skirt being expandable as a result of internal pressures within said bottle to increase the pressure of said sealing engagement, said skirt being inwardly flared at its lower end to facilitate insertion into the mouth of said bottle, a strap depending from one side of the disc portion and adapted to be confined between the bottle and the skirt by the cap and a ring connected to the lower end of the strap, said ring being generally parallel to said disc portion and normally spaced closely adjacent the lower end of said skirt, said ring having a diameter slightly greater than the diameter of said cap whereby the ring may be lifted over the cap so that an upward pull may be exerted thereby on the strap to pry the cap from the bottle.

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10. A sealing gasket as in claim 9 wherein the upper surface of said disc portion and the lower surface of said ring define the upper and lower limits of said gasket and lie in spaced parallel planes, and further wherein a recess is provided on the upper surface of said disc portion to enable it to be positioned on plunger mechanism for automatically placing said gasket on the bottle.

11. A sealing gasket as in claim 9 wherein the gasket is formed of high density polyethylene material.

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