

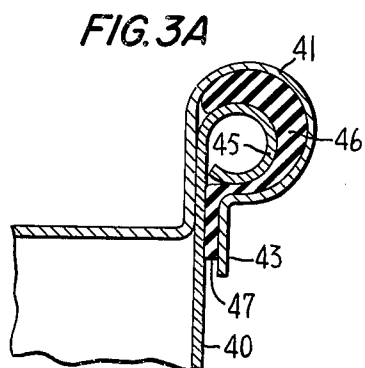
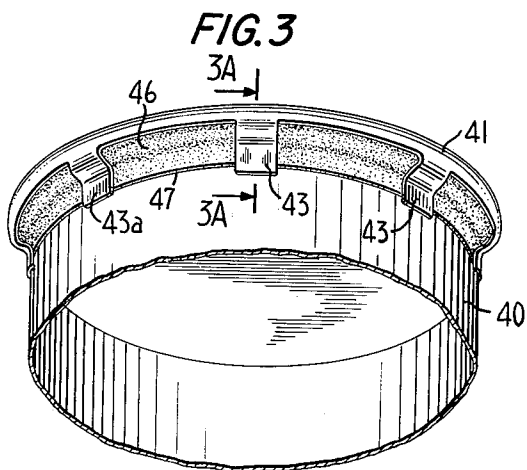
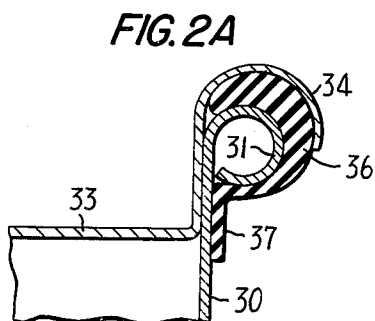
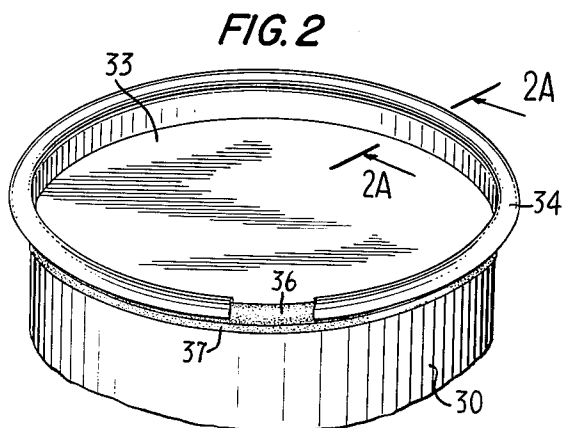
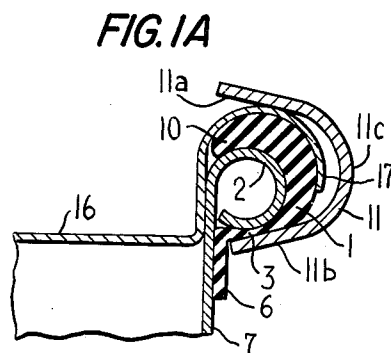
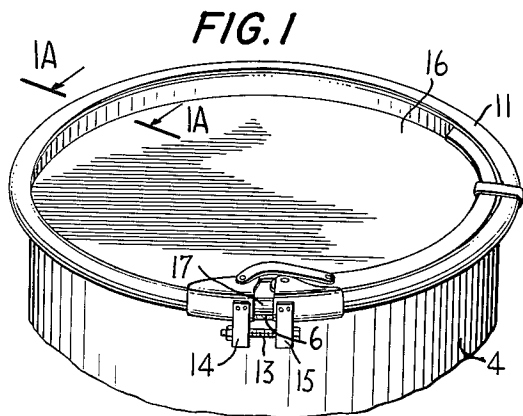
Sept. 7, 1965

H. H. FINE

3,204,811

DRUM-MULTIPLE SEAL GASKET

Filed Aug. 27, 1962



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3,204,811

DRUM-MULTIPLE SEAL GASKET

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Filed Aug. 27, 1962, Ser. No. 219,525
10 Claims. (Cl. 220-46)

This invention relates generally to full open head drums and more particularly to a new and novel multiple-seal ring gasket for use on open head drums.

Full open head drums are now almost universally used in the shipment of all types of commodities except liquids. They are used for the packaging of dry powders, pastes, semi-solids, paints, viscous liquids and special applications such as high priced component parts for critical equipment, for example, automotive and airplane equipment. The success of full open head drums has in part been due to the quick closure components employed thereon. However, these drums have a particular defect in that the gaskets employed thereon presently tend to move out of place when the cover is being applied to the drum. The known gaskets have a configuration which when the drums are stacked the gaskets lose resiliency, for example when they are palletized, and the gasket will take a set so that upon removal of the drums from a stacked relationship the gasket may permit fluid or air to leak into the drum.

It is a principal object of the present invention to provide a new and novel gasket for open head drums which is easily applied and readily removed and which overcomes the defects of the known gaskets.

Another object is to provide a multiple-seal gasket or closure for open head drums which will allow for drums which are off-size or out-of-round, and will effect a multiplicity of fluid-tight seals so that if one fails another seal is still present.

Still another object of the present invention is to provide a drum gasket which can be readily removed and replaced in position when the drums are to be cleaned and which will form a multiplicity of fluid-tight seals so that liquids can be shipped in open head drums.

A feature of the gasket, according to the invention, is the provision thereon of a bead or annulus having an arcuate cross section defining a concave channel interiorly thereof which fits snugly over the outer surfaces of a drum curl. The annulus has a flange or skirt extending from one end thereof substantially in the same plane as the opposite end of the annulus and in position for peripherally engaging, along a limited axial extent, the outer side wall of the drum adjacent and beneath the drum curl to effect an annular sealed area between the outer wall surface and the inner surface of the skirt between the curl and the bottom of the drum.

The arcuate annulus effects a double seal in conjunction with the drum cover which compresses the annulus radially inwardly into the curl and in conjunction with the lower lip of a locking ring or in conjunction with ears on the cover. A third seal is formed by the skirt so that the gasket functions as a triple seal gasket.

The gasket never comes in contact with the contents of a drum and requires no adhesive for effecting the triple seal and eliminates the problem heretofore encountered with respect to the gasket portions thereof tending to fall into the container when the cover is removed because adhesives are used.

Other features and advantages of the drum closure in accordance with the present invention will be better understood as described in the following specification and appended claims, in conjunction with the following drawing, in which:

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FIG. 1 is a perspective view of an open head drum to which the invention has been applied;

FIG. 1A is a sectional view taken along line 1A-1A of FIG. 1;

FIG. 2 is a fragmentary perspective view of another construction of an open head drum to which the ring gasket of the invention is applied and illustrates a construction in which the cover is applied without the use of a locking ring;

FIG. 2A is a sectional view taken line 2A-2A of FIG. 2; and

FIG. 3 is a fragmentary perspective view of another embodiment of a drum or container illustrating the use of the invention with a cover having ears for locking a cover on the container.

FIG. 3A is a sectional view taken along line 3A-3A of FIG. 3.

The invention is particularly applicable to open head drums particularly the type where locking rings are employed. The term drum herein is used generically to include containers of the type having an outer head bead or curl at the open end thereof and sometimes referred to as a chine in the drum trade. The containers may be either large volume drums or smaller containers of any size or volume.

According to the drawings a multiple-seal ring gasket according to the invention comprises an annulus or bead 1 of arcuate configuration in cross section having formed on the interior thereof surfaces defining an interior concave channel 2 which is dimensioned to fit snugly over a curl 3 of a drum 4. Beads or curls on containers are of different diameters so that the annulus of the gasket is made for whatever diameter of curl it is to be used on. The bead or annulus fits over the top of the curl and completely covers the underside of the curl. The annulus terminates on the curl so that it never comes into contact with the contents. The arcuate annulus is provided with a flange or skirt 6 of the same material as the annulus 1 extending outwardly therefrom in position for peripherally engaging the outside wall surface 7 of the drum 4 along a limited axial extent and extends downwardly in a direction toward the drum bottom, not shown. The skirt 6 snugly engages the wall surface to effect an annular sealed area between its inner surface and the drum surface disposed between the drum bottom and curl and close adjacent to the curl.

The annulus 1 and the flange 6 each have substantially uniform thicknesses and the annulus has a free end 10 terminating substantially in the same plane as the outer surface of the skirt 6 when viewed in cross section. The skirt may be anywhere from about one-half inch wide to about one inch and the annulus or bead has an inner diameter corresponding to the diameter of the curl and may be used on curls having diameters in the order of one-half inch to five-eighths. The annulus has a greater thickness than the skirt. The annulus has a thickness, for example of about $\frac{5}{16}$ " and the skirt has a thickness of about $\frac{3}{16}$ ".

The gasket illustrated is preferably made of a resilient material that is not attacked by solvents, for example, neoprene, rubber, paper, fiber, plastic compositions. Other materials, for example, sponge, cork, cellulose and non-toxic, non-inflammable materials may be used. The gasket is preferably made of a resilient, stretchable material extruded as a strip and then cut to size to fit the dimension of the size drum to which it is to be applied. The ends of the strip are secured or bonded, for example by a staple or adhesive to form the gasket as a continuous ring gasket.

In FIG. 1 the gasket, according to the invention, is applied to a conventional open head drum in which a con-

ventional locking ring 11 having adjustable mechanism comprising a bolt 13 passing through projections 14 and 15 for taking up on the locking ring 11 and pulling up on a cover 16 disposed over the gasket as hereinafter explained. In use the gasket is applied over the drum curl with the skirt and annulus as illustrated and heretofore described. The cover 16 is provided with a lip 17 extending substantially over the top of the gasket in position for compressing it against the curl. The locking ring illustrated in cross section in FIG. 1A has an upper lip 11a and a lower lip 11b and has a ring outer portion 11c.

The upper lip 11a engages the top of the cover lip 17 and the ring portion 11c engages the outer periphery of the cover and gasket while the lower lip 11b of the locking ring compresses the gasket lower portion of the arcuate annulus against the underside of the curl thereby forming seals on the curl. The gasket concave channel and the drum curl form an annular sealed area over the curl and between the gasket and lip of the cover a fluid-tight seal is formed when the locking ring is applied and adjusted. The lower lip 11b of the locking ring forms a fluid-tight seal on the underside of the curl between the gasket and curl and between it and the gasket. A third seal is formed along the area defined between the flange 6 and the outer side wall surfaces of the drum 4. The latter seal is effected by the snugness of the skirt and the pressure applied by the atmosphere tending to hold the skirt on the drum.

It will be appreciated that when the bolt 13 is taken up the locking ring fits snugly around the cover and gasket and an effective triple seal is formed precluding any possibility of fluid flow inwardly into the container of the drum or outwardly therefrom. Moreover, the annulus and skirt tend to hold the gasket in position when applied so that there is no need of bonding the gasket on the drum. The gasket is readily applied and can be removed for cleaning the drum. The drum can be sold with the gasket on or it can be applied at a subsequent time. The gaskets can be color coded as desired.

The gasket according to the invention is also applicable to drums or containers of the type illustrated in FIGS. 2-2A in which a drum or container 30 is illustrated as having a head curl 31. In this case a cover 33 is provided with a lip 34 compressing at least a major portion of a gasket annulus 36 formed in a manner similar to the gasket described with respect to FIG. 1. The gasket is provided with a flange or skirt 37 effecting a sealed annular area below the curl 31 as heretofore described. The lip 34 of the drum is of the type that can be snapped on and fits snugly over the curl and gasket thereon and compresses the annulus and effects a seal. In this construction the lack of a locking ring precludes the forming of a seal on the underside of the curl of the type heretofore described.

The invention is likewise applicable to smaller containers or drums of the type illustrated in FIG. 3 in which a container 40, for example a paste container, is provided with a cover 41 having a plurality of angularly spaced ears 43 for holding the cover 41 on a curl 45 on which is mounted a gasket annulus 46 of the type heretofore described. The gasket 46 likewise is provided with an annular flange or skirt 47 extending peripherally around the outer side wall surfaces of adjacent the curl 45 to effect a seal as heretofore described. The ears 43 which are angularly spaced effect intermittently spaced areas in which a very positive seal is formed on the underside of the curl 45 in a manner somewhat comparable to the illustration in FIG. 1 in which a lock and ring is employed except that the underside seal is formed by the compression of the ears. The angular spaced ears 43 have lower portion 43a which presses the skirt radially inwardly further increasing the effectiveness of the seal. The invention provides a multiple-seal gasket usable with various types of locking rings which have adjustment means thereon and conventional covers. The gasket in combination

with the drum component parts forms a triple seal and eliminates leakage by three independent seal areas after the cover and lock and ring are mounted on the drum. A positive seal is constantly provided by the gasket according to the invention. Thus, for example, if the drums are stacked or palletized and the seal effected on the top of the curl is weakened or lost due to set in the gasket or loss of resiliency the seal on the underside of the curl is still present. Moreover, the skirt seal is constantly effective.

It will be understood by those skilled in the art that the gasket according to the invention is likewise applicable to lever-bolt locking rings and to bung drums converted to open head drums.

While preferred embodiments of the invention have been shown and described it will be understood that many modifications and changes can be made within the true spirit and scope of the invention.

What I claim and desire to secure by Letters Patent is:

1. In combination, an open head drum having a head curl, a multiple-seal ring gasket on said drum made of a resilient material comprising an annulus having an arcuate cross section defining an interiorly disposed concave channel receiving the head curl and fitting thereon for effecting a seal between the surfaces of said channel and said curl, said annulus having an annular skirt of the same material extending outwardly from said annulus in position to peripherally engage the outside wall surface of said drum a limited axial extent and extending axially away from said curl snugly engaging said outside wall surface to effect a peripheral seal between it and said drum along an annular area substantially immediately adjacent said curl and between said curl and a bottom end of said drum, a cover for covering said drum having a lip for compressing said arcuate annulus against at least the top surfaces of said curl for effecting a sealed area defined between said annulus and said curl, and effecting a seal between said cover and said annulus, and a locking ring having an upper lip for pressing said cover lip toward said curl and a lower lip for compressing said annulus along an annular area on the underside of said curl to effect along an annular area on the underside of said curl to effect another fluid-tight sealed annular area between said ring gasket, said drum and said locking ring.

2. In combination, an open head drum having a head curl, a multiple-seal ring gasket on said drum made of a resilient, stretchable material comprising an annulus having an arcuate cross section defining an interiorly disposed concave channel receiving the head curl and fitting snugly thereon for effecting a seal between the surfaces of said channel and said curl, said annulus having an annular skirt of the same material extending outwardly from said annulus in position to peripherally engage the outside wall surface of said drum a limited axial extent and extending axially away from said curl snugly engaging said outside wall surface to effect a peripheral seal between it and said drum along an annular area substantially immediately adjacent said curl and between said curl and a bottom end of said drum, a cover for covering said drum having a lip for compressing said arcuate annulus against at least the top surfaces of said curl for effecting a sealed area defined between said annulus and said curl and effecting a seal between said cover and said annulus, and a locking ring having an upper lip for pressing said cover lip toward said curl and having a lower lip for compressing said annulus along an area on the underside of said curl to effect another fluid-tight sealed annular area between said ring gasket, and said drum and between said gasket annulus and said lower lip of said locking ring.

3. In combination, an open head drum having a head curl, a multiple-seal ring gasket on said drum made of a resilient material comprising an annulus having an arcuate cross section defining an interiorly disposed concave channel receiving the head curl and fitting thereon for effecting a seal between the surfaces of said chan-

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nel and said curl, said annulus having an annular skirt of the same material extending outwardly from said annulus in position to peripherally engage the outside wall surface of said drum a limited axial extent and extending axially away from said curl snugly engaging said outside wall surface to effect a peripheral seal between it and said drum along an annular area substantially immediately adjacent said curl and between said curl and a bottom end of said drum, a cover on said drum having a lip compressing said arcuate annulus against at least the top and outer surfaces of said curl for effecting a sealed area defined between said annulus and said curl and between said annulus and said cover lip.

4. In combination, an open head drum having a head curl, a multiple-seal ring gasket on said drum made of a resilient material comprising an annulus having an arcuate cross section defining an interiorly disposed concave channel receiving the head curl and fitting thereon for effecting a seal between the surfaces of said channel and said curl, said annulus having an annular skirt of the same material extending outwardly from said annulus in position to peripherally engage the outside wall surface of said drum a limited axial extent and extending axially away from said curl snugly engaging said outside wall surface to effect a peripheral seal between it and said drum along an annular area substantially immediately adjacent said curl and between said curl and a bottom end of said drum, a cover for said drum having a lip for compressing said arcuate annulus against at least the top surfaces of said curl for effecting a sealed area defined between said annulus and said curl and effecting a seal between said cover and said annulus, and having angularly spaced ears for compressing said annulus along angular spaced areas on the underside of said curl to effect a sealed area between said ring gasket and the underside of said curl.

5. A multiple-seal ring gasket for open head drums having a head curl comprising, a bead annulus made of a resilient material having an arcuate cross section defining an interiorly disposed concave channel for receiving the head curl therein and configured and dimensioned in cross section to fit snugly over substantially the entire peripheral outer surface of said curl, said annulus having an annular skirt of the same material extending outwardly from said bead annulus in position to peripherally engage the outside side wall surface of said drum close adjacent to said drum curl and extending axially away from said bead annulus a limited extent and in use extending axially of said drum away from said curl and snugly engaging said outside wall surface to effect a peripheral seal on said drum along an annular area substantially immediately adjacent said curl and between said curl and a bottom end of said drum.

6. A multiple-seal ring gasket for open head drums having a head curl comprising, an annulus made of a resilient, stretchable material having an arcuate cross section defining an interiorly disposed concave channel for receiving the head curl therein and configured and dimensioned in cross section to fit snugly over substantially the entire peripheral outer surface of said curl, said annulus having a convex outer surface for cooperating with an arcuate lip of a cover positionable over said annulus, said annulus having an annular skirt of the same material extending outwardly from said annulus in position to peripherally engage the outside side wall surface

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of said drum close adjacent to said curl and extending axially away from said annulus a limited extent and in use axially of said drum away from said curl for snugly engaging said outside wall surface to effect a peripheral seal on said drum along an annular area substantially immediately adjacent said curl and between said curl and a bottom end of said drum.

7. A multiple-seal ring gasket for open head drums having a head curl comprising, an annulus made of a resilient material having an arcuate cross section defining an interiorly disposed concave channel for receiving the head curl therein and configured and dimensioned at least in cross section of fit snugly over substantially the entire outer surface of said curl, said annulus having a convex outer surface for cooperating with an arcuate lip of a cover positionable over said annulus, said annulus having an annular skirt of the same material extending outwardly from said annulus in position to peripherally engage the outside side wall surface of said drum close adjacent to said curl and extending axially away from said annulus a limited extent and in use extending axially of said drum away from said curl snugly engaging said outside wall surface to effect a peripheral seal on said drum along an annular area substantially immediately adjacent said curl and between said curl and a bottom end of said drum.

8. A multiple-seal ring gasket for open head drums according to claim 7, in which said annulus and said skirt are of different thicknesses.

9. A multiple-seal ring gasket for open head drums according to claim 7, in which said annulus and said skirt each has a uniform thickness, and in which said annulus has a greater thickness than said skirt.

10. A multiple-seal ring gasket for open head drums having a head curl comprising, a bead annulus made of a resilient material having an arcuate cross section defining an interiorly disposed contoured channel for receiving a head curl therein and configured and dimensioned in cross section to fit snugly over substantially the entire peripheral outer surfaces of said curl, said annulus having an annular skirt of the same material extending outwardly from said annulus in position to peripherally engage the outside side wall surface of said drum close adjacent to said curl and extending axially away from said annulus and in use extending axially of said drum away from said curl and for snugly engaging said outside wall surface to effect a peripheral seal on said drum along an annular area substantially immediately adjacent said curl and between said curl and an end of said drum spaced farthest from said curl.

References Cited by the Examiner

UNITED STATES PATENTS

2,148,468	2/39	Hothersall	220—46
2,152,634	4/39	Cornell	220—55
2,915,330	12/59	Verbiar	220—55
2,961,109	11/60	Podesta	215—40

FOREIGN PATENTS

1,085,337	7/54	France.
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Examiners.

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,204,811

September 7, 1965

Harry H. Fine

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

In the grant, lines 1 to 3, for "Harry H. Fine, of Kew Garden Hills, New York, assignor to Irving Silver and Barry K. Fine, of Kew Garden Hills, Queens, New York, and Rego Park, New York, respectively," read -- Harry H. Fine, of Kew Garden Hills, New York, assignor of one-third each to Irving Silver and Barry K. Fine, of Kew Garden Hills, Queens, New York, and Rego Park, New York, respectively --; line 12, for "Irving Silver and Barry K. Fine, their heirs" read -- Harry H. Fine, Irving Silver, and Barry K. Fine, their heirs --; in the heading to the printed specification, lines 3 to 5, for "Harry H. Fine, Kew Gardens Hills, N. Y., assignor to Irving Silver and Barry K. Fine, Kew Garden Hills, Queens, N. Y., and Rego Park, N. Y., respectively" read -- Harry H. Fine, Kew Garden Hills, N. Y., assignor of one-third each to Irving Silver and Barry K. Fine, Kew Garden Hills, Queens, N. Y., and Rego Park, N. Y., respectively --.

Signed and sealed this 3rd day of May 1966.

(SEAL)

Attest:

ERNEST W. SWIDER
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Commissioner of Patents