Feb. 14, 1961 C. A. TEVANDER ET AL 2,971,663

SEALING CAP FOR CONTAINERS

Filed July 2, 1959

Fig. 1.

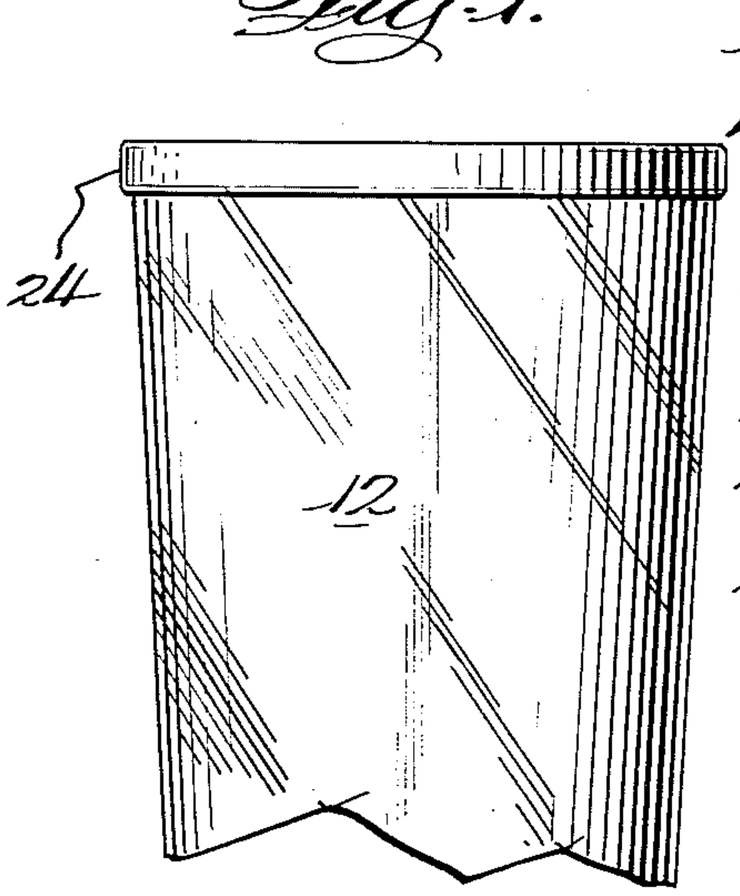


Fig. 3.

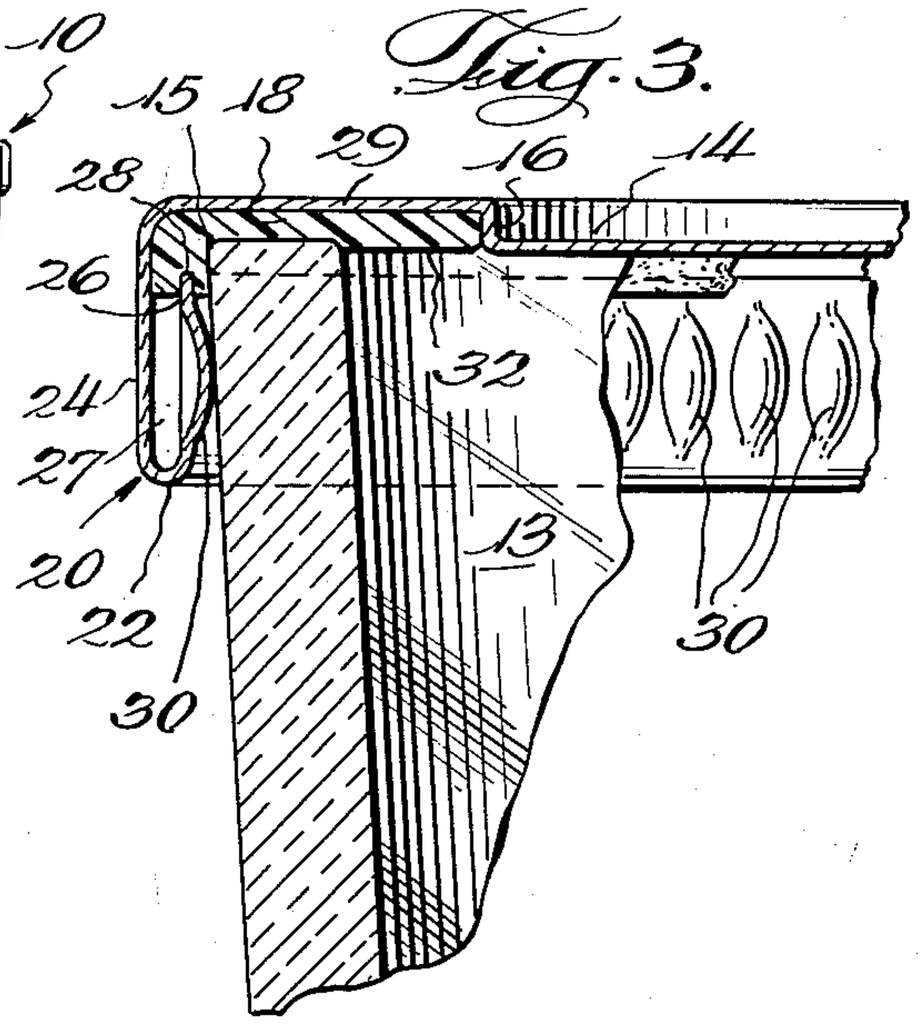


Fig. 2

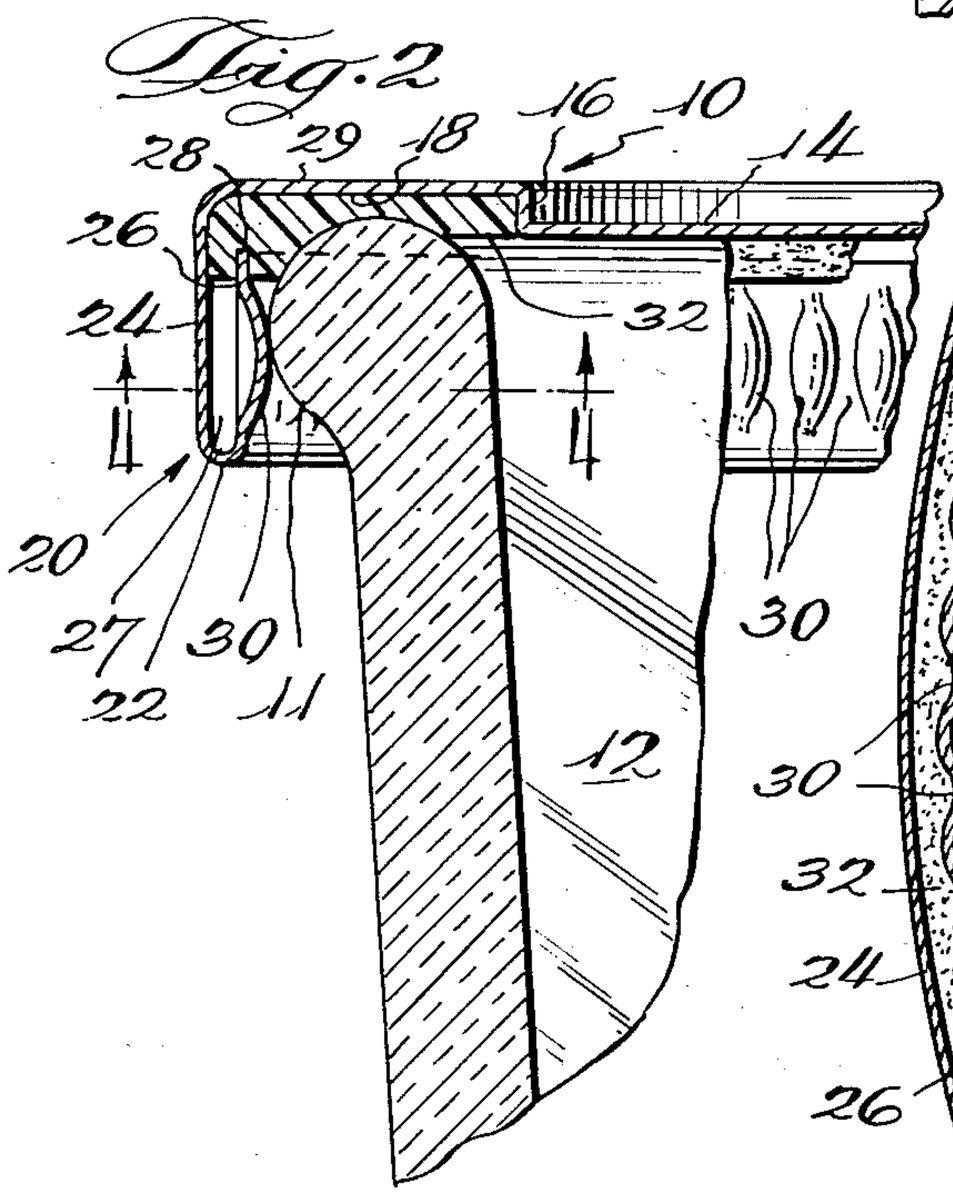
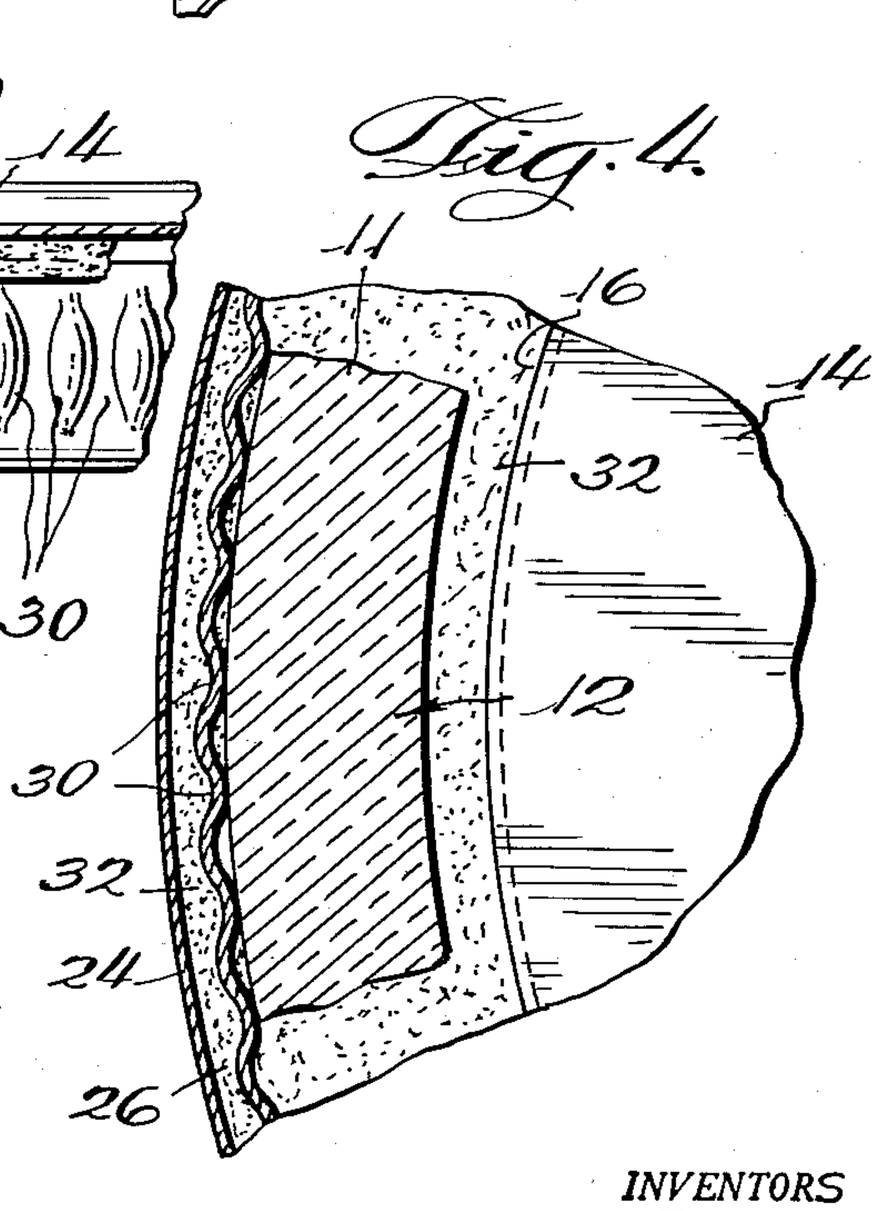


Fig. 4.



INVENTORS

Clarence A. Tevander

Robert A. Clark

By Silverman, Mullin & Cass

Attorneys

United States Patent Office

2,971,663

Patented Feb. 14, 1961

2,971,663

SEALING CAP FOR CONTAINERS

Clarence A. Tevander and Robert A. Clark, Maywood, Ill., assignors to Swan Metal Cap Co., Inc., Chicago, Ill.

Filed July 2, 1959, Ser. No. 824,605

4 Claims. (Cl. 215—40)

This invention relates generally to closure or sealing caps for open mouthed containers. More particularly, the invention relates to sealing caps of the type which are adapted to be frictionally press-fitted over the upper end of a container to form a releasable seal for the container and its contents.

Sealing caps of the general character described are, of course, familiar and well known. They enjoy particularly wide usage for sealing glass containers such as jars or bottles containing various food products. Despite the widespread use of such sealing caps, the same have nonetheless been characterized by one or more disadvantages or limitations. For example, many of the prior sealing caps required that a vacuum be created in the container since without the differential air pressure the cap could not be maintained in sealing relationship on the container. Such a requirement naturally necessitated the use of expensive and complicated equipment and adversely affected the speed of the sealing operation.

It is therefore an important object of this invention to provide a sealing cap which may be simply and quickly frictionally press-fitted over the top of a glass container to provide a hermetic seal without the need for creating a vacuum in the container.

In an effort to overcome the disadvantages of the vacuum sealing caps, frictional sealing caps of various types were attempted. These, however, were unsuccessful or introduced other undesirable factors. Thus, for example, a cap having a concavo-convex corrugated flange was introduced. However, aside from the unattractive appearance presented by such a cap, the indented corrugated spaces were conducive to the collection of dirt, thereby affording an objectionable problem in sanitation.

It is well known that many types of foods which are packaged in glass containers of the type under discussion are eaten in piecemeal fashion and not all at once. Included among such foods might be jellies, jams, sauces, spreads and the like. In such cases it is obviously desirable that it be possible to repeatedly re-seal the container after the initial opening thereof and until the contents of the container are exhausted. Where the prior sealing caps were operationally held in position by a vacuum, such containers obviously could not be re-sealed by hand once the same had been opened. Even in cases where a vacuum was not required, it was found that the initial opening of the container necessitated the distortion and/or mutilation of the sealing cap so that the same could not be re-used for re-sealing the container.

Another important object therefore, is to afford a sealing cap of the character described which forms a releasable seal so that the same may be used to re-seal the container upon which the same is mounted.

A basic problem familiar to the industry is the fact that although sealing cap and container sizes may be standardized, the normal tolerances of manufacture of both the caps and containers quite often results in a mismatch between these parts. A related problem is the fact that many supposedly round containers are not perfectly annular. Due to the nature of their construction, many of the prior sealing caps were unable to compensate for such mis-matches. The result was either a poorly sealed container for a completely wasted sealing cap.

Still another important object therefore, is to provide a sealing cap of the character described which is so constructed that normal tolerances in the manufacture thereof and of the containers upon which the same are to be used will not affect the efficient use thereof. In this regard, it is contemplated that our new and improved sealing cap will utilize a return-bent double walled flange which is able to compensate for normal tolerance variations and for containers which are not perfectly round.

A further object is to provide a sealing cap of the character described which utilizes a novel means for insuring a re-usable perfect seal, said novel means comprising a resilient compressible air pocket between the walls of said return-bent flange.

Another object is to afford a sealing cap of the character described having no exposed or raw edges which might be injurious to the hand or susceptible to rust and oxidation.

Still a further object is to afford a sealing cap of the character described which, because of its double walled flange construction, is stronger and able to withstand much higher pressures than heretofore, thus permitting a tighter seal.

Yet another object is to provide a sealing cap of the character described which is equally effective on all shapes of containers, such as containers having beaded top lips, containers having straight side walls and a straight upper lip, and containers having tapered side walls and a straight upper lip. A related object is to provide a sealing cap of the character described which is equally effective on variously sized containers ranging from small mouthed bottles to wide mouthed jars.

Yet a further object is to afford a sealing cap of the character described whose side flange is completely smooth on the exterior thereof so that the same enhances the attractiveness of the container and its contents. A related object is to afford a sealing cap of the character described whose side flange is relatively narrow in width, again enhancing the appearance of the sealed container.

Still another object is to provide a sealing cap of the character described which is inexpensively manufactured by a novel method from ordinary sheet metal materials, and yet is most efficient, sturdy and attractive.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel features of construction, arrangement and a combination of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportion, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

For the purpose of facilitating an understanding of our invention, we have illustrated in the accompanying drawings a preferred embodiment thereof, from an inspection of which, when considered in connection with the following description, our invention, its mode of construction, assembly and operation, and many of its advantages should be readily understood and appreciated.

Referring to the drawings in which the same characters of reference are employed to indicate corresponding or similar parts throughout the several figures of the drawings:

Fig. 1 is an elevational view of the invention showing the same in operational position on the upper fragment of a typical glass container;

Fig. 2 is an enlarged fragmentary longitudinal sectional

view showing the structure of the sealing cap and the manner of engagement thereof on a container having a beaded upper lip;

Fig. 3 is a similar view showing the manner of engagement of the sealing cap on a container having a tapered wall and a straight upper lip; and

Fig. 4 is a fragmentary sectional view taken on the plane of line 4—4 in Fig. 2 and viewed in the direction indicated.

Referring now to the various figures of the drawings, it will be seen that the reference character 10 indicates generally our new and improved sealing cap, the same being shown operationally mounted on a typical tumbler or glass container 12. The specific container 12 shown is provided with a beaded upper lip 11 as indicated in Fig. 2.

The sealing cap 10 comprises a disk or cover portion 14 offset as at the annular shoulder 16 to provide an annular upwardly extending recess 18. The function of the recess 18 will become apparent as the description proceeds.

Depending from the marginal edge of the cover 14 is an annular flange indicated generally by the reference numeral 20. The annular flange 20 comprises an integrally formed member which is return-bent as at 22 to afford an outer flange 24 and an inner flange 26 in substantially parallel spaced apart relationship. It is important to note that there is thus provided an air space 27 between the inner flange 26 and outer flange 24. The inner flange 26 may be slightly shorter than the outer flange 24, the free end 28 thereof terminating in spaced relationship with the top 29 of the recess 18.

The inner flange 26 is knurled around the circumference thereof to provide corrugations such as 30. The corrugations 30, in addition to affording ideal gripping surfaces, permit a limited amount of desirable resilient circumferential expansion of the inner flange 26 so that the cap 10 is able to withstand considerable stress when the same is press-fitted over the container 12. In addition, the bend 22 and air space 27 provide an additional means of limited expansion for the inner flange 26. The combination of these elements thus provides a most efficient seal while simultaneously permitting the cap 10 to compensate for the normal tolerance variations in size and shape encountered in the manufacture of caps and containers.

To provide a hermetic seal between the cap 10 and the container 12, an annular band of sealing material such as 32 is employed to fill the recess 18. The band 32 may comprise any suitable sealing material such as a pre-formed rubber or neoprene gasket or ring or the like. However, in the embodiment illustrated, we have employed a sealing material which may be poured, such as liquid rubber, liquid plastisols or the like. In this manner, the band of sealing material 32 not only fills the recess 18 but also seals the air space 27 between the inner flange 26 and the outer flange 24, as indicated in Fig. 2 of the drawings. It will thus be noted that the air in the air space 27 is effectively trapped therein, thereby affording a compressible air pocket which tends to retain the inner and outer flanges in the desirable spaced relationship illustrated. The sealing material 32 also protects the raw edge 28 of the inner flange 26 against oxidation or the like.

In Fig. 3, our sealing cap is illustrated in operational position on a glass container 13 having a straight lip 15, as distinguished from the beaded lip 11 illustrated in Fig. 2. It is important to note that the novel construction of the cap 10 permits the same to be equally effective with either type of container lip. In the case of the straight lip 15, the inner flange 26 is expandable enough to permit passage of the cap over the widest top diameter of the container 13, after which the resilient inner flange springs back into its original spaced relationship with the outer flange 24 to effectively seal

the container. So, too, with the beaded lip 11, the inner flange 26 is elastic enough to permit passage thereof over the widest portion of the beaded lip 11 to a point where it grips a lower portion of smaller circumference of the bead as indicated. The need for creating a vacuum to insure an effective seal is thus eliminated.

In actual practice, the sealing cap 10 is novelly manufactured in the following manner. A shell is drawn from a suitable sheet metal having the cover portion 14 and a straight depending flange. The straight depending flange is equal in length to the combined lengths of the outer flange 24, the inner flange 26 and the bend 22. An annular offset is now made in the straight depending flange at a point intermediate its width to provide the bend 22, and the inwardly offset portion of the straight flange therebelow is knurled as indicated. The offset portion is then bent by pushing inwardly until the same is return-bent to afford the inner flange 26. Thereafter, the liquid sealing material 32 is poured into the recess 18 as described.

It is important to note that the outer flange 24 is relatively short in length and perfectly smooth on the exterior thereof. Thus, the cap 10 enhances the appearance of the container. In addition, the relative shortness of the outer flange 24 permits the container to be readily opened by the use of most common can or bottle opening devices without mutilating the cap. The cap may then be used to effectively re-seal the container as often as required.

From the above description and drawings, it should be apparent that we have provided a novel and improved sealing cap for glass containers. The return-bent double-flanged construction thereof insures a sturdy and effective seal for containers of virtually any shape without the need for creating a vacuum in the container. The elastic air pocket between the two flanges and the resilience of the knurled inner flange further insures an effective seal and serves to prevent the distortion of the inner flange so that the cap may be effectively re-used time and again. The smooth and relatively short outer flange enhances the appearance of the sealed container and further permits the container to be easily pried open without mutilating the cap. The novel method of manufacture is quick and efficient so that the cap may be inexpensively made.

It is believed that our invention, its mode of construction and assembly, and many of its advantages should be readily understood from the foregoing without further descritpion, and it should also be manifest that while a preferred embodiment of the invention has been shown and described for illustrative purposes, the structural details are nevertheless capable of wide variation within the purview of our invention as defined in the appended claims.

What we claim and desire to secure by Letters Patent of the United States is:

1. A sealing cap for containers comprising: a cover portion, an annular portion depending from the marginal edges of said cover portion, said annular portion being return-bent to afford an inner flange and an outer flange in spaced substantially parallel relationship with each other, said inner flange being formed with corrugations, said cover portion being formed with an annular upstanding recess, and an annular gasket of sealing material positioned in said recess, said gasket being poured into said recess so that the same seals entrapped air in the space between said inner and outer flanges.

2. A sealing cap for a container having an annular open top comprising; a circular cover portion, said cover portion being formed with an annular upstanding recess, an annular skirt depending from the marginal edges of said cover portion, said skirt being inwardly return-bent to afford an outer flange and an inner flange in spaced substantially parallel relationship with each other, said inner flange being continuously knurled, said outer

flange being smooth on the exterior thereof, an annular sealing gasket positioned in said recess and sealing the space between said outer and inner flanges to afford a sealed air pocket therebetween, said inner flange being circumferentially resilient so that cap may be press-fitted over the top of said container to provide a releasable seal therefor, said sealing gasket adapted to render said releasable seal hermetic, said sealed air pocket adapted to maintain the spaced parallel relationship between said outer and inner flanges.

3. A sealed package comprising a glass container having an annular top mouth, a sealing cap having a circular cover portion positioned over said annular mouth, an annular skirt depending from said cover portion, said skirt being inwardly return-bent to afford a relatively short outer flange and an inner flange is spaced substantially parallel relationship therewith, said outer flange being smooth on the exterior thereof, said inner flange being continuously knurled about the circumference thereof, said iner flange being circumferentially resilient whereby said package may be re-sealed after being opened, said cover portion being formed with an annular

upstanding recess and an annular sealing gasket positioned in said recess, said sealing gasket sealing the space between said outer and inner flanges to afford a sealed air-cushion therebetween.

4. A sealing cap for containers comprising; a cover portion having an annular upstanding recess, an annular skirt depending from the marginal edges of said cover portion, and annular sealing gasket positioned in said recess, said skirt being inwardly return-bent to afford an inner flange and an outer flange in spaced substantially parallel relationship with each other, the free edge of said inner flange being permanently embedded in said sealing gasket to provide a sealed air pocket between said inner and outer flanges.

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UNITED STATES PATENT OFFICE

CERTIFICATION OF CORRECTION

Patent No. 2,971,663 February 14, 1961

Clarence A. Tevander et al.

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.

Column 2, line 4, for "container for" read -- container or --; column 5, line 5, after "that" insert -- said --; line 16, for "is" read -- in --; line 20, for "iner" read -- inner --; column 6, line 8, after "and" insert -- an --.

Signed and sealed this 20th day of June 1961.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents