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SEAL CONSTRUCTION

Filed Sept. 15, 1964

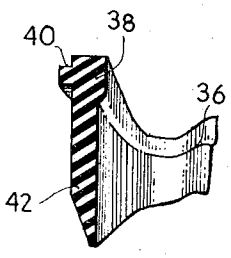



FIG. 2

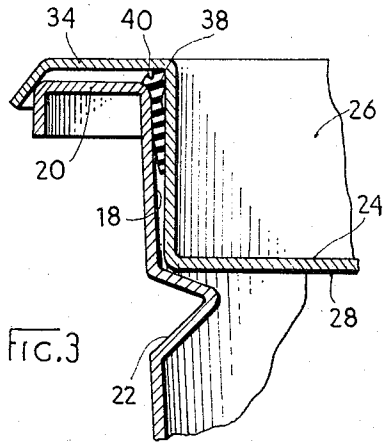



FIG. 3

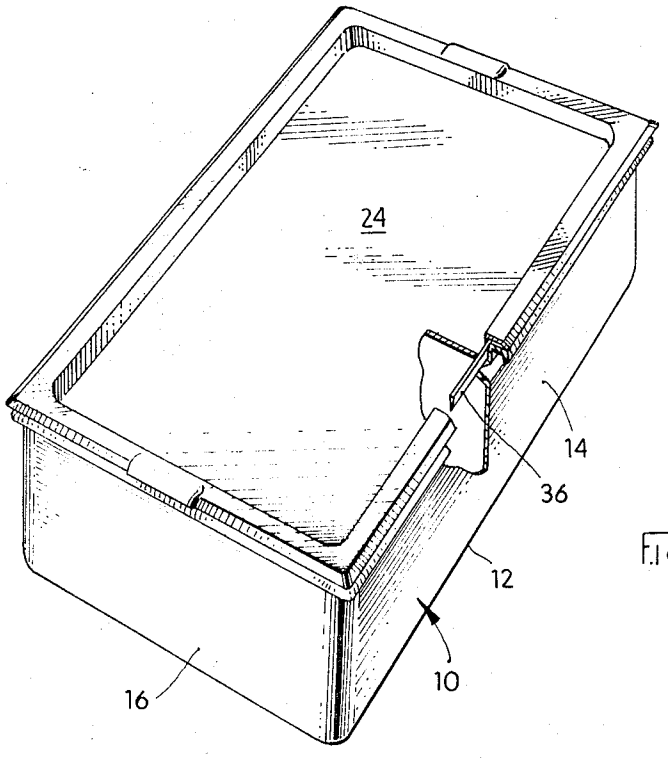



FIG. 1

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# SEAL CONSTRUCTION

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This invention relates to a seal construction and more particularly to a floating seal which is particularly adapted to sealing the space between the cover and container, especially where the cover and container are imperfectly matched and there is a variable clearance between the confronting surfaces of these two parts.

In order to seal the opening of a container, there is provided a cover which conforms at least approximately with the outline of the opening of the container and fits into such opening to protect the interior of the container. In this way, the food or other product within the container can be kept in a heated or cooled condition and guarded against contamination from one source or another. For example, if the product happens to be a food product and is heated, then the cover should seal the interior of the container, keeping the food at its original temperature as closely as possible.

It often occurs, however, that the container and the cover for the container are somewhat distorted during manufacture. The container may be mismatched slightly with the cover so that there is a variation in the clearance between the cover and complementary side walls of the container, and the result is that there are gaps between these two parts after the lid is in place.

In order to seal the interior of the container, it is necessary that the cover completely fill the opening of the container and close off all air passages between the confronting edges of these two members. This can be accomplished only by means of a seal which is used in conjunction with the container. Heretofore, these seals have been bonded or otherwise fixed to one or the other parts; but because of the lack of regularity in outline of the cover and the container, or both, it has been found difficult to effect a proper seal with a fixed seal construction.

Therefore, it is one of the objects of the present invention to provide a seal which will compensate for this lack of regularity in outline between the cover and the container and to accomplish this by means of a floating seal, i.e., one which is not bonded but which can move slightly with respect to the confronting surfaces of the container side walls and cover respectively.

It is another object of the present invention to provide a seal having a deformable sealing lip which sealingly engages the opposing surfaces of the cover and container respectively, moving laterally of such confronting surfaces, in order to compensate for any variation in the clearance between these two parts.

It is a further object of the present invention to provide a sealing member which is relatively long and flexible throughout its length so that it can conform with the outline of the opening for the container and will adjust itself along the length of the seal to provide for variations in clearance between the cover and the opening of the container.

It is an important feature of the present invention that a deformable seal is provided which is free to adjust itself by a "free floating" movement effective to obtain a suitable seal between the cover and the opening of the container irrespective of the slight differences in clearance between the cover and the container after the cover is put in place.

Other objects and features of the present invention will become apparent from a consideration of the following



description which proceeds with the reference to the accompanying drawings, wherein:

FIGURE 1 is a perspective view of a container and its cover in place with a portion of the structure broken away to illustrate the location of the sealing member;

FIGURE 2 is an enlarged fragmentary view and a transverse cross section of the seal shown removed from the cover and container; and

FIGURE 3 is an enlarged sectional view taken through the container, cover and seal when the parts are together.

Referring now to the drawings, the container designated generally by reference numeral **10** is a rectangular cross section structure having a base **12** and side walls, two of which, **14** and **16**, are visible in FIGURE 1. The container is adapted to receive food through its opening **18** and has a flange **20** surrounding the opening **18**. The container may be of any suitable construction, such as stainless steel, reenforced plastic or any other suitable material, the important criteria being that the container be lightweight, durable, washable and capable of containing food or other material both at high temperatures and at low temperatures. The containers which are sometimes referred to as pans or trays are generally transported on portable carts and are used for institutional use, restaurant use and the like.

The container **10** also has an inset **22** (FIGURE 3) to limit movement of the cover **24** through opening **18** and is in sealing relation with the opening **18**. The cover **24** has a depression **26** which extends into the opening **18**, and the bottom **28** thereof is engageable with the inset **22** to limit movement into the opening **18** of the container. The cover **24** also has a shoulder **34** which overlies flange **20** and protects the flange **20** against distortion. Because the cover and container are separately constructed, there inevitably arises, because of manufacturing tolerances, a difference in the running clearance between the confronting edges of the side walls of the container **10** and cover **24**. Consequently, owing to this difference in clearance, particularly differences which occur at the corners where the two parts come together, it is very difficult to effect a suitable seal between the two members because of these differences. However, the present invention seeks to solve this problem by providing a floating seal in the form of a seal member **36** which is both flexible and is elongated to extend around the perimeter or periphery between the cover and container. The sealing member is of polyvinyl chloride construction, or its equivalent, although the exact composition is not a critical part of the present invention. What is important is that sealing action of the seal member is the same around the entire perimeter between the cover and the container regardless of differences in clearance between these two parts.

The seal member **36** includes a sealing lip **38** with a ridge **40** extending outwardly therefrom, these being the portions which are deformable and which provide the sealing surfaces as indicated in FIGURE 3. The ridge **40** bears against the wall of the container, the lip **38** is wedged tightly against the cover **24** (FIGURE 3). Because the sealing member **36** is "free-floating," it can move and adjust itself within the space provided between the cover and the walls of the container. Thus, clearance between these two parts which varies at the corners and along the sides will be compensated for by movement of the seal member up or down (FIGURE 3) so that at the corners, should the corners be closer together, the seal member will move upwardly, and conversely where the side walls and cover are farther apart, the seal member will move downwardly (FIGURE 3).

The seal member **36**, by reason of its free-floating condition, can adjust itself to whatever position is necessary for effective sealing between the cover and the

container. In previous applications, the seal member was bonded to the cover or to the container, and as a result, the two parts when fitted together would produce objectionable clearances or binding at one part or another around the perimeter of the container. But in the present invention, this problem is solved because the seal member can move up or down to adjust the variation of clearance between the two parts. This adjustment along the length of the seal is automatic and proceeds without any effort at adjustment. For example, the seal member is simply positioned around the periphery of the container and the lid is then forced downwardly, and the seal member will then conform itself to whatever position is necessary to effectively seal all of the perimeter between the cover and the container regardless of variations in clearance which might develop between these two parts.

The seal member also includes a trailing portion **42** which extends within the space between the cover and the container to assist in the sealing action whereby the contents of the container are retained in their heated or refrigerated condition.

It should be noted that the container **10** can be placed in a heated or refrigerated portable cart which will cause the container to expand or contract. Also, the heated or cooled contents placed in the container will have a tendency to expand or contract the container. The seal member **36** by reason of its free-floating action can adjust itself with respect to the cover and container to compensate for the expansion or contraction under these conditions.

In operation, the container **10** is filled to the desired level with the food or other product, and seal member **36** is placed around the periphery of the depression **26**, the cover **24** then being inserted into the opening **18**. The cover **24** when pressed downwardly will adjust the sealing member **36** along its length so that the seal member will assume whatever position is necessary to effect uniform sealing action. Because of the decribed "free-floating" action of the sealing member, it is possible to compensate for any changes in clearance around the perimeter of the cover, and hence, the sealing is effective by reason of such free-floating movement of the seal.

The sealing member **36** is removable and can be cleaned separately from the container **10** and cover **24** which are



individually cleanable as well. This contributes to the hygenic standards obtainable with the construction by reason of the separability of the parts. The parts, being separately cleanable, can be cleaned by whatever method best suits the individual construction, size and composition. The sealing member **36** can be separately sterilized and replaced with another sealing member when desired.

Although the present invention has been illustrated and described with certain selected example embodiments, it will be understood that these are illustrative and in no sense restrictive thereof. It is reasonably to be expected that those skilled in this art can make numerous revisions and adaptations of the invention to meet individual design requirements, and it is intended that such revisions and adaptations as incorporate the herein disclosed principles will be included within the scope of the following claim as equivalents of the invention.

I claim:

For use with a container and a cover, said container comprising side walls defining an opening and having an outwardly extending flange and said cover comprising an outwardly extending flange and depressed surfaces therebetween for fitting in said opening in a complementary fashion, an improved seal comprising: an elongated deformable member for fitting between the container and cover along a portion of the flanges and surfaces adjacent thereto, said elongated deformable member having a transverse cross section comprising a trailing portion having a relatively long height and a relatively thin width, an outwardly extending ridge portion positioned near but spaced from the top of said trailing portion, and in inwardly extending sealing lip portion positioned at the top of said trailing portion.

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