

UNITED STATES PATENT OFFICE.

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RECEPTACLE CLOSURE.

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To all whom it may concern:

Be it known that I, CHARLES R. KEERAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Receptacle Closures, of which the following is a specification.

This invention relates to receptacle of the type known as vacuum seals or closures. Jars which are sealed by the vacuum principle are commonly employed for preserving fruit, vegetables, and other food products. My invention is not concerned with any particular style or make of such jars, but may be adapted to different forms of sealing jars, particularly those of the well known Mason and Lightning type.

It is not an easy matter to break the vacuum at the time the jar is to be opened. This is particularly true of glass top jars, the tops which cannot be punctured. The usual method of opening is to insert a thin instrument, such as a case knife, between the gasket and the jar, or its cover, so as to open up a passage through which air may enter the jar to relieve the vacuum. This expedient is attended with certain difficulties, however, due to the fact, among others, that the jar is generally formed with a flange adjacent its mouth or on its cover, around which flange the gasket is fitted and against which it tends to form a seal. Consequently it is difficult to open a vent around the gasket through which air may enter the jar to relieve the pressure on the cap.

Now this invention aims to provide an improved closure operating on the vacuum principle which may be easily opened whenever desired. In carrying out my invention, I maintain the effectiveness of the seal without increasing the number of parts. The operation of breaking the seal, however, is greatly simplified, and the difficulties generally met with in opening up a passage for air to enter the jar are largely overcome. The invention is adapted for use with certain jars in their present standard form, or with jars or caps specially made for the purpose. These, as well as other objects, will more fully hereinafter appear from the specification and claims, and from the several figures of the drawing which illustrate certain exemplifications of my invention in the following manner:

Figure 1 represents, in cross section, the neck of a Mason type of jar equipped with the present closure;

Fig. 2 is a plan view of the under side of the cap or disk used with the construction of Fig. 1;

Fig. 3 is a fragmentary plan view of the under side of a cap or disk made differently from the one shown in Fig. 2, a sealing gasket of different formation being also exhibited;

Fig. 4 is a fragmentary plan view of the upper side of a cap or disk, showing one means for indicating the location of recesses on the under side thereof;

Fig. 5 is a view, similar to Fig. 1, of a modified form of the present closure;

Fig. 6 is a plan view of the under side of the disk shown in Fig. 5.

The Mason type of jar represented in Figs. 1 and 5 is formed with a neck upon whose mouth 13, termed the sealing edge, a gasket 14 is positioned. This gasket may be formed of any suitable material, such, for instance, as rubber. Screw-threads 15 are arranged exteriorly of the jar neck adapted to be engaged by complementary threads formed on a screw ring 16, which consists of a curved ring portion 17 and a flanged edge portion 18.

Arranged to fit within the screw ring in the manner clearly shown in Fig. 1, is a cover for the receptacle consisting of a cap or disk 19 having its periphery offset to provide, in effect, a flanged edge portion connected with the body of the disk by an annular shoulder 21. With the view of facilitating breaking the vacuum, I shape the annular shoulder 21 of the disk to provide a plurality of corrugations, recesses, or undulations, such as are indicated by the numerals 22 in Fig. 2. The gasket 14 which, in this embodiment of the invention, may be of the conventional ring shape, presents its inner peripheral edge in adjacent relation to the projecting portions, designated as 23, which separate the corrugations, recesses, or undulations 22.

When the parts so constructed and arranged are operatively positioned, as shown in Fig. 1, it is obvious that an air tight seal will be formed, a vacuum seal being produced if the contents of the jar are relatively hot at the time the closure is ap-

plied. The breaking of the vacuum is accomplished by inserting a thin instrument, such as a case knife, between the gasket and its seat which in this construction is the flanged edge portion 20 of the disk. The knife in this case may be inserted beyond the inner periphery of the gasket until it has entered one of the corrugations or recesses 22. When so entered, the knife may be laterally moved for the purpose of opening up a slight passage for air to enter the jar, thereby rendering it comparatively easy to break the vacuum seal by the means described. To aid the operator in inserting the knife directly into one of the recesses 22 the top or any visible part of the cap may be suitably marked as by means of niches 24 (see Fig. 4) to indicate the location of these recesses.

Where the disk presents a regular annular shoulder to the gasket, as in the case of the present forms of cap and jars, the gasket tends to seal not only against its seat, but, due to the forces of compression, the gasket is caused to flow or spread inwardly until its inner peripheral edge adheres to the annular shoulder portions of the disk, thus virtually sealing upon that side as well. Now, when a knife blade is inserted between the gasket and its seat, the passage thus opened up does not extend through or around the inner peripheral edge of the gasket. Consequently, removal of the disk in such circumstances must be accomplished by prying it loose by physical force, working against the air pressure on the outside of the closure. With the present construction, however, any passage which is opened up between the outside of the jar and one of the recesses 22 immediately allows the air to pass into the jar and break the vacuum. It is noteworthy also that these projecting portions 23 are relatively pointed, and that the rounded end of a knife may easily find its way into one of the adjacent recesses 22, even if inserted directly in line with one of the projections.

The construction described in connection with Figs. 1 and 2 exemplifies one means by which my invention may be practiced. Other modifications also remain to be considered. In Fig. 3, there is represented a gasket 14 capable of forming a seal when applied to any ordinary jar, such, for instance, as one of the Mason or of the Lightning type. The gasket of Fig. 3, however, differs very materially from those which are ring-shaped in that its inner peripheral edge is formed to present a series of projecting portions 25 between which are corrugations or recesses 26. The relation between the projecting and recessed portions 25 and 26 may be varied to suit requirements, a suggested arrangement being illustrated.

The gasket of Fig. 3 may be used with the jar shown in Fig. 1 (or, indeed, with many other kinds of jars), and with a disk which is in all substantial respects similar to that of Figs. 1 and 2, excepting that its annular shoulder 27 is formed round instead of having corrugations or recesses therein. When assembled with a disk of this kind, the inner peripheral edge of the gasket can engage with the annular shoulder 27 of the disk only at the projecting portions 25, thereby preventing adhesion except at the points of contact between the gasket and the shoulder 27. In this arrangement the gasket is centered upon the disk just as accurately as with the construction of Figs. 1 and 2. Open spaces are likewise provided adjacent to the shoulder portions of the disk, owing to the formation of the corrugations or recesses 26 which allow air to enter therethrough when any passage has been elsewhere opened up between the gasket and its seat by insertion of a knife or otherwise. The advantages claimed for the construction of Figs. 1 and 2 are, therefore, attainable with the gasket shown in Fig. 3.

It is to be noted that this gasket last described is capable of wide application. In Mason jars, for instance, use is made of a zinc cap, the gasket being interposed between the base or bottom edge of the cap and the shoulder 28 which is commonly formed exteriorly of the neck. In such circumstances, the seat for the gasket is the shoulder 28, the base or bottom edge of the cap being the sealing edge. The gasket, however, tends to seal against the jar neck as well, due partly to compression forces which tend to spread the gasket. Prying a knife under the gasket, however, is ineffectual to easily open up a passage between the inner peripheral side of the gasket and the jar neck. By using a gasket of the general form shown in Fig. 3, however, the gasket is prevented from sealing against the jar neck, but can only seal upon the shoulder 28. Insertion of a knife blade between this gasket and its seat will, therefore, result in a passage being opened up to the inner side of the jar cap which permits air to enter into the interior of the jar. It should accordingly be borne in mind that the gasket of Fig. 3, either in the form shown, or in any equivalent form, possesses special advantages which may be realized without regard to the particular kind of jar with which it is used.

Turning now to Figs. 5 and 6, a modified construction of closure will be seen. The jar illustrated in Fig. 5 is of the Mason type, and accordingly I have designated its individual parts by reference numerals the same as are on Fig. 1. The gasket shown in these figures may be of the same form as that

illustrated in Figs. 1 and 2, but certain peculiarities of construction are to be found in the disk. As best appears in Fig. 6, this disk, designated generally by the numeral 29, is formed with an annular shoulder 30 from which is extended a peripheral edge portion 31 offset with respect to the body of the disk, within which edge portion and in adjacent relation to the shoulder 30 is an annular channel or groove 32. Connecting with this channel or groove is one or more slots 33 formed in the surface of the shoulder 30. In practice the constituent parts of the closure would be related somewhat as shown in Fig. 5.

When a seal is formed, the gasket 14 seats against the peripheral edge of the disk and against the shoulder 30 as well. A prying instrument, such as a knife, may conveniently be inserted between the disk and this peripheral edge at the time the jar is to be opened. The tip end of the knife blade will enter the space provided by the channel 32 in which suction forces are operative due to communication which is established with the jar interior through the slots 33. By properly manipulating the knife, air will pass between the gasket and its seat to enter the channel 32 and pass into the jar interior through the slots 33. With this construction the breaking of the vacuum seal is greatly facilitated, as will be readily understood. It may be mentioned that the gasket of Fig. 1 is preferred with this construction, although the gasket of Fig. 3 would answer as well, but the provision of the recessed channel within the disk edge and the communicating slots in the shoulder 30 operate satisfactorily to let the air into the jar interior so that any special form of gasket is unnecessary.

As I have already stated, in the art of vacuum sealed jars, it is recognized as comparatively simple to provide a tight seal; to break the seal, however, is not an easy task. Particularly is this true when a high degree of vacuum has been attained, or a heavy sure-sealing gasket is employed. Unless air can be admitted to the jar interior, the operation of removing the cap requires the application of a very considerable physical force, equal, at least, to the atmospheric pressure working on the cap plus the adhesion between the jar and its cover. With the parts constructed according to my invention, however, the operation of admitting air into the jar interior is greatly simplified, due to the fact that one or more passages are always preserved open on the inner peripheral side of the gasket, so that when an opening has been made between

the gasket and its seat the air will immediately have access to the jar interior.

It is clear that the present improvements may be embodied in a number of different styles of jars, only a few of which have herein been suggested. Except as the appended claims may contain express limitations, it is not to be inferred that the principle of my invention is restricted in its application to the exemplified structures shown, nor to the particular kinds and types of receptacles indicated, as manifestly it is possible to use other forms, and in other adaptations, which would fall equally within the spirit and scope of my invention.

I claim:

1. In combination with an open mouth receptacle, a closure consisting of a cap provided with an annular depending shoulder and with a gasket seat bounded by the shoulder on one side and by the peripheral edge of the cap on the other, the cap seat being formed with an annular channel adjacent the shoulder, there being a passage leading from the channel to the inner face of the cap, a gasket arranged for positioning upon the seat provided on the cap, the cap and gasket being adapted to fit over the receptacle mouth to form a closure therefor, substantially as described.

2. In combination with an open mouth receptacle, a closure consisting of a cap, a gasket adapted to seat upon the cap, means for centering the gasket upon the cap, an annular channel recessed in the cap adjacent the inner peripheral edge of the gasket, the centering means being formed with a passage leading from the channel to the inner face of the cap, the gasket and cap being adapted to fit over the receptacle mouth to form a closure therefor, substantially as described.

3. In combination with an open mouth receptacle, a gasket adapted to seat upon the cap, a shoulder depending from the cap adjacent the inner peripheral edge of the gasket and adapted to center the gasket upon the cap, there being an annular channel formed in the cap adjacent the shoulder and a passage in the shoulder leading from its inner end to the channel, whereby communication is established between the channel and inner face of the cap around the inner peripheral edge of the gasket, the gasket and cap being adapted to fit over the receptacle mouth to form a closure therefor, substantially as described.

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Witness:

EPHRAIM BANNING.