July 31, 1945. H. W. INGLE 2,380,443

CLOSURE HOLD-DOWN SPRING CLAMP FOR PACKING JARS

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Fig. 1.

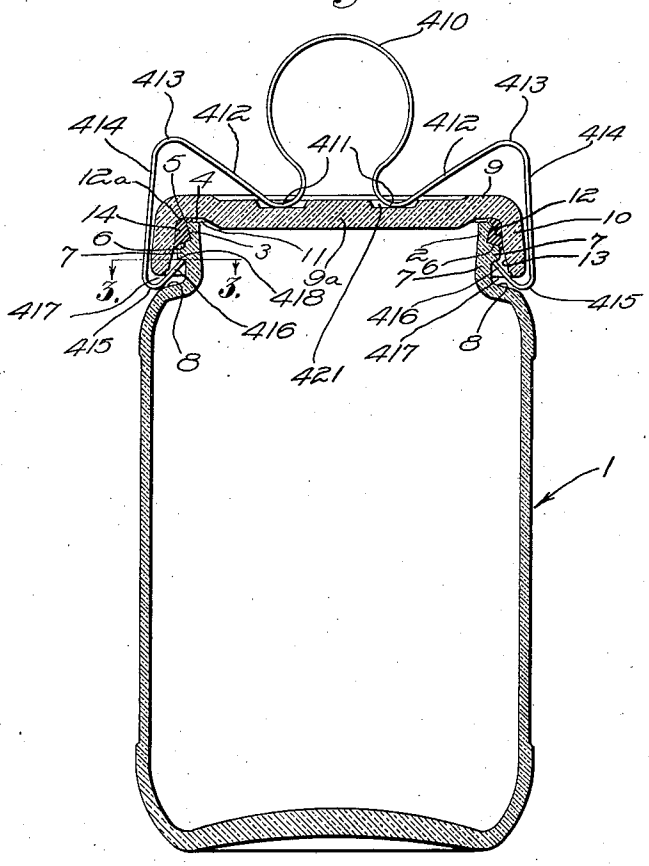


Fig. 2.

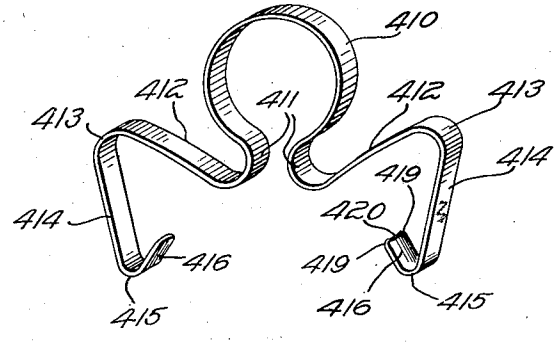
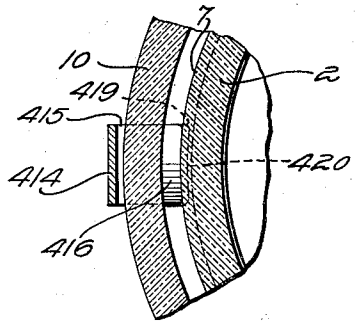


Fig. 3.



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CLOSURE HOLD-DOWN SPRING CLAMP FOR PACKING JARS

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2 Claims. (Cl. 215—91)

This invention relates generally to the packaging of foodstuffs and other substances, especially in a sealed package of the type which comprises a glass container, such as a jar, a closure cap for the container and a sealing gasket of suitable material disposed between the container and the cap.

An object of the invention is to provide an improved spring clamp of the character described which will be effective, when applied, to hold a cap in place on its jar until an excess pressure has been built up within the jar, at which time the clamp will yield to allow the cap to be displaced sufficiently by such excess pressure to permit escape thereof and then will act automatically to return the cap accurately to its former position on the jar.

A further object of the invention is to provide a spring clamp of the character described which is adapted for use with a suitable jar, jar closure cap and sealing gasket combination to enable such jar to be packed and effectively sealed by conventional home canning procedure in which a partial vacuum created within the jar by cooling of the contents thereof is relied upon to effect sealing of the closure cap to the jar.

A further object of the invention is to provide a spring clamp of the character described which includes a portion adapted to serve as a convenient finger-hold or handle for the clamp.

A further object of the invention is to provide a spring clamp of the character described which may be made of a single strip of suitable material, bent to provide a pair of hooks at the ends of the strip adapted to extend up under the edge portion of the skirt of a closure cap on a jar against downwardly facing surfaces on the neck finish portion of the jar and other portions which exert spring pressure in a downward direction on the top of the cap at places located at opposite sides of and equi-distant from the vertical center line of the cap and at the lower ends of the side members of an open-bottomed handle loop or finger-hold portion of the clamp.

The improved clamp of the present invention in the form now preferred by me is designed primarily for use with a jar, jar cap and sealing gasket combination such as that which is disclosed in the co-pending application of Walter K. Berthold, Serial No. 487,892, filed May 21, 1943, for Sealed package and method of sealing, so as to adapt that combination for home canning. The improved clamp, in its preferred form and a use thereof are shown, by way of example, in the accompanying drawing, in which:

Figure 1 is a vertical sectional view, showing the improved spring clamp applied to a glass jar, closure cap and sealing gasket combination of the aforesaid Berthold application;

Fig. 2 is a perspective view of the clamp alone; and

Fig. 3 is a relatively enlarged horizontal section substantially along the line 3—3 of Fig. 1, showing the particular shape of the end portion of one of the hooks of the spring clamp and the relationship thereof to the shape of the adjacent portion of the jar.

In the drawing, Fig. 1 shows a glass jar 1 having an open upper end or neck finish portion 2 provided with an external annular frusto-conical sealing surface 3 thereon adjacent to an end surface 4 at the mouth of the jar. The frusto-conical surface 3 is of greater diameter at its end nearest to the mouth of the jar than at its opposite end. A rounded corner surface 5 merges the frusto-conical surface 3 into the end surface 4. At its lower or smaller end, the frusto-conical surface 3 is merged into an outwardly and downwardly inclined surface 6, constituting the upper surface of an external flange or bead 7 on the neck finish portion of the jar. At a predetermined distance below the flange or bead 7, the jar is enlarged to form the body thereof, thus providing a shoulder 8. This shoulder 8 may serve as a rest for a cap pry-off implement (not shown).

The closure cap may be made of glass and comprises a cover or head portion 9 and a depending annular rim flange or skirt 10. The head or cover portion 9 may have its central portion 9a depressed so as to depend into the neck portion of the jar while leaving an annular clearance space 11 between the end surface 4 of the jar and the overlying portion of the cap when the latter is in applied position. The inner wall of the skirt of the cap is formed to provide a cylindrical sealing surface 12 extending from the juncture of the skirt and the head or cover portion of the cap for a sufficient part of the length of the skirt to cooperate effectively with the frusto-conical surface 3 on the neck finish portion of the jar when the cap is in applied position. The surface 12 is shown as being merged into the lower surface of the head of the cover portion of the cap by an arcuately curved or rounded surface 12a at the inner corner of the cap. At its lower end, the surface 12 may merge into a downwardly enlarging inclined guiding surface 13 extending past the flange or bead 7 on the neck of the jar. The skirt of the cap terminates at its

lower edge a short distance above and within prying distance of the shoulder 8.

A gasket 14, which may be a ring of rubber or some rubber-like or other compressible and resilient material encircles the upper end portion of the jar above the bead 7. The inner diameter of the gasket may be about that of the diameter of the smaller end of the frusto-conical sealing surface 3. The outer diameter of the gasket may be slightly more than the diameter of the cylindrical surface 12 of the inner wall of the skirt of the cap. The height of the gasket ring is slightly greater than the vertical distance between the surface 6 on the flange or bead 7 and the level of the upper end surface 4 at the mouth of the jar. A thinner gasket may be used with the same jar and closure cap, specifically as disclosed in another application of said Berthold, Serial No. 487,893, filed May 21, 1943, for a Sealed package and method of sealing.

A spring clamp of the invention, as shown in Figs. 1 and 2, may have been formed of a single strip of any metal or other suitable material having good spring qualities. This clamp comprises an intermediate open-bottomed handle loop or finger hold 410, the side members of which are reversely curved at their lower ends at 411 so as to merge into the lower ends of the upwardly and outwardly inclined inner legs 412 of angular clamping members 413. The angular clamping members 413, which are of generally inverted V-shape, have depending outer legs 414, the lower end portions of which are formed as hooks 415. The bill portions 416 of these hooks are turned inwardly and upwardly and thus are adapted to extend inwardly and upwardly in the space 417 between the lower edge portion of the skirt of the cap and the enclosed portion of the neck of the jar into contact with the downwardly facing bottom surface 418 of the flange or bead 7 at diametrically opposite points on the latter when the clamp is in applied position substantially as shown in Fig. 1. At this time, the portions 411 of the clamp at the junctures of the inner legs 412 of the clamping members 413 and the side members of the handle loop 410 will bear against and exert a substantial downward pressure on the upper surface of the cap at places equi-distant from and at diametrically opposite sides of the vertical center line of the cap. Preferably, the cap has relatively depressed or equivalently formed surface portions 421 which engage with the portions 411 to resist unintended or accidental lateral displacement of the clamp on the cap. The portions 411 of the clamp thus may be termed closure presser members. Spreading of the legs 412 and 414 of the angular clamping members 413 to cause the bills of the hooks 415 to engage under diametrically opposite portions of the bead 7 on the neck of the jar will set up a spring action effective on the members 411 to cause them to press downwardly on the cap.

By referring to Figs. 2 and 3, it will be noted that the bill portions of the hooks 415 are rounded at their corners, as indicated at 419, and are curved concavely in cross section, as indicated at 420. This latter feature is to enable the contact ends of the hook bills to conform to the curvature of the portions of the neck of the jar with which they are engaged when the clamp has been applied. The opposite ends of the clamp thus are not likely to be accidentally displaced from engagement with diametrically opposite portions of the neck of the jar. Rounding of the corners of the glass contacting ends of the clamp reduces the possibility that glass of the jar may be chipped or harmfully scratched by the impact of sharp corners on these ends when the clamp is sprung into applied position on the jar. It is obvious that the contact end of the bill of each of the hooks of the clamp is adapted to contact with any suitably located downwardly facing surface on a jar to which the clamp has been applied.

The particular jar, closure cap and gasket combination shown in Fig. 1, may be packed and sealed in a commercial packing plant by equipment available there and without need to rely upon the action of a partial vacuum within the jar, resulting from the cooling of the contents of the jar as in home canning, to effect the sealing. However, this same combination may be packed originally or on re-use by conventional home canning procedure. In that event, a yielding hold-down for the cap is necessary to allow excess pressure to escape, if any builds up within the jar, and to assure setting up of a partial vacuum within the jar.

In the use of the clamp, as in home canning, the contents to be packed may be placed within the jar while at a high temperature or the temperature may be increased by heating. The cap may be placed over the upper end of the jar upon the gasket and the clamping members of the clamp may be manipulated so that the hooks thereof will be engaged with diametrically opposite portions of the downwardly facing bottom surface of the bead 7 to bring about downward pressure on the top surface of the cap by the presser members 411, substantially as shown in Fig. 1. Should excess pressure build up within the jar, the cap will lift under such pressure against the resistance of the spring clamp sufficiently to allow escape of the excess pressure and thereafter will be returned downwardly to the desired sealing position. When the contents of the jar cool, a partial vacuum will be created which will retain the cap sealed onto the jar.

The handle member 410 may be grasped and the clamp and jar lifted conveniently as a unit. It will be noted that upward lifting or tilting of the cap under pressure from within the jar will increase the clamping action of the angular clamping members on the jar and cap. The clamping members, including the hook portions of the outer legs thereof, clear the skirt of the cap sufficiently not to interfere with upward lifting of the cap in response to excess internal pressure within the jar and return downward movement of the cap to the desired position.

When it is desired to disengage the clamp from the jar, this may be done conveniently and easily by holding the clamp at its handle loop portion and exerting outward and downward pressure on the outer leg of each of the angular clamping members 413 in turn, as by placing the blade of a knife or other implement (not shown) against the inner side of such outer leg and using it to move the outer leg downwardly and outwardly.

The invention is not limited to the details of the illustrative embodiment thereof shown in the accompanying drawing and herein particularly described as, obviously, changes therein and modifications thereof will readily occur to those skilled in the art.

What I claim is:

1. The combination with a packing container which is open at its upper end and has an upper end portion provided with an external bead thereon adjacent to said upper end and with a shoulder thereon spaced below the bead, a clo-

sure cap for the container having a skirt extending downwardly over the upper end portion of the container to a level below that of the bead and within prying distance of said shoulder, and a gasket in sealing position between the upper end portion of the container above the bead and the cap, of a spring clamp formed to extend across the closure cap and to provide a pair of hooks having inwardly and upwardly turned bill portions which extend between the shoulder on the container and the skirt of the cap and inwardly and upwardly within said skirt against the bead so as to cause the clamp to exert a yielding downward pressure on the cap.

2. The combination with a packing container which is open at its upper end and has an upper end portion provided with an external bead thereon adjacent to said upper end, a closure cap for the container having a skirt extending downwardly over the upper end portion of the container and over the bead thereon to a substantial distance below the level of the bead, and a sealing gasket located between the upper end portion of the container above the bead and the skirt of the cap, of a closure cap hold-down clamp comprising a strip of resilient material formed to provide an upright open-bottomed handle loop intermediate the ends of the strip, a pair of outwardly and upwardly inclined angular clamping member of a generally inverted V-shape and a pair of reversely curved presser members respectively connecting the angular clamping members with said open-bottomed handle loop at opposite sides of the latter, said angular clamping members having outer leg portions depending below the level of the rest of said clamp and being formed with hooks at their lower extremities having inwardly and upwardly turned bill portions extending inwardly beneath the skirt and upwardly within the latter against said bead at diametrically opposite points on the upper end portion of the container and cooperating with the latter to cause said presser members to rest upon and exert a yielding downward pressure on the closure cap at places located equidistant from and at opposite sides of the vertical center line of the cap, said cap having depressions in its top surface of said places for the reception of said presser members.

HENRY W. INGLE.