

Nov. 5, 1957

D. E. McCARTY
PACKAGING MACHINE

2,811,818

Filed June 2, 1953

3 Sheets-Sheet 1

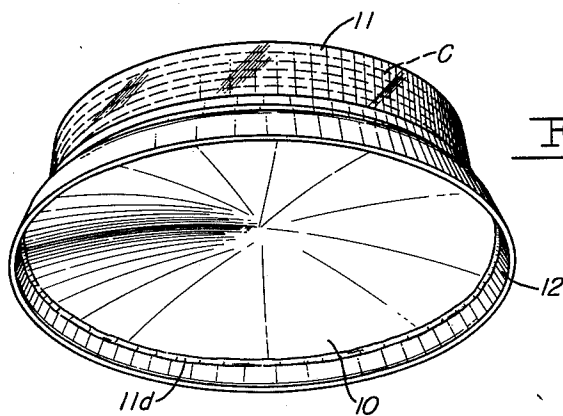


Fig 1

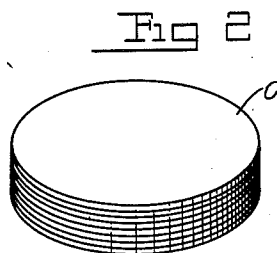


Fig 2

Fig 3

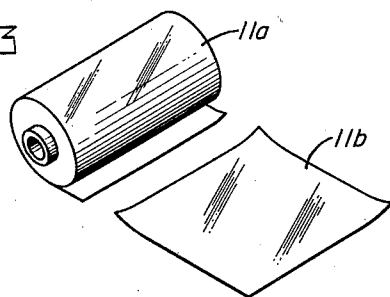


Fig 5

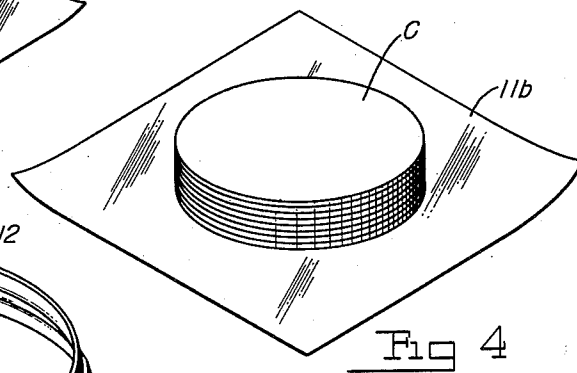
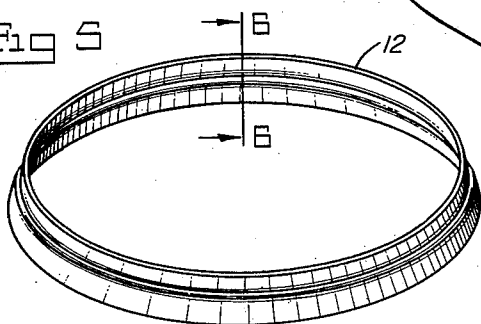


Fig 4

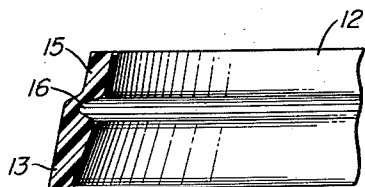


Fig 6

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3 Sheets-Sheet 2

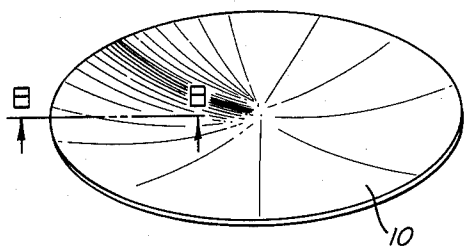


Fig 7

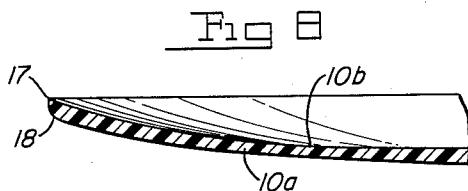


Fig 8

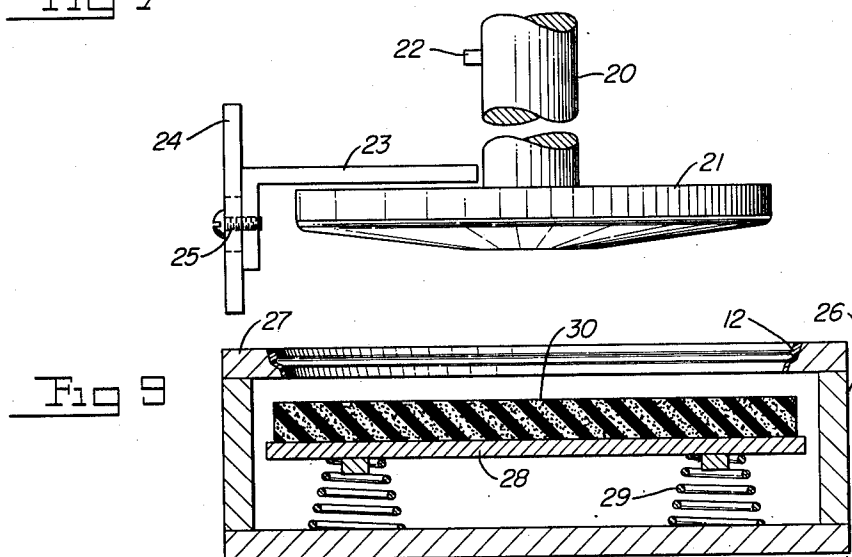


Fig 9

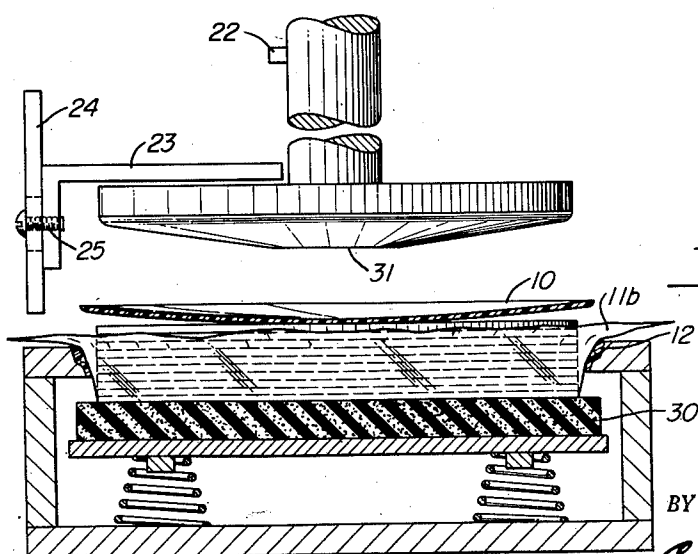


Fig 10

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3 Sheets-Sheet 3

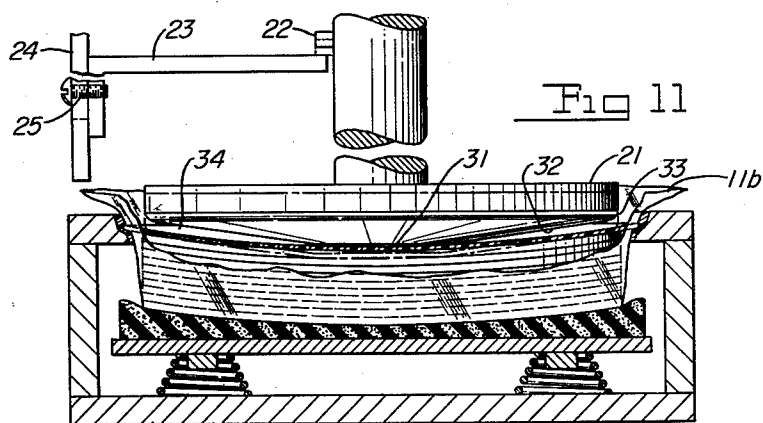


Fig 11

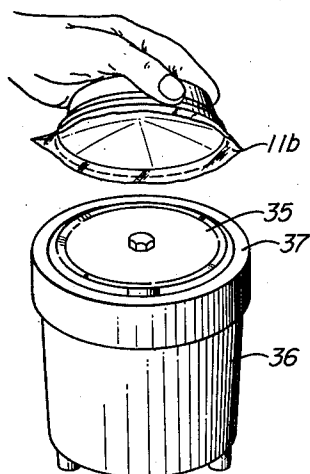


Fig 12

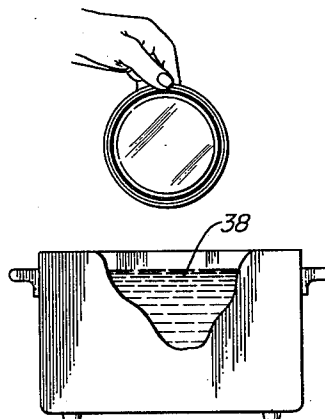


Fig 14

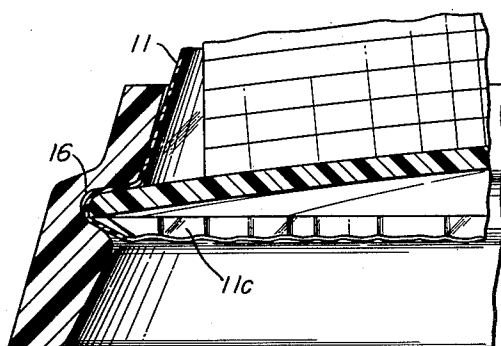


Fig 13



Fig 15

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2,811,818

PACKAGING MACHINE

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Application June 2, 1953, Serial No. 359,091

5 Claims. (Cl. 53—321)

My invention relates to a packaging machine. It has to do, more particularly, with a machine for packaging a commodity in the display package disclosed in my copending application Serial No. 338,687, filed February 25, 1953, now Patent No. 2,754,959.

This application is a continuation-in-part of said application Serial No. 338,687, now Patent No. 2,754,959.

In the copending application Serial No. 338,687, now Patent No. 2,754,959, I disclose the basic steps of a process of packaging a commodity in a display package of the type disclosed and claimed in said application. The present application is directed to a machine for performing that basic process.

The display package disclosed in said copending application is adapted to display the commodity, for example, sliced lunchmeat, in an attractive and sanitary manner. The package consists of a convex base, specifically a dome-shape disc, upon which the meat is supported, a transparent protective covering or film which completely encloses the meat supported on the base, and extends over the edges of the base, and a retaining member, in the form of a grooved-ring, into which the edge of the disc snaps to grip and seal the film between the edge of the disc and the ring.

In the following description and attached drawings, I disclose a machine for performing the steps of the process for assembling the above-indicated package and contents.

In the drawings:

Figure 1 is a bottom perspective view of the assembled package and contents.

Figure 2 is a top perspective view of a pile of lunchmeat to be packaged into the complete package shown in Figure 1.

Figure 3 shows a roll of the protective film with a piece cut therefrom for incorporation in the package.

Figure 4 shows the meat of Figure 2 supported on the piece of film of Figure 3.

Figure 5 is a top perspective view of the retaining ring to be assembled into the package shown in Figure 1.

Figure 6 is a vertical sectional view taken through the ring along line 6—6 of Figure 5.

Figure 7 is a perspective view of the concave side of the disc to be assembled into the package shown in Figure 1, the dome-shape disc being in inverted position from that which it occupies in the assembled package.

Figure 8 is a vertical sectional view through the disc taken along line 8—8 of Figure 7.

Figure 9 is a view partly in side elevation and partly in vertical section of the press used for assembling the parts of the package to enclose the meat.

Figure 10 shows the press of Figure 9 with the retaining ring in the complementary die in the press, the meat on the film disposed within the ring on the flexible support of the press, and with the disc over the meat, all preparatory to pressing the ring into the disc and causing it to snap into the groove therein.

Figure 11 is a view similar to Figure 10 but showing

the disc in final position in the retaining groove in the ring.

Figure 12 shows the step of trimming off the excess part of the film protruding downwardly from between the ring and the edge of the disc.

Figure 13 is an enlarged vertical sectional view through a portion of the assembled package, showing it after the trimming operation has been completed.

Figure 14 is a view showing the assembled package of Figure 13 being dipped to shrink the film thereof.

Figure 15 is a view similar to Figure 13 but showing the condition of the protruding edge of the film after dipping of the package as in Figure 14.

In the drawings, I have shown in Figure 1, the assembled package which is disclosed in my copending application Serial No. 338,687. This package consists of the base member 10, the protective covering 11, and the retaining ring 12, which are assembled around the commodity C shown as a pile or stack of sliced lunchmeat.

The base member 10 is dome-shaped, considering the package in normal or upright position as shown in Figure 1, it being shown in detail in Figures 7 and 8 where it is shown inverted. This base 10 is preferably of a plastic material which has sufficient flexibility or yieldability to permit snapping into the retaining ring 12 as hereinafter described. The disc is preferably formed of a thermosetting material, such as an urea formaldehyde type resin which will not be affected by the hot liquid in the package dipping operation which will be at a temperature ranging from 195° to 205° F. To give it a greater degree of flexibility to facilitate insertion into the ring 12 without cracking, the disc 10 is made thinner along an annular area about midway radially between its center and its circumference, as indicated by the numeral 10a in Figure 8. The lower curvature of the disc is of a definite continuous curvature and is indicated by the numeral 10b. The disc 10 is preferably, though not necessarily, translucent. The lower corner of the edge of the disc 10 is a sharp knife edge 17 while its upper corner is rounded as indicated at 18.

The ring 12 is preferably made of the same type of resin as the disc 10 but it need not be translucent. It should be of a type of resin also so as not to be adversely affected by the temperature of the liquid in the subsequent dipping operation. It may be of a different color plastic than the disc 10 for contrast. It will be noted from Figure 6 that the ring 12 is provided with a lower skirt 13 which is flared outwardly to guide the disc 10 thereinto, as will later appear. Spaced upwardly from its lower edge, the ring 12 is provided with a disc-receiving groove 16, the ring being provided with an inwardly offset inwardly tapering lip 15 above the groove 16.

The protective film material 11 is a transparent material which will shrink when heated to a suitable temperature. A thermoplastic resin, of the vinylidene chloride type, is suitable for this purpose and, more specifically, one of the "Saran" type, manufactured by Dow Chemical Company and known as No. Q853 has been found by me to be particularly suitable. This type will shrink when heated instantaneously to a temperature ranging from 195° to 205° F.

The protective film 11 may come in the form of a roll 11a, as shown in Figure 3, from which a suitable square section 11b may be cut. The section 11b will receive the pile of meat C (Figure 2) which will be placed thereon as shown in Figure 4, it being noted that the section 11b will be of substantially greater area than that of the meat.

To assemble the disc 10, the film section 11b, and the ring 12 along with the stack of meat C to form the complete package, I use a press arrangement illustrated in Figures 9 to 11.

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This press arrangement includes the vertically movable plunger 20 which is provided with a head 21 that has a lower surface of special contour to facilitate snapping of the disc 10 into the ring 12. The plunger may be moved vertically by suitable means (not shown) and the lowermost position of the head 21 is limited by a stop 22 on the plunger 20 engaging with a stop arm 23 carried by a suitable adjacent fixture support 24. The stop arm 23 is vertically adjustable on the support 24 by a pin and slot connection 25 so that the lowermost position of the head 21 can be varied in accordance with the thickness of the stack of meat being packaged. Obviously, different amounts of the meat will be packaged at different times and the stop arm can be reset whenever desired.

The press also includes a hollow base member 26 which has at its upper end a die 27 which removably receives the ring 12 and is complementary therewith when the ring is inserted therein in inverted position as shown in Figure 9. Obviously, the ring 12 can be lifted readily from the die 27.

Within the hollow base member 26 is a supporting plate 28 which is carried by the compression springs 29 so that it can yield downwardly in the base. The upper surface of the plate 28 preferably carries a pad 30 of sponge or foam rubber or the like. The upper surface of the pad 30 is normally below the level of the die 27 as shown in Figure 9.

In assembling the package, after the ring 12 is inserted in the die 27, the meat C on the film section 11a is dropped through the ring 12 onto the pad 30 as shown in Figure 10. It will be noted that the meat is smaller in diameter than the ring 12, so it will readily slip there-through, and that the film section 11b is of sufficient area to extend upwardly over the die-supported ring 12 in all directions. The disc 10 is now placed on the stack of meat, on the top surface thereof, as shown in Figure 10, which will later be at the bottom of the assembled package.

Next, as indicated in dotted lines in Figure 11, the plunger head 21 is moved downwardly until the stop 22 engages the stop 23 and then as the plunger is started in its upward travel again, the edge of the disc 10 snaps into the groove 16 of the ring 12. The contour of the lower surface of the head 21 is definitely related to the curvature 10b of the disc 10 to obtain the proper action in inserting the disc into the ring 12. It will be noted from Figures 10 and 11 that the lower surface of the head 21 includes the central relatively flat area 31 and the upwardly beveled annular area 32 which extends from the area 31 almost to the outer edge of the head 21. The outer edge of the head 21 at its lower corner is rounded as indicated at 33. The outer annular area 32 is inclined upwardly more sharply than the upward curvature 10b of the adjacent surface of the disc 10. Consequently, with the central area 31 of the head 21 in contact with the surface 10b of the disc 10, as shown by full lines in Figure 11, there will be an annular space 34 between the outer portion of the disc and the angled annular area 32 of the head 21. Consequently, as the disc 10 is pushed downwardly by the head its outer portion will flex upwardly until it contacts the head area 32, as shown by dotted lines in Figure 11. This will cause a slight decrease in the overall radius of disc 10 and at this instant the stops 22 and 23 will have located the disc at the level of the groove 16 in the ring 12. Then a slight upward movement of the head 21 and the resulting corresponding movement of surface 32 away from surface 10b will result in the edge of the disc 10 snapping into the ring groove 16 where it will be securely retained.

It will be apparent that during the pressing operation, as the pressure on the disc 10 and the underlying stack of meat C is increased, the supporting plate 28 moves downwardly against the force of springs 29 and permits the meat to drop downwardly through the ring 12 from

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its position in Figure 10 to its position in Figure 11 where the edge of the disc is snapped into the groove 16 in the ring. Furthermore, the pad 30 being readily compressible will conform to the curvature imparted to the contacting surface of the protective film and the associated surface of the meat C as shown in Figure 11.

Because of the dome-shape of the disc and the thin section 10a, the disc will have the desired flexibility so that it can conform to the shape of the plunger head 21 without cracking. The sharp knife edge 17 on the disc will aid in gripping the film while the rounded edge 18 prevents tearing when the film is subsequently shrunk.

As shown in Figure 11 an excess of the film section 11b will extend outwardly from between the ring 12 and the edge of the disc 10.

The excess of the film section 11b is removed as shown in Figure 12. The cutter for performing this operation may be a driven cutting disc 35 of such a size that it will slip upwardly within the flared skirt 13 of the ring 12 to a level spaced slightly below the retaining groove 16 thereof. The base 36 which carries the disc 35 may also have an annular upstanding flange 37 which aids in centering the package relative to cutting disc 35. After the cutting operation, the film will appear as in Figure 13 where it will be noted that it has the downwardly extending short skirt 11c.

After the package is assembled as indicated above, it is subjected to a heating operation to cause the film 16 to shrink. This heating must be instantaneous to prevent the film from being ruptured and to shrink it uniformly which will not occur with dry heat. Therefore, it is desirable to use a spraying or dipping operation where the film is subjected to a hot liquid which is at a temperature ranging from 195° to 205° F. I prefer to dip the entire package in a bath 38 of hot water. This will cause the plastic film to shrink. The skirt 11c of the film will shrink and roll up to form a continuous bead 11d (Fig. 15) which will cooperate with the knife edge 17 to form an effective seal at such edge. The convex upper surface of the disc 10 will push upwardly against the bottom of the stack of meat C and will cause its upper surface to tightly contact with the film. Since the film 11 will tightly and smoothly contact the upper surface of the stack C of meat, the upper surface of the meat will assume the convex contour of the disc 10, as shown in Figure 1. Because of this contact, no condensation can develop between the surface of the meat and the film and, therefore, the meat will be displayed attractively regardless of temperature variations. The protective film 11 will remain under tension so that the tight contact between the film and the upper surface of the meat will be maintained. The meat will be so sealed in the package that any substantial shrinkage thereof will be precluded because the moisture cannot escape therefrom. The groove 16 and the inwardly offset portion 15 of the ring 12 above the groove will eliminate any possibility of the disc 10 moving bodily upwardly within the ring during shrinkage of the film 11.

Although I have specified that the package assembled is of annular form, it is to be understood, as indicated in said copending application, that it can be square or have other outlines.

The machine I have provided for assembling the display package is simple, efficient and sanitary and can be used by unskilled persons.

Having thus described my invention, what I claim is:

1. A press for assembling an article in a package consisting of a convex disc, a flared retaining ring with a retaining groove, and a protective film, which comprises a complementary die for supporting the ring with its flare upwardly, a downwardly yieldable support below the die upon which the film with the article thereon is rested within the ring and with the film extending upwardly over the ring in all directions and also with the disc on the top surface of the article with its concave side uppermost, a

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plunger having a convex lower surface for engaging the disc and pushing it downwardly along with the article until it is at such a level that its edge will be positioned in said retaining groove of the ring, said plunger being shaped to a more sharp contour than the disc so that the diameter of the disc will be reduced as the plunger moves downwardly to permit it to fit into said groove, and stop means for limiting downward movement of the plunger.

2. A press according to claim 1 wherein the plunger has a convex surface comprising a central flat area and an annular upwardly angled area.

3. A press for assembling an article in a package consisting of a convex disc, a flared retaining ring with a retaining groove, and a protective film; which comprises a complementary die for supporting the ring with its flare upwardly, a downwardly yieldable support below the die upon which the film with the article thereon is rested within the ring and with the film extending upwardly over the ring in all directions and also with the disc on the top surface of the article with its concave side uppermost, and a plunger having a convex lower surface for engaging the disc and pushing it downwardly along with the article until it is at such a level that its edge will be positioned in said retaining groove of the ring, said plunger being shaped to a more sharp contour than the disc so that the diameter of the disc will be reduced as the plunger moves downwardly to permit it to fit into said groove.

4. A press for assembling an article in a package consisting of a convex disc, a flared retaining ring with a retaining groove, and a protective film; which comprises a complementary die for supporting the ring with its flare outwardly, means for supporting the film with the article thereon in concentric relationship to the ring and with the film extending outwardly over the ring in all directions and also with the disc having its concave side resting on the article, a plunger supported in axial alignment with the ring-supporting die and having a convex surface for

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engaging the disc and pushing it along with the article and film into the flared ring until the disc is at such an axial position that its edge will be positioned in said retaining groove of the ring, said plunger being shaped to a more sharp contour than the disc so that the diameter of the disc will be reduced as the plunger moves into said die to permit the edge of the disc to snap into said groove, and means for moving said plunger and die axially relatively to cause the disc to snap into said groove.

5. A press for assembling an article in a package consisting of a convex base having a flexible edge, a flared retaining member with a retaining groove formed therein, and a flexible protective film; which comprises a die for supporting the retaining member with its flare outwardly, means for supporting the film with the article thereon in centered relationship to the die and with the film extending outwardly over the retaining member in all directions and also with the base having its concave side resting on the article, a plunger supported in axial alignment with the die and having a surface for engaging the base and pushing it along with the article and film into the flared retaining member until the base is at such an axial position that its edge will snap into said groove, and means for moving said plunger and die axially relatively to cause the flexible edge of the base to snap into the groove of the retaining member.

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