

May 2, 1967

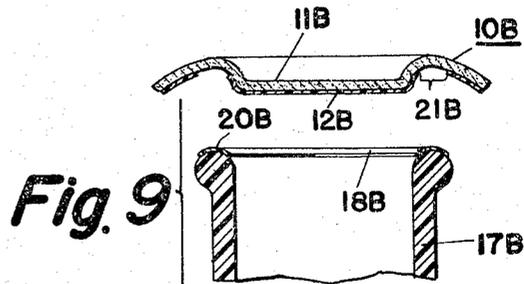
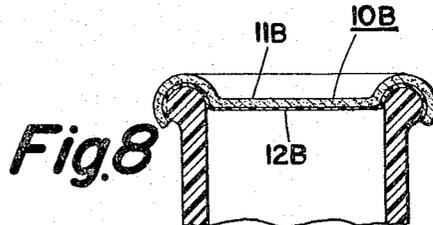
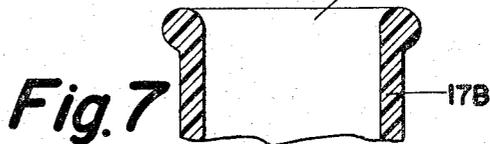
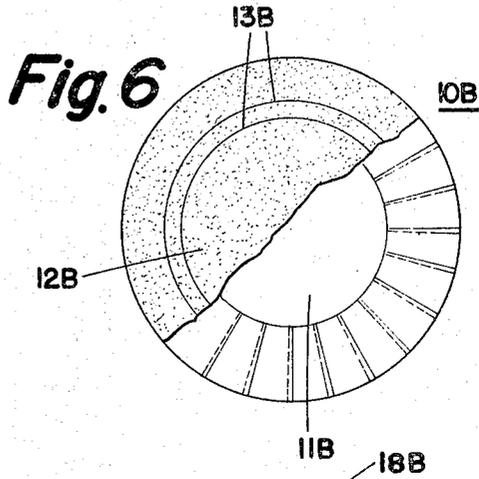
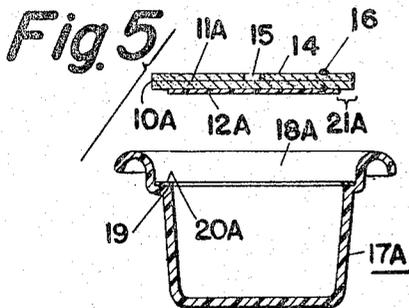
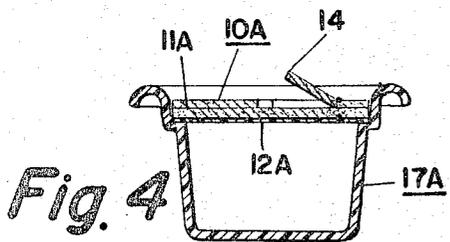
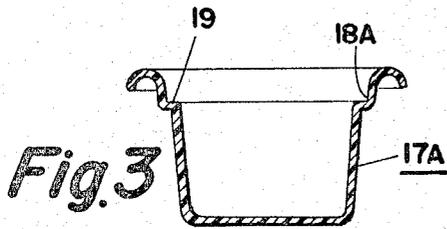
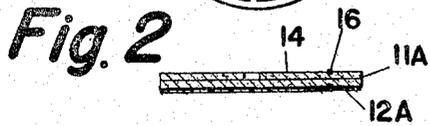
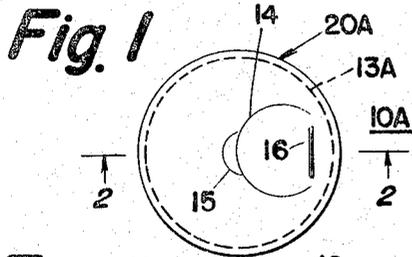
T. E. BETNER

3,317,068

TEAR-OPEN SEALED CONTAINERS AND CLOSURES THEREFOR

Filed March 22, 1965

2 Sheets-Sheet 1



May 2, 1967

T. E. BETNER

3,317,068

TEAR-OPEN SEALED CONTAINERS AND CLOSURES THEREFOR

Filed March 22, 1965

2 Sheets-Sheet 2

Fig. 10

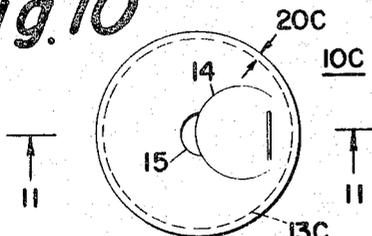


Fig. 11

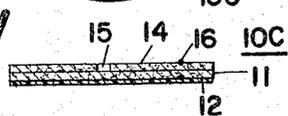


Fig. 12

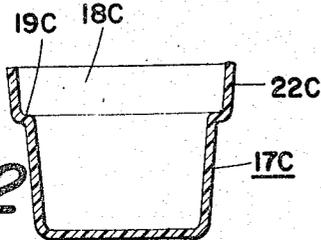


Fig. 13

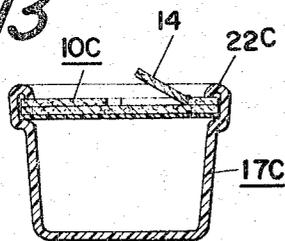


Fig. 14

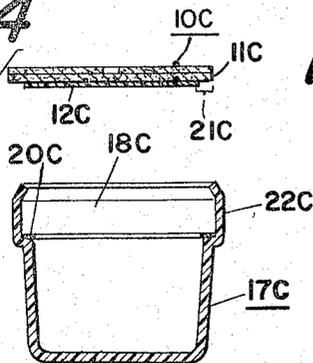


Fig. 15

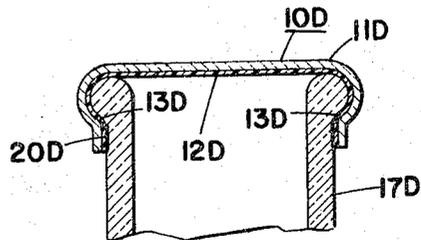


Fig. 16

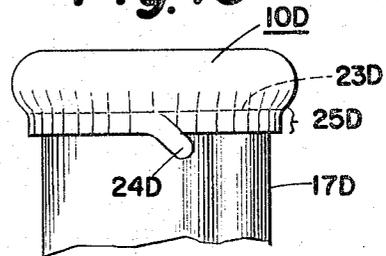
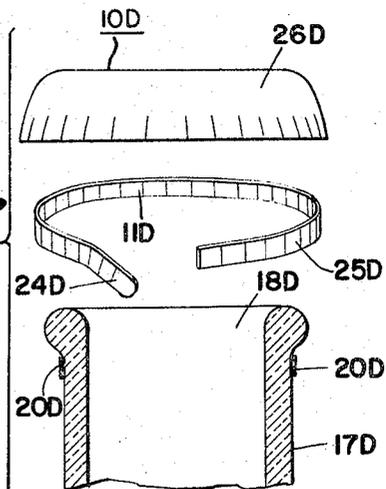


Fig. 17



1

3,317,068
**TEAR-OPEN SEALED CONTAINERS AND
CLOSURES THEREFOR**

Thomas E. Betner, Bryn Mawr, Pa., assignor to Acme
Plate & Mat Company, Malvern, Pa., a corporation of
Pennsylvania

Filed Mar. 22, 1965, Ser. No. 441,470
8 Claims. (Cl. 215—39)

This invention relates to sealed containers and particularly to a cover construction which affords hermetic sealing of the container body, which can be manually torn off for access to the container contents and which after tear-off can be used to re-close the unsealed container.

In accordance with the present invention, the open end of the container body is sealed by a push-on lid or cap cover comprising two bonded layers of substantially different strength. The container-sealing bond between the thin inner layer and the container mouth is stronger than the interlayer bonding of the cover so that when access to the sealed container contents is desired, the lifting off of the outer layer of the cover leaves the peripheral sealing area of the thin inner layer of the cover attached to the container mouth. The outer layer of the removed cover remains essentially intact and is usable to re-close the unsealed container by gripping engagement between the cover and retaining structure of the container body.

More particularly, the outer layer of the cover may be of cardboard, metal foil or the like coated or laminated with a thin layer of heat-sealing thermoplastic or other sheeting. The inner layer is pre-weakened as by scoring clearly to define the peripheral sealing area of the cover. At least the mouth of the container body is made of, or coated with, thermoplastic to afford between the container mouth and the applied cover a strong hermetic seal exceeding the strength of the bond between the two layers of the cover. By selection of the width of the seal and, therefore, the seal area, the amount of force required to delaminate the cover in opening of the container may be predetermined. The cap preferably snugly fits within the container mouth: in some modifications the cap may be crimped over the rim of the container mouth so that, after unsealing, the removed cap may be re-inserted and recrimped to re-close the unsealed container; in other modifications, the rim of the container mouth may be crimped over the topside marginal area of the cap so that, after unsealing, the removed cap may be re-inserted and held in place by re-crimping the rim of the container mouth.

In those modifications in which the cover fits wholly within the container mouth, a lifting tab within the perimeter of the cover may be provided to facilitate unsealing of the container without tools. Such tab is not necessary for other modifications in which, for example, the cap is crimped over the container mouth. In either case, the outer layer of the cover is strong enough to resist the lifting force applied to separate its outer layer from that portion of the inner layer which is sealed to the container mouth.

The invention further resides in sealed containers and container closures having features of construction, combination and arrangement hereinafter described and claimed.

For a more detailed understanding of the invention, reference is made to the following description of pre-

2

ferred embodiments thereof and to the accompanying drawings in which:

FIG. 1 is a top plan view of a lid or cover suited for insertion wholly within the mouth of the container body of FIG. 3;

FIG. 2 is a side elevational view in section taken on line 2—2 of FIG. 1;

FIG. 3 is a side elevational view in section of a container body;

FIG. 4 is a side elevational view in section showing the lid of FIG. 1 sealed to the container body of FIG. 3;

FIG. 5 is a side elevational view in section showing the container of FIG. 4 unsealed and its re-usable lid;

FIG. 6 is a bottom plan view of a crimp-type cover with part of its inner layer broken away;

FIG. 7 is a fragmentary sectional view in side elevation of the beaded open top of a container;

FIG. 8 is a side elevational view in section showing the cover of FIG. 6 sealed to the open end of the container body of FIG. 7;

FIG. 9 is a side elevational view in section showing the container of FIG. 8 unsealed and its re-usable cover;

FIG. 10 is a top plan view of a cover for insertion in the mouth of the container body of FIG. 13;

FIG. 11 is a side elevational view in section taken on line 11—11 of FIG. 10;

FIG. 12 is a side elevational view in section of a container body with a crimp-over rim;

FIG. 13 is a side elevational view in section showing the lid of FIG. 10 sealed within the mouth of the container 12 and mechanically held by the crimped-over rim;

FIG. 14 is a side elevational view in section showing the container of FIG. 13 unsealed and its re-usable cover;

FIG. 15 is a fragmentary side elevational view in section showing another crimp-type cover sealed to a container body having a beaded mouth;

FIG. 16 is a fragmentary side elevational view of the sealed container of FIG. 15 showing an unsealing tab; and

FIG. 17 is a fragmentary side elevational view in section showing the container of FIGS. 15 and 16 unsealed, its re-usable crimp-on cover, and a throw-away strip torn from the original cover.

Referring to FIGS. 1 to 4, the push-in lid 10A for closing the open end or mouth 18A of container body 17A to form a sealed container comprises the bonded layers 11A, 12A which differ substantially in strength and thickness. The inner weaker layer 12A is sealed throughout its marginal area 20A to the ledge 19 formed within the mouth of the container body. Such marginal area is clearly defined by the score line 13A, or equivalent cuts or perforations, which do not penetrate through the outer layer. With the cap applied and sealed, the container contents are isolated from ambient atmosphere by a hermetic seal protected from mechanical injury by the strong outer layer of the cover.

To facilitate removal of the cover 10A for original access to the container contents, the cover may be provided with a pre-cut lift-tab 14 and a pre-cut fingernail notch 15. The cuts defining tab 14 and notch 15 are only in the outer layer 11A and do not extend to or through the inner layer 12A of the cover. To unseal the container of FIG. 4, it is only necessary to grasp and lift the tab 14 of cover 10A while container body 17A is held as by

the other hand. During such lifting of cover 10A, the marginal area 20A of the inner layer 12A separates from the outer layer 10A and remains permanently attached to the ledge 19 of the container body (FIG. 5)—so leaving on the under side of the peeled-off lid 10A a peripheral gap 21A which there exposes the upper layer 11A. In some cases, as for example when of cardboard, such exposed surface of the layer 11A is slightly rough because of adherence of surface material to the marginal area 20A. However, even in such case, the thick outer layer 11A of lid 10A remains essentially intact so that the lid 10A may be used to re-close the unsealed container for satisfactory protected storage under conditions less stringent than existing during the handling and shipment of the sealed containers. The frictional engagement between the periphery of the re-used cover and the container body at and above the ledge 19 suffices to hold the cover in place for re-use purposes.

The outer layer 11A of the push-in type lid 10A (FIGS. 1 to 5) is of substantial thickness and rigidity. It may, for example, be cardboard, hardboard, plywood and plastic sheet of thickness in the range from about 0.001" to 0.030". The relatively thin layer 12A of lid 10A may be a thermoplastic coating applied to the web or sheet from which the lids are cut, or it may be a thin thermoplastic film, usually of thickness of the order of about 0.001", bonded to such web. For most applications, the inner layer 12A of lid 10A is coextensive with the outer layer, but it may be a coating stripe approximately the dimensions and shape of ledge 19 of the container body. Both layers of lid 10A may be of transparent heat-sealing plastic to permit their joiner by hot or cold-welding and to permit inspection of the contents of a sealed container whose body is opaque or not exposed. The scoring 13A, or equivalent, is effected after joiner of the layers 11A, 12A and does not penetrate through the outer thicker layer 11A.

For most uses, the inner layer 12A of cover 10A is a heat-sealing plastic, for example, polyethylene, for sealing of the cover to the open end of a container body, either formed from heat-sealing plastic by injection molding, pressure or vacuum-forming or the like, or at least whose mouth end specifically at shoulder 19 has been coated with thermoplastic. In the latter case, the container body, or the mouth end thereof, may be of any container material including glass, tin, aluminum, heavy cardboard or plastic which itself is not heat-sealing. In all cases, the mouth of the container body may be oval, square, circular or other shape, and the cover 10A will be of similar shape and size to fit into the container mouth.

Referring to FIGS. 6 to 8, the crimp-on lid 10B for closing the upper end or mouth 18B of container body 17A to form a sealed container comprises the bonded layers 11B, 12B of substantially different strength. The thin inner layer 12B is sealed throughout its marginal area 20B to the rim of the container mouth 18B. The marginal area 20B is clearly defined by the score line 13B, or equivalent, whose cuts, perforations or scoring do not break through the outer layer 11B.

The container 17B may, for example, be a milk bottle, either formed of plastic, or whose mouth is coated with thermoplastic, for heat-sealing to the inner layer 12B of lid 10B so to afford a hermetic seal isolating the container contents from atmosphere. By preselection of the width of the seal and, therefore, the seal area, the force required to delaminate the lid in opening of the container may be predetermined. Such control of the force required for unsealing exists for the other modifications as well. The peripheral edge or margin of lid 12B is pre-pleated to facilitate crimping over the beaded rim 18B of the container mouth, so to relieve the hermetic seal from handling stresses.

To unseal the container (FIG. 8) for initial access to its contents, the crimped edge of cover 10B is lifted up-

wardly and outwardly at any region, the unsealed marginal area of the cover serving as a lifting tab. During such lifting of the cover 10B to peel it off the container body, the marginal area 20B of the inner cover layer 12B remains permanently attached (FIG. 9) to the beaded mouth of the container body. The separation of the marginal sealing area of the inner layer 12B from the upper layer 11B leaves a peripheral gap 21B in the undersurface of the removed cover 11B. However, even in such case, the outer layer 11B remains essentially intact (FIG. 9) so that the removed lid may be used again to re-close the unsealed container by manually pressing the recessed central portion of the cover into the container mouth and pressing the pleated edge over and under the beaded rim thereof. The gripping engagement between the re-applied cover 10B and the beaded edge of the container suffices to hold the cover in place for re-use purposes of the container; it may be enhanced by locating the seal, as in FIGS. 15 to 17, lower on the outside of the beaded rim of the container mouth or below such bead.

For the crimp-on lid 10B of FIGS. 6 to 9, the outer layer 11B of the cover may be metal foil, thin cardboard, heavy paper or the like. The relatively thin inner layer 12B of cover 10B may be a coating applied to the web or sheet from which lids are cut, or it may be a thin film or membrane usually of thickness of the order of 0.001" bonded to such web. Preferably and for most applications, the inner layer 12B of cover 10B is coextensive with the upper layer 12b, but it may be a coating stripe generally corresponding in location with the area 20B.

For most applications, the inner layer 12B of cover 10B is a heat-sealing plastic, for example, polyethylene for sealing of cover 10B to the open end of the container body either made from heat-sealing plastic or at least whose beaded mouth has been coated with such material. In the latter case, the container body 17B may be of any container material including glass, cardboard or plastic which itself is not heat-sealing. It is also to be understood that, as in other modifications, the mouth of the container body 17B may be circular, oval, square or other shape, and the cover 10B for it will be of similar shape but somewhat larger for crimping over the mouth.

Referring to FIGS. 10 to 14, the push-in lid 10C for closing the open end or mouth 18C of container body 17C to form a sealed container comprises the bonded layer 11A, 12A which, as in the modifications previously described, differ substantially in strength and thickness. The lid 10C may be of the same construction as the lid 10A of FIGS. 1 and 2 for insertion into the open mouth of container body 17C which differs in construction from the container body 17A of FIG. 3 in that it is of heavy cardboard, aluminum foil or the like whose rim 22C may be crimped (FIG. 13) over the topside marginal area of cover 10C. In the initial closure of the filled container body 17C, the inner weaker layer 12A of the inserted lid 10C is sealed throughout its marginal area 20A to the ledge 19 formed within the mouth of the container body. At least the ledge region of the container mouth is coated with heat-sealing thermoplastic. With the cap 10C inserted and heat-sealed, the container contents are isolated from ambient atmosphere by a hermetic seal: the rim 22C of the container mouth is then crimped inwardly to provide clamping pressure on the topside of the sealed lid correspondingly to relieve the seal of strain and stress incident to shipment and handling of the sealed container.

To unseal the container (FIG. 13), it is only necessary to grasp and lift the tab 14, or equivalent, of cover 10C while the container body 17C is held as by the other hand. During lifting of cover 10C, the marginal area 20C of the inner layer 12C of cover 10C remains attached to ledge 19C of the container body and so separates from the corresponding area of the underside of the outer layer 11C of the cover; at the same time, the lifting force uncurls or straightens out the crimped rim 22C of the con-

tainer mouth 18C so that the cover 10C, in state shown in FIG. 14, is removed from the open mouth of the container body 17C for unobstructed access to the container contents.

As in FIG. 5, the lid 10C of FIG. 14 may be used for re-closure of the unsealed container for temporary protection of the unused contents by reinserting the lid in the open mouth of the container and recrimping the rim 22C of the container to hold the lid in place without depending upon frictional engagement between the periphery of the lid and the container mouth at and above ledge 19C.

Referring to FIGS. 15 and 16, the crimp-on lid or cap 10D for closing the upper open end or mouth 18D of container body 17D to form a sealed container comprises the bonded layers 11D, 12D of substantially different strength. The outer layer 11D is preferably of metal foil; the thin inner layer 12D, as in the other modifications, may be a thermoplastic coating applied to the sheet or web from which the lids are cut, or it may be a thin thermoplastic film bonded to such web to form a laminate. The thin inner layer 12D of the initially applied cover 10D is heat-sealed throughout its peripheral area 20D to the outside of the container body 17D below the beaded rim thereof. Such marginal area, is defined by the score line 13D. The outer layer 11D of the cover is also externally scored or perforated along the line 23D to outline a tear-off strip 25D opposite the sealed marginal area 20D of the inner layer 12D of the cover. Preferably, and as shown in FIG. 16, the cover 10D has a tab 24D extending beyond the sealed edge of the cover.

The container body 17D may be a bottle, can or jar; when it is not of heat-sealing plastic, such material is applied to encircle the container body at least as a stripe adjacent the region where the exterior face of the side wall or neck joins the beaded rim of the container mouth. Application of heat and pressure to the periphery of the applied cover 10D effects a hermetic seal between the inner layer 12D of the cover 10D and such region of the container body: the crimping of the cover 10D over the beaded rim of the container mouth relieves the seal of handling stresses.

To unseal the container (FIG. 16) for initial access to its contents, the cover tab 24D is lifted slightly and pulled clockwise around the container so to peel off the marginal area 25D of the outer layer 11D of the cover (FIG. 17). During such peel-off, the marginal area 20D of the inner layer of the cover remains attached to the container body (FIG. 17). The broken ring formed by the torn-off marginal area 25D of the outer layer of the original cover 10D is thrown away. However, the central disc or cap portion 26D of the original cover is reusable to protect the partially depleted contents of the container. For such re-use purposes, the removed cover cap 26D is applied over the mouth of the container and its peripheral area re-shaped over the beaded rim to hold the cover in place.

It is to be understood the invention is not limited to the specific modifications shown but comprehends equivalents within the scope of the appended claims.

What is claimed is:

1. A sealed container and cover arrangement which can be unsealed by removal of the cover without recourse to a knife or other tool and which provides for recapping of the unsealed container by the removed cover comprising
 a container body having cover-retaining structure adjacent its open end, and
 a cover comprising two layers of substantially different strength having their adjacent faces bonded together, at least the outer stronger layer of said cover extending across said open end of the container with its peripheral area in gripping engagement with said cover-retaining structure of the container body, only the inner and weaker of said layers of the cover

being sealed throughout a marginal area of the cover to the container body to provide hermetic sealing of the container by said inner layer of the cover, the bond between said inner, weaker layer of the cover and said container body being stronger than the bond between said layers of the cover,

the lifting of said cover releasing said gripping engagement between its outer layer and said cover-retaining structure of the container body and also breaking the bond between said layers of the cover and so leaving said marginal area of the inner layer of the cover attached solely to the container body for access to the interior of said container body, said outer layer of the removed cover remaining essentially intact for subsequent recapping of the unsealed container by restoration of said gripping engagement between said retaining structure of the container body and said peripheral area of the cover.

2. A sealed container and cover arrangement as in claim 1 in which
 the container body has an internal peripheral ledge spaced below the rim of the open end for sealing engagement with said marginal area of the inner layer of the cover, and
 the peripheral edge of the outer layer of the cover is frictionally gripped by the interior face of the container body above said ledge.
3. A sealed container and cover arrangement as in claim 1 in which
 the open end of the container body has a beaded rim for sealing engagement with said marginal area of the inner layer of the cover, and
 the peripheral area of the cover is crimped over said beaded rim of the container body.
4. A sealed container and cover arrangement as in claim 1 in which
 the inner layer of the cover is heat-sealing plastic, and at least the cover-engaging surface of the container body is heat-sealing plastic.
5. A sealed container and cover arrangement as in claim 1 in which
 the weaker inner layer of the cover is coextensive with the outer layer with said marginal area of the inner layer defined by scoring, said inner layer of the cover within its said marginal area remaining bonded to said outer layer of the cover upon said lifting of the cover.
6. A sealed container and cover arrangement as in claim 1 in which
 the weaker layer of the cover comprises a marginal coating stripe of heat-sealing thermoplastic.
7. A sealed container and cover arrangement as in claim 1 in which
 the container body has an internal peripheral ledge spaced below the rim of the container open end for sealing engagement with said marginal area of the inner layer of the cover, and
 said rim of the container open end is flexible and crimped over into clamping engagement with the topside of the cover.
8. A sealed container and cover arrangement as in claim 1 in which
 the open end of the container body has a beaded rim for sealing engagement below the rim with said marginal area of the inner layer of the cover as shaped over said beaded rim.

References Cited by the Examiner

UNITED STATES PATENTS

1,111,259	9/1914	Huff	215—38
1,153,518	9/1915	Ray	215—38
1,690,781	11/1928	Genese	215—38
1,693,455	11/1928	Meldrum	215—38

(Other references on following page)

7

UNITED STATES PATENTS

2,077,992	4/1937	Eisen -----	215—40
2,141,556	12/1938	Reifsnyder -----	229—5.6
2,188,946	2/1940	Gutmann -----	215—40
2,390,291	12/1945	Blackman -----	215—42 X 5
2,604,223	7/1952	Horning.	
2,646,183	7/1953	Pellett -----	215—40
3,018,941	1/1962	Wagaman.	
3,194,479	7/1965	Rumberger -----	229—43
3,243,070	3/1966	Hoyle -----	215—38 10

8

FOREIGN PATENTS

218,960	1/1962	Austria.
29,162	12/1911	Great Britain.
849,076	9/1960	Great Britain.
977,312	12/1964	Great Britain.

JOSEPH R. LECLAIR, *Primary Examiner.*FRANKLIN T. GARRETT, GEORGE O. RALSTON,
*Examiners.*D. F. NORTON, *Assistant Examiner.*