

[54] **A LIGHT-TIGHT CARTRIDGE FOR CONTAINING SHEET MATERIAL**

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[73] Assignee: **Eastman Kodak Company**, Rochester, N.Y.

[22] Filed: **Nov. 7, 1972**

[21] Appl. No.: **304,448**

[52] U.S. Cl. .... **95/19, 95/71, 206/62 R**

[51] Int. Cl. .... **G03b 19/10**

[58] Field of Search .... **95/19, 66, 67, 71, 72; 206/60 R, 62 R; 250/475, 478, 479, 481**

[56] **References Cited**

**UNITED STATES PATENTS**

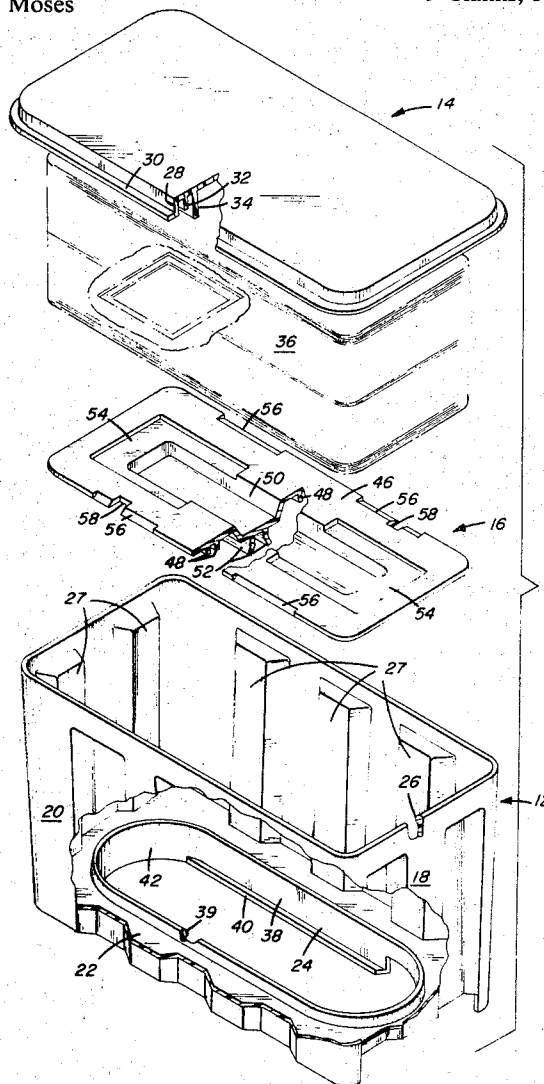
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Primary Examiner—Richard L. Moses

[57] **ABSTRACT**

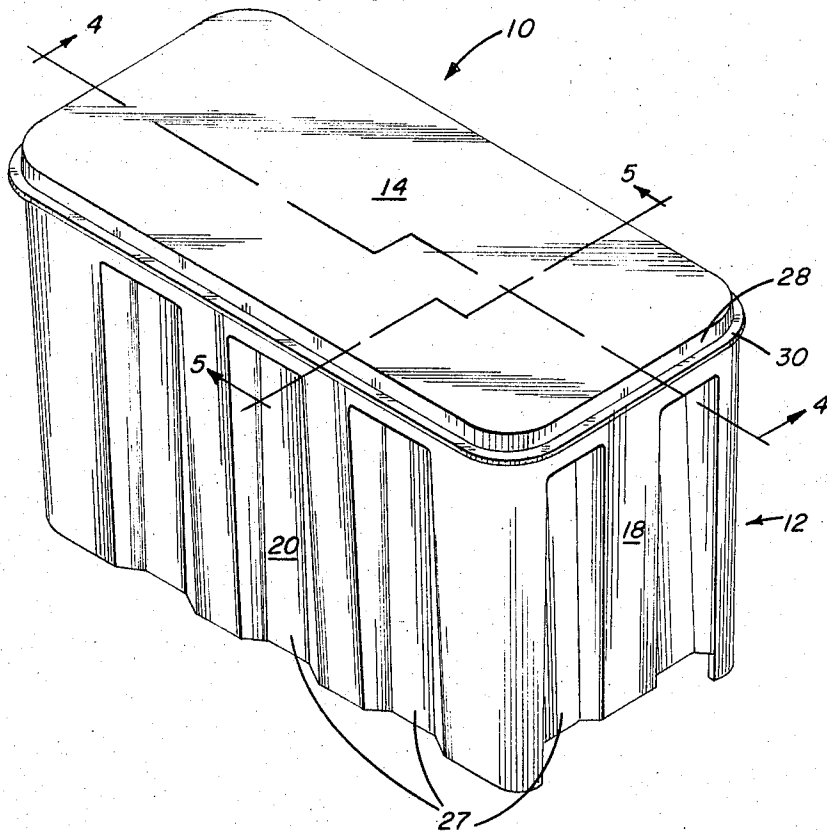
A hermetic, light-tight cartridge for containing sheet material containing a light-sensitive element, such as an aperture card. The cartridge is arranged to permit the cards to be withdrawn. The cartridge comprises a body portion having a generally rectangular cross section, a bottom wall portion, and opposed side and end walls connected to the bottom wall portion. The body portion has an open top through which the cards may be withdrawn and an opening in the bottom wall portion. A removable top is provided for the body portion and a closure member is provided for the opening in the bottom wall. The closure member comprises a support plate disposed within the body portion and having a size generally equal to the size of the sheet material. The closure member is arranged to positively and releasably engage and seal the periphery of the opening in said bottom wall portion and the removable top is arranged to positively and releasably engage and seal the top edge of the body portion. The closure member has means engageable exterior of the cartridge for movement into and out of engagement with the opening and to lift the sheet material out of the top of the opened cartridge.

**9 Claims, 5 Drawing Figures**

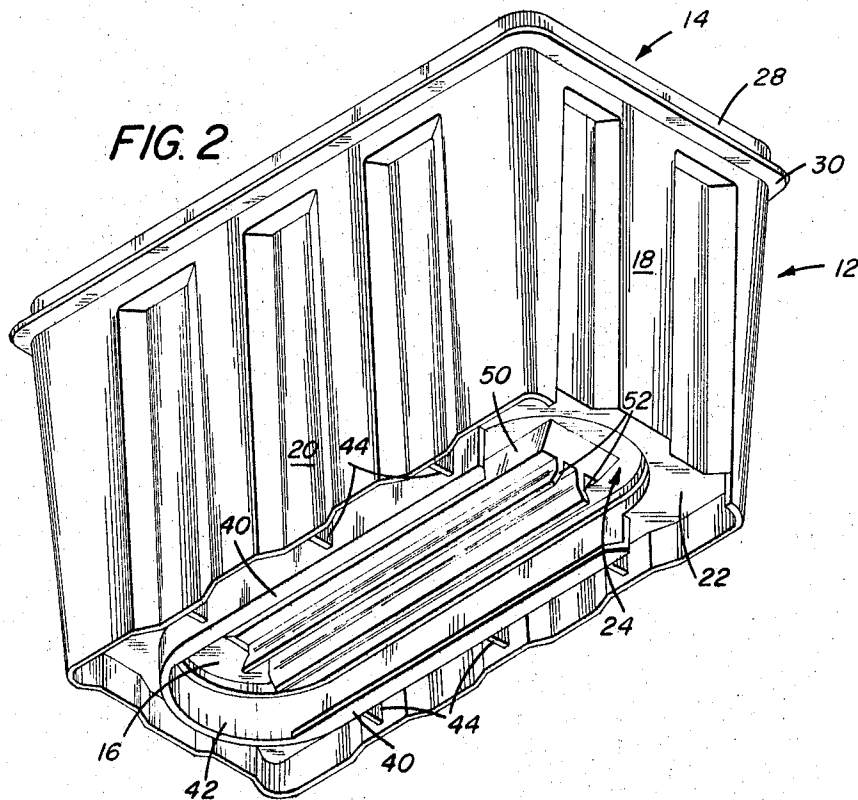


SHEET 1 OF 3

**FIG. 1**



**FIG. 2**



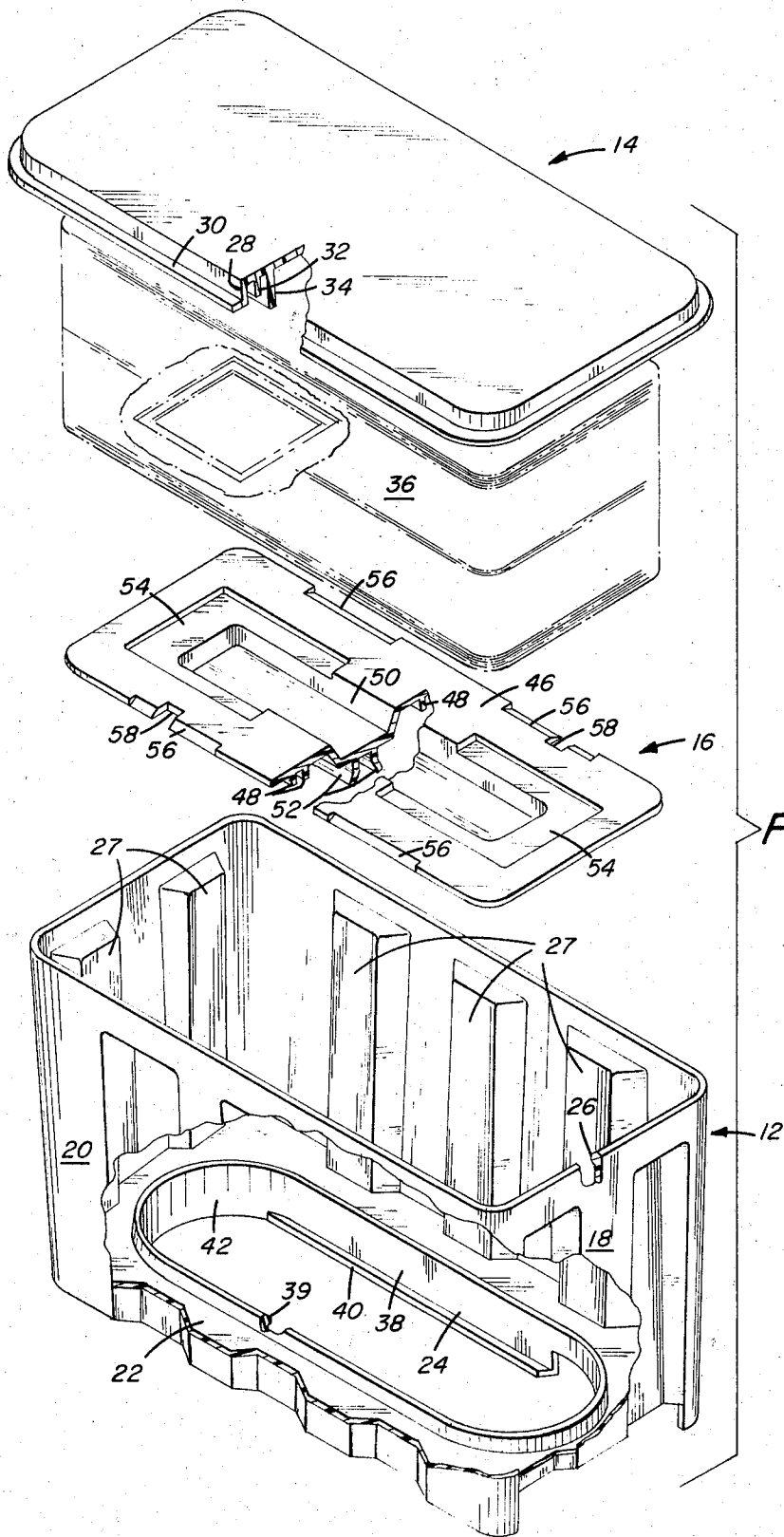


FIG. 4

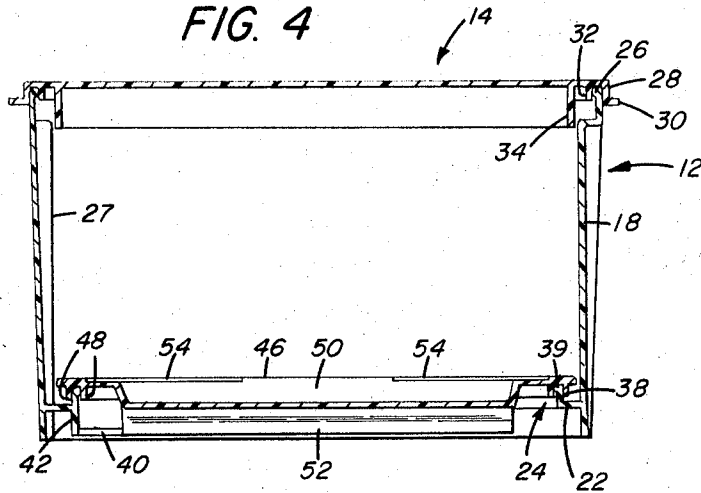
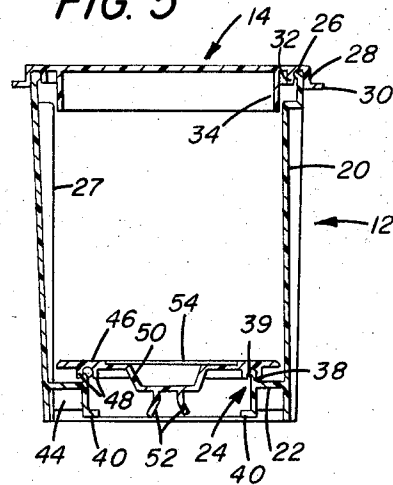


FIG. 5



## A LIGHT-TIGHT CARTRIDGE FOR CONTAINING SHEET MATERIAL

### BACKGROUND OF THE INVENTION

Many cartridges have been designed for shipping and storing sheet material such as aperture cards formed with an aperture having a section of light-sensitive film mounted therein which are openable when desired to form a container from which the cards may be fed into a photographic apparatus. Generally, however, such cartridges have not, in themselves, provided the necessary moisture protection and have required the use of outer wraps which must be removed prior to use. This results in waste disposal problems for the wrapping and prevents ready resealing of the cartridge if a partially used cartridge is to be removed from the apparatus. Some cartridges have been constructed which initially provide the needed light and moisture tightness in themselves, but when opened are not resealable so that removal of a partially empty cartridge would expose some or all of the contents to light.

### SUMMARY OF THE INVENTION

The present invention is thus directed to a cartridge for packaging and storing sheet material bearing a light-sensitive film portion, such as aperture cards, and, more particularly, one which also permits the material to be dispensed therefrom by feeding means associated with photographic apparatus.

A cartridge embodying the novel features of the present invention is advantageous in that it permits the sheet material to be supplied to the photographic machine without removing the sheet material from the cartridge. This permits the loading of a photographic machine with a supply of light-sensitive material in a lighted area and eliminates the possibility of exposure of some of the material to stray light and physical damage to said material, as may be the case when it is necessary to remove the material from the cartridge and place the same in a machine when the machine is in a darkroom.

This invention is also advantageous in that it provides a reclosable hermetic cartridge which is moisture and light tight before it is opened for use and after reclosure should it be necessary to remove a partially used cartridge from the photographic apparatus.

The present invention is particularly adapted for use with cards of the type commonly employed in tabulating and storing systems which have an aperture formed therein and sorting a film section of light-sensitive material mounted in the aperture. The cartridge is adapted for use with apparatus of the type described in the commonly assigned, copending U.S. application, Ser. No. 304,446, entitled Card Loading Mechanism for a Photographic Copying Machine and filed on even date herewith in the names of Endter et al. In this arrangement, the aperture cards containing unexposed film are introduced into the apparatus contained within a hermetic cartridge which is automatically opened and the cards lifted out of the cartridge for use. The cartridge is so arranged that it can only be inserted into the apparatus in the proper orientation. Moreover, should it be necessary, the unused cards may be returned to the cartridge, the cartridge again be hermetically sealed, and the cartridge removed from the apparatus without deleteriously affecting the unexposed film.

Accordingly, the present invention provides a three part, light-tight, moisture proof cartridge for aperture cards which serves as a package for the aperture card from point of manufacture to the customer and as a camera loading device which permits loading and unloading of the camera without the necessity of a darkroom. The cartridge comprises a body portion having a generally rectangular cross section, a bottom wall portion, and opposed side and end walls connected to the bottom wall portion. The body portion has an open top and an opening in the bottom wall portion. A removable top is provided for the open top of the body portion and a closure member is provided for the opening in the bottom wall portion. The closure member comprises a support plate disposed within the body portion which has outside dimensions generally equal to the outside dimensions of the sheet material. The closure member is arranged to engage the periphery of the opening in the bottom wall portion and has means engageable exterior of the cartridge for movement of the closure member into and out of engagement with the periphery of the opening.

More specifically, the present invention provides a molded plastic light-tight hermetic cartridge for containing a plurality of sheet members bearing a light-sensitive element, e.g. aperture cards, from which the sheet members may be withdrawn. The cartridge comprises a molded body portion having a generally rectangular cross section, a bottom wall portion, and opposed side and end walls connected to the bottom wall portion. The body portion has an open top and an opening in the bottom wall portion. The side walls and one of the ends walls extend beyond the bottom wall portion to form a skirt member on three sides of the cartridge. Wall means is provided, coextensive with at least two sides of the opening in the bottom wall portion, which extends outwardly from the bottom wall portion. This coextensive wall means has a flange portion at the outer edge thereof substantially parallel to the bottom wall portion and extending partially over said opening in the bottom wall portion. A seal means is provided coextensive with the periphery of the opening in the bottom wall portion and extends inwardly therefrom. A removable top is also provided for the body portion which has peripheral seal means arranged to positively and releasably engage the upper edge of the body portion. The removable top has a rib member spaced inwardly from said seal means which is arranged not to contact the topmost sheet member when the top is in engagement with the body portion. A closure member is provided for the opening in the bottom wall portion and comprises a support plate disposed within the body portion. The support plate has outside dimensions generally equal to the outside dimensions of the sheet members with means on the outer surface of the closure member arranged to positively and releasably engage the inwardly extending seal means about the opening in the bottom wall portion. The closure member also has longitudinally extending channel means extending outwardly therefrom and arranged to extend through the opening in said bottom wall portion for engagement exterior of the cartridge for movement of the closure member into and out of engagement with the opening and to lift the sheet material out of the top of the opened cartridge.

The various features of novelty which characterize the present invention are pointed out with particularity

in the claims annexed to and forming a part of this specification. For a better understanding of the invention, its operating advantages and the specific objects obtained by its use, reference should be had to the accompanying drawings and descriptive matter in which a preferred embodiment of the present invention is illustrated and described.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top perspective view of a closed cartridge incorporating a preferred embodiment of the present invention;

FIG. 2 is a bottom perspective view of the cartridge illustrated in FIG. 1;

FIG. 3 is an exploded perspective view, partially in section of the cartridge illustrated in FIG. 1;

FIG. 4 is a sectional view of the cartridge taken along line 4—4 of FIG. 1; and

FIG. 5 is a sectional view of the cartridge taken along line 5—5 of FIG. 1.

The cartridge 10 of the present invention comprises three pieces, a body portion 12, a removable top or cover 14, and a bottom closure member 16, all preferably molded of a moisture-proof material such as polyethylene to provide the desirable hermetic properties to the assembled cartridge.

The body portion 12 is generally rectangular in cross section, slightly larger than the aperture cards to be contained therein, and comprises opposed side and end walls, 18 and 20 respectively, and a bottom wall portion 22. The body portion has a substantially completely open top and the bottom wall portion 22 is provided with a centrally disposed opening 24 which permits a portion of the above referenced photographic apparatus to enter the cartridge and engage the bottom closure member 16 in a manner to be described more thoroughly hereinbelow. The upper edge of the side and end walls, which form the periphery of the top opening, are provided with a continuous, inwardly extending peripheral rib 26. The side and end walls provided with inwardly extending reinforcing bosses 27 which supply the necessary rigidity to the cartridge walls. The bosses also provide the aperture cards with the requisite guidance without excessive contact therewith. Furthermore, the space within the cartridge adjacent the bosses facilitate the cartridge loading by handling means including a plurality of fingers that reach down in the cartridge.

The cover 14 is substantially planar and is provided with a downwardly extending peripheral lip 28 which has an outwardly extending flange 30 at its outer extremity. The inner periphery of lip 28 closely engages the outer surface of the upper edge of the body portion 12. The cover is provided with a second downwardly extending peripheral lip 32 which is spaced inward from lip 28 a distance substantially equal to the thickness of the rib 26 on the periphery of the top opening of the body portion 12. The two lips 28 and 32 are arranged, when the cover is on the body portion, to engage the rib 26 around the top opening and to form a moisture and light seal which can be readily opened or reclosed. The cover 14 is also provided with a downwardly extending flange 34, spaced inwardly of lip 32. Flange 34 is longer than lips 28 and 32 but is arranged not to contact the uppermost of the aperture cards 36 (FIG. 3) of a full cartridge.

The bottom wall portion 22 of the cartridge body is provided with a centrally disposed, elongated opening 24 and has an inwardly extending peripheral wall means or rim 38 which terminates within the cartridge in an enlarged bead 39 similar to the rib 26 at the top opening. This portion of rim 38 completely surrounds the opening 24. The rim 38 extends outwardly below the bottom wall portion on at least the two longitudinal sides of the opening 24 and is provided along these sides with a flange 40 extending parallel to the bottom wall portion over the opening therein. The portion of the rim 38 which extends below the bottom wall portion may or may not extend around one end of the opening, as at 42, but the other end of the opening does not have such a rim portion.

The lowermost portions of the opposed side walls 18 and one end wall 20 adjacent the end portion 42 of rim 38 extend beyond the bottom wall portion 22 a distance substantially equal to that of the rim 38. A plurality of reinforcing members 44 extend between the rim 38 and the extended portion of the side and end walls to provide rigidity to the bottom of the cartridge.

The bottom closure member 16 comprises a support plate 46 which has a size generally equal to the size of the sheet members to be held in the container. The bottom closure member is arranged for vertical movement in the cartridge body portion 12 and is provided with a pair of spaced flanges 48 on the bottom thereof which extend parallel to the periphery of the plate member. These flanges are arranged, when the closure member is in the bottom of the body portion, to sealingly engage the bead 39 on the upper end of rim 38 to form a moisture and light seal for the opening 24 in the bottom wall portion which can be readily opened and reclosed. A central portion of the support plate is recessed, as at 50, to strengthen the bottom closure member and form a support which extends outwardly through the opening 24. A pair of longitudinal ribs 52 extend outwardly from the outer portion of recess 50 and form a gripping surface by which the previously referenced apparatus can positively grip the closure member 16 for vertical movement in the cartridge. The support plate is also recessed, as at 54, at opposite ends beneath the area of the aperture card containing the photographic film to prevent damage of the film by contact with the support plate. There are two such recesses 54 so that the closure member is longitudinally symmetrical to avoid the necessity or orienting the closure member during assembly. The support plate is also provided with recesses 56 and 58 along the edges, also symmetrically arranged, for detecting and feeding the aperture cards in the photographic apparatus.

When the cartridge is filled with aperture cards and the top cover 14 and the bottom closure member 16 are in place, with the respective flanges engaging the respective beads on the body portion, a hermetic, light-tight container is provided which requires no additional wrapping to protect the contents. Moreover, since both openings are resealable, the cartridge can be partially emptied and then resealed providing further protection to the remaining contents. Further, the present cartridge is arranged for cooperation with apparatus such that the cartridge provides hermetic and light protection until after it is inserted into the apparatus. After the cartridge is inserted into the apparatus in the closed condition, and in only one orientation because of the omission of the rim 38 from one end of the opening and

the omission of the corresponding end wall extension, the flanges 40 are engaged by a relatively stationary element to prevent vertical movement of the cartridge. The apparatus is then closed and the cartridge is in a dark compartment. Thereafter the flange 30 of the top cover is engaged and the cover is lifted off. During insertion, the dependent ribs 52 have been engaged by a movable element of the apparatus which is arranged to lift the lower closure member and the cards thereon, and to lift the cards into contact with a feeding device for transport to an exposure station. Because of the fact that the ribs are positively engaged, it is also possible for the apparatus to lower the cards back into the cartridge and to pull the bottom closure member into sealing engagement with the sealing means about the opening in the bottom wall portion. Likewise, the top can be reattached and the resealed cartridge may be safely removed from the apparatus.

Accordingly, it will be seen that the present invention provides a hermetic, light-tight cartridge for sheet material bearing a light sensitive element, such as aperture cards, which both protects the elements and permits their automatic handling in the appropriate apparatus.

The invention has been described in detail with particular reference to preferred embodiments thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

We claim:

1. A cartridge for containing sheet material from which said material may be withdrawn, said cartridge comprising a body portion having a generally rectangular cross section, a bottom wall portion, and opposed side and end walls connected to said bottom wall portion, said body portion having an open top and an opening in said bottom wall portion, a removable top for said body portion, and a closure member for said opening in said bottom wall portion comprising a support plate disposed within said body portion and having outside dimensions generally equal to the outside dimensions of the sheet material, said closure member arranged to engage the periphery of the opening in said bottom wall portion, said closure member having means engageable exterior of said cartridge for movement of the closure member into and out of engagement with the periphery of said opening.

2. The invention according to claim 1 wherein said removable top and said closure member are arranged to sealingly engage the body portion to form a hermetic cartridge.

3. The invention according to claim 1 including means engageable on the exterior of said cartridge to prevent movement of the body portion as the closure member is moved.

4. The invention according to claim 1 wherein said side walls and one of said end walls extend beyond the bottom all portion to form a skirt member on three sides of the cartridge.

5. A light-tight cartridge for containing a plurality of sheet members bearing a light-sensitive element from which said sheet members may be withdrawn, said cartridge comprising a body portion having a generally rectangular cross section, a bottom wall portion, and opposed side and end walls connected to said bottom wall portion, said body portion having an open top and an opening in said bottom wall portion, means engage-

able on the exterior of said cartridge arranged to prevent vertical movement of said body portion, seal means coextensive with the periphery of said opening in the bottom wall portion and extending inwardly from said bottom wall portion, a removable top for said body portion, said removable top having means arranged to engage the upper edge of said body portion, and a closure member for said opening in said bottom wall portion comprising a support plate disposed within said body portion and having outside dimensions generally equal to the outside dimensions of the sheet members, means on said closure member arranged to engage the inwardly extending seal means about the opening in the bottom wall portion, said closure member having means extending outwardly therefrom arranged to extend through said opening in said bottom wall portion and being engageable exterior of said cartridge for movement of the closure member into and out of engagement with said opening.

6. The invention according to claim 5 wherein said removable top and said closure member are arranged to sealingly engage the body portion to form a hermetic cartridge.

7. The invention according to claim 5 wherein said seal engaging means of said closure member is arranged on the outer surface of said closure member.

8. A molded plastic light-tight hermetic cartridge for containing a plurality of sheet members bearing a light-sensitive element from which said sheet members may be withdrawn, said cartridge comprising a molded body portion having a generally rectangular cross section, a bottom wall portion, and opposed side and end walls connected to said bottom wall portion, said body portion having an open top and an opening in said bottom wall portion, said side walls and one of said end walls extending beyond the bottom all portion to form a skirt member on three sides of said cartridge, wall means coextensive with at least two sides of said opening in said bottom wall portion and extending outwardly from said bottom wall portion, said coextensive wall means having a flange portion at the outer end thereof substantially parallel to said bottom wall portion and extending partially over said opening in said bottom wall portion, seal means coextensive with the periphery of said opening in the bottom wall portion and extending inwardly from said bottom wall portion, a removable top for said body portion, said removable top having peripheral seal means arranged to positively and releasably engage the upper edge of said body portion, said removable top also having a rib member spaced inward from said seal means and arranged not to contact the topmost sheet member when the removable top is in engagement with said body portion, and a closure member for said opening in said bottom wall portion comprising a support plate disposed within said body portion and having outside dimensions generally equal to the outside dimensions of the sheet members, means on the outer surface of said closure member arranged to positively and releasably engage the inwardly extending seal means about the opening in the bottom wall portion, said closure member having longitudinally extending channel means extending outwardly therefrom and arranged to extend through said opening in said bottom wall portion, said channel means being engageable exterior of said cartridge for movement of the closure member into and out of engagement with said opening.

9. The invention according to claim 8 wherein the side and end walls are provided with inwardly extending stiffening members extending from the bottom wall portion toward said open top.

\* \* \* \* \*

UNITED STATES PATENT OFFICE  
CERTIFICATE OF CORRECTION

Patent No. 3,810,229 Dated May 7, 1974

Inventor(s) Walter B. Dunning, Dale S. Endter, William G. McDonald  
and Arthur C. Rissberger, Jr.

It is certified that error appears in the above-identified patent  
and that said Letters Patent are hereby corrected as shown below:

In the ABSTRACT, line 8, delete "the", first occurrence;

Column 1, line 50, delete "storing" and substitute therefor  
--sorting--;

Column 1, line 51, delete "sorting" and substitute therefor  
--have--;

Column 3, line 25, delete "lythylene" and substitute therefor  
--lyethylene--;

Column 3, line 62, delete "or" and substitute therefor --and--;

Column 4, line 48, delete "or" and substitute therefor --of--;

Column 5, line 58, delete "all" and substitute therefor --wall--;

Column 6, line 34, delete "all" and substitute therefor --wall--;

Column 6, line 39, delete "end" and substitute therefor --edge--; and

Column 6, line 40, delete "nd" and substitute therefor --and--.

Signed and sealed this 1st day of October 1974.

(SEAL)

Attest:

McCOY M. GIBSON JR.  
Attesting Officer

C. MARSHALL DANN  
Commissioner of Patents



UNITED STATES PATENT OFFICE  
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