April 3, 1962 R. F. REIFERS 3,028,065

MOLDED PULP EGG CARTON

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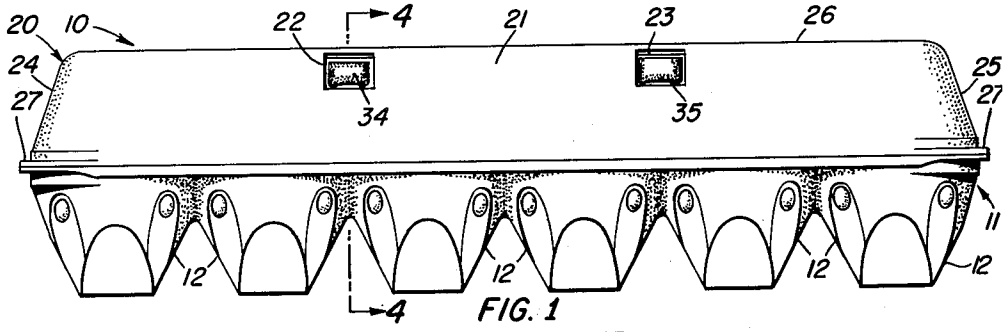

FIG. 1

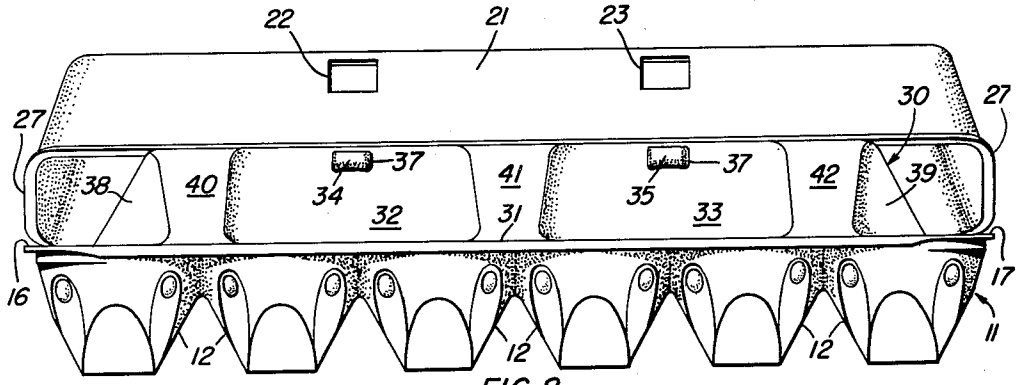

FIG. 2

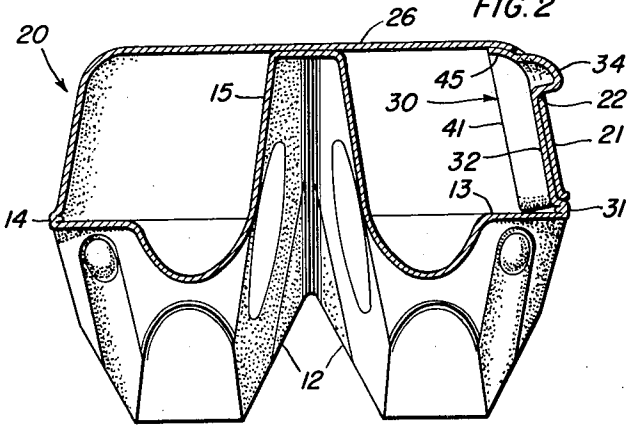

FIG. 4

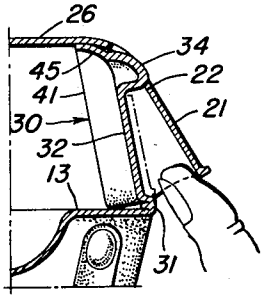

FIG. 5

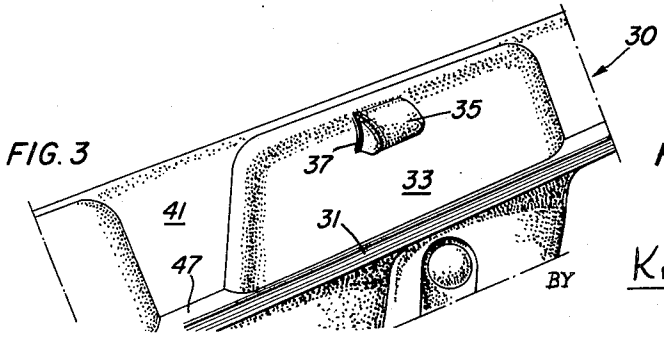

FIG. 3

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MOLDED PULP EGG CARTON

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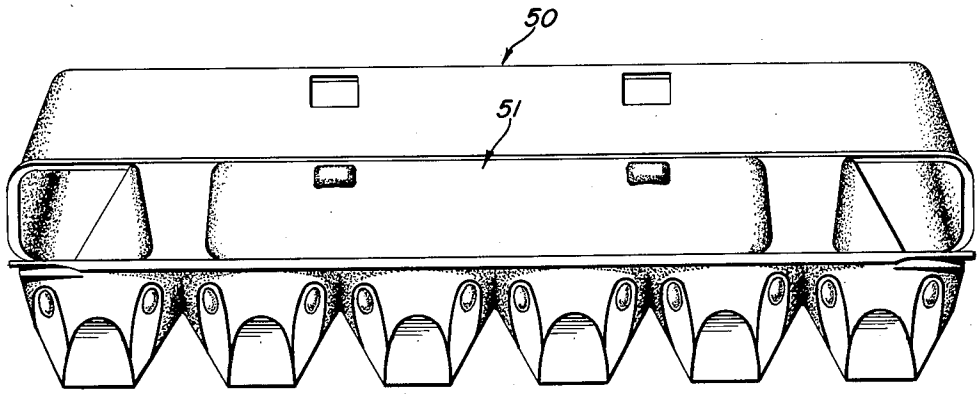

FIG. 6

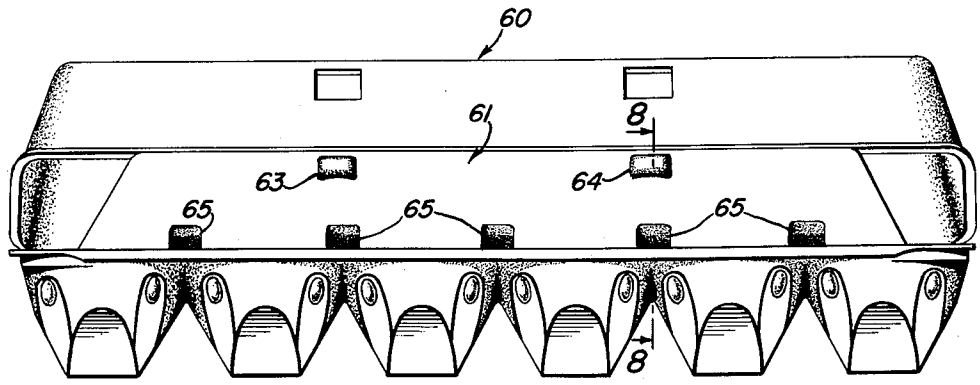

FIG. 7

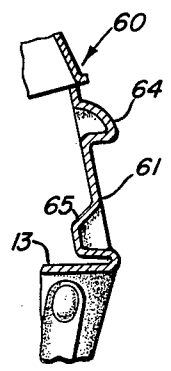

FIG. 8

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MOLDED PULP EGG CARTON

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2 Claims. (Cl. 229—2.5)

The present invention relates to improvements in a molded pulp egg carton of the type comprising an integral tray, cover, and locking flap, and more particularly to such a carton in which the front wall of the cover is planar and the locking flap has two elongated bulges each of which supports a locking projection.

Of the many types of egg cartons made of molded pulp which have heretofore been proposed, one which has gained wide acceptance is generally of the type shown in Cox #2,771,223 issued November 20, 1956. In this patent, there is shown a molded pulp egg carton having a tray provided with a plurality of cells, the tray having a cover integrally hinged to the side wall thereof and a flap integrally hinged to the other side thereof; when the non-cellular cover of the carton of the aforementioned patent is closed, the flap thereof extends upwardly within and adjacent to the front wall of the cover. The cover in accordance with the said patent has proven to be generally strong, and as a consequence the breakage of eggs carried within the carton has been quite small.

In my co-pending application, Serial No. 654,016, filed April 19, 1957 for "Molded Pulp Egg Carton," now Patent No. 2,990,094 there are embodied some of the principles disclosed in the above mentioned Cox patent and further providing for a locking construction for the egg carton thereof. In particular, the said co-pending application discloses a non-cellular cover having depending front and rear walls which are of scalloped shape, featuring longitudinally spaced, outwardly curved or recessed bays formed by frusto-conical sectional surfaces molded in the front wall of the cover. The locking flap of the carton described in said application is similarly shaped, and in the closed position of the carton extends upwardly from the tray front wall and lies within the cover front wall, the frusto-conical sections of the curved front wall and of the locking flap being in register with each other. The locking flap is provided with a pair of locking lugs, each of the lugs extending outwardly from the locking flap, and from an area thereof lying between two of the outwardly curved bays of the locking flap. Each locking lug extends through a locking aperture provided in the cover front wall, the apertures being formed in the cover front wall between two of the outwardly curved bays thereof.

As a consequence of the above described construction, there was provided a strong carton that was readily adapted to be closed by automatic machinery and which carton when closed was securely locked in the closed position. Opening of the carton was accomplished by forcing the locking lugs towards the interior of the carton so that they no longer engaged in the apertures in the cover front wall, and so the cover could be rotated on its hinged connection with the tray to thereby open the carton.

Although the carton described in said application was a highly advantageous and desirable carton, it has been found that there has arisen objections to this carton on the part of some of the purchasers thereof at the retail level. Otherwise stated, some housewives and similar users have found that the carton of said application does not yield as readily as they desire to their efforts to open that carton. As a consequence, despite the many advantages of the carton, it was learned that objections to it did exist on a limited basis.

The carton of the said application was further characterized by requiring special printing machines to effect printing of the scalloped front and rear walls of the cover section.

An object of the present invention is to provide a molded pulp egg carton of the type comprising an integrally joined tray, cover and locking flap which may be securely locked and which may be closed and locked on automatic equipment, and which is also readily openable.

Another object of the present invention is the provision of a molded pulp egg carton having an integrally joined tray, cover and locking flap which is sufficiently strong to withstand normal cover loads and which may be readily opened.

A still further object of the present invention is to provide a molded egg carton which may be securely locked, easily opened and which will be sufficiently strong for the usual purposes.

Still another object of the present invention is to provision of an egg carton that is relatively strong, that may be closed by automatic machinery and when closed be securely locked, and which will afford maximum areas for printing without requiring special printing machinery.

Other objects and the nature and advantages of the instant invention will be apparent from the following description taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a front elevation of an egg carton in accordance with the present invention in closed position.

FIG. 2 is a view similar to FIG. 1 but showing the egg carton in partially open position.

FIG. 3 is a perspective view of a part of the locking flap of the egg carton of FIG. 1.

FIG. 4 is a closed sectional view taken on the line 4—4 of FIG. 1.

FIG. 5 is a partial cross sectional view similar to FIG. 4, and showing the releasing of a locking lug of said carton.

FIG. 6 is a view similar to FIG. 2, but showing another embodiment of an egg carton in accordance with the present invention.

FIG. 7 illustrates still another embodiment of the invention.

FIG. 8 is a cross sectional view taken on the line 8—8 of FIG. 7.

Referring now to the drawings, wherein like reference characters are used to designate like or corresponding parts throughout the several views, there is shown in FIG. 1 an egg carton **10** comprising a tray generally designated as **11** and a cover generally designated as **20**. Tray **11** comprises a plurality of cells **12**, and in the carton **10** which is illustrated there are two rows of cells, each row having six cells therein. The cover **20** has a front wall **21** that is characterized by being planar from end to end thereof.

Cover front wall **21** is provided with a pair of spaced apertures **22** and **23** therein adjacent the upper margin thereof. The end walls **24** and **25** of cover **20** are generally outwardly tapering, from the planar top **26** of cover **20** and the end walls **24** and **25** each has at the bottom thereof an outwardly extending generally horizontal flange, the flange of end wall **24** being designated **27** and the flange of end wall **25** being designated **27'**.

Referring now to FIG. 2, there is shown the carton **10** in partially opened position, there being revealed by the upward movement of cover **20** a locking flap **30**. Locking flap **30** is integrally joined to the upper margin of tray **11** at a hinge line **31**. Locking flap **30** has a pair of spaced elongated, outwardly curved bays **32** and **33** rising upwardly from the hinge line **31**, and each of the bays **32**, **33** has extending therefrom a locking lug,

the locking lug of bay 32 being designated 34 and the locking lug of bay 33 being designated 35.

The configuration of locking flap 30, and particularly the bay and locking lug construction thereof is clearly shown in FIGS. 3 and 4. Thus, in FIG. 3 it may be seen that bay 33 rises directly from hinge line 31 and that the locking lug 35 thereof extends outwardly from it. The junctures 37 between lugs 34, 35 and bays 32, 33 are so located that the outer surface of the bays and hinge line 31 beneath the bays are all in the same plane.

At either end of locking flap 30 there are provided the partial bays 38 and 39, and between the several bays and partial bays above mentioned there may be seen recesses, there being three such recesses designated 40, 41 and 42.

The bays 32, 33, see 32 in FIG. 4, for example, are inwardly curved at their upper ends to provide a generally horizontal portion 45 which is in substantial area contact with the underside of top 26 of cover 20. At the lower ends of the several recesses 40, 41 and 42 there are provided horizontal portions, horizontal portion 47 being seen in FIG. 3 at the lower end of recess 41. The tray 11 has, beneath each of the horizontal portions of the locking flap 30, a corresponding horizontal shelf-like portion, portion 13 being visible in FIG. 4. Each of the horizontal portions of the recesses 40, 41 and 42 rests upon a corresponding shelf-like portion, such as shelf-like portion 13 to thereby effect load transmission to the tray.

Cover 20 is hingedly connected to one side of tray 11 at hinge line 14, as may be seen in FIG. 4, and the tray 11 is preferably characterized by having upstanding posts therein, such as post 15 shown in FIG. 4, which engages with the underside of the top 26 of cover 20. Tray 11 has at the ends thereof horizontally extending flanges 16 and 17.

It will be understood that the carton 10 is manufactured by a pulp molding process, and the carton is then shipped to a desired point and filled with eggs, it being then in the opened position thereof, with the cover 20 being at one side of tray 11 and the locking flap 30 extending outwardly from the other side thereof. By passing the carton 10 through automatic equipment, the locking flap 30 is rotated about hinge line 31 into the position shown in FIG. 4 and the cover 20 is rotated about the hinge line 14. The bottom edge of cover front wall 21 will move downwardly past the locking lugs 34 and 35, at which point a camming action will take place between the said locking lugs 34 and 35 and the interior side of cover front wall 21, if necessary. Cover 20 will thereupon continue to rotate until finally the apertures 22 and 23 will be in register with the locking lugs 34 and 35, respectively, and the interior surface of cover front wall 21 no longer being in contact with the locking lugs 34 and 35, these lugs 34 and 35 will be snapped through the apertures 22 and 23, respectively, by virtue of the natural resiliency of the pulp fibres in the hinge line 31, and in the locking flap 30. The carton 10 will then be securely locked and the parts will occupy the position shown in FIG. 4, with the locking lugs extending through the apertures, as exemplified by locking lug 34 extending through aperture 22, and preventing opening pivotal movement of cover 20.

Vertical loads imparted to cover 20 will be transmitted to tray 11 by virtue of hinge line 14, upstanding post 15, and by virtue of the engagement of the cover 20 with locking flap 30. Particularly, the load will be transmitted from the cover 20 into the horizontal portions, as exemplified by portion 45, and will be transmitted from locking flap 30 into the tray 11 through hinge line 31 and through the engagement of the horizontal portions at the bottom of the several recesses 40, 41 and 42 which engage with the shelf-like portions of the tray as exemplified by the shelf-like portion 13 shown in FIG. 4. In addition, the load will be transmitted from the cover 20 into the tray 11 through horizontal flanges 26, 16 and 27, 17.

Because of the relatively great length and planar configuration of front wall 21 and cover 20, it is relatively easy to engage the lower edge of front wall 21, as by the thumb or thumb nail, opposite recess 41, and to deflect that portion of front wall 21 outwardly away from locking flap 30. Thus, front wall 21 will be bowed between its connections with the end walls 24 and 25 having its maximum deflection opposite recess 41. The outward bowing of front wall 21 is illustrated in FIG. 5, wherein it may be seen that aperture 22 is caused to be almost clear of locking lug 34, so that by a slight inward force on locking lug 34, it will disengage completely from aperture 22; locking lug 34 may be similarly quickly and easily disengaged from aperture 23 to thereby release the locking arrangement of the carton 10.

In FIG. 6 there may be seen a carton 50 that is generally similar to the carton 10 of FIGS. 1–5, but wherein there is provided a locking flap 51 that has a single outwardly curved bay 52 provided with the two spaced locking lugs 53 and 54. The carton 50 is otherwise substantially the same as the carton 10.

As shown in FIG. 7, the locking flap may be flat, and without the bay or bays which are present in FIGS. 2 and 6. Thus, the carton 60 of FIG. 7 has a locking flap 61 that is planar and has a pair of locking lugs 63 and 64. In this embodiment, the natural and inherent resiliency of the hinge of the locking flap 61 serves to urge the locking flap 61 into contact with the inner face of the cover front wall, the locking lugs 63 and 64 thereby extending through the corresponding apertures in the cover front wall. The locking flap 61 of FIG. 7 is provided with button-like indentations 65, each of which is in registry with a horizontal shelf-like portion 13, whereby transmission of load and a limitation on inward pivoting of the locking flap 61 is effected.

The embodiment of the invention illustrated in FIGS. 7 and 8 has substantially the same security of closure and strength transmission characteristics as the embodiment of FIGS. 1 to 6, as will be understood.

There has been provided an egg carton that is of a relatively strong construction, being made of molded pulp and having a tray with a cover and a locking flap integrally joined to opposite sides thereof, the carton being readily closed by automatic equipment and easily opened. In fact, the carton of the present invention is so constructed that the easy and natural opening movements thereof presents itself to the housewife as the obvious and inherent manner of opening the carton. Thus, the carton of the present invention is not only strongly and securely locked when in closed position, but is inherently and obviously easily opened.

It will be understood further that the carton of the present invention provides the added advantage, in addition to those recited above, of providing a cover with a configuration, i.e., the planar front wall, that may be readily printed, as with advertising matter.

It will be obvious to those skilled in the art that various changes may be made without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the drawings and described in the specification, but only as indicated in the appended claims.

What is claimed is:

1. A molded pulp egg carton comprising a cellular tray, a cover hingedly connected to the tray along mutually adjacent edges and a locking flap integrally and hingedly connected to the tray along the side thereof opposite the side to which said cover is connected, said tray and said cover having at the ends thereof generally horizontally extending flanges in substantial surface and load transmitting contact, said cover having a generally flat top and planar depending and outwardly tapering walls, the cover front wall having a pair of spaced apertures therein adja-

cent the upper margin thereof, said locking flap having a pair of spaced elongated outwardly curved bays, rising upwardly from the hinge line connection thereof with said tray, said locking flap being recessed the width of said locking flap at each end of each of said bays and forming a substantial finger-receiving portion inwardly of the hinge connection of said locking flap and behind said front wall, a locking lug extending outwardly from each of said bays adjacent the top of said bays and for extending through one of said apertures, said tray having horizontal shelf-like portions adjacent and rearwardly of the hinge connection between said tray and said locking flap, said locking flap having horizontal portions at the bottom and top of each of the recesses thereof in substantial load transmitting engagement with the horizontal shelf-like portions of said bottom and the flat top of said cover, whereby loads on the cover of said carton will be transmitted through the end flanges and through the locking flap to said tray and whereby the front wall of said cover may be readily outwardly deflected to release said locking projections from engagement with said apertures.

2. The structure of claim 1; said cellular tray including intermediate, vertically projecting post portions terminating above said hinge connections and terminally engageable beneath an intermediate undersurface portion of said cover top.

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