

June 20, 1967

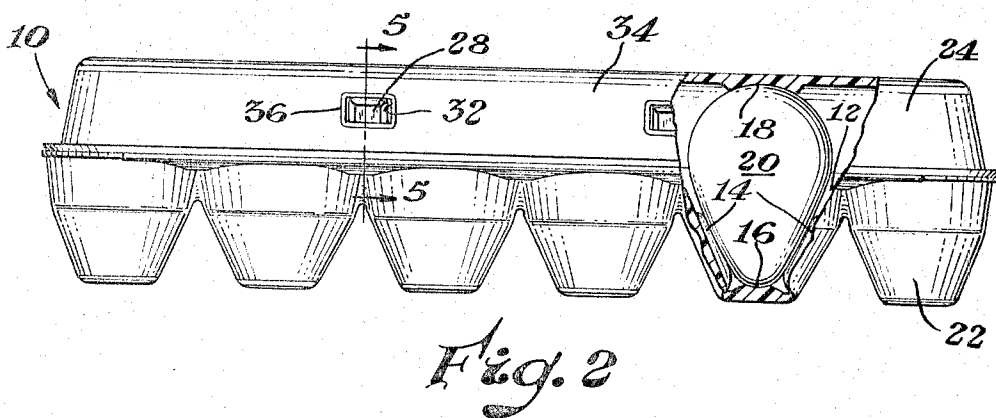
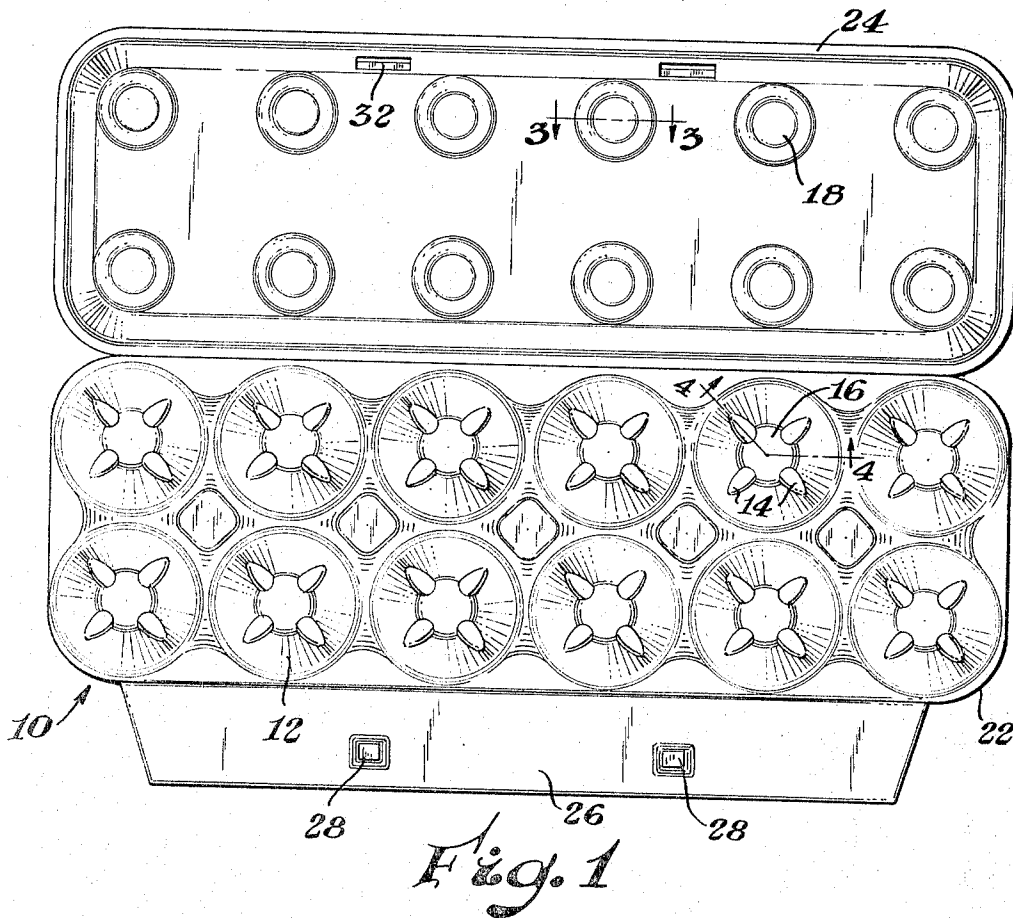
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3,326,443

EGG CARTON

Filed July 19, 1965

2 Sheets-Sheet 1



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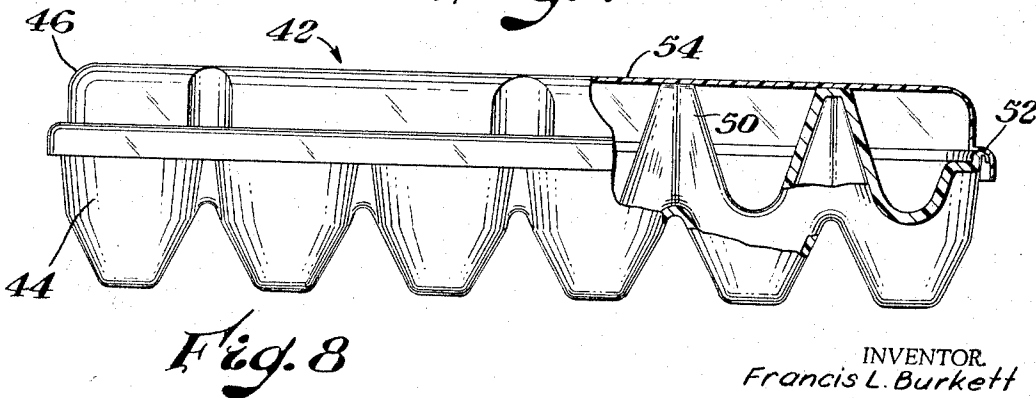
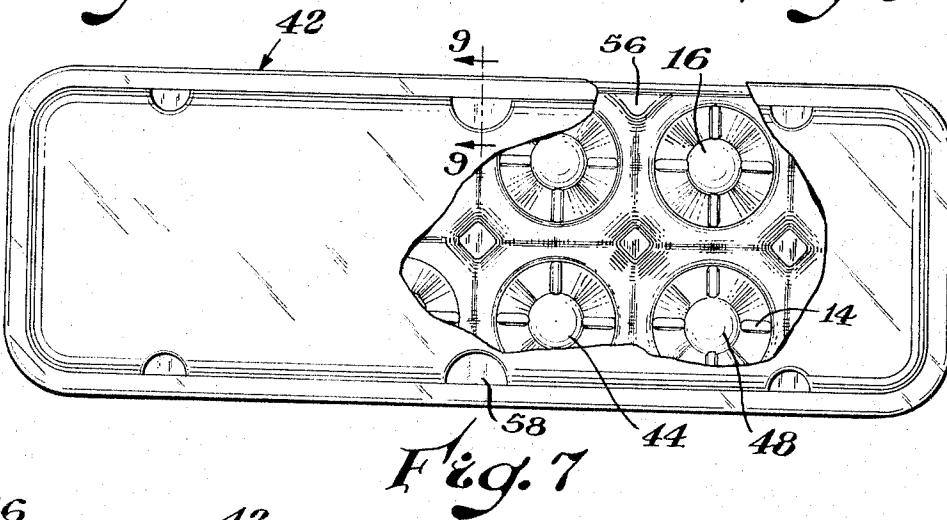
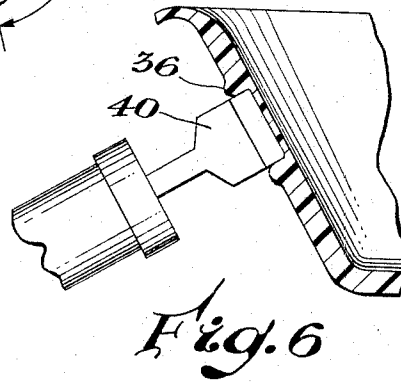
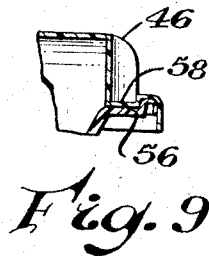
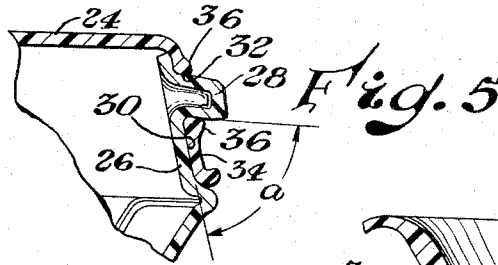
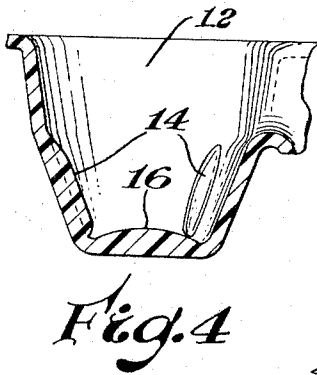
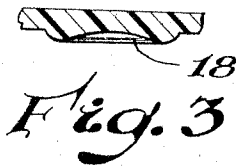
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EGG CARTON

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2 Sheets-Sheet 2



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3,326,443

EGG CARTON

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Filed July 19, 1965, Ser. No. 473,027

9 Claims. (Cl. 229-2.5)

This invention relates generally to an egg carton formed from foam plastic sheet material. More particularly, this invention relates to a vacuum, matched-die formed foam plastic carton construction providing numerous improvements such as an especially high-shock-absorbing cell structure for eggs and a highly secure latch construction. In one embodiment, an egg carton includes the novel foam plastic base of this invention in combination with an improved see-through film cover.

Prior to the present invention, there was no carton providing completely satisfactory cushioning of eggs contained in its cells such that the eggs, even under excessive conditions of load or impact, would remain unbroken. It is thus an object of the present invention to provide a foam plastic egg carton having substantially improved cushioning properties over prior art cartons such as that shown by U.S. Patent No. 3,093,286, for example.

Prior egg cartons have also failed to provide a secure, simple latch mechanism, especially when formed of a foam plastic material. It is therefore another object of the present invention to provide a substantially improved latch mechanism for a foam plastic egg carton or the like.

Still another object of the present invention is to provide an all-plastic egg carton construction having extremely superior cushioning properties, structural strength to handle high-vertical loads, while providing free viewing of the contents.

Briefly then, the present invention comprises providing an all-foam plastic egg carton having improved cooperatively associated cushions in the egg cell walls and the lid to achieve high resistance to load and impact forces. The cushions are formed by opposed vacuum drawing of the heated foam plastic sheet forming the carton. The invention further comprises an all-foam plastic carton having a novel acute angle latch arrangement formed integrally therein to lock the carton shut in an especially secure fashion. The aperture through which the locking member protrudes has a greatly strengthened bulbular ridge about its periphery. Also comprehended is an all-plastic egg carton construction having a see-through plastic top with a greatly cushioned foam plastic bottom, the combination providing a carton having high vertical load strength.

Yet additional objects and advantages of the present invention, and its numerous cognate benefits and features are even more apparent and manifest in and by the ensuing description taken in conjunction with the accompanying drawing in which wheresoever possible, like characters of reference designate corresponding material and parts throughout the several views thereof, in which:

FIGURE 1 is a plan view of an open egg carton constructed according to the principles of the present invention;

FIGURE 2 is a front-elevational view thereof, with a portion broken away;

FIGURE 3 is a greatly enlarged cross-sectional view thereof taken along reference line 3-3 of FIG. 1;

FIGURE 4 is a greatly enlarged fragmentary cross-sectional view thereof taken along reference line 4-4 of FIG. 1;

FIGURE 5 is an enlarged fragmentary cross-sectional view thereof taken along reference lines 5-5 of FIG. 2;

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FIGURE 6 is an enlarged fragmentary view of FIG. 1 showing a step in the making of a portion thereof;

FIGURE 7 is a plan view of a modified form of egg carton with a portion thereof broken away;

FIGURE 8 is an elevational view thereof with portions broken away; and

FIGURE 9 is an enlarged fragmentary cross-sectional view taken along the reference line 9-9 of FIG. 7.

Referring more particularly to FIGS. 1 to 4, there is shown a thermoplastic egg carton 10, which carton can be formed from a one-piece sheet material such as expanded polystyrene. The carton 10 basically comprises a tray portion or base 22, cover or lid 24 and front flap 26, the lid and flap preferably hingedly connected to opposite sides of base 22. The generally elongated rectangular base 22, as illustrated, has one dozen egg cells 12.

The carton 10 is basically formed into shape from the sheet material generally by plug assist vacuum drawing. Egg cells 12 are particularly formed by a matching die technique with the plug grooved and fitted for vacuum operation so that a plurality of side ribs or cushions 14 and bottom puffed cushion pad 16 are formed, by opposed vacuum drawing, on the inside of the cell wall of each cell 12. Similar opposed vacuum forming on opposite sides of the lid structure forms expanded cushions or pads 18 generally opposed to pads 16.

These cushions 14, 16 and 18 cradle the egg 20 as shown in FIG. 2 and substantially prevent movement of the egg during transporting of the carton. For severe impact and load stacking stresses the unique cushioning effect of the cushions 14, 16 and 18 aids substantially in prevention of rupture of the egg wall. It is believed this much improved cushioning is achieved because of the lower density of the cushions 14, 16 and 18, the walls of the cellular structure of the foam itself being thinner than the rest of the carton permitting more ready flexing thereof during stress applications. These conditions apparently are achieved because of the opposed vacuum drawing technique employed in forming the cushions 14, 16 and 18.

By being puffed up, the cushions, particularly opposed cushions 16 and 18, also provide flexibility in cradling eggs of different sizes and shapes. Larger eggs will fit snugly into opposed cushions 16 and 18 while smaller eggs can still be secured between these cushions with the latter being in a less compressed state. Likewise, of course, side cushions 14 provide flexibility in cradling eggs of wide or narrow configurations. The exact number and shape of pads 14 may be varied from that shown and still be within the scope of the invention.

Latch projections 28 protrude outwardly from flap 26 at an angle a which is acute to the flat outer surface 30 of flap 26 (shown most clearly in FIG. 5). Since front wall 34 of lid 24 is substantially parallel with surface 30, projection 28 will also be at an acute angle with the front wall 34. In this particular illustration angle a is about 71° , it being understood that this angle can vary several degrees in either direction and still accomplish the object of the present invention.

Adapted to mate with each projection 28 is an aperture 32 along the front wall 34 of lid 24. The aperture 32 includes about its peripheral edge a bulbular ridge 36 providing an aperture highly resistant to tearing at its edges. This ridge 36 is formed by squeezing the foam plastic material while in a heated condition so as to extrude a bulbular mass from under a forming tool 40, this bulbular mass forming peripheral ridge 36. FIG. 6 illustrates this ridge forming step, with it being understood that aperture 32 is not fully formed at this stage but must be later cut out in a customary manner by a cut-

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ting tool (not shown). Ridge 36 is formed using only material which otherwise would have been wasted.

Thus, when a projection 28 extends through aperture 32 it is securely locked about peripheral ridge 36. That is, the undercut provided by the angle *a* on the under side of latch projection 28 insures a more positive sealing action with the aperture 32, especially where a ridge 36 is employed.

Modified carton 42, illustrated in FIGS. 7 to 9, comprises a foam plastic tray-like base 44 and a film cover 46, which cover may be fitted to the foam bottom. Preferably, base 44 is formed in the manner as described earlier with respect to base 22 of carton 10. Thus base 44 includes a dozen egg cells 48 with each cell having side cushion pads 50 and a bottom cushion pad 52 which are similar to cushions 14 and 16 previously described.

Cover 46 is preferably formed of a clear or transparent or translucent polystyrene or other comparable plastic film or sheet material capable of maintaining its weight and shape generally without additional support. Cover 46 can be pressure formed to achieve the shape illustrated, which forming technique is well known in the art. Base 44 includes pillars 50 which extend above the rim 52 of the base to a height which will support the flap top portion 54 of cover 46. By having such a high pillar structure the strength of the cover 46 is greatly increased, particularly for stacking purposes. A horizontally disposed shoulder 56, formed integral with base 44 and its rim 52, is in mating disposition with a similarly disposed shoulder 58 of cover 46, the mutual support of the shoulders 56 and 58 further strengthening the stacking ability of carton 42. Thus, there is shown a novel carton which achieves improved egg cushioning while permitting visual inspection of the eggs when the carton is in a closed position.

While certain representative embodiments and details have been shown for the purpose of illustrating the invention, it will be apparent to those skilled in the art that various changes and modifications can be made therein without departing from the spirit and scope of the invention. Such changes can be in other structures and materials which serve to achieve the principles of this invention.

Accordingly, what is claimed as new is:

1. An egg carton having a tray-like base, a lid covering the top of said base, said base comprising foam plastic material, a plurality of egg cells integral with said base, cushions being integrally formed with the cell walls and extending interiorly about the walls of each of said cells adapted to cradle an egg, said cushions having a density less than that of the rest of the carton.

2. The carton of claim 1 wherein the foam material

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comprising said cushions has a thinner cellular structure than that of the rest of the carton.

3. The carton of claim 2 wherein said cushions are about the side and bottom walls of each said cell.

4. The carton of claim 3 wherein said lid comprises a transparent plastic film material.

5. The carton of claim 4 wherein pillars extend from said base to the top of said lid.

6. An egg carton having a tray-like base, a lid covering the top of said base, said base and lid comprising foam plastic material, a plurality of egg cells formed in said base, cushions being integrally formed with the cell walls and extending interiorly about the walls of each of said cells, at least one of said cushions being centrally located about the center of the bottom wall of each said cell, a cushion located in said lid in a position opposite from the bottom wall cushions of each egg cell whereby said opposing cushions cradle an egg in each cell.

7. The carton of claim 6 wherein additional ones of said cushions extend inwardly from the side wall of each said egg cell.

8. The carton of claim 7 wherein each of said cushions has a density and cellular structure less than that of the rest of the carton.

9. A foam plastic egg carton having a tray-like base, a lid covering the top of said base and including a front wall portion, a front flap, said base hingedly connected with said lid and flap on opposite sides thereof, the flap extending upwardly from said base behind and generally parallel with front wall portion of said lid when the carton is in a closed position, at least one latch projection extending outwardly from the front surface of said flap and downwardly at an acute angle therewith to define a wedge-shaped undercut, said front wall portion including an aperture mating with said latch projection, a bulbular ridge formed at least along the bottom peripheral edge of said aperture, said latch projection extending through the aperture such that an edge of the aperture fits within said undercut.

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