Feb. 2, 1943. K. K. NEWSOM 2,310,110

PACKING STRUCTURE FOR EGGS

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FIG. 1

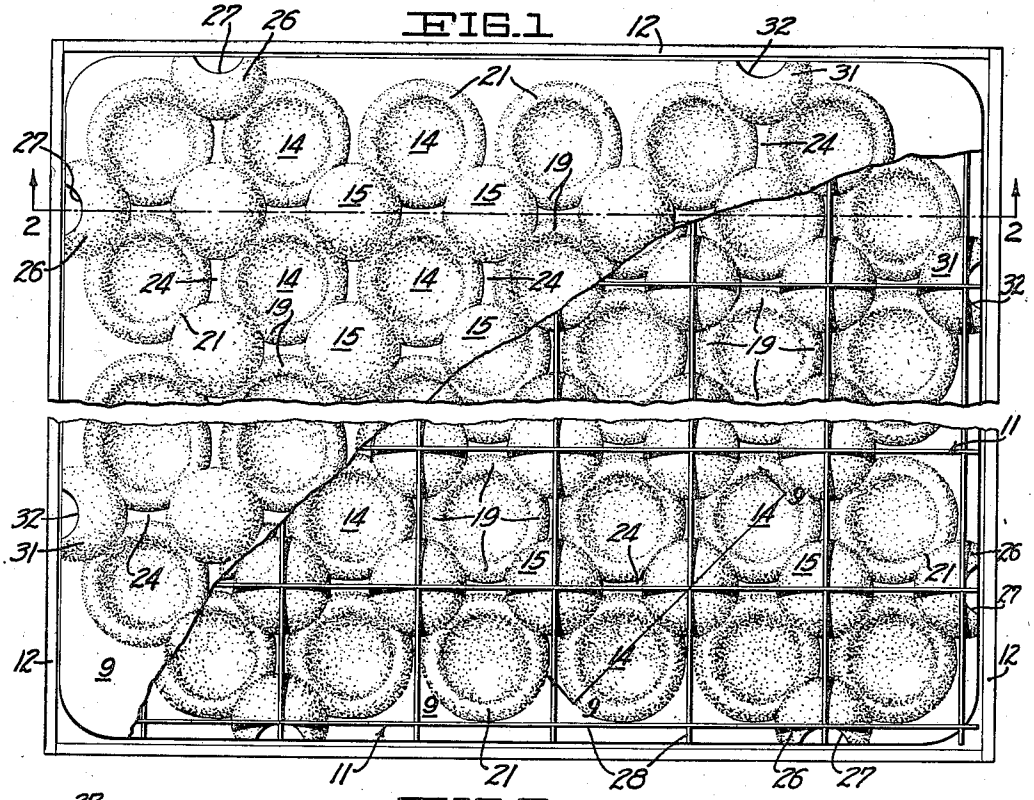


FIG. 2

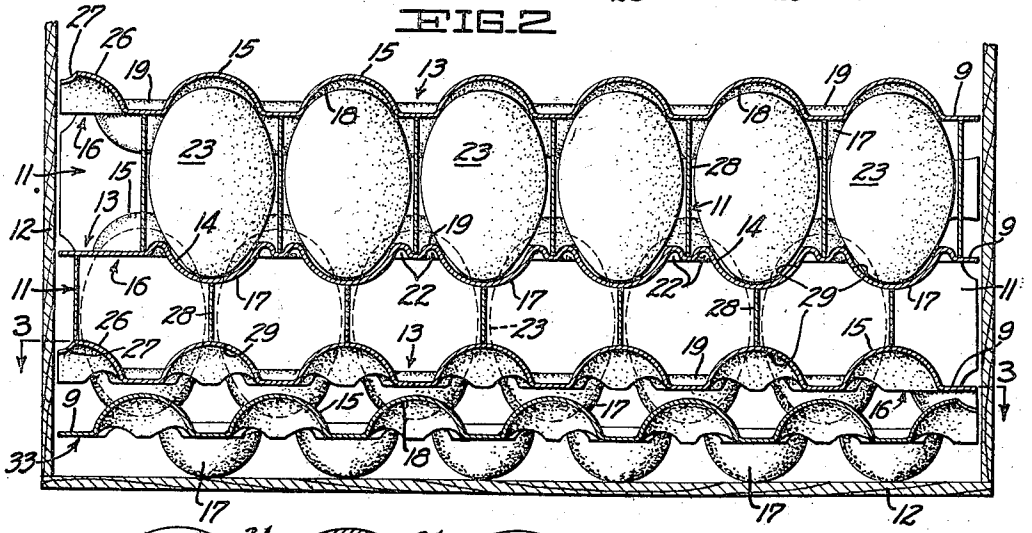
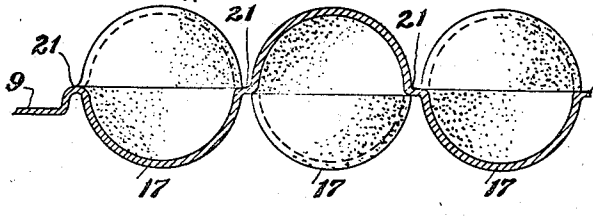


FIG. 3



INVENTOR
KITCHENER K. NEWSOM
BY Charles O. Bruce
HIS ATTORNEY

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FIG. 3

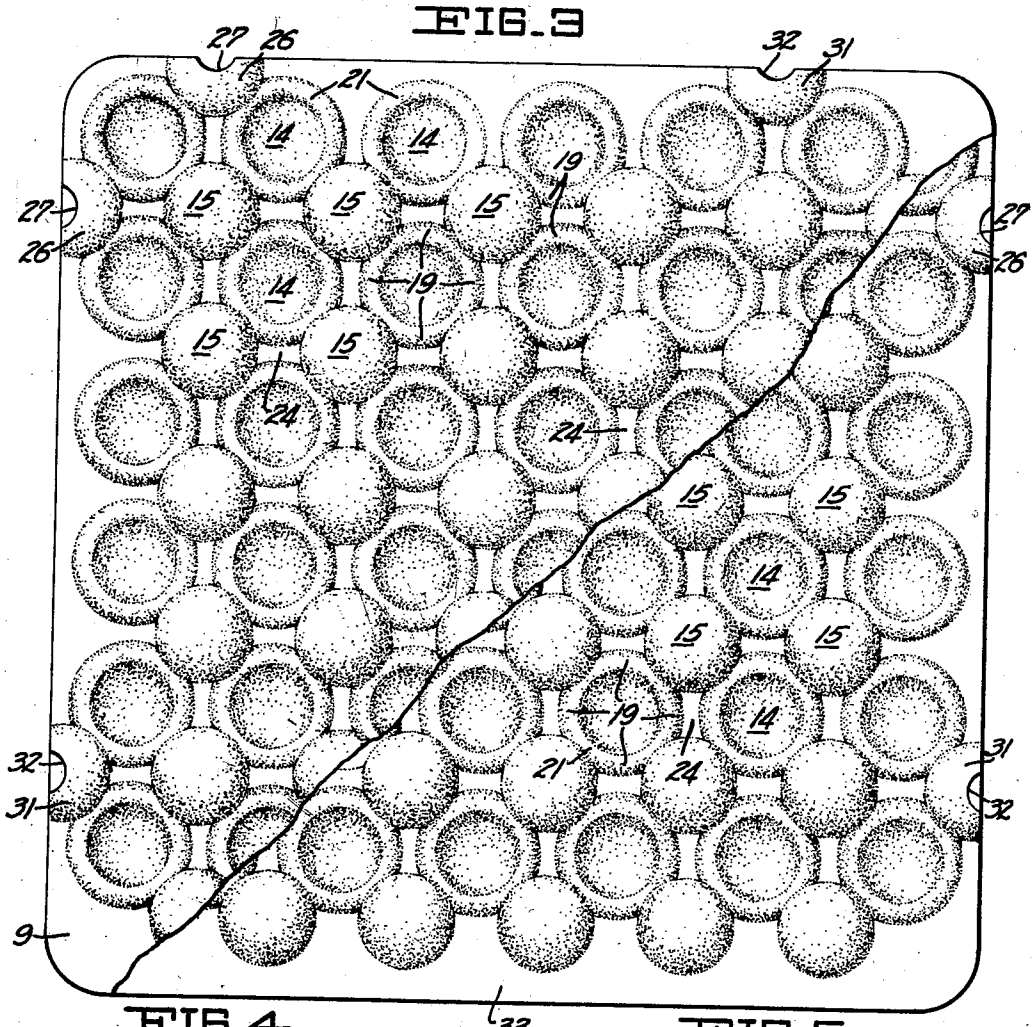


FIG. 4

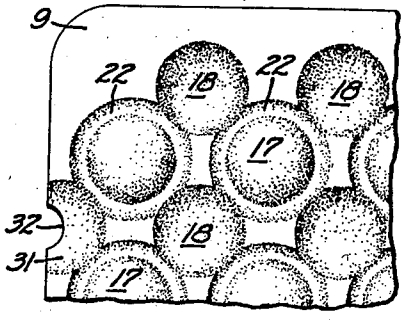
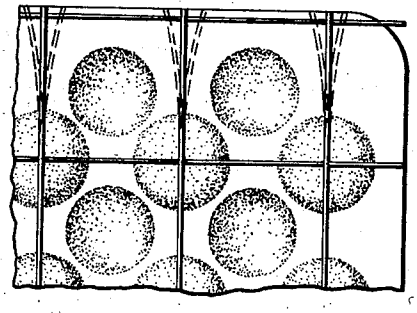


FIG. 5



INVENTOR
KITCHENER K. NEWSOM
BY Charles O. Bruce
HIS ATTORNEY

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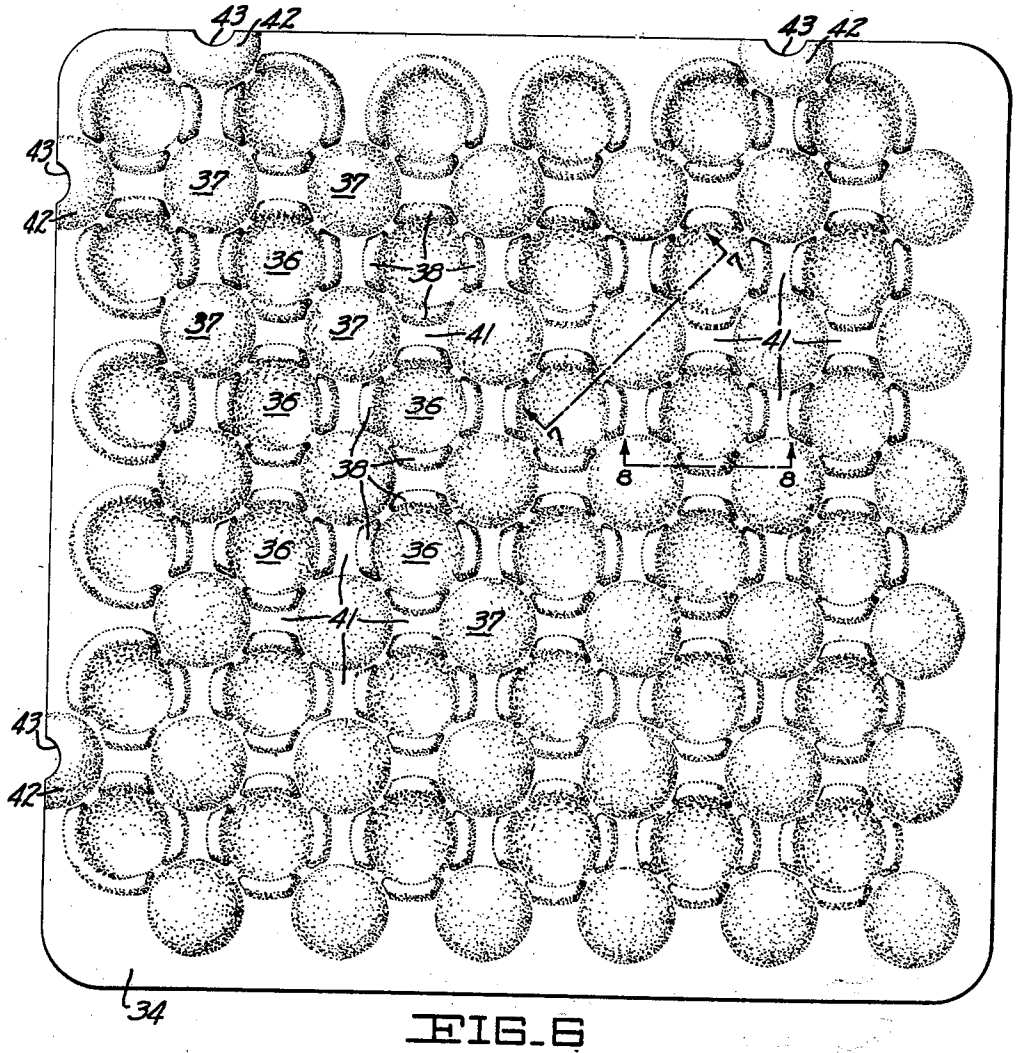


FIG. 6

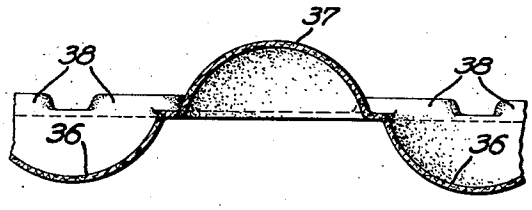


FIG. 7

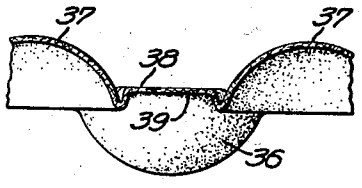


FIG. 8

INVENTOR
KITCHENER K. NEWSOM

BY

Charles O. Bruce
HIS ATTORNEY

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UNITED STATES PATENT OFFICE

2,310,110

PACKING STRUCTURE FOR EGGS

Kitchener K. Newsom, San Francisco, Calif.

Application July 29, 1939, Serial No. 287,312

9 Claims. (Cl. 217—26)

My invention relates generally to packing structures and more particularly to a structure for the packing of eggs or other fragile objects where n a plurality of alternating fillers and flats are employed.

The egg industry has long been concerned with the problem of providing an economical and effective packing structure by means of which eggs may be packed, shipped and stored in predetermined quantities with maximum freedom from breakage. Because of the fragility of eggs it has been found desirable to separate the eggs from each other and this has heretofore been accomplished by a filler and flat construction, the filler providing individual cells for the eggs, and the flats providing means for positioning and supporting the egg within the cell. The structures now in use, however, possess certain objectionable features among which is a lack of economy in egg carrying capacity compared to space consumed; also the flats lack stability and have a tendency to buckle under the weight of the eggs supported thereon when the flat is lifted from a stack; the loaded flats are difficult to remove from a case; the supporting surface of the egg seat is insufficient to maintain the egg secure in upright position for display purposes when the filler is removed from the flat; the fluid from broken eggs is free to flow into adjacent egg seats; and portions of the filler have a tendency to move laterally on the flat to disturb the position of the eggs and cause breakage. In my new packing structure, however, the foregoing objectionable features are obviated.

The principal object of my invention, therefore, is to provide an improved packing structure for the safe handling, shipping and storage of eggs.

Other objects of my invention are: To provide an improved egg flat having means thereon for stabilizing said flat; to provide an egg flat that may be readily removed from a container or case; to provide, in a packing structure of the class described, means for preventing lateral movement of the filler on the flat; to provide, in an egg flat, means bounding the egg seats for increasing the seating surface of said seats; to provide, in an egg flat, means on a surface thereof for preventing the spread of fluid from a broken egg; to provide, in a packing structure of the class described, improved means for cushioning the top and bottom of the structure; and to provide a structure of the class described capable of packing a maximum quantity of eggs in a minimum space.

My invention possesses other objects and features of advantage, some of which, together with the foregoing, will be set forth in the following description of my invention. It is to be understood, however, that I do not limit myself to this disclosure of the species of my invention, as I may adopt variant embodiments thereof within the scope of the claims.

Referring to the drawings:

Figure 1 is a fractional plan view of a packing structure illustrating one embodiment of my invention. A portion of one flat is shown broken away to disclose the relative position of an underlying filler and flat.

Figure 2 is a vertical sectional view taken in a plane indicated by the line 2—2 of Figure 1.

Figure 3 is a plan view taken along the plane 3—3 of Figure 2 but following the contour of the seating surface of the bottom flat of the stack, a portion of the bottom flat being broken away to show the position of the cushioning flat.

Figure 4 is a fragmentary plan view of the reverse or positioning side of the flat.

Figure 5 is a fragmentary plan view of a common type of flat and filler, the dotted lines illustrating the lateral movability of a portion of the filler relative to the flat.

Figure 6 is a plan view of a flat incorporating another embodiment of my invention.

Figure 7 is a fractional vertical sectional view taken in the plane 7—7 of Figure 6.

Figure 8 is a fractional vertical sectional view taken in the plane 8—8 of Figure 6.

Figure 9 is a fractional vertical sectional view taken in the plane 9—9 of Figure 1.

Broadly stated, my invention comprises a plurality of tiers of alternating flats and fillers adapted for the packing of eggs and capable of progressive assembly in a crate or container. Each flat is preferably formed of a relatively thin rectangular sheet of material having a pattern on one side thereof characterized by a repeated design wherein a depressed portion adapted to seat an egg end is bounded by a plurality of raised portions; the extent of the raised and depressed portions being such as to provide a reverse pattern on the opposite side of said flat so that when two flats are placed in superposed relation and the position of one is rotated 180° with respect to the position of the other the axes of the depressed portions on the confronting surfaces of the flats will coincide.

Means is provided for stabilizing each flat which preferably comprises stiffening ridges bounding the depressions on one side of the flat

and rising above the common level thereof between adjacent raised portions. Each of said ridges is so disposed that a portion of the surface thereof forms a continuation of the surface of the depressed portion which it bounds, whereby the surface area of each depression is increased to provide maximum support for an egg seated therein. These ridges further provide, between adjacent raised portions, a trough which lies between adjacent depressed portions and serves to entrap the fluid from broken eggs and restrain spreading thereof into adjacent depressions or egg seats.

A filler is provided for interposing between the confronting surfaces of superposed flats and the same is preferably formed of a plurality of intersecting strips of material adapted to provide cells each disposed between opposed depressions of superposed flats. Notches are provided at the intersections of said strips conforming to the shape of the raised portions of the flats and forming seats for such raised portions. The bottom edges of the strips between the notches are adapted to seat on the undeformed surface of the flat and within the troughs formed by the stiffening ridges thereof. Means is also provided on the edge portion of said flat for engaging said filler for preventing lateral movement of the filler on the flat; and further means deforming adjacent edge portions of the flat near a corner thereof is provided to facilitate removal of the flats from an egg case or the like. Cushioning means is also provided for protecting the top and bottom layers of eggs in a stack of filled flats and fillers which comprises a cushioning flat superimposed on each the top and bottom flat of the stack and so rotated with reference thereto that the raised portions of one flat are disposed between the raised portions of the other, with their extremities resting upon the stabilizing ridges thereof.

My invention may be more fully understood by detailed reference to the drawings, attention being first directed to Figures 1 through 4 thereof. Here a plurality of alternate flats 9 and fillers 11 are assembled in superimposed relation in a common type case or container 12 formed of wood, corrugated board or other suitable material commonly employed by the trade. The flats 9 are preferably formed of a relatively thin rectangular sheet of material having a molded or pressed pattern on one side or the seating face 13 thereof characterized by a repeated design wherein a depressed portion 14 fitting an egg end is bounded by a plurality of raised portions 15, and all of such portions being preferably of semi-spherical shape. The pattern formed by the repetition of the design, as illustrated in Figure 1, provides a plurality of alternating rows of depressed and raised portions which extend both ways across the sheet parallel to the sides thereof with the depressed portions disposed in staggered relation to the raised portions. It will be observed from the drawings that the extent of the depressed and raised portions is such as to provide a reverse pattern on the opposite or positioning face 16 of the flat wherein a raised portion 17 is bounded by a plurality of depressed portions 18.

I prefer in practice to provide each flat with thirty-six depressed portions in the seating face thereof arranged in six rows of six depressed portions each and with a like number of raised portions similarly disposed. I have found that such flats when loaded with three dozen eggs are neither too bulky nor too heavy for convenient and safe handling. However, it is to be understood that the number of depressed portions in a flat may be varied, as well as the number of rows thereof and the number of depressions in each row, to suit the requirements of the user, all without departing from the spirit of my invention.

Each flat 9 is preferably formed of wood or other cellulose fibre, although laminated paper stock may be satisfactorily employed. Flats formed of such material normally possess substantial resilience or yieldability which to a certain extent is desirable in preventing breakage of eggs. However, such a flat, when loaded with eggs and handled separately, is liable to buckle or so deform as to unseat the eggs and cause damage thereto. I obviate this objectionable feature in my flat yet still retain the advantageous feature of the resilience of the flat material by providing means for stabilizing the flat which preferably comprises stabilizing ridges 19 disposed on the seating face of the flat about each depressed portion 14 thereof and between adjacent raised portions 15. Said ridges are preferably formed integral with said sheet material and rise above the general level of the flat but to a less height than the raised portions. As shown in Figures 1 and 2, these ridges may join with and include a portion of the surface of each raised portion and merge with each other to form a continuous annular ridge 21 bounding a depressed portion. Since these ridges are preferably, although not necessarily, molded from the sheet material of the flat, the reverse side thereof forms recesses or depressions 22 in the positioning side of the flat.

It will be observed that each ridge 19 is so disposed with reference to the depressed portion 14 which it bounds and is of such contour that a portion of its surface forms a continuation of the surface of the depressed portion to increase the size thereof and provide a substantial support for the end of an egg 23 seated therein. Such increased support I have found is capable of maintaining an egg in upright position without additional support so that a single flat may be filled with eggs and handled and used for display purposes with little danger of dislodging the eggs from their seats. In addition, the ridges 19 extend between the raised portions to form troughs 24 between adjacent depressed portions. These troughs serve to collect fluid from broken eggs and restrain its flow into adjacent depressed portions. The spread of egg fluid into the depressions is particularly objectionable because, on drying, the fluid causes the eggs to stick to the seats so that they cannot be removed without danger of breakage.

In order to facilitate removal of the flats from the case 12 I provide on adjacent edges of the flat near one corner thereof a pair of segmental raised portions 26 having an arcuate recess 27 in the top thereof through which the finger tips of the user may be inserted to lift the corner of the flat and permit insertion of the hand thereunder. A loaded flat can thus be readily removed from the case without damaging the fingers of the user against the side of the case or disturbing the seating of the eggs.

I wish to point out that the depressed and raised portions of the flats are so disposed and arranged that when one flat is superposed above another and the position of one rotated 180° with respect to the position of the other, the axes of the depressions as well as those of the raised portions in the confronting surfaces of the flats

coincide. The depressed portions 14 in the seating face 13 of one flat seats and supports one end of the egg 23 while the opposite end of such egg is capped and positioned by the depressed portion 18 in the confronting or positioning face 16 of the other flat.

Filler 11, preferably formed of a plurality of intersecting strips 28 of cardboard or the like, is interposed between the superposed flats and provides an individual cushioning cell about each egg 23. These strips at the intersections thereof are provided with arcuate notches 29 which conform to the shape of the raised portions 15 or 17 of the flats to provide seats therefor. The bottom edges of the strips between said notches are adapted to seat in the bottom of the troughs 24 on the seating face of one flat while the top edges thereof intermediate said notches bear upon the undeformed surface between the recesses 22 on the positioning face of the other or superposed flat. It will be noted that the bottom edges of the strips being confined within the troughs prevent lateral movement of the central portion of the filler upon the seating surface of the flat, thus giving greater stability to the entire structure.

I further provide means on the flat engaging the filler for preventing lateral movement on the flat of the end cells of the filler which enclose the outer rows of depressed portions, such movement being illustrated in Figure 5. For this purpose I prefer to employ the segmental raised portions 26 which deform the edge portions of the flat together with similar raised portions 31 which are spaced therefrom and all of which preferably align with rows of raised portions 15. The bottom edges of the filler are preferably notched to conform to the contour of said segmental raised portions 26 and 31 so as to seat thereon and lock the outer cells of the filler against lateral movement on the flat. The portions 31 may be provided with a recess 32 to further facilitate removal of the flat.

My invention further contemplates the provision of means for cushioning the top and bottom of a stack of flats and fillers to prevent injury to the eggs contained therein. For this purpose, as shown in Figures 2 and 3, I provide a cushioning flat 33 for the bottom flat 9 of the stack and which is identical therewith. The position of flat 33 is rotated 90° with respect to the position of flat 9 whereby the raised portions of one flat are disposed between the raised portions of the other with the extremities of the raised portions 17 on the positioning surface of flat 9 resting upon the ridges 19 on the confronting surface of the cushioning flat 33. It will thus be seen that the ends of the eggs are spaced from the walls of the case 12 and cushioned from the direct effect of any blow upon the case. Furthermore, the cushioning flat lends itself to speedy assembly with the stack and affords maximum protection to the eggs contained therein.

While I have shown in Figure 2 only the bottom portion of the stack with its cushioning flat it will be understood that the top of the stack may be protected in the same manner with a like cushioning flat similarly disposed.

With reference to the embodiment illustrated in Figures 6, 7, and 8, a flat 34 is provided with depressed and raised portions 36 and 37, respectively, forming a pattern of like design to that heretofore described in connection with Figure 1. A plurality of ridges 38 rising above the general level of the flat bound each depression and are preferably formed integral with the flat with anterior recesses 39. A portion of the surface of each ridge forms a continuation of the surface of the depressed portion 36 bounded thereby to increase the seating surface thereof; and each ridge is disposed between the adjacent surfaces of adjacent raised portions and serve to lend such stability to the flat that the same may be handled without buckling or undue bending when loaded with eggs.

Troughs or valleys 41 formed between adjacent depressed portions and between the adjacent surfaces of the raised portions by means of the ridges 38 serve to prevent the fluid of a broken egg from spreading into adjacent egg seats. In this connection I prefer that the ends of the ridges be as close as practical to the surfaces of the raised portions to restrict the flow of egg fluid therebetween.

The two edges of the flat adjacent the outer rows of depressed portions are each provided with a pair of spaced raised portions 42 which are adapted to engage the edges of any standard form of filler, such as shown in Figures 1 and 2, to prevent lateral movement of the end cells thereof on the flat. Each of the raised portions 42 is provided with a recess 43 in the top thereof through which the fingers of the user may be inserted to lift the flat from a container.

Applicant desires to point out that the staggering of the depressed and raised portions of the flats causes an overlapping of the egg ends of adjacent layers of eggs in a stack (see Figure 2) and thus makes possible the packing of a maximum quantity of eggs in a minimum of space which is an important economical factor in handling, shipping and storage.

I claim:

1. In an egg flat formed of sheet material and having a pattern on one side thereof wherein egg supporting portions depressed from a horizontal plane are bounded by a plurality of egg engaging portions disposed entirely above said plane, means for strengthening said flat comprising ridge means formed in said sheet material surrounding said egg supporting portions, said ridge means forming junctures between said depressed and raised portions above said plane.

2. In an egg flat formed of sheet material and having a pattern on one side thereof wherein egg supporting portions depressed from a horizontal plane are bounded by a plurality of egg engaging portions disposed entirely above said plane, means for strengthening said flat comprising ridge means formed in said sheet material surrounding said egg supporting portions, said ridge means being disposed entirely above said plane and forming junctures between said depressed and raised portions.

3. In an egg flat formed of sheet material and having a pattern on one side thereof wherein a depressed portion is bounded by a plurality of raised portions, means for stabilizing said flat comprising an annular ridge concentric with said depressed portion merging with said raised portions above the general level of said sheet.

4. In an egg flat formed from a sheet of material and having a pattern on one side thereof wherein a depressed portion is bounded by a plurality of raised portions, means for strengthening said flat comprising an annular ridge forming a rim of said depressed portion rising upwardly from the general level of said sheet and merging with the surface of each of said raised portions above the general level of said sheet, said raised portions

forming a reverse pattern on the other side of said sheet.

5. In an egg flat formed of sheet material and having a pattern on one side thereof wherein a depressed portion is bounded by a plurality of raised portions, means for strengthening said flat comprising an annular ridge formed of integral portions of said sheet material including part of the surface of each of said raised portions, said annular ridge forming a non-reentrant continuation of the surfaces of said raised portions and said depressed portions.

6. In an egg flat formed from a sheet of material and having a pattern on one side thereof wherein a semi-spherical depressed portion is bounded by a plurality of semi-spherical raised portions, means for strengthening said flat comprising annular stabilizing ridges formed in said sheet concentric with said depressed portions and forming a connection between said raised portions above the plane of said sheet and having a surface thereof forming a continuation of the surface of said depressed portion.

7. An egg flat formed of sheet material having a pattern on one side thereof characterized by a repeated design wherein a depressed portion of the sheet is bounded by a plurality of raised portions, the repetition of said design providing a plurality of alternating rows of depressed and raised portions extending both ways across the sheet with the depressed portions disposed in staggered relation to the raised portions, and annular ridges formed in said sheet bounding said depressed portions, one side of the material forming each of said ridges being a continuation of the surface of said depressed portion, the opposite side of the last-mentioned material forming a continuation of the surface of the adjacent raised portions, said ridges forming troughs between adjacent raised portions.

8. In an egg flat formed from a sheet of material and having a pattern on one side thereof characterized by a repeated design wherein a depressed portion of the sheet is bounded by a plurality of raised portions, the repetition of said design providing a plurality of alternating rows of depressed and raised portions extending both ways across the sheet with the depressed portions disposed in staggered relation to the raised portions, and undulated recessed ridges formed of integral portions of said sheet bounding said depressed portions and connecting said adjacent raised portions to provide a trough therebetween the undulations of said ridges being above the plane of said sheet.

9. In an egg packing structure a pair of superposed flats each comprising a rectangular sheet of material having a pattern on one side thereof characterized by a repeated design wherein a depressed portion is bounded by a plurality of raised portions, the repetition of said design providing a plurality of alternating rows of depressed and raised portions extending both ways across the flat parallel to the edges thereof with the depressed portions disposed in staggered relation to the raised portions, ridges formed on said sheet bounding said depressed portions and merging with said raised portions to provide a trough between adjacent raised portions, the opposed upper and lower surfaces of the materials forming said ridges respectively forming surfaces of said depressed and raised portions, said pattern of said depressed and raised portions being reversed on the opposite side of said sheet; one of said flats occupying a position rotated 180° with respect to the position of the other of said flats whereby each row of depressions in the surface of one flat is axially aligned with similar depressions in the confronting surface of the other flat, a plurality of intersecting strips of material positioned between said flats to provide between each opposed and related pair of depressions an enclosed cell in which an egg may be placed with the opposite ends thereof disposed in said opposed depressions, said strips of material at the intersections thereof being provided with notches which conform to the shape of said raised portions of the flats to provide seats for said raised portions, and the bottom edges of said strips between said notches being adapted to seat in said troughs of the bottom flat.

KITCHENER K. NEWSOM.