March 14, 1961 R. F. REIFERS 2,974,789

EGG CASE PACKING

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Fig. 1.

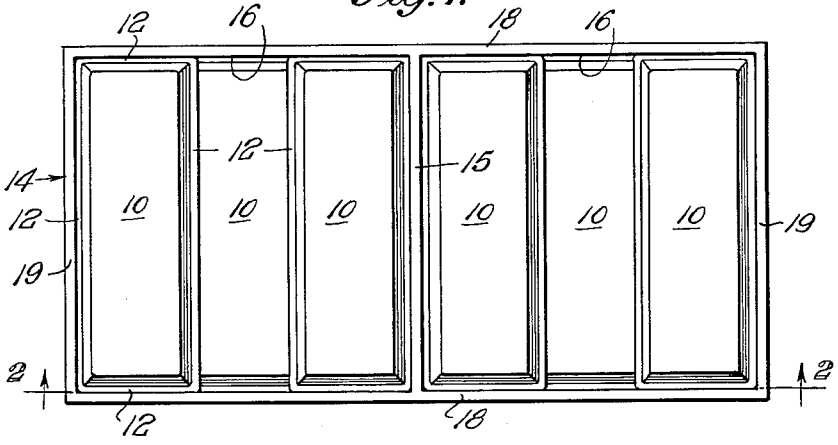
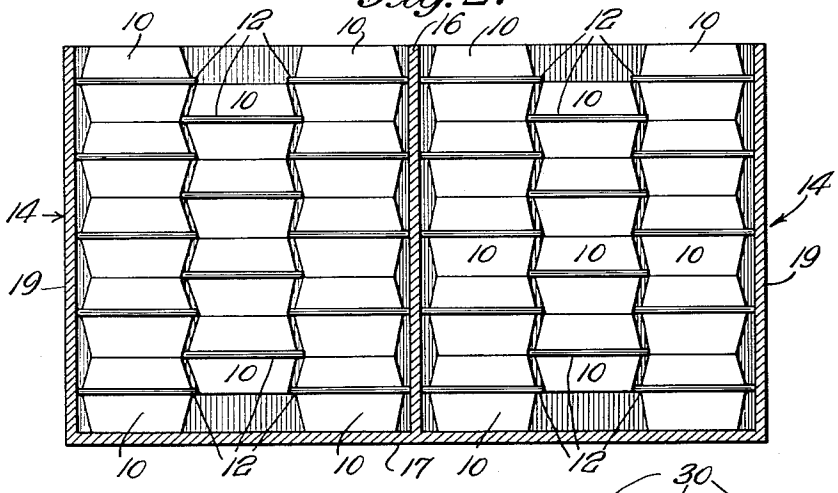


Fig. 2.



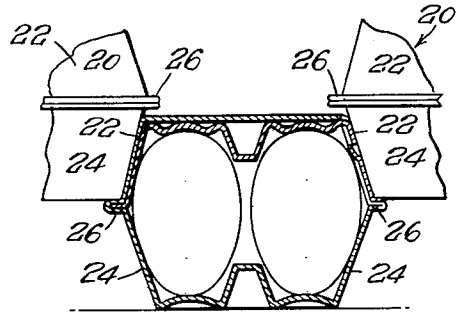


Fig. 6.

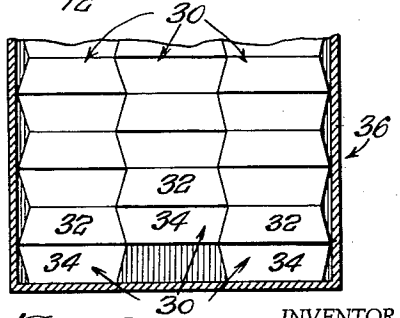


Fig. 3.

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Fig. 5.

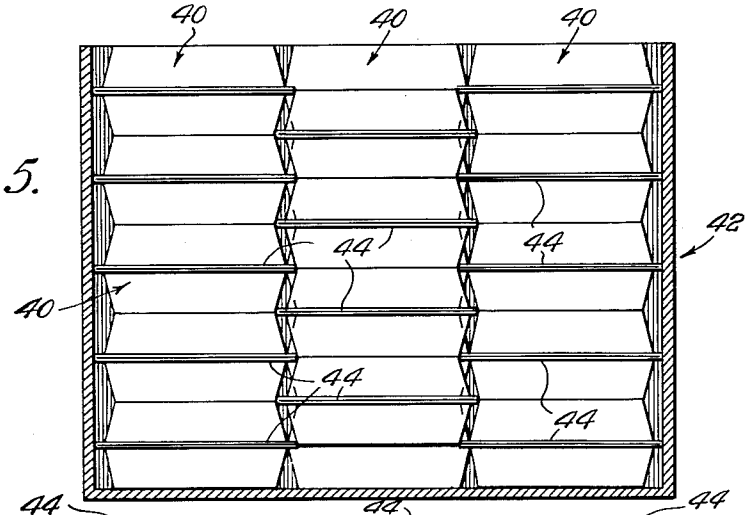
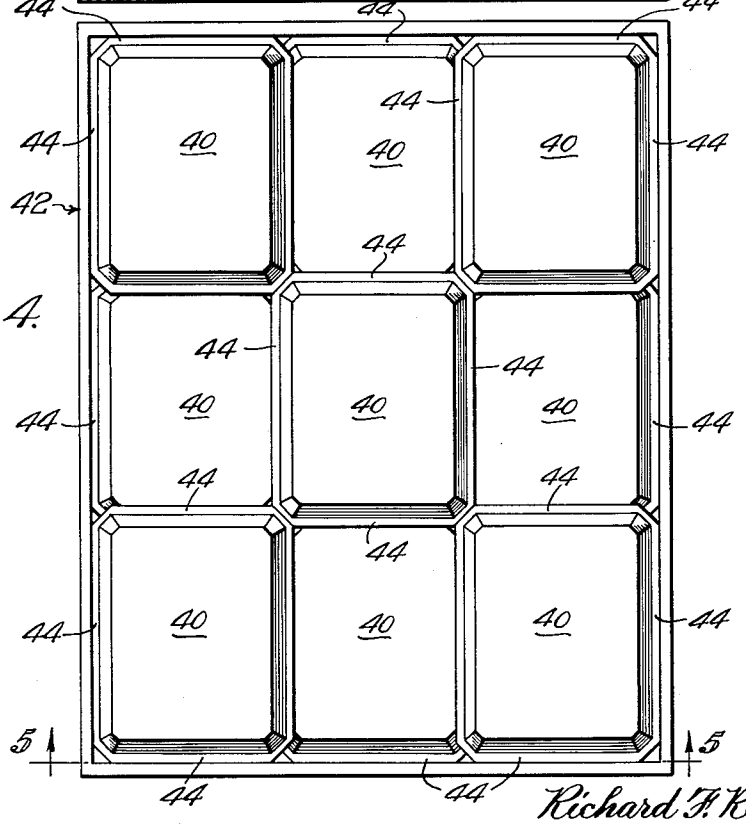


Fig. 4.



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EGG CASE PACKING

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Filed Dec. 4, 1957, Ser. No. 700,671

3 Claims. (Cl. 206—65)

This invention relates to egg case packing, and more particularly to an improved arrangement and method for packing egg cartons within a case thereof.

This application is a continuation-in-part of copending application Serial No. 321,669, filed November 20, 1952, for "Molded Pulp Carton Lock," now Patent #2,843,304, issued July 15, 1958.

In packing large quantities of eggs for shipment or storage, it has been customary for many years to pack thirty dozen eggs in each case or crate thereof, and two packing systems have generally been employed for this purpose. In one of these systems, each case is divided vertically into two compartments, each of which is designed to receive five layers of eggs, with each of said layers containing three dozen eggs. The eggs in these layers are kept separated by collapsible interlocked vertical partitions known as fillers, and the layers are separated by compartmented cushioning sheets known as flats. Eggs packed in this manner usually must be removed from the cases and packed into cartons, each of which contains the standard unit quantity of one dozen eggs, before being sold by retail dealers. It is evident that this packing system necessitates additional handling of the eggs after leaving the egg producer, thereby entailing extra expense and possible losses due to breakage. Though it is still standard procedure to pack eggs in egg cases utilizing fillers and flats, another general packing system has been advocated in recent years, wherein the eggs are packed directly into the cartons of one dozen eggs each, and thirty of such cartons are packed into each case. The cases are usually divided vertically into two compartments, and these compartments are each designed to accommodate five layers of cartons arranged in three vertical stacks, with the cartons therein resting directly on top of each other without any intervening flats or separating fillers.

Egg cartons are commercially available in many different styles and types. They may be classified broadly into 2 x 6 type cartons and 3 x 4 type cartons, which numbers refer to the number of rows and the number of egg receiving cells in each row, respectively. Viewed in plan elevation, the 2 x 6 type cartons resemble an elongated rectangle in configuration, while the 3 x 4 type cartons are more nearly square in horizontal cross-section. One type of carton used extensively in the egg industry is generally hexagonal in configuration when viewed in vertical cross-section, resembling two trapezoids having equally inclined sides and having a common base line. Although minor variations in contour are evident among the many styles and types of cartons available, one common characteristic is the presence of inclined side walls, resulting in a general irregularity in overall shape. When some cartons are packed into cases in vertical stacks, as previously described, there is considerable waste or unoccupied space between and around adjacent cartons therein. Due to this fact, it may be necessary to employ larger cases than would be required if

the space were filled more efficiently, and insufficient bracing is provided to prevent the cartons from shifting during shipment.

An object of the present invention is to provide a new and improved egg case packing system.

Another object of the invention is to provide a new and improved arrangement and method for packing egg cartons into a case thereof, to utilize the space therein more efficiently and provide adequate bracing of the cartons.

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 top plan view of an egg case packed with 2 x 6 type egg cartons in an arrangement embodying the invention;

Fig. 2 is a vertical section taken along the line 2—2 of Fig. 1;

Fig. 3 is a vertical section of an egg case packed in accordance with the invention for another type of egg carton;

Fig. 4 is a top plan view of an egg case packed with 3 x 4 type egg cartons in another arrangement embodying the invention;

Fig. 5 is a vertical section taken along the line 5—5 of Fig. 4; and

Fig. 6 is an enlarged fragmentary vertical sectional view of a plurality of egg cartons packed in an arrangement embodying the invention.

Referring to Figs. 1 and 2, wherein a packing arrangement for 2 x 6 type egg cartons is illustrated, a plurality of egg cartons 10 shown therein are similar to the extensively used type of carton previously described. Namely, the cartons 10 are generally hexagonal in configuration when viewed in vertical cross-section, resembling a pair of mated trapezoids having equally inclined sides and having a common base line. Since one of the trapezoids is inverted on the base line, the side walls of the two trapezoids are oppositely inclined. The side walls of the upper trapezoid have an upwardly convergent taper, while the side walls of the lower trapezoid have a downwardly convergent taper. In overall shape, the cartons 10 approximately resemble hexagonal prisms, but their end walls may be inclined in the same manner as their side walls. It should be noted that there are no projecting locking lugs or any other projecting members on the exterior of the side walls of the cartons 10, although as is customary a peripheral flange 12 may project outwardly from the midpoint of the cartons where the oppositely inclined side walls of the two trapezoids meet.

The cartons 10 are packed in a rectangular exterior case or crate 14 having a central vertical partition 15 which divides the case 14 into two equal carton receiving compartments 16. The case 14 is also provided with an integral bottom wall 17, a pair of side walls 18, and a pair of end walls 19. In the usual manner a cover (not shown) may be provided for the case 14.

In accordance with the present invention, the egg cartons 10 packed within the case 14 are stacked vertically in a symmetrical staggered arrangement, wherein the cartons 10 are superposed in a plurality of adjacent vertical stacks staggered in height, thereby forming diagonal columns of cartons. By means of their peripheral flanges 12, the inclined side walls of the cartons 10 are spaced from and positioned parallel to the oppositely inclined side walls of the adjacent cartons in the adjacent stacks. Due to the fact that the flanges 12 are located intermediate the upper and the lower portions of the cartons 10 and approximately at the midpoint of the height of the

cartons, these flanges engage the laterally adjacent cartons at their tops and bottoms. Centrally disposed cartons in the interior of the stacks thereof are in engagement with adjacent cartons on all six sides thereof, as shown in Fig. 2, but the ends of the cartons are not adjacent to any other cartons, as shown in Fig. 1. Merely as a matter of convenience in illustrating the invention, the compartments **16** of the case **14** are each provided with three stacks or tiers of the cartons **10**, and two of these stacks contain five superposed cartons, while the third stack, which is positioned between the other two, has only four superposed cartons. Hence, the total number of cartons in the case **14** happens to be twenty-eight, but this number may be varied in increments which are multiples of two by employing egg cases of different heights. Thus, if the case **14** were made higher by an amount equal to half the height of one of the cartons **10**, two more cartons could be accommodated in the egg case **14**, and one of these additional cartons would be placed in each of the central stacks in the two compartments **16**. In this manner, the case **14** could be made to hold thirty dozen eggs, which is the standard quantity customarily employed in the egg industry.

In packing the cartons **10** into the case **14** to form this arrangement, the first or bottom layer of the cartons may be formed by placing two cartons spaced at opposite sides of the bottom of each of the two compartments **16**, the second layer may be formed by placing one carton into the center of each compartment **16** between and into engagement with the two previously packed cartons, and adding successive superposed layers alternately corresponding to the first two layers until the case **14** is filled.

The above-described symmetrical staggered arrangement of hexagonal cartons in mutual engagement represents the most efficient employment of the available packing space within any egg case. Although it is apparent in Fig. 2 that at the top and the bottom of the central stack in each of the compartments **16** there is waste or unoccupied space equivalent to one-half the volume of an egg carton, the remainder of the packing space within the case **14** is filled so compactly that the net result is more efficient usage of the space in comparison with conventional packing systems wherein equal unstaggered vertical stacks are employed. Furthermore, in this staggered arrangement, the cartons **10** brace each other firmly against possible lateral shifting motion during shipment. Of course, suitable fillers could be inserted into the above-mentioned unoccupied spaces at the top and the bottom of the central stacks of cartons to provide additional bracing at these places.

Details of a slightly different packing arrangement in which a plurality of cartons **20** flushly engage and brace each other are shown clearly in Fig. 6. Each of the cartons **20** comprises an upper trapezoidal portion **22** and a lower trapezoidal portion **24**, which lower portion is inverted with respect to the upper portion, and these two portions possess a common base where an outwardly projecting peripheral flange **26** is located. The upwardly convergent side walls of the upper portion **22** of the cartons, which are packed in the central stack in each of the compartments of the egg case, are in flush engagement with and wedged against the corresponding downwardly convergent side walls of the lower portion **24** of the adjacent cartons in the adjacent two stacks. The projecting peripheral flanges **26** may assist in supporting superposed cartons in the stacks, but their main purpose is to provide a supporting ledge between the upper portion **22** and the lower portion **24** of each carton **20**, and in some types of cartons these flanges may be eliminated entirely.

Fig. 3 shows a packing arrangement embodying the invention for a type of egg carton in which such projecting peripheral flanges have been substantially eliminated. A plurality of cartons **30**, each having an upwardly tapered upper trapezoidal portion **32** and a downwardly tapered lower trapezoidal portion **34**, are packed into a case **36** in a symmetrical staggered stacking arrangement forming diagonal columns of the cartons. The absence of any flanges or other projecting members permits the oppositely tapered side wall of the upper portions **32** and the lower portions **34** of adjacent cartons to be wedge against each other in flush engagement over their entire surface areas.

The particular egg carton illustrated in Fig. 6 is disclosed in detail and claimed in the aforesaid copending application Serial No. 321,669, filed November 20, 1952, for "Mold Pulp Carton Lock." The carton disclosed in said copending application is provided with a new type of locking member which is flush with the cover when locked, thereby permitting flush stacking in accordance with the present invention. In this carton, nothing projects outwardly which could possibly be displaced or damaged by engagement or impact, or which could prevent such staggered flush stacking. Many of the different styles and types of egg cartons available in the commercial market possess outwardly projecting locking members, and heretofore the projection of such members was not considered objectionable since flush stacking in accordance with the present invention was not contemplated by the manufacturers and consumers of such cartons. However, other types of egg cartons are available in which the locking member is flush with the carton body when locked. For example, J. W. Cox Patent #2,529,-140, issued November 7, 1950, discloses such an egg carton.

The packing arrangement for 3 x 4 type cartons illustrated in Figs. 4 and 5 embodies a modification of the invention. For this arrangement a plurality of egg cartons **40**, each containing one dozen eggs, are packed into an egg case **42**, which preferably is not divided by any vertical partitions. The cartons **40** are packed into the case **42** in a staggered stacking arrangement of diagonal columns in nine adjacent vertical stacks, as shown in Fig. 4. These nine stacks are symmetrically positioned in three adjacent rows and three adjacent horizontal columns at right angles thereto. Hence, a carton positioned in the interior of the central stack in this arrangement is in contact with adjacent cartons at all six sides thereof and also at both ends thereof. The 3 x 4 type cartons **40** are generally similar in configuration to the 2 x 6 type cartons **10** described in the first embodiment of the invention, and the cartons **40** are provided with a projecting peripheral flange **44**, but the cartons **40** are more nearly square when viewed in plan elevation. The flanges **44** keep the oppositely tapered side walls of the cartons **40** in a spaced and parallel relationship, in the same manner as do the flanges **12** for the cartons **10**.

Merely for purposes of illustration as a suitable example embodying the invention, the egg case **42** is shown filled by forty-one of the egg cartons **40**. They are contained in five stacks of five cartons each in engagement with four adjacent stacks of four cartons each. It is evident that the total number of cartons which can be accommodated in an egg case can be varied readily by changing the height of the case employed. Thus, by increasing the height of the case **42** by an amount equal to the height of half of a carton, four more cartons could be packed into the case, thereby making it possible to pack a total of forty-five cartons therein.

In packing the cartons **40** into the case **42** to form this arrangement, the first or bottom layer of the cartons may be formed by placing five of the cartons on the bottom of the case **42** to occupy the four corners and the center thereof. Next, the second layer may be formed by placing four of the cartons into the spaces intervening between the previously packed cartons and into engagement with the upper side edges thereof. Successive superposed layers alternately corresponding to the first two layers may be added until the case **42** is filled. It is evident in Figs. 4 and 5 that at the top and the bottom of the four stacks containing only four cartons each,

there is waste or unoccupied space equivalent in each instance to one-half the volume of an egg carton. However, the remainder of the space available in the case 42 is filled compactly and efficiently, and superior bracing is provided by the cartons themselves without any assistance from fillers. Of course, suitable fillers could be inserted into the above-mentioned unoccupied spaces at the top and the bottom of the stacks, if desired.

Although it is preferred for the egg case 42 to be devoid of any vertical partitions dividing the case into compartments, it is obvious that such partitions may be desired in larger egg cases. However, practical considerations governed by shipping regulations as well as the maximum bulk and weight that can be most readily handled, would probably result in the use of cases having approximately the capacity of those illustrated and described herein.

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. In an egg case package, including a rectangular exterior case, and a plurality of egg cartons having a capacity of one dozen eggs each packed therein, each of said cartons having a trapezoidal upper portion provided with upwardly converging inclined side walls and having a similar trapezoidal lower portion provided with corresponding downwardly converging inclined side walls, the improvement comprising a symmetrical staggered stacking arrangement of said cartons superposed in a plurality of adjacent vertical stacks staggered in height wherein adjacent stacks differ in height by an amount equivalent to about half the height of one carton at both the top and the bottom of the stacks, and said cartons being in mutual engagement and having their inclined side walls adjacent and parallel to the oppositely inclined side walls of laterally adjacent cartons, whereby the available packing space in the case is efficiently occupied and the cartons brace themselves against lateral shifting.

2. In an egg case package, including a rectangular exterior case, and a plurality of egg cartons packed therein, each of said cartons being adapted to contain one dozen eggs, each carton having a trapezoidal upper portion provided with upwardly converging inclined side walls and having a similar trapezoidal lower portion provided with corresponding downwardly converging inclined side walls, the improvement comprising a symmetrical staggered stacking arrangement of said cartons superposed in at least three adjacent vertical stacks staggered in height, wherein one of said stacks differs in height from that of the other two by an amount equivalent to about half the height of one carton at both the top and the bottom of the stack, and said cartons having their inclined side walls in flush engagement with and parallel to the oppositely inclined side walls of laterally adjacent cartons in the adjacent stacks, whereby the available packing space in the case is efficiently occupied and the cartons brace themselves against lateral shifting.

3. In an egg case package, including a rectangular exterior case, and a plurality of egg cartons packed therein, each of said cartons being adapted to contain one dozen eggs, each carton having a trapezoidal upper portion provided with upwardly converging inclined side walls and having a similar trapezoidal lower portion provided with corresponding downwardly converging inclined side walls, the improvement comprising a symmetrical staggered stacking arrangement of said cartons superposed in at least nine adjacent vertical stacks staggered in height, said stacks being symmetrically positioned in three adjacent rows and three adjacent columns at right angles thereto, alternate stacks differing in height from that of adjacent stacks by an amount equivalent to about half the height of one carton at both the top and the bottom of the stack, and said cartons being in mutual engagement and having their inclined side walls adjacent and parallel to the oppositely inclined side walls of laterally adjacent cartons, whereby the available packing space in the case is efficiently occupied and the cartons brace themselves against lateral shifting.

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