

Nov. 20, 1945.

J. E. WALSH
CARTON

2,389,222

Filed Dec. 2, 1943

2 Sheets-Sheet 1

Fig. 1

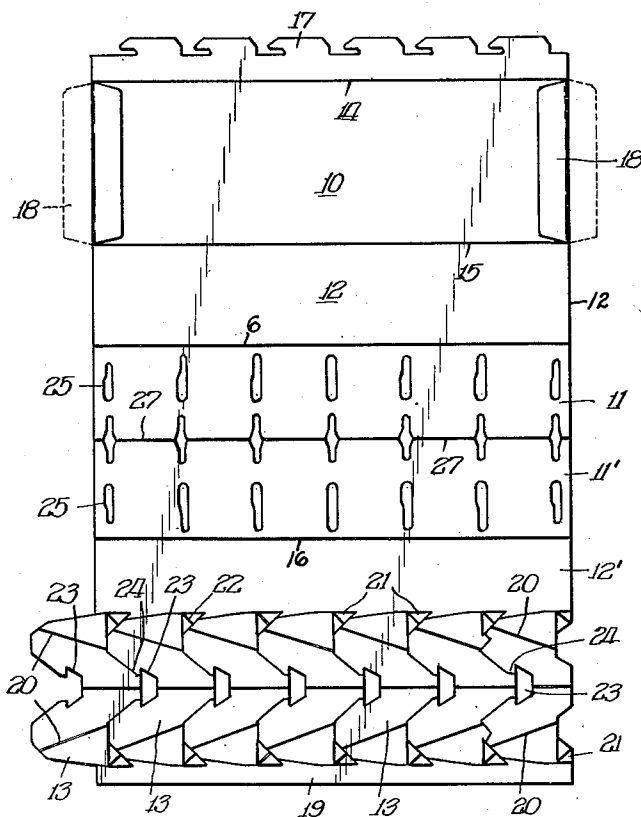


Fig. 2

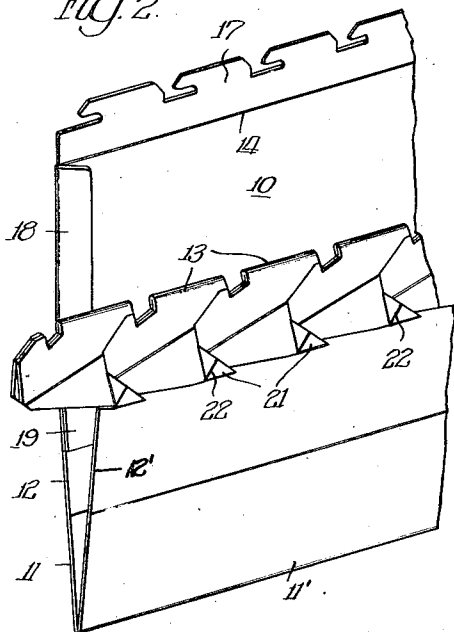
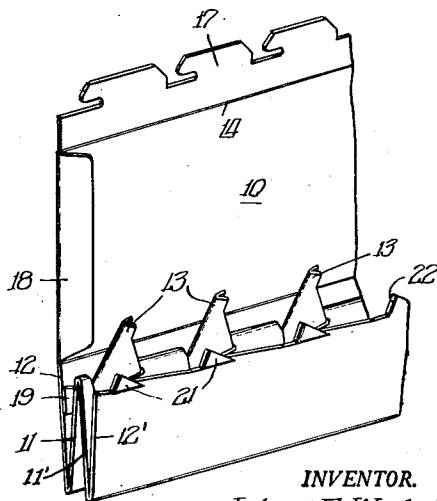


Fig. 4



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UNITED STATES PATENT OFFICE

2,389,222

CARTON

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Application December 2, 1943, Serial No. 512,544

5 Claims. (Cl. 229—28)

This invention relates to improvements in egg cartons and has particular reference to re-usable pre-assembled collapsible egg cartons which are capable of being expanded into egg-receiving cellular structures by the insertion of eggs when ready for packing.

The present invention is particularly applicable, for example, to a machine set-up type of carton such as that shown in the Troyk Reissue Patent No. 18,922. Hand operated set-up machines are available for such cartons, but the more speedy automatic set-up machines are becoming increasingly essential to the industry. However, automatic machinery is expensive and complicated and cannot always readily be utilized to best advantage by certain packers. These machines with associated equipment, such as conveyors, take up valuable space. Also, while cartons adapted to be set up by such machines can quickly be assembled, the cartons themselves, because of their bulk, use additional space when accumulated while waiting to be used, or while traveling along conveyors necessary to bring them into and out of the candling and packing rooms.

A principal object of the invention is to provide an egg carton which has been pre-assembled and collapsed, preferably at the factory or at any other time until ready for use, and which is of such construction that it is readily expansible into egg-receiving formation upon the insertion therein of eggs.

More specifically, it is an object of the present invention to provide a pre-assembled collapsible egg carton of the machine set-up type which has cross partitions having hinges each of which is weakened along a predetermined line of fold so that they can be folded upon themselves to permit the carton to be collapsed to flattened condition until expanded into egg-receiving compartments by the insertion therein of eggs.

An additional object of the invention is the provision of such an egg carton having a reinforced cover to hold the cells with eggs therein in locked and expanded position.

A further object of the invention is the provision of a pre-assembled and collapsible carton of the foregoing type which, after it has been used and the eggs removed, will readily fall back into collapsed position and can be made available for re-use.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises an article of manufacture possessing the features, proper-

ties, and the relation of elements which will be exemplified in the article hereinafter described and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

Fig. 1 is a plan view illustrating a preferred form of a die-cut and scored blank for practicing the present invention;

Fig. 2 is a perspective view of a portion of a carton structure, made from a blank such as that depicted in Fig. 1, folded and secured in position for machine assembly;

Fig. 3 is a slightly expanded end elevational view of a completed collapsed carton made from the structure illustrated in Fig. 2 after the latter has been machine assembled;

Fig. 4 is a perspective view of a portion of the machine assembled blank shown in Fig. 3;

Fig. 5 is a plan view of a fragmentary portion of an expanded container, such as that illustrated in Fig. 3, showing the open cell structure; and

Fig. 6 is an end elevational view of a carton illustrated by Figs. 5 and 6 with the cover closed.

Referring more particularly to Fig. 1 of the drawings, there is shown a die-cut and scored blank forming a cover 10, bottom walls 11 and 11', a rear wall 12, a front wall 12', and cross partitions 13, 13' respectively. The cover and walls are defined by score or crease lines 14, 15 and 16, 16, as well as a crease line at 27. The upper portion of the continuous bottom forming walls 11, 11' provide a longitudinal partition. Along one longitudinal edge of the cover on the other side of the score line 14 are a plurality of cover locking hooks 17. Along each end edge of the cover is a reinforcing member 18 which preferably is an extension thereof which has been folded over as indicated from the dotted line position. These extensions preferably are glued to the under side of the cover, as will more fully appear hereinafter, and form stiffening braces to aid in holding the carton cover body in expanded position. At the other end of the blank adjacent the cross partitions is a glue flap 19.

Each of the cross partitions is weakened along a predetermined line of fold such as, for example, by score lines indicated at 20. Each transverse partition has two such score lines. One line 20 on each partition 13 is disposed between the rear wall 12 of the carton and the bottom wall 11 forming one side of the longitudinal partition.

The other score line 20 on the partition 13 is disposed between the front wall 12' and the bottom wall 11' forming the other side of the longitudinal partition. The top of each one of the score lines 20 begins at a point 20a on the transverse partition 13 which is about midway between a vertical center line of the transverse partition 13, overlying the ridge of the longitudinal partition, and the ends of the transverse partition where they join the rear and front walls 12 and 12'. Each score line slants downwardly and outwardly away from the other and each terminates at the bottom of the transverse partition at 20b. The bottom of each score line lies adjacent to and points in the direction of the crease lines 16, 16 which form hinges for the bottom and front walls 11 and 12, and 11' and 12' respectively. These cross partitions have small triangular sections 21 at each end and preferably each of these triangular sections is similarly weakened as by score lines 22 which bisect the triangular sections 21. The center portion of each partition is cut out as indicated at 23, leaving adjacent hooks 24. Each bottom wall 11 has cut-out portions 25 as well as cut-out sections 26.

After glue has been applied to the under surface of the glue flap 19 and to the upper surface of each extension member 18, the blank is folded upon itself along a score line 27 and the glue flap turned over and secured with its glue-applied surface to the top portion of the rear wall 11. At the same time the extension members 18, 18 may be folded over and glued to the under side of the cover. The folded and glued together blank is more fully illustrated in Fig. 2. In this condition stacks of such folded blanks can immediately be run through automatic set-up machines.

After the desired number of cartons have been set up they can, because of the deep score lines, be collapsed by any suitable means applying pressure. The collapsed cartons can be stored, or they can immediately be packed in suitable boxes and shipped. When the cartons are set up and collapsed at the factory, as is preferable, egg packers need not be concerned with carton set-up machinery. The shipping boxes containing the collapsed cartons need not be opened for use until the egg candling room is reached. After the eggs have been candled, it is but necessary to insert them into the carton and, in so doing, the pressure of the eggs will expand the walls of the carton and in this manner a pre-assembled collapsed carton is set up merely by the insertion of eggs.

While the eggs ordinarily are sufficiently rigid to hold the cartons in expanded position, the stiffening braces 18, 18 have been provided in order to prevent them slipping upwardly and unlocking the cover. The cartons in their collapsed condition may have a tendency, because of the action of the scored cross partitions, to restore the walls and partitions to collapsed condition. The stiffening members therefore also brace and hold the walls and partitions in expanded position and prevent the carton cover from buckling where it extends across the top of the cellular structure.

Machine set-up cartons of the type herein described ordinarily, after having been emptied, have to be discarded. The reason for this is that the interlocking arrangement of the cross partitions and longitudinal partition is so well accomplished that it is difficult satisfactorily to disengage these members so that the carton can be

re-used. For example, it will be seen by reference to Fig. 2 that after the cross partitions 13 are rotated from their horizontal position around the hinges 21 adjacent the front and rear walls of the carton the hooks 24 engage the upper shoulders of the cut-out portions 25, 25 and that the upper shoulder of each cut-out portion 23 of the cross partitions 13 come to rest within the cut-out portions 26. This is accomplished by the operation of the set-up machine which urges the bottom walls 11, 11 upwardly between the front and rear walls 12, 12, thus transforming the upper portion of the bottom wall into a longitudinal partition, the entire wall structure, front and rear as well as bottom, being W-shaped in cross section. With this interlocking of the cross partitions, after they have been rotated around their hinges into vertical position and so interlockingly made to engage with the rest of the structure, it becomes difficult to restore the carton, without danger of tearing, to a position such as that shown in Fig. 2. Ordinarily, in attempting to do so, the structure becomes weakened and it becomes impractical to attempt to restore it to a cellular egg-receiving structure. However, with the score lines placed as indicated in the cross partitions and the hinges, it is unnecessary to disassemble the carton. It need only be collapsed and restored to its original pre-assembled condition and no further set-up problem is involved. It is then only necessary, under conditions where it is desirable and permissible to permit egg cartons to be re-used, to expand the same once again by the insertion of eggs in the egg-receiving compartments and in this way the carton can again be used.

It will thus be seen that the objects hereinbefore set forth may readily and efficiently be attained and since certain changes may be made in the above article and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An assembled collapsible egg carton, comprising front and rear walls joined by a continuous bottom which extends into a longitudinal partition, cross partitions having hinges secured adjacent said walls for rotation from horizontal to spaced apart upright position providing egg-receiving cells interlockingly engaging said continuous bottom, each cross partition being weakened in areas which provide predetermined lines of fold to permit the walls and partitions flatly to collapse against each other until ready for use when they are expanded into egg-receiving cells by insertion of eggs between said walls and partitions, said lines of fold each beginning at the top of each cross partition on each side of the longitudinal partition at a point which is about midway between a vertical line overlying the ridge of the longitudinal partition and the ends of the transverse partitions where they join the rear and front walls of the carton, one of said lines terminating at the bottom of one side of its trans-

verse partition adjacent to and pointing in the direction of a crease line forming a hinge between the rear wall and continuous bottom and another of said lines terminating at the bottom of the opposite side of the transverse partition adjacent to and pointing in the direction of a crease line forming a hinge between the front wall and continuous bottom.

2. An assembled collapsible egg carton, comprising front and rear walls joined by a continuous bottom which extends into a longitudinal partition, cross partitions having hinges secured adjacent said walls for rotation from horizontal to spaced apart upright position providing egg-receiving cells interlockingly engaging said continuous bottom, each cross partition having score lines along its sides to permit the walls and partitions flatly to collapse against each other until ready for use when they are expanded into egg-receiving cells by insertion of eggs between said walls and partitions, said lines of fold each beginning at the top of each cross partition on each side of the longitudinal partition at a point which is about midway between a vertical line overlying the ridge of the longitudinal partition and the ends of the transverse partitions where they join the rear and front walls of the carton, one of said lines terminating at the bottom of one side of its transverse partition adjacent to and pointing in the direction of a crease line forming a hinge between the rear wall and continuous bottom and another of said lines terminating at the bottom of the opposite side of the transverse partition adjacent to and pointing in the direction of a crease line forming a hinge between the front wall and continuous bottom.

3. An assembled collapsible egg carton, comprising front and rear walls joined by a continuous bottom which extends into a longitudinal partition, cross partitions having hinges secured adjacent said walls for rotation from horizontal to spaced apart upright position providing egg-receiving cells and interlockingly engaging said continuous bottom, each cross partition being doubly folded along lines of fold on each side of said longitudinal partition to collapse the walls and partitions flatly against each other until ready for use when they are expanded into egg-receiving cells by insertion of eggs between said walls and partitions, said lines of fold each beginning at the top of each cross partition on each side of the longitudinal partition at a point which is about midway between a vertical line overlying the ridge of the longitudinal partition and the ends of the transverse partitions where they join the rear and front walls of the carton, one of said lines terminating at the bottom of one side of its transverse partition adjacent to and pointing in the direction of a crease line forming a hinge between the rear wall and continuous bottom and another of said lines terminating at the bottom of the opposite side of the transverse partition adjacent to and pointing in the direction of a crease line forming a hinge between the front wall and continuous bottom.

4. An assembled collapsible egg carton, comprising front and rear walls joined by a continuous bottom which extends into a longitudinal partition, cross partitions having hinges secured adjacent said walls for rotation from horizontal to spaced apart upright position providing egg-receiving cells and interlockingly engaging said continuous bottom, each cross partition and each hinge being doubly folded along lines of fold on each side of said longitudinal partition to collapse the walls and partitions flatly against each other until ready for use when they are expanded into egg-receiving cells by insertion of eggs between said walls and partitions, said lines of fold each beginning at the top of each cross partition on each side of the longitudinal partition at a point which is about midway between a vertical line overlying the ridge of the longitudinal partition and the ends of the transverse partitions where they join the rear and front walls of the carton, one of said lines terminating at the bottom of one side of its transverse partition adjacent to and pointing in the direction of a crease line forming a hinge between the rear wall and continuous bottom and another of said lines terminating at the bottom of the opposite side of the transverse partition adjacent to and pointing in the direction of a crease line forming a hinge between the front wall and continuous bottom.

5. An assembled collapsible egg carton, which comprises front and rear walls joined together by a continuous bottom which extends into a longitudinal partition, a cover connected to one of said walls, cross partitions having hinges secured adjacent said walls for rotation from horizontal to spaced apart upright position forming egg-receiving cells and interlockingly engaging said continuous bottom, each cross partition being doubly folded along lines of fold on each side of said longitudinal partition to collapse the walls and partitions flatly against each other until ready for use when they are expanded into egg-receiving cells by insertion of eggs between said walls and partitions, said cover having stiffening braces extending over the top of said cellular structure to hold the same in expanded position, said lines of fold each beginning at the top of each cross partition on each side of the longitudinal partition at a point which is about midway between a vertical line overlying the ridge of the longitudinal partition and the ends of the transverse partitions where they join the rear and front walls of the carton, one of said lines terminating at the bottom of one side of its transverse partition adjacent to and pointing in the direction of a crease line forming a hinge between the rear wall and continuous bottom and another of said lines terminating at the bottom of the opposite side of the transverse partition adjacent to and pointing in the direction of a crease line forming a hinge between the front wall and continuous bottom.