Oct. 28, 1952 S. BERGSTEIN 2,615,378

APPARATUS FOR ASSEMBLING MULTIPLE PART EGG CONTAINERS AND THE LIKE

Original Filed May 22, 1948

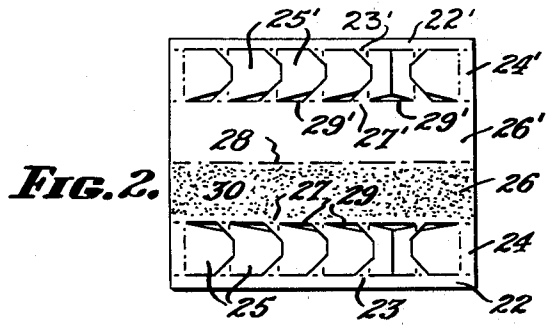



FIG. 2.

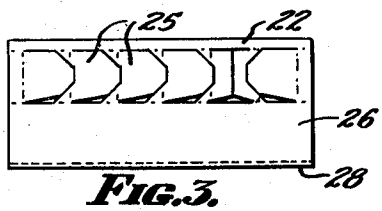



FIG. 3.

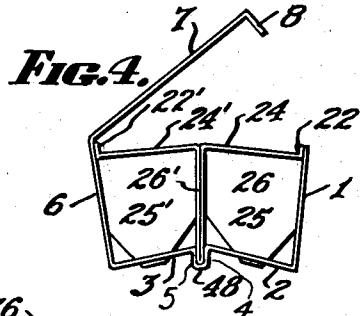



FIG. 4.

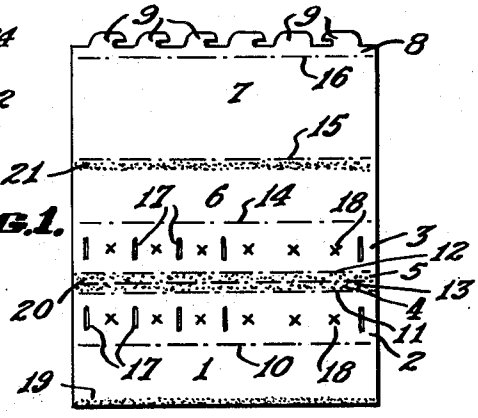



FIG. 1.

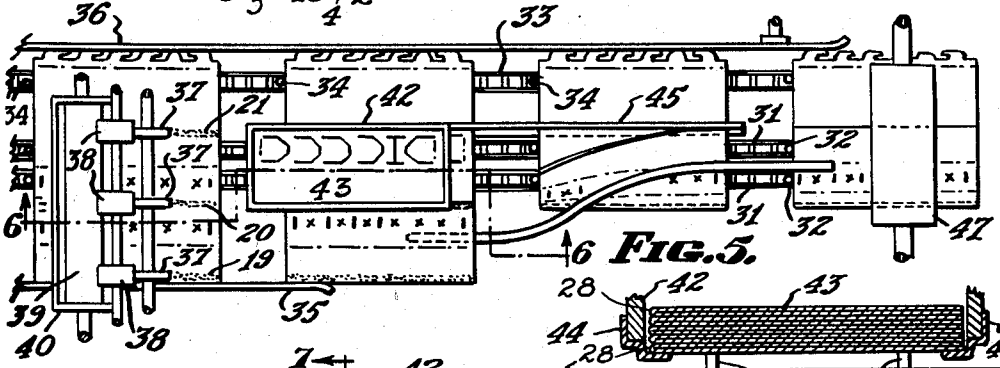



FIG. 5.

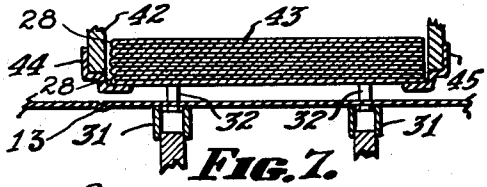



FIG. 7.




FIG. 6.

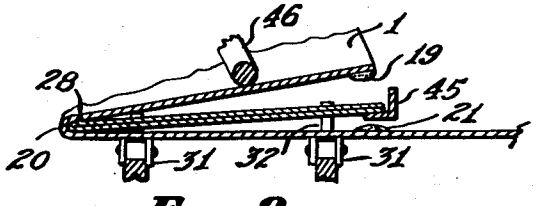



FIG. 8.

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## APPARATUS FOR ASSEMBLING MULTIPLE PART EGG CONTAINERS AND THE LIKE

Samuel Bergstein, Cincinnati, Ohio

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5 Claims. (Cl. 93—37)

1

My invention relates to cellular cartons which are made up and stored and shipped in knocked down, partially assembled condition.

It is an object of my invention to produce a simple, knock-down cellular container which may be made rapidly by machinery and which will require only the simplest manipulation by the user to erect it and make it ready for the reception of the articles to be packed.

It is a further object of my invention to provide a knock-down cellular container comprising an outer band member and an inner partitioning element of double thickness, the parts being adhesively secured together in assembled condition by means of apparatus in which advantages in economy are attained, especially in the elimination of expensive hand manipulation ordinarily accompanying the assembly of such containers.

It is another object of my invention to produce containers of this character rapidly and inexpensively, solely by means of relatively simple and inexpensive machinery.

These and other objects of my invention which will be apparent from the following description taken in connection with the accompanying drawing, wherein an exemplary embodiment of my invention is illustrated as follows:

Figure 1 is a plan view of the outer band or shell element of my container in blank condition.

Figure 2 is a plan view of the inner partition element in blank condition.

Figure 3 is a plan view showing the inner partition element after folding and gluing along its median line of articulation.

Figure 4 is an end elevation of the erected carton illustrating the completed carton in erected condition.

Figure 5 is a plan view of my apparatus illustrating how the inner element is registered and secured to the outer band.

Figure 6 is a diagrammatical side elevation of the apparatus illustrated in Figure 5 taken along the line 6—6 of that figure.

Figure 7 is a sectional view taken along the line 7—7 of Figure 6.

Figure 8 is a sectional view taken along the line 8—8 of Figure 7.

In its usual embodiment, my container comprises two rows of six compartments each. It will be understood, however, that I am not limited to egg containers of this size, or for that matter, to egg containers at all, as my invention may be employed to provide other types of containers wherein a plurality of container parts are to be assembled one inside the other.

2

Referring to Figure 1 of the drawings, I have illustrated a preferred blank for forming the outer band element of an egg container which may be assembled on my apparatus. It comprises front wall 1, bottom forming portions 2 and 3 separated by ridge-forming portions 4 and 5, rear wall 6, cover portion 7, and closure flap 8 having a plurality of retaining tongues 9, all in the order named. Front wall 1 is hingedly connected to bottom portion 2 by score line 10, while score lines 11 and 12 hingedly connect portions 4 and 5 to bottom portions 2 and 3 respectively. Score line 13 serves to connect the two ridge-forming portions, while the score lines 14, 15 and 16 hingedly connect members 3, 6, 7 and 8 respectively. Bottom portions 2 and 3 have longitudinally spaced transverse slots 17 and may be further configured by spaced bisecting lines of cut 18, which serve as cushions for the eggs.

Longitudinal stripes of adhesive are indicated at 19, 20 and 21, which, in accordance with my invention, are applied to the band element while it is in blank condition and before the inner partition element is associated with it in the assembling operations, as will be explained more fully hereinafter.

In Figure 2, I have illustrated a preferred blank for forming the inner partition element of my container. It is composed of like halves, corresponding members of which have been given corresponding numerals in the drawings. To avoid confusion, the numerals referring to one-half the blank have been primed to distinguish them from their unprimed counterparts. Thus the partition element comprises glue laps 22 and 22' hingedly connected by score lines 23 and 23' to horizontal partition panels 24 and 24' cut and scored to provide a plurality of transverse partition members 25 and 25'. Vertical partition elements 26 and 26' are hingedly connected to the opposite edges of partition panels 24 and 24' by score lines 27 and 27'. The halves are articulated to one another by a common line of score 28. Transverse partition members 25 and 25' have triangular portions cut from their inner sides as indicated at 29 and 29', while 30 indicates a coating of adhesive applied to partition member 26.

The inner partition element is seen in Figure 3 as it appears after having been folded along score line 28. The partition halves have been brought into face to face relation with adhesive coated vertical partition members 26 firmly adhered to the opposed vertical partition 26'. This operation may be performed by any ordi-

nary folding and gluing machine now in general use in the industry, and such machine may be provided as an adjunct to the assembling device taught herein. In general, the blank for the inner partition element is first passed between a glue roller to receive the adhesive coating 30; and it is next folded along the median score line 28 whereby the adhesively coated vertical partition element 26 is brought into contact with vertical partition member 26'. Pressure may then be applied by means of rollers to secure a firm bond between the glued members. The partition element is then in condition to be associated with the outer band element by means of my apparatus.

The completely assembled and erected container is illustrated in Figure 4 of the drawings; and as can be seen, the lower edge of the double thickness, central partition is nested between and adhesively secured to the rib forming portions 4 and 5, while the glue laps 22 and 22' are adhesively secured to the upper edges of the wall members 1 and 6 of the outer band.

The mechanism whereby the inner partition is associated with the outer band is illustrated in Figures 5 through 8 of the drawings. The cut and scored outer band blanks are fed crosswise onto a pair of moving chains 31 by any suitable feed means (not shown) and each blank is engaged along its trailing edge by aligned dogs or lugs 32 projecting upwardly from the moving chains. The chains 31 are spaced laterally of each other so that the dogs 32 will engage the trailing edges of the bottom forming portion 3 and the rear wall 6, respectively. It may be found necessary in some instances to add an additional chain 33 having dogs 34 and moving in sequence with the chains 32 to keep the blanks in proper alignment as they move through the machine. Guide rails 35 and 36 may be provided to maintain the blanks in proper position and prevent them from skewing to one side.

As the blanks move along on chains 31 and 33 they first pass beneath glue roller 37 fed by intermediate rolls 38 and 39 from glue pot 40. Supporting rolls 41 are provided beneath glue roll 37 to provide a firm contacting surface over which the blanks pass. The glue rollers 37 apply to the blanks the three longitudinal glue stripes 19, 20 and 21.

After receiving the glue stripes, the blank is next passed beneath hopper 42 filled with folded and glued inner partition elements indicated generally at 43. The hopper is positioned so that the partition elements are supported above bottom portion 3 and rear wall 6 of the outer band with articulated edge 28 of the inner partition lying directly above median score line 13 of the outer band element. The partition elements are retained in the hopper 42 by means of the angular rails 44 and 45, rail 44 terminating at the forward edge of the hopper while rail 45 extends beyond the hopper to retain the free outer edges of the partition elements after extraction from the hopper. The front and rear walls of the hopper are raised slightly to expose the end edges of lowermost partition element in the stack.

The partition elements, as will be evident, are extracted from the hopper by means of dogs 32, which it will be remembered, also engage the rear edges of the outer band blanks. The height of the dogs is fixed so that they will pass beneath the raised rear wall of the hopper or through the openings provided therein to engage the exposed rear edge of the lowermost partition element. The forward motion of the dogs carries the partition element forward, moving it from beneath the hopper along guide rails 44 and 45. Guide rail 45 which extends beyond the hopper maintains the partition in proper alignment after it has moved from beneath the hopper so that its position at all times is directly above, although not fully in contact with, bottom portion 3 and rear wall 6 of the outer band blank. However, as the inner partition element is withdrawn from the hopper, its leading edge will have a tendency to sag, i. e. bend downwardly so as to touch the outer band. Rail 45 will prevent the free outer edges of the partition element from doing this; but the closed bottom edge 28 is free to sag and will come into contact with the band at a point adjacent score line 13. As soon as the partition element moves out completely from under the hopper, its bottom edge 28 will drop on to the outer band as it is no longer partially supported by the rail 44. Thus, at this point, the partition element lies slightly inclined with its entire bottom edge resting on glue stripe 20 of the outer band adjacent score lines 13 and with its outer free edges supported above the outer band by the angular rail 45 which prevents the undermost glue lap 22' from touching the glue stripe 21. While in this condition a sweep 46 engages the underside of bottom member 2 and folds it over onto the partition along the score line 13, thereby causing the folded edge 28 of the partition and the adjacent areas to contact the glue stripe 20 and hence bond to ridge-forming portions 4 and 5. This action is best illustrated in Figure 8 wherein outer band portions 1 and 2 are shown partially folded over the inner partition element by action of sweep 46. Guide rail 45 still holds the free outer edges of the partition element free from contact with the outer band and also serves as a means to force the opposite closed edge of the partition firmly into the crotch formed by folding the outer band on the score line 13.

When the partition element passes the end of guide rail 45, the free outer edges of the partition will drop down onto the outer band with the under or lowermost side of the partition contacting underlying portions of the band. Glue lap 22' will fall onto glue stripe 21, and at the same time panel 1 carrying glue stripe 19 will be folded down upon glue lap 22 by sweep 46. Pressure rollers 47 are provided at the end of the sweep 46 to press the elements firmly together, thus causing a good surface bond between the adhesive stripes and the glue laps.

The resulting structure is a completely assembled carton, which when erected, will appear as shown in Figure 4 of the drawings wherein the collapsed outer band has been expanded and the transverse partition members folded downwardly into place and locked in the slots 17 in the bottom portions of the outer band.

It will be understood that the teachings embodied in my invention may be adapted to containers of various types wherein it is desired to associate an inner element with an outer enclosing element in substantially the manner described.

Modifications may, of course, be made in my invention without departing from the spirit of it.

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

1. In apparatus for assembling containers comprising an outer band and an inner partition

element, means for moving said outer band blank in a predetermined path of travel, said means comprising a plurality of chains moving in timed relationship having aligned lugs for engaging the trailing edges of the outer band blanks, a hopper positioned above the path of travel of said blanks and adapted to contain said inner partition elements, said hopper having angular guide rails paralleling the path of travel of said blanks and arranged to position the lowermost partition element in said hopper in the path of travel of said lugs, glue applying means for applying predetermined longitudinal glue stripes to said outer band blanks, said hopper being positioned to align said partition elements to overlie said glue stripes, one of said guide rails extending beyond said hopper so as to retain one edge of each inner partition element suspended above the underlying blank after the elements have been withdrawn from the hopper, whereby one edge at least of each partition element is maintained out of contact with an underlying glue stripe while the opposite edge of each partition element is in contact with another of said glue stripes, and means for folding said outer band blanks about the last mentioned edge of said partition element while said first mentioned edge is maintained out of contact with said blank.

2. In a device for assembling multiple part containers comprising an outer band and an inner partition element, means for moving outer band blanks in a predetermined path of travel including engagement means for engaging the trailing edges of said outer band blanks, means positioned above said moving means for retaining a quantity of inner partition elements, guide means on said retaining means for positioning the lowermost inner partition element in the path of travel of said engagement means, whereby said engagement means contacts the rear edge of said lowermost partition element and moves it from said retaining means, glue applying means for applying longitudinal glue stripes to said outer band blanks being positioned ahead of said retaining means, said retaining means being positioned to align said inner partition elements with said glue stripes, one of said guide means having an extension extending beyond said retaining means so as to retain one edge of inner partition elements suspended above the underlying blanks after the said partition elements have been withdrawn from the retaining means, whereby one edge of said inner partition elements is maintained out of contact with an underlying glue stripe while the opposite edge of the partition elements falls onto an underlying glue stripe, and sweep means for infolding portions of said outer container blank about the last mentioned edge of the inner partition elements, said guide means extension terminating just short of the point where the sweep means will have folded a portion of the outer band blank through substantially 180°, and means beyond said guide means extension for pressing the edge of the inner partition elements released by said extension into contact with the underlying glue stripe on the outer band blanks.

3. In apparatus for the purposes described, means for moving container blanks in a predetermined path of travel, said means comprising a pair of chains moving in timed relationship and have aligned lugs for engaging the trailing edges of the container blanks, a hopper positioned above the path of travel of said blanks and adapted to contain elements to be associated with said container blanks, said hopper including angular guide rails paralleling the path of travel of said blanks and arranged to position the elements in the hopper in the path of travel of said lugs, adhesive applying means for applying adhesive to predetermined areas of said blanks, one of said guide rails extending beyond said hopper a distance sufficient to retain an edge of the elements suspended above the under-lying blanks as the elements are withdrawn from the hopper, whereby one edge at least of each element is maintained out of contact with an adhesive area on the under-lying blank while the opposite edge of the element is brought into contact with an adhesive area on the blank, means for folding the blank about the last mentioned opposite edge of the element, and means beyond said extending guide rail for pressing said first mentioned edge of the element into contact with an under-lying adhesive area on the container blank as the said first mentioned edge passes beyond said extending guide rail.

4. In apparatus for assembling multiple part carton structures, means for moving one of said parts in a predetermined path of travel, means for providing predetermined areas of activated adhesive on said first mentioned part, means for positioning another of said parts in the path of travel of said first mentioned part, said moving means including means for engaging and registering said second part with said first part for joint movement, means for suspending at least one edge of said part out of contact with an adhesive area of said first part during their initial joint movement while the opposite edge of said second part is brought into contact with an adhesive area on said first part, means for folding a portion of said first part about the last mentioned edge of said second part, and means beyond said edge suspending means for pressing the edge of the second part into contact with the under-lying adhesive area of the first part upon release of said edge by said suspending means.

5. An apparatus for assembling multiple part carton structures, means for moving one of said parts in a predetermined path of travel, glue applying means for applying glue to predetermined areas of said first mentioned part, means for positioning a second part in the path of travel of said first mentioned part, means in connection with said moving means for engaging and registering said second part with said first part for movement therewith, means for suspending at least one edge of said second part during initial joint movement of said parts, means for folding a portion of said first part about the last mentioned edge of said second part, said suspending means being adapted to release said suspended edge of said second part as said first part is infolded, and means for bringing the released edge of said second part into contact with an under-lying area of adhesive on said first part.

SAMUEL BERGSTEIN.

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