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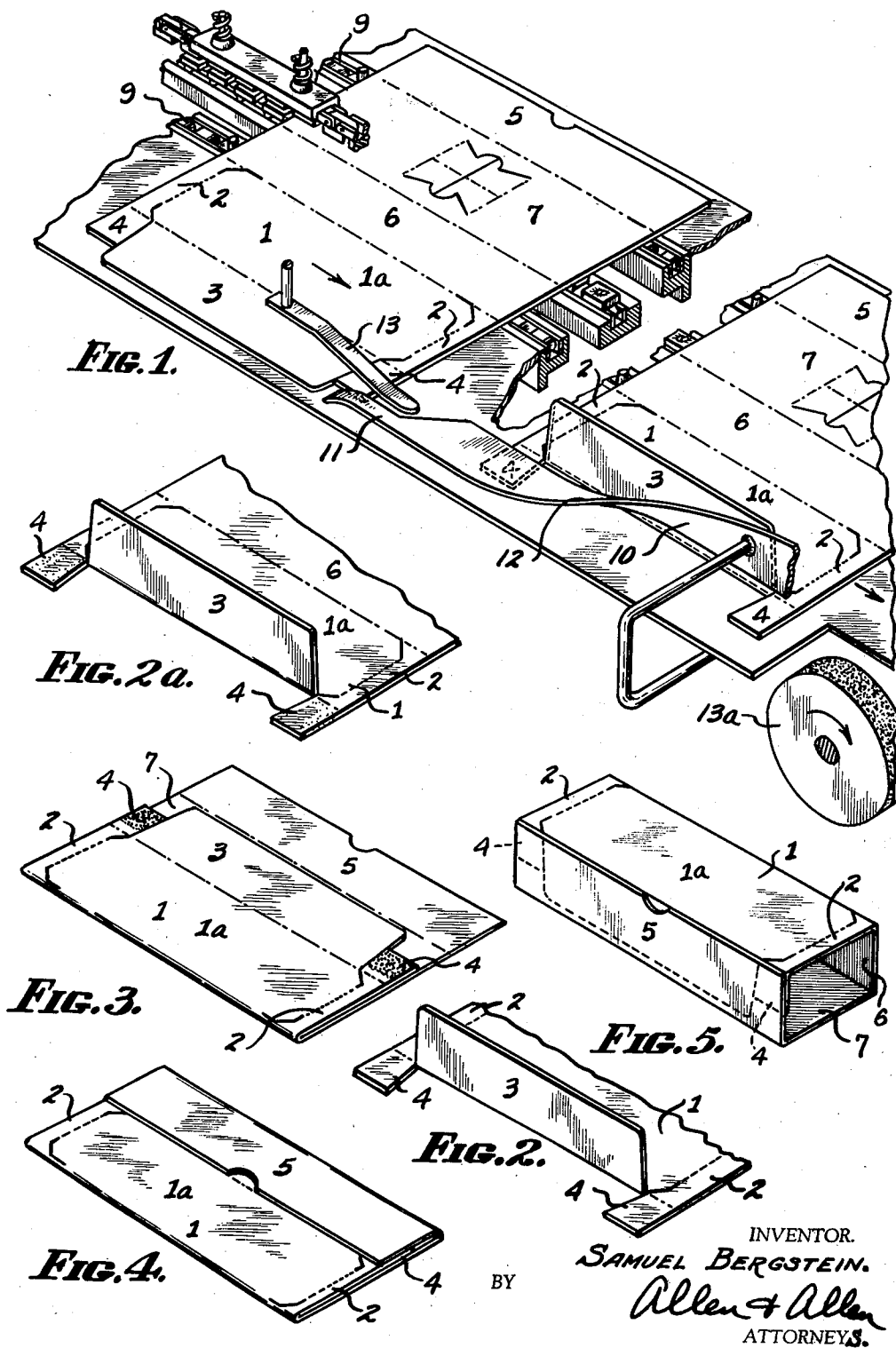
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2,211,488

METHOD OF FORMING EGG CARTONS

Filed July 19, 1938

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

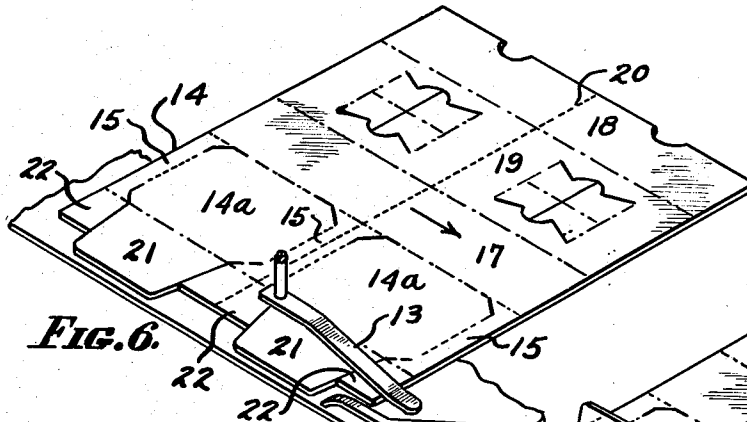


FIG. 6.

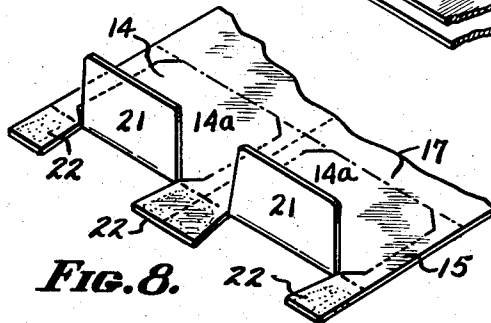


FIG. 8.

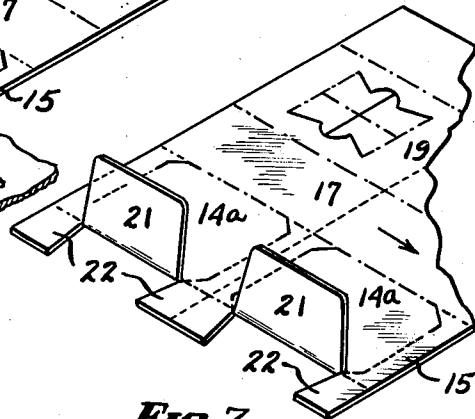


FIG. 7.

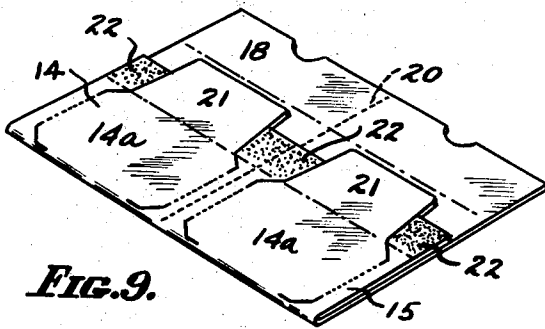


FIG. 9.

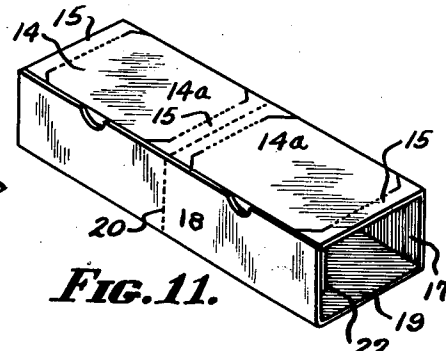


FIG. 11.

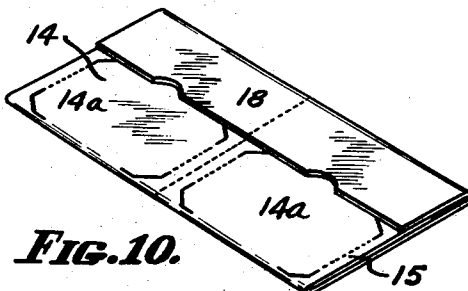


FIG. 10.

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UNITED STATES PATENT OFFICE

2,211,488

METHOD OF FORMING EGG CARTONS

Samuel Bergstein, Cincinnati, Ohio

Application July 19, 1938, Serial No. 220,068

6 Claims. (Cl. 93—49)

This application is a continuation in part of my pending application, Serial No. 714,678 and covers the method described in said former application for making structures such as egg cartons.

An object of my invention is to provide a method of folding and gluing blanks having a plurality of projecting independent flaps.

An object of my invention is the provision of a method of forming a sealed, tubular carton having a tamper proof feature.

An object of my invention is the provision of a method of making a carton structure severable into a plurality of operative cartons.

Another object of my invention is to provide a method of folding and gluing such blanks, wherein intermediate flaps are folded to underlie an opposite outer panel, but are unsecured thereto.

A still further object of my invention is to provide a method of folding and gluing such blanks in flat knocked-down form, while the blanks are being moved along.

These and other objects of my invention will be apparent from the following descriptions taken in connection with the accompanying drawings, wherein one preferred method of practicing the invention is specifically set forth, the novelty inherent in the invention being set forth in the claims appended to this specification, to which reference is hereby made.

In the drawings:

Figure 1 is a perspective view illustrating part of the steps in forming the carton from the flat blank.

Figure 2 is a perspective view showing a step in the folding of the blank illustrated in Figure 1.

Figure 2a illustrates a step subsequent to Figure 2, adhesive having been applied to the under surface of the glue flaps.

Figure 3 illustrates a perspective of this blank in a subsequent stage of folding.

Figure 4 is a perspective illustrating the blank after the final folding operation, in which form the carton is ready for shipment.

Figure 5 is a perspective of the finished carton structure shown in Figure 4 upon being square up.

Figure 6 is a view of another form of blank consisting of multiple units, illustrating part of the steps in forming the carton from the blank.

Figure 7 is a perspective of the blank shown in Figure 6 in its initial stage of folding.

Figure 8 shows the step subsequent to Figure 7, adhesive having been applied underneath the glue flaps.

Figure 9 is a perspective of this blank with subsequent folding operations.

Figure 10 shows the final step of folding, in which form the carton is now ready for shipment.

Figure 11 illustrates the finished carton shown in Figure 10, in squared up form.

Referring first to Figure 1, the form of blank indicated has a panel No. 1 which for the sake of convenience will be referred to as the top panel. As indicated in the drawings, this panel is divided by transverse lines of weakening without complete severance, preferably by a line of perforations, into an intermediate portion 1a and marginal portions 2—2. Articulated to panel 1 are a plurality of projecting flaps, intermediate flap 3 which is connected to the portion 1a being referred to for convenience as the tuck-in flap, while the marginal flaps adjoining 3, and articulated to the portions 2, 2 and marked 4, 4 will be referred to for the sake of convenience as the glue flaps. It will be convenient to refer to 6 as the back panel, and 7 as the bottom panel, and to 5 as the front panel.

Referring for a moment to the completed, erected carton as illustrated in Figure 5, wherein I will employ like numerals to those set forth above as to the blank, the reasons for the designations given in the paragraph above will be readily apparent. Referring to Figure 5, the glue flaps 4, 4, have been secured to the front panel 5. The tuck-in flap 3 is in position behind front panel 5, but it is unsecured to the front panel. In this erect position the carton can be packed with contents by insertion through either end, as for example, by sliding in a filler which has been loaded with eggs. And when it is desired to remove the contents, the carton can be opened from the top by lifting upward on the intermediate panel portion 1a, severing the panel along the lines of weakening therein. The tuck-in flap 3 being unsecured to the adjoining marginal flaps 4, 4 will readily start to lift, and when the entire intermediate lid portion has been raised into open position, the carton will still retain its tubular form due to the marginal portions 2, 2.

In order to accomplish this, my preferred procedure is to have the blanks move along with the flaps projecting transverse the direction of motion without any reference to timed relation. The first step in the folding is to divert the tuck-in flap from the plane of the flat blank, preferably upward as illustrated in Figure 2. Thereafter in the course of further movement, the glue flaps can be coated on the under side by a continuously revolving glue wheel, as shown in Figure 2a. Thereafter, the partially folded position of the tuck-in flap may be relaxed, and the usual

type folding device, such as twist belts or the like, employed to fold over the top panel (as shown in Figure 3), the final stage thereafter being to fold the front panel over as shown in Figure 4. Since the top wall has merely been weakened but not completely severed, the top wall and flaps fold as a unit, with no dislocation of parts either in feeding or folding. The folded carton thereafter is conveyed to pressure devices, such as a series of rollers or a stacking conveyor where the cartons are lapped under pressure in offset relation to cause adhesion.

In Figure 1, I have illustrated one way of accomplishing the foregoing steps automatically. Here the carton blanks are fed along by suitable conveying elements indicated at 9 in the direction indicated by the arrow. Suitably mounted on the frame of the machine is a twist plate 10 having a narrow extension 11 which is spaced so as not to engage the glue flaps 4, 4 as the blank moves forward, but which projection does engage the longer tuck-in flap 3, as illustrated. In conjunction with this twist plate is an overhead spring finger 13, suitably positioned as indicated, which depresses the glue flaps 4, 4 as the blank moves under it, which, as shown, does not depress the tuck-in flap 3, because the outer edge of the tuck-in flap 3 is supported by the extension 11 of the twist plate, as previously explained.

As a result the tuck-in flap rides on the twist plate, while the glue flaps travel underneath it, and the plate is twisted as indicated at 12 to bring the tuck-in flap into upright position out of the plane of the glue flaps, so that as the blank further progresses in the same direction of motion the extended glue flaps can receive a coating of adhesive on their under surface from the continuous glue wheel 13a, which lies in the path of the glue flaps. Thereafter, the twist plate can release the tuck-in flap, and the carton structure is ready for folding as illustrated in Figures 3 and 4 to bring it into its final form.

In Figures 6 to 11, I have shown an alternate form of blank which is adaptable to my method, the finished carton in squared-up form being shown in Figure 11. While manufactured as a single unit, the carton in use can be broken along the line of fracture 20 into two distinct and independent units.

Referring to the blank shown in Figure 6, it can be seen that there are two tuck-in flaps and three glue flaps, the middle glue flap being adapted to be subsequently severed into two parts if the carton is broken into two units by the user along the line of weakening 20, as explained in the preceding paragraph. As in the previous example, the glue flaps are of shorter length than the tuck-in flap.

As illustrated, the blanks consist of a top panel designated by 14 across which there are transverse lines of weakening without severance dividing this top panel into two lid portions 14a, 14a and adjoining marginal portions 15. The projecting independent flaps comprise two independent tuck-in flaps 21, 21 articulated to 14a, 14a, and three glue flaps 22, 22, 22 and there is also the back panel 17, the bottom panel 19, and the front panel 18. As illustrated the line of fracture 20 transverses the entire blank, and it can be seen that this line 20 divides the blank into two component units, each unit of which is constructed in exactly the same manner as the blank previously described in Figures 1 to 5.

And in forming the carton, the steps are the

same as previously described in connection with the other blank previously referred to. As illustrated in Figure 6, the spring finger 13 again serves to deflect the glue flaps under the twist plate, the twist plate engaging the tuck-in flaps and in the course of further motion of the blank turning the tuck-in flaps in upright position as shown in Figure 7. Again this leaves the glue flaps projecting in the original plane of the blank, so that in the course of further motion of the blank the continuously revolving underneath glue wheel can apply adhesive to the under surface of these flaps as shown in Figure 8, whereupon the tuck-in flaps may be released and the carton folded as shown in Figure 9, and lastly as shown in Figure 10 thereafter conveyed under pressure to secure adhesion.

It can be seen that by my method I accomplish the gluing and folding of blanks having a plurality of projecting flaps that certain selective flaps including the forward and rearward flaps in the direction of motion of the blank are adhered, while other flaps are left unsecured, but in folded condition underlying the front panel, and that I accomplish this by a rapid operation as the blanks are moved along, resulting in a carton in knocked-down form having the characteristics described.

The embodiment shown in my preferred method as it permits application of adhesive to intermittent flaps without the need of timed spacing of the blanks. It will be apparent that my procedure for forming cartons of this type can be carried out also on machines adapted to convey a succession of blanks in timed relation, in which case a timed adhesive mechanism can be used to apply glue either to the upper surface of the front panel on the portions corresponding to the glue flaps, or to the glue flaps themselves without the need of flap separation. It is also apparent that variations can be made in the blank adaptable to my method, such as having the glue flaps articulated to the front panel instead of to the lid panel, as it is immaterial which of the two outer panels the glue flaps are articulated thereto, but I prefer the particular blank structures illustrated due to the fact that they are more economical. All such modifications should be understood to be included in the scope of my invention, and what I claim as new and novel, and desire to secure by Letters Patent is as follows:

1. A method of forming a closed tubular carton having when erected a separate tuck in flap in position within the carton and attached only to a central panel divided from the top of the carton by partially severed lines, which consists in forming a blank having a main bottom panel, side panels, top panel and a flap articulated to the top panel, forming incomplete lines of severance through the top panel portion to define sides of a median portion forming complete lines of severance between the median portion of the flap and its ends, so as to leave glue tabs separated from the rest of the flap at both ends, folding the entire top panel with the articulated flap portions over upon the remainder of the blank, and then folding the still uncovered side wall portion over upon the articulated flap portions, adhesive having been applied to those areas wherein said side wall engages the separated glue tabs whereby the median portion of the said flap will when the carton is erected, be detached from the glued portions, and in position to be lifted up by completing the partial lines of severance of the median portion of the top panel, the adhesive be-

ing applied by the step of separating the median portion of the flap from the terminal tabs, applying adhesive to the faces of said tabs, and then releasing the median portion before folding over the top panel.

2. A process of making a glued, collapsible tubular carton having an initially sealed top panel portion and adapted to be opened without destroying the carton, which comprises scoring a blank along longitudinal fold lines to form bottom, side and top walls and a sealing flap, perforating said blank along transverse lines to define panel portions extending transversely of the top wall, completely severing said sealing flap along lines in continuation of said perforation lines, applying glue to the blank in a manner to secure certain of said severed portions of said sealing flap along one longitudinal edge of the blank to the other longitudinal edge of the blank, and folding said blank into tubular form along some only of said longitudinal fold lines.

3. A process of making a glued, knockdown tubular carton having initially sealed top panel portions and adapted to be opened without destroying the carton, which comprises scoring a blank along longitudinal fold lines to form side, bottom and top walls and a sealing flap, perforating said blank along transverse lines to provide panel portions extending transversely of the top wall, said panel portions being at least five in number, completely severing said sealing flap along lines in continuation of said perforation lines, applying glue to the blank in a manner to secure alternate ones of said severed portions of said sealing flap including the end portions thereof along one longitudinal edge portion of the blank to the other edge portion of the blank, and folding said blank into tubular form along some only of said longitudinal fold lines.

4. A process as set forth in claim 3 including the step of perforating the blank transversely through all walls with a line of perforations cen-

trally disposed of the blank, whereby the carton is separable into two complete operative units.

5. A process of making a glued, collapsible, tubular carton having an initially sealed top panel portion and adapted to be opened without destroying the carton, which comprises cutting, scoring and perforating a blank so as to provide bottom, side and top walls articulated together, incompletely severed panel portions extending transversely of said top wall to provide a closure panel, and laterally contiguous tube-maintaining panels, a tuck flap articulated to said closure panel and sealing flaps for said tube-maintaining panels, said flaps being free of each other, applying glue to the blank in such a way as to adhere said sealing flaps to a wall at the respective edges of the blank, and folding said blank into tubular form along certain only of said lines of articulation.

6. A process of making a glued, knockdown tubular carton which includes cutting, scoring and perforating a blank to provide a bottom, side walls on each side of the bottom, a top articulated to one of the side walls, the perforating step providing lines of weakening in the top wall to divide it into at least one portion which may be used as a lid panel, and tube-maintaining portions at each side thereof, said lid panel having a tuck flap articulated thereto, there being sealing flaps for said tube-maintaining portions, said perforations being formed without completely severing said top wall whereby said top wall may be folded as a unit, applying glue to said blank in such a way as to cause adhesion of said sealing flaps to an opposite edge of said blank, and folding the blank into tubular form along some only of said lines of articulation, the flat, tubular blank thus formed being erectible without freeing said lid panel, said carton thus being one in which lifting the lid panel breaks the said lines of perforation and provides an indication that the carton has been opened.

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