July 6, 1926. 1,591,427

J. W. LEARY

CARTON

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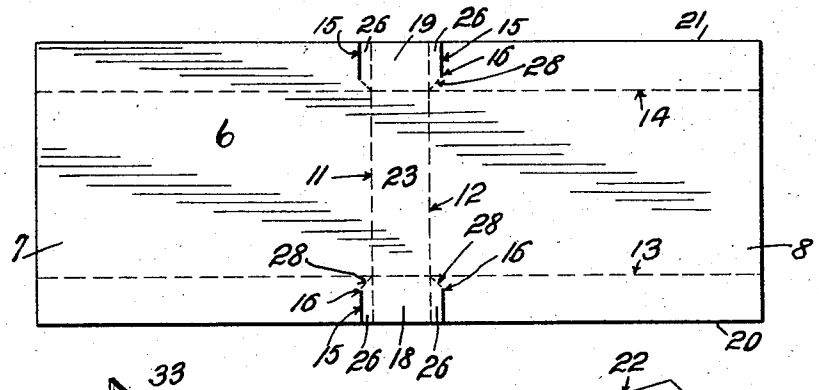


Fig. 1.

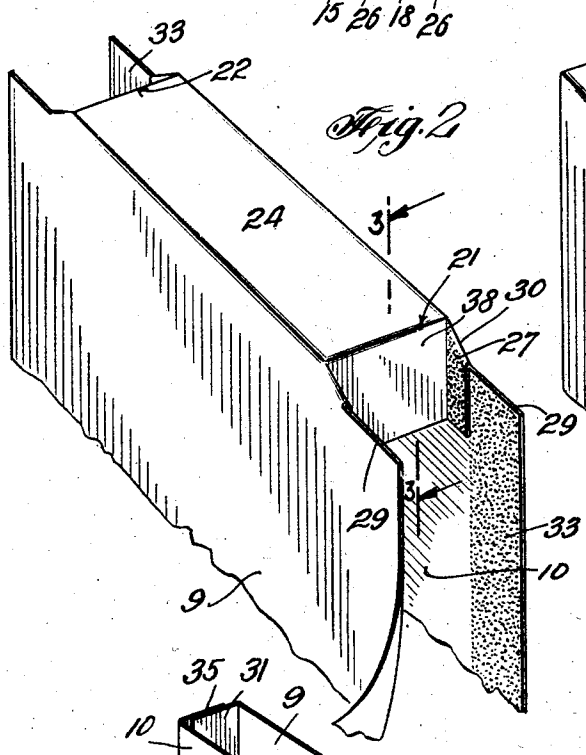


Fig. 2.

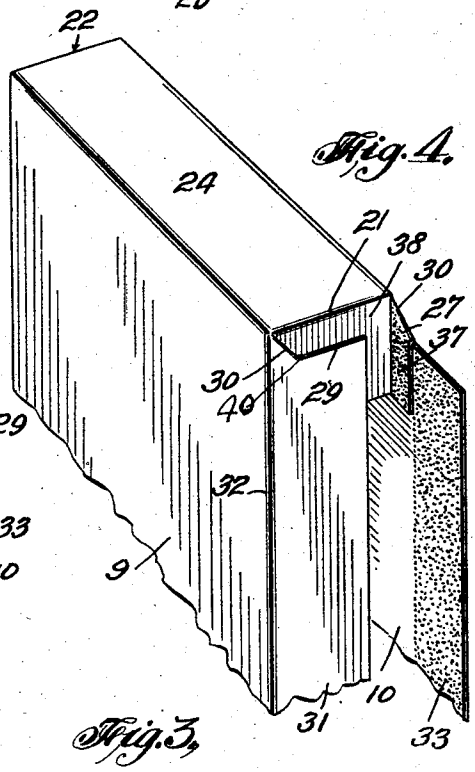


Fig. 4.

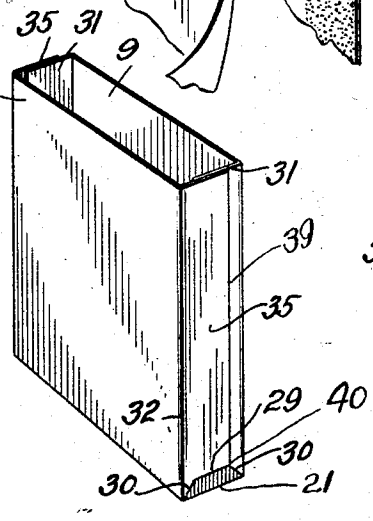


Fig. 5.

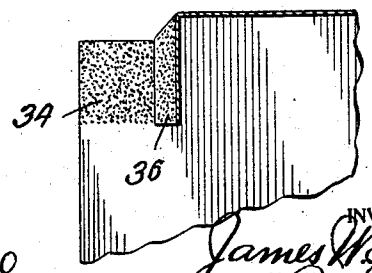


Fig. 3.

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UNITED STATES PATENT OFFICE.

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CARTON.

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The invention relates to an improvement in cartons of the type adapted for use in automatic filling or packaging machines.

Cartons of this type usually comprise a box-like structure rectangular in cross-section, closed at its bottom and open at the top. Such cartons are automatically produced on one machine and then delivered to the filling or packaging machine by which the open top ends of the cartons are closed after the cartons have been filled with tobacco or other commodity. Cartons which are especially adapted for automatic filling with tobacco are usually composed of a single sheet of material without lining. Many efforts have heretofore been made to arrange the folds of the sheet of material out of which the carton is made so that the carton will not leak at the corners.

One object of the present invention is to produce an improved carton of this type the folds of which are so arranged that the carton will not leak at the corners. A further object of the invention is to arrange the folds in such manner that the carton will have a more pleasing appearance than the cartons of this type heretofore produced. Still another object of the invention is to arrange the folds in such a way that the material need not be overlapped as much as is customary at the present time, thereby effecting a saving of material by making it possible to produce a carton of equal capacity from less material. And another object of the invention is to arrange the folds in such a manner that with less overfolded material there will be greater space for the glue, thereby assuring a stronger carton. To these ends the invention consists in the improved carton hereinafter fully described and particularly pointed out in the appended claims.

In the accompanying drawings illustrating the preferred form of the invention, Fig. 1 is a plan of a blank from which the improved carton is produced; Fig. 2 is a perspective view, on an enlarged scale, of the bottom end of the improved carton, showing the condition of the carton after the two ends of the sheet have been folded over to form the sides and the first folds have been made in the two side ends of the carton; Fig. 3 is a section taken along the line 3—3 of Fig. 2; Fig. 4 is a view similar to Fig. 3 showing the condition of one of the ends of the box when the second fold has been laid down on the first fold; and Fig. 5 is a perspective view of the improved carton in condition to be delivered to the automatic filling machine.

In producing the improved carton of the present invention, I take an elongated rectangular sheet of thin cardboard or other like material suitable for the purpose, as indicated at 6. The ends 7 and 8 of the sheet 6 are first folded upon each other to form the sides 9 and 10 of the carton. The ends 7 and 8 are folded along the transverse lines 11 and 12. The distance between the lines 11 and 12 determines the thickness of the carton. The longitudinally extending lines 13 and 14 indicate the points at which the side edges of the blank 6 are turned over to form the overlapping end folds of the carton.

In blanking out the sheet 6 I make four transverse slits 15 in the side edges of the sheet, as shown in Fig. 1. These slits 15, it will be observed, are substantially parallel with the fold lines 11 and 12. It will be further observed that the inner ends 16 of the slits 15 terminate short of the fold lines 13 and 14 and that the distance between the ends 16 of the slits and the fold lines 13 and 14 is substantially equal to the distance between the slits 15 and the adjacent fold lines 11 and 12. These distances may be varied considerably within the scope of the invention. The slits 15 determine the character of the folds at the bottom corners of the box and the distances between the slits 15 and the fold lines 11 and 12 on the one hand, and the distances between the ends 16 of the slits 15 and the fold lines 13 and 14 on the other hand, determine the appearance of the folds at the bottom corners of the carton.

When the ends 7 and 8 of the sheet 6 have been folded upon the transverse lines 11 and 12 to form the sides 9 and 10 of the carton, as indicated in Fig. 2, the next step in the method of producing the improved carton is to turn down or fold over the material occupying the middle portions 18 and 19 between the ends of the lines 11 and 12. The length of the folds made from the areas 18 and 19 is equal to the distance between the line 13 and the side edge 20 of the sheet and between the line 14 and the side edge 21. The middle portions 18 and 19 of the side edges of the sheet 6 thus constitute the first folds in the ends of the carton, being turned

or bent over along the lines 13 and 14, as indicated at 21 and 22 in Fig. 2. Thus the space 23 in Fig. 1 bounded by the lines 11 and 12, on the one hand, and by the lines 13 and 14 on the other, forms the bottom 24 of the carton.

When the middle portions 18 and 19 of the lateral sides of the sheet 6 are turned down to constitute the first folds of the ends of the carton, the material occupied by the spaces 26 on each side of the middle portions 18 and 19 is also turned down, as indicated at 27 in Figs. 2 and 4. The spaces 26 are bounded by the slits 15, the lines 11 and 12, and the diagonal lines 28 extending from the inner ends 16 of the slits 15 to the points where the lines 11 and 12 cross the lines 13 and 14. The folding over of the material occupying the spaces 18 and 19 and the spaces 26 leaves the blank in the condition shown in Fig. 2. It will be observed that the bottom end (shown at the top in Figs. 2 and 4) of each projecting lateral end of the sides 9 and 10 is determined by a slit 15 and a diagonal line 28, the transverse portion 29 of the lower edge being formed by a slit 15 and the oblique portion 30 being formed along a diagonal line 28.

The third step in folding the blank 6 into a carton is to turn over or fold down the lateral projecting edges of one of the sides 9 and 10, as indicated at 31 in Fig. 4, in which figure the front projecting edge of the side 9 is shown folded down upon the first end fold 38. It will now be understood that the distance of the slits 15 from the fold lines 11 and 12 determines the distance from the transverse edges 29 of the folds 31 to the bottom corner edges 21 and 22 of the carton; and that the distance between the inner ends 16 of the slits 15 and the longitudinal fold lines 13 and 14 determines the distance between the outer ends of the transverse edges 29 of the end folds and the side edges 32 of the carton.

After the folds 31 have been turned down in place, as indicated in Fig. 4, the projecting lateral edges 33 of the sides 10 are folded down on top of the folds 31 to form the folds 35. The distance between the slits 15 and the adjacent transverse fold lines 11 and 12, in the form of carton shown in the drawings, is so proportioned to the distance between the fold lines 11 and 12 that when the lateral ends of the sides 9 and 10 of the carton are folded down one upon the other the free end 39 of the fold 35 overlaps the fold 31 as far as the point of junction 40 between the transverse portion 29 and the oblique portion 30 of the lower edge of the fold 31. Thus the lines 21, 29 and 30 at the lower right hand corner in Fig. 5 define a regular trapezoid in which the end lines 30 are equal and slope in opposite directions. The carton is now in the condition illustrated in Fig. 5, and is seen to be an open ended structure suitable for use in automatic filling or packaging machines.

Before the lateral ends or edges of the side 9 are turned down to constitute the folds 31 the inner surface of the upper portion thereof is coated with glue as indicated at 34 in Fig. 3. And in like manner the turned down parts 27 formed from the areas 26 are coated with glue, as indicated at 36 in Fig. 3. The glue covered parts 34 and 36 are folded down against the folds 38 formed from the areas 18 and adhere thereto. Before the projecting lateral edges or ends 33 of the side 10 are folded down on the fold 31 the inner surfaces of the parts 37 and the inner surfaces of the ends 33 are covered with glue, as indicated by the stippled portions in Figs. 2 and 4. It will be observed that the glued area of the ends 33 of the side 10 is as wide as the overlap of the ends 33 on the folds 31, which overlap is indicated in Fig. 5.

It will be understood that by slitting the side edges of the blank 6 to form the transverse edges of the lower ends of the side edges or ends of the sides 9 and 10 to constitute the end folds 31 and 35 of the carton, a larger area for the glue is provided than in cartons of this type as heretofore constructed, with the result that the folds at the lower corners of the carton are thereby made stronger. Moreover by slitting the edges of the blank 6 to provide the transverse bottom ends of the side folds of the carton it is not necessary to overlap the folds 31 and 35 as much as has formerly been the practice, thereby effecting a saving of material. By reference to the lower portion of the right hand end of the finished carton shown in Fig. 5, it will be seen that the folds produced as a result of making the slits 15 are neater and more attractive than those formed by the old methods of folding the material without slitting it.

Having thus described the invention what I claim as new is:—

1. A carton comprising a structure substantially rectangular in cross-section and having an open top, said structure being formed from a single sheet of material folded upon itself once to constitute the bottom and the side walls of the carton, the distance between the transverse fold lines bounding the bottom and side walls determining the thickness of the carton, the side edges of the sheet from which the carton is to be made being provided with four transverse slits, two on each side, extending from the edges of the blank inwardly and terminating short of the longitudinal fold lines which determine the end folds of the carton, said slits being located outside the transverse fold lines and being spaced therefrom a distance substantially equal to the distance between the inner ends

of the slits and the longitudinal fold lines so that when the ends of the carton are folded down one upon another the bottom edge of the outer end fold, a part of the bottom edge of the inner fold and the lower edge of the end of the carton bound a regular trapezoid.

2. A carton comprising a structure open at its top and formed from a single sheet of material folded upon itself once to constitute the bottom and side walls of the carton, the distance between the transverse lines bounding the bottom and side walls determining the thickness of the carton, the side edges of the blank being provided with four transverse slits, two on each side, extending from the edges of the blank inwardly and terminating short of the longitudinal fold lines of the end folds of the carton, said slits being located outside the transverse fold lines a distance substantially equal to the distance between the ends of the slits and the longitudinal fold lines.

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