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TEAR LINE CONSTRUCTION FOR PAPERBOARD CARTONS

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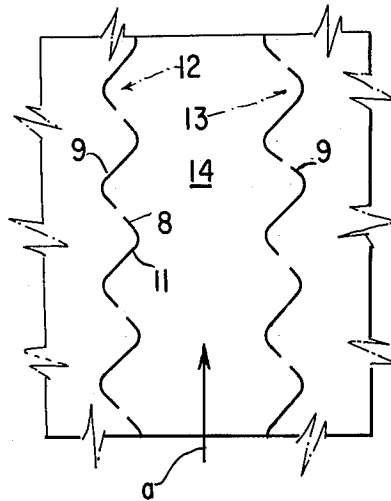


FIG. 2

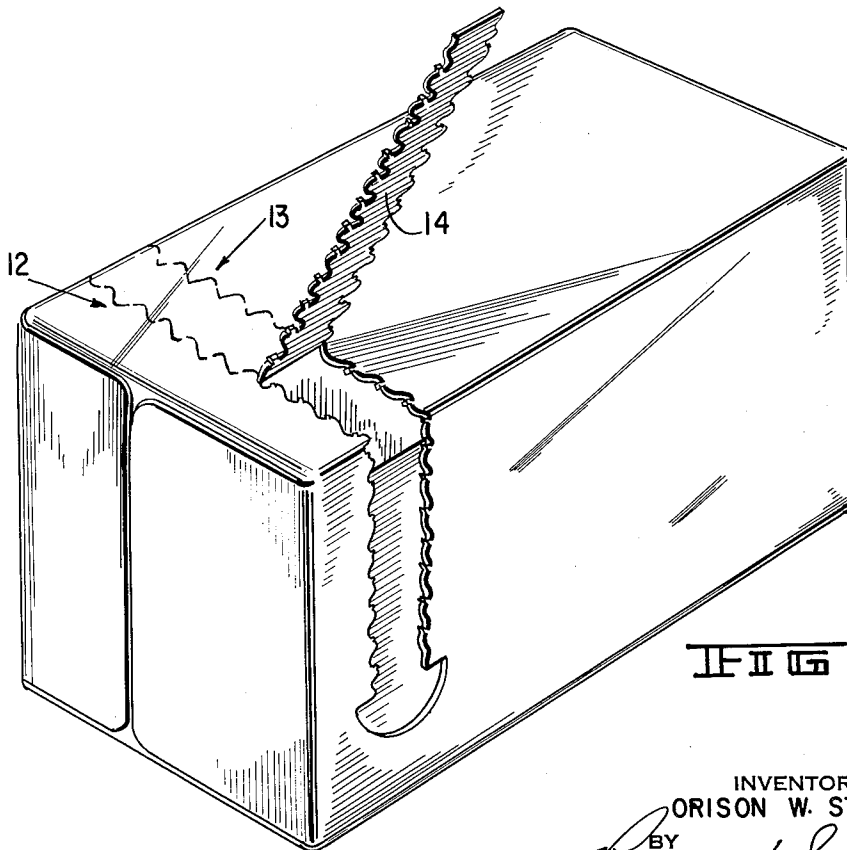


FIG. 1

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TEAR LINE CONSTRUCTION FOR PAPERBOARD CARTONS

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Original application Oct. 25, 1957, Ser. No. 692,431, now Patent No. 3,004,697, dated Oct. 17, 1961. Divided and this application Oct. 16, 1961, Ser. No. 145,081 3 Claims. (Cl. 229—51)

The invention relates to improvements in the construction of tear lines, and more particularly to the configuration and arrangement of tear lines made up of a succession of spaced cut lines knifed into, or through, the paperboard stock. My invention is useful wherever tear lines are employed: for example, along the edge of a cover or cover opening, around the sides of a coupon section, across or around the body of a carton to assist in opening the carton or to form a hinged cover at one end, or along the edges of a tab for a pouring opening or a re-closure, and so on. This application is a division of my copending application Serial No. 692,431, filed October 25, 1957, now Patent No. 3,004,697, granted October 17, 1961.

A common difficulty with tear lines is that the line of tearing will often wander away from the cuts or perforations which are supposed to control the direction, or directions, of tear. Sometimes a succession of cut lines arranged at an angle to the line of tear will be used, but the trouble with this is that there is a tendency to tear away to the outside of the forward ends of such cuts. What may happen is that the paperboard stock will begin to tear at the end of a cut, the line of tear continuing from this point to the outside of its intended course, in which circumstance the actual tear will "miss" the succeeding cut altogether. Once this occurs, the tear goes out of control and may miss a whole series of cuts before getting back on the beam.

I have found that a much more certain control of the direction and course of actual tearing can be secured by arranging a succession of spaced cut lines at an angle to the line of tear, using cut lines which are hooked around in the general direction of the line of tear. With this construction a tear which begins to wander to either side of the forward end of a cut will nevertheless be quite certain to cross the path of the succeeding cut. The effect might be described as one in which wandering of the tear is corrected within the space of two succeeding cuts. Thus the course of tearing is corrected at close intervals, the correction being made quite certain by reason of the special configuration and arrangement of the cuts. The cuts which are "hooked" at their forward ends ("forward" in relation to the direction of tearing) and their rearward ends may be described as having the general configuration of S's or reversed S's. Here we might have S's along one tear line and reverse S's along a second tear line spaced from, and perhaps parallel to the first. The tearing action beginning at the hook at the forward end of the S-cut will be quite certain to cross the path of the next succeeding cut. This is the sine qua non of a perfectly controlled tear line.

With reference to the drawings I shall now describe the best mode contemplated by me for carrying out my invention.

FIG. 1 is a perspective view of a carton to illustrate how my improved tear line construction can be applied to a tear-out strip extending around one or more sides of the carton.

FIG. 2 is an enlarged view of a section of the tear-

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out band and adjacent portions of the side wall of the carton of FIG. 1.

In the construction shown, there are spaced tear lines 12 and 13 each comprising a succession of spaced cut lines 8 arranged at an angle to the line of tear and having hooked forward ends 9 and rearward ends 11. Notice that the ends 9 are hooked around in the general direction of the line of tear; and that when tear-out strip 14 is broken out and away from the sides of the carton, and is pulled up and over as shown in FIG. 2, the hooked ends 9 are effective to control the course of tearing so that it will cross the path of each succeeding cut line. This will be explained more exactly with reference to FIG. 2 in which the arrow *a* represents, diagrammatically, the direction of pull.

The cut lines 8 have been described as having ends 9 hooked around in the general direction of the line of tear. These cut lines are characterized by the fact that the end portions 9 of each is turned in toward an adjacent end portion of the succeeding cut line. As shown in FIGS. 1 and 2, the opposite end portion 11 of each cut line is turned in the opposite direction. This results in a tear line construction 12 which may be described as comprising a succession of similarly disposed spaced cut lines of the general configuration of S's or, defining S as being inclusive of its mirror image, this will include also the tear line construction 13 in which the S's are reversed. In either case 12 or case 13, the forward end 9 of each cut is hooked around in the general direction of the line of tear and is turned in toward an adjacent end portion of the succeeding cut lines while the opposite end portion of each cut is turned in the opposite direction. Thus the parallel spaced tear lines 12 and 13 of the construction shown in FIG. 2 which are complementary are utilized to provide a tear-out strip 14 extending around three sides of the carton.

The terms and expressions which I have employed are used in a descriptive and not a limiting sense, and I have no intention of excluding such equivalents of the invention described, or of portions thereof, as fall within the scope of the claims.

I claim:

1. Tear line construction for paperboard cartons which comprises a succession of similarly disposed spaced cut lines of the general configuration of S's, S being defined as inclusive of its mirror image, each end portion of each of said cut lines being directed toward the adjacent end portion of the succeeding cut line.

2. Tear line construction according to claim 1 in which there are two spaced tear lines each comprising a succession of cut lines as defined, the cut lines comprised in one of the tear lines being of the general configuration of S's, and those of the other tear lines being of the general configuration of S's as seen in mirror image.

3. In a carton made of paperboard stock, a tear line which comprises a succession of similarly disposed spaced cut lines of the general configuration of S's arranged along a line of tear and in which the hooked portions forming the end portions of the S's are located at the forward and rearward ends of the cut lines (i.e. "forward" in relation to the direction of tearing) with the ends of each hooked portion extending at an angle of approximately forty-five degrees to the line of tear and in line with the adjacent end of the hooked portion adjacent thereto.

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