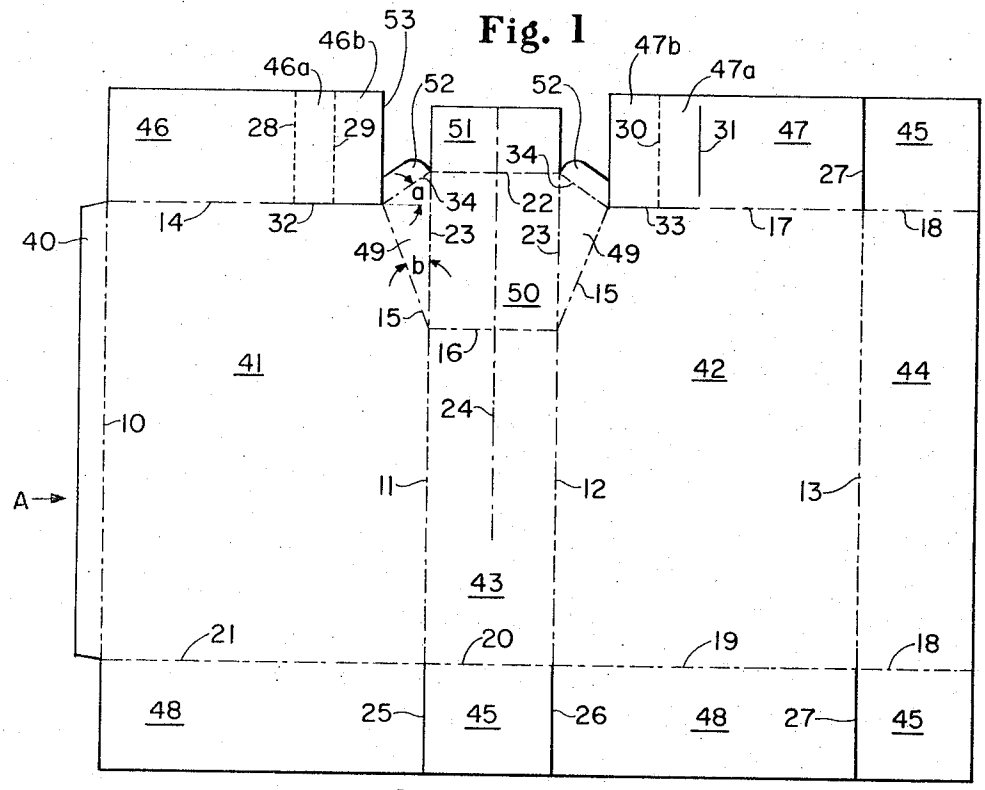
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DISPENSING CARTON

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Fig. 1



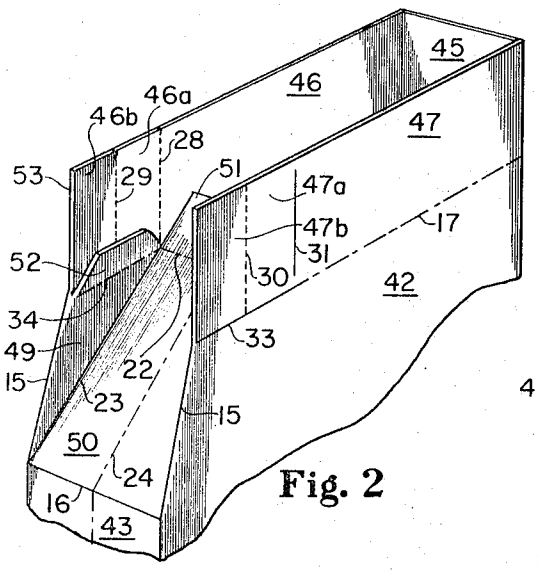


Fig. 2

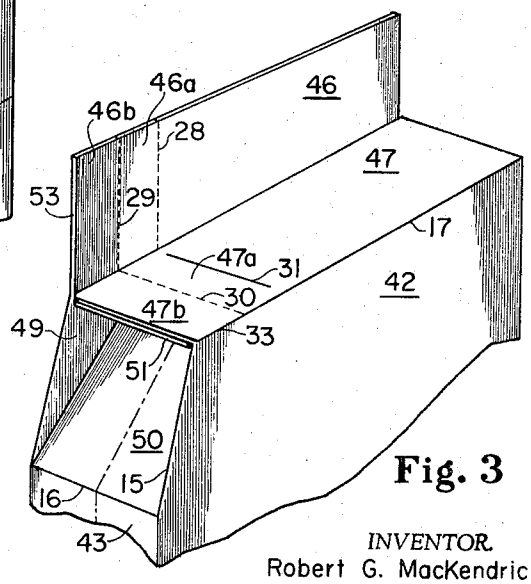


Fig. 3

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Fig. 4

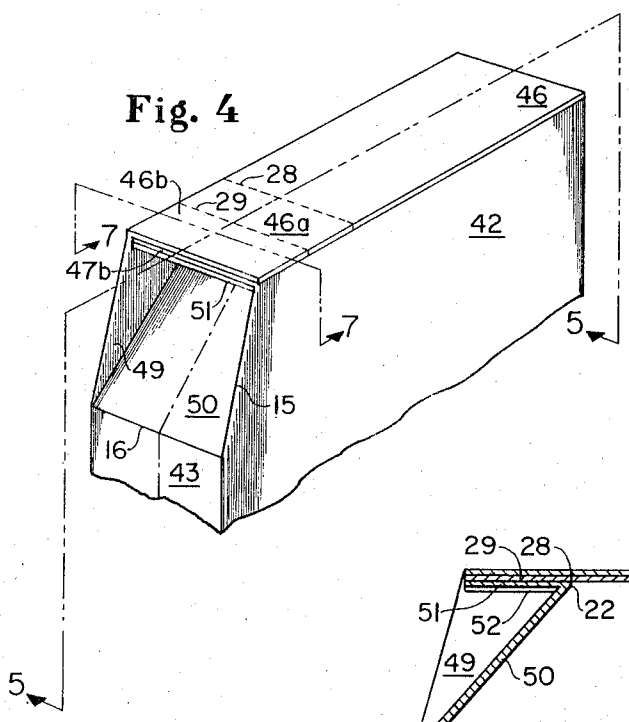


Fig. 5

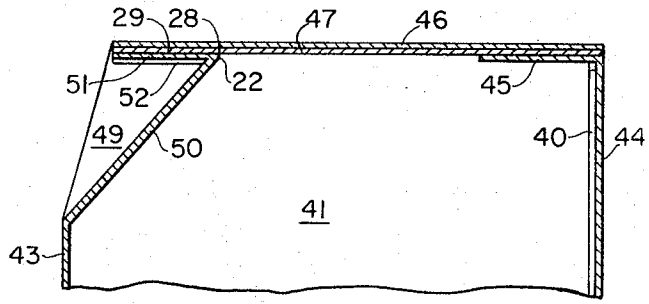


Fig. 6

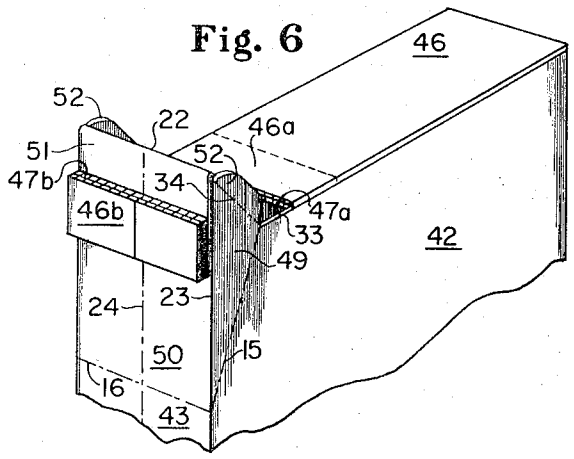
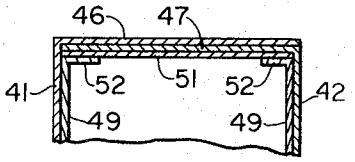


Fig. 7



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3,306,514

DISPENSING CARTON

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Filed Apr. 13, 1965, Ser. No. 447,683
1 Claim. (Cl. 229—17)

This invention relates to an improvement in cartons. More particularly it relates to an improved dispensing carton having an extensible, reclosable pouring spout and being particularly advantageous for packaging and dispensing dry, flowable products.

Cartons adapted for packaging powdered, flaked, or granular products generally have provisions for an opening near the upper side edge of the carton. These provisions usually involve scores and perforations of various types. The usual type found on cartons containing soap powders or detergent granules is shown in U.S. Patent 2,039,437, issued May 5, 1936, to Jack H. Moore. The part of the carton having the perforations is depressed to break the perforations and, together with a portion of the top of the carton, is torn back to form a pouring opening. Although generally satisfactory, this type of pouring opening is sometimes blocked by the top flap, thereby making dispensing difficult. In addition, it is virtually impossible to reclose the carton in order to protect its contents.

A dispensing carton having an integral pouring spout which is also reclosable is described in U.S. Patent Re. 25,532, reissued on March 10, 1964, to Norman J. Asman. This carton is particularly adapted for conveniently dispensing dry, flowable products. However, when dry, powdered products or products having fine granules are packaged therein, the carton tends to permit leakage or "sifting" at the junction of the pouring spout and the carton body.

Accordingly, it is a principal object of this invention to provide an improved dispensing carton which does not "sift" when filled with a finely powdered material.

Another object of the invention is to provide a sift-proof dispensing carton which is capable of being reclosed.

Briefly stated, in accordance with one aspect of the invention, a carton is provided with an integral pouring spout formed from the upper part of a side panel and from the corresponding corners of each of the main panels. The side panel of the carton forms the front panel of the pouring spout and the portions of the main panels form the side panels of the spout. The spout so formed is hingedly attached to the carton by scorelines so as to be reclosable by folding the carton side panel inwardly toward the inside of the carton whereupon the spout side panels also fold inwardly and lie in superposed relationship with the main panels. In order to prevent leakage at the junction of the spout side panels and the corresponding edges defined by the carton top panel and main panel, sealing flaps are incorporated on the spout side panels, which flaps bear against the carton top when the spout is closed and thereby provide a seal to preclude product loss from around the spout side panels.

While the specification concludes with a claim particularly pointing out and distinctly claiming the subject matter regarded as forming the present invention, it is believed the invention will be better understood from the following description taken in connection with the accompanying drawings in which:

FIGURE 1 is a plan view of an integral blank suitably cut and scored to form a dispensing carton;

FIGURE 2 is a perspective view, partially cut away, of the blank of FIGURE 1 partially set up and glued to form a carton shell;

FIGURE 3 is a perspective view, similar to FIGURE 2 showing a further stage in forming the completed carton;

FIGURE 4 is a perspective view, partially cut away, of the completed carton;

FIGURE 5 is a cross-sectional view of the completed carton, taken along the line 5—5 of FIGURE 4;

FIGURE 6 is a perspective view, partially cut away, of the carton with the dispensing spout extended for pouring of the contained product; and

FIGURE 7 is a cross-section of the completed carton taken along the line 7—7 of FIGURE 4.

Referring first to FIGURE 1, the carton is made of a single foldable blank A of flexible material such as paperboard. The blank A is divided by score lines **10–23** and **34**, cut lines **25–27** and cut-score lines **32, 33** into hingedly connected panels and flaps, including glue flap **40**, main panels **41** and **42**, side panels **43** and **44**, dust flaps **45**, end closure flaps **46–48**, spout side panels **49**, spout front panel **50**, spout tab **51**, and spout sealing flaps **52**.

End closure flaps **46** and **47** have lines of weakening impressed therein, such as perforation lines **28–30** and cut-score line **31** which may or may not, as desired, terminate short of the edges of flap **47**. These lines provide marginal portions **46***a*, **46***b*, **47***a* and **47***b*, which facilitate opening the spout of the closed set-up carton, as will be described in more detail hereinafter.

The blank A is formed into a glued carton shell by folding flap **40** and panel **41** about score line **11** to overlie panels **43** and **42**, applying adhesive to the exposed surface of flap **40**, and then folding panel **44** about score line **13** to overlie the adhesive surface of flap **40** and become adhered thereto. In such condition, the shell economically may be shipped to the product packager for set-up, filling and closing.

FIGURE 2 depicts an initial stage in closing the top of the carton. In forming the carton from the glued shell previously described, the shell is squared to position the panels **41, 43, 42** and **44** consecutively at right angles to each other. Spout front panel **50** hingedly connected along terminating score line **16** is pressed inwardly so that spout side panels **49** lie in superposed relationship with and inwardly of main panels **41** and **42** and spout sealing flaps **52** lie in superposed relationship with and inwardly of top panels **46** and **47**. As shown in FIGURE 2, the spout front panel **50** lies inwardly of score lines **15** and is hingedly attached to the spout side panels **49** along score lines **23** and to side panel **43** along score line **16**.

Spout sealing flaps **52** are folded downwardly along score lines **34** to lie parallel to a plane containing score lines **14** and **17**. Spout tab **51** is then folded outwardly along score line **22** to overlie spout sealing flaps **52** and parallel to the top edges of main panels **41, 42** as defined by score lines **14** and **17**, and dust flap **45** is folded inwardly along score line **18** to lie parallel to the top edges of the main panels. An adhesive is applied to the exposed upper surface of flap **45** and to the inside of marginal portion **47***b*, and end closure flap **47** is then folded inwardly in superposed relationship on spout tab **51** and dust flap **45** and is adhered thereto, as shown in FIGURE 3. Closure of the top of the carton is completed by applying adhesive to the exposed upper surface of flap **47**, and folding flap **46** over in adhering relation therewith. The completed top closure thus formed is shown in FIGURES 4, 5 and 7. After the top of the carton is assembled, sifting of the product around side panels **49** is prevented by spout sealing flaps **52** which act to seal the joint formed by the edge of spout tab **51** and top panel **47**. This is accomplished by the sealing flaps **52** bearing on the bottom of spout tab **51** with sufficient pressure to form

a positive seal which prevents leakage of granular material from the carton along the upper edge of each spout side panel. This seal is effected without the use of adhesive.

The carton, having the top closed as just described, may then be filled with the product to be packaged by pouring or otherwise inserting the product through the unclosed bottom of the carton. The bottom may then be closed conventionally, by consecutively infolding flaps **45** and **48**, with the one flap **48** superposed over and adhered to the other flap **48**.

Referring also to FIGURE 6, in opening the carton the spout tab **51** and the glued portions **46***a*, **46***b*, **47***a* and **47***b* of the end closure flaps overlying it are pulled upward, causing a tearing action along cut-score lines **32** and **33**, terminating at perforation line **28**, and cut-score line **31**. The spout tab **51** and the overlying glued portions **46***b* and **47***b* of the end closure flaps are then pulled outwardly away from perforation lines **28** and **29**. This causes a tearing action along perforation lines **29** and **30** leaving portions **46***b* and **47***b* of the glued end closure flaps attached to the spout tab and free from the remainder of the end closure flaps. Tearing action occurs along perforation lines **29** and **30** rather than along perforation line **28** and cut-score line **31** since the bond is weaker along the first mentioned lines and also since the end of spout tab **51** is adhered to marginal portion **47***b* but not to marginal portion **47***a*. The spout may then be fully extended with the spout front panel **50** lying in a line with side panel **43**, as shown in FIGURE 6. Spout side panels **49** provide a toggle action which tends to maintain the spout in open or extended position. The spout tab **51** can then be folded down outwardly to lie superposed on the spout front panel **50**. Pressing the spout side panels **49** toward each other forces the spout front panel **50** to bend outwardly along score line **24**, contributing further to the formation of a spout-like construction and thus facilitating pouring of the contents from the carton. Portions **46***a* and **47***a* of the end closure flaps overlie the edges **32** and **33** of the main panels. These portions serve to restrict the size of the pouring or dispensing opening and to help close the opening when the spout is reclosed as hereinafter described.

The carton is reclosed by releasing the pressure on spout side panels **49**, lifting spout tab **51** until it is essentially perpendicular to the spout front panel **50** and pressing inwardly on the center of spout front panel **50**. When the spout is partially closed, the toggle action of spout side panels **49** completes the closure and maintains the spout in recessed position essentially as shown in FIGURE 4.

Several elements of the design are critical to the proper formation and function of the carton, among which are the angular relationships present in the geometry of the spout panels and the presence of spout sealing flaps **52** to prevent sifting. In the closed carton the upper edge of the spout front as defined by score lines **22** should extend to the intersection of perforated line **28** and partial cut line **31** with the top edges of the main panels **41**, **42** defined by score lines **14** and **17**, respectively. In order to obtain this relationship, and also have the spout front panel **50** co-planar with side panel **43** when the spout is fully extended, a particular relationship between the angles in the spout side panels must be employed. As shown in FIGURE 1, the angle formed by score lines **23** (comprising extensions of score lines **11** and **12**, respectively), and **15** is indicated by *b* and the angle between the upper score lines **34** of the spout side panels **49** and an extension of top edges **14**, **17** of main panels **41** and **42**, respectively, is denoted by *a*. With the spout closed, the angle formed by spout front panel **50** with an extension of side panel **43**, i.e., the angle formed by a plane containing score lines **23** and a plane containing extensions of score lines **11** and **12**, consequently will be $2b$.

Angles *a* and *b* must bear a definite relationship to each other to assure proper formation of the carton. Since the angle defined by edge **53** and the extension of cut-score **32** is a right angle, the angle formed by edge **53** and score line **34** is therefore $(90°-a)$ since the latter angle and angle *a* are complementary. The angle formed by the extension of score line **15** and edge **53** is equal to *b* since the corresponding sides of these angles are parallel. In forming the carton, spout side panel **49** is, in effect, rotated about score line **15** as an axis and therefore in order for score line **34** to be juxtaposed to cut score **32** when spout side panel **49** is folded in to lie superposed on main panel **41**, the angle formed by score line **34** and the extension of score line **15** must be equal to the angle formed by cut score **32** and the extension of score line **15**. Since the angle formed by the extension of score line **15** and edge **53** is equal to *b* as demonstrated above, the angle formed by cut score **32** and the extension of score line **15** must be $(90°-b)$ since these two angles are complementary. Equating the latter angle, i.e. $(90°-b)$, with the angle formed by score line **34** and score line **15** extended, i.e., $(90°-a+b)$, and solving this equation for *a* gives the result that *a* is equal to $2b$. The use of this angular relationship insures the desired fit of the spout to the carton when in opened and closed position. A suitable set of angles would be 22°23′ for *b* and 45° for *a* although other pairs of angles may be employed, i.e., 30° and 60°. Based on interrelated considerations such as the amount of board used in the carton, the size of the opening, and ease of opening and reclosing the carton, the use of 22°30′ and 45° angles is preferred. Obviously, since both sides of the spout are identical in construction the aforementioned relationship holds true for either side.

Although score lines **34** are juxtaposed to cut score lines **32** and **33**, the differences in mass assembly of cartons permits leakage of product from around the spout. This sifting of product around the spout of a formed carton is effectively prevented by spout sealing flaps **52** which serve to provide a positive seal at the junction of the upper edge of the spout side panels **49** and cut score lines **32** and **33**.

If the carton is to be completely emptied at the time it is first opened, the portions **46***a*, **46***b*, **47***a* and **47***b* of the end closure flaps may be integrally glued together and to tab **51** so that the tearing of the end closure flaps takes place at perforation line **28** and cut-score line **31**, thereby providing a larger dispensing opening.

The present invention provides a carton construction incorporating a convenient pour spout. The carton requires a minimum of paperboard stock and can be readily set up, filled with the commodity to be packaged and sealed by automatic machinery. The carton has ample strength to withstand shipping and handling without leakage of product contained therein or premature opening, and the design of the spout opening is such that the spout readily assumes its original position upon closing. Any conventional end closure means, such as that illustrated and described, may be employed on the end of the carton opposite the spout as those means do not constitute an inventive feature. It is to be understood that the size and shape of the carton and the material from which it is formed may be varied in numerous ways by those skilled in the art without departing from the spirit of the invention.

What is claimed as new is:

A reclosable dispensing carton formed of a single blank suitably cut and scored to provide a pair of opposed main panels, each of said panels having one of a pair of opposed edge-defining biased score lines extending from a lateral to a top edge near one corner thereof; a pair of opposed side panels hingedly connected to the lateral edges of said main panels, one of said side panels terminating in a score line at the point where said biased score lines intersect said lateral edges; a pair of bottom

closure flaps hingedly connected to adjacent ends of said main panels; a pair of top closure flaps hingedly connected to adjacent ends of said main panels; a spout front panel hingedly connected to said one side panel along said terminating score line; a pair of opposed spout side panels each being superposed against and between said main panels and each hingedly connected along one edge to the edge of one of said main panels along said biased score lines, and hingedly connected along another edge to said spout front panel; a spout tab hingedly connected to the upper edge of said spout front panel lying in subposed relationship under and adhered to one of said top closure flaps and extending approximately to the upper termini of said biased score lines; a sealing flap hingedly connected to the upper edge of each of said opposed spout side panels, said sealing flaps positioned in underlying relationship to said spout tab and in non-adhesive contiguity therewith so that each sealing flap bears on the bottom of the spout tab along the conjunction of the spout side panel and the spout tab with sufficient pressure to form a seal which prevents

leakage of granular material from the carton along the upper edge of each spout side panel; said spout front panel forming an angle with an extension of said one side panel twice that of the angle formed by said biased score lines and said extension; and lines of weakness in said top closure flaps and along the score lines connecting said top closure flaps and said main panels to facilitate tearing to open the spout; said spout in opened position having said spout front panel and spout side panels lying coplanarly with said one side panel and said main panels respectively.

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