Aug. 18, 1964 N. J. ASMAN 3,144,978

CARTON

Filed July 20, 1962 2 Sheets-Sheet 1

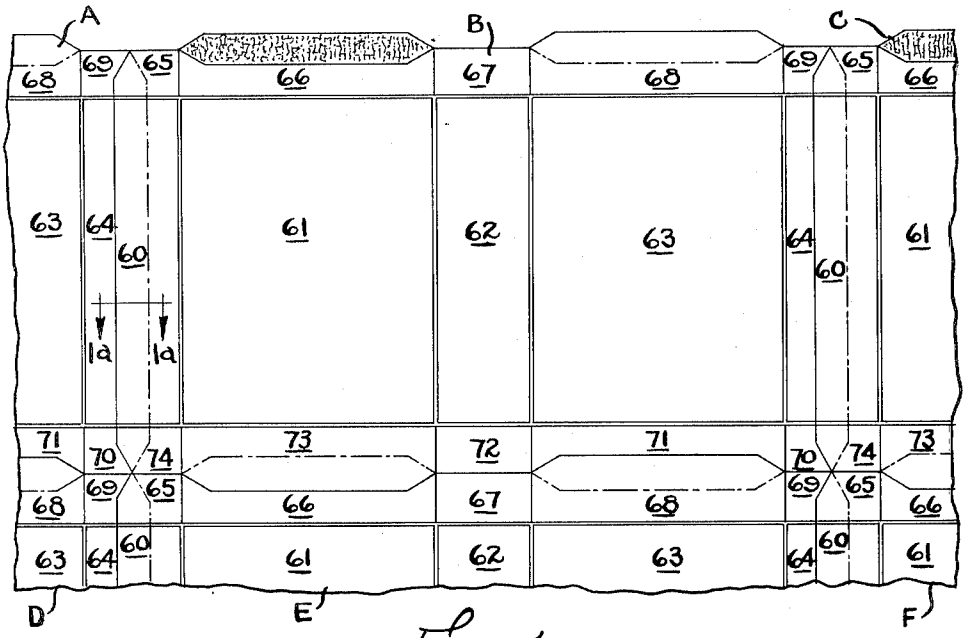


Fig. 1

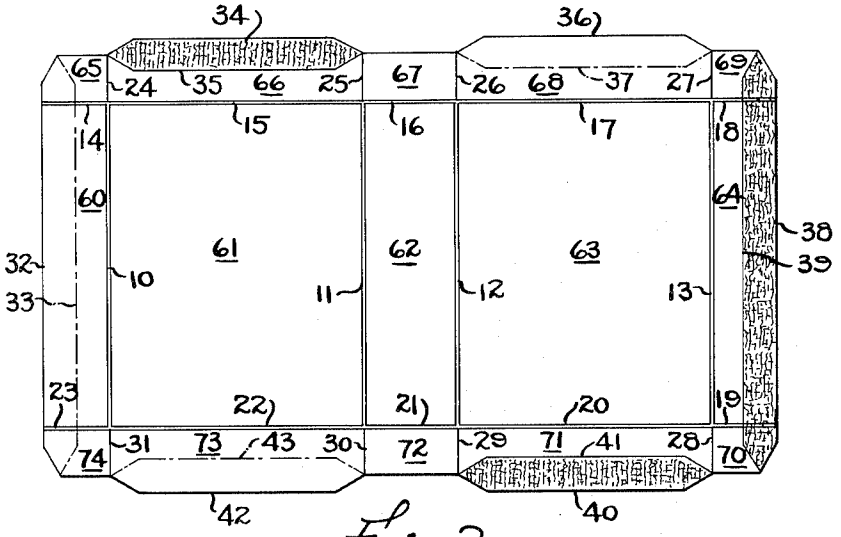


Fig. 2

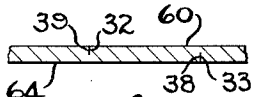


Fig. 1a

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CARTON

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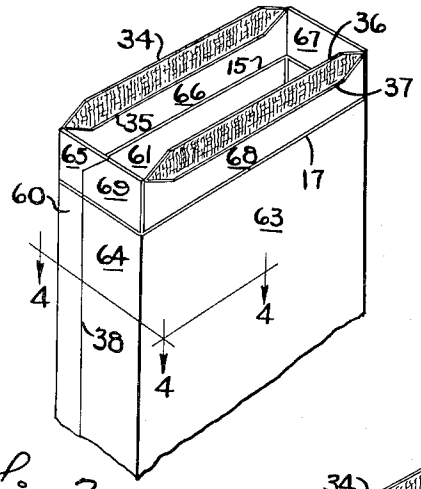


Fig. 3

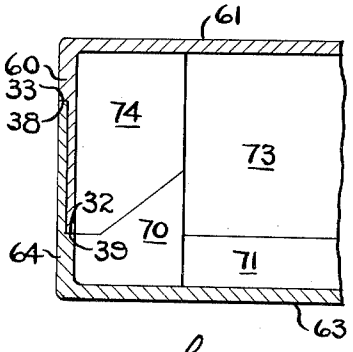


Fig. 4

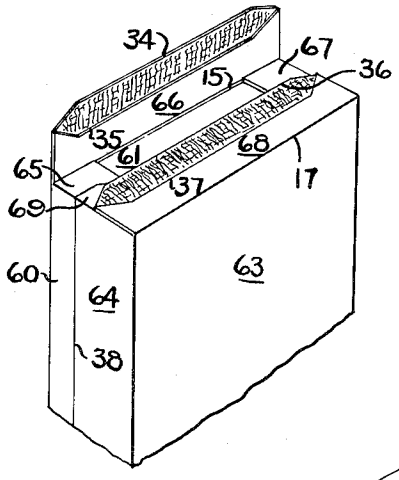


Fig. 5

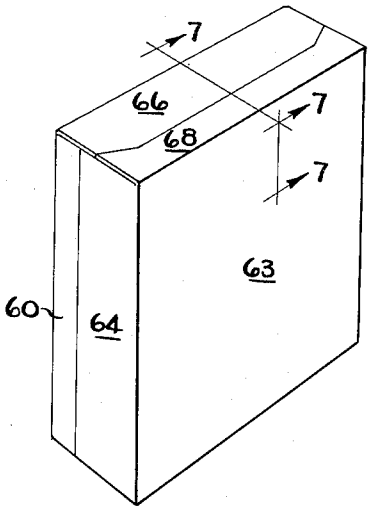


Fig. 6

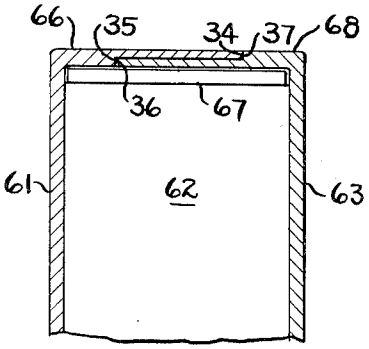


Fig. 7

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United States Patent Office 3,144,978 Patented Aug. 18, 1964

3,144,978
CARTON

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Filed July 20, 1962, Ser. No. 211,287
6 Claims. (Cl. 229—37)

This invention relates to a tamperproof carton which can be made from a single blank of a type suitable for a variety of uses, such as the packaging of food products, and the method of producing said carton. More specifically, the invention may be used for making siftproof packages of foods, such as powdered cake mixes.

Granular or powdered foods are packaged customarily in a carton having an inner liner material or separate pouch to prevent the commodity from escaping through the end edges or corners of the carton. Unless an inner liner or pouch is employed, the product may escape through openings created by the overlapping of the closure elements. This type of package has several economic drawbacks. The cartons are more expensive to produce, not only because of the additional material required for the liner or pouch, but also because of the cost of inserting the material either as a liner or as a commodity-containing pouch. Further, the double thickness of carton material accompanying the overlapping of the closure flaps increases the cost of the carton. From the standpoint of economy of operation, it is therefore desirable to produce sealed tamperproof cartons from blanks that can be perfectly dovetailed when laid out on a sheet, and which do not require an inner liner or pouch to render them siftproof.

It is therefore an object of the present invention to provide a tamperproof carton that can be produced from a carton blank which is perfectly dovetailed with immediately adjacent carton blanks in layout prior to the separation of the individual blanks.

Yet another object of the present invention is to provide a sealed carton which requires no inner liner or pouch to render it essentially siftproof.

Still another object of the present invention is to provide a method of producing from a dovetailed blank sealed, tamperproof cartons which are essentially siftproof.

A further object of the present invention is to provide a carton having two opposed overlapping elements sealed together with the resulting thickness through the overlapping area of the elements being equal to the thickness of either of the elements adjacent over the lapping area.

Another object of the present invention is to provide a dovetailed layout of the carton blanks in which a single thickness of the flexible carton material provides a portion of a flap or panel element for each of two immediately adjacent carton blanks.

Still another object is to provide a carton which can be readily set up and closed by automatic equipment.

According to the present invention, a carton is produced from a completely dovetailed blank, having at least one pair of closure elements which coact to close one side or end of the finished carton, each of said elements having a portion approximately one half of the thickness of the element removed with the removed portions being essentially equal in area to each other. The combined

thickness of the elements in the set up carton, when the areas having the portions removed are overlapped, is essentially equal to the thickness of either of the aforementioned elements in the area adjacent the removed portions.

Further details, advantages and objects of the invention will be apparent from the following specification and accompanying drawings wherein:

FIGURE 1 is a plan view of a fragment of a continuous web suitably cut and scored to form a plurality of successive mating or dovetailed carton blanks,

FIGURE 1*a* is a partial section of the web of carton blanks taken along line 1*a*—1*a* of FIGURE 1,

FIGURE 2 is a plan view of blank B of FIGURE 1 separated from the surrounding blanks,

FIGURE 3 is a fragmental perspective view of the blank shown in FIGURE 2 partially set up,

FIGURE 4 is a partial sectional view of the partially set up carton with the bottom closed taken along line 4—4 of FIGURE 3,

FIGURE 5 is a fragmental perspective view similar to FIGURE 3, showing a further stage in forming the completed carton,

FIGURE 6 is a perspective view of the completed carton, and

FIGURE 7 is a partial sectional view of the closed carton taken along line 7—7 of FIGURE 6.

Referring first to FIGURE 1, a fragmental portion of a web of flexible sheet material, such as paperboard, which has been suitably cut and scored is shown. The web is divided by said cutting and scoring into blanks A, B, C, D, E and F which are located in adjacent relationship with no waste or broke between adjoining blanks. Each of the blanks is identical with all of the other blanks and has the same corresponding elements. Although the blanks shown in FIGURE 1 are interconnected, all of the edges found in a single blank are shown. For instance, the edges 32, 34, 36, 38, 40 and 42 found in FIGURE 2, which shows blank B of FIGURE 1 separated from the other blanks, define the points of connection between the adjacent blanks. FIGURE 1*a* which is a fragmental section through the web shows the connecting portion between blanks A and B and is representative of the areas adjacent the other hereinbefore mentioned edges. The web in this area has two offset cut lines extending approximately half way through the sheet material from opposite sides of the web. Each cut line defines a pair of edges in face to face relationship, i.e. 32 and 39 on the upper side of the web, 33 and 38 on the lower side.

The blanks A, B, C, D, E and F are separated along the connected edges by shearing or peeling the carton material from the inner end of one of the cut lines extending half way through the sheet material to the inner end of the cut line extending into the sheet from the opposite side. For example, in FIGURE 1*a*, the separation is along a plane essentially parallel to the surfaces of the blank and which passes through the inner ends of the cut lines. As is readily apparent, the thickness of the separated blanks in the areas adjacent the edges 32, 34, 36, 38, 40 and 42 is essentialy one half the thickness of the remainder of the blank and of the same density as the original blank. A substantial economy in carton material is made possible by the use of the same portions of

carton material to provide separate portions of two different flaps. In customary carton construction *each* of the end panels is usually either coextensive or nearly coextensive in area with the end opening and are of full thickness throughout. It is to be noted that the free upper edge of the blanks in the web shown in FIGURE 1 would ordinarily either have other blanks or waste connected thereto. The additional blanks or waste has been omitted to facilitate description of the layout of blanks and interconnection thereof.

Blank B, shown in FIGURE 2, is representative of the individual separated blanks shown in FIGURE 1. The blank is divided by score lines 14–23 and cut lines 24–31 into hingedly connected panels and flaps including side panels **60**, **62** and **64**, main panels **61** and **63**, dust flaps **65**, **67**, **69**, **70**, **72** and **74**, and end panels **66**, **68**, **71** and **73**. Side panels **60** and **64** and end panels **66**, **68**, **71** and **73** are actually closure panels since they cooperate to form a composite panel to close the carton. Each of the closure or side and end panels has an offset inner edge and outer edge because of the difference in thickness of the adjacent portions of the panels. Similarly, dust flaps **65**, **69**, **70** and **74** have areas of varying thickness. The marginal portion located between the inner and outer edges of one side panel as well as the marginal portions of the adjoining dust flaps cooperate with the marginal portions of the side panel and adjoining dust flaps on the opposite edge of the blank when overlapped to form a composite panel of essentially uniform thickness. Similarly, the marginal portions of the end panels on a common edge of the carton blank combine when overlapped to form a composite panel of essentially uniform thickness as described more fully below. It is important from the standpoint of appearance as well as siftproofness that cooperating marginal portions be of the same configuration.

The blank B is formed into a glued carton shell by applying adhesive to the marginal portions of side panel **64** and dust flaps **69** and **70** defined by inner edge **39** and outer edge **38**, infolding main panel **61** about score line **11** to lie directly superposed on main wall **63**, infolding side panel **64** and the attached dust flaps **69** and **70** about score line **13**, and adhering the adhesive bearing marginal portions to the underlying marginal portions of side panel **60** and dust flaps **65** and **74** defined by edges **32** and **33**. In such condition, the shell may be shipped economically to the product packager for set up, filling and closing.

FIGURE 3 depicts an initial stage in which the carton is squared and ready for filling. When the shell is squared panels **61**, **62**, **63** and the composite panel formed by panels **60** and **64** are positioned consecutively at right angles to each other. FIGURE 3 shows in section the composite panel formed of side panels **60** and **64**. In the composite panel inner edge **33** of side panel **60** abuts outer edge **38** of side panel **64**. Similarly, outer edge **32** of side panel **60** abuts the inner edge **39** of side panel **64**. The dust flaps **70** and **74** with overlapped marginal portions are shown in FIGURE 4 folded inwardly perpendicular to the side panels. The abutment of adjacent edges is dependent upon the marginal portions of the side panels **60** and **64** being of the same configuration.

Since the closing steps are the same for both ends of the carton, reference is had to closing just one end of the carton. The end of the carton shown in FIGURE 4 has been previously closed. In closing the other end, dust flap **67** and the composite dust flap composed of overlapped dust flaps **65** and **69** are folded inwardly about their respective score lines connecting them to the side panels to lie perpendicular to the side panels. Next end panel **68** is infolded about score line **17** to lie superposed on dust flaps **65**, **67** and **69** in a position perpendicular to the main walls **61** and **63**, as shown in FIGURE 5. The closure is completed by applying adhesive to the inner surface of the marginal portion of end panel **66**, defined by edges **34** and **35**, and infolding panel **66** about score line **15** to overlie and become adhered to the underlying marginal portion of end panel **68** defined by edges **36** and **37**. FIGURE 6 shows the completed sealed carton.

FIGURE 7 shows in section the end closure of the completed carton. The inner and outer edges of end panels **66** and **68** from abutting pairs of edges in which edge **34** abuts edge **37** and edge **35** abuts edge **36**. Again, as in the composite side panel construction, the marginal portions overlap so that the composite panel has a single uniform thickness. Because of the uniform thickness of the composite panels and the fact that the inner and outer surfaces of the composite panels are defined by a single pair of planes, the space usually found between the end panels and the dust flaps due to the overlapping of the end panels is eliminated. In ordinary cartons the thickness of the carton wall in the area of overlapping is usually twice the thickness of the carton material. The double thickness is undesirable since it destroys siftproofness (if the carton is unlined), presents an uneven printing surface and increases the amount of material required.

It is apparent that the carton can be made siftproof by applying adhesive to the outer surfaces of the dust flaps so that the inner surfaces of the end panels become adhered thereto. Such a carton is completely tamperproof since an entry cannot be made without a tearing of the carton elements. If desired, the composite panel construction according to the present invention can be utilized on either the side panel or end panels alone. For instance, the composite side panel construction may be employed in the carton shown in U.S. Patent No. 3,037,681. The resulting carton, although not siftproof and requiring more carton material, still effects an economy of carton material over conventional cartons employing overlapping full thickness panels.

The present invention provides an economy tamperproof carton which can be produced readily on automatic machinery from an integral blank. The initial dovetailed composite layout of the carton blank provides an economy of material not only due to the dovetailing, thereby eliminating broke and the necessity of removing it, but also because one thickness of carton material produces elements for two adjacent blanks. The carton constructed from the dovetailed blanks can be made siftproof readily without the use of a separate line or pouch. Furthermore, the over-all appearance of the finished carton is markedly improved since there is no raw edge of board resulting from overlapping of carton elements.

It is to be understood that the description of the construction given is merely illustrative and may be varied or modified, such variations being intended to be included within the scope of the appended claims.

I claim:

1. A composite layout of dovetailed attached carton blanks comprising a plurality of blanks defined by cut lines and score lines; each of said blanks including (1) a pair of main panels hingedly connected along one edge by an intervening side panel (2) a pair of closure panels extending from corresponding edges of said main panels having their remote edges on each side of the blank being defined by partial cut lines extending halfway through the thickness of the carton blank, the edge defining partial cut lines on one side of the blank being offset from the edge defining partial cut lines on the other side of the blank.

2. The layout of claim 1 wherein in each blank the offset between the edge defining partial cut lines of one closure panel extending from one main panel is essentially equal to the offset in the closure panel extending from the corresponding edge of the other main panel.

3. The layout of claim 2 wherein in each blank the outermost edge defining partial cut line of said one closure panel is on the opposite side of the layout from the outermost edge defining partial cut line of the closure panel extending from said corresponding edge.

4. A composite layout of dovetailed attached carton blanks comprising a plurality of blanks defined by cut

lines and score lines; each of said blanks having (1) a pair of main panels hingedly connected along one edge by an intervening side panel (2) closure panels extending from the remaining edges of each of said main panels having their remote edges on each side of the blank being defined by partial cut lines extending halfway through the thickness of the carton blank, the edge defining partial cut lines on one side of the blank being offset from the edge defining partial cut lines on the other side of the blank.

5. The layout of claim 4 wherein the offset between the edge defining partial cut lines of one closure panel extending from one main panel is essentially equal to the offset in the closure panel extending from a corresponding edge of the other main panel.

6. The layout of claim 5 wherein the outermost edge defining partial cut line of said one closure panel is on the opposite side of the layout from the outermost edge defining partial cut line of the closure panel extending from said corresponding edge.

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