Jan. 12, 1965 E. P. ADAMS ETAL 3,165,253

CARTON CONSTRUCTION AND METHOD OF CLOSING

Filed Sept. 5, 1961 4 Sheets-Sheet 1

FIG-1

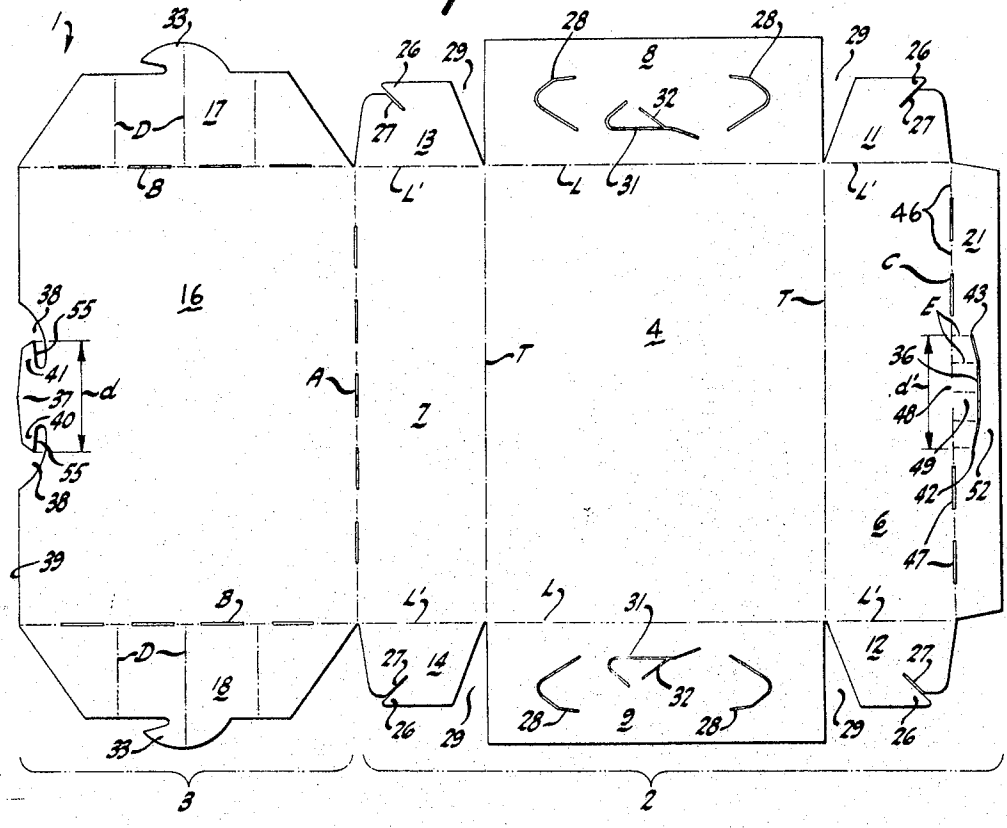
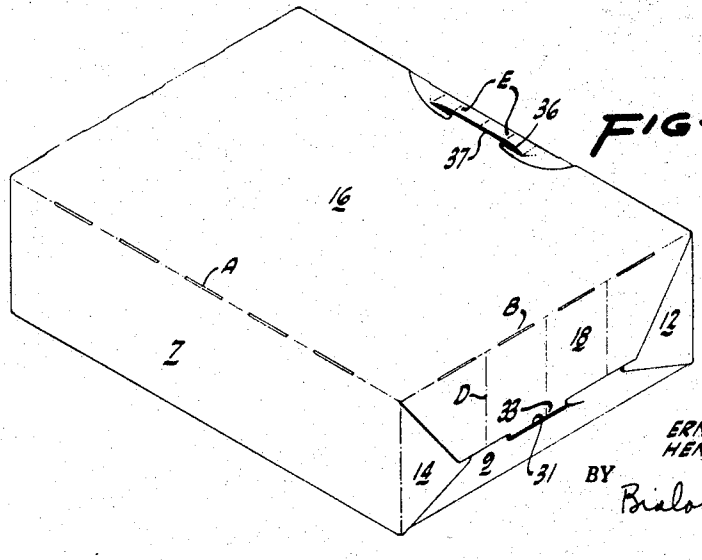


FIG-2



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CARTON CONSTRUCTION AND METHOD OF CLOSING

Filed Sept. 5, 1961 4 Sheets-Sheet 2

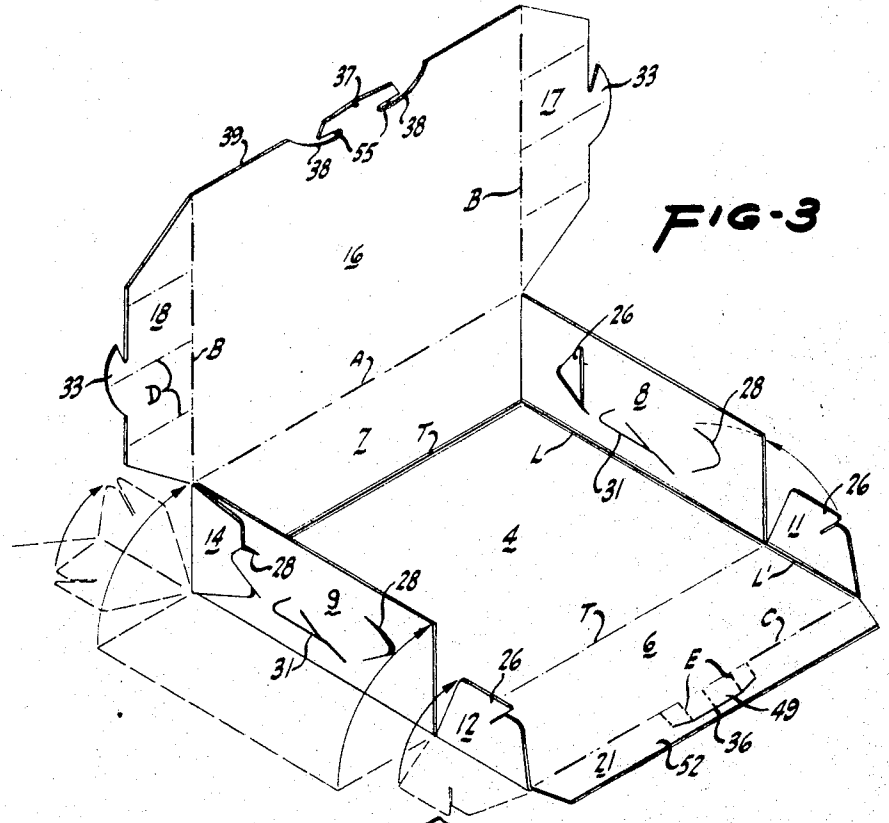

FIG-3

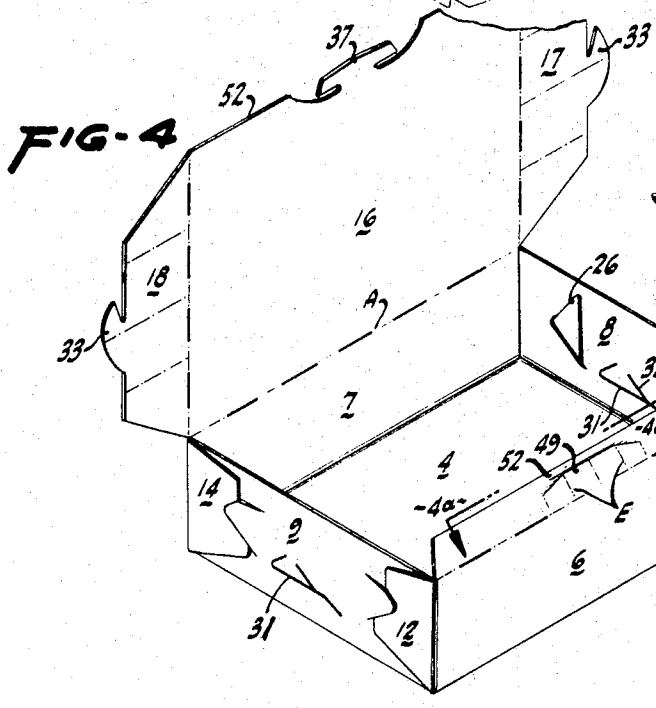

FIG-4

FIG-4a

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CARTON CONSTRUCTION AND METHOD OF CLOSING

Filed Sept. 5, 1961 4 Sheets-Sheet 3

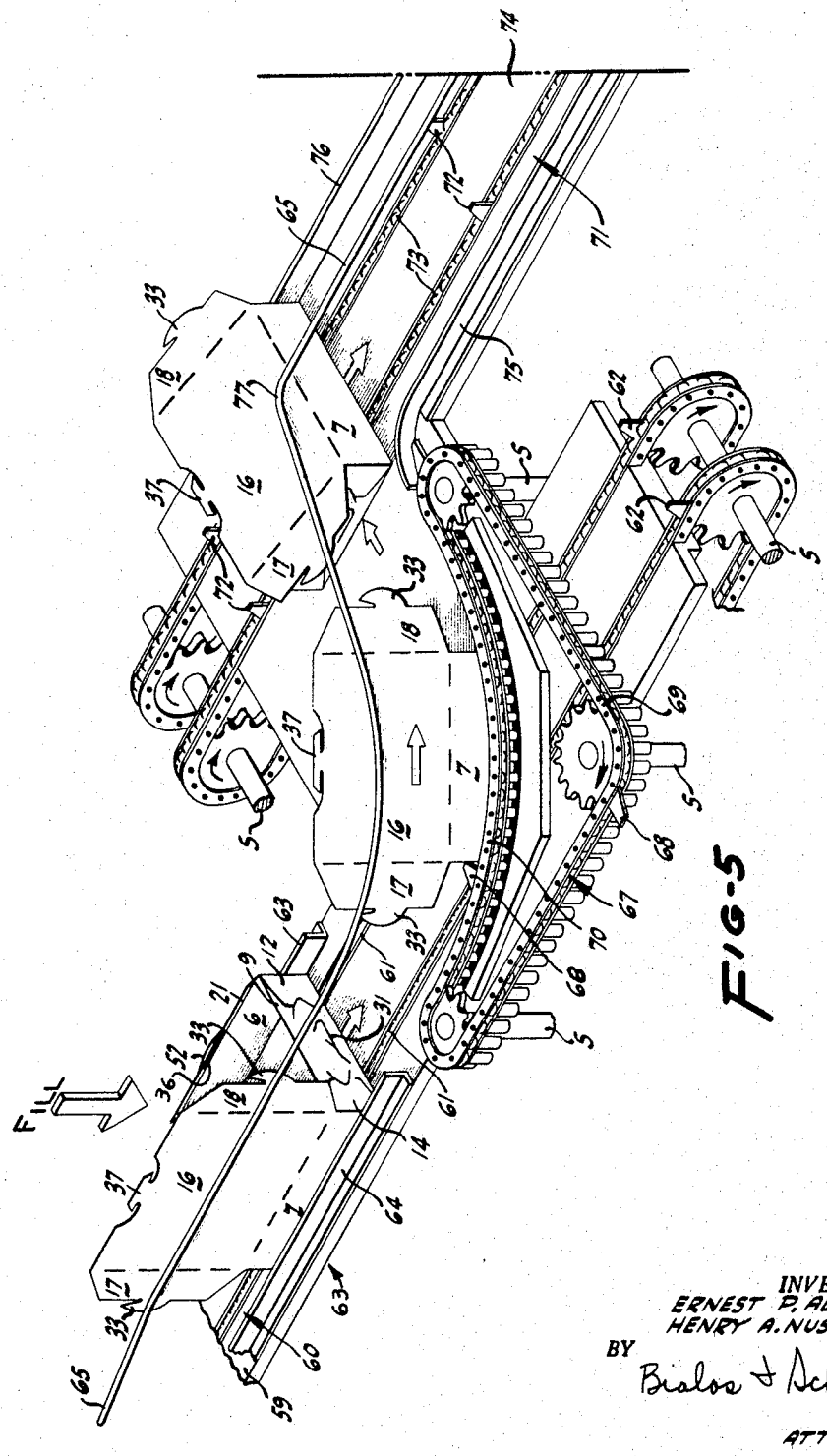

FIG-5

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CARTON CONSTRUCTION AND METHOD OF CLOSING

Filed Sept. 5, 1961 4 Sheets-Sheet 4

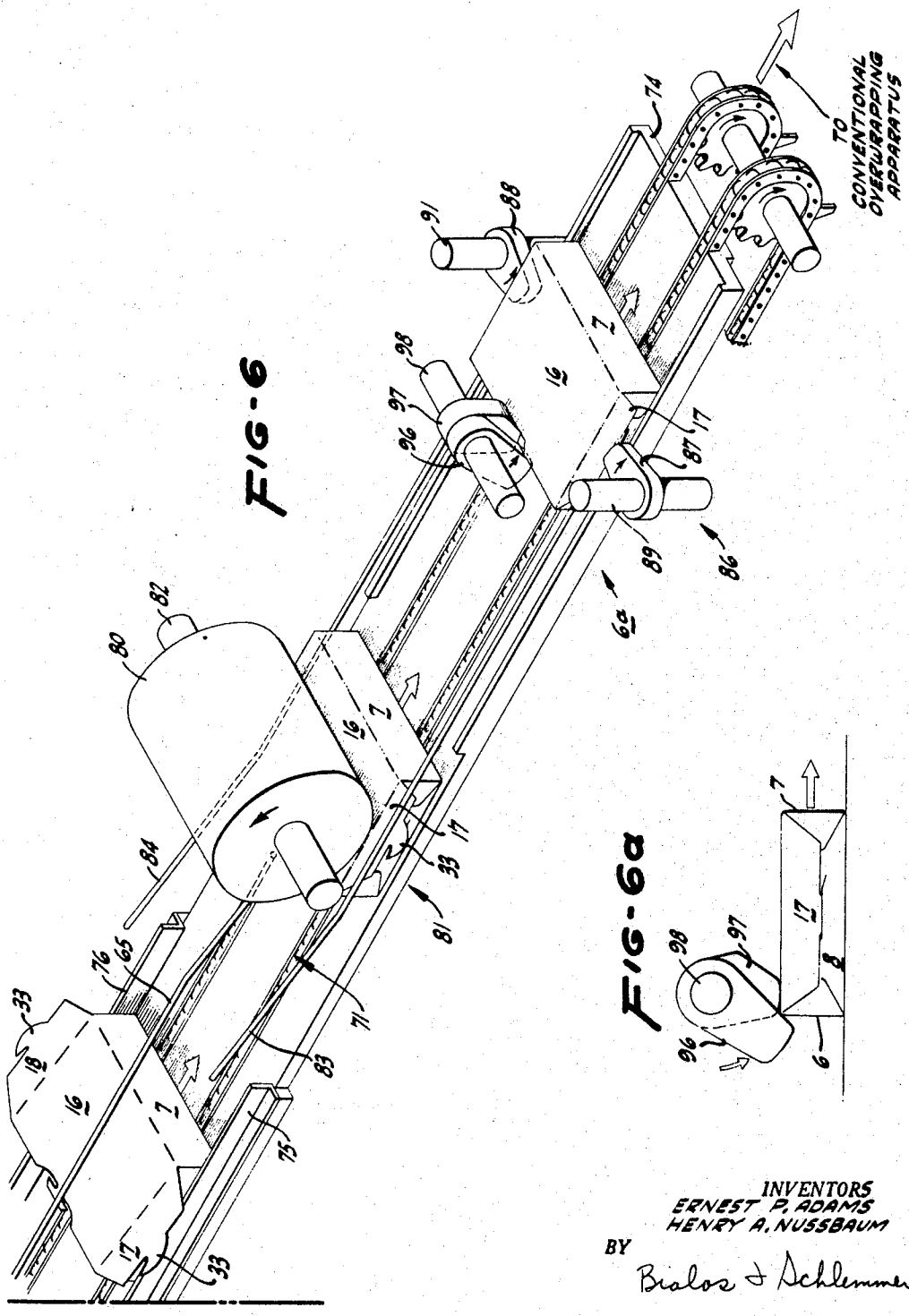

FIG-6

FIG-6a

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3,165,253

CARTON CONSTRUCTION AND METHOD OF CLOSING

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6 Claims. (Cl. 229—33)

This invention relates generally to a carton construction and more particularly relates to a top filling tray type carton particularly adapted for packaging frozen foods or other products, and to a method for filling such a carton with the desired quantity of product and for subsequently closing the same.

Still more particularly, this invention relates to a paperboard carton desirably treated with wax, plastic or the like to improve the moisture barrier characteristics thereof; and to a carton which requires a minimum amount of material for the blank from which the carton is erectable. Furthermore, the invention relates to a carton provided with novel means for simplifying closing of the carton and for maintaining the carton lid closed preparatory to an overwrapping operation at which time a wrapper of waxed paper or plastic is applied around the filled and closed carton.

Because the subject carton preferably is over-wrapped in the manner well known in the frozen food packaging art, it is not necessary for the lid closure means embodied therewith to hold the carton closed with great tenacity. That is, the overwrapper applied around the carton securely holds the carton closed during freezing, and subsequent shipment and handling. Accordingly, the carton need only be closed sufficiently tightly prior to overwrapping to maintain the product therein while the carton is moved from carton closing machinery to overwrapping machinery.

In this connection, it is preferred that lid closure means employed with the carton possess easy opening characteristics so that the ultimate consumer of the carton's product may readily open the carton after purchase and after the overwrapper has been removed. Included in the lid closure means are interengageable tab and slit means provided on the cover portion and tray portion of the carton, and interengageable tongue and slit means provided on cooperable side wall portions of the carton.

Furthermore, because the subject carton preferably is intended to be filled and closed in a rapid process on high speed automatic machinery, means is incorporated in the carton for precluding product spillage during the carton filling and closing operation. Such product spillage precluding means preferably comprises part of the closure means between the carton cover portion and tray portion and is defined by a damming flap hingedly connected to a wall panel of the tray portion.

A further important feature of the carton resides in the particular fold line arrangement employed for securing the product damming flap to its associated carton wall. In this connection, such fold line embodies means for selectively weakening the carton along a predetermined direction to facilitate folding of the damming flap, but such carton weakening is interrupted at a predetermined location so that the carton is made selectively resistant to fo'ding at such location. Such location preferably is situated intermediate the opposite ends of a closing slit provided in the damming flap so that such slit is automatically opened at least partially when the flap is folded along such fold line. Also, stiffening means are provided adjacent the closing slit to further enhance automatic opening thereof when the damming flap is folded.

While top loading tray type cartons have been known

in the prior art heretofore, generally the lids of such prior art cartons are held closed by employing an auxiliary flap on the carton lid from which flap a locking tongue projects freely. Such tongue is generally received in secure, difficult-to-remove relationship, in a locking slit provided in the front wall of the carton tray portion.

This prior art arrangement has important drawbacks. That is, difficulty is encountered on high speed automatic closing machinery in inserting the locking tongue on the lid auxiliary flap into the locking slit provided in the carton front wall. Furthermore, additional material is required in providing the separate auxiliary flap on the carton lid and the tongue projecting therefrom. Such a projecting tongue also results in excess waste material being created in providing the projecting tongue.

In distinction to such prior art cartons, the subject carton includes a closing tab provided directly on the carton lid which fallls entirely within the marginal confines of such lid. That is, no auxiliary lid flaps or projecting tabs extend from the lid of the subject carton as in prior art constructions. This results in a minimum of material being required and precludes unnecessary material waste. In the carton art, it is well known that any savings of material, however slight, in each carton unit is very important because of the large number of cartons made, filled and sold.

Additionally, the subject carton dispenses with the need for a locking slit in the front wall of the carton tray portion so that the closing tab on the carton lid may be easily slidably depressed into the closing slit provided in the foldable damming flap. This closure construction permits carton closing in a much easier fashion than encountered heretofore with prior art cartons in which the lid locking tongue was received in a locking slit in the carton front wall. This easy closing feature of the carton also facilitates subsequent carton opening by the consumer.

In view of the foregoing, objects of the present invention include the provision of a carton construction provided from a minimum of material; the provision of a carton construction which includes means for obviating product leakage and spillage during carton filling and closing; the provision of a carton which is provided with interengageable means for maintaining the carton closed prior to overwrapping and which may be readily opened by the consumer at a later date; the provision of particular fold line structure in conjunction with the carton closure means which facilitates carton closing; and the provision of a carton which readily and rapidly may be filled and closed on automatic machinery in high speed operations preparatory to carton overwrapping.

These and other objects of the subject invention will become apparent from a study of the following description in which reference is directed to the accompanying drawings.

FIG. 1 is a plan view of a blank from which the subject carton is erectable;

FIG. 2 is an isometric view of the carton fully erected and closed;

FIGS. 3 and 4 are isometric views illustrating the procedure of transforming the carton from the blank form of FIG. 1 to the closed form of FIG. 2;

FIG. 4*a* is an end view taken in the plane of line 4*a*—4*a* of FIG. 4 which illustrates the automatically operable locking slit of the carton closure means which facilitates lid closing following carton filling;

FIGS. 5 and 6 are generally schematic views of an apparatus for carrying out the carton filling and closing method;

FIG. 6*a* is a generally schematic view looking in the direction of arrow 6*a* in FIG. 6 illustrating the manner in which the closing tab on the carton lid is depressed

into the closing slit in the damming flap of the carton tray portion.

Before describing the carton closing procedure, reference is first directed to the carton construction illustrated in FIGS. 1 through 4. As seen in FIG. 1, the carton is erectable from a blank **1** of paperboard or like well known carton forming material, which preferably is treated with wax or a plastic, such as polyethylene, to enhance the moisture barrier characteristics thereof. Such blank may be cut from a generally rectangular sheet of material with marginal portions of such sheet being cut away to define the respective carton panels and flaps. The blank, for ease of reference, comprises two portions, namely a bottom or tray portion **2** and a top or cover portion **3**, which are hingedly interconnected.

The tray portion **2** is defined by a bottom panel **4**, a front wall panel **6** which is free of slits and cuts, and a rear wall panel **7** hingedly interconnected along parallel transverse fold lines T to opposite margins of the bottom panel. Fold lines T preferably are defined by a continuous line of scoring which is free of cuts to preclude leakage. Opposite side wall panels **8** and **9** are hingedly connected to opposite side margins of bottom panel **4** along longitudinal fold lines L which extend normal to the aforementioned fold lines T.

Hingedly connected to each of the front and rear wall panels **6** and **7** along extensions L′ of fold lines L are a series of four corner flaps **11**, **12**, **13** and **14**, respectively. Fold line extensions L′ also preferably are defined by continuous lines of scoring which are free of cuts to preclude leakage.

The cover portion of the carton blank is hingedly connected to the tray portion along a fold line A which preferably is of the cut-score type. That is, fold line A is defined by alternate cuts and scores which extend generally parallel to the fold lines T which define the margins of the bottom panel **4**. The cover portion is defined by a lid panel **16** connected along fold line A to the margin of rear wall panel **7** which is the top margin of such panel when the blank is erected. Hingedly connected to opposite side margins of lid panel **16** along cut-score fold lines B, which are further extensions of the aforementioned fold lines L and L′, are a pair of cover side flaps **17** and **18**.

Hingedly connected directly to the front wall panel **6** along a special predetermined fold line C to be described is a product damming flap **21**. The fold line C is of a special construction and defines the upper margin of the front wall panel when the blank is erected. While the product damming flap **21** forms part of the tray portion of the carton, as will become evident hereinafter, such flap is cooperable with the lid panel **16** of the carton in maintaining the carton lid closed after filling and preparatory to overwrapping.

As should be evident, bottom panel **4** defines the bottom of the tray portion of an erected carton with panels **6** and **7** defining respectively the front and rear walls of the tray portion. Panel **9** cooperates with flaps **12** and **14** in defining one side wall of the tray portion while panel **8** and flaps **11** and **13** cooperate to define the opposite side wall of the tray portion. The lid panel **16** cooperates with the product damming flap **21** in defining the top of a closed carton, while the side flaps **17** and **18** of the cover portion overlap the aforementioned tray portion side walls for the purpose to be described.

Means are provided on the respective front and rear wall panels and opposite side wall panels for connecting such panels together to define the carton tray portion. In the embodiment illustrated, such means includes the aforementioned corner flaps **11**, **12**, **13** and **14**. As seen in FIG. 1, each of such corner flaps includes a generally triangular locking tab **26** defined by a slit **27** extending into the corner flap from an outer corner thereof. Each tab **26** is adapted to be received in a generally U-shaped locking slit **28** provided in an associated side wall panel.

That is, each side wall panel **8** and **9** is provided with a pair of such slits **28** for receiving therein the locking tabs **26** of two associated corner flaps. Each corner flap is defined by a generally triangular cutout portion **29** which separates the flap from the adjacent side margin of an associated side wall panel. This cutout portion is effective to facilitate interengagement of the side wall slits and corner flap tabs in the well known manner.

Also provided in each of the side wall panels **8** and **9** intermediate the pair of tab receiving slits **28** is a third slit **31** which has a generally J shape. To impart added flexibility to the respective side wall panels a straight slit extension **32** is provided in conjunction with each slit **31** which is directed from the top of the J towards the hook thereof.

Referring now to the cover portion of the carton, each of the side flaps **17** and **18** is provided with means to be received in the aforementioned J-shaped slits **31** in the side wall panels of the tray portion. Such means comprises a hook shaped tongue **33** provided on and projecting freely from each of the side flaps **17** and **18**. When the blank is erected, and the resulting carton filled with product, tongues **33** are snapped or slid into engagement with the side wall slits **31** for maintaining the lid **16** closed over the carton contents. Preferably a series of parallel score lines D extend into and across each side flap **17** and **18** normal to the fold line B along which each flap is connected to lid **16**. These score lines rigidify and reinforce the flaps to facilitate proper folding thereof along fold lines B.

To assist in maintaining the carton lid closed after filling, and to preclude bulging of the carton front wall **6** outwardly when the carton is filled and prior to overwrapping, closure means also is provided on the damming flap **21** and the lid panel **16**. Such closure means includes a closing slit **36** spaced from but extending generally parallel to the aforementioned special fold line C by means of which the flap **21** is hingedly connected to the front wall panel **6**. Adapted to be received in such closing slit **36** is a closing tab **37** which is formed directly on the lid panel **16**. Closing tab **37**, as seen in FIG. 1, falls entirely within the marginal confines of the lid panel and is defined by a pair of curved cutout portions **38** which extend into the lid panel from its free margin **39**, which is the margin opposite from the margin along which the lid is connected to rear wall **7** along fold line A. The cutout portions **38** define opposite ends **40** and **41** of the closing tab which are to be engaged with the slit **36** in flap **21** when the carton is closed.

An important feature of this invention resides in the dimensional relationship between the closing tab **37** and closing slit **36**. That is, as seen in FIG. 1 the maximum transverse dimension or width *d* of closing tab **37** preferably is substantially equal to or slightly less than the maximum transverse dimension or width *d′* between the opposite ends **42** and **43** of the closing slit **36**. As a result, the tab may be slidably engaged in the slit during the closing operation without undue tab or slit distortion.

To further facilitate receipt of the closing tab in the closing slit, the special fold line construction C mentioned previously is provided. As seen in FIG. 1, the fold line C is defined by alternate series of scores **46** and cuts **47** for substantially the full width of the carton. However, such series of cuts and scores is interrupted in the vicinity of the closing slit **36**. That is, the fold line C is free of cuts and scores in a predetermined location **48** which lies intermediate the opposite ends **42** and **43** of the closing slit so that the wall panel **6** and flap **21** are coplanar continuations of each other in such location.

While the cuts and scores **46** and **47** facilitate folding of the damming flap **21** relative to the carton front wall panel **6**, the absence of cuts, scores and other weakening means in the predetermined location **48** intermediate the ends of the closing slit makes the flap **21** resistant to folding in such predetermined location. The absence of such

scores and cuts in the arrangement illustrated has the effect of stiffening the flap intermediate the ends of the locking slit. This stiffening or rigidifying tends to cause the closing slit to open automatically when the damming flap **21** is folded relative to the front wall **6**. That is, when the damming flap **21** is folded downwardly relative to the front wall panel **6**, the absence of weakening cuts and scores between the ends of the slit results in the portion of the flap **49** between the slit and the fold line C tending to remain in the plane of the front wall panel. This results in at least partial automatic opening of the slit in the manner seen in FIG. 4*a*. That is, the flap portion **49** lying between the opposite ends of the slit and the fold line C defines a gap or opening **51** with the remaining portion **52** of the flap. It is in such gap that the closing tab **37** is slidably depressible when the carton lid is closed in the manner to be described.

The length of the predetermined location in which flap **21** and wall panel **6** are selectively free of cuts and scores may be varied as required to provide the desired degree of automatic slit opening.

Stiffening of the flap portion **49** between the closing slit **36** and fold line C may further be enhanced as seen in FIG. 1 by providing a series of short score lines E which extend normal to the slit **36** between the slit and fold line C. In the embodiment shown five such score lines E are shown but it should be understood that more or fewer lines may be employed as may be found desirable. The effect of such lines is to further stiffen the flap portion **49** lying between the slit and the fold line E to further increase the resistance of such flap portion to bending with the flap **21** when the flap is folded preparatory to carton closing.

Referring now to FIGS. 3 and 4, the sequence of erecting the carton from the blank of FIG. 1 to the completely set up and closed carton of FIG. 2 will be described. First, the opposite side wall panels **8** and **9** are folded upwardly relative to the bottom panel **4** to lie normal thereto. Thereafter, the rear wall panel **7** with the cover portion of the carton attached thereto is folded upwardly about fold line T. Thereafter, the respective corner flaps **13** and **14** are connected to rear wall panel **7** by slidably inserting locking tabs **26** into the locking slits **28** provided in the side wall panels.

Then the front wall panel **6** is folded upwardly about its fold line T normal to bottom wall panel **4** and the respective corner flaps **11** and **12** are connected with the respective side wall panels by enggaing the locking tabs **26** thereof in the remaining side wall locking slits **28**. Thereafter, the product damming flap **21** is folded downwardly to partially overlie the bottom panel **4** of the carton which, as noted previously, automatically effects at least partial opening of the closing slit **36**. In this condition the carton is ready for filling.

Subsequently, the lid panel **16** is folded downwardly about fold line A to overlie the bottom panel **4**. Simultaneously with or subsequent to folding of the lid panel **16**, the side flaps **17** and **18** hingedly connected thereto are folded downwardly to overlie the side walls **8** and **9** of the tray portion and the tongues **33** provided thereon are snapped or slid into engagement with the slits **31** provided intermediate the pair of locking slits **28** provided in the opposite side wall panel. As noted previously, to facilitate engagement of the tongues **33** in the side wall slits **31**, the aforementioned slit extensions **32** are provided which permit additional inward depressing of the side wall panels as the tongues are snapped or slid into engagement therewith.

When the lid **16** is folded downwardly relative to the bottom **4** of the carton tray portion, the closing tab **37** on the lid is brought into overlying relationship with the partially opened closing slit **36**. As a result, it is a simple matter to depress or slide the locking tab into the locking slit by applying downward pressure on the locking tab in the vicinity of its hinged connection to the main portion of lid **16**. If, as is preferred, at the same time downward pressure is applied to the lid, inward pressure is applied to the front wall **6** of the carton the locking tab **37** is slidably depressed into lid closing engagement with the opening of the slit. In such condition, the inner edge portions **55** of opposite ends of the locking tab are engaged in saw tooth fashion with the slit opening **36** as seen in FIG. 2.

When in this condition, the lid of the carton is firmly held in engagement with the tray portion so that product loss or spillage is precluded during the subsequent overwrapping operation. However, the inter-engagement of the closing tab **37** and closing tongues **33** of the carton with their respective slits is not of such a secure nature that extreme difficulty is encountered by the consumer when it is desired to open the carton. That is, the carton may readily be opened after the overwrapping has been removed by merely raising up on the free margin **39** of the lid to slide the locking tab **37** from the slit **36**. Thereafter, it is a simple matter to disengage the locking tongues from the respective side wall slits so that the lid may be pivoted to the open position to permit unrestricted access to the carton contents.

Reference is now directed to the generally schematic showing of FIGS. 5 and 6 which illustrate a procedural method of filling and closing the carton of the subject type. Such method relates to preparing a filled and closed carton for a subsequent overwrapping operation on any conventional overwrapping machinery in the well known manner. After the carton has been partially erected from blank form so that the bottom tray portion is defined by set up side walls and opposite front and rear walls (FIG. 4), the product damming flap **21** is folded so that the same at least partially overlies the bottom of the carton. Such folding of the damming flap **21** may be accomplished by hand, but preferably a suitable plow device forming part of the filling and closing apparatus is employed for this purpose.

Preparatory to filling, each carton of a series to be filled, closed and overwrapped is in the condition shown in FIG. 4 with the lid **16** extending substantially upward in coplanar relationship relative to the vertical rear wall **7** and with the side flaps **17** and **18** extending laterally in coplanar relationship with the lid. Preferably the damming flap **21** is prefolded to at least partially overlie the carton bottom **4** and the closing slit **36** is at least partially open. When in such condition the carton is moved in a first direction over an L-shaped table **59** by any suitable conveyor arrangement **60**, which in FIG. 5 comprises a pair of conveyor chains **61** having spaced pusher lugs **62** thereon of the well known type. Each carton is moved with a side wall **9** in leading relationship to a filling station **63** at which a suitable quantity of a given product is introduced into the carton in any well known manner. During filling, movement of the carton by the conveyor **60** preferably is continuous.

To insure proper movement and positioning of the respective cartons in the series beneath the filling station, side guide rails **64** preferably are provided on table **59**. As each carton moves past the filling station the upright lid **16** thereof is brought into contact with an elongated plow rod **65** supported above the table **59** in any well known manner. During the filling operation, the folded product damming flap **21** precludes product spillage over the front wall of the carton by forming a product dam along the upper margin of the front wall.

Following carton filling, each carton is moved from the filling station by conveyor **60** into contact with means for changing the direction of movement of each carton. That is, a second conveyor **67** is provided which has spaced pusher lugs **68** on the travelling chain **69** thereof. As seen in FIG. 5, the second conveyor chain **69** has one reach **70** which follows a curved path and thereby changes the direction of movement of each filled

carton. That is, the conveyor **67** performs the dual function of moving each carton from the first conveyor **60** while simultaneously changing its direction of movement into a path which extends generally at right angles to the first direction.

The second conveyor **67** moves the carton onto a third conveyor **71** which similarly is provided with spaced pusher lugs **72** on a pair of chains **73** which extend along an extension **74** of the carton supporting table **59**.

Opposite carton guide rails **75** and **76** are provided on table extension **74** between which each carton is subsequently moved. The second conveyor **67** moves each carton against guide rail **76** in timed relationship with movement of the third conveyor **71**. After a given carton has been positioned on the third conveyor **71**, the lugs **72** thereof move the same between the guide rails **75** and **76** in a third direction which is generally parallel to said first direction. However, in this connection, the side wall **9** of each carton no longer is in leading relationship but, as seen in FIGS. 5 and 6, the rear wall **7** of each carton thereafter is in leading relationship as the carton is moved by the third conveyor.

The conveyor chains of the respective conveyors **60**, **67** and **71** may be driven in any suitable manner and in the schematic embodiment shown, toothed sprockets secured for rotation to drive shafts S are provided for this purpose. Each of the respective conveyors is driven in timed relationship with respect to the others so that the pusher lugs of each conveyor will pick up a carton automatically as such carton is moved by one conveyor onto another. In this regard, substantially no interruption of carton movement is effected so that the filling and closing operation may be continuously carried on.

As mentioned previously, at the filling station or shortly thereafter, the upright carton lid is brought into engagement with plow rod **65**. As seen in FIGS. 5 and 6 such plow rod follows a path that corresponds generally to the shape of table **59** and its extension **74**. That is, at the filling station the rod is generally in vertical alignment with guide rail **64**. Beyond the filling station the rod extends inwardly and downwardly towards the table and changes its direction to conform generally to the arcuate reach **70** of the conveyor chain **69**. This effects progressive folding of each carton lid as the carton is moved from the first conveyor onto the third conveyor by the second conveyor. At the third conveyor, the plow rod makes a substantially right angle bend at **77** and thereafter extends still further downwardly towards the table extension **74** over which the cartons are carried.

In this manner, as the carton moves in said third direction, the lid **16** is progressively folded further downwardly toward engagement with the previously folded product damming flap. It is during the period of transitional movement from the second direction of carton movement to the third direction of carton movement that the aforementioned product damming flap performs its most important function. That is, as seen in FIG. 5, after a carton has been moved against guide rail **76** by the second conveyor, the carton is engaged by travelling lugs **72** of the third conveyor **71** which effects an abrupt right angled change of direction of carton movement. This change of direction, which preferably is effected at high speed, may result in the jolting or jarring of the carton as the same is initially pushed by the conveyor lugs **72** of the third conveyor. This tends, due to inertia, to cause the product in the carton to flow over the upper marginal edge of the trailing front wall **6** of the carton. However, because damming flap **21** has been folded downwardly to at least partially overlie the bottom of the carton tray, such flap serves as an effective dam to preclude product spillage as the carton moves into its third path of movement.

This spill preventing feature is highly important if products which include substantial amounts of liquid, such as peas and beans and their accompanying fluid, are being packaged.

Because the subject cartons are intended for the packaging of foods to be frozen, such as peas, beans and the like, which are of a particulate nature, it has been found desirable to press the lid of the carton downwardly onto the product filled therein to insure subsequent complete carton closing. For this purpose a pressure member **80** may be employed at a pressure station **81** beneath which the carton is carried by the third conveyor **71**. In FIG. 6 such pressure member is shown as a roller mounted on a rotatable shaft **82** positioned above the conveyor **71**. Because the rear wall **7** of the carton is in leading relationship, passage of the carton beneath the roller results in increasing pressure being applied to the carton lid **16** as the carton moves beneath the roller which progressively forces any product tending to project from the carton into the tray portion thereof.

As the carton approaches the roller, as seen to the left of FIG. 6, the side flaps **17** and **18** hingedly connected to the carton lid still project substantially coplanar relative thereto. To fold such side flaps down means are provided on opposite sides of the conveyor **71** in the form of plow rods **83** and **84**. The ends of such plow rods are located sufficiently high above the table extension **74** so that the side flaps may pass thereunder initially. However, upon continued movement of the respective cartons, the plow rods depress the side flaps and fold the same downwardly into engagement with the side wall panels of the carton tray portion. It is during this folding operation that the score lines D in the respective side flaps perform their rigidifying function. Such score lines insure proper folding of the side flaps about the fold lines B by which they are hingedly connected to the carton lid.

Following the application of pressure to the lid as described, the third conveyor carries each carton to a tongue and tab interengaging station **86** at which the respective tongues **33** on the side flaps are engaged in the side wall slits **31** and at which the tab **37** on the lid is engaged in the slit **36** of the damming flap **21**.

A pair of pressure fingers **87** and **88** are mounted on a pair of rotatable upright shafts **89** and **91** located on opposite sides of the table extension **74**. The rods are rotated in any suitable manner toward each other in timed relationship with movement of the third conveyor **71** so that as each filled carton of the series passes station **86**, the fingers **87** and **88** contact and depress side flaps **17** and **18** in the vicinity of the tongues **33**. Such engagement of the fingers with the tongues causes the side walls to be flexed inwardly and effects snap lock engagement of the tongues in the slits **31**. Because of the special slit construction **31**, **32** provided in the side walls, such side walls are imparted with additional "give" to more readily accept the tongues therein.

While interengagement of the lid tab **37** with the slit **36** in the damming flap is performed at the same station as the tongue **33** and slit **31** interengagement, because of the relationship of the means employed for these purposes, the tongues **33** are engaged in their slits slightly prior to engagement of the tab **37** in slit **36**. This timing relationship further facilitates engagement of the tongues with the side wall slits.

To effect interengagement of the lid tab **37** in slit **36**, a finger arrangement such as seen in FIGS. 6 and 6*a* may be employed. Such arrangement includes a pair of angularly offset, different length pressure fingers **96** and **97** secured side by side on a rotatable shaft **98** which is driven in any suitable manner in timed relationship with the aforementioned shafts **89** and **91** and conveyor **71**.

As seen in FIG. 6*a*, each carton is moved beneath the shaft **98** and the fingers thereon are rotated with the shaft in a counter-clockwise direction. Such rotation, therefore, brings shorter finger **97**, which is in leading relation relative to longer finger **96**, downwardly into contact with the top of the lid in the vicinity of the tab **37**.

This depresses the lid so that the tab is properly positioned to be slidably engaged in the slit **36** which, as mentioned previously, is at least partially open.

As the lid is depressed by finger **97**, finger **96** engages the front wall of the carton adjacent the upper margin thereof, and pushes such front wall towards the carton rear wall. This has the effect of moving the damming flap and the open slit toward the tab **37** on the carton lid which insures engagement of the tab **37** with the slit **36**. Engagement of finger **96** with the front wall counteracts any tendency of the front wall to bulge due to the contents positioned in the carton.

As a result of the novel engagement of the fingers **96**, **97** to first apply downward pressure on the carton to position the tab **37** into the slit **36** and to thereafter apply pressure to the front wall to move the same towards the rear wall, proper engagement of the tab in the slit **36** is insured.

Following closing of each carton of the series at the station **86** in the manner disclosed, each carton and its contents may then be moved in any convenient manner to conventional overwrapping apparatus, as indicated by the legend in FIG. 6.

Following such overwrapping, the cartons, if the same contain frozen foods, may be transferred in any suitable manner to a freezer prior to being shipped to stores for distribution to the ultimate consumer.

Having thus made a full disclosure of the carton of this invention, and the novel method of filling and closing the same preparatory to overwrapping, reference is directed to the appended claims for a determination of the scope afforded to this invention. It should be understood that modifications to the invention disclosed herein which may become apparent to one skilled in the art are contemplated as falling within the scope of the appended claims as set out hereinafter.

What is claimed is:

1. A carton adapted to be overwrapped comprising a bottom tray portion, and a cover portion hingedly interconnected with said tray portion, said cover portion being closable over and lockable to said tray portion on automatic machinery; said tray portion comprising a bottom, front and rear walls hingedly connected to a first pair of opposite margins of said bottom, opposite side walls hingedly connected to a second pair of opposite margins of said bottom, a pair of corner flaps hingedly connected to opposite side margins of each of said front and rear walls, a tab on each of said corner flaps and a pair of tab receiving slits in each of said side walls between the pair of tab receiving slits therein, a product damming and cover locking flap hingedly connected directly with said front wall along an interrupted fold line which defines the upper margin of said front wall, and a locking slit in said damming and locking flap spaced from said interrupted fold line, said fold line being free of scoring, cuts and other means of weakness in an area intermediate the opposite ends of said locking slit so that said damming and locking flap and said front wall are co-planar continuations of each other in said area prior to such flap being folded into substantially parallel relationship with said bottom panel so that said flap is resistant to folding adjacent said slit, whereby said slit automatically opens at least partially when said damming and locking flap is folded during closing of said carton; said cover portion comprising a lid hingedly connected along another fold line to the upper margin of said rear wall of said tray portion, and a pair of side flaps hingedly connected to opposite side margins of said lid, each of said side flaps having a tongue projecting therefrom each of which is engaged in said third slit of an associated side wall of said tray portion, said lid having a closing tab directly thereon formed within the marginal confines thereof, said tab when said carton is closed being received directly in said locking slit in said damming and locking flap and lying beneath such flap for maintaining said lid closed, said lid tab being defined by cuts extending directly into said lid from the free marginal edge thereof opposite from the fold line along which said lid is hingedly connected to the upper margin of said tray portion rear wall.

2. The carton of claim 1 in which said damming and locking flap includes a series of flap reinforcing and stiffening score lines extending from adjacent said interrupted fold line along which such flap is connected with said front wall toward said locking slit, said score lines further enhancing automatic opening of said slit during closing of said carton cover portion over said tray portion.

3. The carton of claim 1 in which said cover portion side flaps are provided with a plurality of reinforcing score lines extending from adjacent said opposite side margins of said lid toward the respective tongues provided on such respective side flaps.

4. A flat one-piece carton blank comprising a bottom tray portion and a cover portion hingedly interconnected, said cover portion being closable over and lockable with said tray portion on automatic machinery when said blank is erected; said tray portion comprising a bottom panel, front and rear wall panels hingedly connected to a first pair of opposite margins of said bottom panel, side wall panels hingedly connected to a second pair of opposite margins of said bottom panel, a pair of corner flaps hingedly connected with opposite side margins of each of said front and rear wall panels, a tab on each of said corner flaps and a pair of tab receiving slits in each of said side wall panels for receiving said tabs when said blank is erected, a third slit in each of said side wall panels between the pair of tab receiving slits therein, a product damming and cover locking flap hingedly connected directly with the margin of said front wall panel which is the top margin thereof when said blank is erected, said product damming and cover locking flap being adapted to be folded into substantially parallel relationship with said bottom panel when said blank is erected, such flap being connected with said front wall panel along a predetermined interrupted fold line which defines said upper margin of said front wall panel when said blank is erected, and a locking slit in said product damming and locking flap spaced from said interrupted fold line, said interrupted fold line being free of scoring, cuts and other means of weakness in an area intermediate the opposite ends of said locking slit so that said damming and locking flap and said front wall panel are co-planar continuations of each other in said area, whereby such flap is resistant to folding adjacent said slit and said slit automatically opens at least partially when said flap is folded over during erection of said blank; said cover portion comprising a lid panel hingedly connected to a margin of said rear wall panel of said tray portion, and a pair of side flaps hingedly connected to opposite side margins of said lid panel, each of said side flaps having a tongue projecting therefrom each of which is engageable in said third slit of an associated side wall panel of said tray portion when said blank is erected, said lid panel having a tab thereon formed within the marginal confines thereof which is engageable is said locking slit for maintaining said cover portion closed over said tray portion when said blank is erected, said lid panel tab being defined by cuts extending directly into said lid panel from the free marginal edge thereof opposite from the margin along which said led panel is hingedly connected to said tray portion rear wall panel.

5. The carton blank of claim 4 in which said damming and locking flap includes a series of flap reinforcing and stiffening score lines therein extending from adjacent said interrupted fold line along which such flap is connected with said front wall panel toward said locking slit, said score lines further enhancing automatic opening of said slit during closing of said carton cover portion over said tray portion when said blank is erected.

6. The carton blank of claim 4 in which said cover

portion side flaps are provided with a plurality of reinforcing score lines extending from adjacent said opposite side margins of said lid panel toward the respective tongues provided on such respective side flaps.

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