April 23, 1957 P. J. GRAYBILL 2,789,747

CARTON WITH FOLDING SPOUT

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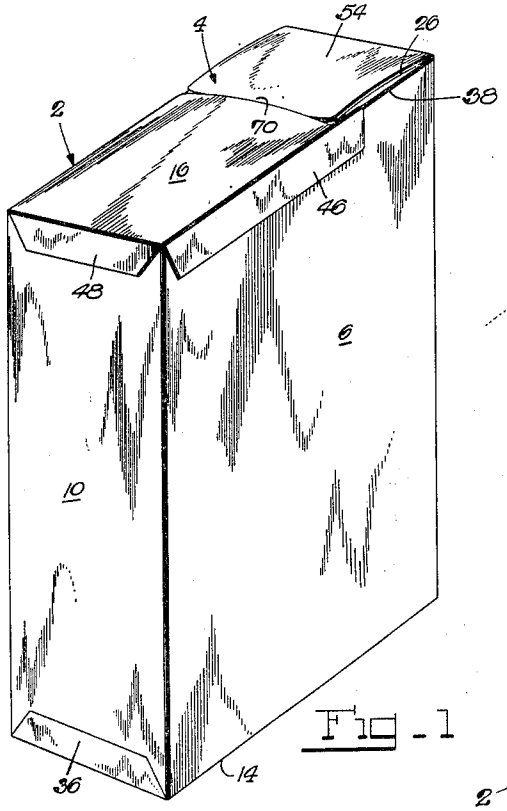
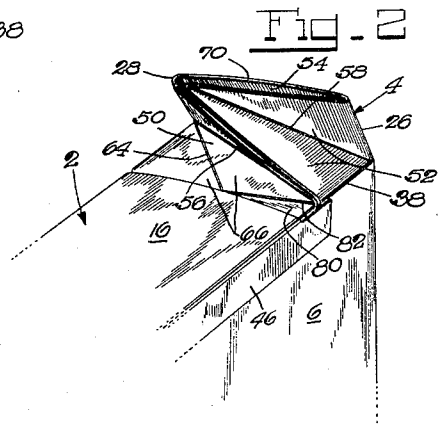


Fig. 1



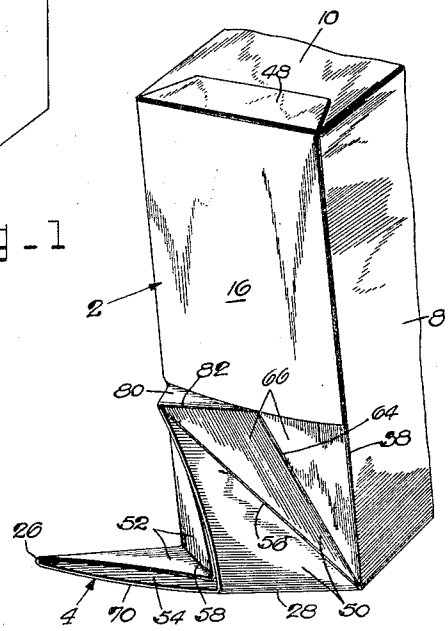


Fig. 3

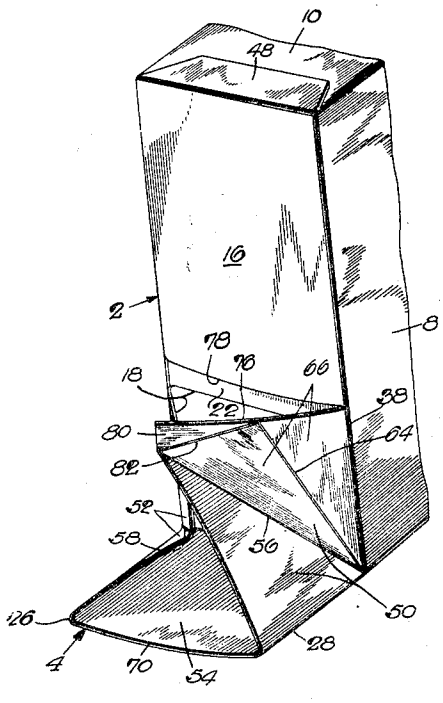


Fig. 4

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CARTON WITH FOLDING SPOUT

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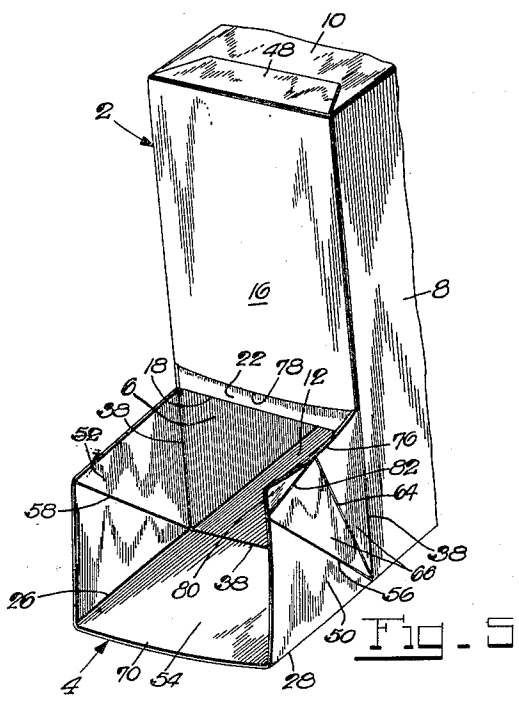


Fig. 5

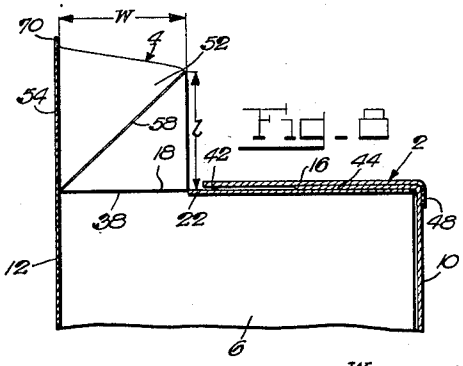


Fig. 8

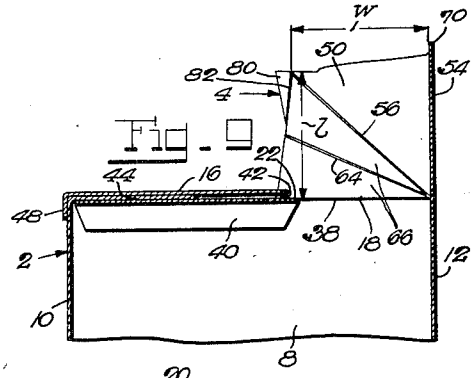


Fig. 9

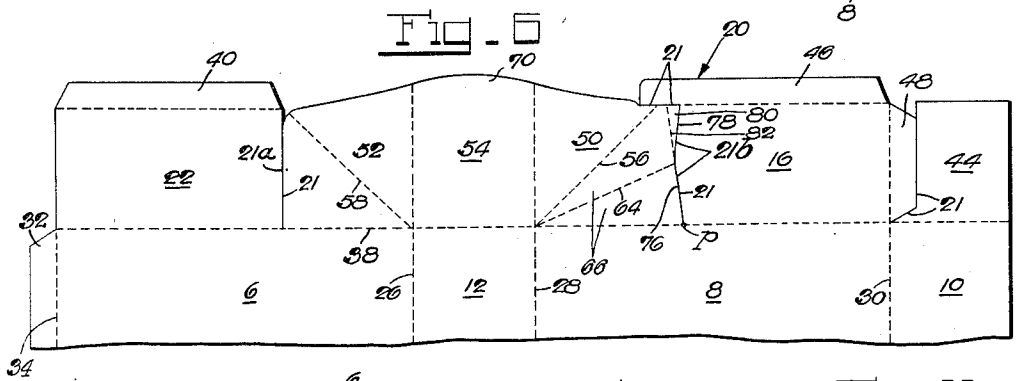


Fig. 6

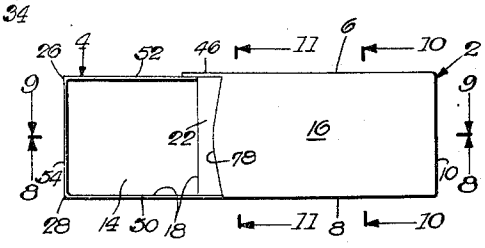


Fig. 7

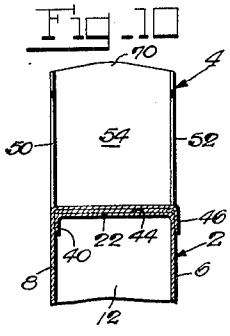


Fig. 10

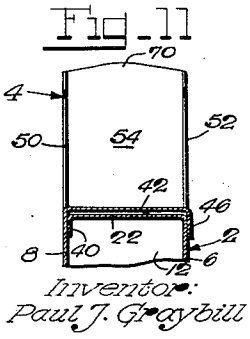


Fig. 11

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April 23, 1957 P. J. GRAYBILL 2,789,747

CARTON WITH FOLDING SPOUT

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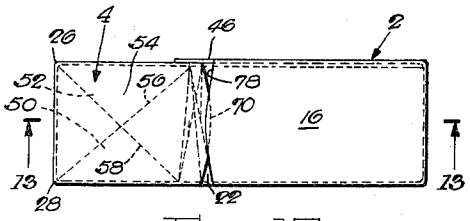


Fig. 12

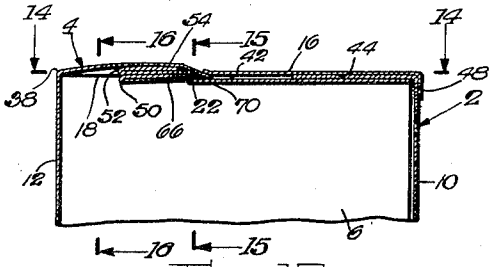


Fig. 13

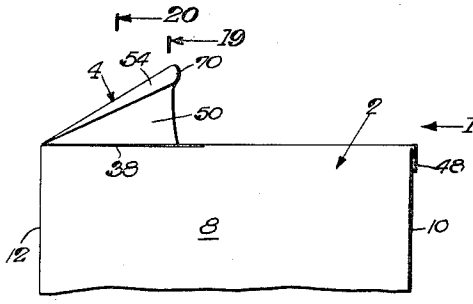


Fig. 17

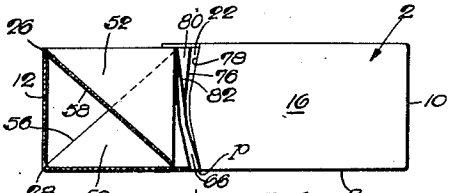


Fig. 14

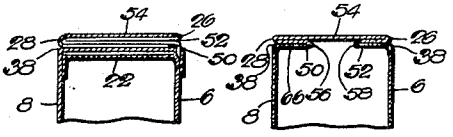


Fig. 15

Fig. 16

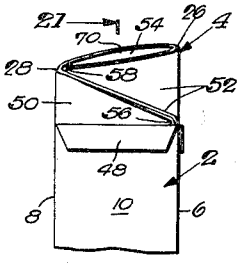


Fig. 18

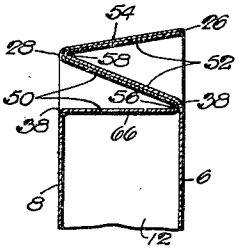


Fig. 19

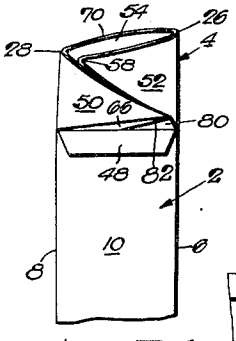


Fig. 24

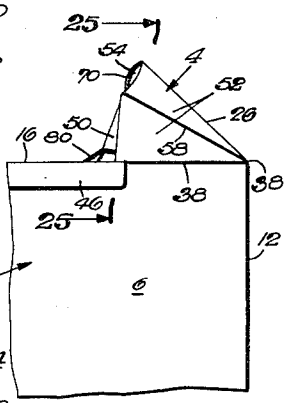


Fig. 23

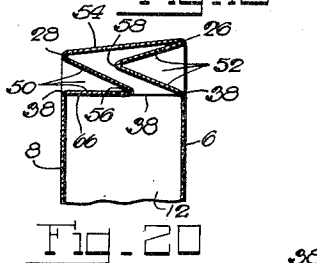


Fig. 20

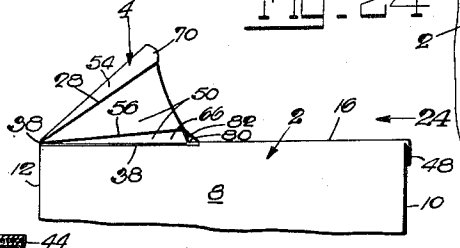


Fig. 22

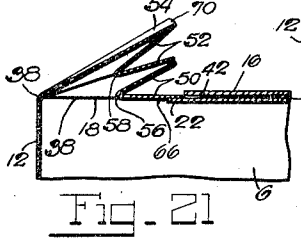


Fig. 21

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CARTON WITH FOLDING SPOUT

Filed Nov. 17, 1953 4 Sheets-Sheet 4

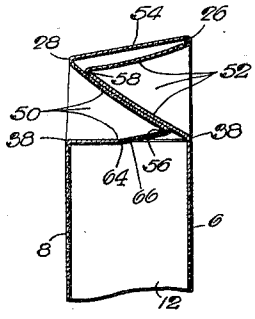


Fig. 25

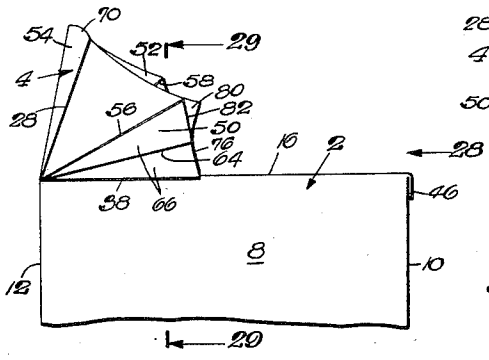


Fig. 26

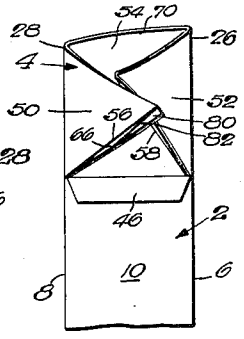


Fig. 28

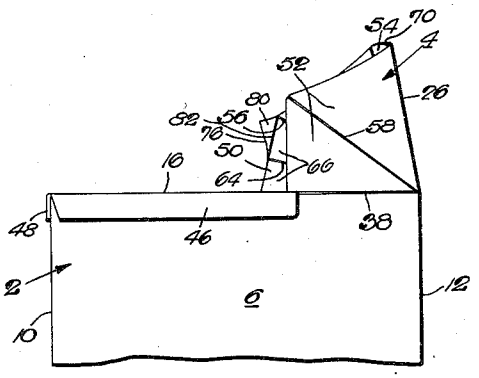


Fig. 27

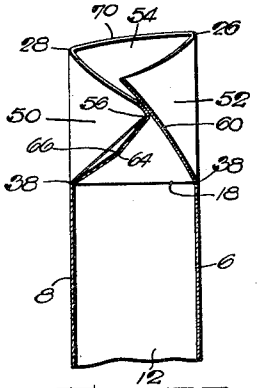


Fig. 29

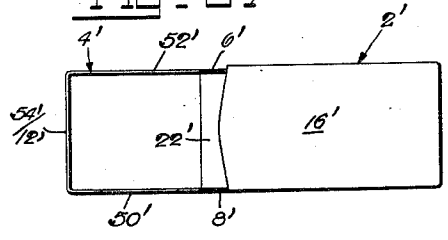


Fig. 30

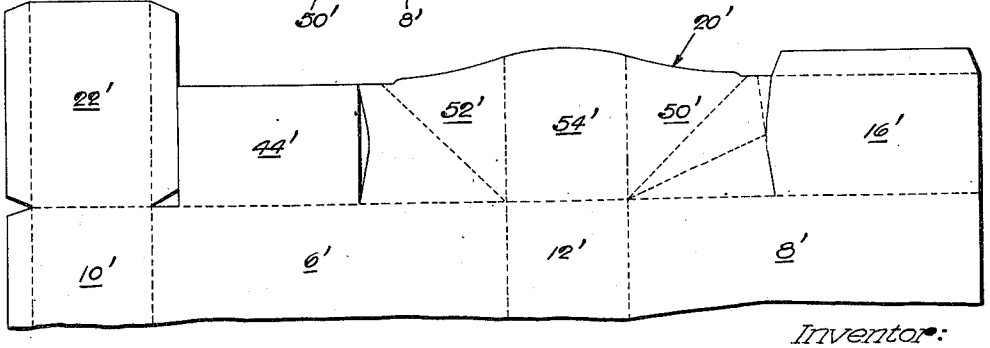


Fig. 31

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United States Patent Office

2,789,747

Patented Apr. 23, 1957

2,789,747

CARTON WITH FOLDING SPOUT

Paul J. Graybill, New Haven, Conn.

Application November 17, 1953, Serial No. 392,559

5 Claims. (Cl. 229—17)

This invention relates to spout-equipped cartons in general, and to cartons with spouts of the folding type in particular.

It is the primary aim and object of the present invention to provide on a carton a folding spout which has improved characteristics in comparison to those of previous folding spouts.

Thus, it is among the objects of the present invention to provide on a carton a folding spout which, when closed, effectively seals the carton from such extraneous matter as dust, moisture or vermin even after the spout has been opened and closed repeatedly.

It is another object of the present invention to provide on a carton a folding spout which is constructed so as to remain of its own accord in any one of an infinite number of adjustable positions substantially between its closed and normally fully open positions, thereby to permit ready pouring of the contents from the carton at a controlled variable rate.

It is a further object of the present invention to provide on a carton a folding spout of the aforementioned adjustable opening which is so constructed that the same will in any position within its adjustable range be tubular or near-tubular to such an extent as to permit pouring of the contents from the carton at the desired rate to which the spout opening is adjusted even if the carton is way over-tilted for the desired flow rate.

Another object of the present invention is to provide on a carton a folding spout of which the opposite side flaps or walls are so arranged that one side flap or wall will gradually interfold between the bottom wall of the spout and the other folding side flap or wall when the spout is being closed from its normally open position, and will gradually unfold from between the bottom and the other unfolding side flap when the spout is being opened, thereby to achieve the tubular formation of the spout to the aforementioned extent and, by virtue of the ensuing friction between the side flaps when partly infolded, also self-retention of the spout in any of its partially open positions within the aforementioned adjustable range.

It is another object of the present invention to provide on a carton a folding spout of which the bottom and opposite side flaps are so dimensioned that the aforementioned interfolded side flap will, in a quick-closure position of the spout in which both side flaps are as yet partly unfolded beneath the bottom and the latter still extends somewhat away from the carton, fit completely, though somewhat loosely, the gap between the bottom and other side flap and close the carton for all practical intents and purposes, thereby to achieve ready and instantaneous closure of the carton on merely tapping the spout in any of its open positions in order to compel it into the above-mentioned quick-closure position.

It is a further object of the present invention to provide a spout-equipped carton with a ledge on which the innermost folded side flap rests, and which terminates in a shoulder over which springs the adjacent edge of the innermost flap with a perceptible snap action into seating engagement with the ledge and also into interlock with the shoulder when the spout is tapped or otherwise forced into its quick-closure position, and which resists opening of the spout until force is applied thereto which, while slight in magnitude, must nevertheless be sufficient to release the interlocked surface of the innermost side flap from the shoulder with another perceptible snap action, thereby not only giving assurance to the user of the carton that the latter is satisfactorily closed when the mentioned closure snap action is perceived, but also preventing unauthorized self-opening of the spout under the weight of the contents of the carton if the latter is placed or held in partly or completely inverted disposition.

A further object of the present invention is to provide on a carton a folding spout of which the innermost fold of the innermost folded side flap is divided by a score line or crease into complemental parts which on closure and opening of the spout are, under the compulsion of the remaining folded parts of the spout, swung similarly as the leaves of a hinge to effect orderly partial collapse and recovery, rather than random bending and unbending, of this innermost fold, thereby to achieve smooth and predetermined folding and unfolding of the spout as well as exercise control over the force required for opening and closing the spout.

Further objects and advantages will appear to those skilled in the art from the following, considered in conjunction with the accompanying drawings.

In the accompanying drawings, in which certain modes of carrying out the present invention are shown for illustrative purposes:

Fig. 1 is a perspective view of a carton with a folding spout embodying the present invention, the spout being shown in its full-closure position;

Fig. 2 is a fragmentary perspective view of the carton with its spout shown in a quick-closure position;

Figs. 3 and 4 are fragmentary perspective views of the carton with its spout shown in different partly open positions;

Fig. 5 is another fragmentary perspective view of the carton with its spout shown in fully open position;

Fig. 6 is a fragmentary view of a blank from which the carton and its spout are formed;

Fig. 7 is a top plan view of the carton with its spout in fully open position;

Figs. 8, 9, 10 and 11 are fragmentary sections through the carton and its spout as taken on the lines **8—8**, **9—9**, **10—10** and **11—11**, respectively, of Fig. 7;

Fig. 12 is a top plan view of the carton with the spout thereof in its full-closure position as in Fig. 1;

Fig. 13 is a fragmentary longitudinal section through the carton and spout as taken on the line **13—13** of Fig. 12;

Fig. 14 is a section through the carton and spout as taken on the line **14—14** of Fig. 13;

Figs. 15 and 16 are fragmentary sections through the carton and spout as taken on the lines **15—15** and **16—16**, respectively, of Fig. 13;

Fig. 17 is a fragmentary side view of the carton with the spout thereof in its quick-closure position as in Fig. 2;

Fig. 18 is a fragmentary end view of the carton and spout as seen in the direction of the arrow **18** in Fig. 17;

Figs. 19 and 20 are fragmentary sections through the carton and spout as taken on the lines **19—19** and **20—20**, respectively, of Fig. 17;

Fig. 21 is a fragmentary section through the carton and spout as taken on the line **21—21** of Fig. 18;

Fig. 22 is a fragmentary side view of the carton with its spout in partly open position as in Fig. 3;

Fig. 23 is a fragmentary view of the carton with its

spout in the same partly open position as in Fig. 22, but as seen from the opposite side;

Fig. 24 is a fragmentary end view of the carton and spout as seen in the direction of the arrow 24 in Fig. 22;

Fig. 25 is a fragmentary section through the carton and spout as taken on the line 25—25 of Fig. 23;

Fig. 26 is a fragmentary side view of the carton with its spout in another partly open position;

Fig. 27 is a fragmentary view of the carton with its spout in the same partly open position as in Fig. 26, but as seen from the opposite side;

Fig. 28 is a fragmentary end view of the carton and spout as seen in the direction of the arrow 28 in Fig. 26;

Fig. 29 is a fragmentary section through the carton and spout as taken on the line 29—29 of Fig. 26;

Fig. 30 is a top plan view of a carton and spout embodying the present invention in a modified manner; and

Fig. 31 is a fragmentary view of a blank from which the modified carton and spout of Fig. 30 are formed.

Referring to the drawings, and more particularly to Figs. 1 to 5 thereof, the reference numeral 2 designates a carton for holding goods which are usually packaged or may be packaged in this manner. The carton 2 is for the dispensation of its contents provided with a spout 4 of the folding type. The carton, which may be of any conventional construction, comprises opposite side walls 6 and 8, opposite ends walls 10 and 12, a bottom wall 14 (Figs. 1 and 5), and a top wall 16 covering the permanent end-closure portion of the dispensing-end of said carton. Provided in the top wall 16 is a discharge opening 18 which may be opened and closed by the folding spout 4 in a manner described hereinafter.

In the example shown, all parts of the carton 2, including the folding spout 4, are blanked in a single piece 20 (Fig. 6) from suitable carton material, and the blank 20 is suitably scored and cut so as to be foldable into the required finished form. The cut lines in the blank 20 are indicated by the reference numeral 21. Further provided on the carton 2 beneath the top wall 16 thereof is a ledge 22 (Figs. 4 and 5) on which the spout 4 is adapted to rest when folded into its fully closed position shown in Figs. 1 and 13 or into its other closed position shown in Figs. 2 and 21.

For initially forming or setting up the carton 2, it may briefly be explained that the carton blank 20 (Fig. 6) is folded along the prescored longitudinal lines or creases 26, 28 and 30 so as to bring the opposite side walls 6, 8 and opposite end walls 10, 12 into the rectangular disposition which they assume in the carton formation. A side tab extension 32 on the side wall 6 of the blank 20 may next be folded about the prescored line or crease 34 for its attachment, by cementing for instance, to the adjacent end wall 10 in order permanently to retain the side and end walls of the carton in their rectangular disposition. The bottom wall 14 of the blank 20 may next be folded into closure relation with the side and end walls of the carton and be permanently secured thereto by suitable cemented tab extensions or Van Buren Ears on the bottom wall of which one is shown at 36 in Fig. 1. The ledge 22 may next be folded inwardly about the coextensive part of the prescored transverse line or crease 38 (Fig. 6) so as to span the side walls 6 and 8, the ledge preferably having a foldable side tab extension 40 which may be cemented against the side wall 8 of the carton in order to secure the ledge in place therein (Figs. 10 and 11). In order to provide near the discharge opening 18 and between the top wall 16 and ledge 22 a pocket or tuck-slot 42 (Figs. 8 and 9) for a purpose to be described, the blank 20 is provided with a spacer flap 44 which, on being folded inwardly about the coextensive part of the prescored line 38, will overlap the mounted ledge 22. Next, the top wall 16 is folded inwardly about the coextensive part of the same prescored line 38 and brought into overlapping relation with the spacer flap 44, the top wall 16 being preferably provided with foldable side and end tab extensions 46 and 48 which may conveniently be cemented to the adjacent side and end walls 6 and 10, respectively, for permanently securing the top wall in place (Fig. 1) and holding the spacer flap 44 in snug interposition between the top wall and the ledge 22 (Fig. 10).

The spout 4, which in its open position is channel-shaped (Fig. 5), is in the present instance formed by opposite side flaps 50 and 52 and a bottom flap 54 which are continuous with each other along the fold lines or creases 26 and 28, and also continuous with the adjacent side walls 8 and 6 and end wall 12, respectively articulated, along the fold line 38. The continuance of these spout-forming flaps with each other and with the adjacent side walls 8, 6 and end wall 12 of the carton is clearly demonstrated in Figs. 5 and 6. The parts of the fold line 38 which are coextensive with the flaps 50, 52 and 54 of the spout 4 form in the set-up condition of the carton individual hinge connections between these flaps and the adjacent carton walls so as to permit inward folding of the former into covering relation with the discharge opening 18 in the carton. In order to permit such inward folding of the flaps 50, 52 and 54 of the spout 4 into covering relation with the discharge opening 18 in the carton, the parts of the fold lines 26 and 28 which are coextensive with these flaps also serve in the setup condition of the carton as hinge connections between these flaps. In order that the side flaps 50 and 52 of the spout 4 may thus fold inwardly beneath the bottom flap 54, the former must furthermore be scored or creased at 56 and 58, respectively, in the usual diagonal fashion so that they may fold on themselves when the bottom flap 54 is turned toward the top wall 16 of the carton (Figs. 12 to 16).

It is one of the objectives of the present invention to effect closure of the spout 4 and, hence, of the carton when the side flaps 50 and 52 of the spout are still partly unfolded and its bottom flap 54 is still some distance from the top wall 16 of the carton (Figs. 2 and 17 to 19). In order to accomplish this, one of the side flaps, in this instance the side flap 52, is, on closure of the spout 4 into the position shown in Fig. 2, caused to interfold between the bottom flap 54 and the other side flap, in this instance the flap 50, and the dimensions of these side flaps are such that the upper folded side flap or wall 52 fills substantially the entire gap between the lower folded side flap 50 and the bottom flap 54. Thus, in order that the upper folded side flap 52 may, in the closure position of the spout in Fig. 2, substantially fill the entire gap between the lower folded side flap 50 and the bottom flap 54, the portions of the side flaps 50 and 52 within which their respective fold lines 56 and 58 extend diagonally are square and each of their dimensions, expressed in length and width as indicated at l and w, respectively, in Figs. 8 and 9, is substantially equal to the dimension of the carton measured across the side walls 6 and 8 thereof. Further, since the fold lines 56 and 58 extend diagonally of these square side flap portions, the latter will fold completely upon themselves when the spout is closed.

On closing the spout 4 from its fully open position in Fig. 5 into the position in Fig. 2, the side flap 52 will frictionally be resisted by the other folding side flap 50 in its tendency to interfold between the latter and the bottom flap 54. This frictional resistance to the interfolding of the side flap 52 begins when both folding side flaps 50 and 52 engage each other (Fig. 4), and persists substantially until they reach the relative disposition shown in Fig. 2. Hence, it is within the relatively wide range of the interfolding action of the side flap 52 substantially from the position in Fig. 4 to the position in Fig. 2 that the side and bottom flaps 50, 52 and 54 of the spout define a tubular discharge passage of infinitely variable cross-sectional area. Moreover, the frictional resistance encountered by the infolding side flap 52 on the other folding side flap 50 is sufficiently large to retain the spout in

any of its infinite positions within the aforementioned range in which the same provides a tubular discharge passage, and permit the discharge of the carton contents through the latter without danger of self-opening of the spout beyond its adjusted position. The considerable frictional resistance encountered by the interfolding side flap **52** on the other side flap **50** may be appreciated from the fact that the fold **60** of the side flap **52** is in any of the adjustable partly-open spout positions more or less bent from the pressure exerted thereagainst by the other side flap **50** at its fold line **56**. Thus, Figs. 26 to 29 show the spout in one of its infinite number of partly-open positions, and Fig. 29 clearly demonstrates the outward bending of the fold **60** of the side flap **52** under the pressure exerted thereon by the other side flap **50** at its fold line **56**. Although the frictional resistance encountered by the unfolding side flap **52** on the other side flap **50** is sufficient to retain the spout in any of its infinite number of partly-open discharge or pouring positions as explained, this frictional resistance is not so great as to prevent closure of the spout into the position shown in Fig. 2 on merely tapping or pushing the same into the latter position with a relatively light force.

The side flap **50** of the spout is, in the present instance, provided with a further fold line **64** which, as shown in Figs. 3, 25 and 29, permits the innermost fold **66** of the side flap **50** to hinge sufficiently to prevent permanent random bending of the side flap **50** or of the adjacent interfolding side flap **52** under the pressure which they exert on each other when the spout is being closed into its position shown in Fig. 2. Thus, the entire side flap **50** acts, by virtue of its fold lines **56** and **64**, as a multiple hinge which not only affords a ready control over the magnitude of the frictional resistance encountered by the interfolding side flap **52** on the side flap **50**, but also compels the side flap **52** to interfold between the other side flap **50** and the bottom flap **54**, as contemplated, when closing pressure is applied to the latter.

As already mentioned, the spout **4** and, hence, also the carton **2** are to all practical intents and purposes closed when the former assumes the position shown in Fig. 2, hereinafter called "quick-closure" position. Even if the carton should be inverted with its spout lowermost, the contents of the carton will not at all, or at worst only to a negligible extent, escape through the spout in its quick-closure position, for any opening of the spout from the latter position under the weight of the carton contents thereon will be fully resisted by the considerable friction between the side flaps **50** and **52** immediately on even slight unfolding of the latter from the quick-closure position of the spout. Figs. 2 and 17 to 21 show the spout **4** in its quick-closure position, and its truly closed condition in this position is clearly demonstrated in Figs. 2, 19 and 21.

When the spout **4** is fully closed, i. e. when its bottom flap **54** is turned completely against the top wall **16** of the carton (Figs. 1 and 12 to 16), the side flaps **50** and **52** are completely folded upon themselves between the ledge **22** and the bottom flap **54** (Figs. 13 and 15) and the spout **4** may be retained in this position, hereinafter called "full-closure" position, by tucking a preferably curved tab portion **70** of the bottom flap **54** into the previously described pocket or tuck-slot **42** between the ledge **22** and the top wall **16** of the carton (Figs. 1, 12 and 13).

The interfolded side flap **52** is, on closure of the spout **4** from its quick-closure position (Fig. 2) into its full-closure position (Fig. 1) so tensioned by the folding side flap **50** and the inwardly turning bottom flap **54** that the spout will, on its release, immediately snap back of its own accord into its quick-closure position, unless the tab portion **70** of the bottom flap **54** is tucked into the pocket **42** in the full-closure position of the spout (Fig. 13). Accordingly, the interfolded side flap **52** will have a substantial press-fit between the other folded side flap **50** and the bottom flap **54** and form an exceptionally effective seal for the carton when the spout is held in its full-closure position by the tucked-in tab portion **70** of the bottom flap **54**. On the other hand, the quick-closure position of the spout (Fig. 2) is in most cases sufficient to close the carton and protect its contents, and the spout may quickly be manipulated into its quick-closure position on merely tapping the same at its bottom flap, and if the closing force exerted on the bottom flap, should carry the spout beyond its quick-closure position and even into its full-closure position, the same will of its own accord snap back to its quick-closure position as explained. Thus, the spout **4** and, hence, also the carton **2** may for most purposes be satisfactorily closed, by merely tapping the spout quickly into or beyond its quick-closure position without any further ado whatsoever.

Since in the instant formation of the blank **20** the interfolding side flap **52** and the ledge **22** are separated by a mere cut line **21***a* (Fig. 6), it follows that the side flap **52** would in its interfolded condition be fully within the confines of the discharge opening **18** in the top of the carton if this flap were not made of increasing length toward the bottom flap **54** which, in order to be insertable with its tab portion **70** into the pocket **42**, must be of greater length than the side flap **52** at the ledge **22** (Figs. 8, 12 and 13). Further, the side flap **50**, which becomes the bottommost folded flap of the spout **4** either in its quick-closure position or in its full-closure position, is of such over-all width (Figs. 5 and 9) that the same will rest with its bottommost fold **66** on the ledge **22** (Figs. 13, 15 and 21).

Since in the instant formation of the blank **20** the bottommost fold **66** of the side flap **50** and the top wall **16** are separated by a mere cut line **21***b* (Fig. 6), their adjacent edges **76** and **78**, respectively, are alike and are preferably curved as shown in Figs. 4 and 5 so that the preferably curved tab portion **70** of the bottom flap **54** may the more easily be tucked into the pocket **42** in the full-closure position of the spout **4** (Fig. 12). As indicated in Fig. 14, the curved edge **76** of the bottommost fold **66** of the side flap **50**, which in either closure position of the spout rests directly on the ledge **22**, swings slightly away from the adjacent edge **78** of the top wall **16** of the carton when the spout is urged from its quick-closure position into its full-closure position. This is due to the fact that the bottommost fold **66** of the bottommost side flap **50** is the one which offers the least resistance to the inevitable slight relative shift of the side flaps **50** and **52** in consequence of the tight interfolding of the side flap **52** between the other flaps **50** and **54** when the spout is fully closed, and it is this relative shift between the side flaps **50** and **52** which draws the bottommost fold **66** of the side flap **52** slightly away from the adjacent edge **78** of the top wall **16** of the carton in a swinging motion about the point *p* at which the side flap **50** and the top wall **16** merge (Figs. 6 and 14). When the spout is released in any position intermediate its full-closure and quick-closure positions, the same will quickly revert of its own accord into its quick-closure position, as explained, and in consequence swing the bottommost fold **66** of the side flap **50** with its edge **76** into abutting engagement with the adjacent edge or shoulder **78** of the top wall **16** of the carton and thus yieldingly prevent opening of the spout from its quick-closure position. In folding the spout toward its quick-closure position, the force with which the bottommost fold **66** of the bottommost flap **50** is urged against the top wall **16** of the carton is such that the fold **66** will spring with a readily perceptible snap action from the top wall **16** onto the ledge **22** and thereafter recede thereon slightly away from the adjacent edge or shoulder **78** of the top wall when the spout is being folded beyond its quick-closure position. Conversely, the force with which the edge **76** of the bottommost flap **50** will, in the quick-closure position of the spout, engage the adjacent edge **78** of the top wall **16** of the carton is such that the edge **76** will, on opening

the spout from its quick-closure position, jump from engagement with the edge or shoulder 78 with a perceptible snap. Accordingly, the abutting pressure between the adjacent edges 76 and 78 of the spout flap 50 and of the carton wall 16 will, on opening the spout from its quick-closure position, increase until the edge 76 of this spout flap jumps from engagement with the edge 78 of the carton wall 16. In order that this increasing abutting pressure may not permanently bend at random that portion 80 of the bottommost fold 66 of the spout flap 50 which by virtue of this abutting pressure is subjected to maximum bending stresses, the spout flap 50 is provided with another fold line or crease 82 about which this maximum stressed release-flap 80 will hinge until it clears the edge 78 of the carton wall 16 when the spout is being opened from its quick-closure position (Figs. 3 and 22 to 24).

Fig. 30 shows a modified carton 2' with a folding spout 4' which has all the advantages of the described carton 2 with its folding spout 4, but distinguishes from the same by providing for the extension of both folded side flaps 50' and 52' into overlapping relation with the ledge 22' when the spout is in its full-closure position, thereby further to enhance the sealing of the carton by the spout when the latter is in its fully closed condition. To achieve this, the ledge portion 22' of the blank 20' from which the carton 2' and spout 4' are formed is continuous with the end wall portion 10' of the blank (Fig. 31) so that in the formation of the carton and spout the ledge 22' may be folded inwardly of the end wall 10' between the side walls 6' and 8' and into the confines of the channel formed by the side and bottom flaps 50', 52' and 54' of the spout adjacent the opposite end wall 12' and the side walls 6' and 8' (Fig. 30). The spacer flap 44' is then folded into superposed relation with the ledge 22', whereupon the top wall 16' is folded over the spacer flap 44' and secured in place between the side walls 6' and 8'. No further description of the set-up of the carton 2' and spout 4' from the blank 20' is deemed necessary since the rest of its set-up is fully suggested by the previously described set-up of the blank 20 into the carton 2 with its spout 4.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

I claim:

1. A carton made of foldable stock having a dispensing end, with a quadrangular discharge opening, said opening having articulated thereabout on three sides, a movable folding spout, said spout comprised of a substantially quadrangular bottom wall, its free end terminating in a tab portion, and two diagonally creased substantially quadrangular side-walls articulated to the sides of said bottom-wall, said carton-end comprised also of a permanent end-closure portion articulated to part of the edges of the two carton side-walls and the edge of the adjacent carton end-wall, said permanent end-closure portion extending inwardly from said carton end-wall to its juncture with the spout side-walls, said permanent end-closure having a ledge member extending inwardly beyond the juncture of at least one of the spout side-walls thus ostensibly protruding into said discharge opening, said spout adapted in one position to discharge the contents of said carton and in another position to close said discharge opening, said spout side-walls being so dimensioned, adapted and disposed that when in said closed position they are folded inwardly each upon itself with at least part of the outer terminal ends in one direction extended beyond the confines of said discharge opening to overlay said ledge, and in the other direction to at least abut each other above said ledge, said permanent end-closure portion having at least part way across thereon a shoulder, said shoulder coincident with the edge of at least one of said spout side-walls against which said side-wall abuts when spout is in said closed position; also said permanent end-closure portion having a tuck-slot thereon, so disposed in its open position, to accommodate the tab portion of said spout bottom-wall; thus when spout is in said closed position the terminal ends of said side-walls are positioned in a compressed condition, partly abutting said shoulder, between said ledge and the tucked-in bottom-wall of said spout, in a secured sift-proof closure.

2. A carton made of foldable stock having a dispensing end, with a quadrangular discharge opening, said opening having articulated thereabout on three sides, a movable folding spout, said spout comprised of a substantially quadrangular bottom-wall, its free end terminating in a tab portion, and two diagonally creased substantially quadrangular side-walls articulated to the sides of said bottom-wall, said carton-end comprised also of a permanent end-closure portion articulated to part of the edges of the two carton side-walls and the edge of the adjacent carton end-wall, said permanent end-closure portion extending inwardly from said carton end-wall to its juncture with the spout side-walls; said permanent end-closure portion also having a ledge member extending inwardly beyond the juncture of at least one of the spout side-walls thus ostensibly protruding into said discharge opening, said end-closure portion having a shoulder at least part way across thereon, and also a tuck-slot therein, said spout adapted in one, open and secured, position to discharge the contents of said carton at a controlled rate with said side-walls partially folded inwardly along said diagonal creases in a bellows-like fold, abutting approximately at their apexes and thus forming with said bottom-wall a V tubular funnel spout, said tubular formation being sustained by the stresses and predisposition in said foldable stock to reclose, said spout also adapted in a secured quick-closure position with said side-walls being folded fully together closing said spout and completely closing said discharge opening, said spout side-walls being dimensioned in one direction completely interfolded, with internal stresses and a predisposition to unfold, the upper of said side-walls folded between the folds of the lower side-wall and the spout bottom-wall and the lower of said side-walls folded between the upper side-wall and the ledge member, with at least the lower of said side-walls so dimensioned in the other direction that they extend beyond the confines of said discharge opening and overlay said ledge, firmly abutting said shoulder on said permanent end-closure portion, said shoulder positioned to thus firmly hold from unfolding said innermost side-wall and thence the complete spout against said stresses in its completely interfolded quick-closure position; said spout adapted also in a final full-closure position, with said side-walls fully collapsed along said diagonal creases and articulations with at least the innermost side-wall superimposed upon said ledge and said bottom-wall superimposed on said side-walls and so dimensioned as to fully cover said side-walls and allow said end-tab to be positioned in said tuck-slot immediately adjacent thereto in said permanent end-closure portion, thus effecting a completely collapsed spout and a secured closure of said discharge opening.

3. The carton and folding spout of claim 2 having the bottommost fold of said lower side wall bisected into two triangular sectors by a crease extending transversely from the outer terminal edge thereof to its opposite apex, in one position said sectors to lie flatly against said ledge when said spout is in a closed position, and in another position to unfold hinge-like when said spout is being opened, said first sector to be resisted by said upper side-wall into which said first sector must

be forced to form an arc-like bend in order to unfold, this due to the upward support of said sector by said ledge; and also, in still another position when said spout is open, said two sectors to assume a partially folded condition due to the inherent folding tendency of said stock at said crease, thus fore-shortening their total width and positioning the apex of said lower side-walls inwardly and below the apex of the opposing upper side-wall thus insuring the proper interfolding of said side-walls when said spout bottom-wall is tapped or otherwise forced inwardly in closing said spout.

4. The carton and folding spout of claim 3 having a triangular release flap articulated to the terminal end of said lower side-wall, said release flap having been formed from said side-wall by a crease extending from near the outer end of the medial diagonal crease of said side-wall to a point at least part way across and on said terminal end, said release flap in one position to release said lower side-wall from said shoulder by unfolding hinge-like when the spout is being forced open.

5. A carton made of foldable stock having a dispensing end, with a quadrangular discharge opening, said opening having articulated thereabout on three sides, a movable folding spout, said spout comprised of a substantially quadrangular bottom-wall, and two diagonally creased substantially quadrangular side-walls articulated to the sides of said bottom-wall, said carton-end comprised also of a permanent end-closure portion articulated to part of the edges of the two carton side-walls and the edge of the adjacent carton end-wall, said permanent end-closure portion extending inwardly from said carton end-wall to its juncture with the spout side-walls; said permanent end-closure portion also having a ledge member extending inwardly beyond the juncture of at least one of the spout side-walls thus ostensibly protruding into said discharge opening, said end-closure portion having a shoulder at least part way across thereon, said spout adapted in one, open and secured, position to discharge the contents of said carton at a controlled rate with said side-walls partially folded inwardly along said diagonal creases in a bellows-like fold, abutting approximately at their apexes and thus forming with said bottom-wall, a V tubular funnel spout, said tubular formation being sustained by the stresses and predisposition in said foldable stock to reclose, said spout also adapted in a secured quick-closure position with said side-walls being folded fully together closing said spout and completely closing said discharge opening, said spout side-walls being dimensioned in one direction completely interfolded, with internal stresses and a predisposition to unfold, the upper of said side-walls folded between the folds of the lower side-wall and the spout bottom-wall and the lower of said side-walls folded between the upper side-wall and the ledge member, with at least the lower of said side-walls so dimensioned in the other direction that it extends beyond the confines of said discharge opening and overlays said ledge, firmly abutting said shoulder on said permanent end-closure portion, said shoulder positioned to thus firmly hold from unfolding said innermost side-wall and thence the complete spout against said stresses in its completely interfolded quick-closure position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,704,987	Marsh	Mar. 12, 1929
2,077,341	Martin et al.	Apr. 13, 1937
2,205,068	Potter	June 18, 1940
2,288,042	Spilman	June 30, 1942
2,398,200	Van Voorhis	Apr. 9, 1946
2,565,182	Maxon	Aug. 21, 1951