

Dec. 28, 1965

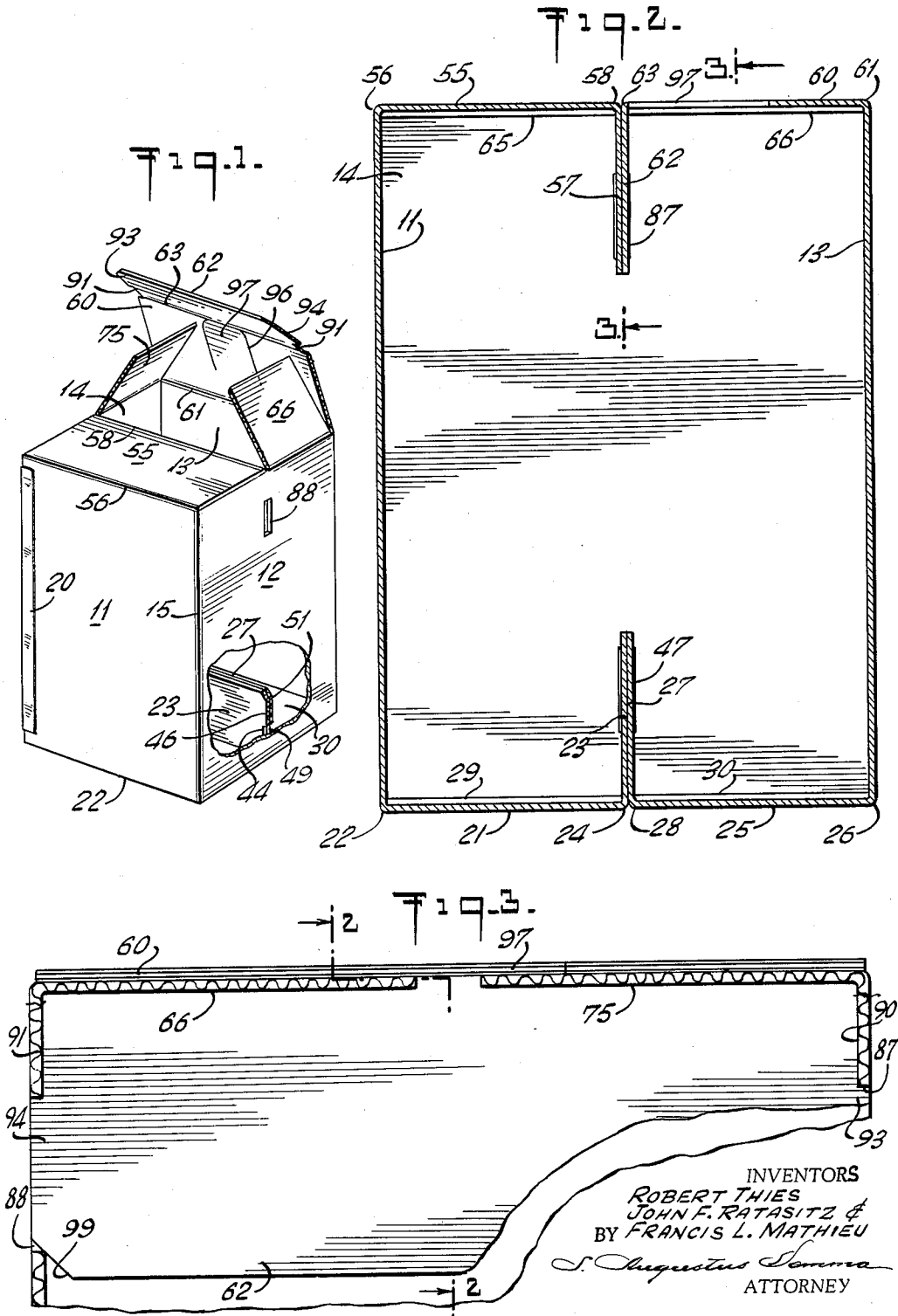
R. THIES ETAL

3,226,007

CARTONS

Filed April 3, 1964

2 Sheets-Sheet 1



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CARTONS

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Fig. 4.

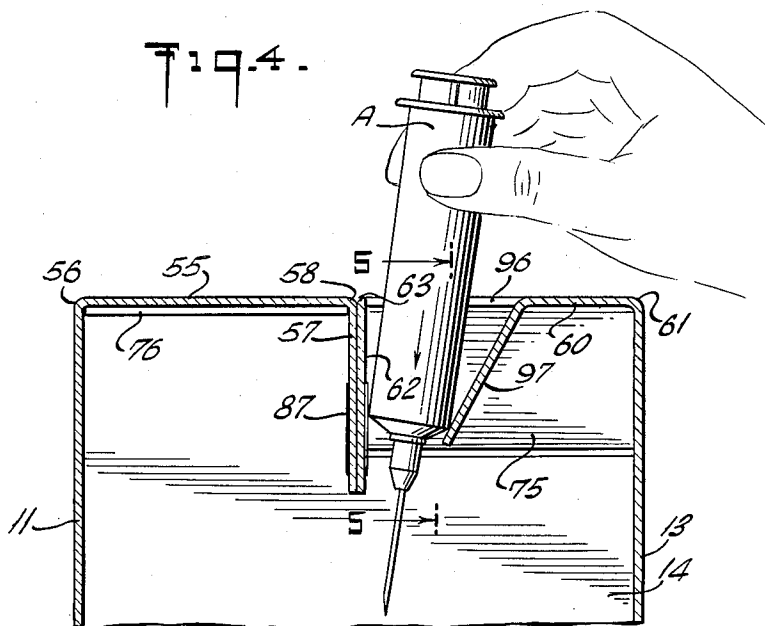


Fig. 5.

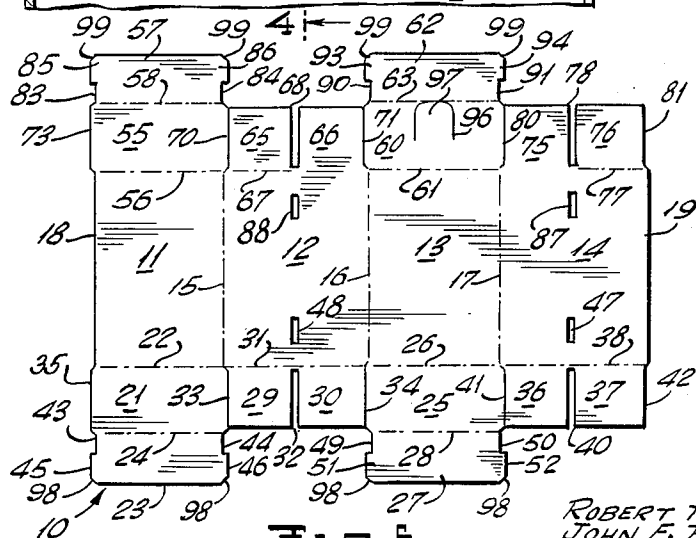
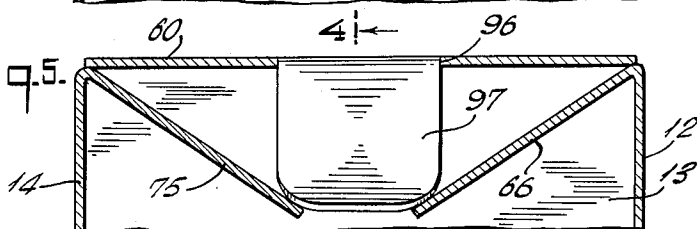


Fig. 6.

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3,226,007
CARTONS

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The present invention relates to disposable cartons, which although having a wide range of utility, are particularly useful in hospitals, doctors' examining rooms and the like for the temporary storing and disposal of used medical devices, such as syringes, swabs, tongue pallets or depressors and the like.

In a hospital or doctor's examining room, after such medical devices as syringes, swabs, tongue depressors and the like have been used, it is a problem to store these waste devices temporarily in a manner to safeguard against their contaminating influence until they can be disposed of.

An object of the present invention is to provide a new and improved carton for waste devices, (1) which can be manufactured inexpensively enough to permit its economical disposal with its waste contents, (2) which is constructed from a blank having parts which can be readily set up to form the closed carton and which become locked together to form the closed carton without the use of staples or similar rigid fasteners automatically when these parts are folded and tucked into place, (3) which is constructed and designed to maintain its waste contents hygienically stored and confined, while at the same time permitting easy discharge of waste devices therein with minimum of manipulation, (4) which is constructed and designed to reduce the chances of any sharp elements such as needles from penetrating through the carton walls as these elements are dropped into the carton, thereby reducing the incidence of contamination from any such sharp elements, and (5) which can be handled and disposed of with its waste contents without coming into contact with these contents.

Various other objects of the invention are apparent from the following description and from the accompanying drawings, in which

FIG. 1 is a perspective of the carton embodying the present invention and shown in the last stages of being set up for use;

FIG. 2 is a vertical section through the closed carton shown ready for use, and taken on lines 2—2 of FIG. 3;

FIG. 3 is a detail vertical section of the upper part of the carton taken on lines 3—3 of FIG. 2;

FIG. 4 is a detail vertical section of the upper part of the carton taken on lines 4—4 of FIG. 5 and shown while a used syringe is being discharged therein;

FIG. 5 is a detail vertical section of the upper part of the carton taken on lines 5—5 of FIG. 4; and

FIG. 6 is a plan of the blank from which the carton embodying the present invention can be set up.

Referring to the drawings, and specifically to FIG. 6, there is shown a flat blank 10 from which the carton of the present invention can be set up. The blank 10 is desirably made from double-faced corrugated cardboard having a certain amount of inherent resiliency especially along fold lines thereof and in order to facilitate bending of its upper and lower closure flaps to be described it is desirable to have its corrugations, i.e. its furrows, extending longitudinally from left to right (FIG. 6), so that these flaps can be folded easily along these furrows, as shown in FIG. 3.

The blank 10 comprises four main contiguous and successive panels 11, 12, 13 and 14 separated by fold lines

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15, 16 and 17 in the form of crease or score lines along which the blank is adapted to be folded to form the side walls of the carton. The sides 18 and 19 of the blank can be brought together in abutting relation and secured together by means of an adhesive tape 20 (FIG. 1) flexible enough to permit said tape to be folded along the line of juncture between these carton sides. With the sides 18 and 19 secured together by means of the tape 20, the blank 10 can be folded along the fold line 16, so that the blank so taped and doubly folded, will be flat and can be shipped and stored in this condition; in this condition, the blank 10 is ready to be set up easily with a minimum of manipulation into carton forms.

The lower end of the panel 11 has integral therewith an outer bottom semiclosure flap 21 separated from the panel by a fold line 22 in the form of a crease or score line and having an end tuck extension 23 separated from the flap 21 by a fold line 24 in the form of a crease or score line. The lower end of the panel 13 has integral therewith a similar outer bottom semiclosure flap 25 adapted to mate with the semiclosure flap 21 in set up condition of the carton to form with said flap 21 a full bottom outer closure for said carton. This semiclosure flap 25 is separated from the panel 13 by a fold line 26 in the form of a crease or score line and has an end tuck extension 27 separated from the flap 25 by a fold line 28 in the form of a crease or score line.

The panel 12 has between the two outer bottom semiclosure flaps 21 and 25 a pair of similar adjoining inner bottom semiclosure flaps 29 and 30 terminating at or just short of the fold lines 24 and 28 and separated from the panel 12 by a fold line 31 in the form of a crease or score line in alignment with and forming a continuation of the fold lines 22 and 26. These inner bottom semiclosure flaps 29 and 30 are spaced from each other by a slot 32 extending to the fold line 31 and are separated from the outer semiclosure flaps 21 and 25 by means of slits 33 and 34 extending to said fold line 31. These slits 33 and 34 are offset slightly inwardly from the fold lines 15 and 16 so that the distance between these slits is slightly less than the width of the panel 12, and the outer side edge 35 of the outer semiclosure flap 21 is outwardly offset slightly from the corresponding side edge 18 of the panel 11, so that the width of said flap 21 is greater than the width of the panel 11 for the reasons to be made apparent.

The panel 14 has a pair of similar adjoining inner bottom semiclosure flaps 36 and 37 terminating at or just short of the fold line 28 and adapted to mate with the inner bottom semiclosure flaps 30 and 29 respectively with the ends of the two pairs of flaps 30, 29 and 36, 37 in spaced but close relationship in set up condition of the carton. The inner semiclosure flaps 36 and 37 are separated from the panel 14 by means of a fold line 38 in the form of a crease or score line in alignment with and forming a continuation of the fold line 26 and are spaced from each other by a slot 40 extending to the fold line 38. The inner semiclosure flap 36 is separated from the outer semiclosure flap 25 by a slit 41. This slit 41 as well as the side edge 42 of the flap 36 are offset slightly inwardly from the fold line 17 and the side panel edge 19, so that the distance between the slit 41 and the flap edge 42 is less than the width of the panel 14 and the width of the outer semiclosure flap 25 is greater than the width of the panel 13 for the reasons to be made apparent.

The tuck extension 23 is provided at its sides near the fold line 24 with notches 43 and 44 to define locking tabs 45 and 46 adapted to fit into slots 47 and 48 respectively in the panels 14 and 12 respectively in set up condition of the carton to lock the tuck extension 23 into place in this set up condition of the carton. Similarly, the tuck extension 27 is provided at its sides near the

fold line 28 with notches 49 and 50 to define locking tabs 51 and 52 adapted to fit into the panel slots 48 and 47 respectively in set up condition of the carton to lock the tuck extension 27 into place in this set up condition of the carton.

The upper end of the panel 11 has integral therewith an outer top semiclosure flap 55 separated from the panel 11 by a fold line 56 in the form of a crease or score line and having an end tuck extension 57 separated from the flap 55 by a fold line 58 in the form of a crease or score line. The upper end of the panel 13 has integral therewith a similar outer top semiclosure flap 60 adapted to mate with the semiclosure flap 55 in set up condition of the carton to form with said flap 55 a full top closure for said carton. This semiclosure flap 60 is separated from the panel 13 by a fold line 61 in the form of a crease or score line and has an end tuck extension 62 separated from the flap 60 by a fold line 63 in the form of a crease or score line.

The panel 12 has between the two outer top semiclosure flaps 55 and 60 a pair of similar adjoining inner top semiclosure flaps 65 and 66 terminating at or just short of the fold lines 58 and 63. The flap 65 is separated from the panel 12 by a fold line 67 in the form of a crease or score line in alignment with and forming a continuation of the fold line 56, while the flap 66 is desirably not so separated from the panel 12 by a preformed fold line for the reasons to be made apparent. These inner top semiclosure flaps 65 and 66 are spaced from each other by a slot 68 extending to the fold line 67 and are separated from the outer top semiclosure flaps 55 and 60 by means of slits 70 and 71 extending to the fold lines 56 and 61 respectively. These slits 70 and 71 are offset slightly inwardly from the fold lines 15 and 16 so that the distance between these slits is slightly less than the width of the panel 12, and the outer side edge 73 of the outer top semiclosure flap 55 is outwardly offset slightly from the corresponding side edge 18 of the panel 11, so that the width of said flap 55 is greater than the width of the panel 11 for the reasons to be made apparent.

The panel 14 has a pair of similar adjoining inner top semiclosure flaps 75 and 76 terminating at or just short of the fold line 63 and adapted to mate with the inner top semiclosure flaps 66 and 65 respectively with the ends of the two pairs of flaps 65, 66 and 75, 76 in spaced but close relationship in set up condition of the carton. The inner top semiclosure flap 76 is separated from the panel 14 by means of a fold line 77 in the form of a crease or score line in alignment with the fold lines 56 and 61, while the flap 75 is desirably not so separated from the panel 14 by a preformed fold line for the reasons to be made apparent. These inner top semiclosure flaps 75 and 76 are spaced from each other by a slot 78 extending to the fold line 77. The inner top semiclosure flap 75 is separated from the top outer semiclosure flap 60 by a slit 80. This slit 80 as well as the side edge 81 of the flap 76 are offset slightly inwardly from the fold line 17 and the side panel edge 19, so that the distance between the slit 80 and the flap edge 81 is less than the width of the panel 14 and the width of the outer top semiclosure flap 60 is greater than the width of the panel 13 for the reasons to be made apparent.

The top tuck extension 57 is provided at its sides near the fold line 58 with notches 83 and 84 to define locking tabs 85 and 86 adapted to fit into slots 87 and 88 respectively in the panels 14 and 12 respectively in set up condition of the carton to lock the tuck extension 57 into place in this set up condition of the carton. Similarly, the top tuck extension 62 is provided at its sides near the fold line 63 with notches 90 and 91 to define locking tabs 93 and 94 adapted to fit into the panel slots 88 and 87 respectively in set up condition of the carton to lock the tuck extension 62 into place in this set up condition of the carton.

In order to permit access to the interior of the set up

carton for the discharge of the used articles to be disposed of therein while maintaining the carton closed against possible contamination with its contents, the outer top semiclosure flap 60 has an inverted U-shaped cut 96 to define a tongue 97 which can be depressed to form a trap door for the carton in set up condition. This trap door 97 is centrally located between the slides of the outer top semiclosure flap 60 and has its free end almost co-extensive or in alignment with the fold line 63.

The blank 10 constructed as described can be easily, expeditiously and cheaply manufactured on a mass production basis by cutting, slitting, slotting and creasing or scoring in well known manner.

To set up the carton, the tubular blank 10 with its panel edges 18 and 19 secured together by means of the adhesive tape 20 is bent along the fold lines 15, 16 and 17 and along the tape to open up the blank into rectangular tubular form. With the blank so initially set up, the inner bottom semiclosure flaps 29, 30, 36 and 37 are folded along the fold lines 31 and 38 at right angles to the panels 12 and 14. In this folded position of the flaps 29, 30, 36 and 37, the two slots 32 and 40 will be in alignment to form an opening between the pairs of flaps 29 and 37 and the pair of flaps 30 and 36. The tuck extensions 23 and 27 are then bent inwardly along the fold lines 24 and 28 respectively at right angles to the outer bottom semiclosure flaps 21 and 25 respectively and said flaps 21 and 25 are bent along the fold lines 22 and 26 respectively, while the tuck extensions 23 and 27 are pushed inwardly into the carton between the pair of flaps 29 and 37 and the pair of flaps 30 and 36 through the opening defined by the aligned slots 32 and 40 until the outer bottom semiclosure flaps 21 and 25 overlie the inner bottom semiclosure flaps 29, 30, 36 and 37 and lie flat against the latter flaps with the fold lines 24 and 28 meeting and the tuck extensions 23 and 27 fully inserted into the carton in face to face contact and conjointly forming an upstanding wall, as shown in FIGS. 1 and 2. To facilitate entry of the tuck extensions 23 and 27 through the opening formed by the slot 32 and 40 during this operation of setting up the carton, the outer corners of said tuck extensions are bevelled at 98.

Because the distance between opposed panels 12 and 14 is slightly less than the widths of the tuck extensions 23 and 27 to the outer edges of their locking tabs 45, 46, 51 and 52, as the tuck extensions 23 and 27 are pushed to their full extent through the opening formed by the slots 32 and 40, the locking tabs 45 and 46 on the sides of the tuck extension 23 and the locking tabs 51 and 52 on the sides of the tuck extension 27, slide along the inner surfaces of the opposed panels 12 and 14 with compressive force until these locking tabs reach the panel slots 47 and 48, whereupon said tabs will snap into said slots and thereby lock automatically the tuck extensions 23 and 27 to the panels 12 and 14.

The two upstanding tuck extensions 23 and 27 face to face as shown in FIGS. 1 and 2, serve not only as means for keeping the flaps 21 and 25 in outer closure position on the carton but also serve conjointly as a brace between the lower parts of the panels 12 and 14 to prevent collapse of the carton and as a baffle to interrupt the free fall of a used disposable article dropped into the carton. By means of such obstructive action, if this used disposable article contains a sharp point or edge like the needle of a syringe, it will not drop with sufficient force to the bottom of the carton to cause such a needle or sharp point to penetrate the bottom overlapping flaps and protrude from said carton into position to injure or contaminate.

With the carton set up to the stage indicated in which its bottom is fully closed, the upper part of the carton is closed by first bending the inner top semiclosure flaps 65 and 76 inwardly about the preformed fold lines 67 and 77 and bending the inner top semiclosure flaps 66 and 75 inwardly along the creaseless bases of said flaps 66 and 75. The absence of preformed folding lines for the flaps

66 and 75 causes said flaps to be urged resiliently upwardly against the trap door 97 after bending along said flaps 55 and 60 and especially against the trap door 97 to maintain said door normally closed. If the fold lines for the flaps 66 and 75 were preformed by creasing or scoring, these flaps would still be urged resiliently upwardly against the trap door 97 after bending along said fold lines as described, but not as strongly as when these fold lines are not preformed.

With the inner top semiclosure flaps 65, 66, 75 and 76 folded inwardly as described, the upper tuck extensions 57 and 62 are bent inwardly along the fold lines 58 and 63 respectively at right angles to the outer top semiclosure flaps 55 and 60 respectively and said flaps 55 and 60 are bent along the fold lines 56 and 61 respectively while the tuck extensions 57 and 62 are pushed inwardly into the carton between the pair of flaps 65 and 76 and the pair of flaps 66 and 75 through the opening defined by the aligned slots 68 and 78 until the outer top semiclosure flaps 55 and 60 overlap the inner top semiclosure flaps 65, 66, 75 and 76 and lies flat against the later flaps with the fold lines 58 and 63 meeting and the tuck extensions 57 and 62 fully inserted into the carton face to face. In this condition of the carton, the tuck extensions 57 and 62 conjointly form a depending wall, as shown in FIGS. 2, 3, and 4.

To facilitate entry of the tuck extensions 57 and 62 through the opening formed by the slots 68 and 78 during the operation of setting up the carton described, the outer corners of said tuck extensions are bevelled at 99.

Because the distance between opposed panels 12 and 14 is slightly less than the widths of the tuck extensions 57 and 62 to the outer edges of their locking tabs 85, 86, 93 and 94, as these tuck extensions are pushed to their full extent through the opening formed by the slots 68 and 78, the locking tabs 85 and 86 on the sides of the tuck extension 57 and the locking tabs 93 and 94 on the sides of the tuck extension 62 slide along the inner surfaces of the opposed panels 12 and 14 with compressive force until these locking tabs reach the panel slots 87 and 88, whereupon said tabs will snap into said slots and thereby lock automatically the tuck extensions 57 and 62 to the panels 12 and 14.

The two depending tuck extensions 57 and 62 face to face as shown in FIGS. 1 and 2, serve (1) as a means for holding the top semiclosure flaps 55 and 60 down, (2) as a brace between the upper parts of the panels 12 and 14, and (3) as a guide wall for the waste articles as they are discharged through the trap door 97 into the carton, as shown in FIG. 4.

The carton set up as described is ready for use as a repository for waste articles, such as those used in doctors' offices or medical institutions. In this condition, the trap door 97 is closed and is urged in this closed position by the two inner top closure flaps 66 and 75 bearing up against it, as shown in FIGS 2 and 3. When it is desired to drop a waste article, as for example, a used syringe A into the carton, the trap door 97 is pressed downwardly, either by the article itself as shown in FIG. 4 or by the fingers of the person depositing the article, against the resilient resistance of the door itself and of the flaps 66 and 75, and the article is passed through the entranceway defined by said door. In the process of depressing the trap door 97 downwardly, the two inner top closure flaps 66 and 75 are bent downwardly along their fold lines, as shown in FIGS. 4 and 5. The two depending top tuck extensions 57 and 62 in this operation serve as a guide wall along which the waste article is slid while the article is depressing the trap door 97 open, to serve as a buttress for the article in the operation of so depressing the trap door, as shown in FIG. 4.

When the article is dropped through the trap door 97 in the manner described and is released to permit it to be deposited in the carton, it will fall in the carton. The lower upstanding tuck extensions 23 and 27 substantially

in the plane of the upper tuck extensions 57 and 62 form a baffle or obstruction, which breaks the free fall of the waste article, or diverts it as it approaches the bottom of the carton, thereby reducing the possibility of any sharp element on such an article, as for example, a syringe needle, from hitting the bottom of the carton, or hitting it with a force sufficient to cause the sharp point to penetrate the bottom of the carton and to protrude outwardly therefrom.

After the waste article has been dropped through the trap door 97 in the manner described, and the trap door is released, it will return upwardly almost to its original closed position due to the inherent resiliency of the trap door, and the upper inner closure flaps 66 and 75 will follow the trap door upwardly due to their inherent resiliency, almost close to the trap door. In this manner, the substantial closing of the trap door 97 when the carton is not in use is assured, thereby confining the waste contents of the carton against possible contamination outside the carton.

When the carton has been filled with waste articles, it can be disposed of with its contents by incineration or other suitable form of hygienic disposal.

In the embodiment described and shown, the side panels 11 and 14 are each in one piece and the blank can be formed into a collapsed tube by folding the blank along the fold line 16 and securing the sides 18 and 19 of these panels together by means of the tape 20; with this construction, when the carton is set up, the tape will be at the corner of the carton. However, it might be desirable in some cases to locate the tape 20 along a panel spaced from the corners of the carton. For that purpose, one of the end panels in the blank, instead of being in one piece as shown in the drawings, may be formed of two sections located at opposite ends of the blank respectively, and in forming the collapsed tube or in setting up the carton, these panel sections are unified by means of the tape 20 joining the outer side edges of these panel sections together. For example, the panel 11, instead of being in a single piece is divided vertically to constitute two sections located at opposite ends respectively of the blank. The two panel sections may be exactly equal, in which case the tape 20 joining these sections together in abutting side edge relationship will be located in the vertical center of the panel resulting from this joining of the panel sections, or if desired, the two panel sections may be of different widths, so that the tape joining the latter sections will be offset from the vertical center line of the resulting panel, but will still not be located at the corner of the set up carton.

While the invention has been described with particular reference to a specific embodiment, it is to be understood that it is not to be limited thereto but is to be construed broadly and restrictedly solely by the scope of the appended claims.

What is claimed is:

1. A carton comprising four panel walls rectangularly arranged, a pair of outer semiclosure flaps integrally connected to the upper ends of two opposite panel walls respectively by respective fold lines and having tuck extensions at their free ends separated from said flaps by fold lines and tucked inside said carton, said flaps being dimensioned to bring the two tuck extensions together face to face, one of said semiclosure flaps having a trap door in the form of a tongue supported only at one end along a hinge line for hinge action about said hinge line, said hinge line being substantially parallel to and spaced from the fold line of the tuck extension of the latter semiclosure flap, said trap door extending from said hinge line towards the latter fold line and having its other free end near the latter tuck extension, said tuck extensions forming a guide wall inside said carton for guiding articles dropped into said carton through the entranceway defined by said trap door.

2. A carton as described in claim 1, the other two panel walls having respective slots, and each of said tuck extensions having locking tabs at opposite ends extending into said slots respectively.

3. A carton made of material having limited resiliency and comprising four panel walls rectangularly arranged, a pair of inner spaced adjoining semiclosure flaps integrally connected to the upper end of one of said panel walls and bent about a fold line across the top of the carton, a second pair of inner spaced adjoining semiclosure flaps integrally connected to the upper end of another one of said panel walls opposite said one panel wall and bent about a fold line across the top of the carton, said flaps being arranged in aligned pairs, each pair of aligned flaps consisting of two flaps connected to opposite panel walls respectively, the two pairs of aligned flaps defining an opening between the two latter pairs resulting from the spacing between adjoining flaps, and a pair of outer semiclosure flaps integrally connected to the upper ends of the other two opposite panel walls respectively by fold lines and overlying said pairs respectively of aligned inner semiclosure flaps, said outer semiclosure flaps having respective tuck extensions at their free ends separated from said outer semiclosure flaps by fold lines and tucked inside said carton through said opening and between the two pairs of inner aligned semiclosure flaps, one of said outer semiclosure flaps having a trap door in the form of a tongue supported only at one end for hinge action at the latter end and having its other free end located near its tuck extension, the two aligned inner semiclosure flaps which underlie said one outer semiclosure flap having free ends permitting said underlying inner semiclosure flaps to be depressed about their respective fold lines against their inherent resiliency, said trap door being located over the free ends of the latter underlying pair of inner aligned semiclosure flaps, whereby upon depressing the trap door, the opening movement of the trap door resulting therefrom is not only resisted by the inherent resiliency of said trap door but also by the inherent resiliency of said underlying pair of inner aligned semiclosure flaps, said tuck extensions forming a guide wall inside said carton for guiding articles dropped into said carton through the entranceway defined by said trap door.

4. A carton as described in claim 3, comprising a closure flap at the bottom of the carton and a wall other than one of said panel walls inside said carton near the bottom of the carton and upstanding transversely from the bottom closure flap, said upstanding wall acting as a baffle to break the free fall of articles dropped into said carton through said trap door.

5. A blank for making a carton, comprising four panels arranged side by side and separated by fold lines, said panels being dimensioned to form the four upstanding side walls of a rectangular carton when said carton is set up from said blank, a pair of outer semiclosure flaps integrally connected to one end of alternate panels and separated therefrom by fold lines, each of said flaps having a length approximately equal to one-half the width of the panel between said alternate panels, each of said flaps having a tuck extension separated from its corresponding semiclosure flap by a fold line, a pair of inner spaced adjoining semiclosure flaps integrally connected to each of the other alternate panels at said end and each foldable about a line substantially in alignment with said end, said inner semiclosure flaps being arranged in position to form two pairs of aligned inner semiclosure flaps separated by an opening defined by the spacing between adjoining inner semiclosure flaps when said blank is set up to form the carton, with each aligned pair of inner semiclosure flaps underlying a corresponding outer semiclosure flap, the inner semiclosure flaps in one of said pairs of inner aligned semiclosure flaps being of such length as to be free at their confronting free ends for hinge movement and as to be free from substantial overlap at said confronting ends, the outer semiclosure flap overlying said pair of inner aligned semiclosure flaps with free ends having a trap door cut therefrom and located in position to overlie said free ends in set up condition of the carton, said tuck extensions being located and dimensioned to extend through said opening in set up condition of the blank, said trap door being supported at one end along a hinge line spaced from and substantially parallel to the fold line of the tuck extension on the latter outer semiclosure flap for hinge action about said hinge line, said trap door extending from said hinge line towards the latter fold line and terminating at its free end near the latter fold line.

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