Oct. 31, 1961 J. A. RICHARDSON 3,006,529

CARTONS

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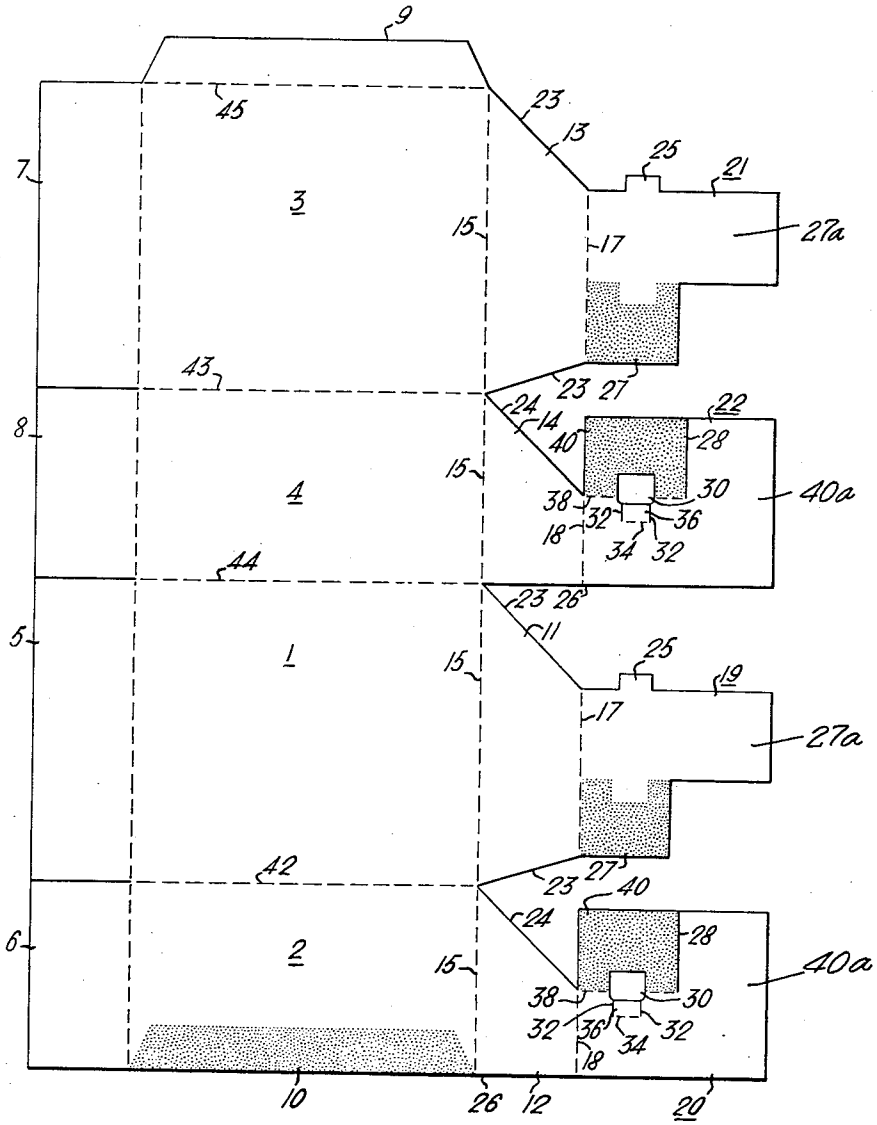


Fig. 1

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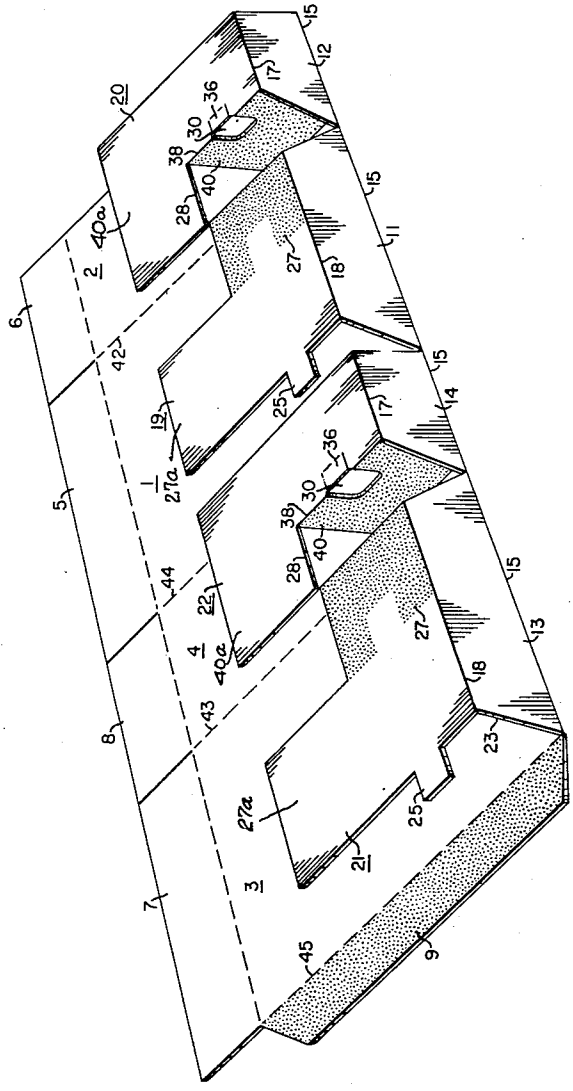


Fig. 2

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CARTONS

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Fig. 7

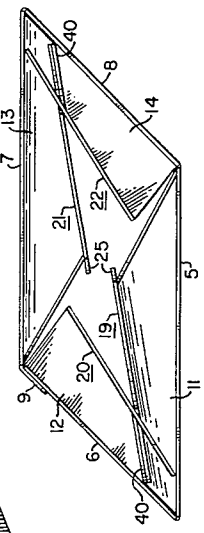
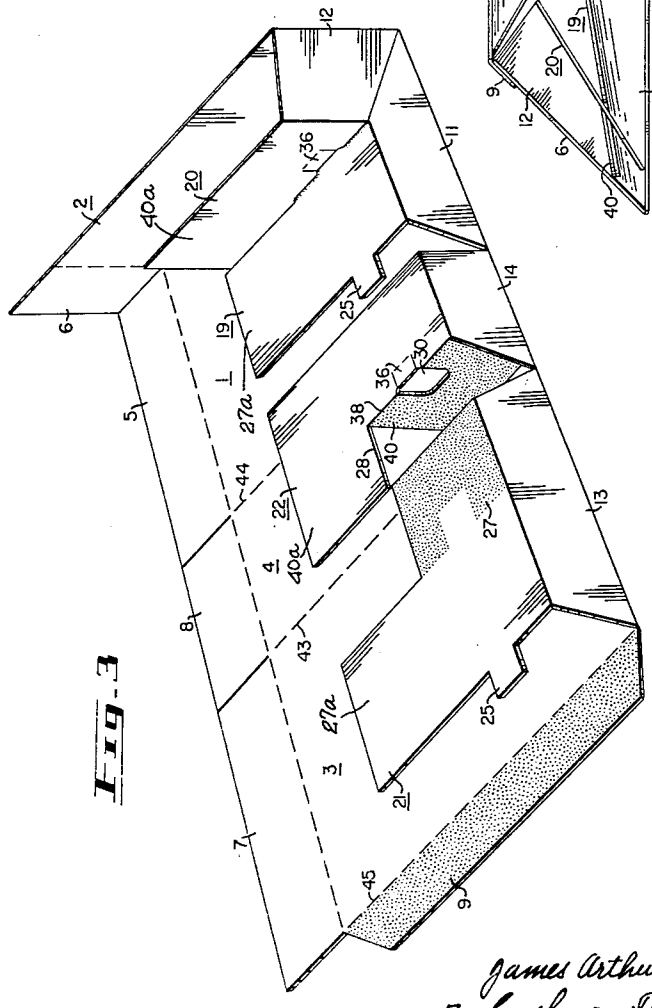


Fig. 3



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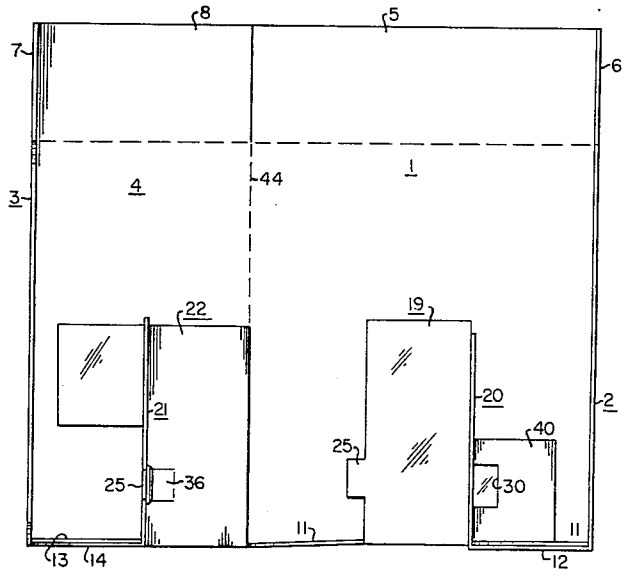


Fig. 4

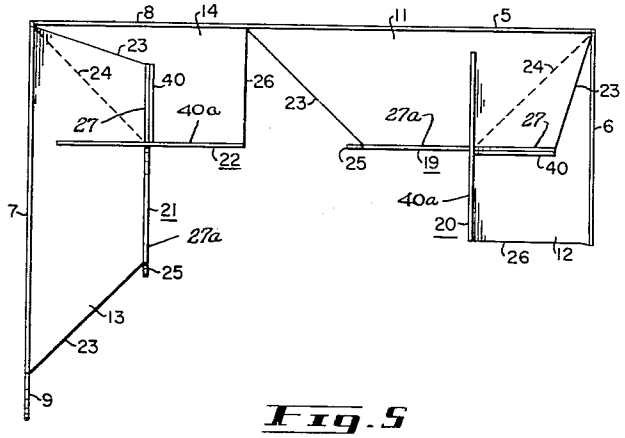


Fig. 5

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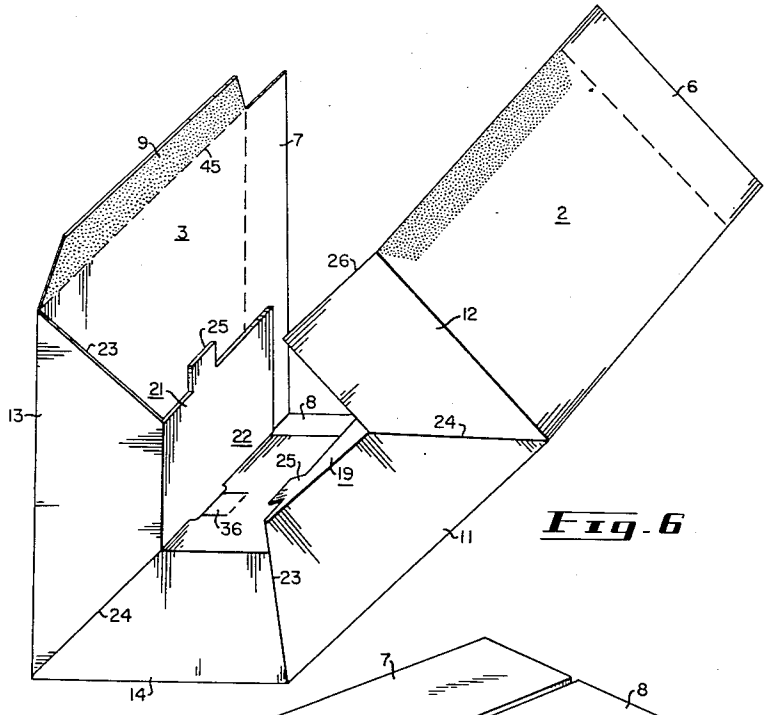


Fig. 6

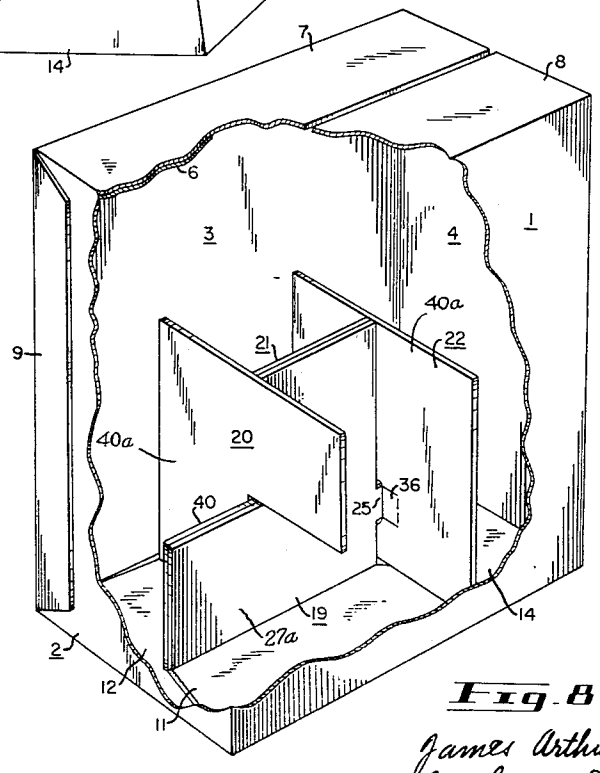


Fig. 8

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3,006,529
CARTONS

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4 Claims. (Cl. 229—28)

This invention relates to cartons and more particularly to an improved carton of the type formed from a single blank of material having portions adapted to be folded so as to provide a wall structure, a bottom and mutually transverse interlocking partitions therein, the latter forming a plurality of article receiving compartments within said carton.

The object of this invention is to provide novel means for locking the members forming the bottom of the carton and those forming the partitions in mutually cooperating position with respect to one another.

According to one aspect, this invention relates to a one-piece blank for forming a multi-cell carton having mutually transverse partitions therein defining article receiving compartments; said blank comprising a plurality of main panels joined together along first parallel score lines and adapted, upon folding along said first score lines, to form end walls and side walls of the carton; a secondary panel connected to each main panel by means of a common score line at right angles to said first score lines; each of said secondary panels being adapted, upon folding along said common score line to form a bottom wall of the carton; a pair of first and second tertiary panels each connected, by means of a second score line parallel to said common score line, to a selected and spaced pair of secondary panels; each of said first and second tertiary panels having a primary portion and an auxiliary wing portion, said portions being integrally and hingedly connected together along a common hinge line normal to said second score line; a cut-out portion in each of said first and second tertiary panels extending across said common hinge line with the major portion of each of said cut-outs being located in said wing portion; a pair of third and fourth tertiary panels, each connected, by means of a second score line parallel to said common score line, to one of a remaining pair of secondary panels, said tertiary panels being alternately arranged; each of said third and fourth tertiary panels having a primary connecting portion and an auxiliary portion integral therewith, each of said primary connecting portions being located adjacent to a said auxiliary wing portion and being adapted to be secured thereto in face-to-face contact, whereby, on folding of the blank and erection of said carton, each of said auxiliary wing portions is adapted to hinge about its hinge line and to extend at right angles to its said primary portion; a locking tongue integral with and projecting from a marginal side edge of each of said auxiliary portions of said third and fourth tertiary panels and coplanar with the latter, said edge being remote from the associated said integral primary connecting portion; each of said locking tongues having dimensions substantially similar to the dimensions of said cut-outs and being in alignment with the latter; whereby, on folding of the blank and erection of said carton, said locking tongue of said third tertiary panel is adapted to enter and cooperate with said cut-out in said second tertiary panel and to be in face-to-face contact with said fourth tertiary panel and coplanar with said wing portion of said second tertiary panel, and said locking tongue of said fourth tertiary panel is adapted to enter and cooperate with said cut-out in said first tertiary panel and to be in face-to-face contact with said third tertiary panel and coplanar with said wing portion of said first tertiary

panel; said third and fourth tertiary panels and said wing portion of said first and second tertiary panels thereby forming a first pair of complementary partitions within said carton and in face-to-face contact with one another; said primary portions of said first and second tertiary panels forming a second pair of complementary partitions within the carton, said second pair of partitions being spaced apart and transverse to said first pair of partitions; said cooperation of said locking tongues and said cut-outs positively locking said partitions in mutually cooperating position with one another.

According to another aspect, this invention relates to a multi-cell carton of the type having end walls and side walls, extensions on all of said walls, said extensions, by the mutual bending and engagement thereof forming a bottom wall of the carton; a pair of first and second panels each integrally and hingedly connected to a selected and spaced pair of said extensions and extending at right angles thereto; each of said first and second panels having a primary portion and an auxiliary wing portion, said portions being integrally and hingedly connected together along a common hinge line; a cut-out portion in each of said first and second panels extending across said common hinge line with the major portion of each of said cut-outs being located in said wing portion; a pair of third and fourth panels, each integrally and hingedly connected to one of a remaining pair of said extensions and extending at right angles thereto; each of said third and fourth panels having a primary connecting portion and an auxiliary portion integral therewith, each of said primary connecting portions being located adjacent to a said auxiliary wing portion and being secured thereto in face-to-face contact, whereby, each of said auxiliary wing portions extends at right angles to its said primary portion; a locking tongue integral with and projecting from a marginal edge of each of said auxiliary portions of said third and fourth panels and coplanar with the latter, said edge being remote from the associated said integral primary connecting portion; each of said locking tongues having dimensions substantially similar to the dimensions of said cut-outs and being in alignment with the latter; said locking tongue of said third tertiary panel being located in and cooperating with said cut-out in said second panel and being in face-to-face contact with said fourth panel and coplanar with said wing portion of said second panel, said locking tongue of said fourth panel being located in and cooperating with said cut-out in said first panel and being in face-to-face contact with said third panel and coplanar with said wing portion of said first panel; said third and fourth panels and said wing portions of said first and second panels thereby forming a first pair of complementary partitions within said carton in face-to-face contact with one another; said primary portions of said first and second panels forming a second pair of complementary partitions within the carton, said second pair of partitions being spaced apart and transverse to said first pair of partitions; said cooperation of said locking tongues and said cut-outs positively locking said partitions in mutually cooperating position with one another.

The invention is illustrated, by way of example, in the accompanying drawings, in which:

FIGURE 1 is a plan view of the blank from which the knockdown carton is ultimately formed;

FIGURES 2 to 6 show the knock-down carton in various stages of assembly;

FIGURE 7 is the underside view of a completed carton in partially erected condition; and

FIGURE 8 is a plan view of a partially erected carton.

Referring to the drawings, and in particular to FIGURE 1, the one-piece blank is provided with a plurality of main panels 1 to 4, joined together along first parallel

score lines 42–44. The panels 1 and 3 ultimately serve as the side walls of the carton and panels 2 and 4 ultimately serve as the end walls of the carton. Panels 1 and 3 are each provided with hingeable extensions 5, 7 which ultimately serve as the top side closures of the carton whereas panels 2, 4 are each provided with hingeable extensions 6, 8 ultimately serving as the top end closures of the carton.

A hingeable tab 9 is provided on one side of panel 3 extending throughout the length of the latter and having the underside thereof, as viewed in FIGURE 1, coated with any suitable pressure sensitive adhesive. A strip 10 of similar pressure sensitive adhesive extends throughout the length of panel 2 and adjacent to one marginal edge thereof.

The main panels are each provided with an extension. Said last-mentioned extensions, as will be described hereinafter, by the mutual bending and engagement thereof, form a bottom wall of the carton.

The extension of the main panel 1 is constituted by a secondary panel 11, and a third tertiary panel indicated generally at 19. The extension of the main panel 3 is constituted by a secondary panel 13, and a fourth tertiary panel indicated generally at 21, said third and fourth tertiary panels 19 and 21 each being connected to their respective secondary panels 11, 13 by means of a second score line 17 parallel to a common score line 15 connecting the secondary panels with the main panels, said common score line 15 being at right angles to said first score lines 42–44.

The extension of the main panel 2 is constituted by a secondary panel 12 and a first tertiary panel indicated generally at 20. The extension of the main panel 4 is constituted by a secondary panel 14, and a second tertiary panel indicated generally at 22, said first and second tertiary panels 20, 22 each being connected to their respective secondary panels 12, 14 by means of a second score line 18 also parallel to said common score line 15.

It will be seen, from reference to FIGURE 1, that the ends of each of the secondary panels 11, 13 extend inwardly, at 23 from their point of juncture with the common score line 15, to their point of juncture with the second score line 17. On the other hand, it will also be seen that one free edge 24 of each of the secondary panels 12, 14 of the main panels 2, 4, extends inwardly from its point of juncture with the common score line 15 to its point of juncture with the second score line 18, whereas the remaining free edge 26 of each said secondary panels 12, 14 is co-extensive with the respective main panel 2, 4.

The third and fourth tertiary panels 19, 21 are of substantially inverted L-shape and each have a primary connecting portion 27 and an auxiliary portion 27*a* integral therewith. Each of the auxiliary portions 27*a* has an integral locking tongue 25 projecting from one marginal side edge thereof and coplanar therewith, said edge being remote from the associated integral primary connecting portion 27. One face of the auxiliary portions 27*a* of the third and fourth tertiary panels 19, 21 is coated with any suitable pressure sensitive adhesive.

The first and second tertiary panels 20, 22 each have a primary portion 40*a* and an auxiliary wing portion 40, said portions being integrally and hingedly connected together along a common hinge line 38 normal to said second score line 18. Each of said first and second tertiary panels 20 and 22 is provided with an incision 28 parallel with its associated second score line 18, and a cut-out portion 30 extending across said common hinge line 38 with the major portion of each cut-out being located in the wing portion 40. One edge of each cut-out portion 30 has a pair of parallel and spaced incisions 32 extending therefrom, said incisions 32 being arranged parallel with the incision 28 and being coupled together, at one end thereof, by means of a score line 34 at right angles thereto. That portion of each primary portion

40*a* located between the incisions 32 and the score-line 34 ultimately serves as a resilient tab 36 as will be described hereinafter. One face of each auxiliary wing portion 40 is coated with any suitable pressure sensitive adhesive.

As will be seen from FIGURE 1, each of the locking tongues 25 has dimensions substantially similar to the dimensions of the cut-outs 30 and is in alignment therewith.

The assembly of the carton to its knock-down condition will now be described, with reference to FIGURES 2 to 6.

As will be appreciated, the blank shown in FIGURE 2 has been turned so that the upper face shown in FIGURE 1 is the obverse side of that shown in FIGURE 2.

The first stage of assembly is that, as is shown in FIGURE 2, the secondary panels 11–14, ultimately serving as the bottom wall of the carton, are bent along the common score line 15, so as to be at right angles to their associated main panels 1–4. Thereafter, the tertiary panels 19–22 are bent along the second score lines 17, 18 so as to extend at right angles to their respective secondary panels 11–14 and so as to be parallel with the main panels 1–4 and to project upwardly within the carton ultimately formed. The auxiliary wing portion 40 of each first and second tertiary panels 20, 22 is then bent along the common hinge line 38 so as to extend at right angles to said first and second tertiary panels 20, 22 and toward the main panels 2, 4 respectively.

The next stage in the assembly of carton is as shown in FIGURE 3 where, as will be seen, the main panel 2 is bent along a score line 42 (see FIGURES 1 and 2), located between said main panel 2 and the adjacent main panel 1, so that the adhesively coated auxiliary wing portion 40 of the first tertiary panel 20 adheres, in face-to-face contact with the primary connecting portion 27 of the third tertiary panel 19 and whereby the remaining portions of said third and fourth tertiary panels 19, 20 are arranged at right angles to one another. It will be appreciated that when the main panel 2 is bent along the score line 42 as described above, the secondary panel 12 of said main panel 2 partially overlaps the secondary panel 11 of the main panel 1.

Thereafter, the main panel 3 is bent along a score line 43 (see FIGURES 1 to 3), located between said main panel 3 and the adjacent main panel 4 so that the primary connecting portion 27 of the fourth tertiary panel 21 of said main panel 3 is secured in face-to-face contact with the adhesively coated auxiliary wing portion 40 of the second tertiary panel 22 of the main panel 4. By this arrangement, the remaining portions of the fourth and second tertiary panels 21, 22 will be arranged at right angles to one another. This stage of the assembly is clearly shown in FIGURE 4 which is a front elevation of the carton assembled thus far and FIGURE 5 which is a plan view of FIGURE 4. However, it will be appreciated that when the main panel 3 is bent along the score line 43, as described above, the secondary panel 14 of the main panel 4 will partially overlap the secondary panel 13 of said main panel 3.

Thereafter, the panel 1 is bent along a score line 44 (see FIGURES 1 to 4) located between said main panel 1 and the main panel 4 so that, and as will be seen from FIGURE 6, the secondary panel 11 of said main panel 1 will partially overlap the secondary panel 14 of the main panel 4. Concurrently, the locking tongue 25 projecting from the third tertiary panel 19 will engage the free end, defined by one edge of the cut-out portion 30 of the second tertiary panel 22, of the resilient tab 36 of the said second tertiary panel 22 and, due to the natural resiliency of the material forming said tab, the latter will bend slightly along its score line 34 out of its normal plane thereby permitting said locking tongue 25 to enter the cut-out portion 30 formed in the second tertiary panel 22 and be in face-to-face contact with the fourth

tertiary panel **21** of the main panel **3**. When the locking tongue **25** is thus positioned, tab **36** will resume its normal coplanar relationship with the tertiary panel **22** and will assist in maintaining said tongue in its operative position.

Simultaneously with the engagement of the above-mentioned tongue and the bending of the main panel **1** along the score line **44**, the locking tongue **25** on the fourth tertiary panel **21** of the main panel **3** will enter the cut-out portion **30** of the first tertiary panel **20** of the main panel **2** in like manner.

Thereafter, the hingeable tab **9** on the main panel **3** is bent along a score line **45** so that its coated face will mate with, and engage, the coated portion **10** of the main panel **2**. The carton will thus be in an erected condition.

To place the carton in its knock-down condition for storage, it is merely necessary for manual pressure to be evenly applied to diagonally opposite corners. Such pressure will cause the secondary panels **11–14** forming the bottom wall to bend along the common score line **15**, so that they will project upwardly into the carton. Due to the secondary panels **11–14** forming the bottom wall being connected to the tertiary panels **19–22** by means of the second score lines **17, 18**, and also due to the adhesive connection between the third and first tertiary panels **19** and **20** and a similar connection between the fourth and second tertiary panels **21** and **22**, initial upward movement of the subsidiary panels **11–14** forming the bottom wall will cause disengagement of the locking tongues **25** with their associated cut-out portions **30**. Hence, continued manual pressure on the diagonally opposite corners will cause said tertiary panels **19–22** to become co-extensive with their associated secondary panels **11–14** so that they will be arranged parallel with the main panels within the flattened carton.

It will also be appreciated that the aforementioned manual pressure and upward movement of the secondary panels **12** and **14** forming the bottom wall, causes each of the first and second tertiary panels **20, 22** to bend along its common hinge line **38** so that it will become coextensive with its respective auxiliary wing portion **40** which is adhesively secured to the associated tertiary panels **19, 21**. Thus, the first and second tertiary panels **20, 22** will be parallel with the third and fourth tertiary panels **19, 21** when the carton is in its knock-down condition.

When it is desired to erect a knock-down carton for filling purposes, pressure is again brought to bear on diagonally opposite corners of said knock-down carton whereby the secondary panels **11–14** will be caused to take up their operative position to form the bottom wall of the carton. As this occurs, each of the auxiliary wing portions **40** of the first and second tertiary panels **20** and **22** is adapted to hinge about its hinge line **38** to extend at right angles to its primary portion **40***a*. Concurrently, the locking tongue **25** of the third tertiary panel **19** enters and cooperates with the cut-out **30** in the second tertiary panel **22** so as to be in face-to-face contact with the fourth tertiary panel **21** and coplanar with the auxiliary wing portion **40** of the second tertiary panel **22**. Similarly, the locking tongue **25** of the fourth tertiary panel **21** enters and cooperates with the cut-out **30** in the first tertiary panel **20** so as to be in face-to-face contact with the third tertiary panel **19** and coplanar with the wing portion **40** of the first tertiary panel **20**.

Thus, the third and fourth tertiary panels **19** and **21** and the wing portions **40** of the first and second tertiary panels **20** and **22** will thereby form a first pair of complementary partitions in face-to-face contact with one another within the carton, whilst the primary portions **40***a* of the first and second tertiary panels **20** and **22** form a second pair of complementary partitions within the carton. As will be seen from FIGURE 8, the first pair of complementary partitions form a pair of longitudinal partitions extending between the end walls of the carton, and the second pair of complementary partitions are

spaced apart so as to form a pair of transverse partitions extending between the side walls of the carton.

Moreover, due to the cooperation of the locking tongues **25** with the cut-outs **30**, the said pairs of partitions will be positively locked in mutually cooperating position with one another. FIGURE 7 shows a plan view of a knock-down carton in a partially erected condition and FIGURE 8 shows a part-sectional perspective view of an erected carton showing the relationship of the mutually transverse partitions therein.

It will also be appreciated that once an erected carton has been filled with the desired contents, the weight of the latter, in bearing upon the bottom wall assists in maintaining the locking tongues **25** in operative position within their associated cut-out portions **30**, thus maintaining the partition members positively locked in mutual cooperating relationship with one another. When an erected carton has been filled with the desired contents, the top flaps **5–8** are then folded downwardly and sealed in known manner.

If desired, an aperture may be included in one of the end walls of the carton whereby the latter may be carried by insertion of the hand in said aperture.

I claim:

1. A one-piece blank for forming a multi-cell carton having mutually transverse partitions therein defining article receiving compartments; said blank comprising a plurality of main panels joined together along first parallel score lines and adapted, upon folding along said first score lines, to form end walls and side walls of the carton; a secondary panel connected to each main panel by means of a common score line at right angles to said first score lines; each of said secondary panels being adapted, upon folding along said common score line to form a bottom wall of the carton; a pair of first and second tertiary panels each connected, by means of a second score line parallel to said common score line, to a selected and spaced pair of secondary panels; each of said first and second tertiary panels having a primary portion and an auxiliary wing portion, said portions being integrally and hingedly connected together along a common hinge line normal to said second score line; a cut-out portion in each of said first and second tertiary panels extending across said common hinge line with the major portion of each of said cut-outs being located in said wing portion; a pair of third and fourth tertiary panels, each connected, by means of a second score line parallel to said common score line, to one of a remaining pair of secondary panels, said tertiary panels being alternately arranged; each of said third and fourth tertiary panels having a primary connecting portion and an auxiliary portion integral therewith, each of said primary connecting portions being located adjacent to a said auxiliary wing portion and being adapted to be secured thereto in face-to-face contact, whereby, on folding of the blank and erection of said carton, each of said auxiliary wing portions is adapted to hinge about its hinge line and to extend at right angles to its said primary portion; a locking tongue integral with and projecting from a marginal side edge of each of said auxiliary portions of said third and fourth tertiary panels and coplanar with the latter, said edge being remote from the associated said integral primary connecting portion; each of said locking tongues having dimensions substantially similar to the dimensions of said cut-outs and being in alignment with the latter; whereby, on folding of the blank and erection of said carton, said locking tongue of said third tertiary panel is adapted to enter and cooperate with said cut-out in said second tertiary panel and to be in face-to-face contact with said fourth tertiary panel and coplanar with said wing portion of said second tertiary panel, and said locking tongue of said fourth tertiary panel is adapted to enter and cooperate with said cut-out in said first tertiary panel and to be in face-to-face contact with said third tertiary panel and coplanar with said wing portion of said first tertiary panel; said third

and fourth tertiary panels and said wing portions of said first and second tertiary panels thereby forming a first pair of complementary partitions within said carton and in face-to-face contact with one another; said primary portions of said first and second tertiary panels forming a second pair of complementary partitions within the carton, said second pair of partitions being spaced apart and transverse to said first pair of partitions; said cooperation of said locking tongues and said cut-outs positively locking said partitions in mutually cooperating position with one another.

2. A one-piece blank according to claim 1 including a resilient tab integrally and hingedly connected to each said primary portion of each of said first and second tertiary panels and normally coplanar therewith, each of said tabs having a free end, defining an edge of an associated said cut-out portion whereby, on folding of the blank and erection of said carton, said locking tongue of said third tertiary panel contacts the said free end of said resilient tab of said second tertiary panel, and said locking tongue of said fourth tertiary panel contacts the said free end of said resilient tab of said first tertiary panel, each of said tabs thereby being urged out of its normal plane to guide its associated locking tongue into its respective cut-out portion; said resilient tabs, after entry of the associated locking tongues into the respective cut-out portions, resuming normal coplanar relationship with their respective tertiary panels thereby positively maintaining said tongues in operative position.

3. A multi-cell carton of the type having end walls and side walls, extensions on all of said walls, said extensions, by the mutual bending and engagement thereof forming a bottom wall of the carton; a pair of first and second panels each integrally and hingedly connected to a selected and spaced pair of said extensions and extending at right angles thereto; each of said first and second panels having a primary portion and an auxiliary wing portion, said portions being integrally and hingedly connected together along a common hinge line; a cut-out portion in each of said first and second panels extending across said common hinge line with the major portion of each of said cut-outs being located in said wing portion; a pair of third and fourth panels, each integrally and hingedly connected to one of a remaining pair of said extensions and extending at right angles thereto; each of said third and fourth panels having a primary connecting portion and an auxiliary portion integral therewith, each of said primary connecting portions being located adjacent to a said auxiliary wing portion and being secured thereto in face-to-face contact, whereby, each of said auxiliary wing portions extends at right angles to its said primary portion; a locking tongue integral with and projecting from a marginal edge of each of said auxiliary portions of said third and fourth panels and coplanar with the latter, said edge being remote from the associated said integral primary connecting portion; each of said locking tongues having dimensions substantially similar to the dimensions of said cut-outs and being in alignment with the latter; said locking tongue of said third tertiary panel being located in and cooperating with said cut-out in said second panel and being in face-to-face contact with said fourth panel and coplanar with said wing portion of said second panel, said locking tongue of said fourth panel being located in and cooperating with said cut-out in said first panel and being in face-to-face contact with said third panel and coplanar with said wing portion of said first panel; said third and fourth panels and said wing portions of said first and second panels thereby forming a first pair of complementary partitions within said carton in face-to-face contact with one another; said primary portions of said first and second panels forming a second pair of complementary partitions within the carton, said second pair of partitions being spaced apart and transverse to said first pair of partitions; said cooperation of said locking tongues and said cut-outs positively locking said partitions in mutually cooperating position with one another.

4. A carton according to claim 3 including a resilient tab integrally and hingedly connected to each said primary portion of each of said first and second panels and normally coplanar therewith, each of said tabs having a free end, defining an edge of an associated said cut-out portion whereby, on folding of the blank and erection of said carton, said locking tongue of said third panel contacts the said free end of said resilient tab of said second panel, and said locking tongue of said fourth panel contacts the said free end of said resilient tab of said first panel, each of said tabs thereby being urged out of its normal plane to guide its associated locking tongue into its respective cut-out portion; said resilient tabs, after entry of the associated locking tongues into the respective cut-out portions, resuming normal coplanar relationship with their respective tertiary panels thereby positively maintaining said tongues in operative position.

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