July 30, 1968 M. J. COE 3,394,864

CARRY-OUT TRAY HAVING END WALL PANELS

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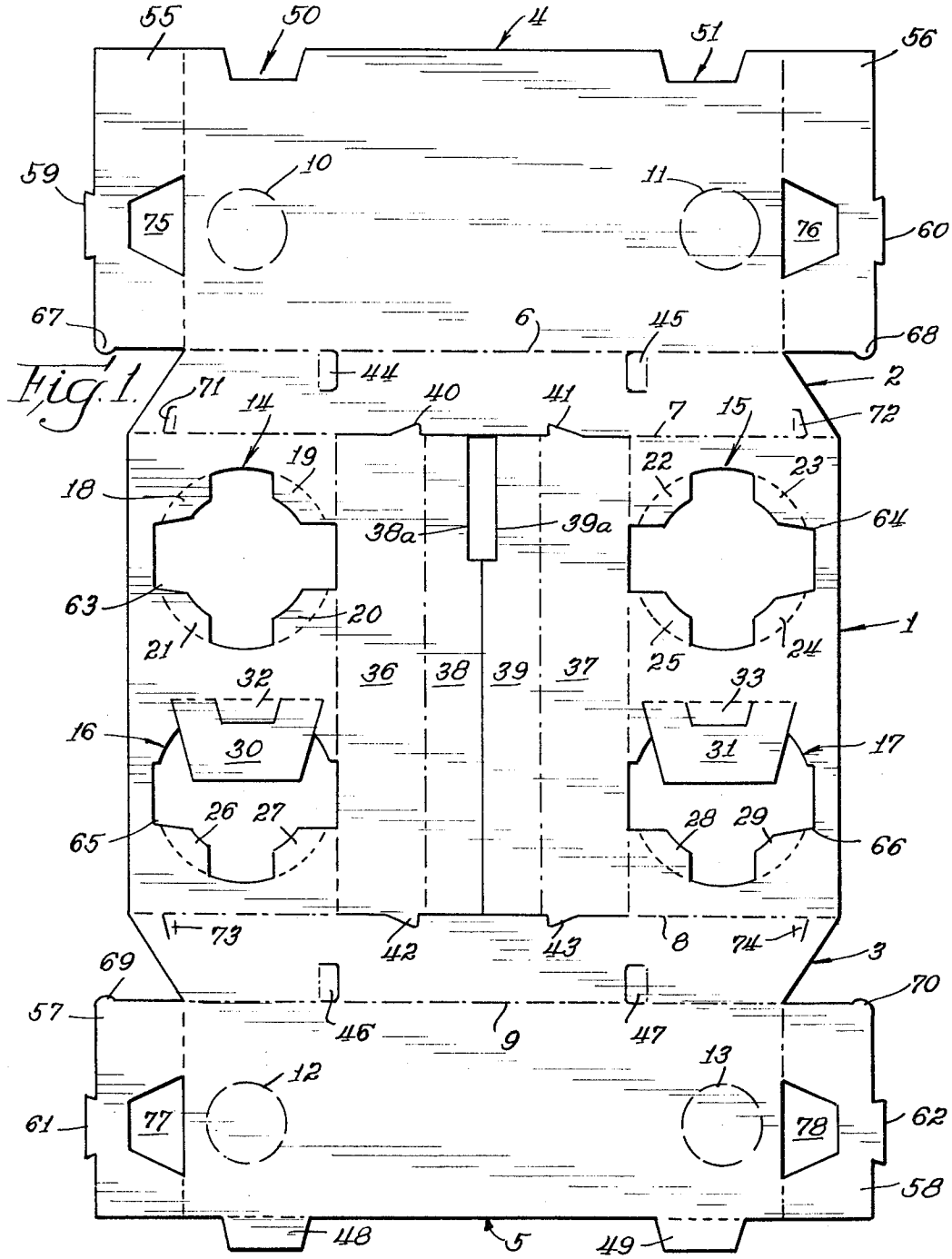


Fig. 1.

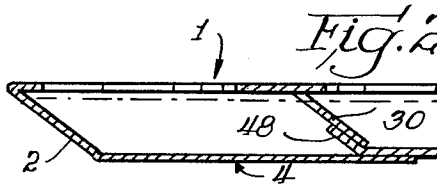


Fig. 2.

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Fig. 3.

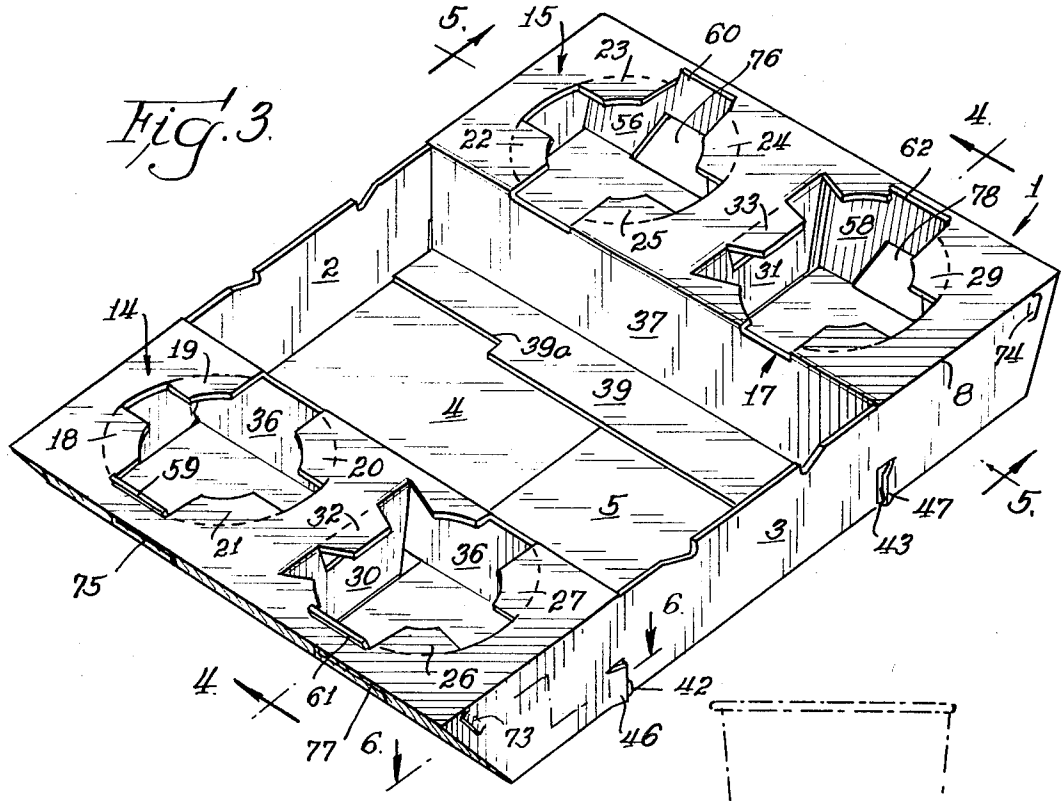


Fig. 4

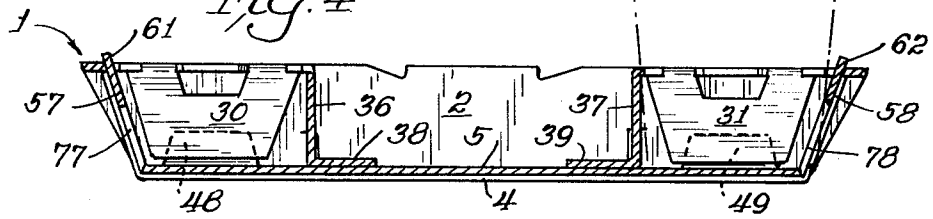


Fig. 6

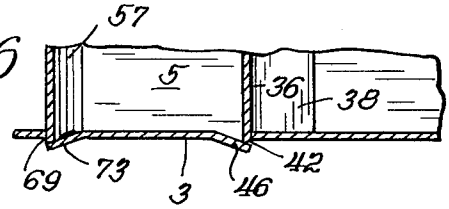
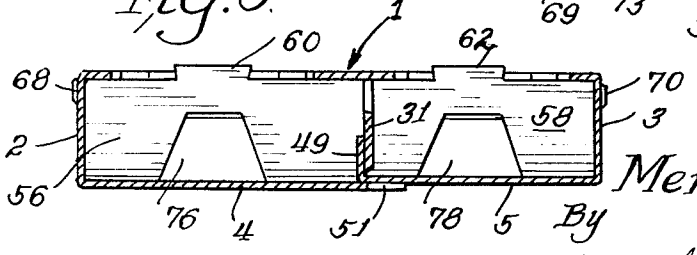


Fig. 5.



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CARRY-OUT TRAY HAVING END WALL PANELS

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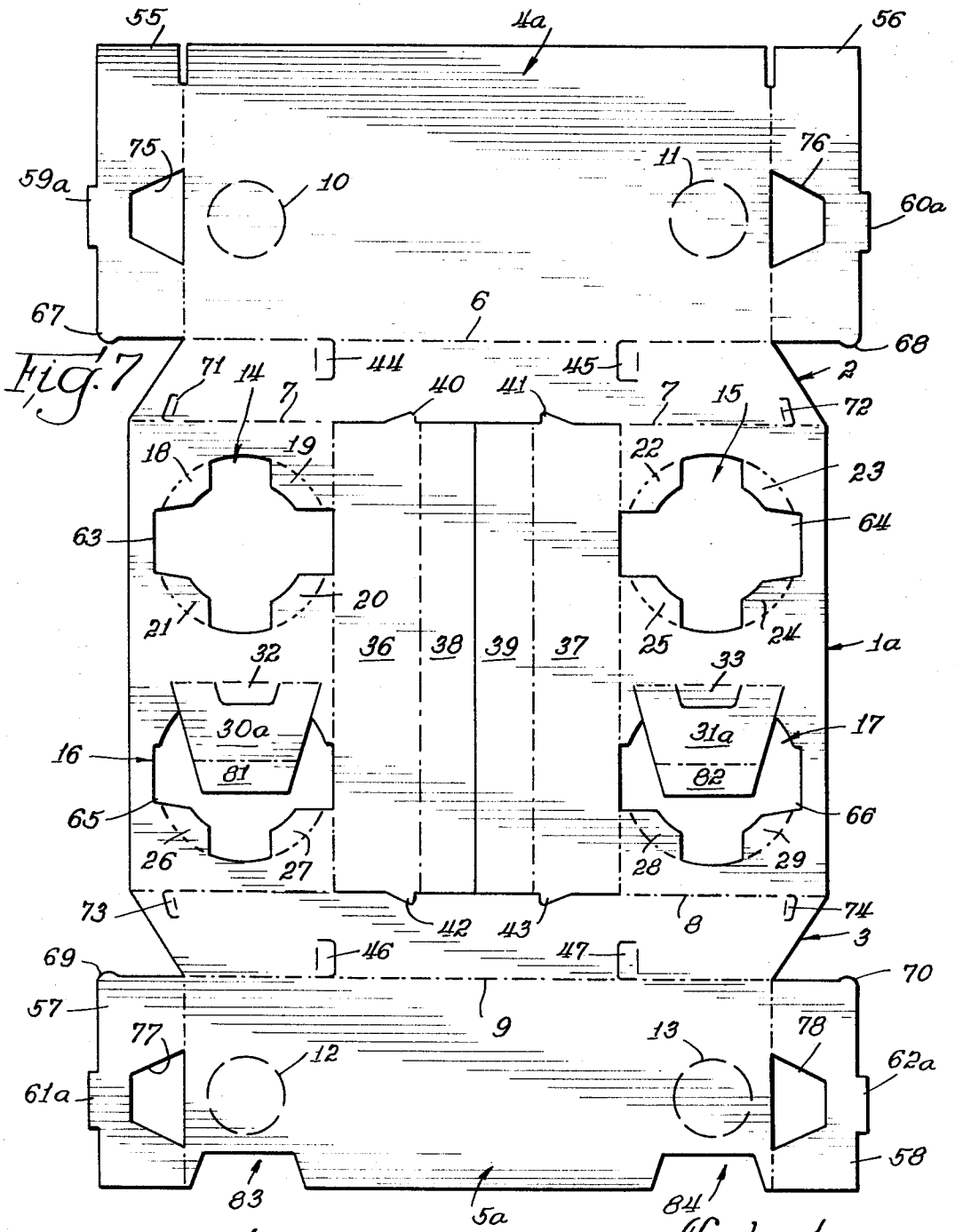


Fig. 7

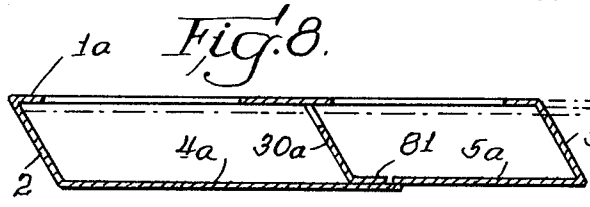


Fig. 8.

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CARRY-OUT TRAY HAVING END WALL PANELS

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Fig. 9

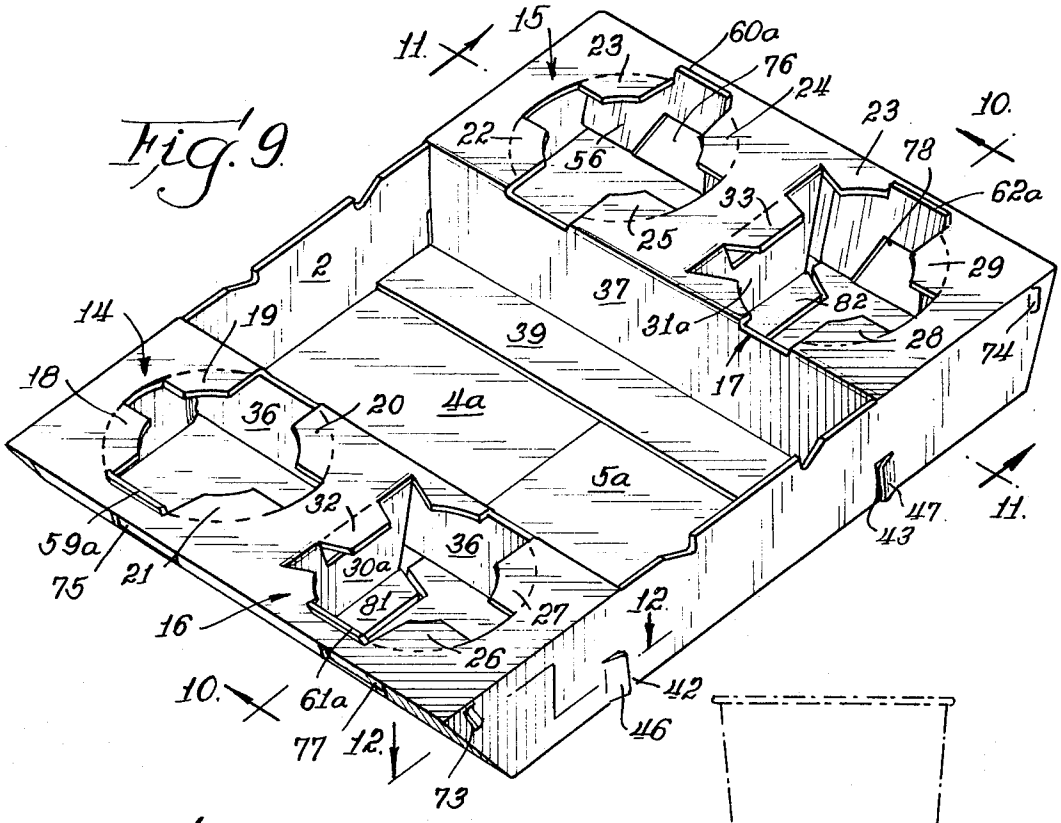


Fig. 10

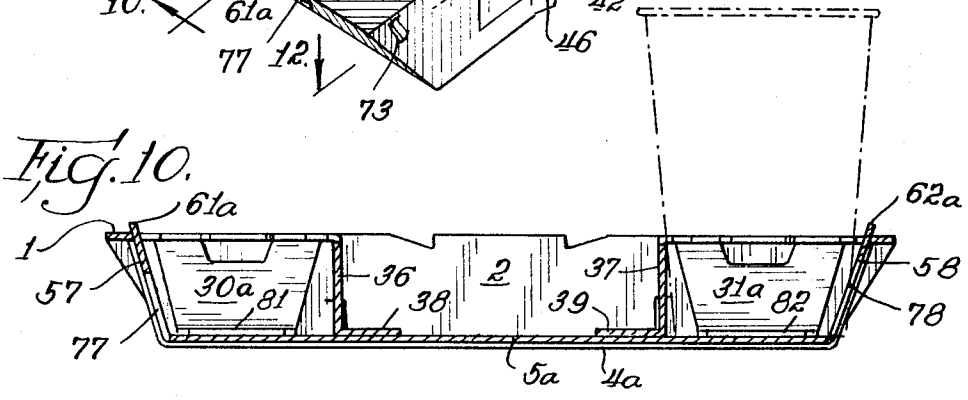


Fig. 12

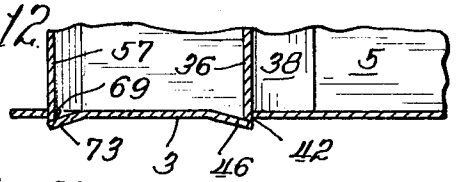
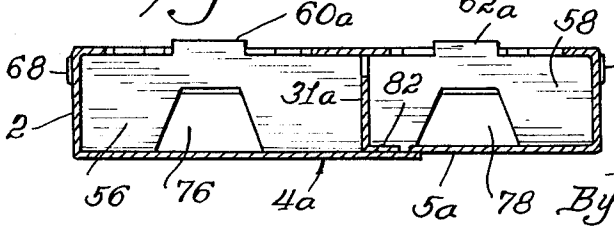


Fig. 11



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CARRY-OUT TRAY HAVING END WALL PANELS

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22 Claims. (Cl. 229—28)

ABSTRACT OF THE DISCLOSURE

A serving tray formed of an integral blank having top, bottom and sidewall panels hingedly connected together at their edges, the top panel being suitably cut to provide a plurality of receptacle openings, and end wall panels hingedly connected at the ends of the bottom panel and having tabs at the ends thereof engaged in the receptacle openings, thereby retaining the end wall panels in place, and strut means struck from the receptacle openings connecting the top panel to the bottom panel.

The present invention relates to a carry-out or serving tray which may be conveniently and simply fabricated from paperboard or like material, and is more particularly concerned with an improved tray of the type described which has means for locking the tray in erected condition and means for rendering the tray more rigid.

Carry-out trays are used extensively by concessionaires for mass spectator events such as football games, baseball games, and the like. Such trays are also used for carrying food and beverages from roadside stands to customers seated in automobiles, as at so-called "drive-ins." The primary requirement for such a tray is that it be relatively inexpensive, since it is generally intended that the tray be discarded after a single use. Consequently, it is generally the practice to fabricate such trays of paperboard or other inexpensive material of construction. However, although the tray must be inexpensive, it must still be sufficiently sturdy to withstand the various forces tending to deform it in the course of normal use. Further, the tray must be provided with several compartments adapted to receive and retain beverage containers, as well as to act as receptacles for food items such as sandwiches, potatoes prepared in various forms, and so on. It is further necessary that the tray be so constructed that it may be maintained in flat position for easy storage in restricted spaces, and that it be realily erectable from the folded form. It is of foremost importance that, once erected, the tray remain in erected condition during use. Trays currently available, although they have many of the enumerated desirable features, are either deficient in some respect, or else are rather complicated and costly to produce. Moreover, most prior art trays do not lend themselves well to being erected and dispensed by means of automatic machinery.

It is an object of the present invention to provide an improved carry-out or serving tray which may be constructed from paperboard. It is a further object to provide such a tray which may be constructed from a single integral blank. It is further an object to provide a tray of the type described which can be stored in flat and folded condition, and subsequently readily erected immediately prior to use, particularly by means of automatic, semi-automatic, or manual machinery. It is an additional object to provide such a tray which has improved strength and rigidity, especially at the ends thereof, to withstand the rigors of normal use. It is still another object to provide such a tray which, when once erected, remains locked in erected condition. It is an additional object to provide a tray of the type described having end wall panels which may be readily erected even by automatic machinery, and which when in place greatly contribute to the strength and rigidity of the tray and additionally prevent articles from falling out the ends thereof. It is a further object to provide a tray having end wall panels, which tray requires only a small amount of additional stock for its fabrication. Another object is the provision of a tray having novel means for affixing struts to the bottom of the tray, namely, tabs struck from a bottom panel member. The accomplishment of the foregoing and additional objects will become more fully apparent hereinafter.

The invention in its preferred embodiment is illustrated by the accompanying drawings in which:

FIG. 1 is a plan view of an integral blank suitable for use in erecting and constructing a carry-out tray according to the invention.

FIG. 2 is an end view of a partially erected tray.

FIG. 3 is a perspective view of a completely constructed and erected tray prepared from the blank of FIG. 1.

FIG. 4 is a cross-sectional view taken at the line **4—4** of FIG. 3.

FIG. 5 is a cross sectional view taken at the line **5—5** of FIG. 3.

FIG. 6 is a fragmentary cross-sectional view taken at the line **6—6** of FIG. 3.

FIG. 7 is a plan view of an integral blank suitable for the erection and construction of a carry-out tray according to another embodiment of the invention.

FIG. 8 is an end view of the partially erected tray of FIG. 7.

FIG. 9 is a perspective view of a completely constructed and erected tray utilizing the blank of FIG. 7.

FIG. 10 is a cross-sectional view taken at the line **10—10** of FIG. 9.

FIG. 11 is a cross-sectional view taken at the line **11—11** of FIG. 9; and

FIG. 12 is a fragmentary cross-sectional view taken at the line **12—12** of FIG. 9.

Reference is now made to the accompanying drawings for a better understanding of the invention, wherein all of the parts are numbered and wherein the same numbers are used to refer to the same parts throughout.

In a preferred form, the tray of the invention is constructed from an integral blank as illustrated in FIG. 1, and comprises a top panel **1**, side panels **2** and **3**, and complementary bottom panel members **4** and **5**. The enumerated panels are hingedly connected together along score lines **6**, **7**, **8**, and **9**. The bottom panel members **4** and **5** are provided with push-out openings **10**, **11**, **12**, and **13** to permit articles such as the ends of ice cream cones to be seated therein, or to permit the use of a finger to aid in retrieving a beverage cup from the erected tray.

The top panel **1** is suitably cut and scored to provide beverage cup or container receiving openings **14**, **15**, **16**, and **17**, having compression sectors **18–29**, which serve to retain the beverage cups or containers and prevent their falling out. The beverage cup openings **16** and **17** are also cut to provide longitudinal struts **30** and **31** which are in turn cut to provide compression sectors **32** and **33**. The top panel **1** is also cut and scored to provide transverse partitions **36** and **37** having hinged feet

38 and 39. The transverse partitions are provided with retaining protuberances 40, 41, 42, and 43. The side panels 2 and 3 are provided with detent-forming doors 44, 45, 46, and 47 positioned to receive and retain the protuberances 40, 41, 42, and 43, respectively, when the partitions 36 and 37 are erected in place.

The bottom panel member 5 is provided with adhesive tabs 48 and 49 adhesively affixed to the longitudinal struts 30 and 31, respectively. The bottom panel member 4 is provided with recesses 50 and 51 which have no function with regard to the carton structure, but which permit the tabs 48 and 49 of an adjacent carton blank to be nested therein, thereby conserving paperboard material during the cutting process.

The bottom members 4 and 5 are provided with end wall members 55, 56, 57, and 58, hingedly connected thereto. Each pair of end wall members is glued together to form end walls. The end walls are provided with dovetail tabs 59, 60, 61, and 62 which are engaged and retained in detent recesses 63, 64, 65, and 66. The inner corners of the end panels are provided with retaining protuberances 67, 68, 69, and 70 adapted to be received in and retained by detent slits 71, 72, 73, and 74, respectively.

In erecting the carry-out tray of the present invention, the inside surface at the edge of the bottom panel member 4 and the inside surfaces of the tabs 48 and 49 are provided with an adhesive. The bottom panel member 5 is then folded at the score line 9 until the tabs 48 and 49 engage and are adhesively affixed to the longitudinal struts 30 and 31, respectively. The bottom panel member 4 and the side panel 2 are then folded over at the score line 7 and adhesively affixed at the edge of the bottom panel member 4 to the edge of the bottom panel member 5. The carton is now in the form of a folded tube and may be stored or shipped in this condition, thereby conserving space. The carton is further erected by opening the tube, as shown in FIG. 2. The transverse partitions 36 and 37 are first positioned by depressing them downwardly until they assume a vertical position with the feet 38 and 39 in engagement with the bottom of the carton. The protuberances 40, 41, 42, and 43 are inserted in the spaces provided by pushing the detent doors 44, 45, 46 and 47 outwardly, thereby locking the transverse partitions in place. The end walls 55, 56, 57, and 58 are then folded in place, with the tabs 59, 60, 61, and 62 engaged and locked within the recesses 63, 64, 65, and 66, respectively, and the protuberances 67, 68, 69, and 70 engaged and locked within the detent slits 71, 72, 73, and 74. As a result, an extremely strong and rigid carry-out tray is formed. FIG. 3 illustrates the completely erected carton. Since the end walls are arranged in inclined position and at an acute angle with respect to the top panel, less paperboard is utilized. Cut-outs 75, 76, 77 and 78 are provided in the end walls at the receptacle openings to permit cups of relatively large diameter to be inserted therein without being impeded by the inclined end walls, as shown in FIG. 4.

As shown in FIGS. 1 and 3, recesses 38*a* and 39*a* are provided at one end of the feet 38 and 39. Although these recesses have no function in the structure of the tray itself, they facilitate erection of the carton on automatic machinery by permitting a sprag comprising part of the machinery to enter through the opening resulting from the recesses and to support the bottom of the tray when the trays are erected into an open tube from a flat folded tube, thereby preventing buckling and failure of the erecting operation. The automatic machinery additionally includes an additional pair of sprags which extend through the beverage cup openings 14 and 15, further contributing to the support of the tray during the erecting operation. A somewhat modified embodiment of the invention is shown in FIGS. 7–12. The basic structure of the tray is similar to that of the first embodiment shown and described. However, the major difference comprises a modification in the means for affixing the longitudinal struts to the bottom of the carton. For the sake of clarity, where the structures remain the same, the numerals used in their designation remain the same as those used in FIGS. 1–6. Referring to FIG. 7, the top panel 1*a* is cut and scored to provide longitudinal struts 30*a* and 31*a* having feet 81 and 82 hingedly connected thereto. The feet are utilized for adhesively affixing the bottom of the struts 30*a* and 31*a* to the bottom panel member 4*a*, obviating the need for the tabs 48 and 49 of the first embodiment. In order to simplify the gluing of the carton, recesses 83 and 84 are provided in the bottom panel member 5*a* permitting the feet 81 and 82 to extend therethrough and to become adhesively affixed to the edge of the bottom panel member 4*a*. Further minor differences between the embodiment of FIGS. 7–12 and that of FIGS. 1–6 lie in the fact that the tabs 59*a*, 60*a*, 61*a*, and 62*a*, are rectangular and not dovetailed. Consequently, the tabs do not lock in the recesses of the beverage container openings, but are merely retained in engagement therewith.

In assembling the carry-out tray of FIGS. 7–12, the bottom panel member 5*a* is first folded over at the score line 9. An adhesive is then applied to the inner edge of the bottom panel member 4*a*, and the panel member 4*a* and the side panel 2 are folded over at the score line 7, the edge of the bottom panel member 4*a* becoming adhesively affixed to both the edge of the bottom panel member 5*a* and the feet 81 and 82. In this condition the tray is in the form of a flat folded tube occupying very little space and may be so stored and shipped. The tray is further erected by pushing the side together, as shown in FIG. 8, until the side walls and the longitudinal struts assume a vertical position. The tray may be completely erected as described above with regard to FIGS. 1–6. The transverse partitions 36 and 37 are down-folded and locked in the erect position. The end panels are then folded up and the tabs 59*a*–62*a* inserted in the recesses 63–66 of the beverage container openings. The fully erected tray is shown in FIG. 9. FIG. 10 illustrates the tray in cross-section and shows how the presence of the cut-outs 75–78 permits beverage cups of larger diameter to be inserted into the container openings. In FIG. 11 the structure is shown whereby the longitudinal struts 30*a* and 31*a* are adhesively affixed to the bottom panel member 4*a* by the feet 81 and 82, the foot 82 being shown adhesively affixed to the bottom panel member 4*a* through the recess 84. FIG. 12 further illustrates the means whereby the transverse partitions 36 and 37 are locked in place in detents provided in the side walls 2 and 3, and whereby the protuberances 67, 68, 69, and 70 of the inner corners of the end walls 55, 56, 57, and 58 are locked in detents 71, 72, 73, and 74 also provided in the side walls.

The carry-out or serving tray of the present invention in its various embodiments has many features which constitute decided improvements over prior art trays. The provision of inclined end walls greatly rigidizes the erected carton without contributing materially to cost. Because of the inclined orientation of the end walls in the finally erected tray, as can be seen in FIG. 1, the end walls in the blank extend very little beyond the edge of the top panel. Such a structure permits end walls to be used while still conserving paperboard. The decrease in the area of the bottom of the tray resulting from the use of an inclined end wall is compensated for by the provision of the cut-outs, as for example, 75–78, as shown in FIG. 4. The end walls are further strengthened by the protuberances which engage the detent slits, as shown in FIG. 6. Moreover, as also shown in FIG. 6, the transverse partitions are maintained in place by the engagement between the protuberances provided thereon with the detent openings provided in the side walls. The present tray has an additional advantage in that novel means is provided for affixing the struts 30 and 31 to the bottom of the tray by means of the tabs 48 and 49, as shown in FIG. 5. Further, the tray is inexpensive to fabricate and is readily

adapted for use with automatic machinery for erection of the tray, thereby eliminating a great deal of manual work at food establishments which utilize the trays.

It is to be understood that the invention is not limited to the exact details of construction, operation, or exact materials or embodiments shown and described, as obvious modifications and equivalents will be apparent to one skilled in the art, and the invention is therefore to be limited only by the scope of the appended claims.

I claim:

1. A serving tray formed of an integral blank comprising a top panel, a pair of side wall panels hingedly connected to the edges of said top panel, a bottom panel hingedly connected to the edges of said side wall panels, and end wall panels hingedly connected at the ends of said bottom panel, said top panel being suitably cut to provide a plurality of receptacle openings, said end wall panels having tabs at the ends thereof engaged in said receptacle openings thereby retaining said end wall panels in place, and strut means struck from said receptacle openings and connecting said top panel to said bottom panel.

2. A serving tray formed of an integral blank comprising a top panel, side wall panels hingedly connected to the edges of said top panel, a bottom panel comprising bottom panel members hingedly connected to the edges of said side wall panels and adhesively affixed to each other, and end wall panels hingedly connected at the ends of said bottom panel, said top panel being suitably cut to provide a plurality of receptacle openings, said end wall panels each comprising a pair of end wall panel members adhesively affixed to each other, said end wall panels having tabs at the ends thereof engaged in said receptacle openings thereby retaining said end wall panels in place, longitudinal struts struck from receptacle openings hingedly connected to said top panel, and means affixing one end of each of said struts to said bottom panel.

3. A serving tray according to claim 1 wherein recesses are provided in said receptacle openings engaging the tabs of said end wall panels.

4. A serving tray according to claim 3 wherein said tabs have a dove-tail contour, thereby locking said end wall panels to said top panel.

5. A serving tray according to claim 1 wherein protuberances are provided at the corners of said end wall panels, and said side wall panels are cut to provide detent means engaging said protuberances, thereby locking said end walls in place with respect to said side wall panels.

6. A serving tray according to claim 1 wherein transverse vertical partitions are provided hingedly connected to said top panel and cooperating with said side panels to define a centrally located food compartment.

7. A serving tray according to claim 6 wherein protuberances are provided at the edges of said transverse partitions, and said side panels are cut to provide detent means engaging said protuberances, thereby locking said transverse partitions in place with respect to said side wall panels.

8. A serving tray according to claim 1 wherein said means connecting said longitudinal struts to said bottom panel comprises tabs hingedly connected to the edge of one of said bottom panel members and adhesively affixed to the ends of said struts.

9. A serving tray according to claim 1 wherein said means connecting said longitudinal struts to said bottom panel comprises a flap hingedly connected to the end of each said strut and adhesively affixed to said bottom panel.

10. A serving tray according to claim 1 wherein said top panel is longer than said bottom panel, and wherein said end wall panels are disposed at an acute angle with respect to said top panel.

11. A serving tray according to claim 10 wherein said end wall panels are provided with cut-outs positioned at receptacle openings, thereby permitting receptacles of relatively large diameter to be inserted in said opening without interference by said end wall panels.

12. An integral blank for forming a serving tray comprising a top panel, a pair of side wall panels hingedly connected to the edges of said top panel, a bottom panel hingedly connected to at least one edge of one of said side wall panels, and end wall panels hingedly connected at the ends of said bottom panel, said top panel being suitably cut to provide a plurality of receptacle openings, said end wall panels having tabs at the ends thereof adapted to be engaged in said receptacle openings for retaining said end wall panels in place, and strut means struck from said receptacle openings and adapted to connect said top panel to said bottom panel.

13. An integral blank for forming a serving tray comprising a top panel, side wall panels hingedly connected to the edges of said top panel, a bottom panel comprising bottom panel members hingedly connected to the edges of said side wall panels and adapted to be adhesively affixed to each other, and end wall panels hingedly connected at the ends of said bottom panel, said top panel being suitably cut to provide a plurality of receptacle openings, said end wall panels each comprising a pair of end wall panel members adapted to be adhesively affixed to each other, said end wall panels having tabs at the ends thereof adapted to be engaged in said receptacle openings thereby retaining said end wall panels in place, longitudinal struts struck from receptacle openings hingedly connected to said top panel, and means adapted to affix one end of each of said struts to said bottom panel.

14. An integral blank according to claim 12 wherein recesses are provided in said receptacle openings adapted to engage the tabs of said end wall panels.

15. An integral blank according to claim 14 wherein said tabs have a dove-tail contour, thereby being adapted to lock said end wall panels to said top panel.

16. An integral blank according to claim 12 wherein protuberances are provided at the corners of said end wall panels, and said side wall panels are cut to provide detent means adapted to engage said protuberances, thereby locking said end walls in place with respect to said side wall panels.

17. An integral blank according to claim 12 wherein transverse vertical partitions are provided hingedly connected to said top panel and adapted to cooperate with said side panels to define a centrally located food compartment.

18. An integral blank according to claim 17 wherein protuberances are provided at the edges of said transverse partitions, and said side panels are cut to provide detent means adapted to engage said protuberances, thereby locking said transverse partitions in place with respect to said side wall panels.

19. An integral blank according to claim 12 wherein said means adapted to connect said longitudinal struts to said bottom panel comprises tabs hingedly connected to the edge of one of said bottom panel members and adapted to be adhesively affixed to the ends of said struts.

20. An integral blank according to claim 12 wherein said means adapted to connect said longitudinal struts to said bottom panel comprises a flap hingedly connected to the end of each said strut and adapted to be adhesively affixed to said bottom panel.

21. An integral blank according to claim 12 wherein said top panel is longer than said bottom panel, and wherein said end wall panels are adapted to be disposed at an acute angle with respect to said top panel.

22. An integral blank according to claim 12 wherein said end wall panels are provided with cut-outs positioned at receptacle openings, thereby permitting receptacles of relatively large diameter to be inserted in said openings without interference by said end wall panels when said serving tray is erected.

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