This invention pertains to an improved food tray blank, container, and package, and more particularly, to such a blank, of sheet material such as paperboard, which may be erected into a tray container by hand or machine without the use of interlocking tabs and slots, metallic fasteners, or adhesives, which container is well adapted for use in a leakproof or watertight package for food items. Delicatessens, meat markets and super markets must frequently package food items such as cuts of meat or pieces of chicken for display in a self-service case and subsequent purchase and removal by a customer. In packaging such food items, the merchant must exercise care in selecting a leakproof or watertight package, in order to avoid consumer dissatisfaction due to leakage from the food package either in the display case or after purchase.

Conventionally, merchants place food items in tray-like containers, and use an overlap to complete the package. In order to avoid the problem of leakage, merchants have turned to molded pulp trays which are given a watertight surface coat to obtain the desired result. Such conventional molded tray containers require a relatively large space for storage, and on becoming damp, through failure of the waterproofing or for any other reason, readily disintegrate. For these reasons, a suitable tray or container which may be stored as a flat blank and erected immediately prior to use has been sought by merchants, in order to alleviate these deficiencies and difficulties.

Conventional attempts to provide blanks adapted for erection into food tray containers have in turn suffered from deficiencies. Any corner construction of such a blank and container relying on interlocking tabs and slots for locking, fails to provide the required leakproof or watertight construction. Those proposed blanks not relying on interlocking tabs and slots have relied on metallic fasteners, such as staples, or adhesives positioned in the corner areas of the erected blank to secure the blank in an erected position. Reliance on such fasteners or adhesives complicates the process of erection of the blanks and introduces the possibility of contamination of the packaged food item from the securing means.

This invention avoids the difficulties and deficiencies of conventional food tray constructions, as outlined above, by providing a blank which may be readily stored in a fiat or planar condition and quickly erected to form a food tray container which is leakproof or watertight, and which does not rely on conventional fasteners or adhesives positioned in the corner areas of the erected blank to hold the container in an erected position. This food tray container is well adapted for use with an overlap to form a package for food items. Accordingly, it is an object of this invention to provide an improved cut and scored blank adapted to be erected into a leakproof and watertight tray container.

Another object of this invention is to provide an improved food tray container erected from a suitably cut and scored blank which is leakproof or watertight and substantially self-sustaining in an erected position. Another object of this invention is to provide an improved food item package including a container erected from a suitably cut and scored blank, which container is formed and assembled without dependence upon conventional fasteners or adhesives positioned to possibly contact the contained food item. Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which:

FIGURE 1 is a plan view of a blank cut and scored in accordance with this invention;

FIGURE 2 is a detail of the corner construction of the blank of FIGURE 1;

FIGURE 3 is a perspective view of one corner portion as seen from the exterior of a food tray container, showing one step in the erection of the blank of FIGURE 1 into a container;

FIGURE 4 is a view similar to FIGURE 3, showing a subsequent step in the erection of the blank of FIGURE 1;

FIGURE 5 is a view similar to FIGURE 3, showing a subsequent step in the erection of the blank of FIGURE 1;

FIGURE 6 is a view similar to FIGURE 3, showing the container as completely erected;

FIGURE 7 is a sectional view through a corner of an erected container, taken along the line 7—7 of FIGURE 6;

FIGURE 8 is a sectional view through the corner of an erected container taken along the line 8—8 in FIGURE 6;

FIGURE 9 is a sectional view through the corner of an erected container taken along the line 9—9 in FIGURE 6;

FIGURE 10 is a perspective view from below of the food tray container of this invention as erected from the blank of FIGURE 1;

FIGURE 11 is a perspective view from above similar to FIGURE 10;

FIGURE 12 is a perspective view, from above, of a food package including the tray container of FIGURES 10 and 11;

FIGURE 13 is a sectional view through a portion of the package of FIGURE 12; taken as indicated by the line 13—13 in FIGURE 12;

FIGURE 14 is a plan view of a second form of blank cut and scored in accordance with this invention;

FIGURE 15 is a perspective view of one corner portion as seen from the exterior of a food tray container, showing one step in the erection of the blank of FIGURE 14, in similarity to FIGURE 4;

FIGURE 16 is a view similar to FIGURE 15, showing the container as completely erected;

FIGURE 17 is a sectional view through a corner of a container erected from the blank of FIGURE 14, taken as indicated by the line 17—17 in FIGURE 16;

FIGURE 18 is a sectional view through a portion of the rim of the container of FIGURE 16, taken as indicated by the line 18—18 in FIGURE 16;

FIGURE 19 is a perspective view, from below, of a container erected from the blank of FIGURE 14;

FIGURE 20 is a perspective view, from above, of a container as shown in FIGURE 19;
FIGURE 21 is a perspective view similar to FIGURE 20 of a food package including the container tray of FIGURE 20:

FIGURE 22 is a sectional view of a portion of the container rim and overlap of the package of FIGURE 21, taken along the line 22—22;

FIGURE 23 is a detailed view of the corner of a blank illustrating a modified form of blanks similar to the blank of FIGURE 14, and cut and scored for erection into a food tray container;

FIGURE 24 is a view similar to FIGURE 15, illustrating the erection of the blank of FIGURE 23;

FIGURE 25 is a sectional view taken as indicated by the line 25—25 in FIGURE 24, of the container erected from the blank of FIGURE 23;

FIGURE 26 is a view similar to FIGURE 19 of a container erected from the blank of FIGURE 23;

FIGURE 27 is a view similar to FIGURE 20, of a container erected from the blank of FIGURE 23;

FIGURE 28 is a view similar to FIGURE 21 of the container erected from the blank of FIGURE 23;

FIGURE 29 is a sectional view of a portion of the container rim and overlap of the package as illustrated in FIGURE 28, taken as indicated by the line 29—29 in that figure.

Broadly, this invention comprehends a cut and scored blank, formed from a suitable sheet of material such as paperboard, which is adapted to be erected into a food tray container which in turn is adapted for use in a food item package. The blank may be a selected one of several forms, three of which are illustrated, any of which provides, on erection, a leakproof or watertight tray which is substantially self-sustaining in the erected position. The blank is so cut and scored as to provide, on erection, a container having a polygonal bottom panel which may have inwardly elogate side flaps in number from at least three sides up to a number sufficiently large that the bottom panel closely approaches a round or circular configuration, a side wall coextensive with and hingedly connected to each side edge of the bottom panel, and corner walls disposed between adjacent pairs of side walls and giving a somewhat rounded appearance to the corners of the erected container. Further, the blank is formed so as to provide the erected container with a reinforcing rim extending entirely around the upper extremity of the container, and the rim defining portions of the container are so formed as to permit the maintaining of the container in an erected position without the use of conventional fasteners or adhesives positioned to positively contact a contained food product.

More specifically, FIGURES 1-12 of the drawings illustrate one form of blank in accordance with this invention, the container erected from the blank, and a package including the container. The blank, indicated generally at 30, is best shown in FIGURES 1 and 2. From those figures, the blank 30 is seen to have a polygonal central panel 31 and a plurality of elongate side panels 32a, 32b, 32c, and 32d, coextensive with and hingedly connected to corresponding side edges of the bottom panel 31 along scored fold lines 33 which together define the polygonal boundary of the central panel 31. Preferably, as shown in FIGURE 1, the central panel 31 is rectangular in configuration.

In order to form a reinforcing rim around portions of the erected container, as will be described more fully hereinbelow, the respective first side flaps 34a, 34b, 34c, and 34d, are coextensive with and hingedly connected to corresponding side panels 32a, 32b, 32c, and 32d along side edges thereof remote from the connection of those side panels and the central panel. The respective first side flaps and side panels are preferably hingedly connected along fold lines 35 parallel to the respective fold lines 33 at which the side panels and the central panel are connected. Outwardly of the first side flaps 34a, 34b, 34c, and 34d, are provided elongate second side flaps 36a, 36b, 36c, and 36d, coextensive with and hingedly connected to corresponding first side flaps 34a, 34b, 34c, and 34d, along scored fold lines 37 parallel to the fold lines 35 connecting the first side flaps and the side panels.

In order to enhance the self-sustaining capability of the erected container, as will hereinafter be made more clear, this invention preferably provides elongate third side flaps 40a, 40b, 40c, and 40d, coextensive with and hingedly connected to corresponding second side flaps along scored fold lines 41 parallel to the fold lines 37 connecting the second and first side flaps.

In order to render the erected container leakproof or watertight, this invention provides a plurality of groups of serially arranged and hingedly interconnected generally triangular panels, herein referred to as gusset panels, with each group being generally designated at 42. Each group of hingedly connected gusset panels 42 is disposed between a pair of adjacent side panels, as illustrated in FIGURE 1, and the enlarged scale view of FIGURE 2 makes the particular arrangement within an individual group more clear. From the enlarged scale view in FIGURE 2, it is seen that a representative group, indicated generally at 42bc as indicative of the disposition of the group between the side panels 32b and 32c, includes one gusset panel 43 which is adapted to form a gusset or a corner wall for the container as will be made more clear hereinafter. In the form illustrated in FIGURES 1-12 each group 42 of gusset panels has the distal ends thereof hingedly connected to the adjacent side panels 32. In the specific group 42bc shown in FIGURE 2, the distal ends of the group are hingedly connected to the side panels 32b and 32c. The group 42bc comprises three gusset panels, including the corner wall panel 43. The other two gusset panels 44, 45 are provided to form seal- ing and locking panels in order to obtain the desired leakproof and watertight construction of an erected tray container, which is assured by having no break in the continuity of the blank material inwardly of the corners of the blank or within the confines of the upper edges of the erected walls. The serially arranged gusset panels 43, 44, and 45 are hingedly connected together as well as hingedly connected at the distal ends of the group, to adjacent side panels. The hinged connection of the panels is such that the two gusset panels 44, 45, not forming a corner wall portion of the erected tray, will fold outwardly behind an adjacent side panel 32c on erection of the blank, as will be made more clear hereinafter.

In order to complete the reinforcing rim portion extending entirely around an erected tray container, and to enhance the self-sustaining characteristics of the container in the erected position, an elongate first corner flap 46 is hingedly connected to and coextensive with each corner wall gusset panel 43 and hingedly connected to an immediately adjacent first side flap 34b. Further, an elongate second corner flap 47 is coextensive with and hingedly connected to a corresponding first corner flap 46 along a side thereof remote from the interconnection of the first corner flap 46 and the corresponding corner wall gusset panel 43. An elongate third corner flap 50 is coextensive with and hingedly connected to a corresponding second corner flap 47, along the side thereof remote from the interconnection of corresponding second and first corner flaps. The purpose and function of all these corner flaps will be made more clear hereinafter when the erection of a container from the blank of FIGURES 1 and 2 is described. FIGURES 34a, 34b, 34c, and 34d, are coextensive with and hingedly connected to corresponding first side flaps 34a, 34b, 34c, and 34d, along scored fold lines 37 parallel to the fold lines 35 connecting the first side flaps and the side panels.

In order to further enhance the self-sustaining characteristics of a container erected from the blank of FIGURES 1 and 2, a locking tab 51 is hingedly connected to a corresponding gusset panel 44, immediately adjacent the corner wall gusset panel 43, and is hingedly connected to a corresponding second corner flap 47. The locking tab 51 is provided with an outer terminal having a particular configuration which has been found to facilitate the erection of the blank into a container. This
is most clearly shown in FIGURE 2, where it may be seen that the outer extremity of the locking tab 51 describes an arc of a circle about a central point 52 displaced from the point of construction. The steps are shown in the fold lines at which the gusset panels 43, 44 and 45 are hingedly connected.

The steps of erecting a food tray container from the blank 30 of FIGURES 1 and 2, and certain details of the container construction, are shown in FIGURES 3–9. More specifically, FIGURES 3–6 illustrate, by showing a single corner, the steps in the erection of the blank 30 into a food tray container. As shown in FIGURE 3, the first step is to fold the side panels 32a, 32b, 32c, and 32d, upwardly from the central panel 31 along the fold lines 35, while simultaneously folding the gusset panels 44, 45, which are to provide sealing and locking panels, into juxtaposed relation adjacent a side panel 32c, and along their common fold line and along the fold line common to a distal gusset panel 45 and the adjacent side panel 32c. In this partly erected condition, as shown in FIGURE 5, the flaps remain substantially planar with their surface of lining panels and the corner wall 43 remains substantially planar with the adjacent gusset panel 44.

A subsequent step in the erection of the food tray container from the blank of FIGURES 1 and 2, is illustrated in FIGURE 4. There, the flaps corresponding to the side panel 32b and immediately adjacent corner wall panel 43 have been folded outwardly and downwardly along the fold line 35. Due to the hinged connection of the first flap 34b, the adjacent first corner flap 46, and the locking tab 51, and the particular angular relationships for those elements established by the direction of the fold lines joining them, the gussets 44, 45 are turned inwardly to be in juxtaposed relation with and along the outer surface of the adjacent side panel 32c, as will be made more clear hereinafter. At this stage in the erection of a food tray container, the first, second, and third flaps remain substantially in a single plane.

A subsequent step in the erection of a food tray container from the blank of FIGURES 1 and 2 is shown in FIGURE 5. There, the second and third side flaps 36a and 40b of the side wall 32b, immediately adjacent the corner wall 43 have been folded along fold lines 37 and 41 so that the second side flap immediately underlies the first side flap 34b, to support the rim portion defined thereby, and the third side flap 40b extends downwardly along and engages the outer surface of the side wall 32b. Similarly, the first side flap 34c, of adjacent side wall 32c has been folded outwardly and downwardly to define a rim portion, and the second side flap 32c and the third side flap 40c of that corresponding side wall have been respectively folded upwardly to underlie the first side flap and downwardly to engage the corresponding wall 32c. The locking tab 51 is thus disposed between and gripped by the first side flap 34c and the second side flap 36c of the side wall 32c, to which the sealing and locking panels 44, 45 are juxtaposed.

This folding step is facilitated by the arcuate outer surface of the locking tab 51, and the sandwicking of the locking tab in this manner so restrains the corner fold construction that it may not be easily unfolded or disassembled.

The final step in erecting a food tray container from the blank of FIGURES 1 and 2 as shown by FIGURE 6. There, the second and third corner flaps 47, 50 have been respectively folded upwardly so as to underlie the rim portion defined by the first corner flap 46 to support that rim portion and downwardly so as to place the third corner flap 50 in engagement with the outer surface of the corner wall 43. The relationships of the various panels in this completed construction is made more clear in FIGURES 7, 8, and 9 which are sectional views of the completed corner as shown in FIGURE 6. In those views, the relative relationships of the first, second and third side and corner flaps are made most clear. The first side flaps and first corner flaps are seen to define rim portions which are reinforced by the second side flaps and second corner flaps underlying the first side flaps and first corner flaps. The third side and corner flaps which engage the outer surfaces of the side walls and corner walls provide a frictional engagement which, in combination with the restraint against unfolding provided by the locking tab 51, maintains the container in an erected position, and renders the container entirely self-sustaining once erected. This operation of the third side and corner flaps is enhanced by sizing those flaps so that adjacent ends abut at the corners, providing an additional frictional locking engagement to prevent spontaneous unfolding of the folded construction.

While this self-sustaining construction is preferred, more conventional means of securing the container in an assembled relation may be used if considered desirable. More specifically, the third side and corner flaps may be secured to the outer surfaces of the corresponding side and corner walls by any suitable means such as an adhesive. Further, where such conventional fastening means are to be used, it is not necessary to employ the third and corner flaps, as the self-sustaining feature is not to be relied on. In such an instance, the second and corner flaps are adhesively or mechanically secured to the corresponding first side and corner flaps, and a satisfactory container is produced. In neither instance is the adhesive or mechanical fastening means so disposed as to present a danger of contamination of the contained food item.

On completion of the erection steps detailed above, a completed food tray container, indicated generally at 53, as shown in the perspective views of FIGURES 10 and 11, has been produced from the suitably cut and scored blank of FIGURES 1 and 2. The food tray container is characterized by having a polygonal bottom panel or wall 54, formed by the central panel 31 of the blank; a plurality of side walls 55a, 55b, 55c, 55d, extending upwardly from the bottom panel, formed by the side panels 32a, 32b, 32c, and 32d, of the blank; a plurality of corner walls 56a, 56b, 56c, 56d, extending upwardly from the bottom panel between adjacent pairs of side walls, formed by the corner wall gusset panels 43 of the blank; and a reinforcing rim 57 extending around the upper extremity of the container and formed by the downwardly and outwardly extending flaps and corner flaps. Due to the flap configuration discussed in detail above, the container rim is reinforced and constructed so as to render the container self-sustaining in the erected condition.

The container of FIGURES 10 and 11 is useful in a food product package, indicated generally at 60 and illustrated in FIGURES 12 and 13. There, the tray container 53 is shown to contain a food product 61, which may, for example, be a chicken or turkey. The food product package 60, including the food product, is completed by applying an overlap 62 of a relatively thin transparent sheet material, of any suitable known type. The sheet material preferably extends over the container rim 57, and is sealed to the lower surface of the rim, as shown by the sectional view of FIGURE 13. This seal may be a heat seal or an adhesive seal, depending upon the particular transparent wrap chosen. When so sealed, the food product packaged is effectively protected from contamination while preventing any escape of fluid from the package. As an alternative to sealing the overlap, it may be secured by other means known to persons assembling such packages, such as a rubber band.

When it is desired that a food tray container and food product package be used which is of a somewhat larger or deeper size than that shown in FIGURES 1–13, a second form of blank, food tray, and food product package as shown in FIGURES 14–22 may be selected. The blank, container and package there illustrated and now to be described differs from the previously described form in a certain particular detail and provides the same advan-
tage of storage in a planar state and subsequent erection into a leakproof or watertight tray container adapted to be used in the assembly of a completed package including a food product and overwrap.

The second form of blank in accordance with this invention is shown in the plan view of FIGURE 14 similar to the previously described FIGURE 1. There, the blank, generally indicated at 70, is shown to have a polygonal central panel 71 and a plurality of side panels 72a, 72b, 72c, and 72d, hingedly connected to corresponding sides of the central panel 71 along scored fold lines 73 which together define the polygonal boundary of the central panel 71. Preferably, the central panel 71 is rectangular in configuration.

In order to form a rim around portions of the erected container, first side flaps 74a, 74b, 74c, and 74d, are hingedly connected to corresponding side panels 72a, 72b, 72c, and 72d, along a side thereof remote from the connection of those side panels and the central panel 71. Outwardly of the first side flaps 74a, 74b, 74c, and 74d, are provided second side flaps 75a, 75b, 75c, and 75d, hingedly connected to corresponding first side flaps. Outwardly of the second side flaps are provided third side flaps 76a, 76b, 76c, and 76d, hingedly connected to corresponding second side flaps.

The successive and corresponding side flaps are hingedly connected together, and to the corresponding side panels 72a, 72b, 72c, and 72d, along fold lines which are parallel to the fold lines 73 defining the polygonal boundary of the central panel 71, in substantial similarity to the corresponding structure shown in FIGURE 1 described above.

In order to render the container leakproof and watertight, the second form in accordance with this invention provides a plurality of groups of serially arranged hingedly connected gusset panels, each group being generally designated as 77a. Each group of hingedly connected gusset panels is disposed between a pair of adjacent side panels, as illustrated in FIGURE 14, and the particular arrangement within a representative group will be discussed with reference to the group designated as 77bc, as indicative of the position of the group disposed between the side panels 72b and 72c.

In similarity to the representative group of hingedly connected gusset panels 42bc discussed above with reference to the first form of blank in accordance with this invention, the representative group 77bc has the distal ends of the group hingedly connected to the adjacent side panels 76b and 76c. The group 77bc includes five gusset panels, one of which is a corner wall gusset panel 80 adapted to form a corner wall of the container on erection. Disposed between the corner wall gusset panel 80 and each distal end are two gusset panels 81, 82, and 81', 82', hingedly connected to fold outwardly and into juxtaposed relation outside of adjacent side panels 72b and 72c on erection of the blank, as will be made more clear hereinafter. The serially arranged group 77bc of hingedly interconnected gusset panels provides a leakproof or watertight construction in the erected tray container which is assured by having no break in the continuity of the blank material at the corners of the blank or of the erected walls.

In order to complete the reinforcing rim portion extending entirely around the tray container, and to enhance the self-sustaining characteristics of the container in the erected position, a first corner flap 83 is hingedly connected to each corner wall gusset panel 80. Furthermore, a seed corner flap 84 is hingedly connected to a corresponding first corner flap 83 along the side thereof remote from the interconnection of the first corner flap 83 and the corresponding corner wall gusset panel 80 and a third corner flap 85 is hingedly connected to a corresponding second corner flap 84, along the side thereof of remote from the corresponding second and first corner flaps. The purpose and function of these corner flaps will be made more clear hereinafter when the erection of a container from the blank in FIGURE 14 is described in detail.

In order to further enhance the self-sustaining characteristics of a container erected from the blank of FIGURE 14, a locking tab 86, 86', is provided to a corresponding gusset panel 81, 81', immediately adjacent the corner wall gusset panel 80, and is hingedly connected to a corresponding adjacent first corner flap 83. The outer extremity of the locking tab 86, 86', describes an arc of a circle about a central point 87 displaced from the point of conjunction of the fold lines at which the gusset panels 80, 81 and 82 are hingedly connected.

The steps of erecting a food tray container from the blank 70 of FIGURE 14, and certain details of the container construction, are shown in FIGURES 15–18. More specifically, FIGURES 15 and 16 illustrate, by showing a single corner, the steps in the erection of the blank 70 into a food tray container.

This erection process is basically similar to the erection process for the blank 30 of FIGURES 1 and 2, and has been previously described, and the showing here has been somewhat attenuated as it was not felt necessary to show each individual step, in view of the earlier discussion. The steps described in FIGURE 15 shows the side panels 72b and 72c folded upwardly with respect to the central panel 71, with the corresponding first, second, and third side flaps remaining planar with the corresponding side panels. Due to the hinged interconnection of the group 77bc of serially arranged gusset panels, the corner wall gusset panel 80 is folded outwardly to define a corner wall while the gusset panels 81, 82 and 81', 82', intermediate the corner wall gusset panel 80 and the adjacent side panels 72b and 72c are folded to overlie each other and lie along the outer sides of the adjacent side wall panels.

The first, second and third corner flaps 83, 84, and 85, folded downwardly and outwardly, but remain in substantial planar relation, and the locking tabs 86, 86', due to the their hinged connection to the gusset panels 81, 81', immediately adjacent the gusset panel 80 and to the first corner flap 83, are positioned downwardly and outwardly and cause the gusset panels to be juxtaposed along the outside surface of the adjacent walls.

The finished container corner wall construction, following the final step of erection, is shown in FIGURE 16. There, the first side flaps 74b and 74c have been folded downwardly and outwardly to define a reinforcing rim portion around the upper extremity of the container. The second side flaps 75b and 75c have then been folded upwardly to reinforce the rim portion and to sandwich the grip the locking tabs 86, 86' to secure the corner construction against easy unfolding or disassembly. This folding stop is facilitated by the arcuate outer surface of the locking tabs 86, 86', in a manner similar to that discussed previously. The third side flaps 76b and 76c have simultaneously been folded downwardly to engage the outer surfaces of the side wall panels 72b and 72c in order to provide a self-sustaining container structure. Then the second corner flap 84 has been folded upwardly and inwardly to support the rim portions defined by the first corner flap 83, and the third corner flap 85 has been folded downwardly to engage the surface of the wall 80 and provide a self-sustaining construction. In similarity to the form disclosed previously, with regard to FIGURES 1–12, the third corner flaps 85 and third side flaps 76b and 76c are pinched outwardly sized to meet in edge abutting relation, to provide a frictional engagement in addition to the frictional engagement of those members against the respective wall portions, to further enhance the self-sustaining effect.

The relationship of various panels and gussets in the complete construction of FIGURE 16 are made more clear in FIGURES 17 and 18, which are sectional views of the completed corner. In those views, the relative relationships of the gusset panels and side panels are made clear, and especially from FIGURE 17 which is
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taken similarly to previously mentioned FIGURE 9. FIGURE 18, taken similarly to previously mentioned FIGURE 8, illustrates the entrapment of a filling inside the compartment and the frictional engagement of the thin flaps which provides a self-sustaining construction. While this self-sustaining construction is preferred, more conventional means of securing the container in an assembled relation may be considered desirable. More specifically, the third side and corner flaps may be secured to the outer surfaces of the corresponding wall panels by any suitable adhesive or mechanical means. Further, where such conventional fastening means are to be relied on, it is necessary to employ the third side and corner flaps, and the second side and corner flaps may be adhesively or mechanically secured to the corresponding first side and corner flaps.

On completion of the erection steps outlined above, a completed food tray container, indicated generally at 90, as shown in the perspective view of FIGURES 19 and 20, has been produced from the suitably cut and scored blank of FIGURE 14. The food tray container 90 is characterized by having a polygonal bottom panel 91 formed by the central panel 71 of the cut and scored blank 70; a plurality of side walls 92a, 92b, 92c, and 92d extending upwardly from the bottom panel 91 and formed by the side panels 72a, 72b, 72c, and 72d, of the blank 70; a plurality of corner walls 93a, 93b, 93c, and 93d extending upwardly from the bottom panel 91 between adjacent pairs of side walls, and formed by the corner wall gusset panels 80 of the blank 70; and a reinforcing rim 94 extending around the upper extremity of the container and formed by the downwardly and outwardly extending side and corner flaps.

The container of FIGURES 19 and 20 is useful in a food product package, indicated generally 100, and illustrated in FIGURES 21 and 22. In similarity to the package illustrated in FIGURES 12 and 13, the tray container 90 is shown to contain a food product 101, which may, for example, be a chicken or turkey. The food product package 100 including the food item is completed by applying an overwrap 102 of a relatively thin transparent sheet material, of any generally known type. The sheet material preferably extends over the container rim 94 and is sealed to the lower surface of the rim as shown by the section view of FIGURE 22. This seal may be a heat seal or an adhesive seal, depending upon the particular type of transparent wrap chosen. When so sealed, the food product package is effectively protected from contamination while preventing any escape of fluid from the package. As an alternative to sealing the overwrap, it may be secured by other suitable means known to persons assembling such packages, such as a rubber band.

The third form of blank, container, and package in accordance with this invention is illustrated in FIGURES 23-29. Due to the similarity of this third form to the previously described second form, the illustration thereof has been less complete, but considered adequate to make clear the distinction between the forms. The third form provides a leakproof or watertight container and packaging, similar to the previously discussed forms, but modifies the corner construction to provide a more rounded appearance which is more pleasing and less subject to damage by handling when used with a larger size container and package.

A blank 110 embodying the third form of this invention is partially shown in FIGURE 23, which is similar to FIGURE 1. FIGURE 23 shows a corner portion of the blank 110, and it is to be understood that the remaining three corners, not here shown, are similarly constructed. In similarity to the blank of FIGURE 14, the blank 110 includes a polygonal central panel 111 and a plurality of side wall panels, including panels 112a and 112d connected to the bottom panel 111 along fold lines 113. Corresponding side panels 112a and 112d are provided with corresponding first side flaps 114a and 114d; second side flaps 115a and 115d; and third side flaps 116a and 116d. Blank 110 is further provided with a plurality of groups of serially arranged hingedly connected gusset panels, indicated generally at 117, with a representative group 117da being shown in FIGURE 23. In similarity to the group of serially arranged and hingedly interconnected gusset panels 77 provided as a portion of the blank 70 illustrated in FIGURE 14, the representative group 117da includes five gusset panels. One of the groups is a corner wall gusset panel 120 adapted to form a corner wall portion on erection of the blank 110, in similarity to the corner wall gusset panel 80 of the blank 70 shown in FIGURE 14.

In order to provide a more rounded corner construction which is more pleasing in appearance with a larger size container and less subject to damage by handling, the corner wall gusset panel 120 is hingedly connected to the bottom panel 111 in a manner distinctive from that used with the two previously discussed forms. As indicated in FIGURE 23, the corner wall gusset panel 120 is of inverted trapezoidal configuration and hingedly connected to the central panel 111 along a fold line 121, which is disposed with a predetermined angular relationship to the scored fold lines 113, preferably 45° as shown. This is in distinction to the two previously discussed forms in which the corner wall gusset panels 43, 80 has a triangular configuration. In similarity to the previously discussed forms, the group 117da of serially arranged gusset panels has additional gusset panels 122, 123 and 122a, 123a, disposed between the corner wall gusset panel 120 and the adjacent side panels 112a and 112d. Further, the corner wall gusset panel 120 is hingedly connected, at its outer extremity, to a first corner flap 124, which in turn is hingedly connected to a second corner wall flap 125, which in turn is hingedly connected to a third corner wall flap 126. In similarity to the configuration of the blank 70 illustrated in FIGURE 14, locking tabs 127, having arculate outer extremities, are hingedly connected to the gusset panels 122a, 123a, immediately adjacent to the corner wall gusset panel 120 and to the adjacent first corner flap 124.

The erection of a container from the blank 110 of FIGURE 27 proceeds substantially as described above with reference to the blank 70 of FIGURE 14, and is not considered necessary to here repeat the process in detail. One step in the erection process is illustrated in FIGURE 24, which represents an intermediate step between those erection steps represented in FIGURES 15 and 16, and described more fully above. As will be understood, the function of the various flaps and locking tabs of the blank 110 is substantially the same as corresponding flaps and tabs in the previously discussed forms, and the gusset panels 122, 123, and 122a, 123a operate in substantial similarity to the gusset panels 81, 82, and 81a, and 82a, of the blank 70 shown in FIGURE 14.

At the conclusion of the erection process, for the blank 110 shown in FIGURE 23 a tray container 130, as shown in FIGURES 26 and 27, has been produced. This tray container has a bottom panel 131; side walls 132a, 132b, 132c, and 132d; corner walls 133a, 133b, 133c, and 133d; and a reinforcing rim 134 corresponding to the similar elements illustrated in FIGURE 11, and 19 and 20. The distinction in form between the two previously discussed forms and the third form is readily apparent from FIGURES 26 and 27, where the more rounded corner appearance is shown. This corner appearance may be considered more pleasing, and offers some protection against damage in handling, which otherwise might result in breaking the material of the container so as to cause leakage of liquids from a completed package.

The food tray container 130 of FIGURES 26 and 27 is used in assembling the food product package 140 illustrated in FIGURES 28 and 29. There, a tray 130, is
shown to contain a food product 141 may be a chicken or a turkey, which is covered by an overwrap 142 similar to the overwraps 62 and 102 discussed above. As shown by the sectional view of FIGURE 29, the overwrap 142 is similarly sealed to the underside of the rim portion of the tray container 130.

It is, therefore, considered that various forms of an improved food tray blank, container, and package have been illustrated and described which avoid the deficiencies of conventional packages, containers, and blanks by providing a leakproof or watertight package including a container which is self-sustaining in the erectable position and is erected from a planar blank suitably cut and scored from a paperboard material. This improved construction need not rely on conventional adhesive or mechanical fasteners, in order to obtain the desired results.

In the drawings and specification there have been set forth preferred embodiments of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

We claim:

1. A suitably cut and scored blank adapted to be folded and erected into a food product container comprising:

   (a) a polygonal central panel adapted to form the bottom of the container when the blank is erected;
   (b) an elongate side panel coextensive with and hingedly connected along its inner side edge to each side edge of said central panel and adapted to form a side wall of the container upon erection;
   (c) an elongate first side flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each side panel and adapted to define a portion of a container rim upon erection;
   (d) an elongate second side flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each first side flap and adapted to reinforce a portion of said container rim upon erection;
   (e) a group of serially arranged hingedly interconnected gusset panels disposed between each pair of adjacent side panels with distal ends of said group hingedly connected to adjacent side panels, one gusset panel of each group being adapted to form a corner wall upon erection, and an immediately adjacent gusset panel being hingedly connected to said one so as to be foldable outside of an adjacent side panel upon erection;
   (f) an elongate first corner flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each first side flap and adapted to reinforce a portion of said container rim upon erection;
   (g) an elongate second corner flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each second side flap and adapted to reinforce a portion of said container rim upon erection;
   (h) a locking tab hingedly connected to the outer side edge of said gusset panel immediately adjacent said gusset panel of each group of gusset panels and to an adjacent first corner flap and adapted to be sandwiched between adjacent first and second side flaps upon erection.

2. A blank as claimed in claim 1 in which the distal ends of each group of gusset panels are hingedly connected to adjacent side panels.

3. A blank as claimed in claim 1 in which a gusset panel of each group immediately adjacent said one gusset panel of each group is hingedly connected to the latter panel so as to be foldable outside of an adjacent side panel upon erection.

4. A suitably cut and scored blank adapted to be folded and erected into a food product container comprising:

   (a) a polygonal central panel adapted to form the bottom of the container when the blank is erected;
   (b) an elongate side panel coextensive with and hingedly connected along its inner side edge to the outer side edge of each side panel and adapted to define a portion of a container rim upon erection;
   (c) an elongate first side flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each first side flap and adapted to reinforce a portion of said container rim upon erection;
   (d) an elongate second side flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each first side flap and adapted to reinforce a portion of said container rim upon erection;
   (e) a group of serially arranged hingedly interconnected gusset panels disposed between each pair of adjacent side panels with distal ends of said group hingedly connected to adjacent side panels, one gusset panel of each group being adapted to form a corner wall upon erection, and an immediately adjacent gusset panel being hingedly connected to said one so as to be foldable outside of an adjacent side panel upon erection;
   (f) an elongate first corner flap coextensive with and being hingedly connected along its inner side edge to the outer side edge of said gusset panel and adapted to define a portion of a container rim upon erection;
   (g) an elongate second corner flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each first corner flap and adapted to reinforce a portion of said container rim upon erection;
   (h) a locking tab hingedly connected to the outer side edge of said gusset panel immediately adjacent said gusset panel of each group of gusset panels and to an adjacent first corner flap and adapted to be sandwiched between adjacent first and second side flaps upon erection.

5. A blank as claimed in claim 4 further comprising:

   (a) a polygonal central panel adapted to form the bottom of the container when the blank is erected;
   (b) an elongate side panel coextensive with and hingedly connected along its inner side edge to the outer side edge of each side panel and adapted to form a side wall of the container upon erection;
   (c) an elongate first corner flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each first corner flap and adapted to reinforce a portion of said container rim upon erection;
   (d) an elongate second corner flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each second corner flap and adapted to reinforce a portion of said container rim upon erection;
   (e) a group of serially arranged hingedly interconnected gusset panels disposed between each pair of adjacent side panels with distal ends of said group hingedly connected to adjacent side panels, one gusset panel of each group being adapted to form a corner wall upon erection, and an immediately adjacent gusset panel being hingedly connected to said one so as to be foldable outside of an adjacent side panel upon erection.

6. A blank as claimed in claim 4 in which the outer extremity of each of said locking tabs describes an arc of a circle.

7. A suitably cut and scored blank adapted to be folded and erected into a food product container comprising:

   (a) a polygonal central panel adapted to form the bottom of the container when the blank is erected;
   (b) an elongate side panel coextensive with and hingedly connected along its inner side edge to the outer side edge of each side panel and adapted to form a side wall of the container upon erection;
   (c) an elongate first corner flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each first corner flap and adapted to reinforce a portion of said container rim upon erection;
   (d) an elongate second corner flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each second corner flap and adapted to reinforce a portion of said container rim upon erection;
   (e) a group of serially arranged hingedly interconnected gusset panels disposed between each pair of adjacent side panels with distal ends of said group hingedly connected to adjacent side panels, one gusset panel of each group being adapted to form a corner wall upon erection, and an immediately adjacent gusset panel being hingedly connected to said one so as to be foldable outside of an adjacent side panel upon erection.
adjacent side panels with distal ends of said group hingedly connected to adjacent side panels, one gusset panel of each group being adapted to form a corner wall upon erection, and an immediately adjacent gusset panel being hingedly connected to said one so as to be foldable outside of an adjacent side panel upon erection;

(g) an elongate first corner flap coextensive with and hingedly connected along its inner side edge to the outer side edge of said one gusset panel and adapted to define a portion of a container rim upon erection;

(h) an elongate second corner flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each first corner flap and adapted to reinforce a portion of said container rim upon erection;

(i) an elongate third corner flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each second corner flap and adapted to support said first and second corner flaps in position upon erection; and

(j) a locking tab hingedly connected to the outer side edge of said one gusset panel immediately adjacent said one gusset panel of each group of panels and to an adjacent first corner flap and having an outer extremity which describes an arc of a circle and adapted to be sandwiched between adjacent first and second flaps on erection.

8. A blanket as claimed in claim 7 in which each serially arranged group of gusset panels comprises three panels.

9. A blanket as claimed in claim 7 in which each serially arranged group of gusset panels comprises five panels.

10. A blanket as claimed in claim 9 in which each of said one gusset panels is of trapezoidal configuration and has the shorter one of the two parallel side edges hingedly connected to said central panel.

11. A substantially leakproof container for food products erected from a suitably cut and scored unitary blank comprising:

(a) a polygonal bottom panel,

(b) an elongate side wall coextensive with and hingedly connected to each side edge of said bottom panel and extending generally upwardly therefrom,

(c) an elongate first side flap coextensive with and hingedly connected to the upper side edge of each side wall and extending outwardly therefrom,

(d) an elongate second side flap coextensive with and hingedly connected to the outer side edge of each of said first side flaps and being folded along said hinged connection into underlying relation to said first side flap and cooperating therewith to define a side portion of a reinforcing rim for the container,

(e) a corner wall extending upwardly between each pair of adjacent side walls and being hingedly connected along one lateral edge to the end of one adjacent side wall and said corner walls cooperating to define a container wall extending entirely around said bottom panel,

(f) a first corner flap coextensive with and hingedly connected to the upper edge of each corner wall and extending outwardly therefrom,

(g) a second corner flap coextensive with and hingedly connected to the outer edge of each first corner flap and being folded along said hinged connection into underlying relation to said first corner flap and cooperating therewith to define a corner portion of the reinforcing rim for said container,

(h) at least one sealing and locking panel hingedly connected to each corner wall along its lateral edge remote from said one lateral edge thereof connected to said one adjacent side wall and extending laterally therefrom and being folded along said hinge connection to lie along and in substantially sealing relation to the other adjacent side wall, and

(i) a locking tab hingedly connected to the upper edge of each of said at least one sealing and locking panels and being disposed between and gripped by said first and second flaps connected to said other adjacent side wall to maintain said locking tabs between said flaps and thus hold the container in erected position.

12. A container as claimed in claim 11 wherein a pair of hingedly connected sealing and locking panels are provided at each corner of the container and wherein one of said pair is hingedly connected to the lateral edge of said corner wall and the other of said pair is hingedly connected to the end of said other adjacent side wall, said pair of sealing and locking panels being folded along their hinged connection to each other into juxtaposed relation and along their hinged connections to said corner wall and said other adjacent side wall into juxtaposed relation to said other adjacent side wall.

13. A container as claimed in claim 11 further comprising:

an elongate third side flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each of said second side flaps and being folded along said hinged connection to extend downwardly and engage the outer wall surface of an adjacent side wall to aid in supporting the container in an erected position, and

a third corner flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each of said second corner flaps and being folded along said hinged connection to extend downwardly and engage the outer wall surface of an adjacent side wall to aid in supporting the container in an erected position.

14. A substantially leakproof container for food products erected from a suitably cut and scored blank comprising:

(a) a polygonal bottom panel,

(b) an elongate side wall coextensive with and hingedly connected to each side edge of said bottom panel and extending generally upwardly therefrom,

(c) an elongate first side flap coextensive with and hingedly connected to the upper side edge of each side wall and extending outwardly therefrom,

(d) an elongate second side flap coextensive with and hingedly connected to the outer side edge of each of said first side flaps and being folded along said hinged connection into underlying relation to said first side flap and cooperating therewith to define a side portion of a reinforcing rim for the container,

(e) an elongate third side flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each of said second side flaps and being folded along said hinged connection to extend downwardly and engage the outer wall surface of an adjacent side wall to aid in supporting the container in an erected position,

(f) a corner wall extending upwardly between each pair of adjacent side walls and being hingedly connected along one lateral edge to the end of one adjacent side wall and said corner walls cooperating to define a container wall extending entirely around said bottom panel,

(g) a first corner flap coextensive with and hingedly connected to the upper edge of each corner wall and extending outwardly therefrom,

(h) a second corner flap coextensive with and hingedly connected to the outer edge of each first corner flap and being folded along said hinged connection into underlying relation to said first corner flap and cooperating therewith to define a corner portion of the reinforcing rim for the container,

(i) a third corner flap coextensive with and hingedly connected along its inner edge to the outer side edge of each second corner flap and being folded along
said hinged connection to extend downwardly and engage the outer wall surface of an adjacent corner wall to aid in supporting the container in an erected position,

(j) a pair of hingedly connected sealing and locking panels disposed at each corner of the container and having one of said pair hingedly connected to the lateral edge of said corner wall and the other of said pair hingedly connected to the end of said other adjacent side wall, said pair of sealing and locking panels being folded along their hinged connection to each other into juxtaposed relation and along their hinged connections to said corner wall and said other adjacent side wall into juxtaposed relation to said other adjacent side wall, and

(k) a locking tab hingedly connected to the upper edge of said other of said pair of sealing and locking panels and hingedly connected to a lateral edge of said first corner flap, said locking tab being disposed between and gripped by said first and second side flaps connected to said other adjacent side wall to maintain said locking tabs between said flaps and thus hold the container in an erected position.

15. A container as claimed in claim 14 wherein two pairs of sealing and locking panels are disposed in each corner of the container, each pair connecting one lateral edge of said corner wall and an adjacent side wall and being folded into juxtaposed relation with the corresponding adjacent side wall.

16. A container as claimed in claim 15 in which said corner wall has an inverted trapezoidal configuration and is hingedly connected along the lower parallel side edge thereof to said bottom panel.

17. A substantially leakproof food product package including a container erected from a suitably cut and scored unitary blank the package comprising:

(a) a polygonal bottom panel adapted to receive and support a food product,

(b) an elongate side wall coextensive with and hingedly connected to each side edge of said bottom panel and extending generally upwardly therefrom,

(c) an elongate first side flap coextensive with and hingedly connected to the upper side edge of each side wall and extending outwardly therefrom,

(d) an elongate second side flap coextensive with and hingedly connected to the exterior side edge of each said first side flap and being folded along said hinged connection into underlying relation to said first side flap and cooperating therewith to define a side portion of a reinforcing rim for the container,

(e) a corner wall extending upwardly between each pair of adjacent side walls and being hingedly connected along one lateral edge to the end of one adjacent side wall, said side and corner walls cooperating to define a container wall extending entirely around said bottom panel,

(f) a first corner flap coextensive with and hingedly connected to the upper edge of each corner wall and extending outwardly therefrom,

(g) a second corner flap coextensive with and hingedly connected to the outer edge of each first corner flap and being folded along said hinged connection into underlying relation to said first corner flap and cooperating therewith to define a corner portion of the reinforcing rim for said container,

(h) at least one sealing and locking panel hingedly connected to each corner wall along its lateral edge remote from said one lateral edge thereof connected to said one adjacent side wall and extending laterally therefrom and being folded along said hinge connection to lie along and in substantially sealing relation to the other adjacent side wall,

(i) a locking tab hingedly connected to the upper edge of each of said at least one sealing and locking panels and being disposed between and gripped by said first and second side flaps connected to said other adjacent side wall.

and second side flaps connected to said other adjacent side wall to maintain said locking tabs between said flaps and thus hold the container in an erected position, and

(j) a food product disposed within said container and resting on said bottom panel and being held thereon by said side and corner walls, and

(k) an overwrap extending over the top of said container and said food product therein and being secured in encircling relation to said container wall to protect said food product from contamination and to exclude leakage from the package.

18. A substantially leakproof food product package including a container erected from a suitably cut and scored blank, the package comprising:

(a) a polygonal bottom panel adapted to receive and support a food product,

(b) an elongate side wall coextensive with and hingedly connected to each side edge of said bottom panel and extending generally upwardly therefrom,

(c) an elongate first side flap coextensive with and hingedly connected to the upper side edge of each side wall and extending outwardly therefrom,

(d) an elongate second side flap coextensive with and hingedly connected to the outer side edge of each said first side flap and being folded along said hinged connection into underlying relation to said first side flap and cooperating therewith to define a side portion of a reinforcing rim for the container,

(e) an elongate third side flap coextensive with and hingedly connected along its inner side edge to the outer side edge of each of said second side flaps and being folded along said hinged connection to extend downwardly and engage the outer wall surface of an adjacent side wall to aid in supporting the container in an erected position,

(f) a corner wall extending upwardly between each pair of adjacent side walls and being hingedly connected along one lateral edge to the end of one adjacent side wall, said side and corner walls cooperating to define a container wall extending entirely around said bottom panel,

(g) a first corner flap coextensive with and hingedly connected to the upper edge of each corner wall and extending outwardly therefrom,

(h) a second corner flap coextensive with and hingedly connected to the exterior edge of each first corner flap and being folded along said hinged connection into underlying relation to said first corner flap and cooperating therewith to define a corner portion of the reinforcing rim for the container,

(i) a third corner flap coextensive with and hingedly connected along its inner edge to the outer side edge of each second corner flap and being folded along said hinged connection to extend downwardly and engage the outer wall surface of an adjacent corner wall to aid in supporting the container in an erected position,

(j) a pair of hingedly connected sealing and locking panels disposed at each corner of the container and having one of said pair hingedly connected to the lateral edge of said corner wall and the other of said pair hingedly connected to the end of said other adjacent side wall, said pair of sealing and locking panels being folded along their hinged connection to each other into juxtaposed relation and along their hinged connections to said corner wall and said other adjacent side wall into juxtaposed relation to said other adjacent side wall, and

(k) a locking tab hingedly connected to the upper edge of each of said other of said pair of sealing and locking panels and hingedly connected to a lateral edge of said first corner flap and said locking tab being disposed between and gripped by said first and second side flaps connected to said other adjacent side wall.
to maintain said locking tabs between said flaps and thus hold the container in erected position,

(1) a food product disposed within said container and resting on said bottom panel and being held thereon by side and corner walls, and

(m) an overwrap extending over the top of said container and said food product therein and being secured in encircling relation to said container wall to protect said food product from contamination and preclude leakage from the package.

References Cited by the Examiner

UNITED STATES PATENTS

<table>
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<tr>
<th>Patent Number</th>
<th>Date</th>
<th>Inventor</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>170,991</td>
<td>12/1875</td>
<td>Conover</td>
<td>229—31</td>
</tr>
<tr>
<td>927,537</td>
<td>7/1909</td>
<td>Hothersa</td>
<td>229—31</td>
</tr>
<tr>
<td>2,071,949</td>
<td>2/1937</td>
<td>Reich</td>
<td>229—31</td>
</tr>
<tr>
<td>3,054,550</td>
<td>9/1962</td>
<td>Comstock</td>
<td>229—31</td>
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JOSEPH R. LECLAIR, Primary Examiner.

R. PESHOCK, Assistant Examiner.
UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,316,102

Martin Doll et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 8, line 36, after "and", first occurrence, insert -- 85 are --; line 49, for "the", second occurrence, read -- and --; line 59, for "refined" read -- defined --; column 11, line 1, after "141" insert -- which --; line 41, for "a" read -- e --; column 12, line 10, for "apted" read -- adapted --.

Signed and sealed this 28th day of November 1967.

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents