US 20220289459A1

(19) **United States**

(12) **Patent Application Publication**

Kastanek et al.

(10) **Pub. No.: US 2022/0289459 A1**

(43) **Pub. Date: Sep. 15, 2022**

(54) **TRAY WITH COMPARTMENTS**

(71) Applicant: **Graphic Packaging International, LLC**, Atlanta, GA (US)

(72) Inventors: **Raymond S. Kastanek**, Mead, CO (US); **Mark Zammit**, Douglasville, GA (US)

(21) Appl. No.: **17/690,204**

(22) Filed: **Mar. 9, 2022**

Related U.S. Application Data

(60) Provisional application No. 63/159,015, filed on Mar. 10, 2021.

Publication Classification

(51) **Int. Cl.**

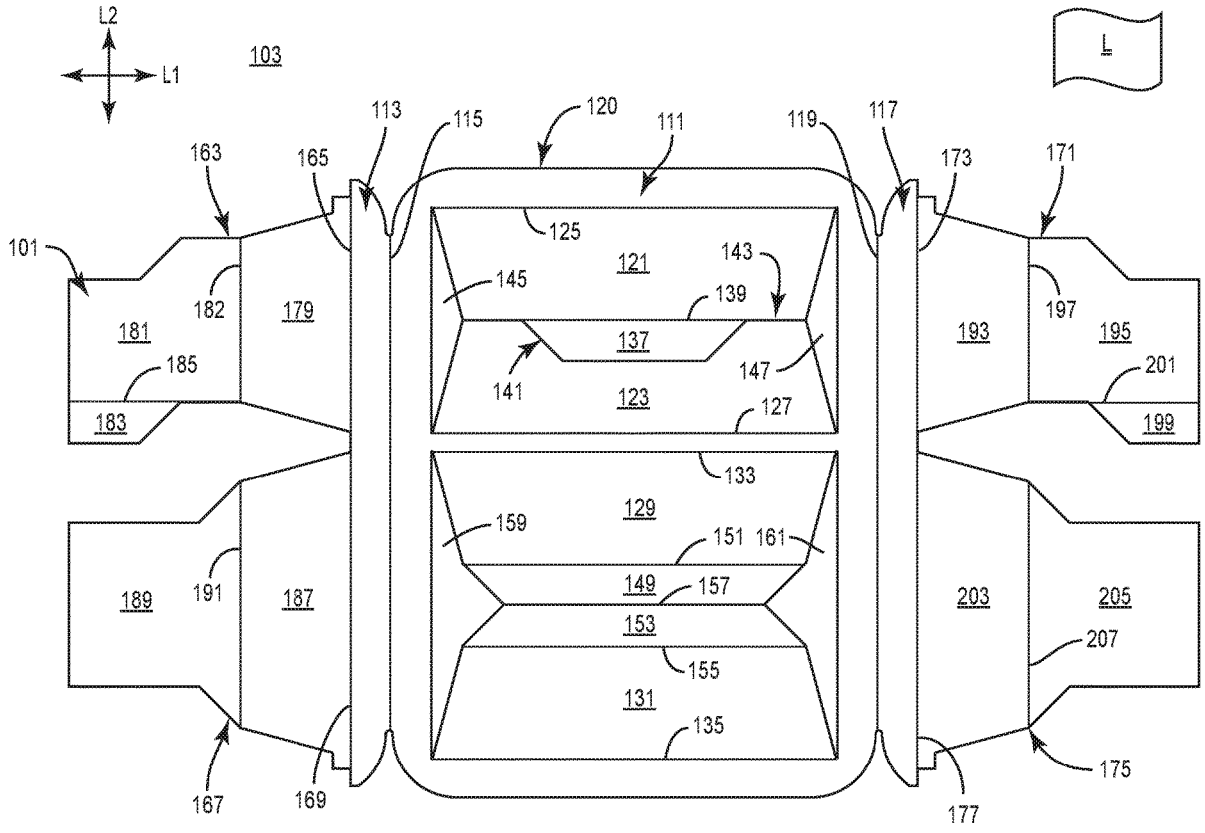
B65D 81/34	(2006.01)
B65D 5/00	(2006.01)
B65D 5/18	(2006.01)
B65D 5/20	(2006.01)
B65D 5/42	(2006.01)
B65D 5/56	(2006.01)
B65D 5/66	(2006.01)
B65D 21/02	(2006.01)

(52) **U.S. Cl.**

CPC ***B65D 81/3453*** (2013.01); ***B65D 5/0015*** (2013.01); ***B65D 5/18*** (2013.01); ***B65D 5/2047*** (2013.01); ***B65D 5/2057*** (2013.01); ***B65D 5/4266*** (2013.01); ***B65D 5/56*** (2013.01); ***B65D 5/66*** (2013.01); ***B65D 21/0233*** (2013.01); ***B65D 21/0234*** (2013.01); *B65D 2581/3472* (2013.01); *B65D 2581/3479* (2013.01); *B65D 2581/3489* (2013.01); *B65D 2581/3494* (2013.01)

(57) **ABSTRACT**

A tray for holding one or more food products includes a plurality of panels including a central panel, a plurality of compartment flaps foldably connected to a respective panel of the plurality of panels, and a plurality of end flaps foldably connected to a respective panel of the plurality of panels, the plurality of compartment flaps and the plurality of end flaps are overlapped to form a plurality of compartments of the tray.



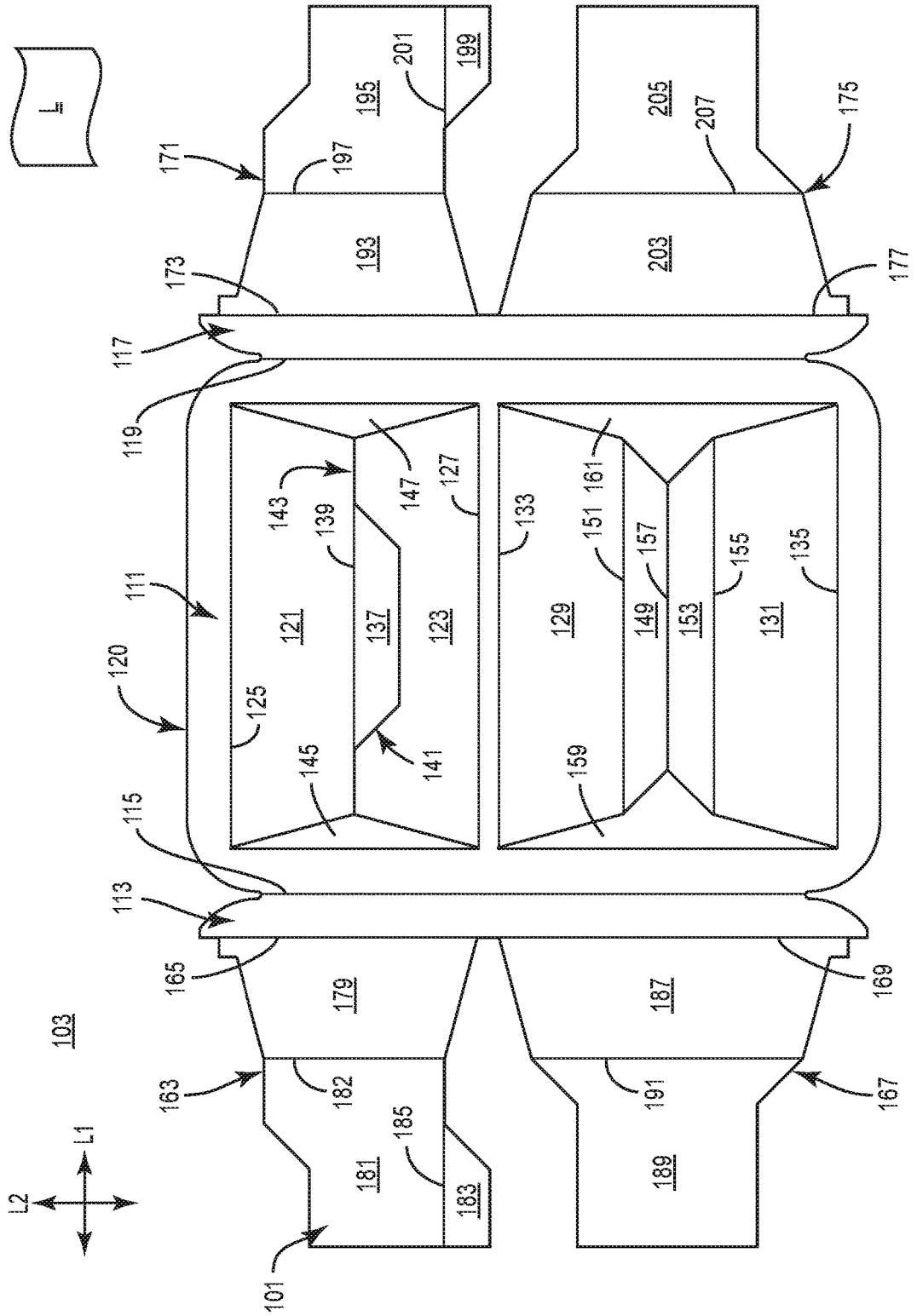

L
171
173
117
119
111
120
115
113
165
163
101
103
L1
L2
197
195
201
199
193
205
207
175
203
177
143
139
147
127
121
137
123
125
145
141
133
161
151
157
155
135
129
149
153
131
159
179
182
185
181
183
187
191
189
169
167

FIG. 1

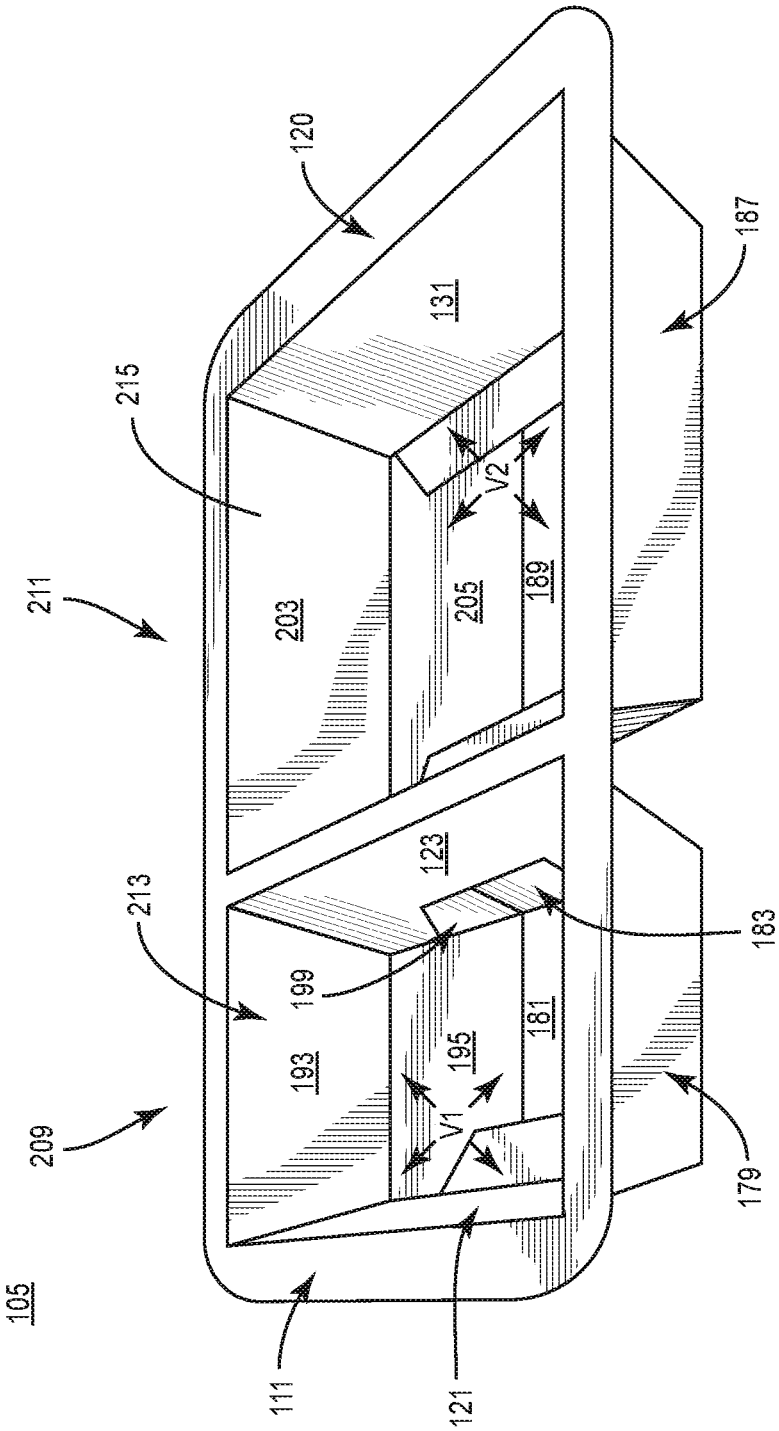

105
209
211
213
215
120
187
131
203
205
189
123
183
199
181
193
195
V1
V2
179
111
121

FIG. 2

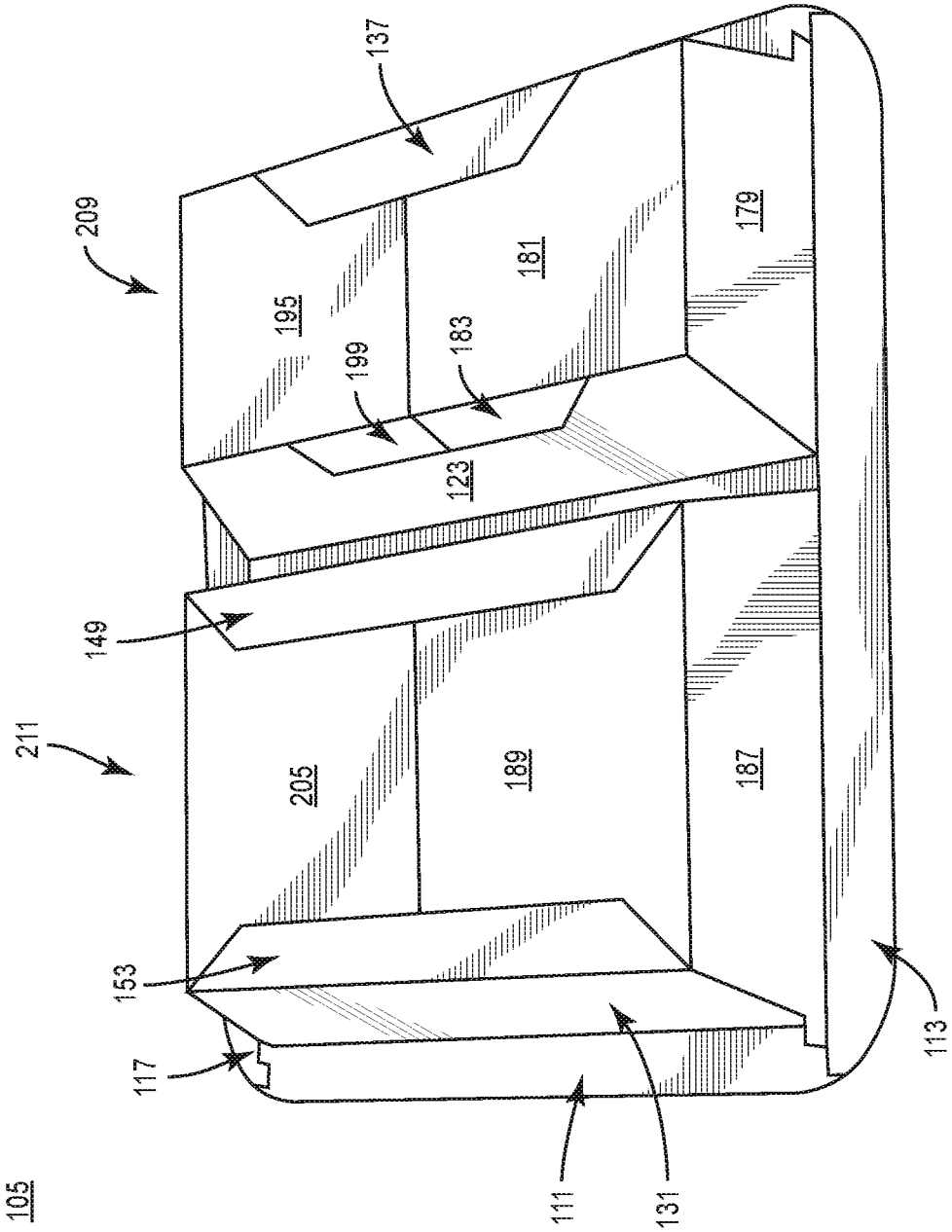

105
111
131
113
117
153
211
205
189
187
149
209
195
199
183
181
179
123
137

FIG. 3

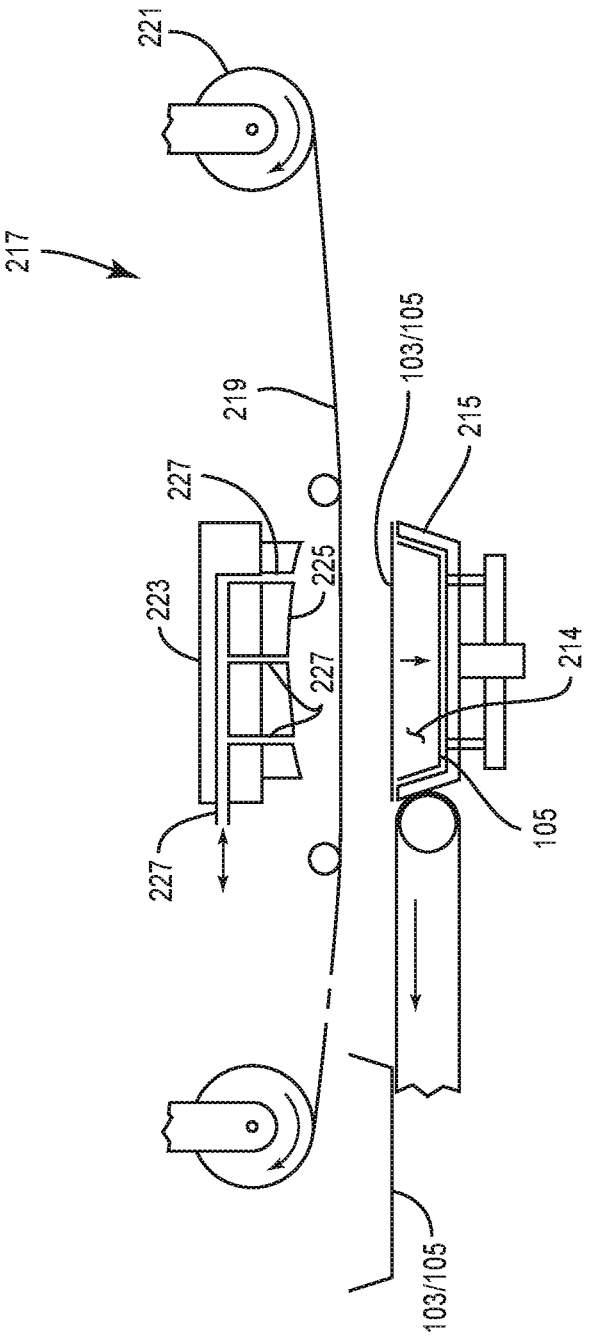


FIG. 4

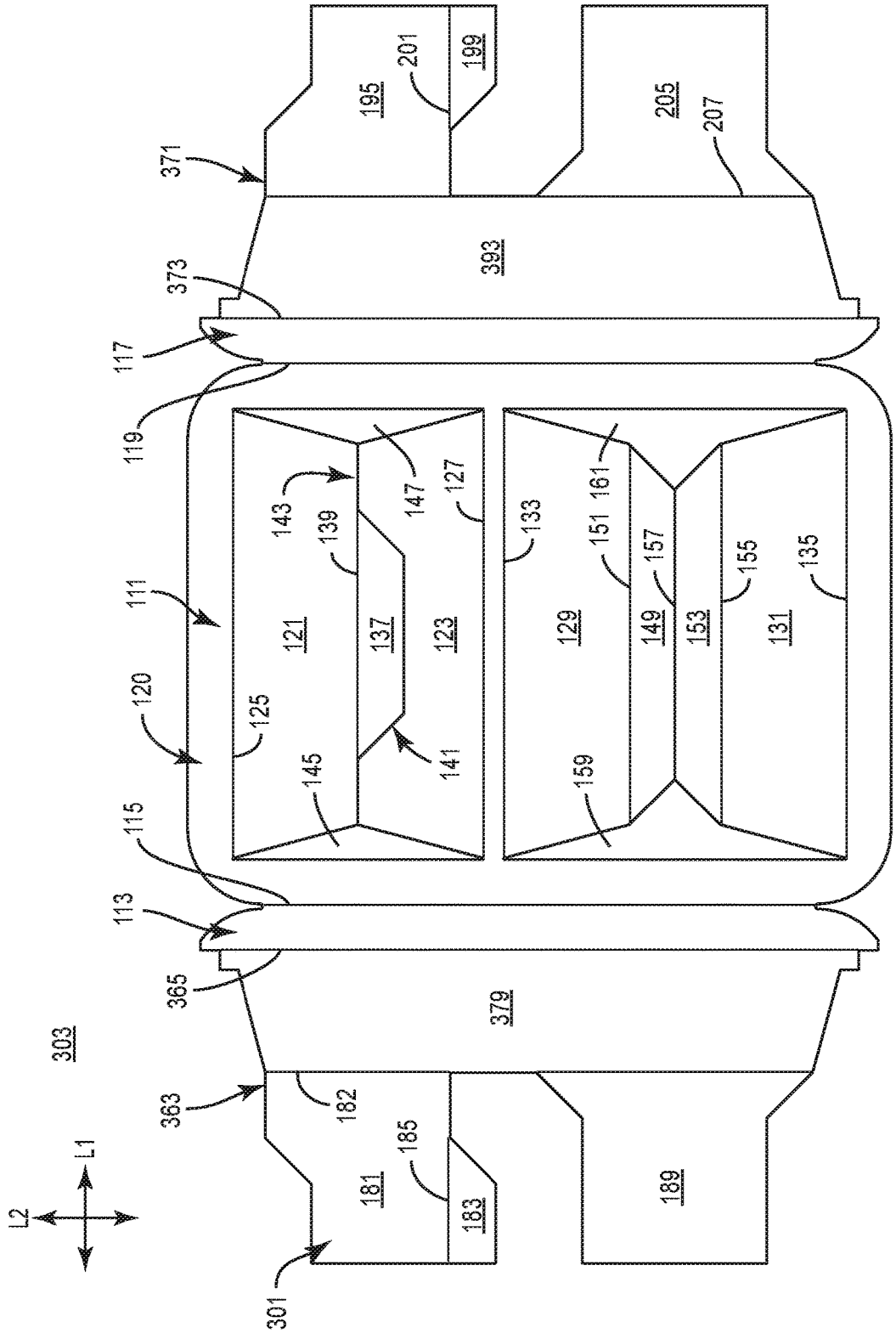

303
L1
L2
301
363
182
185
181
183
365
379
189
113
115
111
120
125
145
121
137
123
141
143
139
147
127
117
119
371
373
393
195
201
199
205
207
133
151
161
129
157
149
153
155
131
135
159

FIG. 5

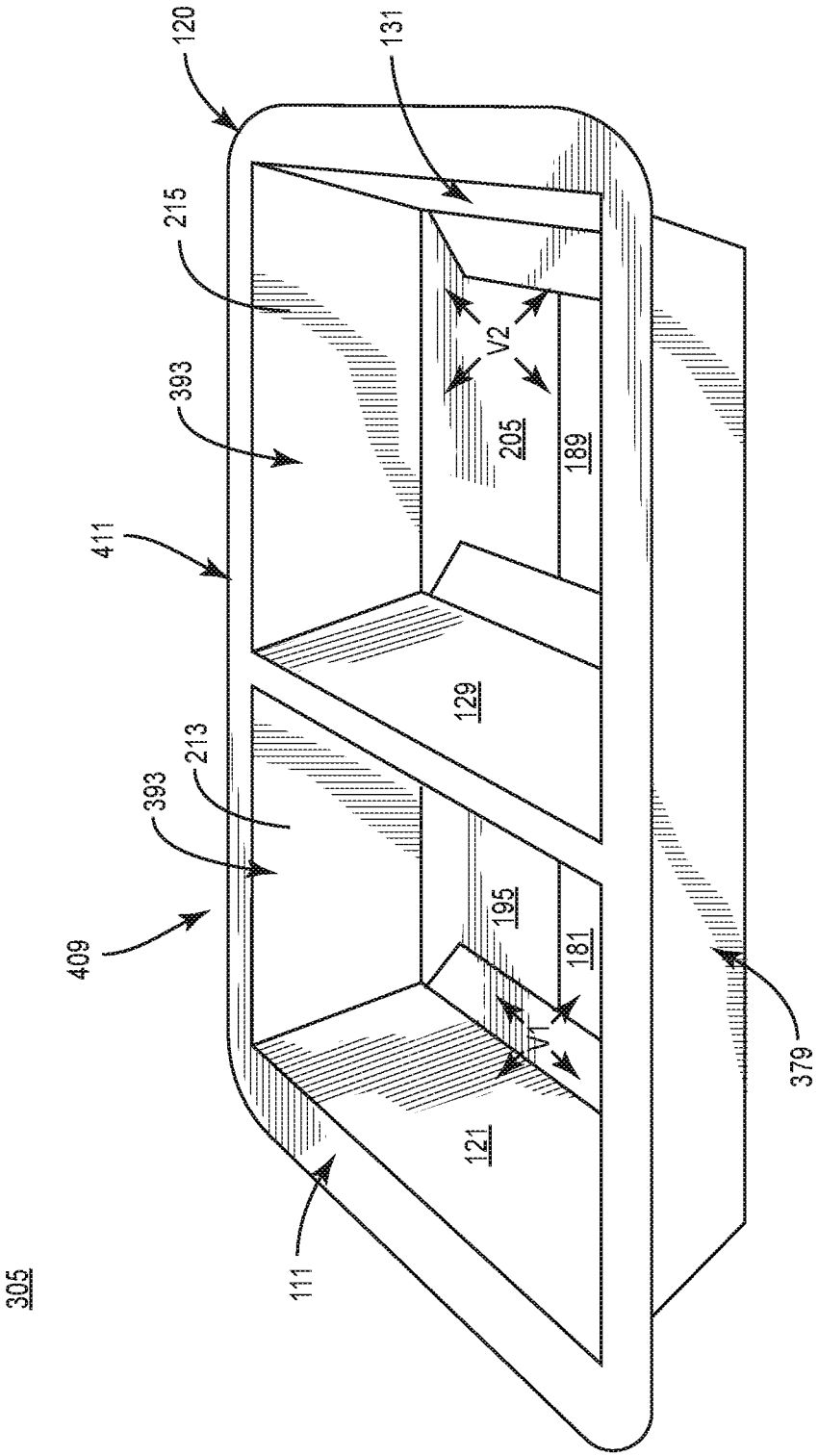

120
131
215
393
411
213
393
409
111
305
379
V2
205
189
129
195
181
V1
121

FIG. 6

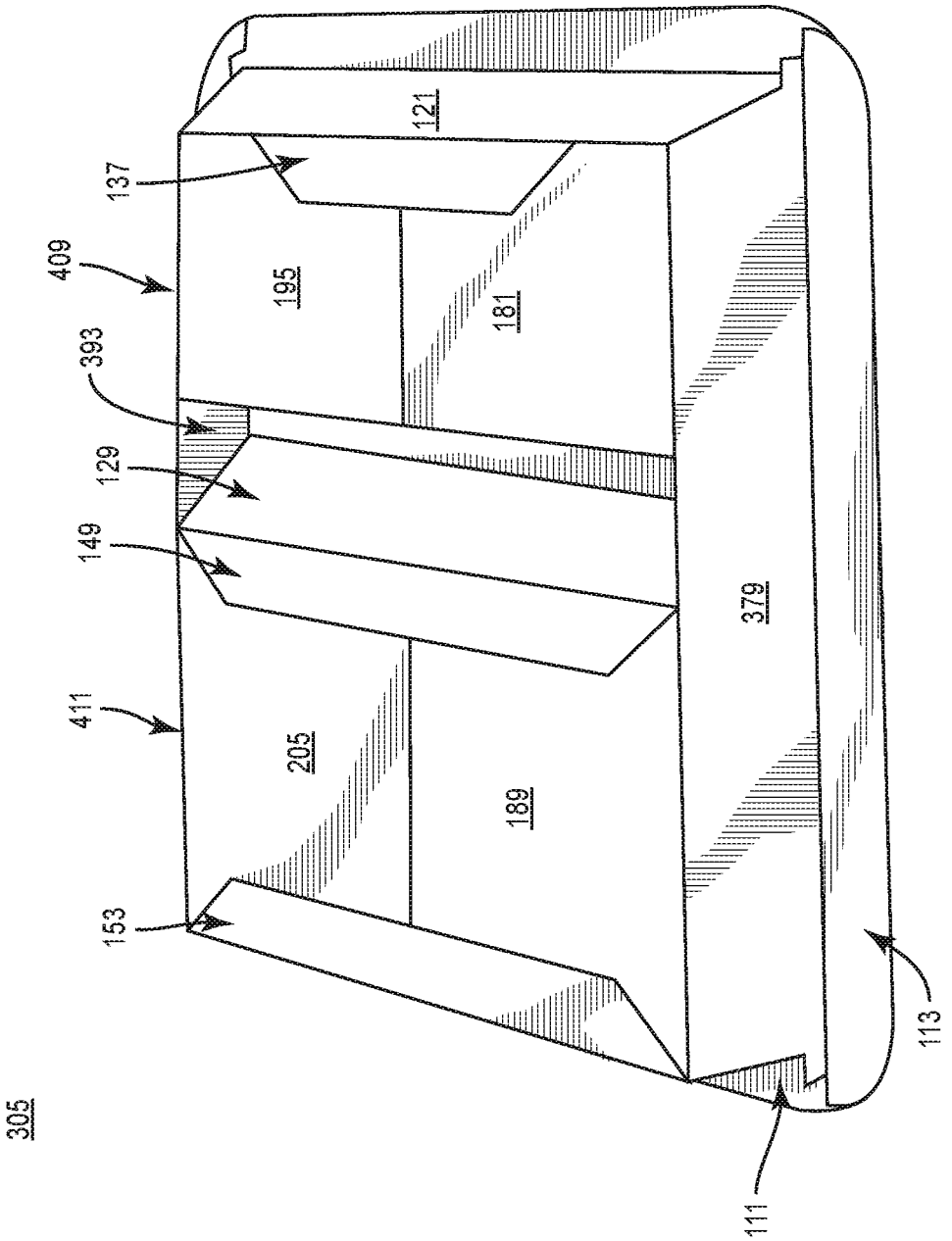


FIG. 7

TRAY WITH COMPARTMENTS

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of U.S. Provisional Patent Application No. 63/159,015, filed on Mar. 10, 2021.

INCORPORATION BY REFERENCE

[0002] The disclosures of U.S. Provisional Patent Application No. 63/159,015, filed on Mar. 10, 2021, U.S. patent application Ser. No. 16/532,819, filed on Aug. 6, 2019, U.S. Provisional Patent Application No. 62/851,932, filed May 23, 2019, U.S. Provisional Patent Application No. 62/796,716, filed Jan. 25, 2019, U.S. Provisional Patent Application No. 62/715,520, filed Aug. 7, 2018, U.S. patent application Ser. No. 16/037,425, filed Jul. 17, 2018, U.S. Provisional Patent Application No. 62/649,159, filed Mar. 28, 2018, U.S. Provisional Patent Application No. 62/643,914, filed Mar. 16, 2018, U.S. patent application Ser. No. 15/654,814, filed Jul. 20, 2017, U.S. Provisional Patent Application No. 62/365,635, filed Jul. 22, 2016, and U.S. patent application Ser. No. 12/992,131, filed Feb. 11, 2011, PCT Patent Application No. PCT/GB/09/50506, filed May 13, 2009, are hereby incorporated by reference for all purposes as if presented herein in their entirety.

BACKGROUND OF THE DISCLOSURE

[0003] The present disclosure relates to blanks, containers, trays, constructs, and various features and methods for forming a container from a blank. More specifically, the disclosure is generally directed to a container with multiple compartments.

SUMMARY OF THE DISCLOSURE

[0004] According to one aspect, the disclosure is generally directed to a tray for holding one or more food products, the tray comprising a plurality of panels comprising a central panel, a plurality of compartment flaps foldably connected to a respective panel of the plurality of panels, and a plurality of end flaps foldably connected to a respective panel of the plurality of panels, the plurality of compartment flaps and the plurality of end flaps are overlapped to form a plurality of compartments of the tray.

[0005] According to another aspect, the disclosure is generally directed to a blank for forming a tray for holding one or more food products, the blank comprising a plurality of panels comprising a central panel, a plurality of compartment flaps foldably connected to a respective panel of the plurality of panels, and a plurality of end flaps foldably connected to a respective panel of the plurality of panels, the plurality of compartment flaps and the plurality of end flaps are for being overlapped to form a plurality of compartments of the tray formed from the blank.

[0006] According to another aspect, the disclosure is generally directed to a method of forming a tray for holding one or more food products, the method comprising obtaining a blank comprising a plurality of panels comprising a central panel, a plurality of compartment flaps foldably connected to a respective panel of the plurality of panels, and a plurality of end flaps foldably connected to a respective panel of the plurality of panels. The method further comprises overlapping the plurality of compartment flaps and the plurality of end flaps to form a plurality of compartments of the tray.

[0007] Those skilled in the art will appreciate the above stated advantages and other advantages and benefits of various additional embodiments reading the following detailed description of the embodiments with reference to the below-listed drawing figures.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] According to common practice, the various features of the drawings discussed below are not necessarily drawn to scale. Dimensions of various features and elements in the drawings may be expanded or reduced to more clearly illustrate the embodiments of the disclosure.

[0009] FIG. **1** is a plan view of a blank used for forming a tray according to a first exemplary embodiment of the disclosure.

[0010] FIG. **2** is a top perspective views of a tray formed from the blank of FIG. **1** according to the first exemplary embodiment of the disclosure.

[0011] FIG. **3** is a bottom perspective view of the tray of FIG. **2**.

[0012] FIG. **4** is a schematic of an apparatus for forming a container in an exemplary embodiment of the disclosure.

[0013] FIG. **5** is a plan view of a blank used for forming a tray according to a second exemplary embodiment of the disclosure.

[0014] FIG. **6** is a top perspective views of a tray formed from the blank of FIG. **5** according to the second exemplary embodiment of the disclosure.

[0015] FIG. **7** is a bottom perspective view of the tray of FIG. **6**.

[0016] Corresponding parts are designated by corresponding reference numbers throughout the drawings.

DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

[0017] The present disclosure relates generally to various aspects of containers, constructs, trays, materials, packages, elements, and articles, and methods of making such containers, constructs, trays, materials, packages, elements, and articles. Although several different aspects, implementations, and embodiments are disclosed, numerous interrelationships between, combinations thereof, and modifications of the various aspects, implementations, and embodiments are contemplated hereby. In one illustrated embodiment, the present disclosure relates to forming a container or tray for holding food items or various other articles. However, in other embodiments, the container or tray can be used to form other non-food containing articles or may be used for heating or cooking.

[0018] FIG. **1** illustrates an exterior surface **101** of a blank **103** for forming a tray **105** (FIG. **2**) or other container according to an exemplary embodiment of the disclosure. In one embodiment, the blank **103** comprises paperboard (e.g., solid bleached sulphate folding boxboard), or other suitable material that can be recyclable and/or suitable for use in an oven (not shown). The blank **103** can be provided with a liner L that comprises a plastic layer such as polyethylene, a polyethylene terephthalate (PET) material, or any other thermoplastic material, or a bioplastic, such as vegetable oil or starch based plastics. In one embodiment, such liner can comprise polyethylene that can be softened and fused to the

blank **103**. In an alternative embodiment, a liner for being attached to the blank **103** can comprise PET or a similar material that is at least partially attached to the blank **103** by a heat seal layer (e.g., a thermoformable sealant grade transparent polyester packaging film, such as Mylar® XMPOL12 available from DuPont Teijin Films U.S. Limited Partnership of Hopewell, Va., or any suitable thermoformable sealant or adhesive, any suitable heat or pressure activated adhesive, or any other suitable material), wherein a PET liner can be more suitable for uses that require heating of the container in an oven. Such a liner can be at least partially attached to the blank **103** for being positioned in contact with one or more food products held in the container **105** (e.g., during heating). In one embodiment, after heating the food product, the blank **103** and an accompanying liner L can be separated to allow both the blank **103** and the liner to be recycled separately.

[0019] The blank **103** can be formed from a single ply of material, such as but not limited to paperboard, cardboard, paper, a polymeric sheet, and/or a laminate that includes more than one layer. In one embodiment, the blank **103** can include a microwave interactive layer (not shown) such as is common in MicroRite® containers available from Graphic Packaging International of Atlanta, Ga. The microwave interactive layer can be commonly referred to as, or can have as one of its components, a susceptor, a foil, a microwave shield, or any other term or component that refers to a layer of material suitable for shielding microwave energy and/or causing heating in a microwave oven.

[0020] As shown in FIG. **1**, the blank **103** has a longitudinal direction L**1** and a lateral direction L**2**. In the illustrated embodiment, the blank **103** has a central panel **111**, a first side attachment panel **113** foldably connected to the central panel **111** at a lateral fold line **115**, and a second side attachment panel **117** foldably connected to the central panel **111** at a lateral fold line **119**.

[0021] As shown, a peripheral region of the central panel **111** can form a flange **120** of the blank **103**/container **105**.

[0022] A first compartment flap **121** and a second compartment flap **123** can be foldably connected to the central panel **111** at respective longitudinal fold lines **125**, **127** (broadly, respective "first fold line") and positioned within the outer edges of the central panel **111** for at least partially forming a first compartment of the tray **105**, and a first compartment flap **129** (broadly, "third compartment flap") and a second compartment flap **131** (broadly, "fourth compartment flap") can be foldably connected to the central panel **111** at respective longitudinal fold lines **133**, **135** (broadly, respective "first fold line") and positioned within the outer edges of the central panel **111** for forming a second compartment of the tray **105**.

[0023] An attachment tab **137** can be foldably connected to the first compartment flap **121** at a longitudinal fold line **139**. The attachment tab **137** can be separable from the second compartment flap **123** at a cut **141** having one or more angled, oblique, and/or curved portions, and the compartment flaps **121**, **123** can be separable at a longitudinal cut **143** interrupted by the fold line **139**. As also shown, a pair of generally triangular cutouts **145**, **147** can be provided in the central panel **111** on opposing sides of the compartment flaps **121**, **123**, and can define respective free edges of the respective compartment flaps **121**, **123**.

[0024] Similarly, an attachment tab **149** can be foldably connected to the first compartment flap **129** at a longitudinal fold line **151** and an attachment tab **153** can be foldably connected to the second compartment flap **131** at a longitudinal fold line **155**, the attachment tabs **149**, **153** separable at a longitudinal cut **157**. A pair of generally triangular cutouts **159**, **161** can be provided in the central panel **111** on opposing sides of the compartment flaps **129**, **131** and can define respective free edges of the respective compartment flaps **129**, **131**.

[0025] In this regard, the fold lines **125**, **127**, **133**, **135** can be positioned along and/or intersecting with a portion of the respective cutouts **145**, **147**, **159**, **161** and/or respective openings in the central panel **111** formed by the respective compartment flaps **121**, **123**, **129**, **131**.

[0026] A plurality of end flaps are attached to respective panels of the plurality of panels of the blank **103**, and can include a first side end flap **163** (broadly, "first end flap") foldably connected to the first side attachment panel **113** at a lateral fold line **165** (broadly, "second fold line"), a second side end flap **167** (broadly, "first end flap" or "third end flap") foldably connected to the first side attachment panel **113** at a lateral fold line **169** (broadly, "second fold line"), a first side end flap **171** (broadly, "second end flap") foldably connected to the second side attachment panel **117** at a lateral fold line **173** (broadly, "second fold line"), and a second side end flap **175** (broadly, "second end flap" or "fourth end flap") foldably connected to the second side attachment panel **117** at a lateral fold line **177** (broadly, "second fold line"). In this regard, the fold lines **165**, **169**, **173**, **177** can be positioned spaced apart from the cutouts **145**, **147**, **159**, **161** and/or an opening in the central panel **111** formed by the compartment flaps **121**, **123**, **129**, **131**.

[0027] The first side end flap **163**, as shown, can include a base/side portion **179** foldably connected to the first side attachment panel **113** at the lateral fold line **165**, and a distal/bottom portion **181** foldably connected to the base portion **179** at a lateral fold line **182**. An attachment tab **183** can be foldably connected to the distal portion **181** of the end flap **163** at a longitudinal fold line **185**.

[0028] The second side end flap **167** can include a base/side portion **187** foldably connected to the first side attachment panel **113** at the lateral fold line **169**, and a distal/bottom portion **189** foldably connected to the base portion **187** at a lateral fold line **191**.

[0029] Similarly, the first side end flap **171**, as shown, can include a base/side portion **193** foldably connected to the second side attachment panel **117** at the lateral fold line **173**, and a distal/bottom portion **195** foldably connected to the base portion **193** at a lateral fold line **197**. An attachment tab **199** can be foldably connected to the distal portion **195** of the end flap **171** at a longitudinal fold line **201**. The second side end flap **175** can include a base/side portion **203** foldably connected to the second side attachment panel **117** at the lateral fold line **117**, and a distal/bottom portion **205** foldably connected to the base portion **203** at a lateral fold line **207**.

[0030] With additional reference to FIGS. **2** and **3**, according to one embodiment, the attachment panels **113**, **117** can be folded at the respective fold lines **115**, **119** into at least partial face-to-face contact with respective portions of the central panel **111**. In addition, the compartment flap **121**/attachment tab **137** and compartment flap **123** can be separated at the respective cuts **141**, **143** and folded downwardly at the respective fold lines **125**, **127** away from the central panel **111**. Similarly, the compartment flap **129**/attachment

tab **149** and the compartment flap **131**/attachment tab **153** can be separated at the cut **157** and folded downwardly at the respective fold lines **133**, **135** away from the central panel **111**.

[0031] The end flaps **163**, **171** can be folded inwardly at the respective fold lines **165**, **173** so as to extend away from the central panel **111** toward an engagement with the downwardly-depending compartment flaps **121**, **123**. In this regard, an edge or surface of each of the base portions **179**, **193** can intersect an edge or surface of the respective compartment flaps **121**, **123**.

[0032] Furthermore, the distal portions **181**, **195** can be folded at the respective fold lines **182**, **197** into a generally spaced and parallel arrangement with the central panel **111**, with an edge or surface of each of the distal portions **181**, **195** intersecting an edge or surface of the respective compartment flaps **121**, **123**. In such an arrangement, the attachment tabs **183**, **199** associated with the end flaps **163**, **171** can be folded at the respective fold lines **185**, **201** into at least partial face-to-face contact with the compartment flap **123** to overlie a space formed by the separation of the attachment tab **137** from the compartment flap **123**, and the attachment tab **137** associated with the compartment flap **121** can be folded into at least partial face-to-face contact with the respective distal portions **181**, **195** of the end flaps **163**, **171**.

[0033] In the foregoing arrangement, the end flaps **163**, **171** and the compartment flaps **121**, **123** and associated attachment tab **137** cooperate for form a first compartment **209**, with the base portions **179**, **193** of the respective end flaps **163**, **171** and the compartment flaps **121**, **123** forming sides of the compartment **209** that are obliquely arranged relative to the central panel **111**, and with the base portions **181**, **195** of the respective end flaps **163**, **171** forming the bottom of the compartment **209**. The aforementioned arrangement of the first compartment **209** can be maintained via the attachment of the tabs **137**, **183**, **199** to respective panels and flaps, and which can be at least partially maintained with an adhesive such as glue.

[0034] Similarly, the end flaps **167**, **175** can be folded inwardly at the respective fold lines **169**, **177** so as to extend from the central panel **111** toward an engagement with the downwardly-depending compartment flaps **129**, **131**, and the distal portions **189**, **205** thereof can be folded at the respective fold lines **191**, **207** into a generally spaced and parallel arrangement with the central panel **111**, with an edge or surface of each of the distal portions **181**, **195** intersecting an edge or surface of the respective compartment flaps **129**, **131**. In such an arrangement, the attachment tabs **149**, **153** associated with the compartment flaps **129**, **131** can be folded at the respective fold lines **151**, **155** into at least partial face-to-face contact with the respective portions of the end flaps **167**, **175**, e.g., the distal portions **189**, **205** of the respective end flaps **167**, **175**.

[0035] The end flaps **167**, **175** and the compartment flaps **129**, **131** and associated attachment tabs can thus cooperate for form a second compartment **211**, with the base portions **187**, **203** of the respective end flaps **167**, **175** and the compartment flaps **129**, **131** forming sides of the compartment **211** that are obliquely arranged relative to the central panel **111**, and with the base portions **189**, **205** of the respective end flaps **167**, **175** forming the bottom of the compartment **211**. The aforementioned arrangement of the compartment **211** can be maintained via the attachment of the tabs **149**, **153** to the respective end flaps, and which can be at least partially maintained with an adhesive.

[0036] The aforementioned arrangement of the tray **105** provides a plurality of compartments, e.g., compartments **209**, **211**, that allow for separation of food products, e.g., for serving to one or more person, to prevent commingling thereof, to provide a main dish and a side dish, to utilize one or more of the compartments **209**, **211** to hold a condiment, etc. Furthermore, the overlapping arrangement of the compartment flaps **121**, **123** and end flaps **163**, **171** provides the compartment **209** with a robust construction that resists deformation, bending, crushing etc. The overlapping arrangement of the compartment flaps **129**, **131** and end flaps **167**, **175** provides a similarly robust construction to the second compartment **211**. In this regard, the end flaps **167**, **175** can be considered reinforcing features of the respective compartments **209**, **211**/tray **105**.

[0037] In this regard, a first interior volume V**1** of the first compartment **209** can be defined between the end flaps **163**, **171** and the compartment flaps **121**, **123**, and a second interior volume V**2** of the second compartment **211** can be defined between the end flaps **167**, **175** and the compartment flaps **129**, **131**.

[0038] While the first compartment **209** is illustrated as defining an interior **213** with an interior volume V**1** that is different, e.g., larger, than the interior volume V**2** of an interior **215** of the second compartment **211**, it will be understood that one or both of the compartments **209**, **211** can have a different configuration or interior volume than that illustrated, or can have the same configuration or volume.

[0039] Furthermore, the aforementioned configuration of the tray **105** allows for nesting or stacking or multiple trays **105** upon one another. For example, an upper tray **105** can be seated or nested into a lower tray below by at least partially positioning the end flaps and compartment flaps defining the respective compartments **209**, **211** in the respective interiors **213**, **215** of the respective compartments **209**, **211** of the lower tray **105**.

[0040] It will be understood that, in embodiments, a liner such as liner L (FIG. **1**) can be applied to at least the interiors **213**, **215** of the respective compartments **209**, **211**, and can overlie seams/points of intersection between the respective compartment flaps and end flaps, e.g., such that the compartments **209**, **211** have leak-resistant properties.

[0041] In one embodiment, the container **105** can be formed similarly to the formation of the containers as shown and described in the incorporated-by-reference applications (e.g., the '425 application, the '814 Application, and/or the '131 application). In an exemplary embodiment shown schematically in FIG. **4**, the blank **103**/container **105** or a folded configuration thereof can be placed on a lower die **215** of a system **217** and a liner material or film sheet **219** (e.g., a polyethylene or PET web) can be fed from a supply roller **221** above the blank **103**/folded blank **103**. An upper die **223** has a heater plate surface **225** having a PTFE coating, for example a Teflon® coating. Alternatively, the heater plate surface **225** could have a coating of any suitable material or the coating could be omitted. As schematically shown in FIG. **4**, the upper die **223** can include a plurality of holes or ducts **227** in the heater plate surface **225** for applying a vacuum and/or air pressure on the sheet **219**. The lower die **215** and/or the upper die **223**, including the ducts **227** and/or the heater plate **225**, could be otherwise shaped,

arranged, positioned, and/or configured without departing from the disclosure. For example, the heater plate **225** could be omitted and the heat could be alternatively applied to the sheet **219** (e.g., with a flow of hot air).

[0042] In the illustrated embodiment, the lower die **215** can hold the blank **103**/folded blank **103** over a cavity **214** in the lower die **215** while supporting the blank **103**/container **105** at the central panel **111** and/or the attachment panels **113**, **117** (e.g., so that the central panel **111** is facing upwardly). An initial vacuum can be applied to ducts **227** to draw the film sheet **219** toward the upper die **223**, the upper die **223** can be heated to a suitable temperature to soften the film sheet **219** and/or to activate a heat seal layer. Instead of, or in addition to, the initial vacuum, air pressure under the film sheet **219** can be employed with similar or equal effect. Subsequently, the film sheet **219** can be forced downwardly (e.g., by air pressure applied by the ducts **227** and/or a vacuum applied from below the blank **103**/container **105**). The air pressure can move the film sheet **219** toward the blank **103**/folded blank **103** and the lower die **215** can support the blank **103**/container **105** as the film sheet **219** is applied to portions of one or more of the flange **120**, the compartment flaps **121**, **123**, **129**, **131**, and the end flaps **163**, **167**, **171**, **175** to form the liner L. In one embodiment, the liner L can help retain the container **105** in its tray shape after the liner L is applied to the blank **103**/folded blank **103**/container **105**. In one embodiment, the container **105** can be ejected from the lower die **215** and transported away from the forming tool on a conveyor, for example.

[0043] In one embodiment, the container **105** can be formed from the blank **103** and have the liner L applied thereto at a much higher rate than systems that separately form the container **105** from the blank **103** blank and then place that formed container **105** into the lower die **215**. In one example, the container **105** of the present embodiment can be formed from the blank **103** together with the liner L at a rate of approximately 200 trays per minute. The container **105** could be otherwise formed without departing from the disclosure. For example, the container **105** could be formed from the blank **103** prior to applying the liner L (e.g., prior to engaging the lower die **215**).

[0044] Referring to FIG. **5**, an exterior surface **301** of a blank for forming a tray **305** (FIG. **6**) according to a second exemplary embodiment of the disclosure is generally designated **393**. The blank **303** and tray **305** can have one or more features that are substantially similar to those described above with regard to the blank **103** and tray **105**, and like or similar features are designated with like or similar reference numerals.

[0045] The blank **303** can have generally the same configuration as the blank **103** described above, except that the end flaps foldably attached to the side attachment panels **113**, **117** are respective end flaps **363**, **371**.

[0046] As shown, the end flap **363** can have a base portion **379** foldably connected to the side attachment panel **113** at a lateral fold line **365** (broadly, "second fold line"), with the distal portions **181**, **189** (broadly, "first distal portion" and "second distal portion") foldably connected to the base portion **379** at the respective fold lines **182**, **191**, and with the attachment tab **183** foldably connected to the distal portion **181** at the fold line **185**.

[0047] Similarly, the end flap **371** can have a base portion **393** foldably connected to the side attachment panel **117** at a lateral fold line **373** (broadly, "second fold line"), with the distal portions **195**, **205** (broadly, "first base portion" and "second base portion") foldably connected to the base portion **393** at the respective fold lines **197**, **207**, and with the attachment tab **199** foldably connected to the distal portion **195** at the fold line **201**. In this regard, the distal portions **181**, **189** of the end flap **363** share the common base portion **379**, and the distal portions **195**, **205** of the end flap **371** share the common base portion **393**.

[0048] With additional reference to FIGS. **6** and **7**, the tray **305** can be formed in a manner similar to that described above with regard to the tray **105**, except that the base portions **379**, **393** of the respective end flaps **363**, **373** form the side portions of each of the compartments **309**, **311** such that the base portions **379**, **393** span each of the compartments **309**, **311**, and is provided with similar advantages to those described above with regard to the tray **105**. The aforementioned arrangement of the tray **305** can be at least partially maintained with one or more applications of an adhesive such as glue.

[0049] It will be understood that, in embodiments, a liner such as liner L (FIG. **1**) can be applied to at least the interiors **413**, **415** of the respective compartments **409**, **411**, and can overlie seams/points of intersection between the respective compartment flaps and end flaps. Such application of the liner L to the container **305** can be accomplished in the manner described above with regard to the container **105**, for example.

[0050] In one embodiment, a lid (not shown) can comprise packaging film that is a thin plastic layer used to preserve and protect a food item contained in the trays **105**, **305** and can be removably attached to a flange of the trays **105**, **305**, e.g., defined by a portion of the central panel **111**. Any plastic film, such as polyethylene, polypropylene, polyethylene terephthalate, polyvinylchloride, polyamide, and ethylene vinyl alcohol, or other suitable material, can be used for forming the lid that is sealed against the sealing surface of the flange/central panel **111**. Further, adhesives can be used between the lid and the sealing surface of the flange/central panel without departing from the disclosure. In one embodiment, the sealing surface of the flange comprises an upper surface of the central panel **111** that is generally free from joints, creases, folds, pleats, edges, and other features that can make sealing a lidding film to the flange more difficult (e.g., that can reduce the smoothness of the flange). Accordingly, the upper surface of the central panel **111** in the trays **105**, **305** of the illustrated embodiment can provide a superior sealing surface than a container that has features such as pleats or joints on its upper flange surface.

[0051] Any of the features of the various embodiments of the disclosure can be combined with, replaced by, or otherwise configured with other features of other embodiments of the disclosure without departing from the scope of this disclosure.

[0052] Optionally, one or more portions of the blank or other constructs described herein or contemplated hereby may be coated with varnish, clay, or other materials, either alone or in combination. The coating may then be printed over with product advertising or other information or images. The blanks or other constructs also may be selectively coated and/or printed so that less than the entire surface area of the blank or substantially the entire surface area of the blank may be coated and/or printed.

[0053] Any of the blanks, trays, or other constructs of this disclosure may optionally include one or more features that

alter the effect of microwave energy during the heating or cooking of a food item that is associated with the tray or other construct. For example, the blank, tray, container, or other construct may be formed at least partially from one or more microwave energy interactive elements (hereinafter sometimes referred to as "microwave interactive elements") that promote heating, browning and/or crisping of a particular area of the food item, shield a particular area of the food item from microwave energy to prevent overcooking thereof, or transmit microwave energy towards or away from a particular area of the food item. Each microwave interactive element comprises one or more microwave energy interactive materials or segments arranged in a particular configuration to absorb microwave energy, transmit microwave energy, reflect microwave energy, or direct microwave energy, as needed or desired for a particular construct and food item.

[0054] In the case of a susceptor or shield, the microwave energy interactive material may comprise an electroconductive or semiconductive material, for example, a vacuum deposited metal or metal alloy, or a metallic ink, an organic ink, an inorganic ink, a metallic paste, an organic paste, an inorganic paste, or any combination thereof. Examples of metals and metal alloys that may be suitable include, but are not limited to, aluminum, chromium, copper, inconel alloys (nickel-chromium-molybdenum alloy with niobium), iron, magnesium, nickel, stainless steel, tin, titanium, tungsten, and any combination or alloy thereof.

[0055] Alternatively, the microwave energy interactive material may comprise a metal oxide, for example, oxides of aluminum, iron, and tin, optionally used in conjunction with an electrically conductive material. Another metal oxide that may be suitable is indium tin oxide (ITO). ITO has a more uniform crystal structure and, therefore, is clear at most coating thicknesses.

[0056] Alternatively still, the microwave energy interactive material may comprise a suitable electroconductive, semiconductive, or non-conductive artificial dielectric or ferroelectric. Artificial dielectrics comprise conductive, subdivided material in a polymeric or other suitable matrix or binder, and may include flakes of an electroconductive metal, for example, aluminum.

[0057] In other embodiments, the microwave energy interactive material may be carbon-based, for example, as disclosed in U.S. Pat. Nos. 4,943,456, 5,002,826, 5,118,747, and 5,410,135.

[0058] In still other embodiments, the microwave energy interactive material may interact with the magnetic portion of the electromagnetic energy in the microwave oven. Correctly chosen materials of this type can self-limit based on the loss of interaction when the Curie temperature of the material is reached. An example of such an interactive coating is described in U.S. Pat. No. 4,283,427.

[0059] The use of other microwave energy interactive elements is also contemplated. In one example, the microwave energy interactive element may comprise a foil or high optical density evaporated material having a thickness sufficient to reflect a substantial portion of impinging microwave energy. Such elements typically are formed from a conductive, reflective metal or metal alloy, for example, aluminum, copper, or stainless steel, in the form of a solid "patch" generally having a thickness of from about 0.000285 inches to about 0.005 inches, for example, from about 0.0003 inches to about 0.003 inches. Other such elements may have a thickness of from about 0.00035 inches to about 0.002 inches, for example, 0.0016 inches.

[0060] In some cases, microwave energy reflecting (or reflective) elements may be used as shielding elements where the food item is prone to scorching or drying out during heating. In other cases, smaller microwave energy reflecting elements may be used to diffuse or lessen the intensity of microwave energy. One example of a material utilizing such microwave energy reflecting elements is commercially available from Graphic Packaging International, Inc. (Atlanta, Ga.) under the trade name MicroRite® packaging material. In other examples, a plurality of microwave energy reflecting elements may be arranged to form a microwave energy distributing element to direct microwave energy to specific areas of the food item. If desired, the loops may be of a length that causes microwave energy to resonate, thereby enhancing the distribution effect. Microwave energy distributing elements are described in U.S. Pat. Nos. 6,204,492, 6,433,322, 6,552,315, and 6,677,563, each of which is incorporated by reference in its entirety.

[0061] If desired, any of the numerous microwave energy interactive elements described herein or contemplated hereby may be substantially continuous, that is, without substantial breaks or interruptions, or may be discontinuous, for example, by including one or more breaks or apertures that transmit microwave energy. The breaks or apertures may extend through the entire structure, or only through one or more layers. The number, shape, size, and positioning of such breaks or apertures may vary for a particular application depending on the type of construct being formed, the food item to be heated therein or thereon, the desired degree of heating, browning, and/or crisping, whether direct exposure to microwave energy is needed or desired to attain uniform heating of the food item, the need for regulating the change in temperature of the food item through direct heating, and whether and to what extent there is a need for venting.

[0062] By way of illustration, a microwave energy interactive element may include one or more transparent areas to effect dielectric heating of the food item. However, where the microwave energy interactive element comprises a susceptor, such apertures decrease the total microwave energy interactive area, and therefore, decrease the amount of microwave energy interactive material available for heating, browning, and/or crisping the surface of the food item. Thus, the relative amounts of microwave energy interactive areas and microwave energy transparent areas may be balanced to attain the desired overall heating characteristics for the particular food item.

[0063] As another example, one or more portions of a susceptor may be designed to be microwave energy inactive to ensure that the microwave energy is focused efficiently on the areas to be heated, browned, and/or crisped, rather than being lost to portions of the food item not intended to be browned and/or crisped or to the heating environment. Additionally or alternatively, it may be beneficial to create one or more discontinuities or inactive regions to prevent overheating or charring of the food item and/or the construct including the susceptor.

[0064] As still another example, a susceptor may incorporate one or more "fuse" elements that limit the propagation of cracks in the susceptor, and thereby control overheating, in areas of the susceptor where heat transfer to the food is low and the susceptor might tend to become too hot.

The size and shape of the fuses may be varied as needed. Examples of susceptors including such fuses are provided, for example, in U.S. Pat. Nos. 5,412,187, 5,530,231, U.S. Patent Application Publication No. US 2008/0035634A1, published Feb. 14, 2008, and PCT Application Publication No. WO 2007/127371, published Nov. 8, 2007, each of which is incorporated by reference herein in its entirety.

[0065] All dimensional information presented herein is intended to be illustrative of certain aspects, features, etc., of various embodiments of the disclosure, and is not intended to limit the scope of the disclosure. The dimensions of the blanks, containers, forming tools, features, or any other dimension, can be more or less than what is shown and described in this disclosure without departing from the scope of this disclosure and can be within the listed ranges of dimensions for each feature or outside the listed ranges of dimensions for each feature without departing from the scope of this disclosure.

[0066] The blanks according to the present invention can be, for example, formed from coated paperboard and similar materials. For example, the interior and/or exterior sides of the blanks can be coated with a clay coating. The clay coating may then be printed over with product, advertising, price coding, and other information or images. The blanks may then be coated with a varnish to protect any information printed on the blanks. The blanks may also be coated with, for example, a moisture barrier layer, on either or both sides of the blanks.

[0067] In accordance with the exemplary embodiments, the blanks may be constructed of paperboard of a caliper such that it is heavier and more rigid than ordinary paper. The blanks can also be constructed of other materials, such as cardboard, hard paper, or any other material having properties suitable for enabling the carton package to function at least generally as described above.

[0068] The foregoing description illustrates and describes various embodiments of the present disclosure. As various changes could be made in the above construction without departing from the scope of the disclosure, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. Furthermore, the scope of the present disclosure covers various modifications, combinations, and alterations, etc., of the above-described embodiments. Additionally, the disclosure shows and describes only selected embodiments, but various other combinations, modifications, and environments are contemplated and are within the scope of the inventive concept as expressed herein, commensurate with the above teachings, and/or within the skill or knowledge of the relevant art. Furthermore, certain features and characteristics of each embodiment may be selectively interchanged and applied to other illustrated and non-illustrated embodiments without departing from the scope of the disclosure.

What is claimed is:

1. A tray for holding one or more food products, the tray comprising:

a plurality of panels comprising a central panel;

a plurality of compartment flaps foldably connected to a respective panel of the plurality of panels; and

a plurality of end flaps foldably connected to a respective panel of the plurality of panels,

the plurality of compartment flaps and the plurality of end flaps are overlapped to form a plurality of compartments of the tray.

2. The tray of claim **1**, wherein the plurality of compartment flaps comprises a first compartment flap foldably connected to the central panel and a second compartment flap foldably connected to the central panel.

3. The tray of claim **2**, wherein the plurality of end flaps comprises a first end flap extending away from the central panel and engaging a portion of each of the first compartment flap and the second compartment flap to at least partially form a first compartment of the plurality of compartments of the tray.

4. The tray of claim **3**, wherein the central panel defines a flange for at least partially receiving a liner.

5. The tray of claim **4**, further in combination with the liner, the liner disposed on a portion of the flange, at least one compartment flap of the plurality of compartment flaps, and at least one end flap of the plurality of end flaps.

6. The tray of claim **3**, wherein one of the first compartment flap and the second compartment flap is foldably connected to the central panel at a fold line intersecting a cutout adjacent the first compartment flap and the second compartment flap, the first end flap is foldably connected to a respective panel of the plurality of panels at a second fold line, and the second fold line is spaced apart from the cutout.

7. The tray of claim **3**, wherein the first end flap comprises a base portion extending away from the central panel and a distal portion foldably connected to the base portion.

8. The tray of claim **7**, wherein the distal portion is obliquely arranged relative to the base portion and the distal portion is arranged generally parallel to the central panel.

9. The tray of claim **8**, wherein an attachment tab is foldably connected to one of the first compartment flap and the second compartment flap and positioned in at least partial face-to-face contact with distal portion of the first end flap.

10. The tray of claim **9**, wherein an attachment tab is foldably connected to the distal portion of the first end flap and positioned in at least partial face-to-face contact with the other of the compartment flap and the second compartment flap.

11. The tray of claim **8**, wherein the plurality of end flaps further comprises a second end flap extending away from the central panel and engaging a portion of each of the first compartment flap and the second compartment flap to at least partially form the first compartment.

12. The tray of claim **11**, wherein an interior volume of the first compartment is defined between the first compartment flap, the second compartment flap, the first end flap, and the second end flap.

13. The tray of claim **12**, wherein the plurality of panels further comprises a first attachment panel foldably connected to the central panel and a second attachment panel foldably connected to the central panel, the first end flap is foldably connected to the first attachment panel and the second end flap is foldably connected to the second attachment panel.

14. The tray of claim **13**, wherein each of the first attachment panel and the second attachment panel is in at least partial face-to-face contact with the central panel.

15. The tray of claim **12**, wherein the plurality of compartment flaps further comprises a third compartment flap

foldably connected to the central panel and a fourth compartment flap foldably connected to the central panel.

16. The tray of claim **15**, wherein the plurality of end flaps further comprises a third end flap extending away from the central panel and engaging a portion of each of the third compartment flap and the fourth compartment flap to form a second compartment of the plurality of compartments of the tray.

17. The tray of claim **16**, wherein the third end flap comprises a base portion extending away from the central panel and a distal portion foldably connected to the base portion of the third end flap.

18. The tray of claim **17**, wherein the plurality of end flaps further comprises a fourth end flap extending away from the central panel and engaging a portion of each of the third compartment flap and the fourth compartment flap to at least partially form the second compartment of the plurality of compartments of the tray.

19. The tray of claim **18**, wherein a second interior volume of the second compartment is defined between the third compartment flap, the fourth compartment flap, the third end flap, and fourth second end flap, the second interior volume being different than the first interior volume.

20. The tray of claim **15**, wherein the distal portion of the first end flap is a first distal portion foldably connected to the base portion, and the first end flap further comprises a second distal portion foldably connected to the base portion, the second distal portion of the first end flap engaging a portion of each of the third compartment flap and the fourth compartment flap to at least partially form a second compartment of the plurality of compartments of the tray.

21. The tray of claim **20**, wherein a portion of the second end flap engages a portion of each of the third compartment flap and the fourth compartment flap to at least partially form the second compartment of the plurality of compartments of the tray.

22. A blank for forming a tray for holding one or more food products, the blank comprising:

a plurality of panels comprising a central panel;

a plurality of compartment flaps foldably connected to a respective panel of the plurality of panels; and

a plurality of end flaps foldably connected to a respective panel of the plurality of panels,

the plurality of compartment flaps and the plurality of end flaps are for being overlapped to form a plurality of compartments of the tray formed from the blank.

23. The blank of claim **22**, wherein the plurality of compartment flaps comprises a first compartment flap foldably connected to the central panel and a second compartment flap foldably connected to the central panel.

24. The blank of claim **23**, wherein the plurality of end flaps comprises a first end flap for being positioned extending away from the central panel and engaging a portion of each of the first compartment flap and the second compartment flap to at least partially form a first compartment of the plurality of compartments of the tray formed from the blank.

25. The blank of claim **24**, wherein the central panel defines a flange for at least partially receiving a liner.

26. The blank of claim **25**, further in combination with the liner, the liner disposed on a portion of the flange, at least one compartment flap of the plurality of compartment flaps, and at least one end flap of the plurality of end flaps.

27. The blank of claim **24**, wherein one of the first compartment flap and the second compartment flap is foldably connected to the central panel at a fold line intersecting a cutout adjacent the first compartment flap and the second compartment flap, the first end flap is foldably connected to a respective panel of the plurality of panels at a second fold line, and the second fold line is spaced apart from the cutout.

28. The blank of claim **24**, wherein the first end flap comprises a base portion extending away from the central panel and a distal portion foldably connected to the base portion.

29. The blank of claim **28**, wherein the distal portion is obliquely arranged relative to the base portion and the distal portion is arranged generally parallel to the central panel.

30. The blank of claim **29**, wherein an attachment tab is foldably connected to one of the first compartment flap and the second compartment flap and for being positioned in at least partial face-to-face contact with distal portion of the first end flap when the tray is formed from the blank.

31. The blank of claim **30**, wherein an attachment tab is foldably connected to the distal portion of the first end flap and for being positioned in at least partial face-to-face contact with the other of the compartment flap and the second compartment flap when the tray is formed from the blank.

32. The blank of claim **29**, wherein the plurality of end flaps further comprises a second end flap for being positioned extending away from the central panel and engaging a portion of each of the first compartment flap and the second compartment flap to at least partially form the first compartment when the tray is formed from the blank.

33. The blank of claim **32**, wherein the plurality of panels further comprises a first attachment panel foldably connected to the central panel and a second attachment panel foldably connected to the central panel, the first end flap is foldably connected to the first attachment panel and the second end flap is foldably connected to the second attachment panel.

34. The blank of claim **33**, wherein each of the first attachment panel and the second attachment panel is for being positioned in at least partial face-to-face contact with the central panel when the tray is formed from the blank.

35. The blank of claim **32**, wherein the plurality of compartment flaps further comprises a third compartment flap foldably connected to the central panel and a fourth compartment flap foldably connected to the central panel.

36. The blank of claim **35**, wherein the plurality of end flaps further comprises a third end flap for being positioned extending away from the central panel and engaging a portion of each of the third compartment flap and the fourth compartment flap to form a second compartment of the plurality of compartments of the tray formed from the blank.

37. The blank of claim **36**, wherein the third end flap comprises a base portion and a distal portion foldably connected to the base portion of the third end flap.

38. The blank of claim **37**, wherein the plurality of end flaps further comprises a fourth end flap for being positioned extending away from the central panel and engaging a portion of each of the third compartment flap and the fourth compartment flap to at least partially form the second compartment of the plurality of compartments of the tray formed from the blank.

39. The blank of claim **35**, wherein the distal portion of the first end flap is a first distal portion foldably connected to the base portion, and the first end flap further comprises a second distal portion foldably connected to the base

portion, the second distal portion of the first end flap for being positioned engaging a portion of each of the third compartment flap and the fourth compartment flap to at least partially form a second compartment of the plurality of compartments of the tray formed from the blank.

40. The blank of claim **39**, wherein a portion of the second end flap is for being positioned to engage a portion of each of the third compartment flap and the fourth compartment flap to at least partially form the second compartment of the plurality of compartments of the tray formed from the blank.

41. A method of forming a tray for holding one or more food products, the method comprising:

obtaining a blank comprising a plurality of panels comprising a central panel, a plurality of compartment flaps foldably connected to a respective panel of the plurality of panels, and a plurality of end flaps foldably connected to a respective panel of the plurality of panels; and

overlapping the plurality of compartment flaps and the plurality of end flaps to form a plurality of compartments of the tray.

42. The method of claim **41**, wherein the plurality of compartment flaps comprises a first compartment flap foldably connected to the central panel and a second compartment flap foldably connected to the central panel.

43. The method of claim **42**, wherein the plurality of end flaps comprises a first end flap and the method comprises positioning the first end flap extending away from the central panel and engaging a portion of each of the first compartment flap and the second compartment flap to at least partially form a first compartment of the plurality of compartments of the tray.

44. The method of claim **43**, wherein the central panel defines a flange for at least partially receiving a liner.

45. The method of claim **44**, further comprising disposing a liner on a portion of the flange, at least one compartment flap of the plurality of compartment flaps, and at least one end flap of the plurality of end flaps.

46. The method of claim **43**, wherein one of the first compartment flap and the second compartment flap is foldably connected to the central panel at a fold line intersecting a cutout adjacent the first compartment flap and the second compartment flap, the first end flap is foldably connected to a respective panel of the plurality of panels at a second fold line, and the second fold line is spaced apart from the cutout.

47. The method of claim **43**, wherein the first end flap comprises a base portion extending away from the central panel and a distal portion foldably connected to the base portion.

48. The method of claim **47**, wherein the method comprises obliquely arranging the distal portion relative to the base portion and arranging the distal portion generally parallel to the central panel.

49. The method of claim **48**, wherein an attachment tab is foldably connected to one of the first compartment flap and the second compartment flap and the method comprises positioning the attachment tab in at least partial face-to-face contact with distal portion of the first end flap.

50. The method of claim **49**, wherein an attachment tab is foldably connected to the distal portion of the first end flap and the method comprises positioning the attachment tab in at least partial face-to-face contact with the other of the compartment flap and the second compartment flap.

51. The method of claim **48**, wherein the plurality of end flaps further comprises a second end flap and the method comprises positioning the second end flap extending away from the central panel and engaging a portion of each of the first compartment flap and the second compartment flap to at least partially form the first compartment.

52. The method of claim **51**, wherein an interior volume of the first compartment is defined between the first compartment flap, the second compartment flap, the first end flap, and the second end flap.

53. The method of claim **52**, wherein the plurality of panels further comprises a first attachment panel foldably connected to the central panel and a second attachment panel foldably connected to the central panel, the first end flap is foldably connected to the first attachment panel and the second end flap is foldably connected to the second attachment panel.

54. The method of claim **53**, wherein the method comprises positioning each of the first attachment panel and the second attachment panel in at least partial face-to-face contact with the central panel.

55. The method of claim **52**, wherein the plurality of compartment flaps further comprises a third compartment flap foldably connected to the central panel and a fourth compartment flap foldably connected to the central panel.

56. The method of claim **55**, wherein the plurality of end flaps further comprises a third end flap and the method comprises positioning the third end flap extending away from the central panel and engaging a portion of each of the third compartment flap and the fourth compartment flap to form a second compartment of the plurality of compartments of the tray.

57. The method of claim **56**, wherein the third end flap comprises a base portion extending away from the central panel and a distal portion foldably connected to the base portion of the third end flap.

58. The method of claim **57**, wherein the plurality of end flaps further comprises a fourth end flap and the method comprises positioning the fourth end flap extending away from the central panel and engaging a portion of each of the third compartment flap and the fourth compartment flap to at least partially form the second compartment of the plurality of compartments of the tray.

59. The method of claim **58**, wherein a second interior volume of the second compartment is defined between the third compartment flap, the fourth compartment flap, the third end flap, and fourth second end flap, the second interior volume being different than the first interior volume.

60. The method of claim **55**, wherein the distal portion of the first end flap is a first distal portion foldably connected to the base portion, and the first end flap further comprises a second distal portion foldably connected to the base portion, the method comprising positioning the second distal portion of the first end flap engaging a portion of each of the third compartment flap and the fourth compartment flap to at least partially form a second compartment of the plurality of compartments of the tray.

61. The method of claim **60**, wherein the method comprises positioning a portion of the second end flap engaging a portion of each of the third compartment flap and the fourth compartment flap to at least partially form the second compartment of the plurality of compartments of the tray.

* * * * *