(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
16 August 2018 (16.08.2018)

WIPO | PCT

(10) International Publication Number
WO 2018/148562 A1

(51) International Patent Classification:
B65D 81/34 (2006.01) *B65D 75/38* (2006.01)
A47J 27/00 (2006.01) *B65D 77/00* (2006.01)
A47J 36/02 (2006.01) *B65D 77/22* (2006.01)

(21) International Application Number:
PCT/US2018/017646

(22) International Filing Date:
09 February 2018 (09.02.2018)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
201711004868 10 February 2017 (10.02.2017) IN

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,

(54) Title: FOOD PACKAGING TRAY

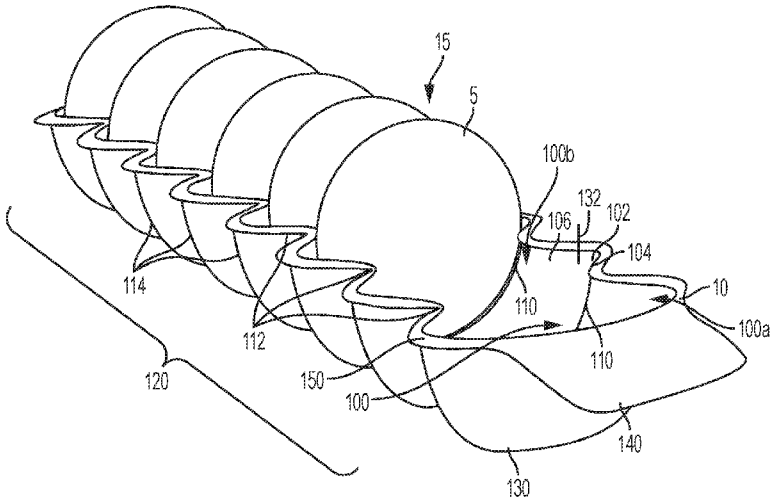

FIG. 1

(57) Abstract: Provided herein are methods and systems related to food packaging. A food packaging tray may include a support layer shaped to form a plurality of interconnected compartments. Each compartment may include a plurality of different surfaces configured to contact different surfaces of a food product when placed within each compartment. The tray also may include an energy absorptive layer having a different material than the support layer. The energy absorptive layer may be coupled to a portion of the support layer forming the interior of one or more of the plurality of interconnected compartments. The energy absorptive layer may transfer heat directly to the exterior of the food product. Each compartment may be separated from an adjacent compartment by at least a portion of the energy absorptive layer such that adjacent surfaces of adjacent food products receive heat transferred from the energy absorptive layer.

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HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

FOOD PACKAGING TRAY

CROSS-REFERENCE TO RELATED APPLICATION(S)

[001] This application claims priority to Indian Application No. 201711004868, filed February 10, 2017, which is incorporated herein by reference, in its entirety, for any purpose.

BACKGROUND

[002] Unless otherwise indicated herein, the materials described in this section are not prior art to the claims in this application and are not admitted to be prior art by inclusion in this section.

[003] Foods with different consistencies such as cookies with soft fillings like butter, jelly, or jam may be a common snack food. Traditionally, packaged forms of these foods may be eaten in an unbaked form being straight from the package. Heating the foods may be a preferable way to consume them as it provides a fresh aroma and improved texture. Traditional heating methods may be insufficient to satisfactorily heat a plurality of food products.

SUMMARY

[004] Techniques are generally described that include methods and systems related to food packaging trays. An example food packaging tray may include a support layer shaped to form a plurality of interconnected compartments. A compartment of the plurality may include at least one surface configured to contact a corresponding surface of a food product placed within the compartment. The example food packaging tray may also include an energy absorptive layer having a different material than the support layer. The energy absorptive layer may be coupled to a portion of the support layer so as to form the interior of one or more of the plurality of interconnected compartments. The energy absorptive layer may be configured to transfer heat directly to the exterior surfaces of the food product. The compartment may be separated from another compartment by at least a portion of the energy absorptive layer such that adjacent surfaces of food products placed

in the compartment and in the another compartment receive heat transferred from the energy absorptive layer.

[005] In various examples of the food packaging tray, the energy absorptive layer may include a susceptor layer. The susceptor layer may include a metalized layer on the support layer. The plurality of interconnected compartments may be coupled to form a longitudinal row of interconnected compartments. The row of interconnected compartments may form a bellows shape. The row of interconnected compartments may be longitudinally expandable from a collapsed state. At least a portion of a wall of the row of interconnected compartments may be weakened section at a minor diameter between consecutive interconnected compartments to allow the row of interconnected compartments to expand in response to the row of interconnected compartments being pulled in a longitudinal direction. A connection member may extend around the periphery of the row of interconnected compartments such that the row of interconnected compartments is operable to receive a cap. The connection member may include a first rim that protrudes outwardly from the top of the row of interconnected compartments. The connection member may include a heat sealable surface free of the susceptor layer. The row of interconnected compartments may include a first row of interconnected compartments. The rim may include a first rim. The cap may include a second row of interconnected compartments having a second rim suitable to seal against the first rim to form a heatable food pack having a row of interconnected compartments to store and heat the food product. Separation tabs may include a susceptor layer with the separation tabs positioned between at least two of the interconnected compartments such that heat is transferred to the food product by the separation tabs where the at least two inter connected compartments are coupled.

[006] Techniques are generally described that include methods and systems related to a heatable food pack to heat in a microwave oven. An example heatable food pack may include a plurality of food products. The heatable food pack may also include a tray having a plurality of interconnected tray compartments. One of the plurality of food products may be received within a respective one of the interconnected compartments. A compartment of the plurality of tray compartments may have at least one surface

configured to contact one or more surfaces of one of the food products. The at least one surface of the compartment may be at least partially covered with an energy absorptive layer configured to transfer heat directly to the one or more surfaces of the one of the plurality of food products. The compartment may be separated from another compartment of the plurality of tray compartments by at least a portion of the energy absorptive layer such that oppositely faced surfaces of food products received within the compartment and in the another compartment are exposed to heat transferred from the energy absorptive layer. The heatable food pack may also include a cap having a plurality of interconnected cap compartments and configured to attach to the tray. The interconnected cap compartments and the interconnected tray compartments may together form a plurality of interconnected closed compartments.

[007] In various examples of the heatable food pack, at least some of the plurality of food products may include an outer crust and an inner filling. The energy absorptive layer may include a susceptor layer having an optical density that causes the outer crust to crisp concurrently with the inner soft filling being heated. The susceptor layer may include a metalized layer on the support layer. The metalized layer may be in direct contact with a portion of the outer crust. The plurality of interconnected closed compartments may be coupled together to store the plurality of food products in a longitudinal row of interconnected closed compartments. The longitudinal row of interconnected closed compartments may form a bellows shape that is longitudinally expandable from a collapsed state to an expanded state. The contact between the at least one surface of the compartment, which is included in the longitudinal row of interconnected closed compartments, and the one or more surfaces of the plurality of food products may be higher in the collapsed state than in the expanded state. The plurality of food products may be more easily removed from the tray in the expanded state than in the collapsed state. At least a portion of an outer wall of the row of interconnected closed compartments may be weakened section at a minor diameter between at least some of the interconnected closed compartments so as to allow the row of interconnected closed compartments to expand in response to the row of interconnected closed compartments being pulled in the longitudinal direction. As the row of interconnected closed compartments is expanded, portions of the

energy absorptive layer may be separated from portions of the plurality of food products where those portions of the energy absorptive layer and those portions of the plurality of food products contact one another. The cap and the tray may be separable from one another along at a connection member such that the plurality of food products received within the interconnected tray compartments are accessible. The heatable food pack may include one or more separation tabs that are separable from the plurality of tray compartments and include at least a susceptor layer that contacts portions of the one or more surfaces of the one of the plurality of food products at least one location that is not contacted by the at least one surface of the compartment of the plurality of tray compartments.

[008] Techniques are generally described that include methods related to food packaging. An example method may include inserting a food product into a tray compartment of a tray having a plurality of interconnected tray compartments such that different sides of the food product contact a susceptor layer of side walls of the tray compartment. The method may also include covering the tray with a cap having a plurality of interconnected cap compartments, such that a cap compartment of the cap corresponds to the tray compartment to confine the food product therein and other different sides of the food product contact a susceptor layer of the cap compartment. Interconnected tray compartments of the tray and the interconnected cap compartments of the cap may be separated from next closest compartments by at least a portion of the susceptor layer such that adjacent surfaces of consecutive food products receive heat transferred from the at least the portion of the susceptor layer.

[009] In various examples of the methods related to food packaging, the method may include sealing the cap to the tray along respective rims that extend from the sides of the cap and the tray. The sealing may be done by heating the respective rims and applying pressure thereto. The method may also include providing an expander between at least some of the different tray compartments in the plurality of interconnected compartments. The expander may include a weakened section defined by each of respective rims between each of the respective interconnected compartments that allow the cap and tray to expand in response to a longitudinal force being applied to the interconnected compartments. The

inserting may include placing the food product in multiple tray compartments in the plurality of interconnected tray compartments.

[010] In another example, a method related to food preparation may include heating a food product packaged within a packaging article having a tray with a plurality of interconnected compartments, including heating a susceptor layer that at least partially lines the plurality of interconnected compartments in the tray and heating a susceptor layer that at least partially lines a plurality of interconnected compartments in a cap coupled to the tray. The heating of the food product may last for a duration sufficient to at least soften a center of the food product while the susceptor layer of the tray and the susceptor layer of the cap crisps an outer surface of the food product that is in contact with walls of the interconnected compartments that are at least partially lined with the susceptor layers. The method may also include, at least partially reducing the heating of the food product after a duration sufficient to at least soften a center of the food product while the susceptor layer of the tray and the susceptor layer of the cap crisps the outer surface of the food product.

[010] The method may further include expanding an expander between at least some of different tray compartments in the plurality of interconnected compartments in the tray. The expanding may comprise applying a longitudinal force to the packaging article causing the packaging article to expand longitudinally and to at least partially separate the susceptor layer from the food product. The applying the longitudinal force to the packaging article expands a slit formed at a weakened section located on respective rims of the tray and cap and between the respective interconnected compartments. The method may further include removing the cap to expose the food product for consumption.

[011] The foregoing summary is illustrative only and is not intended to be in any way limiting. In addition to the illustrative aspects, embodiments, and features described above, further aspects, embodiments, and features will become apparent by reference to the drawings and the following detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[012] The foregoing and other features of the present disclosure will become more fully apparent from the following description and appended claims, taken in conjunction with

the accompanying drawings. Understanding that these drawings depict only several examples in accordance with the disclosure and are, therefore, not to be considered limiting of its scope, the disclosure will be described with additional specificity and detail through use of the accompanying drawings, in which:

[013] FIG. 1 is a perspective view of a heatable food pack with a food product;

[014] FIG. 2 is a perspective assembly view of a heatable food pack with a food product;

[015] FIG. 3 is a top view of a heatable food pack product with the cap removed;

[016] FIG. 4A is a detail view of a tray rim in a collapsed state taken along section IV-IV of FIG. 3;

[017] FIG. 4B is another view of the tray rim of FIG. 4A in an expanded state;

[018] FIG. 5 is a cross sectional side view taken along section V-V of FIG. 3 with the cap included;

[019] FIG. 6 illustrates a packaging method; and

[020] FIG. 7 illustrates a food preparation method,

[021] all arranged or disclosed in accordance with at least some embodiments of the present disclosure.

DETAILED DESCRIPTION

[022] In the following detailed description, reference is made to the accompanying drawings, which form a part hereof. In the drawings, similar symbols typically identify similar components, unless context dictates otherwise. The illustrative examples described in the detailed description, drawings, and claims are not meant to be limiting. Other examples may be utilized, and other changes may be made, without departing from the spirit or scope of the subject matter presented herein. The aspects of the present disclosure, as generally described herein, and illustrated in the Figures, can be arranged, substituted, combined, separated, and designed in a wide variety of different configurations, all of which are implicitly contemplated herein.

[023] This disclosure is drawn, inter alia, to methods, systems, products, devices, and/or apparatus generally related to food packaging trays and/or heatable food products. An example food packaging tray may include a support layer shaped to form a plurality of

interconnected compartments. Each compartment may have a plurality of different surfaces configured to contact different surfaces of a food product when placed within each compartment. In a heatable food product, separate food products may occupy one or more of the interconnected compartments. The example food packaging tray may also include an energy absorptive layer having a different material than the support layer. The energy absorptive layer may be coupled to a portion of the support layer forming the interior of one or more of the plurality of interconnected compartments. The energy absorptive layer may be configured to transfer heat directly to the exterior of the food product. Each compartment may be separated from an adjacent compartment by at least a portion of the energy absorptive layer such that adjacent surfaces of adjacent food products receive heat transferred from the energy absorptive layer.

[024] FIG. 1 is a perspective view of a heatable food pack with a food product, arranged in accordance with at least some embodiments described herein. FIG. 1 illustrates a perspective view of a heatable food pack 15 having a food packaging tray 10 with a food product 5. FIG. 1 shows the food packaging tray 10 having a variety of features including one or more interconnected compartments 100 (e.g., adjacent compartments 100a and 100b), a first surface 102 within the compartment 100, a second surface 104 within the compartment 100, a third surface 106 within the compartment 100, a separator 110 between compartments 100, a minor diameter 112 between compartments 100, a major diameter 114 between compartments 100, a support layer 130, an energy absorptive layer 132, a holder tab 140, and a connection member 150. As shown the interconnected compartments 100 form a row of compartments 120. The various components and features described in FIG. 1 are merely examples, and other variations, including eliminating components, combining components, adding components, modifying components, and substituting components are all contemplated.

[025] In accordance with various embodiments, the food packaging tray 10 may have one or more interconnected compartments 100. As shown in FIG. 1, most of the compartments 100 may be occupied by food product 5. However, adjacent compartments 100a and 100b are illustrated as empty. Each of the compartments 100 may be shaped and sized such that they closely fit a size and shape of the food product 5. The food packaging tray 10 can be

adapted to many different types of food products. As such, the compartments 100 can have many different types of sizes and shapes. In some embodiments, each of the compartments 100 may have a similar size and shape compared to the other compartments. Such an embodiment may be useful in situations in which all of the food products 5 are the same type, size, or shape of food product. In another embodiment, one or more of the compartments 100 may be significantly different in size and/or shape compared to the other compartments. Such an embodiment may be useful in situations in which some of the food products 5 are different in type, size, or shape than the other food products. The compartments 100 may also be organized with respect to one another in multiple different ways. For example, as shown in FIG. 1, the plurality of compartments may be organized linearly forming a row 120 of compartments 100. In other embodiments, there may be multiple rows, a staggered formation, a stacked formation, or other orientations or formations of compartments 100 formed with respect to one another.

[026] The separate compartments (e.g., 100a and 100b) may be defined from one another by a separator 110 positioned between respective adjacent compartments (e.g., 100a and 100b). The separator 110 may be a wall, protrusion, insert, or other feature that separates the containment space of one compartment (e.g., 100a) from the containment space of another compartment (e.g., 100a). In some embodiments, the separator 110 may be integrally formed as part of the support layer 130. In accordance with various embodiments, the separator 110 may be configured to contact adjacent sides of the food products 5 between adjacent food products. In one example, the food packaging tray 10 may be defined by the support layer 130. The support layer 130 may form an outer wall. The outer wall may have a minor diameter 112 between compartments 100 and a major diameter 114 defining the compartments 100. The walls forming the minor diameter 112 between the compartments 100 may define the separator 110, may provide the structure itself that forms the separator 110, may provide the base for the separator 110, may be coupled to the separator 110, or may otherwise operate in conjunction with the separator 110. Portions of the interior surfaces of the minor diameter 112 may be configured to contact the adjacent sides of the separate food products 5. In one example, the first surface 102 within the compartment 100 may define a portion of the wall of compartment 100

having the largest diameter or the portion of the wall configured to contact the outer most portion of the food product. The second surface 104 within the compartment 100 may define a portion of the wall of the compartment 100 that extends between the first surface 102 and the smallest diameter portion of the wall defining part of the separator 110. The third surface 106 within the compartment 100 may define a portion of the wall of the compartment 100 that extends between the first surface 102 and the smallest diameter portion of the wall defining part of another separator 110. In this way, the surfaces 102, 104, and 106 may define a compartment 100, with surfaces 104 and 106 configured to contact opposite surfaces of the food product 5. In some embodiments, the surfaces 102, 104, and 106 may comprise distinct and/or separated surfaces. In other embodiments, the surfaces 102, 104, and 106 can comprise a single contiguous surface, albeit non-planar. Thus, the surfaces 102, 104, and 106 may comprise at least one surface in several embodiments. The separator 110 may separate one compartment from the next and the surfaces 102, 104, and 106 may be repeated defining the next compartment 100 to position and contact a next food product 5.

[027] In accordance with some embodiments, each of the plurality of compartments 100 may be entirely separated from one another by walls. In other embodiments, there may be an opening between adjacent compartments, such as the opening shown between adjacent compartments 100a and 100b shown in FIG. 1. Even with an opening between adjacent compartments, the configuration of each compartment 100 may still provide significant contact between one or more of the surfaces 102, 104, and 106 and one or more surfaces of the food products 5 (e.g., front, back and side surfaces of the food products). In other embodiments, the openings between compartments 100 may be omitted or otherwise reduced in size.

[028] In accordance with various embodiments, the food packaging tray 10 may be formed from a plurality of different materials. The plurality of different materials may be structured in layers. In this way, the food packaging tray 10 may have a first layer of material overlaid with a second layer of material. For example, the first layer may be the support layer 130. The support layer 130 may have a semi rigid structure suitable to maintain its shape and/or structural integrity or rigidity when empty, partially loaded, and

fully loaded with food products 5. The support layer 130 may be sufficient rigid to support the food products 5 contained therein when lifted from one end of the food packaging tray 10, such as when being lifted by the holder tab 140. The support layer 130 can be formed from a food grade material. Further, the food grade material may be microwavable and suitable to adhere to a second layer of material. In one example, the support layer 130 may be formed from a polyethylene terephthalate layer of material. Other material, such as paper, cardboard, or other microwave-safe material may also be used.

[029] The second layer may be different than the first layer. For example, the second layer may comprise the energy absorptive layer 132. The energy absorptive layer 132 may be configured to absorb microwave energy and then heat the food product with the energy. In one example the energy absorptive layer 132 may be a susceptor layer. The susceptor layer may be any layer of material suitable to absorb electromagnetic energy and convert it to heat to be transferred to the outer shell of food product 5. For example, the energy absorptive layer 132 may be a metallized film of Aluminum (10-100 nm) bonded to the support layer 130 (e.g., or any substrate like paper, card or polymer film.) The energy absorptive layer 132 may be flexible, thereby allowing it to adapt to most shapes including ones formed by rigid or flexible substrates that provide the surfaces 102, 104, and 106 described above. The flexibility of the energy absorptive layer 132 allows it to make intimate contact with a greater amount of the outer surface of the food product 5. The intimate contact may be physical contact (e.g., touching between the energy absorptive layer 132 and the outer surface of the food product 5) that more effectively transfers heat to the food product 5. Thus, having multiple compartments 100, each lined with the energy absorptive layer 132, may allow for greater intimate contact with (and thereby improved efficiency and effectiveness in the heating of) more food products 5 positioned within the compartments 100.

[030] The energy absorptive layer 132 may be applied to the support layer 130 in any manner suitable to allow heating of the food product 5 via the energy absorptive layer 132. In one example, the energy absorptive layer 132 may comprise a metalized susceptor layer deposited on the support layer 130. In various embodiments of the deposited metalized susceptor layer, the susceptor layer may have depositions that vary in thickness allowing

some portions of the susceptor layer to absorb and transfer more energy to the outer shell (e.g., outer surface or outermost crust) of the food product 5. In other embodiments, the susceptor layer can be applied to the support layer 130 as a uniform deposition. In another example, the energy absorptive layer 132 may comprise a susceptor film laminated onto the support layer 130. In various embodiments of a laminated susceptor film, the susceptor layer may be laminated in patches of the susceptor film onto the support layer 130. Accordingly, by varying the deposition or lamination of the energy absorptive layer 132, the heating of the outermost crust of food product 5 can be significantly varied to achieve a target result. For example, some zones of the food product 5 can be crispier due to higher density or the mere presence of the susceptor layer. In other embodiments, the optical density of the energy absorptive layer 132 can be controlled to provide greater or lesser crisping to the food product 5 over the product's entirety or to targeted areas.

[031] The support layer 130 and the energy absorptive layer 132 may be coextensive or the energy absorptive layer 132 may cover merely a portion of the support layer 130. In accordance with various embodiments, the absorptive layer 132 may overlay the support layer 130 in at least interior regions configured to contact at least a portion of the food product 5. The susceptor layer may include a film of susceptor material positioned within the first layer at locations where it is desirable to crisp a crust on the outer shell of the food product 5.

[032] FIG. 2 is a perspective assembly view of a heatable food pack with a food product, arranged in accordance with at least some embodiments described herein. Specifically, FIG. 2 illustrates a perspective exploded view of a heatable food pack 25 with the food product 5. In accordance with various embodiments, the heatable food pack 25 may include both the food packaging tray 10 and a food packaging cap 20. FIG. 2 shows the heatable food pack 25 with the food packaging tray 10 in conjunction with the food packaging cap 20. The food packaging cap 20 may have a variety of features including one or more interconnected compartments 200 (e.g., adjacent compartments 200a and 200b), a separator 210 between compartments 200, a minor diameter 212 between compartments 200, a major diameter 214 forming part of the compartments 200, a cap support layer 230, cap a holder tab 240, and a connection member 250. As shown, the interconnected

compartments 200 may form a row 220 of compartments 100. The various components described in FIG. 2 are merely examples, and other variations, including eliminating components, combining components, adding components, modifying components, and substituting components are all contemplated.

[033] In accordance with various embodiments, the food packaging cap 20 may have one or more interconnected compartments 200. Each of the compartments 200 may be shaped and sized such that they closely fit the size and shape of the food product 5. The food packaging cap 20 can be adapted to many different types of food products. As such, the compartments 200 can have many different types of sizes and shapes. In some embodiments, each of the compartments 200 may have a similar size and shape compared to the other compartments. Such an embodiment may be useful in situations in which all of the food products 5 are the same type, size, or shape of food product. In another embodiment, one or more of the compartments 200 may be significantly different in size and/or shape compared to the other compartments. Such an embodiment may be useful in situation in which some of the food products 5 are different in type, size, or shape than the other food products. The compartments 200 may also be organized with respect to one another in multiple different ways. For example, as shown in FIG. 2, the plurality of compartments 200 may be organized linearly forming the row 220 of compartments 200. In other embodiments, there may be multiple rows, a staggered formation, a stacked formation, or other orientations or formations of compartments 200 formed with respect to one another.

[034] The separate compartments (e.g., 200a and 200b) may be defined from one another by the separator 210 positioned between respective adjacent compartments (e.g., 200a and 100b). The separator 210 may be a wall, protrusion, or other feature that separates the containment space of one compartment (e.g., 200a) from the containment space of another compartment (e.g., 200a). In some embodiments, the separator 210 may be integrally formed as part of the cap support layer 230. In accordance with various embodiments, the separator 210 may be configured to contact adjacent sides of the food products 5 between adjacent food products. In one example, the food packaging cap 20 may be defined by the cap support layer 230. The cap support layer 230 may form an outer wall. The outer wall

may have a minor diameter 212 between compartments 200 and a major diameter 214 defining the compartments 200. The walls forming the minor diameter 212 between the compartments 200 may define the separator 210, may provide the structure itself that forms the separator 210, may provide the base for the separator 210, may be coupled to the separator 120, or may otherwise operate in conjunction with the separator 210. Portions of the interior surfaces of the minor diameter 212 may be configured to contact the adjacent sides of the separate food products 5.

[035] In accordance with various embodiments, the food packaging cap 20 may include a plurality of different materials. The plurality of different materials may be structured in layers. In this way, the food packaging cap 20 may have a first layer of material overlaid with a second layer of material. This structure may be similar to those discussed above with regards to the food packaging tray 10. Like the food packaging tray 10, the food packaging cap 20 may have a second layer that is different than a first layer. For example, the second layer may comprise an energy absorptive layer 232 (not visible from the perspective of FIG. 2 but shown in the cross section of FIG. 5). The aspects of the energy absorptive layer 232 may be similar to those same aspects discussed above with regard to the energy absorptive layer 132 for the food packaging tray 10 of the heatable food pack 15.

[036] In accordance with various embodiments, the food packaging tray 10 may include the connection member 150. The connection member 150 may include structures configured to couple to a corresponding connection member on a cap, cover, or the like. As illustrated in FIG. 2, the food packaging cap 20 may include the connection member 250. The connection member 250 may include structures configured to couple to a corresponding connection member on a tray, base, or the like. The connection member 150 and the connection member 250 may be configured to couple with one another. In one example, the connection member 150 may be a flat shelf extending from the body of the food packaging tray 10. The connection member 250 on the food packaging cap 20 may also be a flat shelf extending from the body of the food packaging cap 20. The flat shelves may have the same or similar shape such that the shelves are configured to mate with one another. The shelves may also be coextensive with one another. The shelves may comprise

a horizontal extension of material that may be 3-5 mm in width. The shelves may extend around the entire or a portion of the periphery of the food packaging tray 10 and the food packaging 20. Once mated together the connecting members 150, 250 may be sealed. The seal allows for food grade packaging compliance to, for example, limit moisture ingress. In one example, the seal may be formed by an adhesive, such as a food grade safe adhesive or an adhesive generally used in food based packaging. In another example, the seal may be formed by a weld, heat seal, ultrasonic welding, or other process for attaching two discrete plastic structures to one another. For example, in heat based adhesion, the heat applied to the connection members 150, 250 may bond them together. In other embodiments, the connection members 150 and 250 may have a configuration other than that of a flat shelf. The connection members 150 and 250 may have opposing interlocking features (such as clips, protrusions and depressions, adhesive strips, Velcro, etc.), such that when they are pressed together, the connection members 150 and 250 may mechanically interlock with one another. In a more specific example, the interlocking features are food grade for safe use with food products.

[037] In accordance with various embodiments, the food packaging tray 10 may include the holder tab 140. The holder tab 140 may include a structure suitable for a user to grasp and apply pressure to the holder tab 140 such that the food packaging tray 10 can be supported. In addition or as an alternative, the holder tab 140 may be suitable to receive a pressure from a user such that the food packaging tray 10 is separated from the food packaging cap 20. Similarly and in accordance with various embodiments, the food packaging cap 20 may include a holder tab 240. The holder tab 240 may include a structure suitable for a user to grasp and apply pressure to the holder tab 240 such that the food packaging tray 10 is separated from the food packaging cap 20 by separating holder tab 240 from holder tab 140. Part of the holder tabs 140 and 240 may also form a part of the connection members 150 and 250. The holder tabs 140 and 240 may also be configured to couple to a second set of holder tabs 140 and 240 on another set of food packaging trays and food packaging caps. In this way, a single package can be configured as a double pack allowing for a single structure having two food packaging caps and two food packaging trays providing twice the storage. The separate tabs may be contiguous

having a perforation for separation or the separate tabs may be coupled together in ways discussed above of coupling the connection members together.

[038] In accordance with various embodiments, the food packaging tray 10 and the food packaging cap 20 may be identical. In such embodiments, the food packaging tray 10 and/or the food packaging cap 20 may be designed such that a single structure is suitable to be used as either or both the food packaging tray 10 and the food packaging cap 20. In this way, the food packaging tray 10 and the food packaging cap 20 may be produced using the same manufacturing and tooling processes. Simplification of processes may also allow for cost reduction due to simplification of production and assembly.

[039] In accordance with various embodiments, the food packaging tray 10 and the food packaging cap 20 may be substantially identical but not necessarily completely identical. In such an embodiment, one or both the structures (e.g., food packaging tray 10 and food packaging cap 20) can be modified during the manufacturing process by using tooling inserts or fixtures in addition to utilization of the base tooling, which remains common for both the cap and the tray. This significant overlap in the base tooling and general shape helps achieve changes in shape but still keeps the cost of production low.

[040] In accordance with various embodiments, the food packaging tray 10 and the food packaging cap 20 may have complementary shapes. In such an embodiment, the food packaging tray 10 and the food packaging cap 20 may have significantly different shapes but still being suitable to mate with one another and adequately cover and transfer heat to the food product 5 for crisping the outer shell. Such an embodiment may be usable for non-symmetric food products or in instances where the energy absorptive layer 132 or 232 is present merely on the food packaging tray 10 or the food packaging cap 20. Allowing for differences in the tray and the cap may allow for greater flexibility in adequately packaging a broader range of food products and may offer more aesthetic flexibility in packaging.

[041] FIG. 3 is a top view of a heatable food pack product with the cap removed, so as to show a food product in each of the compartments, arranged in accordance with at least some embodiments described herein. Specifically, FIG. 3 shows a top view of the components discussed above, namely, the plurality of interconnected compartments 100

including the first compartment 100a and the second compartment 100b, the surfaces 102/104/106, the separators 110, the minor diameter 112, the major diameter 114, the support layer 130, the energy absorptive layer 132 (shown as the cross hatch), the holder tab 140, the connection member 150, and the food product 5. The energy absorptive layer 132 is shown as the cross-hatching, with the support layer 130 shown without cross-hatching. The various components described in FIG. 3 are merely examples, and other variations, including eliminating components, combining components, adding components, modifying components, and substituting components are all contemplated. FIG. 3 also illustrates the section IV-IV from which FIG. 4A is taken.

[042] FIG. 4A is a detail view of a tray rim in a collapsed state taken along section IV-IV of FIG. 3, arranged in accordance with at least some embodiments described herein. FIG. 4B is another view of the tray rim of FIG. 4A in an expanded state, arranged in accordance with at least some embodiments described herein. FIG. 4A shows a top view of the components discussed above, namely the minor diameter 112, the major diameter 114, and the connection member 150. FIG. 4A also shows an expansion joint 122 in a collapsed state 122a. FIG. 4B is a detail view of the tray rim in an expanded state taken along section IV-IV of FIG. 3, arranged in accordance with at least some embodiments described herein. FIG. 4B shows a top view of the components discussed above, namely the minor diameter 112, the major diameter 114, and the connection member 150. FIG. 4B also shows expansion joint 122 in an expanded state 122b. The various components described in FIGS. 4A and 4B are merely examples, and other variations, including eliminating components, combining components, adding components, modifying components, and substituting components are all contemplated.

[043] In accordance with various embodiments, the food packaging tray 10 or the combination of the food packaging tray 10 and the food packaging cap 20 may be expandable and collapsible in a longitudinal direction. For example, as shown in FIG. 4B, the structure may be expandable in response to a force F being applied in the longitudinal direction shown by the arrows associated with force F in FIG. 4B. The expandable and collapsible configuration may be provided by one or more of the food packaging tray 10 or food packaging cap 20, including an accordion shape that is suitable to allow for

elongation and contraction. Such a shape is shown by way of example in FIGS. 1-5. In each of these examples, the food packaging tray 10 includes minor diameters 112 and major diameters 114 alternating and forming an accordion shape. The stress concentrations (caused by the force F at the minor and major diameters 112 and 114, respectively) cause the angles between the opposing walls at these locations to increase via, for example, direction tearing along the weakened section, thereby allowing the entire structure to lengthen.

[044] In the alternative or in addition to the accordion shape, the food packaging tray 10 and/or food packaging cap 20 may include expansion joints 122. The expansion joints 122 may be a weakened section that allows a predicable slit to be formed. The weakened section may include perforations, nicks, cuts, slits, notches, or other configuration in the outer structure of the food packaging tray 10 or food packaging cap 20. For example, the expansion joints 122 may be located on the connection members 150 and 250. In one embodiment, the expansion joints 122 may be located in the minor diameter 112 of the connection members 150 and 250. In the collapsed state (shown by way of example in FIG. 4A), the expansion joints 122 are closed joints 122a providing the food packaging tray 10 with its minimal length. In the expanded state (shown by way of example in FIG. 4B), the expansion joints 122 are open joints 122b providing the food packaging tray 10 with its extended length. The transition between the closed state and the open state may be performed in response to force F in the longitudinal direction of the tray. In various embodiments, the expansion joint 122 may extend all the way across the connection member (e.g., 150 and 250). In other embodiments, the expansion joint 122 may be merely a v-notch on the outer edge of the connection member (e.g., 150 and 250). The v-notch may act as a crack initiation point allowing the crack to propagate along the outer structure of the tray/cap (e.g., the connection members 150 or 250). In this way, the force F causes the food packaging tray 10 and/or the food packaging cap 20 to undergo a controlled rupturing (such as a tearing or cracking) of the tray/cap at multiple locations (e.g., the minor diameters) to allow a bellows-like expansion of the structure. As indicated above, this controlled rupturing may occur at the multiple weakened sections or expansion joints 122 in the connection members. In some embodiments, the food product 5 may be

extracted from the tray 10 without expansion of the tray. For example, during heating the food product may lose its moisture and shrink. This shrinking may loosen the food product in the tray allowing for easy extraction without expansion of the tray.

[045] In the collapsed state, the interior side walls of the food packaging tray 10 and/or the food packaging cap 20 may be in contact with or in close proximity to the outer shell of the food product 5. In this configuration, the energy transfer between the energy absorptive layer 132 and the food product 5 may be maximized or otherwise increased. The close proximity, however, may be undesirable for extracting the food products 5 from the food packaging tray 10. By applying the longitudinal force F to the food packaging tray 10 and the food packaging cap 20, the food packaging tray 10 and food packaging cap 20 may be elongated, thereby pulling the interior walls a small distance from the food product 5 and decreasing the proximity. This separation may allow for easier extraction of the food products 5 from the food packaging tray 10.

[046] FIG. 5 is a cross sectional side view of the packaged food product taken along section V-V of FIG. 3 with the cap included, arranged in accordance with at least some embodiments described herein. FIG. 5 shows features discussed above with regards to FIGS. 1-3 with the addition of the outer shell 6 and interior (e.g., filling 7) of the food product 5 and a separation tab 160. The various components described in FIG. 5 are merely examples, and other variations, including eliminating components, combining components, adding components, modifying components, and substituting components are all contemplated.

[047] As discussed above and illustrated in FIG. 5, an opening may extend between adjacent compartments 100a, 100b. In some applications, an opening may be preferable as the food product would not be proximal to or in contact with the energy absorptive layer between compartments at the opening. In applications where it is preferable to have the food product 5 proximal to an energy absorptive layer between compartments 100 at the opening, the separation tab 160 may be inserted between the compartments 100. In such embodiments, the separation tab 160 may include an energy absorptive layer on each side of the separation tab 160 or the separation tab 160 itself may be formed from an energy absorptive material. By locating the separation tab 160 between compartments 100, the

opening may be occupied (e.g., covered) by an energy absorptive material suitable to transfer heat to the outer shell 6 of the food product 5 proximate to this area.

[048] Also illustrated in FIG. 5 is an example of the food product 5. Such food products 5 may include the outer shell 6 and the inner filling 7. The outer shell 6 may be a crust or similar food structure that benefits from the application of higher intensity heat that would cause the outer shell 6 to crisp. In one example, the outer crust may include a heat responsive coating that responds to the heat from the energy absorptive material or enhances the heat intensity locally at the outermost crust of the food product 5. The inner filling 7 may be a softer material that melts under normal heating. An example would be a cookie having a chocolate filling. The cookie's outer shell 6 may be suitable to crisp with the chocolate in the inner filling 7 being suitable to melt. Heating such a product in the heatable food pack packaging 15 would allow for multiple crispy shelled, melted centered cookies to be heated at the same time.

[049] FIG. 6 illustrates a food packaging method 300, arranged in accordance with at least some embodiments of the present disclosure. An example of the method 300 may include one or more operations, functions, or actions as illustrated by one or more of diagrams 310, 320, 330, 340, 350, and/or 360. The example food packaging method 300 may begin with diagram 310, which may include providing the food packaging tray 10. Diagram 310 may be followed by diagram 320, which may include inserting the food product 5 into each compartment 100 of the food packaging tray 10. As discussed above, the food packaging tray 10 may have a plurality of interconnected compartments 100. The outer shell of the food product 5 may be brought into contact with different side walls (e.g., surfaces 102, 104, and 106) of the compartment 100 having a susceptor layer (e.g., energy absorptive layer 132) that contacts different sides of the one food product 5. Diagram 320 may be followed by diagram 330, which may include covering the food packaging tray 10 with the food packaging cap 20, which includes a plurality of corresponding interconnected compartments 200. The food packaging cap 20 and the food packaging tray 10 may confine the food product 5 within the compartments of the food packaging cap 20 and food packaging tray 10. As the compartments 200 of the food packaging cap 20 may have a susceptor layer as well, each side of the food product 5 may contact the susceptor

layer. Each of the tray interconnected compartments 100 and the cap interconnected compartments 200 may be separated (e.g., such as via the separation tab 160) from adjacent compartments by at least a portion of the susceptor layer such that adjacent surfaces of adjacent food products receive heat transferred from the energy absorptive layer.

[050] Diagram 330 may be followed by diagram 340, which may include sealing the food packaging cap 20 to the food packaging tray 10 along respective connection members 150 and 250 (e.g., rims extending from each structure). A sealer mechanism 12, such as two metal dies, may be brought into contact with the connection members 150 and 250 so as to apply compressive force against the rims (e.g., against the connection members 150 and 250 that are positioned against each other). Diagram 340 may be followed by diagram 350, which includes applying pressure and heating by use of the sealer mechanism 12 (e.g., metal dies), to thermally fuse the connection members 150 and 250 together so that the food packaging tray 10 and the food packaging cap 20 are attached to one another to form a thermally sealed tray and cap assembly. In embodiments that do not utilize heating to effectuate attachment (e.g., embodiments where the food packaging tray 10 and the food packaging cap 20 can be clipped together, adhered together with adhesive, etc.), the application of compressive pressure (without heat) by the sealer mechanism 12 can be sufficient to attach/seal the food packaging tray 10 and the food packaging cap 20 to each other.

[051] Diagram 350 may be followed by diagram 360, which may include removing the sealer mechanism 12 from the sealed tray and cap assembly. Diagram 360 may also include providing expansion joints 122 between each of the different tray compartments in the plurality of interconnected compartments 100 and 200. The expansion joints 122 may include a weakened section defined by each of respective rims between each of the respective interconnected compartments 100 that allows the food packaging cap 10 and food packaging tray 20 to expand in response to a longitudinal force being applied to the interconnected compartments 100. In other embodiments, other types of force may be used to expand the food packaging tray 20. For example, a torsional (i.e. twisting) force may be applied or a bending force may be applied.

[052] The operations in the described example diagrams are for illustration purposes. In some embodiments, the operations may be performed in a different order. In some other embodiments, various operations may be eliminated. In still other embodiments, various operations may be divided into additional operations, supplemented with other operations, modified, or combined together into fewer operations. Other variations of these specific operations are contemplated, including changes in the order of the operations, changes in the content of the operations being split or combined into other operations, etc.

[053] FIG. 7 illustrates a food preparation method 400, arranged in accordance with at least some embodiments of the present disclosure. An example of the method 400 may include one or more operations, functions, or actions as illustrated by one or more of diagrams 410, 420, 430, 440, and/or 450. An example food packaging method 400 may begin with diagram 410, which may include providing a packaged food product with a food packaging tray 10 that is coupled to a food packaging cap 20 having a plurality of interconnected compartments 100 and 200 with food products 5 in a plurality of the compartments 100 and 200. Each compartment of the plurality of interconnected compartments 100 and 200 in the respective food packaging tray 10 and food packaging cap 20 may be at least partially lined with a susceptor layer. In various examples, each of the interconnected compartments 100 in the food packaging tray 10 and the interconnected compartments 200 in the food packaging cap 20 may be separated from adjacent compartments by at least a portion of the susceptor layer such that adjacent surfaces of adjacent food products 5 receive heat transferred from the energy absorptive layer 132.

[054] Diagram 410 may be followed by diagram 420, which may include heating the packaged food product. The heating may continue for a duration sufficient to melt or otherwise loosen a soft center of the food product 5 while the susceptor layer crisps the outer surface of the food product 5 on each of a plurality of sides of the food product 5 that are in contact with walls of each of the interconnected compartments 100 and 200 lined with the susceptor layer. Heating may be performed, for example, in a microwave oven.

[055] Diagram 420 may be followed by diagram 430, which may include reducing the heat applied to the packaged food product or removing the packaged food product from the heat source, such as for example, removing the packaged food product from the

microwave. One the heating is reduced or eliminated a longitudinal force may be applied to the packaged food product to lengthen the packaging and separate the interior walls of the packaging from the food product 5. Other force(s) to twist, compress, etc. may be applied to the packaging (alternatively or in addition to the longitudinal force) to facilitate separation and access to the food product 5.

[056] Diagram 430 may be followed by diagram 440, which may include at least partially removing the food packaging cap 20 from the food packaging tray 10 so as to expose the food product 5 for consumption. Diagram 440 may be followed by diagram 450, which may include removing the food product 5 from the food packaging tray 10 and then consuming the food product 5.

[057] The operations included in the described example diagrams are for illustration purposes. In some embodiments, the operations may be performed in a different order. In some other embodiments, various operations may be eliminated. In still other embodiments, various operations may be divided into additional operations, supplemented with other operations, modified, or combined together into fewer operations. Other variations of these specific operations are contemplated, including changes in the order of the operations, changes in the content of the operations being split or combined into other operations, etc. In some examples, the food packaging cap 20 may be removed before the packaging is elongated.

[058] The present disclosure is not to be limited in terms of the particular examples described in this application, which are intended as illustrations of various aspects. Many modifications and examples can be made without departing from its spirit and scope. Functionally equivalent methods and apparatuses within the scope of the disclosure, in addition to those enumerated herein, are possible from the foregoing descriptions. Such modifications and examples are intended to fall within the scope of the appended claims. The present disclosure is to be limited only by the terms of the appended claims, along with the full scope of equivalents to which such claims are entitled. This disclosure is not limited to particular methods, reagents, compounds compositions or biological systems, which can, of course, vary. The terminology used herein is for the purpose of describing particular examples only, and is not intended to be limiting.

[059] With respect to the use of substantially any plural and/or singular terms herein, such terms can be translated from the plural to the singular and/or from the singular to the plural as is appropriate to the context and/or application. The various singular/plural permutations may be expressly set forth herein for sake of clarity.

[060] In general, terms used herein, and especially in the appended claims (e.g., bodies of the appended claims) are generally intended as "open" terms (e.g., the term "including" should be interpreted as "including but not limited to," the term "having" should be interpreted as "having at least," the term "includes" should be interpreted as "includes but is not limited to," etc.).

[061] If a specific number of an introduced claim recitation is intended, such an intent will be explicitly recited in the claim, and in the absence of such recitation no such intent is present. For example, as an aid to understanding, the following appended claims may contain usage of the introductory phrases "at least one" and "one or more" to introduce claim recitations. However, the use of such phrases should not be construed to imply that the introduction of a claim recitation by the indefinite articles "a" or "an" limits any particular claim containing such introduced claim recitation to examples containing only one such recitation, even when the same claim includes the introductory phrases "one or more" or "at least one" and indefinite articles such as "a" or "an" (e.g., "a" and/or "an" should be interpreted to mean "at least one" or "one or more"); the same holds true for the use of definite articles used to introduce claim recitations. In addition, even if a specific number of an introduced claim recitation is explicitly recited, such recitation should be interpreted to mean at least the recited number (e.g., the bare recitation of "two recitations," without other modifiers, means at least two recitations, or two or more recitations).

[062] Furthermore, in those instances where a convention analogous to "at least one of A, B, and C, etc." is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (e.g., "a system having at least one of A, B, and C" would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). In those instances where a convention analogous to "at least one of A, B, or C, etc." is

used, in general such a construction is intended in the sense one having skill in the art would understand the convention (e.g., "a system having at least one of A, B, or C" would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). Virtually any disjunctive word and/or phrase presenting two or more alternative terms, whether in the description, claims, or drawings, should be understood to contemplate the possibilities of including one of the terms, either of the terms, or both terms. For example, the phrase "A or B" will be understood to include the possibilities of "A" or "B" or "A and B."

[063] For any and all purposes, such as in terms of providing a written description, all ranges disclosed herein also encompass any and all possible subranges and combinations of subranges thereof. Any listed range can be easily recognized as sufficiently describing and enabling the same range being broken down into at least equal halves, thirds, quarters, fifths, tenths, etc. As a non-limiting example, each range discussed herein can be readily broken down into a lower third, middle third and upper third, etc. All language such as "up to," "at least," "greater than," "less than," and the like include the number recited and refer to ranges which can be subsequently broken down into subranges as discussed above. Finally, a range includes each individual member. Thus, for example, a group having 1-3 items refers to groups having 1, 2, or 3 items. Similarly, a group having 1-5 items refers to groups having 1, 2, 3, 4, or 5 items, and so forth.

[064] The herein described subject matter sometimes illustrates different components contained within, or connected with, different other components. Such depicted architectures are merely examples, and that in fact many other architectures can be implemented which achieve the same functionality. In a conceptual sense, any arrangement of components to achieve the same functionality is effectively "associated" such that the desired functionality is achieved. Hence, any two components herein combined to achieve a particular functionality can be seen as "associated with" each other such that the desired functionality is achieved, irrespective of architectures or intermedial components. Likewise, any two components so associated can also be viewed as being "operably connected", or "operably coupled", to each other to achieve the desired functionality, and any two components capable of being so associated can also be viewed

as being "operably couplable", to each other to achieve the desired functionality. Specific examples of operably couplable include but are not limited to physically mateable and/or physically interacting components and/or wirelessly interactable and/or wirelessly interacting components and/or logically interacting and/or logically interactable components.

[065] While various aspects and examples have been disclosed herein, other aspects and examples will be apparent. The various aspects and examples disclosed herein are for purposes of illustration and are not intended to be limiting, with the true scope and spirit being indicated by the following claims.

CLAIMS

What is claimed is:

1. A food packaging tray, comprising:

a support layer shaped to form a plurality of interconnected compartments, a compartment of the plurality having at least one surface configured to contact a corresponding surface of a food product placed within the compartment;

an energy absorptive layer comprising a different material than the support layer and coupled to a portion of the support layer so as to form an interior of one or more of the plurality of interconnected compartments, wherein the energy absorptive layer is configured to transfer heat directly to an exterior of the food product in one or more of the interconnected compartments.

2. The food packaging tray of claim 1, wherein the compartment is separated from another compartment by at least a portion of the energy absorptive layer such that adjacent surfaces of food products placed in the compartment and in the another compartment receive heat transferred from the energy absorptive layer.

3. The food packaging tray of claim 1, wherein the energy absorptive layer includes a susceptor layer.

4. The food packaging tray of claim 3, wherein the susceptor layer comprises a metalized layer on the support layer.

5. The food packaging tray of claim 1, wherein the plurality of interconnected compartments are coupled to form a longitudinal row of interconnected compartments.

6. The food packaging tray of claim 5, wherein the longitudinal row of interconnected compartments forms a bellows shape.

7. The food packaging tray of claim 5, wherein the row of interconnected compartments is longitudinally expandable from a collapsed state.

8. The food packaging tray of claim 5, wherein at least a portion of a wall of the row of interconnected compartments is weakened at a minor diameter between consecutive interconnected compartments to allow the row of interconnected compartments to expand in response to the row of interconnected compartments being pulled in a longitudinal direction.

9. The food packaging tray of claim 5, further comprising a connection member that extends around a periphery of the longitudinal row of interconnected compartments such that the row of interconnected compartments is operable to receive a cap.

10. The food packaging tray of claim 9, wherein the connection member includes a first rim that protrudes outwardly from a top of the row of interconnected compartments.

11. The food packaging tray of claim 9, wherein the connection member comprises a heat sealable surface free of the energy absorptive layer.

12. The food packaging tray of claim 10, wherein the row of interconnected compartments includes a first row of interconnected compartments, wherein the rim includes a first rim, and wherein the cap includes a second row of interconnected compartments having a second rim suitable to seal against the first rim to form a heatable food pack having a row of interconnected compartments to store and heat the food product.

13. The food packaging tray of claim 1, further comprising one or more separation tabs that include a susceptor layer that is positioned between at least two of the

interconnected compartments such that heat is transferred to the food product by the separation tabs where the at least two interconnected compartments are coupled.

14. A heatable food pack to heat in a microwave oven, the heatable food pack comprising:

a plurality of food products;

a tray having a plurality of interconnected tray compartments with one of the plurality of food products received within a respective one of the interconnected compartments, wherein a compartment of the plurality of tray compartments has at least one surface configured to contact one or more surfaces of the one of the plurality of food products, wherein the at least one surface of the compartment is at least partially covered with an energy absorptive layer configured to transfer heat directly to the one or more surfaces of the one of the plurality of food products.

15. The heatable food pack of claim 14, further comprising a cap having a plurality of interconnected cap compartments and configured to attach to the tray, wherein the interconnected cap compartments and the interconnected tray compartments together form a plurality of interconnected closed compartments.

16. The heatable food pack of claim 14, wherein at least some of the plurality of food products includes an outer crust and an inner filling.

17. The heatable food pack of claim 16, wherein the energy absorptive layer includes a susceptor layer having an optical density that causes the outer crust to crisp concurrently with the inner soft filling being heated.

18. The heatable food pack of claim 17, wherein the energy absorptive layer comprises a metalized layer on a support layer and the metalized layer is in direct contact with a portion of the outer crust.

19. The heatable food pack of claim 14, wherein the plurality of interconnected closed compartments are coupled together to store the plurality of food products in a longitudinal row of interconnected closed compartments.

20. The heatable food pack of claim 19, wherein the longitudinal row of interconnected closed compartments forms a bellows shape that is longitudinally expandable from a collapsed state to an expanded state, wherein the contact between the at least one surface of the compartment, which is included in the longitudinal row of interconnected closed compartments, and the one or more surfaces of the plurality of food products is higher in the collapsed state than in the expanded state.

21. The heatable food pack of claim 20, wherein the plurality of food products are more easily removed from the tray in the expanded state than in the collapsed state.

22. The heatable food pack of claim 21, wherein:

at least a portion of an outer wall of the row of interconnected closed compartments is weakened at a minor diameter between at least some of the interconnected closed compartments so as to allow the row of interconnected closed compartments to expand in response to the row of interconnected closed compartments being pulled in a longitudinal direction, and

as the row of interconnected closed compartments is expanded, portions of the energy absorptive layer are separated from portions of the plurality of food products where those portions of the energy absorptive layer and those portions of the plurality of food products contact one another.

23. The heatable food pack of claim 15, wherein the cap and the tray are separable from one another along a connection member such that the plurality of food products received within the interconnected tray compartments are accessible.

24. The heatable food pack of claim 14, further comprising one or more separation tabs that are separable from the plurality of tray compartments and include at least a susceptor layer that contacts portions of the one or more surfaces of the one of the plurality of food products at least one location that is not contacted by the at least one surface of the compartment of the plurality of tray compartments.

25. The heatable food pack of claim 14, wherein the compartment is separated from another compartment of the plurality of tray compartments by at least a portion of the energy absorptive layer such that oppositely faced surfaces of food products received within the compartment and in the another compartment are exposed to heat transferred from the energy absorptive layer

26. A food packaging preparation method, comprising:

inserting a food product into a tray compartment of a tray having a plurality of interconnected tray compartments such that different sides of the food product contact a susceptor layer of side walls of the tray compartment; and

covering the tray with a cap having a plurality of interconnected cap compartments, such that a cap compartment of the cap corresponds to the tray compartment to confine the food product therein and other different sides of the food product contact a susceptor layer of the cap compartment.

27. The food packaging preparation method of claim 26, further comprising sealing the cap to the tray along respective rims that extend from sides of the cap and the tray.

28. The food packaging preparation method of claim 27, wherein the sealing comprises heating the respective rims and applying pressure thereto.

29. The food packaging preparation method of claim 26, wherein the inserting includes placing the food product in multiple tray compartments in the plurality of interconnected tray compartments.

30. The food packaging preparation method of claim 26, further comprising separating the interconnected tray compartments of the tray and the interconnected cap compartments of the cap from a next closest compartments by at least a portion of the susceptor layer such that adjacent surfaces of consecutive food products receive heat transferred from the at least the portion of the susceptor layer.

31. A food preparation method, comprising:

heating a food product packaged within a packaging article having a tray with a plurality of interconnected compartments, including heating a susceptor layer that at least partially lines the plurality of interconnected compartments in the tray and heating a susceptor layer that at least partially lines a plurality of interconnected compartments in a cap coupled to the tray, wherein the heating of the food product lasts for a duration sufficient to at least soften a center of the food product while the susceptor layer of the tray and the susceptor layer of the cap crisps an outer surface of the food product that is in contact with walls of the interconnected compartments that are at least partially lined with the susceptor layers;

at least partially reducing the heating of the food product after a duration sufficient to at least soften a center of the food product while the susceptor layer of the tray and the susceptor layer of the cap crisps the outer surface of the food product.

32. The food preparation method of claim 31, further comprising expanding an expander between at least some of different tray compartments in the plurality of interconnected compartments in the tray.

33. The food preparation method of claim 32, wherein the expanding comprises applying a longitudinal force to the packaging article to cause the packaging article to

expand longitudinally and to at least partially separate the susceptor layers from the food product.

34. The food preparation method of claim 33, wherein the applying the longitudinal force to the packaging article expands a weakened portion located on respective rims of the tray and cap and between the respective interconnected compartments.

35. The food preparation method of claim 31, further comprising removing the cap to expose the food product for consumption.

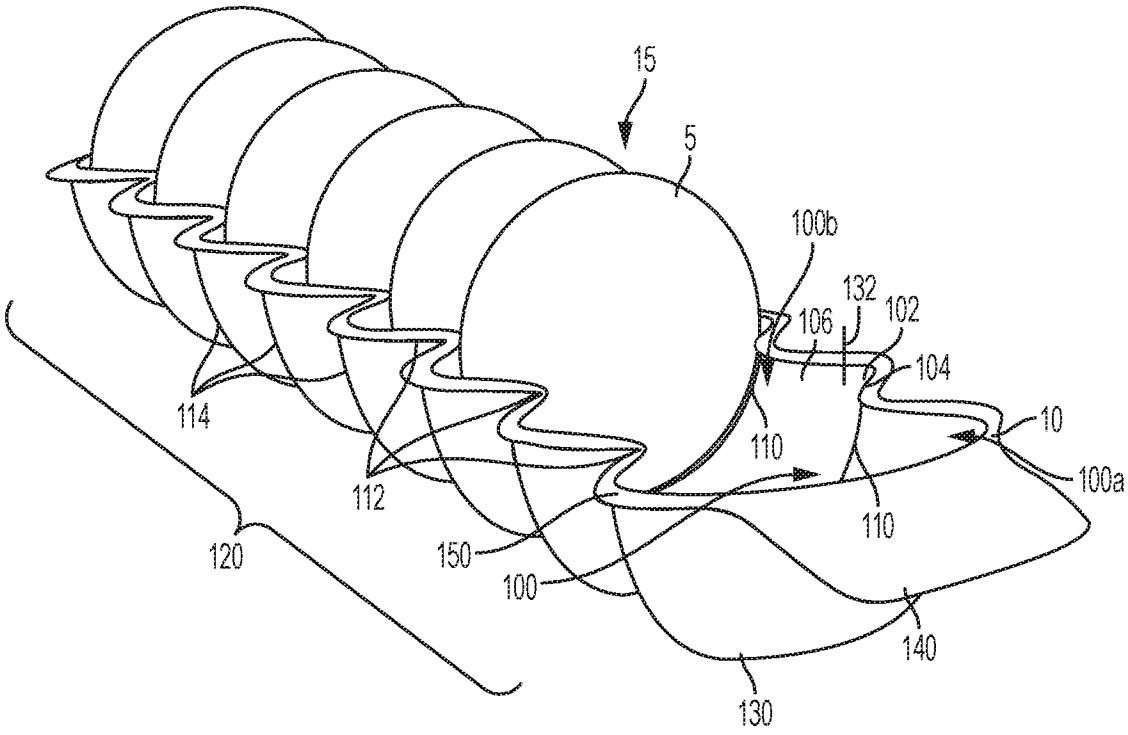
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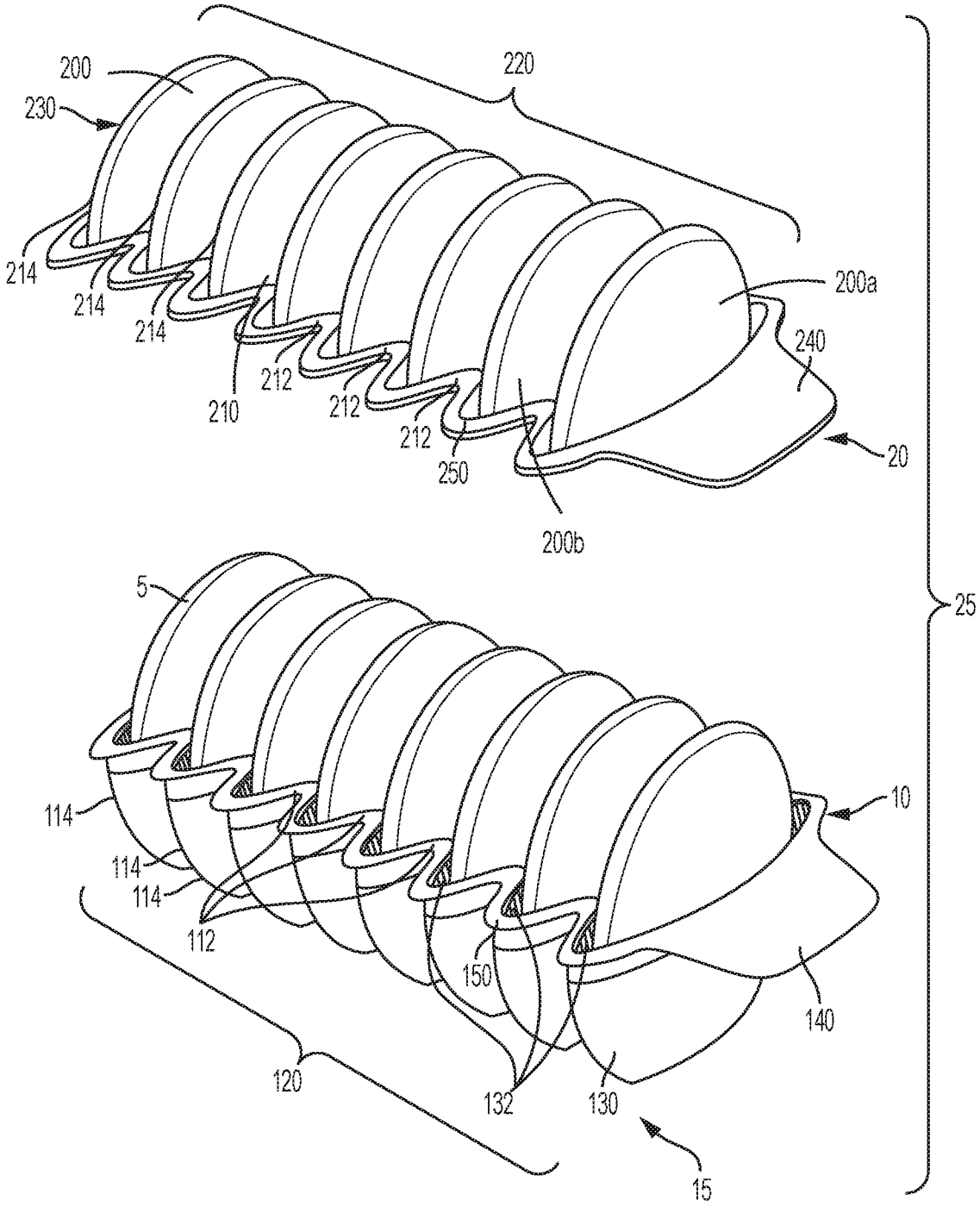
FIG. 1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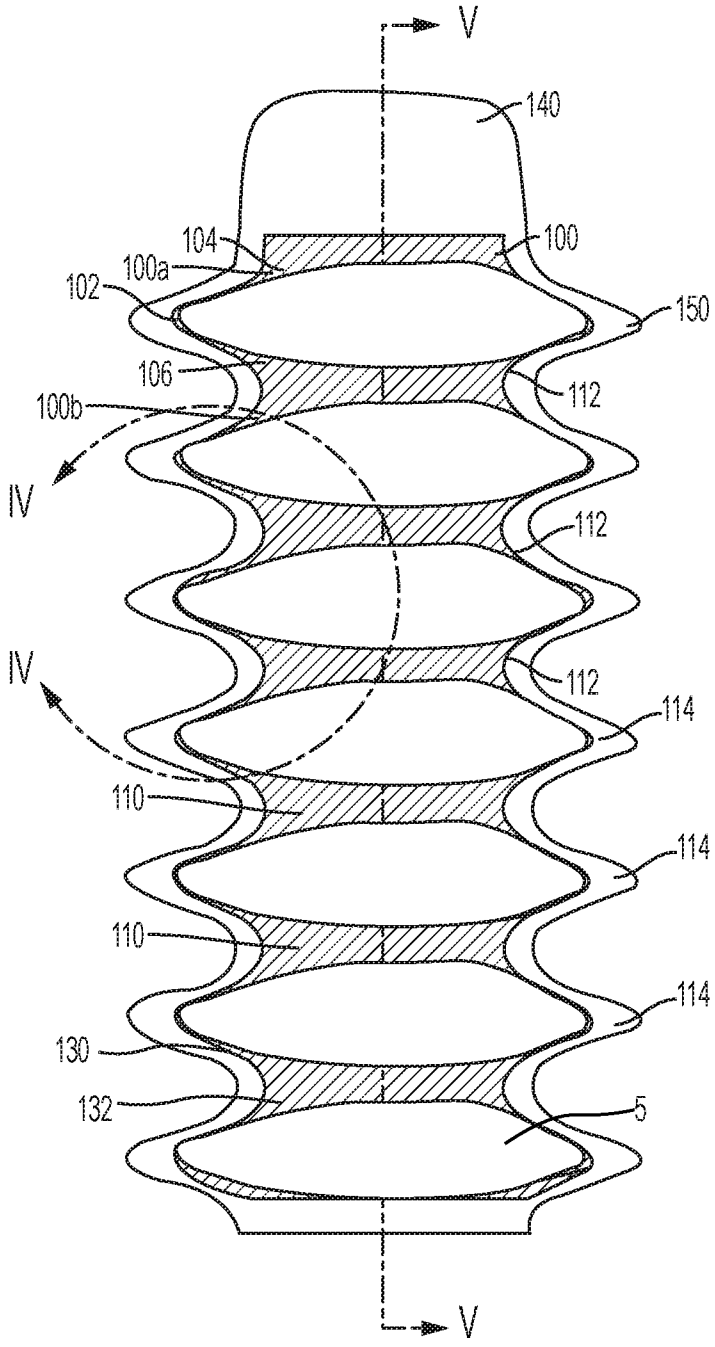
15

FIG. 2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100
100a
102
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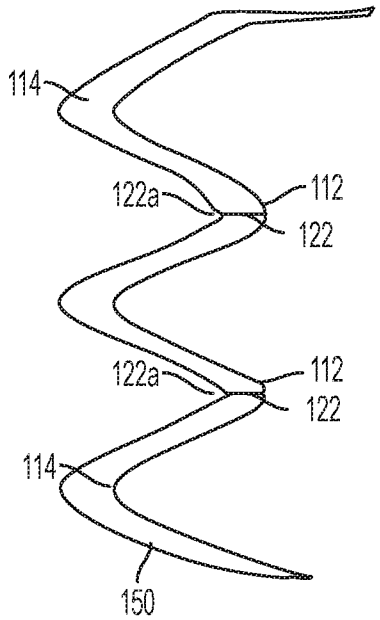
5
V

FIG. 3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114
150

FIG. 4A

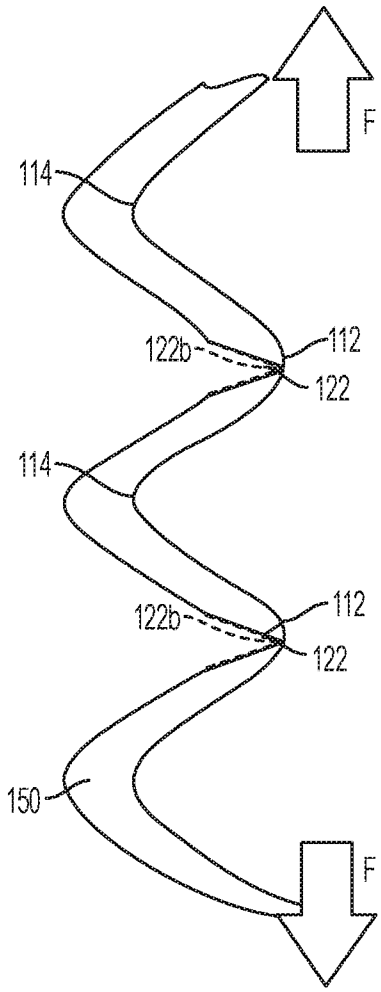
F
114
122b
112
122
114
122b
112
122
150
F

FIG. 4B

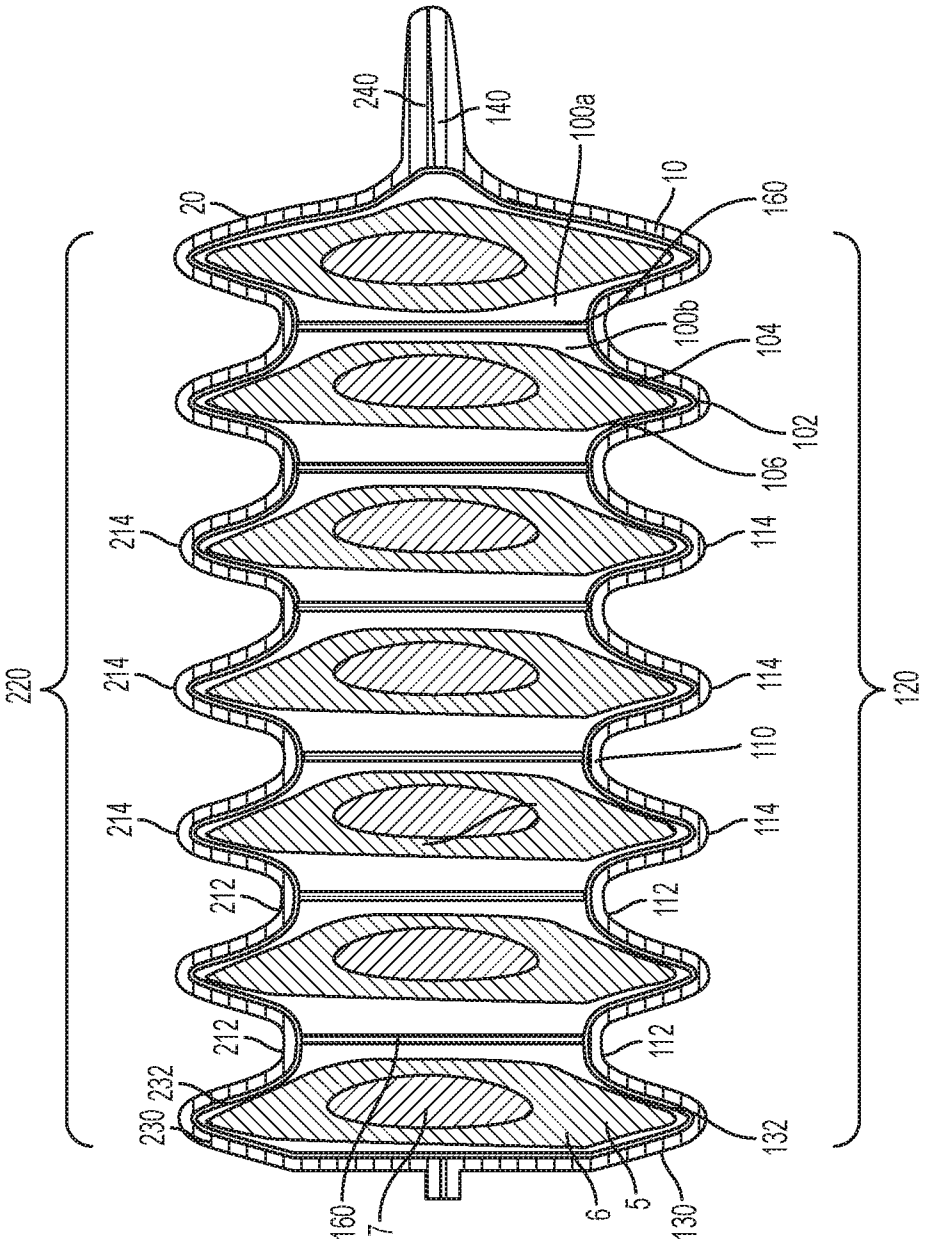
240
140
100a
10
160
20
100b
104
102
106
214
114
220
214
114
120
110
214
114
212
112
212
112
230
232
132
160
7
6
5
130

FIG. 5

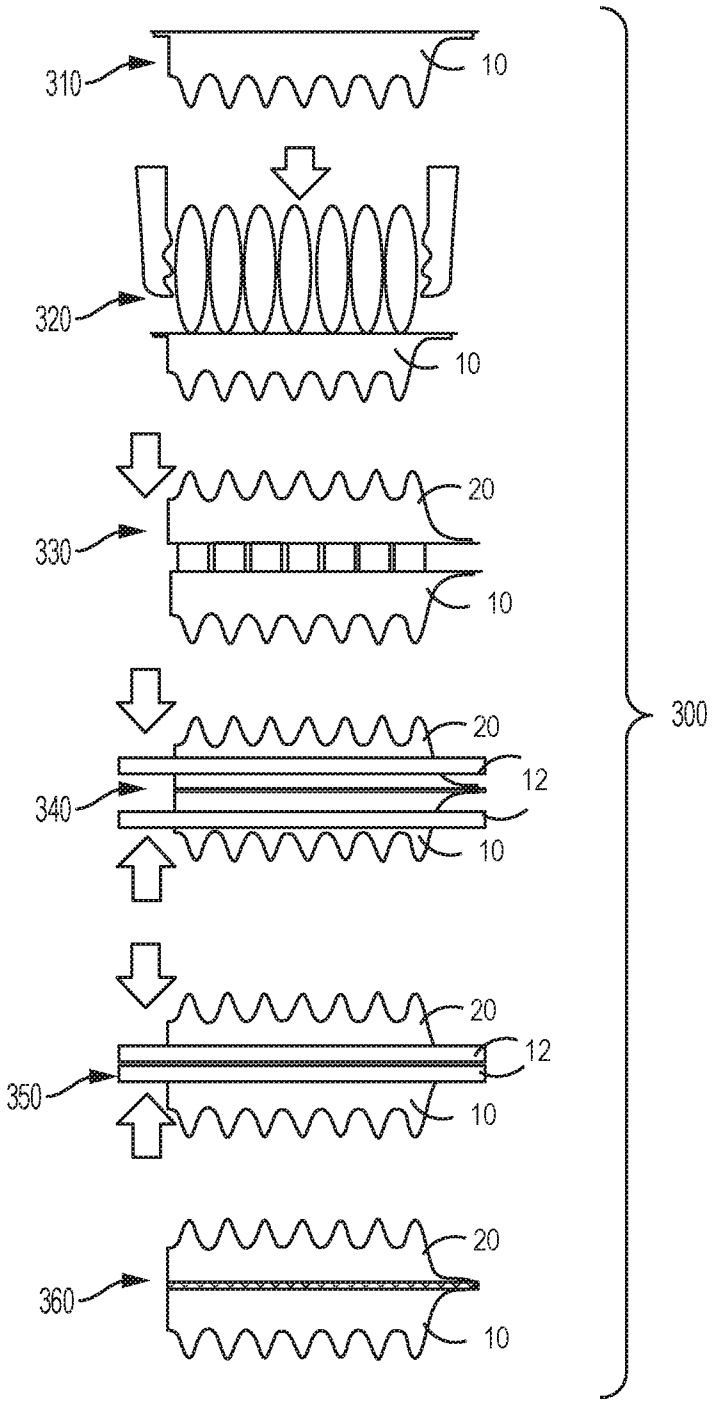

FIG. 6

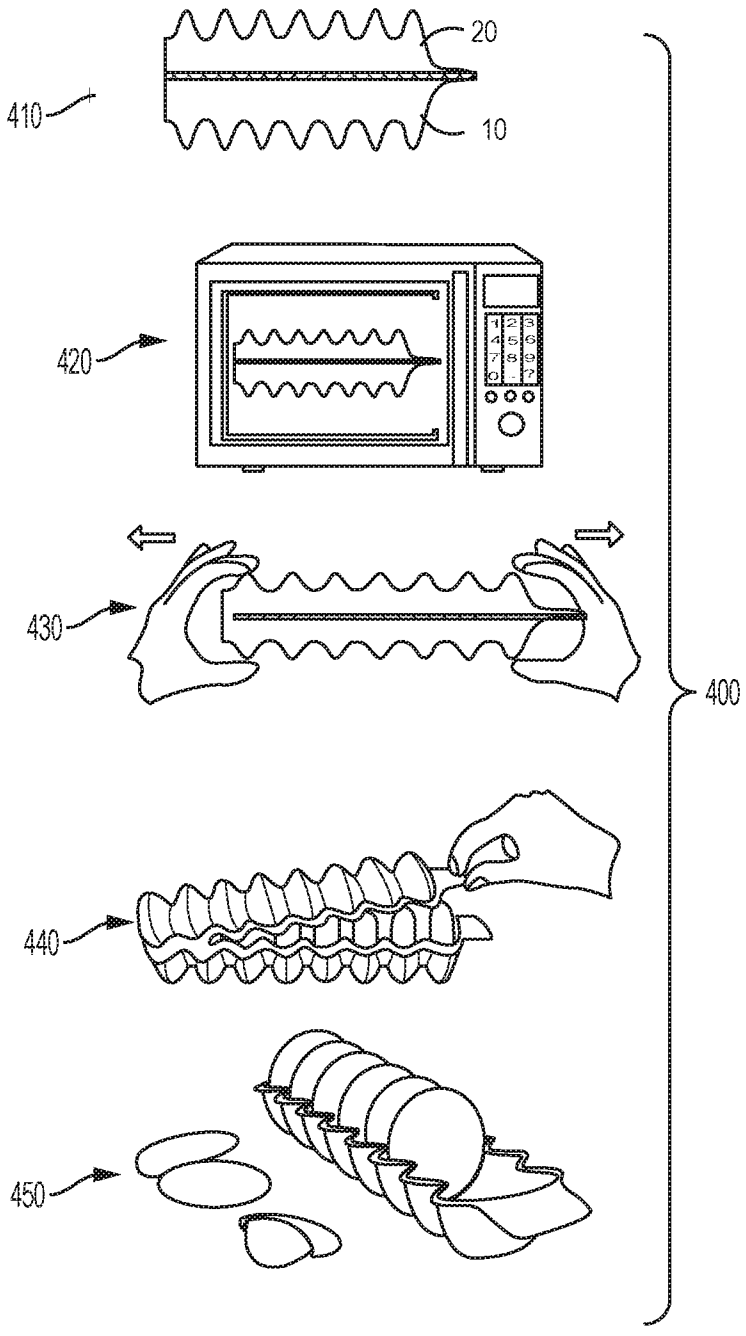

FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2018/017646

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
See extra sheet(s).

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-25

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2018/017646

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B65D 81/34; A47J 27/00; A47J 36/02; B65D 75/38; B65D 77/00; B65D 77/22 (2018.01)

CPC - B65D 81/3453; A47J 27/00; B65D 77/003; B65D 81/3461; B65D 2581/3413; B65D 2581/344; B65D 2581/3441; B65D 2581/3471; H05B 6/80 (2018.05)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2012-30844 A (TOPPAN PRINTING CO LTD) 16 February 2012 (16.02.2012) entire document	1-6, 9-12, 14, 15, 19, 23, 25
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Y		13, 16-18, 24
Y	US 2007/0246460 A1 (FORD et al) 25 October 2007 (25.10.2007) entire document	13, 24
Y	US 2010/0072197 A1 (NEFF et al) 25 March 2010 (25.03.2010) entire document	16-18
A	US 4,943,439 A (ANDREAS et al) 24 July 1990 (24.07.1990) entire document	1-25
A	US 2011/0123685 A1 (CHEN) 26 May 2011 (26.05.2011) entire document	1-25
A	US 5,334,820 A (RISCH et al) 02 August 1994 (02.08.1994) entire document	1-25

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
13 May 2018	08 JUN 2018
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450 Facsimile No. 571-273-8300	Authorized officer Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2018/017646

Continued from Box No. III Observations where unity of invention is lacking

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees need to be paid.

Group I, claims 1-25 are drawn to a food packaging tray.
Group II, claims 26-35 are drawn to a method of food packaging preparation.

The inventions listed in Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1, because under PCT Rule 13.2 they lack the same or corresponding special technical features for the following reasons:

The special technical features of Group I, a compartment of the plurality having at least one surface configured to contact a corresponding surface of a food product placed within the compartment, the energy absorptive layer comprising a different material than the support layer and coupled to a portion of the support layer so as to form an interior of one or more of the plurality of interconnected compartments, wherein the energy absorptive layer is configured to transfer heat directly to an exterior of the food product in one or more of the interconnected compartments, a plurality of food products, one of the plurality of food products received within a respective one of the interconnected compartments, wherein a compartment of the plurality of tray compartments has at least one surface configured to contact one or more surfaces of the one of the plurality of food products, wherein the at least one surface of the compartment is at least partially covered with an energy absorptive layer configured to transfer heat directly to the one or more surfaces of the one of the plurality of food products, are not present in Group II; and the special technical features of Group II, covering the tray with a cap having a plurality of interconnected cap compartments, such that a cap compartment of the cap corresponds to the tray compartment to confine the food product therein and other different sides of the food product contact a susceptor layer of the cap compartment, heating a susceptor layer that at least partially lines a plurality of interconnected compartments in a cap coupled to the tray, wherein the heating of the food product lasts for a duration sufficient to at least soften a center of the food product while the susceptor layer of the tray and the susceptor layer of the cap crisps an outer surface of the food product that is in contact with walls of the interconnected compartments that are at least partially lined with the susceptor layers; at least partially reducing the heating of the food product after a duration sufficient to at least soften a center of the food product while the susceptor layer of the tray and the susceptor layer of the cap crisps the outer surface of the food product, are not present in Group I.

Groups I and II share the technical features of a food preparation tray comprising a support layer shaped to form a plurality of interconnected compartments, and an energy absorptive layer, such that a side of a food product contacts the energy absorptive layer. However, these shared technical features do not represent a contribution over the prior art. Specifically, US 4,943,439 A to Andreas et al. teaches of a food preparation tray (Abstract) comprising a support layer shaped to form a plurality of interconnected compartments (Fig. 6, a package 44 comprising a plurality of compartments defined between by partitions 30, col 5 lns 3-9, such that each compartment is sized to receive a food product 34, col 5 lns 3-9), and an energy absorptive layer (Fig. 6, wherein the package 44 includes a laminate 18, col 5 lns 3-9; wherein the laminate 18 includes a coating 26 configured to absorb microwave energy, see Fig. 2, col 3 lns 58-68 & col 4 lns 1-4), such that a side of a food product contacts the energy absorptive layer (Fig. 6, wherein food products 34 contact the laminate 18 and receive energy from the coating 26 therein, col 5 lns 3-9).

Since none of the special technical features of the Group I and II inventions are found in more than one of the inventions, unity is lacking.