

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
28 August 2008 (28.08.2008)

PCT

(10) International Publication Number
WO 2008/103670 A1

(51) International Patent Classification:

F24C 15/00 (2006.01) *A47J 36/24* (2006.01)
B65D 81/34 (2006.01) *A47J 27/00* (2006.01)

(21) International Application Number:

PCT/US2008/054300

(22) International Filing Date:

19 February 2008 (19.02.2008)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/890,655 20 February 2007 (20.02.2007) US
61/020,312 10 January 2008 (10.01.2008) US

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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, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(54) Title: FOOD PROCESSING APPARATUS

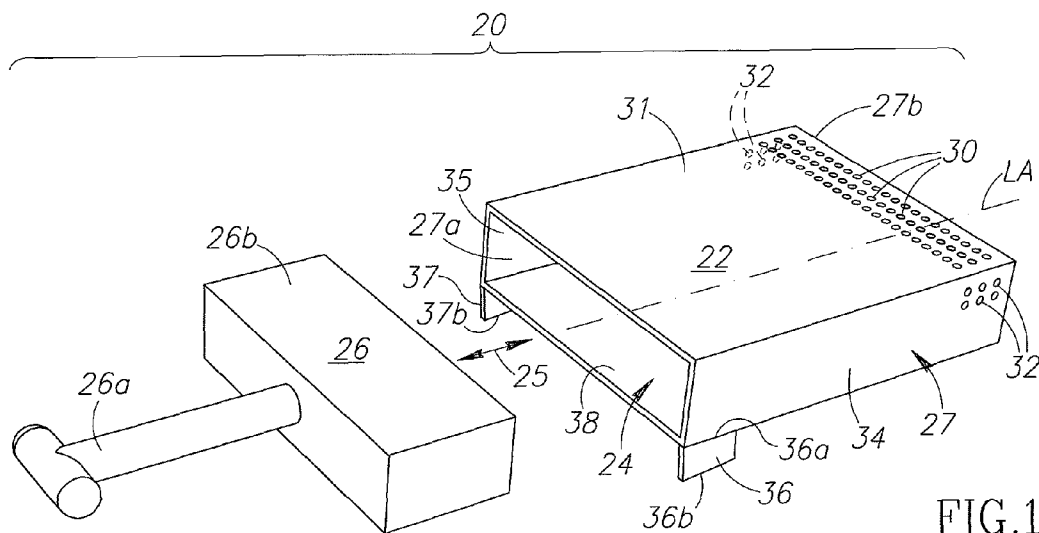


FIG. 1

(57) Abstract: An apparatus with a box-like container includes apertures, and a block member for moving within a cavity in the box-like container. The apparatus is a single unit, from which frozen food, typically in blocks, or out of bags, containers, and the like, may be defrosted and/or, cooked, and then strained, drained or dried, with minimal, if any, spillage or mess.

FOOD PROCESSING APPARATUS

RELATED APPLICATIONS

[0001] This application is related to and claims priority from commonly owned U.S. Provisional Patent Applications: Serial No. 60/890,655, entitled: Food Processing Apparatus, filed on February 20, 2007, and Serial No. 61/020,312, 5 entitled: Food Processing Apparatus, filed on January 10, 2008, the entire disclosures of which are incorporated by reference herein.

TECHNICAL FIELD

[0002] The present disclosed subject matter is directed to apparatus and 10 methods for defrosting and draining food products, specifically frozen foods, such as vegetables, that are packaged and stored in frozen blocks or bagged.

BACKGROUND

[0003] Vegetables, such as spinach, beans, peas, broccoli, corn, and the like, are typically frozen in blocks in correspondingly shaped packages, or in frozen 15 pieces in bags. For example, vegetables in frozen blocks are typically in rectangular box-like packages, typically of paper, or lightweight cardboard or plastic. For example, a rectangular package of frozen vegetables encloses an approximately ten ounce net weight frozen block of vegetables, and measures approximately 5.5 inches by 4 inches by 1.5 inches. Bags are typically of plastic or paper, and are sized to 20 accommodate multiple net weights of frozen vegetables, an example being bags to accommodate net weights of frozen vegetables of 16 ounces and upward. The vegetables are typically removed from the package as a frozen block, or as frozen pieces from bags. The vegetables are then defrosted and/or cooked.

[0004] Defrosting may occur in the package (frozen block or portions 25 thereof) or bag (frozen pieces) in the ambient environment, with the package or bag typically on a plate or the like, or in a container or the like, to hold and confine the water resulting from defrosting. Ambient defrosting may also involve the contents of the package or bag being emptied onto a plate or into a container, pot or the like. The plate or container with the vegetables may be further defrosted and/or cooked in a 30 microwave oven, or other heat providing or cooking device. The frozen block or

frozen pieces may also be defrosted and/or cooked by being placed directly into a pot of boiling water.

[0005] Once the defrosting or cooking is complete, the vegetables must be drained or strained. This involves using one or more pieces of additional equipment, including a straining or draining device, such as a colander, strainer or the like. Transfer of the now defrosted or cooked food, from the plate or container where the defrosting and/or cooking occurred, to the straining or draining device, may involve yet an additional service item, such as a cup, bowl or the like.

[0006] Transferring the vegetables between the aforementioned pieces of equipment, service items and the like, is time consuming and inefficient. It also wastes resources, as each piece of equipment or service item must be cleaned after use. In many cases, the vegetables emit colors, whereby the equipment or service items must be cleaned shortly after use, such that they are not stained or damaged. Additionally, the user must possess all of the pieces of equipment or service items to properly process the vegetables or food in the aforementioned manner.

[0007] Moreover, since food must be transferred between different pieces of equipment or service items for each portion of the aforementioned processing, there is a chance of spillage of both liquid and food. Additional time and labor is necessary to clean up these spills. Furthermore, if the spills are of colored liquid or food, they must be attended to immediately, and may require additional soaps, cleaners or the like, to properly clean the spills and avoid staining or other damage.

SUMMARY

[0008] The present disclosed subject matter overcomes the drawbacks associated with conventional cookware, by providing a single apparatus or single unit, from which frozen food, typically in blocks (from boxes or other similar containers), or in pieces (loose) out of bags, containers, and the like, may be defrosted and/or, cooked, and then strained, drained or dried, with minimal, if any, spillage or mess. The frozen food is, for example, packaged vegetables, such as spinach, beans, peas, broccoli, corn, and the like.

[0009] The disclosed subject matter is directed to an apparatus that is usable for the processes of defrosting and/or cooking and draining or staining food,

typically vegetables, initially in a frozen condition, such as in a block or in pieces (loose). The apparatus includes a container with a block member for moving within the container, for forcing liquid from food or the like, out of the container. The container includes an open end and a closed end and a first side and a second side, and
5 an internal to interior cavity between the first side, the second side and the closed end, for receiving and holding food. There are also a plurality of apertures at the closed end, through which liquid from the food leaves the internal cavity of the container. The block member is correspondingly configured with respect to the shape of the internal cavity for moving within the internal cavity of the container. The container is
10 such that when it rests on a surface, its internal cavity is angled (tilted) with respect to the surface. The angling or tilting is upward, from the closed end, that contacts the surface, to the open end, that is raised above the surface, the open end being at an elevation above the closed end.

[0010] Another embodiment is directed to an apparatus for processing
15 food, that is formed of a container. The container includes a container body with a closed end and an open end, and at least one member, for example, one or more feet extending from the container body, and coupled with the container body, for maintaining the container body at an angle with respect to a surface, such that the open end is at an elevation greater than elevation of the closed end. The container
20 body also includes a first wall and a second wall oppositely disposed with respect to each other and extending between the open end and the closed end; and, lateral walls, oppositely disposed from each other, intermediate the first wall and the second wall, the lateral walls extending between the open end and the closed end. There is an interior cavity defined by the space between the first and second walls and the lateral
25 walls; and, there is at least one aperture at least at the closed end of the container body. The at least one aperture generally includes plural apertures in the first wall and the lateral walls, proximate to the first wall. The apparatus also includes a block member for fitting inside of the interior cavity and being movable therein.

[0011] Also disclosed is a method for removing moisture from food, for
30 example, frozen or defrosted food with water or moisture still remaining on the food. The method includes, providing a container including an open end and a closed end and a first side and a second side, an internal cavity between the first side, the second

side and the closed end configured for receiving food, and a plurality of apertures at the closed end. Frozen food or otherwise defrosting food is placed into the internal cavity of the container. The container is placed on a surface, such that the container is oriented on an angle and the open end is above the closed end. This tilted orientation also allows liquid to collect or pool in the internal cavity at the closed end of the container, such that the liquid remains in the container until it is reoriented. The frozen or defrosting food defrosts, such that liquid collects in the internal cavity at the closed end of the container. A block member, correspondingly configured with respect to the shape of the internal cavity for moving within the cavity is provided, and the block member is brought into the internal cavity and pushed toward the closed end of the container to contact the food and force liquid out through apertures of the plurality of apertures. With the liquid forced out, the block member is removed from the internal cavity, and the food is removed from the container through the open end.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Attention is now directed to the drawing figures, where like numerals or characters indicate corresponding or like components. In the drawings:

[0013] Fig. 1 is an exploded perspective view of the apparatus;

[0014] Fig. 2 is a perspective view of the apparatus of Fig. 1, with a block of frozen food being inserted into the container of apparatus;

[0015] Fig. 3A is a cross-sectional view of the apparatus of Fig. 2, taken along line 3-3, with a block of frozen food therein, upon being placed into a defrosting mechanism;

[0016] Fig. 3B is a cross-sectional view of the apparatus of Fig. 2, taken along line 3-3, with a block of frozen food therein, upon being defrosted in a defrosting mechanism;

[0017] Fig. 4 is a perspective view showing the apparatus with the defrosted food therein being drained; and,

[0018] Fig. 5 is a perspective view of the apparatus with the drained food being deposited into a container for use.

DETAILED DESCRIPTION

[0019] In this document, references are made to directions, such as upper, lower, top, bottom, up, down, upward, downward, front, rear, above, below, lateral and variations thereof. These directional references are exemplary, to show the disclosed subject matter in a typical orientation, and are in no way limiting.

[0020] Figs. 1 and 2, show the apparatus 20 including a container 22, having an interior cavity 24 and a block member (or pusher) 26, with a handle 26a or gripping member, and a contact portion 26b. The block member 26 fits into the container 22 so as to be movable within the interior cavity 24 (or cavity), for example, upward and downward, in the directions as indicated by the double headed arrow 25. The block member 26 is correspondingly configured with respect to the shape of the interior cavity 24, so as to occupy a substantial portion of the cross-sectional area of the container 22.

[0021] The container 22 includes a body 27 (also referred to as the container body), that is, for example, rectangular-shaped, with an interior cavity 24 of uniform or generally uniform cross section. The body 27 of the container includes an open, upper or top, end 27a, and a closed, lower or bottom end 27b. The open, upper or top end 27a, and closed, lower, or bottom end 27b also define the corresponding ends of the container 22, and are used interchangeably herein. The open, upper or top end 27a, while shown as open, may also include an opening (or open side), and the closed, lower or bottom end 27b is defined by a closed, lower or bottom side 28. A longitudinal axis LA extends through the container body 27, between the open 27a and closed 27b ends, and serves as an axis of symmetry for the container body 27. While a box-like rectangular shape for the body 27 of the container 22 is shown, other cubic or cube-like shapes for the container 22 (container body 27) are also permissible, with the block member 26 being correspondingly shaped to be movable within the interior cavity 24.

[0022] There are apertures 30 along a first or front side 31 proximate to the closed end 27b. There are also apertures 32 along the lateral sides 34, 35, that are proximate to the front side 31. The apertures 30, 32 are typically rounded holes, for example, circular in cross-sectional shape, so as to define cylindrical (or disk) shaped

bores extending through the front 31 and lateral 34, 35 sides of the container 22, from the cavity 24 to the ambient environment. The apertures 30, 32 may also be slots, slits, gratings and the like in various other shapes, for example, squares, rectangles, ovals, and the like.

5 **[0023]** Feet (also known as supports or support members) 36, 37, protrude (extend) from a second or rear side 38 of the body 27 of the container 22, proximate to the open end 27a, and are flush with or proximate to the lateral sides 34, 35 of the body 27. The feet 36, 37 are oriented so as to be parallel or substantially parallel with the longitudinal axis LA.

10 **[0024]** The feet (supports or support members) 36, 37 are shaped to allow the container 22 to be positioned, for example, on a flat surface (S1 of Fig. 2, 54 of Figs. 3A and 3B), such that the container 22 can rest in a tilted position (orientation), as it is angled (inclined) upward, from the closed end 27b to the open end 27a, along the rear side 38. In this titled position, the open end 27a is above the closed end 27b
15 of the container 22 (and the open end 27a is at a higher elevation than the closed end 27b, with respect to the surface). The angling may be, for example, at an angle α (Figs. 2 and 3A), that may be approximately 2 degrees or greater, with respect to the horizontal (for example, a surface), and, as another example, may be approximately four degrees with respect to the horizontal. This angling (represented, for example,
20 by the angle α) is such that any liquid in the container 22 will remain below the apertures 30, 32, confined in the container 22 while the container 22 rests (sits) in the position shown in Figs. 2, 3A and 3B.

[0025] The feet 36, 37 attach to the body 27 along upper edges 36a, 37a (Fig. 3A). These upper edges 36a, 37a are angled (for example, at the angle α), with
25 corresponding lower edges 36b, 37b, that are straight (right angles with respect to the side edges of the feet 36, 37), for maximum contact with the surface (for example, the surface S1 as shown in Fig. 2 and the surface 54 in Figs. 3A and 3B) on which the container 22 rests. Alternately, the feet 36, 37 may be straight along their upper edges 36a, 36b, that contact the body 27 at the second or rear side 38, with angled (for
30 example, at the angle α) lower edges 36b, 37b. In another alternate, one or more square or rectangular feet may attach to the rear side 38 at the open end 27a, proximate to the opening of the container body 27, in an orientation perpendicular or

substantially perpendicular to the longitudinal axis LA. These square or rectangular feet would elevate the open end 27a to allow the container 22 to rest (sit) on a surface in the aforementioned tilted position (orientation), with the open end 27a being above the closed end 27b, as detailed above.

5 **[0026]** While two feet 36, 37 are shown, positioned at the open end 27a of the container 22, and spaced apart from each other so as to be proximate to or flush with the respective lateral sides 34, 35 of the body 27, other alternate configurations (shapes) of the feet 36, 37, spacings of and positions of the feet 36, 37, arrangements of the feet 36, 37 with respect to the container body 27, and amounts of the feet 36, 37
10 (single or multiple), are also permissible. These alternates are permissible, provided that they allow the container 22 to rest (sit) on a surface in the aforementioned tilted position (orientation) (with the open end 27a being above the closed end 27b), as detailed above.

[0027] The apertures 30, 32, are positioned, such that when the container
15 22 rests on a surface in a tilted position, in accordance with any of the configurations detailed above, the feet 36, 37 and the closed end 27b, are in contact with the surface (as detailed above and as shown, for example, in Figs. 3A and 3B, discussed below), and there is space for liquid to collect and remain confined in the container 22, below the apertures 30, 32. The liquid 58 results from defrosting or cooking, and remains in
20 the container 22 (the level 60 of the liquid 58 remains below the apertures 30, 32), until the container 22 is repositioned or reoriented, for example, when the food 50 is drained, or strained by the user, as detailed below.

[0028] Also, any size apertures 30, 32, and arrangement thereof, on either the front side 31 alone, one or two lateral sides 34, 35 only, or any combination of
25 front 31 and lateral 34, 35 sides, is permissible, provided the apertures 30, 32 are arranged to be above liquid (water) levels from the defrosted (or cooked) frozen food in the container 22, when the feet 36, 37 and the closed end 27b of the container 22 rest on a surface (and the liquid 58, e.g., water, remains confined in the container 22, as shown in Fig. 3B).

30 **[0029]** The container 22 is typically a unitary member, formed of a microwave-safe, food grade material, such as a microwave safe food grade plastic. This material may be, for example, Lexan®, from GE Plastics of the General Electric

Company. The container 22 may, for example, be formed by conventional manufacturing techniques, including injection and rotational molding, or the like. Similarly, the block member 26, with its handle 26a and contact portion 26b, may be a unitary member of the same material as the container 22 formed by the same techniques. Alternately, the container 22 and the block member 26 may be formed of multiple pieces, fastened together with conventional microwave safe food grade adhesives and the like.

[0030] The container 22, may be, for example, of dimensions, of approximately six inches by approximately four and one-half inches by approximately two inches, to accommodate a frozen block of vegetables, such as a conventional ten ounce package of frozen vegetables, such as frozen spinach, beans, peas, broccoli, corn, and the like. The block member 26 may be, for example, of a cross sectional area of approximately 3.75 inches by 1.75 inches (with a thickness of approximately half an inch), so as to move freely up and down within the cavity 24 of the container 22. There is a small amount of room between the block member 26 and the body 27 of the container 22, to accommodate vegetables or food that may become lodged between the block member 26 and the body 27, allowing the block member 26 to keep moving without substantial extra force being applied. However, tighter or looser tolerances are also permissible. The handle 26a is typically long enough to be easily gripped when the contact portion 26b is well within the cavity 24 of the container 22. Moreover, the apparatus 20 is easily scalable, and may be easily configured to be of larger or smaller dimensions.

[0031] Attention is now directed to Figs. 3A-5. These drawing figures show an exemplary operation of the apparatus 20.

[0032] Turning back to Fig. 2, there is shown the container 22 receiving a block of frozen vegetables or food 50, into the cavity 24. The frozen food, may be, for example, frozen vegetables, as conventionally packaged, in rectangular or square blocks, with the packaging removed. Throughout this document, food and vegetables are used interchangeably.

[0033] The frozen food in the block 50, is placed into the cavity 24 of the container 22 in the direction of the arrow 52, and travels to the closed (lower) end 27b of the container 22, typically resting against the lower side 28 along the rear side 38.

The container 22 is then placed on a surface 54, such as the flat surface of a microwave oven 56, or other defrosting device or defrosting and cooking device. The microwave oven 56 can be adjusted and activated to defrost or defrost and cook the vegetables (food) of the block 50.

5 **[0034]** The container 22 can also be placed onto a flat surface and allowed to defrost in the ambient environment. The container 22, with the block of frozen vegetables 50 therein, rests in a tilted position or orientation, with the open end 27a above the closed end 27b of the container, such that the feet 36, 37 and closed end 27b of the container 22 are in contact with the flat surface 54, as shown in Fig. 3A.

10 **[0035]** Fig. 3B shows the vegetables 50 (no longer as a frozen block) in the microwave oven 56 with defrosting and/or cooking, now complete. Ambient defrosting would produce a similar result. The vegetables 50 have settled, as the liquid 58 from defrosting/and or cooking pools or collects in the interior cavity 24 at the closed end 27b of the container 22. The liquid 58 remains in the container 22, as
15 the level 60 of liquid 58 is below the lowermost apertures 30, 32.

[0036] As shown in Fig. 4, the container 22 with the defrosted and/or cooked food 50 is now removed from the microwave oven 56, and the block member 26 is reinserted into the cavity 24 (shown in broken lines) of the container 22, above the food 50. The block member 26 is pushed downward at the handle 26a, in the
20 direction of the arrow 64, with the contact portion 26b pushing against the food 50. The pushing is such that the food 50 is compressed or squeezed between the contact portion 26b of the block member 26 and the lower side 28 of the container body 27 , coupled with the confinement by the front 31, rear 38 and lateral 34, 35 sides, such that liquid 58 exits the apertures 30, 32.

25 **[0037]** Continued pressure downward (downward pushing) on the food 50 by the block member 26, may continue until as much liquid 58 as desired, or as possible, can be removed from the food 50, such that it is drained or strained. Moreover, the food 50 may be drained or strained, by applying strong manual forces downward on the block member 26 in the container 22, such that, for example, with
30 spinach and the like, the leaves are dry or will dry quickly. The exiting liquid 58 is typically directed to a sink 65, basin, or the like, eliminating any mess associated with the drainage or straining process.

[0038] The now-drained and/or, strained and potentially dried, depending on the sitting time post drainage, and in some cases cooked, food 50 may now be removed from the container 22. As shown in Fig. 5, the container 22 may now be inverted, over a bowl 66, pot, or the like, by a user 68, and tapped, or an instrument
5 inserted into the cavity 24, to free the food 50, such that it falls into the bowl 66.

[0039] While preferred embodiments of the disclosed subject matter have been described, so as to enable one of skill in the art to practice the disclosed subject matter, the preceding description is intended to be exemplary only. It should not be used to limit the scope of the disclosed subject matter, which should be determined by
10 reference to the following claims.

CLAIMS

What is claimed is:

1. An apparatus for defrosting and draining food comprising:
a container including an open end and a closed end and a first side and a
5 second side, an internal cavity between the first side, the second side
and the closed end configured for receiving food, and a plurality of
apertures at the closed end; and,
a block member correspondingly configured with respect to the shape of the
internal cavity for moving within the internal cavity to contact the food
10 and force liquid out through apertures of the plurality of apertures.
2. The apparatus of claim 1, wherein the container includes at least one
foot protruding from the container proximate to the open end, such that the container
rests on a flat surface in a tilted manner with the open end above the closed end.
3. The apparatus of claim 2, wherein the at least one foot includes two
15 oppositely disposed feet protruding from the container proximate to the open end.
4. The apparatus of claim 3, wherein the two oppositely disposed feet
attach to the container at the second side.
5. The apparatus of claim 4, wherein the plurality of apertures at the
closed end are formed in the first side.
- 20 6. The apparatus of claim 5, additionally comprising, oppositely disposed
lateral sides between the first side and the second side, and the plurality of apertures
includes apertures formed in at least one of the lateral sides proximate to the first side.
7. The apparatus of claim 6, wherein the container is of a microwave safe
plastic material.
- 25 8. The apparatus of claim 6, wherein the first side, the second side, the
lateral sides, the open end and the closed end define a container body, and the at least
one foot protrudes from the container body proximate to the open end, such that the

container body rests on a flat surface in a tilted position at least at approximately two degrees with respect to the horizontal, the horizontal defined by the flat surface.

9. An apparatus for processing food comprising:

a container comprising:

a container body including:

an open end and a closed end;

a first wall and a second wall oppositely disposed with respect to each other and extending between the open end and the closed end;

lateral walls, oppositely disposed from each other, intermediate the

first wall and the second wall, the lateral walls extending

between the open first end and the closed second end;

an interior cavity defined by the space between the first and second walls and the lateral walls; and

at least one aperture at least at the closed end of the container body;

and

at least one member in communication with the container body for maintaining the container body at an angle with respect to a surface, such that the open end is at an elevation greater than elevation of the closed end.

10. The apparatus of claim 9, wherein the at least one member is at least proximate to the open end of the container body.

11. The apparatus of claim 10, wherein the at least one member includes two feet oppositely disposed from each other at least proximate to each of the lateral walls.

12. The apparatus of claim 11, wherein the feet are attached to the container body at the second wall.

13. The apparatus of claim 10, wherein the interior cavity includes a longitudinal axis extending between the closed end and the open end and the at least one member is oriented at least substantially perpendicular to the longitudinal axis.

14. The apparatus of claim 13, wherein the at least one member is attached to the container body at the second wall.

15. The apparatus of claim 9, wherein the at least one aperture includes a plurality of apertures.

5 16. The apparatus of claim 13, wherein the plurality of apertures are positioned at the closed end of the container body and are formed in at least one of the lateral walls or the first wall.

17. The apparatus of claim 13, wherein the plurality of apertures are positioned at the closed end of the container body and are formed in the first wall and
10 at least one of the lateral walls, proximate to the first wall.

18. The apparatus of claim 17, wherein the at least one of the lateral walls includes the two lateral walls.

19. The apparatus of claim 9, additionally comprising: a block member for fitting inside of the interior cavity and being movable therein.

15 20. The apparatus of claim 19, wherein the block member includes a block with a shape corresponding to the cross-sectional shape of the interior cavity and a handle attached to the block.

21. The apparatus of claim 9, wherein the container is of a microwave safe plastic material.

20 22. A method for removing moisture from food comprising:
providing a container including an open end and a closed end and a first side and a second side, an internal cavity between the first side, the second side and the closed end configured for receiving food, and a plurality of apertures at the closed end; and,
25 placing frozen food into the internal cavity; and,
placing the container on a surface, such that the container is oriented on an angle and the open end is above the closed end.

23. The method of claim 22, additionally comprising: causing the frozen food to defrost, such that liquid collects in the internal cavity at the closed end of the container.

5 24. The method of claim 23, additionally comprising:
providing a block member correspondingly configured with respect to the
shape of the internal cavity for moving within the cavity; and,
moving the block member into the internal cavity and pushing the block
member toward the closed end of the container to contact the food and
force liquid out through apertures of the plurality of apertures.

10 25. The method of claim 24, additionally comprising:
removing the block member from the internal cavity; and,
removing the food from the container through the open end.

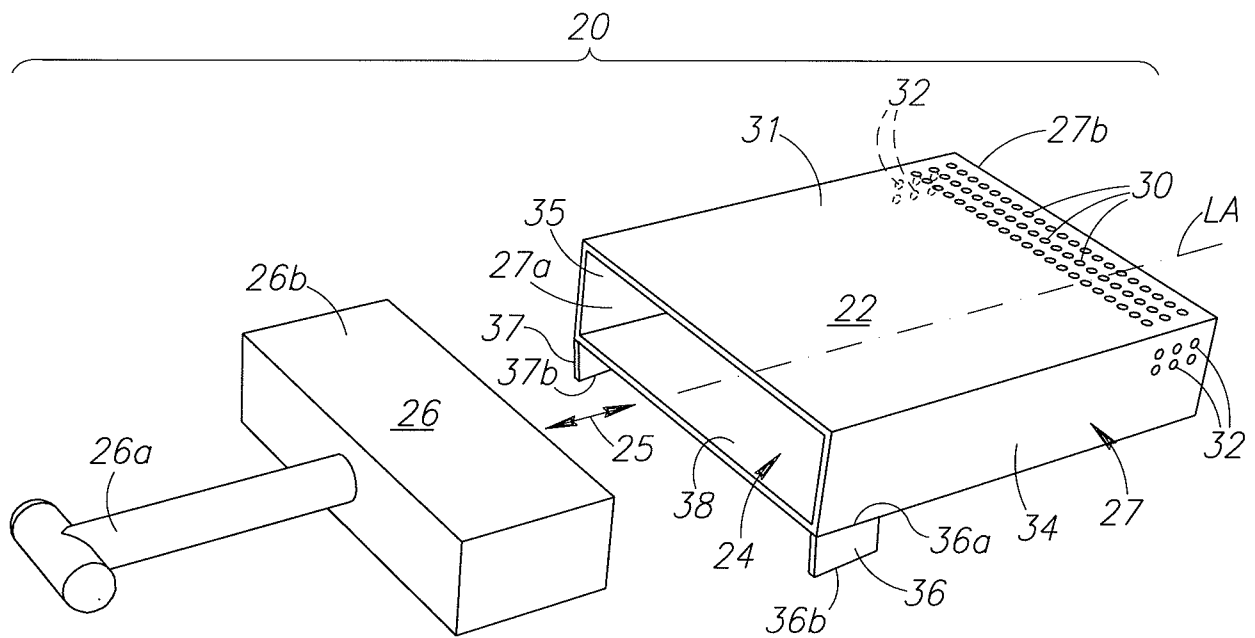
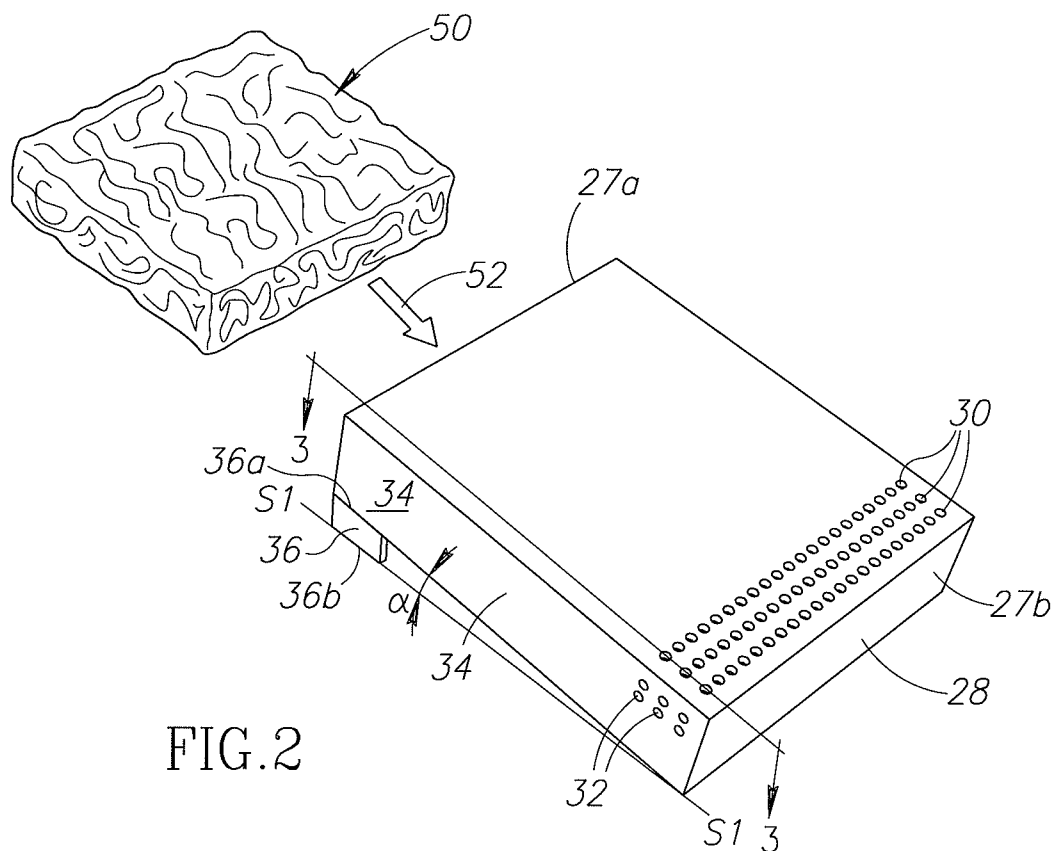
$1/4$ 

FIG.1



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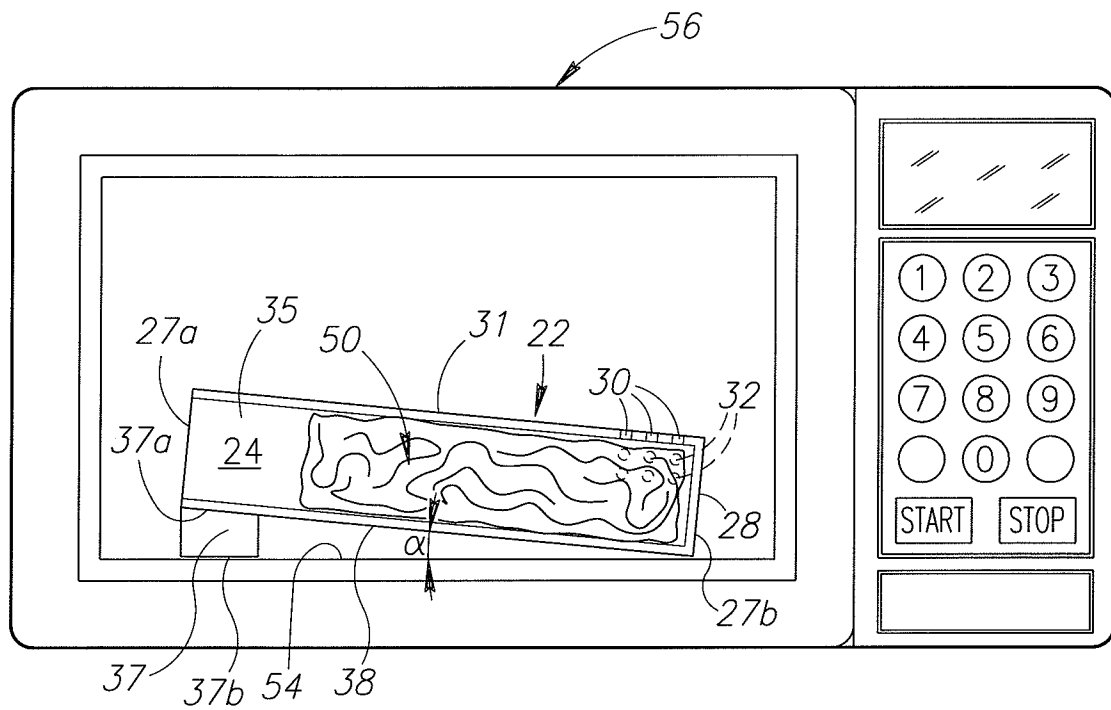


FIG. 3A

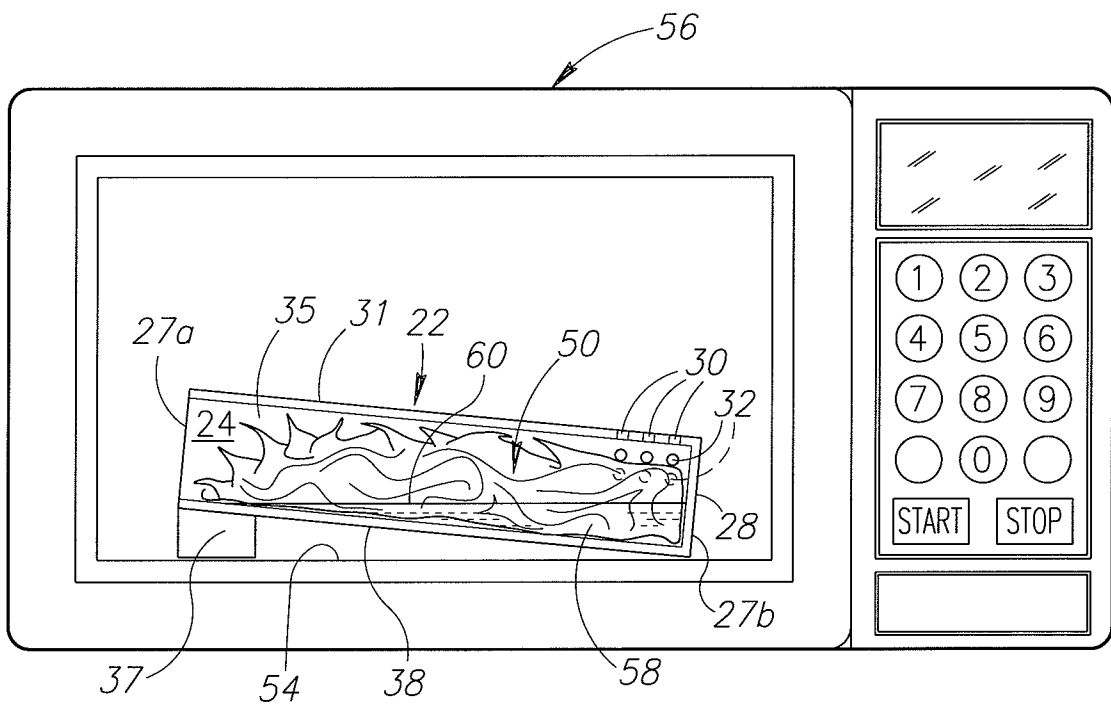


FIG. 3B

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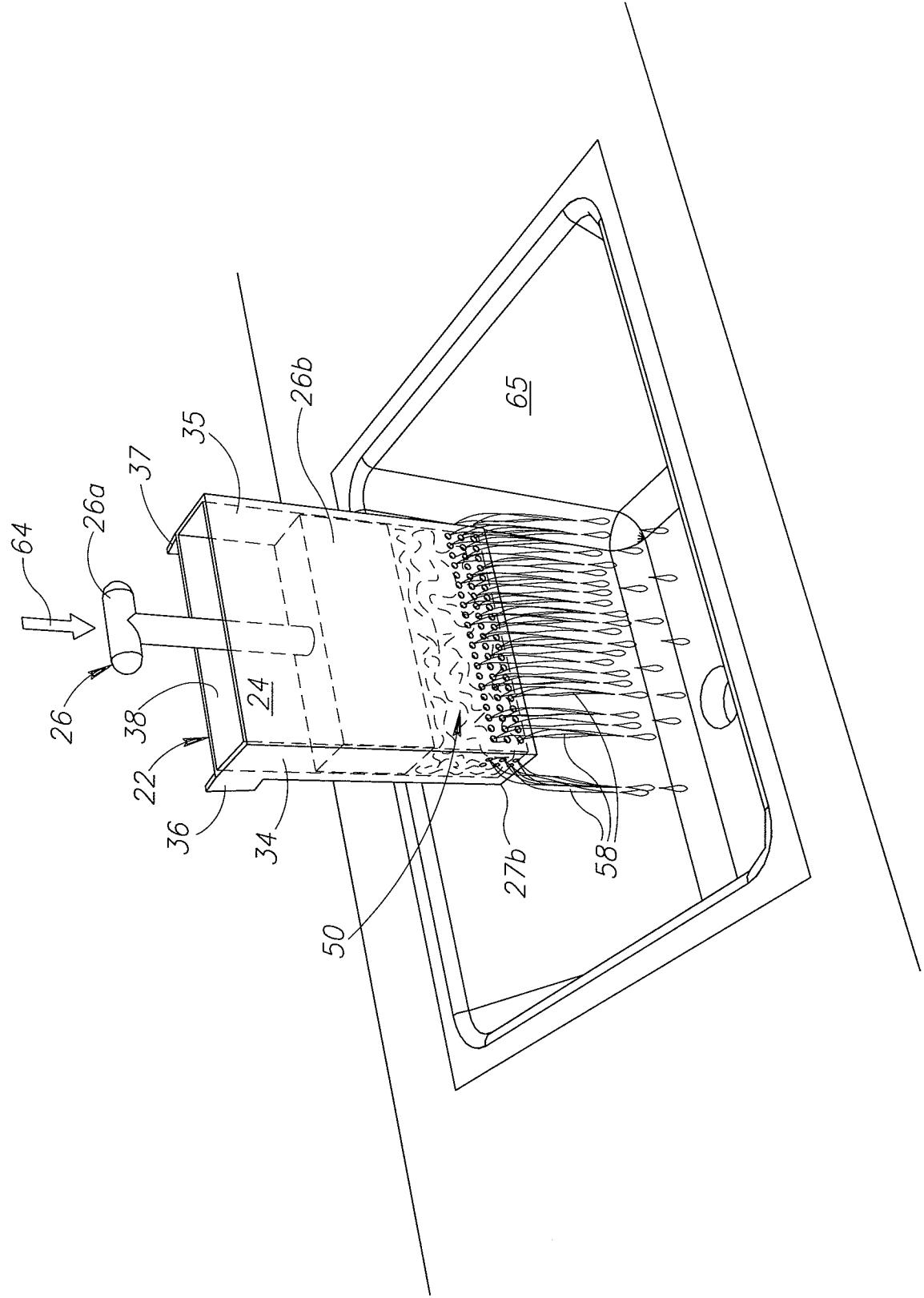


FIG. 4

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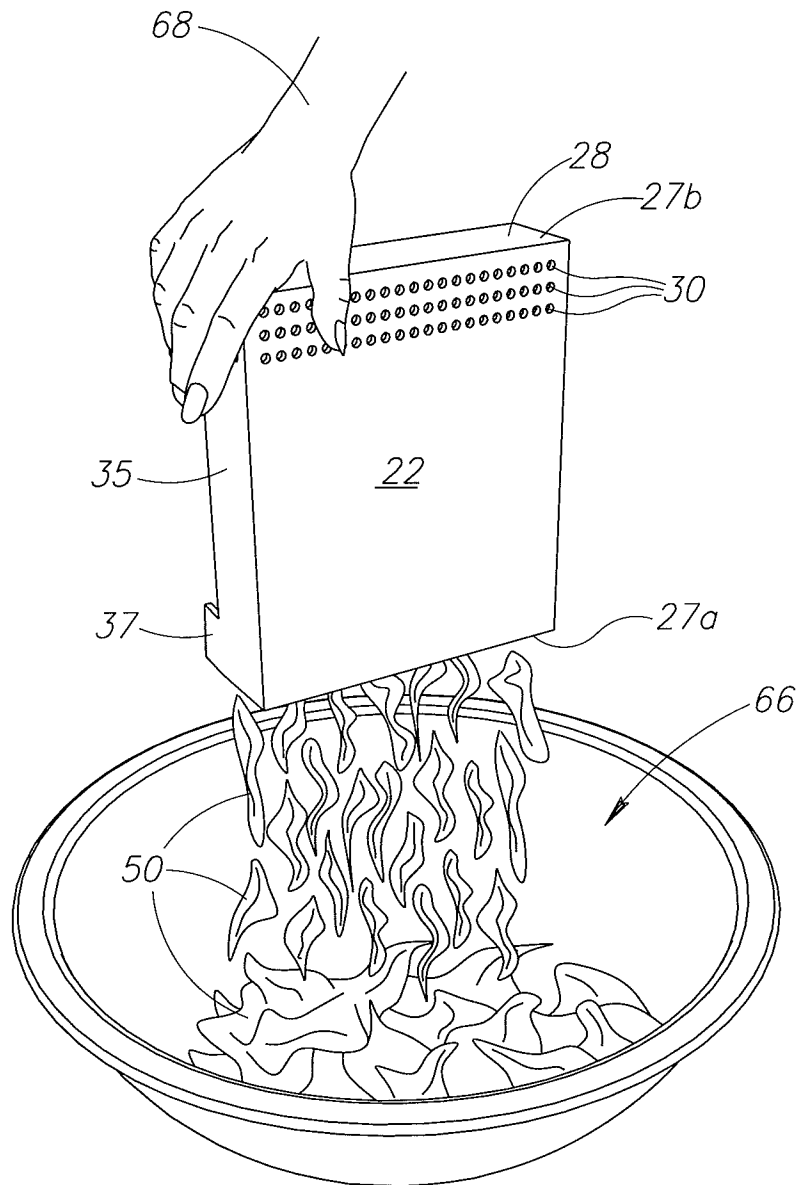


FIG.5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/054300**A. CLASSIFICATION OF SUBJECT MATTER*****F24C 15/00(2006.01)i, B65D 81/34(2006.01)i, A47J 36/24(2006.01)i, A47J 27/00(2006.01)i***

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)

IPC 8 F24C 15/00

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

Korean Utility Models and applications for Utility Models since 1975

Japanese Utility Models and applications for Utility Models since 1975

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

eKIPASS(KIPO internal) & keywords : defrost, container & aperture

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,972,059 A (DAN J. WENDT et al.) 20 November 1990 see column 7, line 41 - column 8, line 36	1-25
A	US 6,486,455 B1 (MUSTAPHA MERABET) 26 November 2002 see column 6, line 26 - column 8, line 6	1-25
A	US 2002/0020702 A1 (ICHIRO MATSUNO et al.) 21 February 2002 see page 3, paragraph [0050] - page 4 paragraph [0062]	1-25

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

* Special categories of cited documents:

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Date of the actual completion of the international search

20 JUNE 2008 (20.06.2008)

Date of mailing of the international search report

20 JUNE 2008 (20.06.2008)

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2008/054300

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