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Grabhorn et al.

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[54] **INSULATOR DEVICE**

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[52] **U.S. Cl.**..... **220/23.86,** 220/97 B, 220/9 F, 220/22.3, 206/4

[51] **Int. Cl.**... **A47g 19/00,** B65d 21/00, B65d 25/18

[58] **Field of Search** ..... 220/23.6, 20, 22.1, 22.3, 220/17, 97 R, 9 F, 97 B, 4 C, 23.8, 63 R, 64, 23.86, 23.83; 249/126; 229/14 R, 14 H, DIG. 11; 206/DIG. 15, 4

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[57] **ABSTRACT**

A plastic, heat insulating ring whose lower perimeter is formed with an exterior bevel surface proportioned and designed to conform to, and be supported upon, the upwardly and outwardly flared lip of a conventional serving tray and whose upper perimeter is formed with a corresponding interior bevel surface proportioned and designed to conform to and support the external surface of such a tray lip, and a transverse divider within the ring which, in some instances, may be selectively positioned at various locations within the ring, and in some instances may be nonrectilinear. In one embodiment, the ring is an integral mold of urethane foam with a heat-formed sealing skin and in another embodiment it may be integrated from mating molded plastic shells filled with such foam and subsequently welded or otherwise secured together.

12 Claims, 8 Drawing Figures

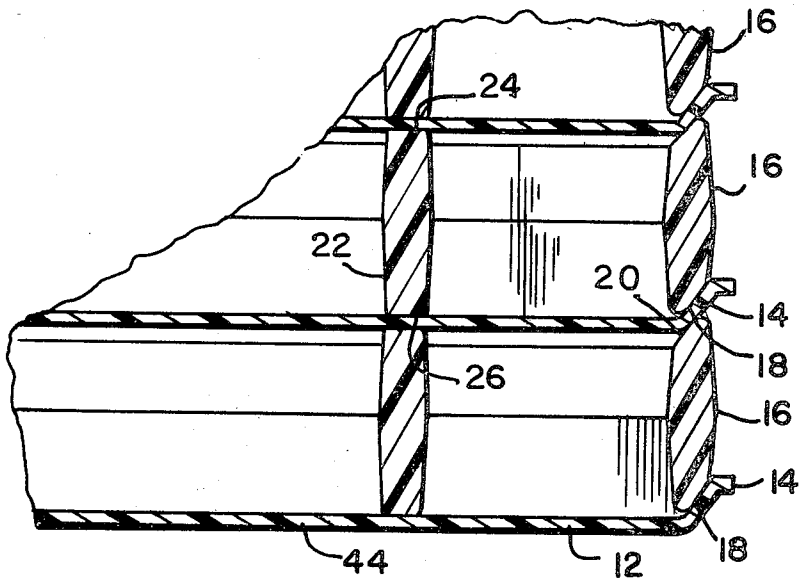
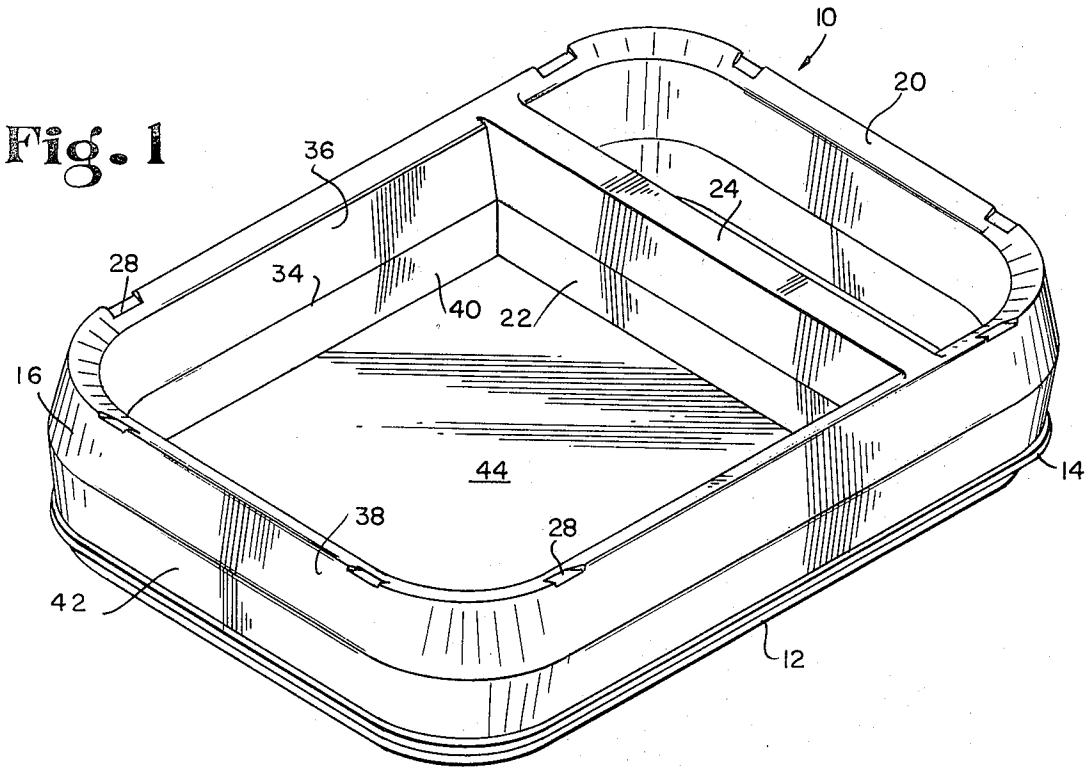


Fig. 1



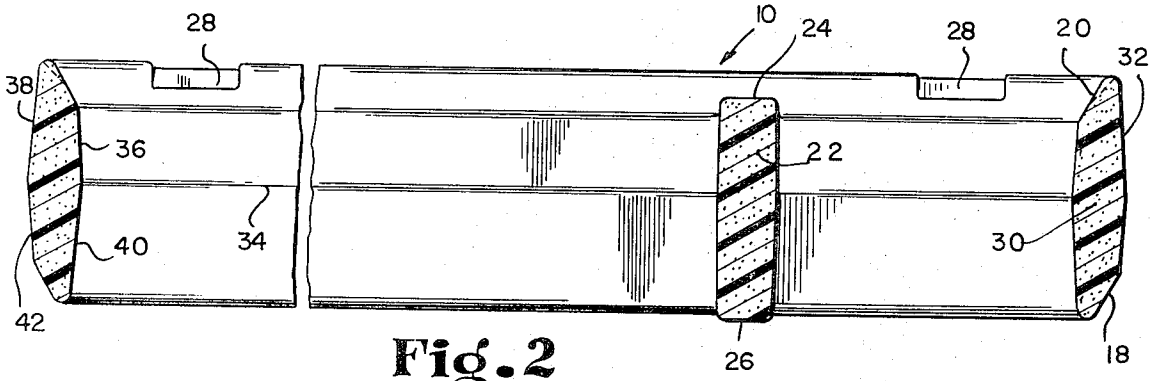


Fig. 2

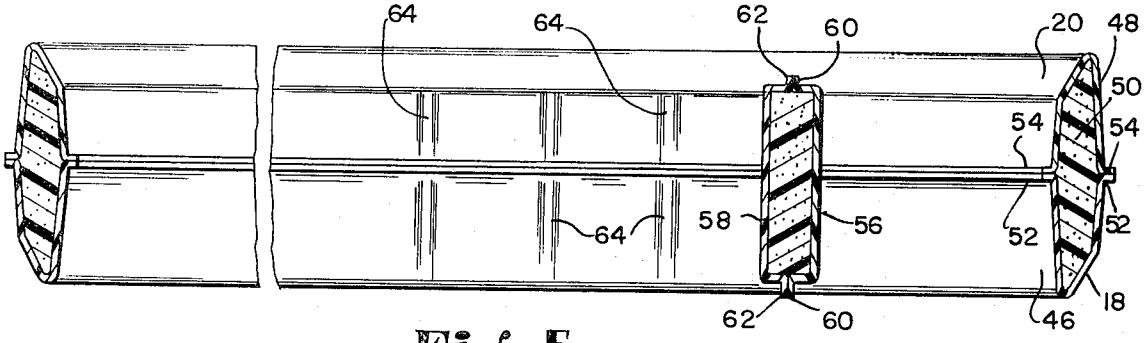
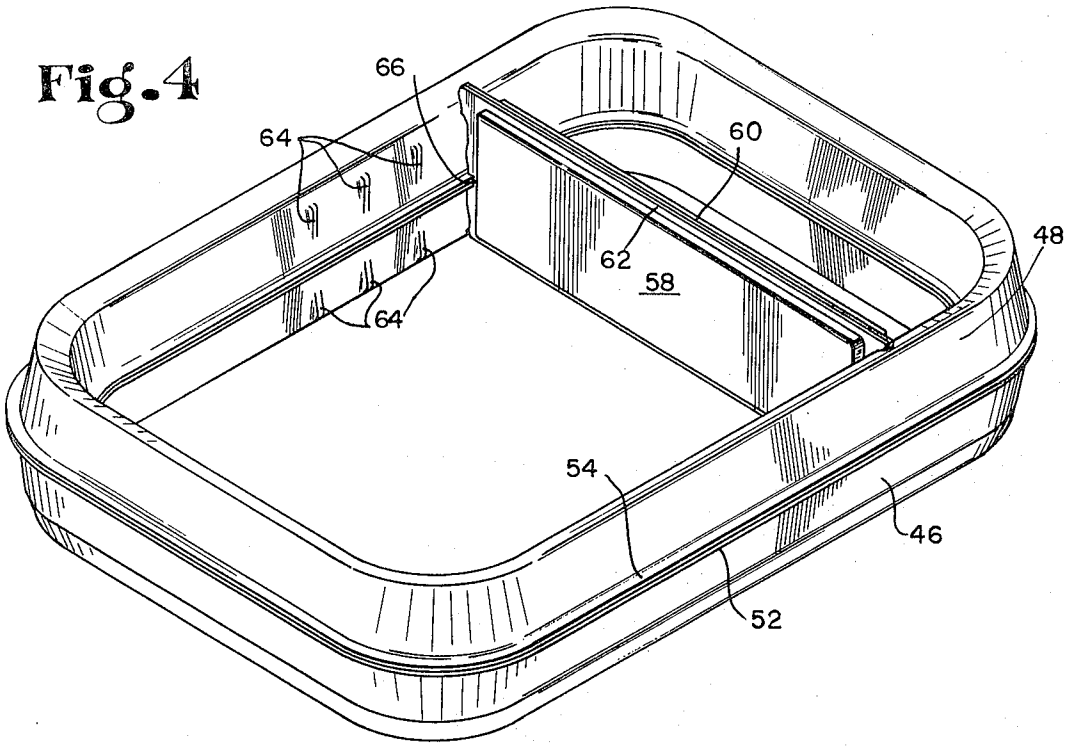


Fig. 5

Fig.4



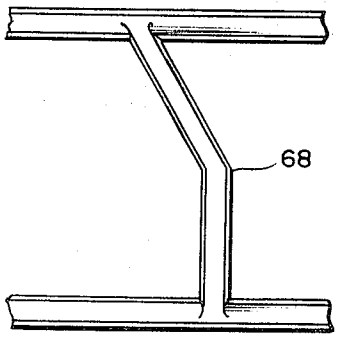


Fig.6

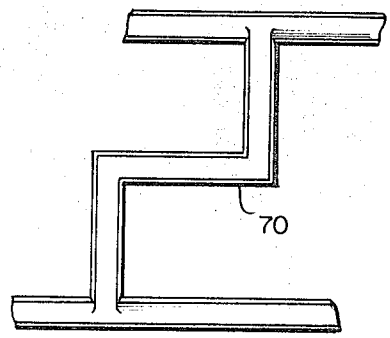


Fig.7

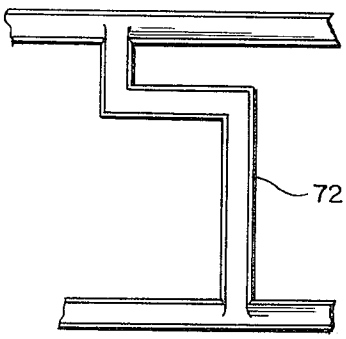
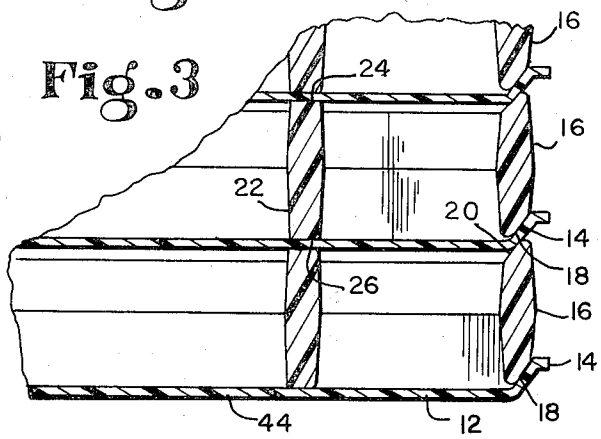


Fig.8

Fig.3



INSULATOR DEVICE

The present invention relates to a heat insulator device primarily intended for use with conventional serving trays for facilitating the stacking of loaded trays. The device is particularly useful when some or all of the trays in a stack are loaded with hot dishes in one area and cold dishes in another area.

The primary object of the invention is to provide an easily-fabricated, inexpensive, light, strong, readily-maintainable device for the purpose described which will guard to a maximum degree against heat flow between trays in a stack and between hot articles and cold articles on a tray. Still further objects will appear as the description proceeds.

To the accomplishment of the above and related objects, this invention may be embodied in the forms illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that change may be made in the specific constructions illustrated and described, so long as the scope of the appended claims is not violated.

In the drawings:

FIG. 1 is a perspective view of one embodiment of our invention supported upon a tray;

FIG. 2 is an enlarged longitudinal section through the device;

FIG. 3 is a fragmentary section through a portion of a stack of trays and intervening insulator devices;

FIG. 4 is a view similar to FIG. 1 but showing a modified form of the invention;

FIG. 5 is a view similar to FIG. 2 but showing the modification of FIG. 4; and

FIGS. 6, 7 and 8 are fragmentary plan views illustrating various forms of nonrectilinear divider elements.

Referring more particularly to FIGS. 1 to 3, it will be seen that we have illustrated a generally oblong ring 10 resting upon a conventional serving tray 12 having the usual upwardly and outwardly flared lip or rim 14. The ring 10 comprises a continuous perimetral wall 16 formed with a downwardly and inwardly inclined bevel surface 18 at its lower exterior perimeter. The surface 18 is proportioned and designed to conform to the interior surface of the tray lip 14 so that, as is perhaps most clearly illustrated in FIG. 3, when a ring 10 is associated with a tray 12, the surface 18 of the ring will be supported upon the internal surface of the tray lip 14.

The wall 16 is further formed with a corresponding downwardly and inwardly inclined bevel surface 20 at its upper interior perimeter. The inclination of the surface 20 conforms to that of the surface 18 so that, when another tray 12 is rested upon the upper surface of the ring 10, the external surface of its lip 14 will bear upon and be supported by the bevel surface 20.

A transverse divider wall 22 extends across the interior of the ring 10 at a suitable location for a purpose which will appear. As is most clearly to be seen in FIG. 2, the upper surface 24 of the wall 22 is located below the top of the ring 10 but above the bottom of the bevel surface 20 so that, when a tray 12 is supported upon the surface 20, the tray floor 44 will substantially bear upon the wall surface 24; and the lower surface 26 of the wall 22 is disposed slightly below the bottom of the ring 10 so that, when the surface 18 is supported from a tray lip 14, the wall 22 will extend close to the floor 44 of the supporting tray.

We may provide a plurality of notches 28 in the upper edge of the ring 10 to guard against the formation of a vacuum within the space bounded by a ring, a supporting tray and a supported tray. Each notch 28 opens from the interior of the ring to the exterior thereof. Conventional trays are sometimes provided with locating pads about their perimeters, and the notches 28 are positioned to accommodate such pads.

In the form of invention illustrated in FIGS. 1 and 2, the wall 16 is a molding comprising an integral, perimetrally continuous body 30 of urethane foam which has been heat treated to define a continuous, liquid-tight skin 32. As shown, the divider 22 is formed as an integral part of the molding. As will be seen, the piece may be formed in a two-part mold with a parting line 34 disposed intermediate draft surfaces 36, 38 and 40, 42. Preferably, the continuous skin will be given a finished surface of epoxy gel.

It will be readily perceived that the ring as above described can be very inexpensively produced. The lightness and strength, as well as the heat insulating capacities, of urethane foam are well known. The skin surface of the molding can be produced in a flash heating operation and, particularly with the epoxy gel finish, will render the article liquid proof and readily cleanable. Because of the provision of the divider wall 22, hot dishes on one side of the tray with which our ring is used will not significantly lose heat during transportation and cold dishes arranged on the other side of the divider wall will not significantly absorb heat. At the same time, the urethane foam insulator ring will not conduct heat from one tray to another in a stack of the character suggested in FIG. 3.

In the form of invention illustrated in FIGS. 4 and 5, the insulator ring is integrated from a plurality of separately produced parts. For instance, mating plastic shells 46 and 48 having mating open mouths surrounded by lips 52 and 54 are formed and suitably filled with urethane foam indicated at 50. The two rings are then brought together with their open mouths in registry and the lips 52 are welded or otherwise suitably secured to the lips 54 to produce a liquid-proof joint. The shell 46 is formed to define a bevel surface 18 and the shell 48 is formed to provide a bevel surface 20.

The divider wall used with this form of the invention may be formed from mating shells 56, 58 provided with perimetral lips 60 and 62 respectively. After filling with urethane foam, the two shells may be brought together with the lips 60 and 62 in registry and the lips may then be suitably sealed to provide a liquid-proof wall.

In this form of the invention, the divider wall 50 may be adjustably positioned within the ring. Perimetrally spaced notches 64 may be formed in each of the shells 46, 48, selectively to receive portions of the perimetral flange defined by the lips 60, 62; and that flange may, in turn, be notched at 66 to receive the flange defined by the interior lips 52, 54.

Thus, the relative areas of the tray floor for receiving hot food and for receiving cold food may be varied as desired.

It may be convenient for the arrangement of hot and cold dishes to use a nonrectilinear divider wall; and in FIGS. 6, 7 and 8 we have shown divider walls 68, 70 and 72 respectively of different shapes for that purpose. While FIGS. 6, 7 and 8 show integral divider walls, it will be apparent that, if suitable securing means

(not shown) is provided, such nonrectilinear divider walls may be adjustably positioned within the ring even though they are not integral with the ring.

It will be appreciated that disposable liners may be placed between the upper surface **20** of each ring **10** and the tray **12** resting thereon to shield the food serving from the bottom of the tray. Such liners, which may inexpensively be fabricated from paper or plastic, may be required by some health authorities. It will further be appreciated that we may provide an insulated cover for the top of each stack of trays **12** and rings **10** to insulate and protect the food on the top tray.

We claim as our invention:

1. A heat insulating device comprising a ring formed from heat insulating material and formed to provide a downwardly and inwardly inclined bevel surface about its lower exterior perimeter and a corresponding downwardly and inwardly inclined bevel surface about its upper interior perimeter.

2. The device of claim **1** including a transverse wall of insulating material within said ring.

3. The device of claim **2** in which the upper surface of said transverse wall is disposed below the plane of the upper perimeter of said ring.

4. The device of claim **3** in which the lower surface of said transverse wall is disposed below the plane of the lower perimeter of said ring.

5. The device of claim **1** in which one of said perimeters is formed with a ventilating notch opening from the interior of said ring to its exterior.

6. The device of claim **1** in which said ring is formed to provide interior and exterior draft surfaces from a plane intermediate its upper and lower perimeters to said perimeters.

7. The device of claim **1** in which said ring is formed to provide interior and exterior draft surfaces from a plane substantially midway between its upper and lower perimeters to said perimeters.

8. The device of claim **1** in which said ring consists of a continuous wall of urethane foam with an enveloping substantially liquid-proof skin.

9. The device of claim **1** in which said ring consists of a mating pair of open-mouthed, continuous shells of self-sustaining, substantially liquid-proof plastic filled with urethane foam and sealed together mouth-to-mouth.

10. The device of claim **2** in which the interior of said ring is formed with a plurality of opposed pairs of recesses for the selective reception of opposite ends of said transverse wall.

11. For use with a tray having an upstanding, outwardly inclined perimetral lip, a device as defined in claim **1** in which said bevel about its lower exterior perimeter is proportioned and designed to conform to the interior surface of said tray lip.

12. A food service system comprising a plurality of serving trays, each tray having an upstanding, outwardly inclined perimetral lip, a plurality of heat insulating rings disposed respectively between and separating said trays, each said ring being formed from heat insulating material, and each said ring being formed at its lower perimeter, to engage the lip of the subjacent tray and, at its upper perimeter, to engage the outer surface of the lip of the superjacent tray.

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