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(54) Insulation front of ice storage compartment

(57) A refrigerator includes a refrigerator cabinet (12), a fresh food compartment (13) disposed within the refrigerator cabinet, a door (14) for providing access to the fresh food compartment (13), and an ice storage bin (40) at the door (14). The ice storage bin (40) includes an ice storage bin body having a front, a back, a bottom, opposite sides, an open top, and a cover (45) mounted to the top. Insulation (47) is provided between the cover (45) and the front of the ice storage bin. The ice storage bin (40) may be pivotally mounted to the door and configured to tilt open to allow for access to ice disposed within the ice storage bin (40). The ice storage bin (40) may be removable. The ice storage bin (40) may be accessed directly from within the fresh food compartment.

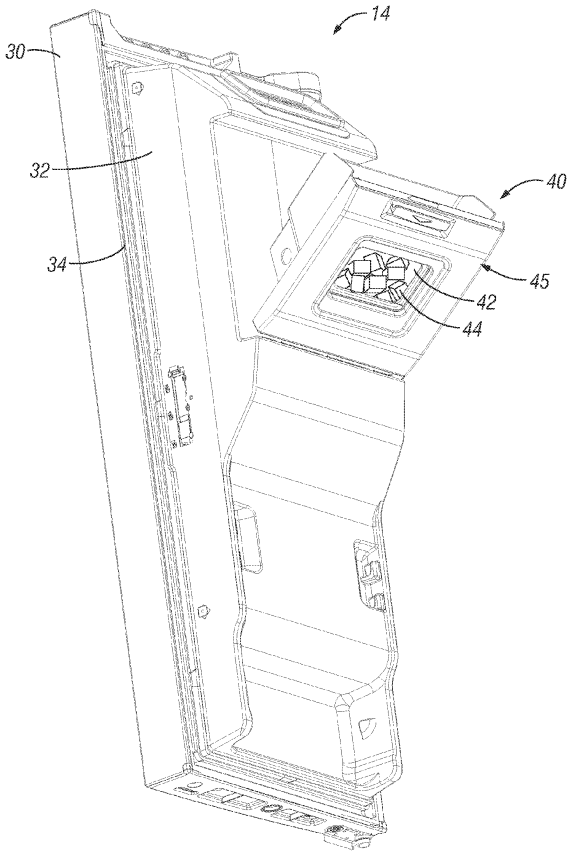

FIG. 3

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Description

[0001] The present invention relates to refrigerators. More specifically, but not exclusively, the present invention relates to refrigerators with ice being stored in a location remote from the freezer such as in a fresh food compartment door.

[0002] Refrigerators typically include ice storage bins. In one configuration of a refrigerator, the ice storage bin may be located at the door of the refrigerator. Either the ice is made at the door and stored in the ice storage bin or the ice is made elsewhere such as in a freezer compartment or ice maker compartment and the ice is conveyed to the ice storage bin at the door. In typical operation, a user can dispense ice using an ice and water dispenser located at the door. Alternatively, the user can open the door of the refrigerator to access the ice bin. However, the ice bin is typically in some form of insulated compartment, as the ice must be kept at a temperature lower than the temperature of the fresh food compartment. Thus, a user must perform additional steps in order to access the ice. These additional steps may include first opening a compartment door and then opening or removing the ice bin. What is needed is an easier and more convenient way to access the ice.

[0003] Therefore, the present invention provides for an ice storage bin which may be accessed directly from within the fresh food compartment.

[0004] According to one aspect of the present invention, a refrigerator is provided. The refrigerator includes a refrigerator cabinet, a fresh food compartment disposed within the refrigerator cabinet, a door for providing access to the fresh food compartment, and an ice storage bin at the door. The ice storage bin includes an ice storage bin body having a front, a back, a bottom, opposite sides, an open top, and a cover mounted to the top. Insulation is provided between the cover and the front of the ice storage bin.

[0005] According to another aspect of the present invention, an ice storage bin is provided. The ice storage bin includes an ice storage bin body having a front, a back, a bottom, first and second opposite sides, and an open top. Insulation is positioned between the front of the ice storage bin body and the cover.

[0006] According to another aspect of the present invention, a refrigerator is provided. The refrigerator includes a refrigerator cabinet, a fresh food compartment disposed within the refrigerator cabinet, a door for providing access to the fresh food compartment, and an ice storage bin at the door, the ice storage bin including an ice storage bin body having a front with integrated insulation, a back, a bottom, opposite sides, and an open top. There is a first nub on the first side of the ice storage bin and a second nub on the second side of the ice storage bin. There are first and second guide members associated with the door which may be positioned on a mounting place. The first and second guide members are configured to provide for a first position wherein the ice storage bin is closed, a second position wherein the ice storage bin is tilted open to allow for access to ice disposed within the storage bin, and a third position wherein the nubs are beyond the guide members and the ice storage bin is removed from the door.

The refrigerator may further comprise a handle on the cover of the ice storage bin body, e.g. a recessed handle. The cover of the ice storage bin body may extend below the bottom of the ice storage bin body. The cover of the ice storage bin body may include an insulated window. The cover of the ice storage bin body may be taller and longer than the back of the ice storage bin body. The first and second guide members may be operatively connected to a mounting plate.

The invention will be further described by way of example with reference to the accompanying drawings, in which:-

[0007] FIG. 1 is a perspective view illustrating one embodiment of a refrigerator with an ice bin with a window (not shown).

[0008] FIG. 2 is a perspective view showing an ice bin with a window on a fresh food compartment door of a refrigerator, with the ice bin in a closed position.

[0009] FIG. 3 is a perspective view illustrating the ice bin with a window on a fresh food compartment door of a refrigerator, with the ice bin tilted outwardly.

[0010] FIG. 4 is a perspective view illustrating the ice bin removed from the refrigerator.

[0011] FIG. 5 is a top view of an ice bin.

[0012] FIG. 1 is a perspective view illustrating one embodiment of a refrigerator with an ice bin with a window. The refrigerator 10 has a cabinet or cabinet 12. The cabinet 12 is an insulated cabinet. A left refrigerator door 14 and a right refrigerator door 16 provide access to a fresh food compartment 13. A freezer drawer 18 may be extended to provide access to items stored in a freezer compartment 19. An ice and water dispenser 20 is positioned on the left refrigerator door 14. An ice maker 21 is shown which is remote from the freezer compartment 19.

[0013] Note that in the embodiment shown in FIG. 1, the ice and water dispenser 20 is on the left refrigerator door 14 of the fresh food compartment 13. Thus, if ice is also stored at the fresh food compartment door 14, the ice must be kept at a temperature lower than that of the fresh food compartment 13.

[0014] FIG. 2 is a perspective view showing an ice bin 40 removably connected to an inside of the fresh food comportment door 14 with the ice bin 40 in a closed position. In FIG. 2, a fresh food compartment door 14 has an outer case 30, an inner case 32, and a seal 34. An ice bin 40 is removably mounted on the door 14. The ice bin 40 is shown in a closed position for insulating ice 44 within the ice bin 40 from the higher temperature associated with the fresh food compartment. An ice bin window 42 allows a user to see the ice level of the ice 44 within the ice bin 40 without opening the ice bin 40, although the ice bin window 42 need not be present. The ice bin 40 has a cover 45 with insulation behind the cover.

[0015] FIG. 3 is a perspective view illustrating the ice bin 40 with a window 42 on a fresh food compartment door 14 of a refrigerator, with the ice bin 40 tilted outwardly to provide access to ice 44 within the ice bin 40. Thus, the ice bin 40 has a second position where the ice bin 40 pivots open to allow for access to the ice within the ice bin.

[0016] FIG. 4 is a perspective view illustrating the ice bin 40 removed removed from the refrigerator. The ice bin 40 may be removably mounted to a mounting plate 58 associated with the door 14. One manner of doing so is to have nubs or protrusions or pins 54 on the ice bin 40 which fit guides such as semi hemispherical apertures 60 on the inside portion of the fresh food compartment door, thereby allowing the ice bin 40 to pivot open to provide access to ice within the ice bin 40 and also to allow the ice bin 40 to be easily and removed from the door 14 and replaced back onto the door 14. Instead of using the type of guides shown, the guides may have other forms such as being tracks, or more elongated channels. Thus, as previously discussed, in a first position the ice bin is closed. In a second position, the ice bin is pivotally open to allow for access to ice within the ice bin and in a third position, the ice bin may be removed by simply lifting the ice bin from guides in the inside portion of the fresh food compartment door. Thus, a user of the refrigerator is provided with easy access to the ice stored within the fresh food compartment. Instead of using the ice and water dispenser, the user may simply open the fresh food compartment door 14 and then tilt open the ice bin 40 to remove large amounts of ice or alternatively, simply remove the ice bin 40 to remove the ice when large quantities of ice are desired, such as for filling a cooler. The ability to remove the ice bin 40 also provides other advantages. For example, the ability to remove the ice bin 40 facilitates easier cleaning of the ice bin 40.

[0017] FIG. 5 is a top view of an ice bin. The ice bin 40 includes a front wall 46, a back wall 68, and opposite side walls 64, 70. The ice bin 40 also includes a front cover 45. Insulation 47 is positioned between the front wall 46 and the cover 45 to thereby integrate insulation into the ice bin 40. The nubs or pins 54 extend outwardly from the opposite side walls 64, 70 to connect with guides. An ice auger 74 and crushing assembly 72 are also shown disposed within the ice bin 40. The ice auger 74 shown extends upwardly from the bottom 62 of the ice bin 40.

[0018] The ice bin 40 has a handle 50 on the cover 45. The handle 50 may be a recessed handle, recessed in an opening 48. A window 42 is shown. The window 42 is preferably formed of a glass or plastic material. The window 42 may be made of a material sufficiently thick to provide for desired insulation or from multiple lanes. Between the cover 45 and the front 46, the ice bin 40 includes an insulation 47. The insulation 47 may be expanded polystyrene (EPS) foam or other type of insulation. Note that the cover 45 of the ice bin has a greater height and width than the side walls 64, 70 of the ice bin 40 and the back wall 68.

[0019] A refrigerator with an ice storage bin with an insulated front wall has been described. The ice storage bin may provide various advantages including ease of use and convenience for a user wishing to retrieve ice from the ice bin of a refrigerator. The use of an insulated front wall for the ice bin allows the ice bin to be directly access from the fresh food compartment. Although specific embodiments are described herein, there are numerous variations, options, and alternatives, including variations in the structure or configuration of the refrigerator, and variations in the type of material used. The present invention is not to be limited to the specific embodiments described herein or combinations of the specific embodiments described but is defined by the following claims.

Claims

1. A refrigerator, comprising:

a refrigerator cabinet;
a fresh food compartment disposed within the refrigerator cabinet;
a door for providing access to the fresh food compartment;
an ice storage bin at the door, the ice storage bin comprising an ice storage bin body having a front, a back, a bottom, opposite sides, an open top, and a cover mounted to the front; and
wherein insulation is positioned between the cover and the front of the ice storage bin.

2. The refrigerator of claim 1 wherein the ice storage bin is pivotally mounted to the door and configured to tilt open to allow for access to ice disposed within the ice storage bin.

3. The refrigerator of claim 1 or 2, further comprising a first nub on the first side of the ice storage bin and a second nub on the second side of the ice storage bin.

4. The refrigerator of claim 3 further comprising guide members on a mounting plate positioned on the door, the first and second nubs configured to fit into the guide members to provide for a first position wherein the ice storage bin is closed, a second position wherein the ice storage bin is tilted open to allow for access to ice disposed within the storage bin, and a third position wherein the nubs are beyond the guide members and the ice storage bin is removed from the door.

5. The refrigerator of claim 4 wherein an insulated window is integrated into the front of the ice storage bin.

6. The refrigerator of any one of claims 1 to 5 further

comprising a handle on the front of the ice storage bin body.

7. The refrigerator of claim 6 wherein the handle is a recessed handle.

8. The refrigerator of any one of claims 1 to 7 wherein the cover of the ice storage bin body extends below the bottom of the ice storage bin body.

9. An ice storage bin, comprising:

an ice storage bin body having a front, a back, a bottom, first and second opposite sides, an open top, and a cover mounted to the front; wherein insulation is integrated between the front of the ice storage bin body and the cover.

10. The ice storage bin of claim 9 further comprising a first nub extending outwardly from the first side of the ice storage bin body and a second nub extending outwardly from the second side of the ice storage bin body, the first and second nub configured to fit within guide members associated with refrigerator door.

11. The ice storage bin of claim 9 or 10 wherein the cover of the ice storage bin body extends below the bottom of the ice storage bin body.

12. The ice storage bin of claim 9, 10 or 11 wherein the ice storage bin body includes an insulated window to provide for viewing through the cover and the front of the ice storage bin body.

13. The ice storage bin of claim 9, 10, 11 or 12 further comprising an ice auger.

14. The ice storage bin of claim 9, 10, 11 or 12 further comprising an ice crushing assembly.

15. A refrigerator comprising a fresh food compartment and the ice storage bin of any one of claims 9 to 14 operatively connected to a door of the fresh food compartment.

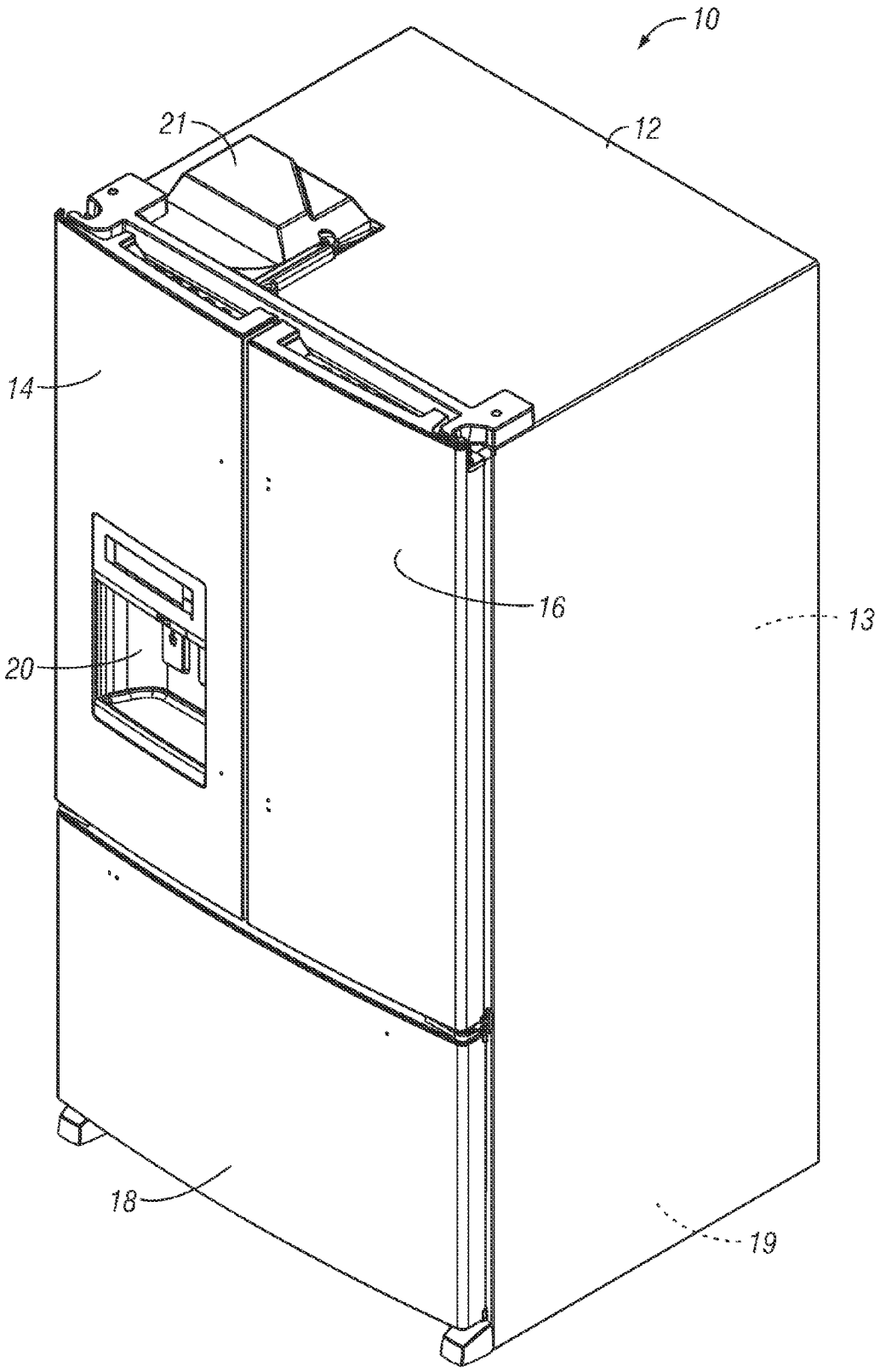

FIG. 1

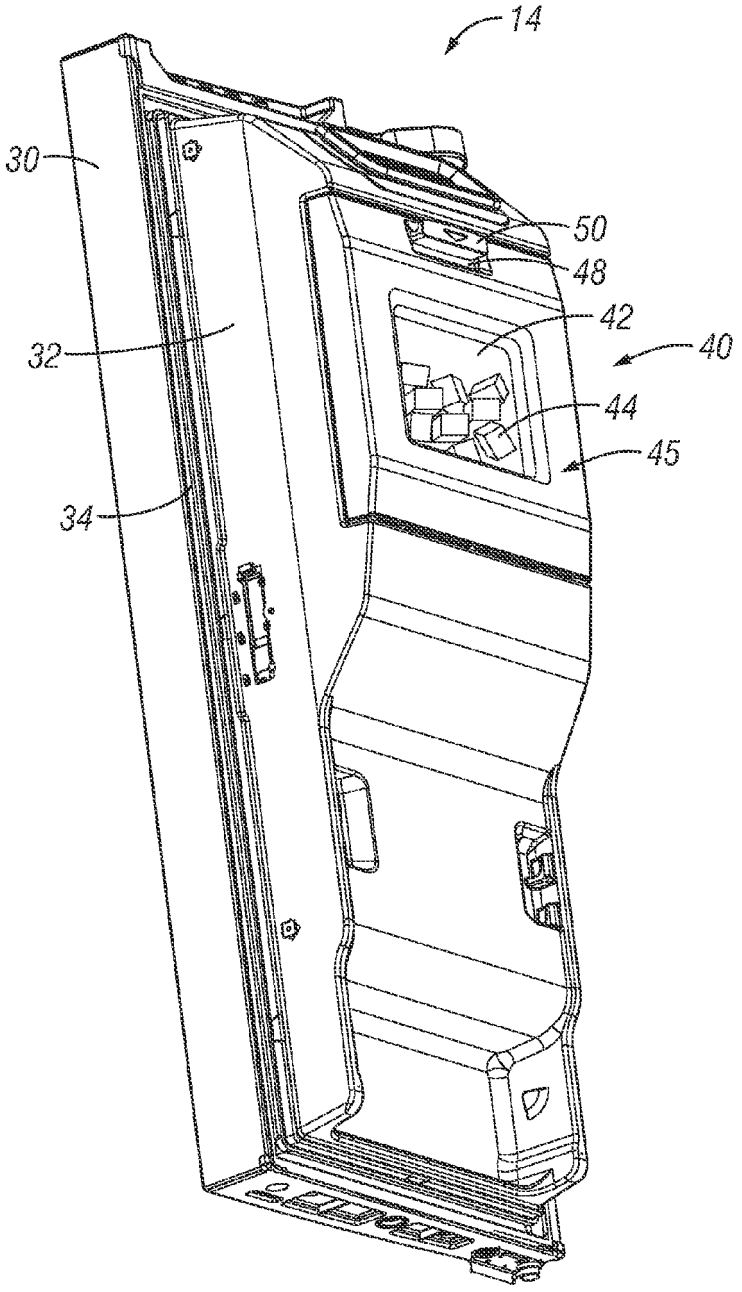

FIG. 2

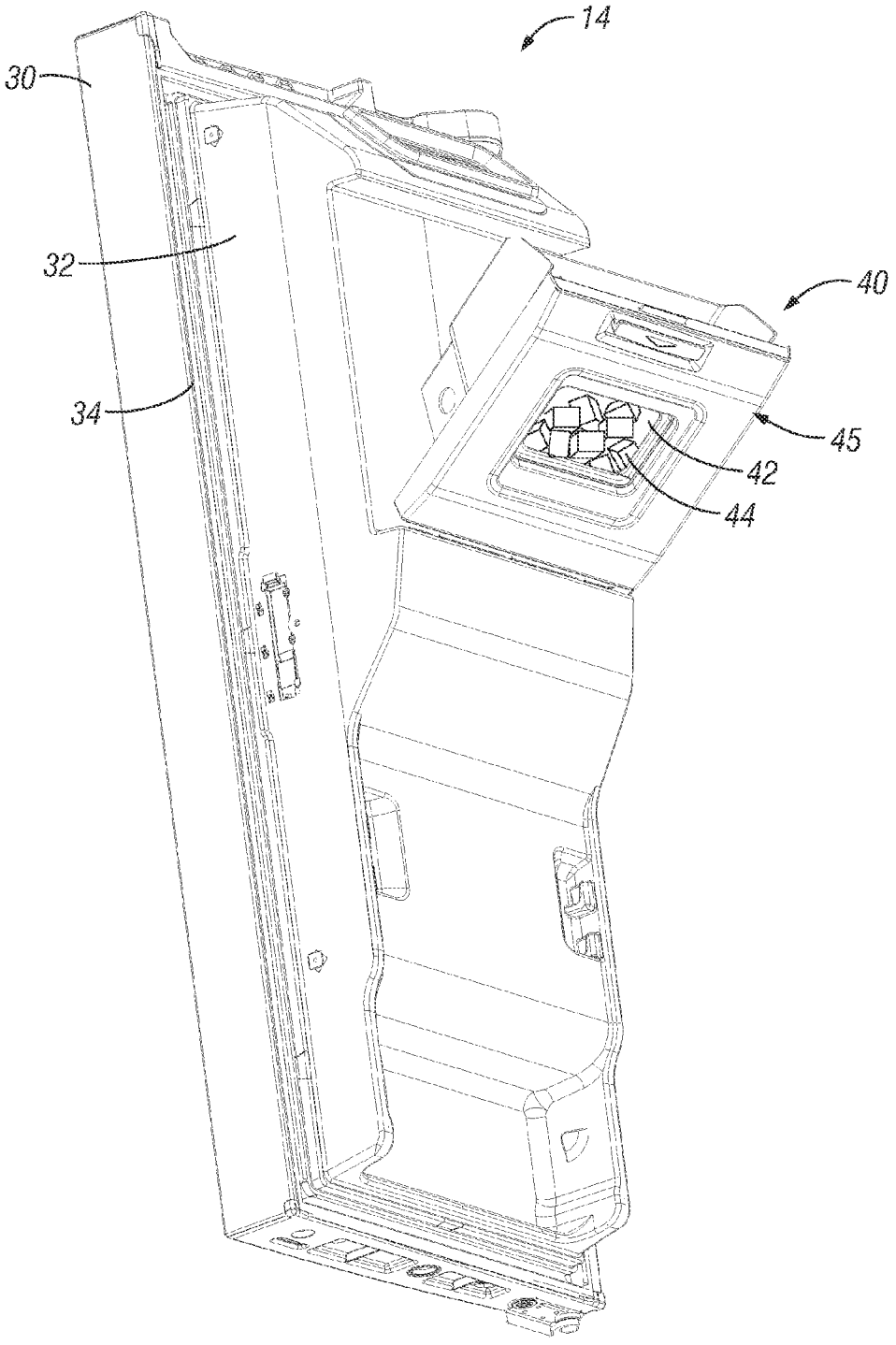

FIG. 3

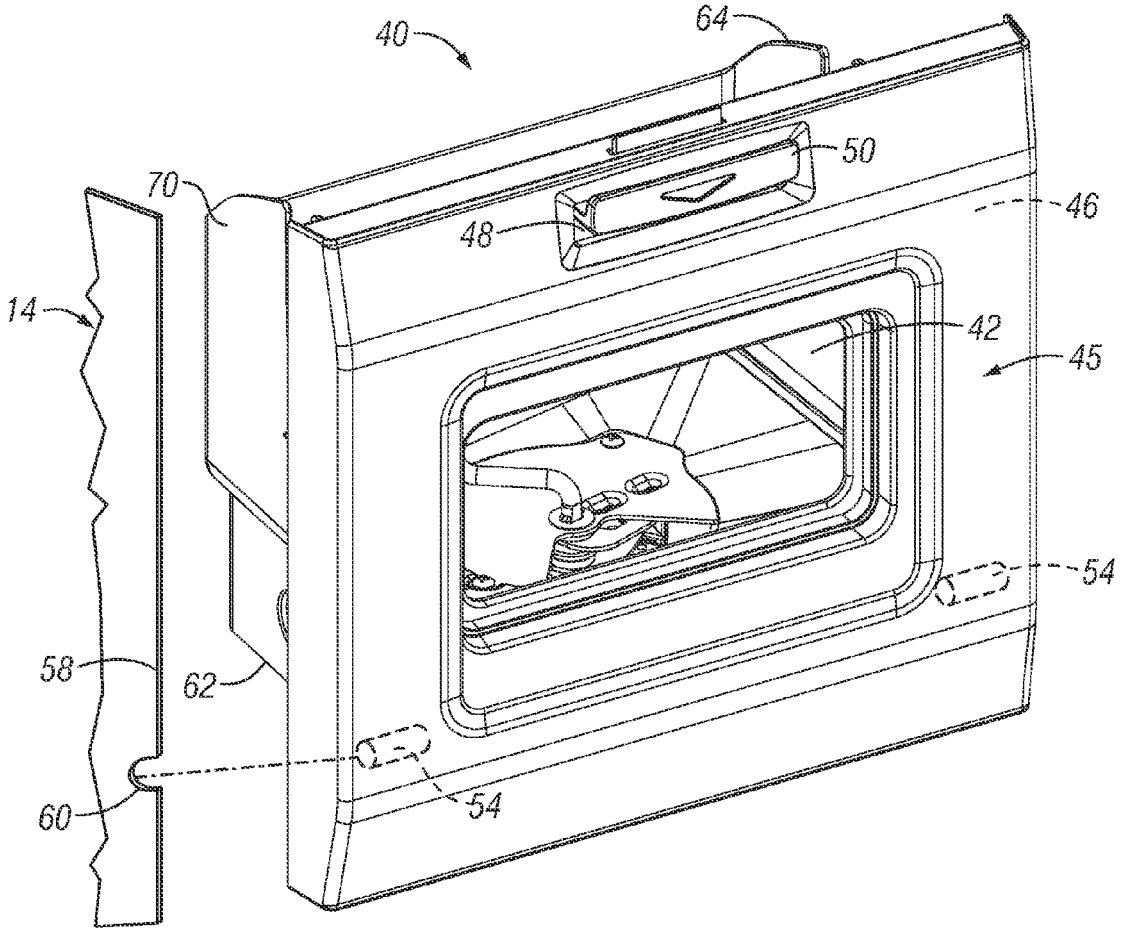

FIG. 4

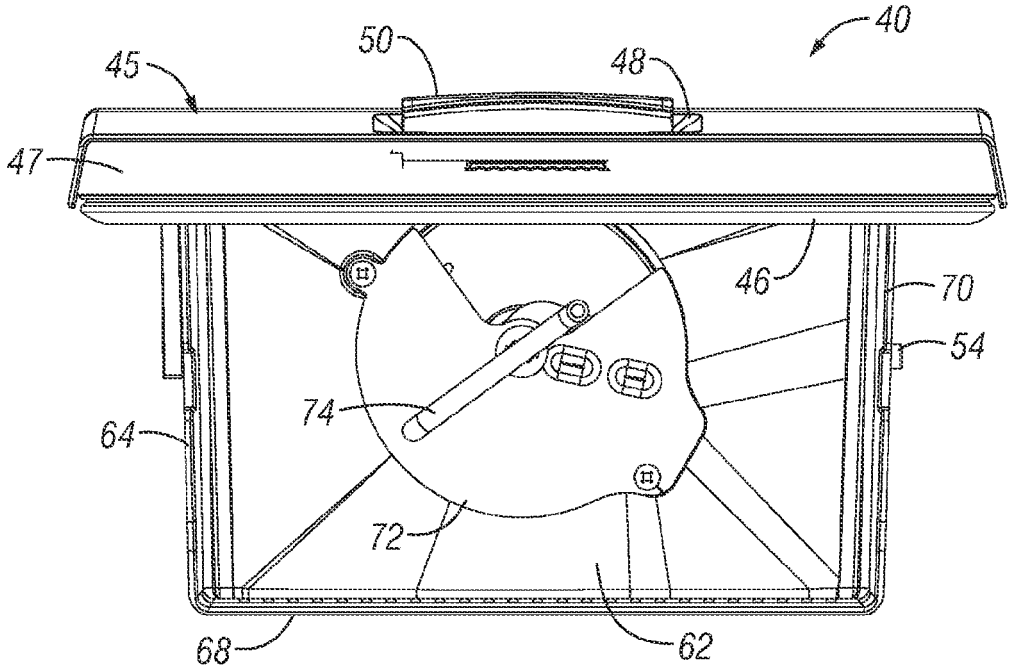

FIG. 5