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(54) **MODULAR INTERFACE FOR PANTRY TEMPERATURE CONTROL**

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F25D 29/00	(2006.01)

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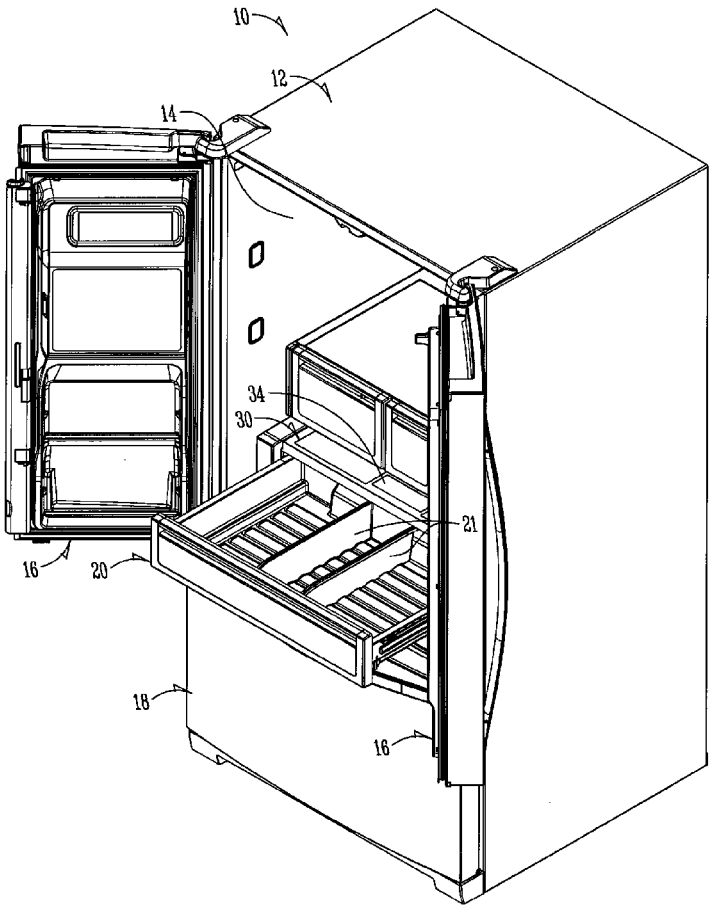
(57) **ABSTRACT**

A refrigerator includes a refrigerator cabinet, a refrigerator compartment disposed within the refrigerator compartment, a drawer within the refrigerator compartment, a cover on a top of the drawer, a plurality of apertures in the cover, and controls on the cover for controlling temperature within the drawer. The cover is configured to be positioned between a user interface assembly and a user interface cover with screws through the apertures in a first configuration wherein the controls are electronic controls for controlling temperature within the drawer. The cover is further configured to be snapped to a control housing using the plurality of apertures for alignment in a second configuration wherein the controls are manual controls for controlling the temperature within the drawer.



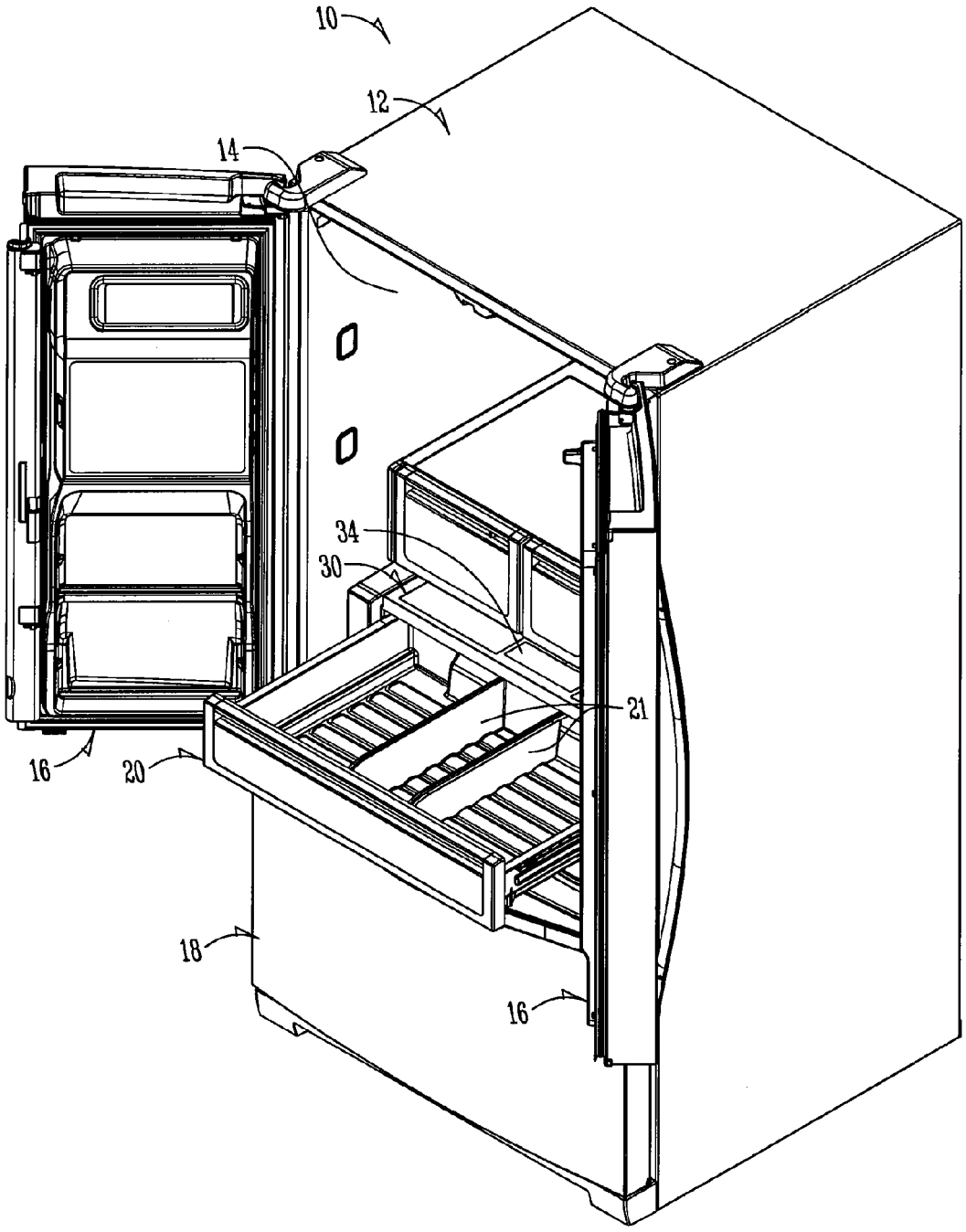


Fig. 1

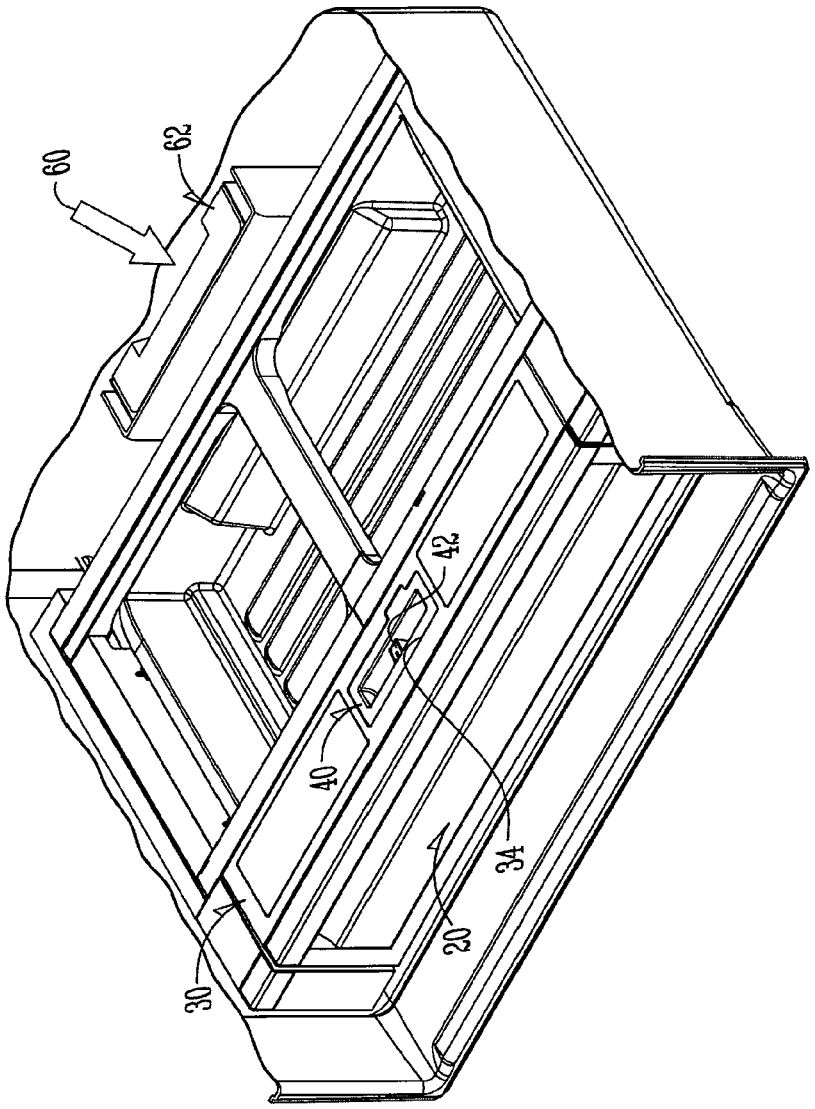


Fig. 2

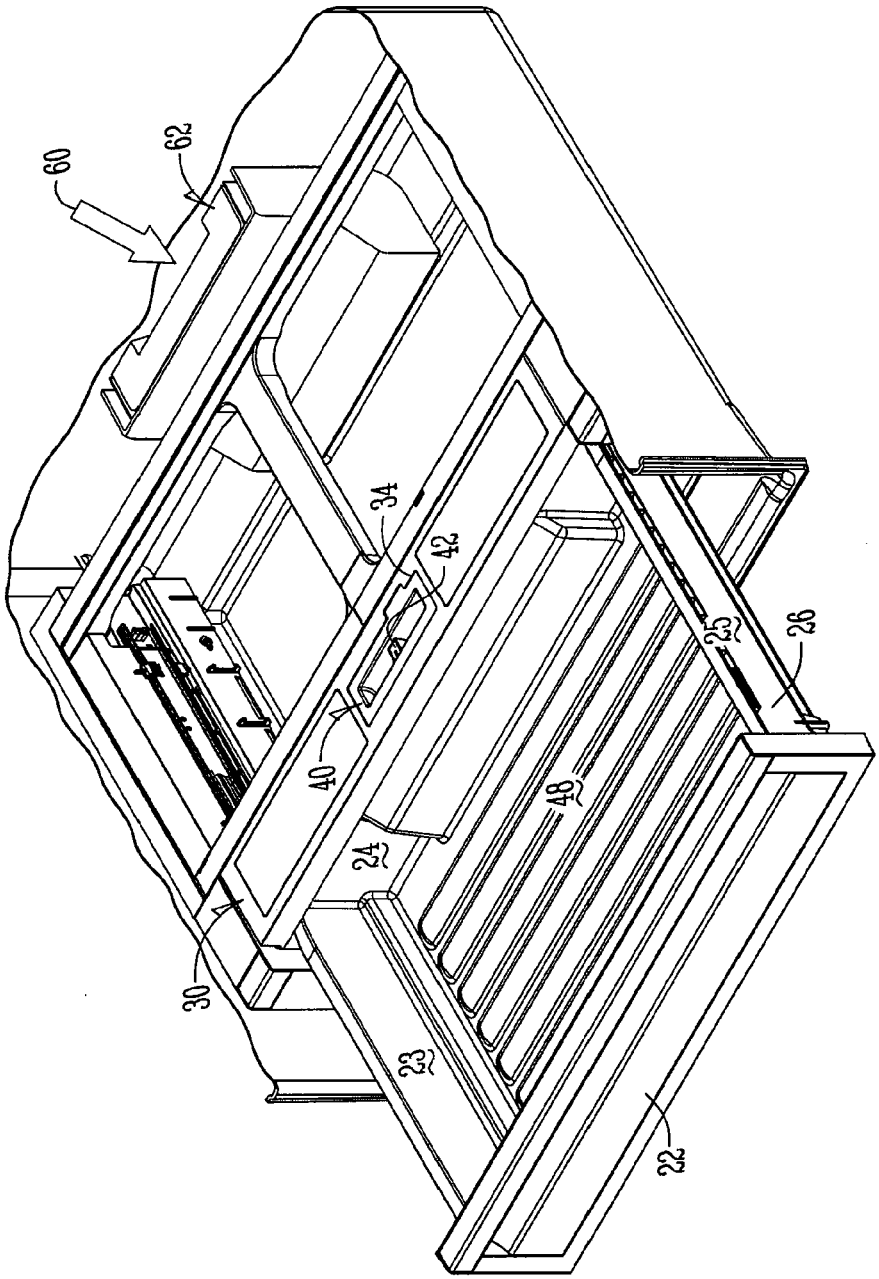


Fig. 3

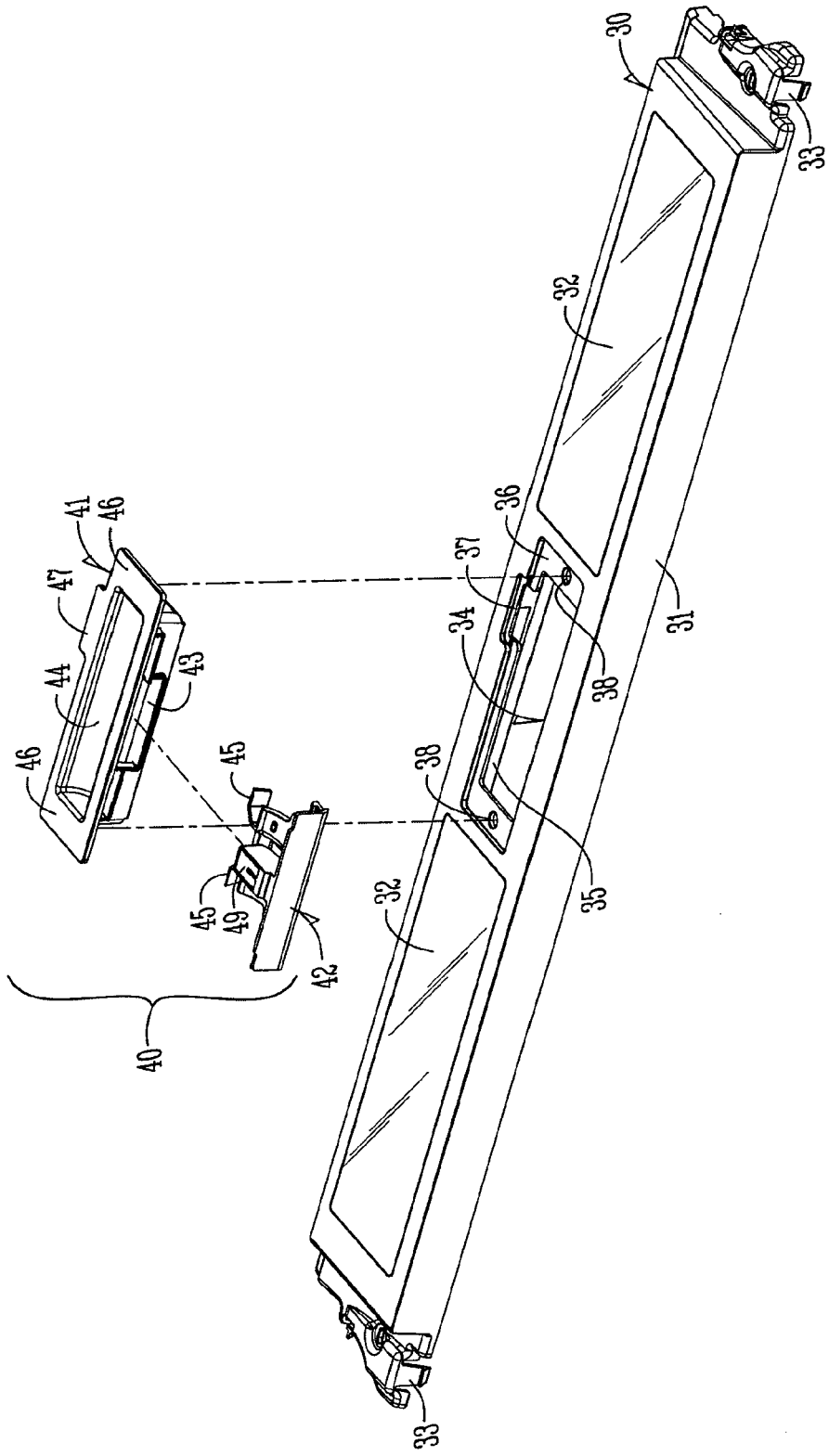


Fig. 4

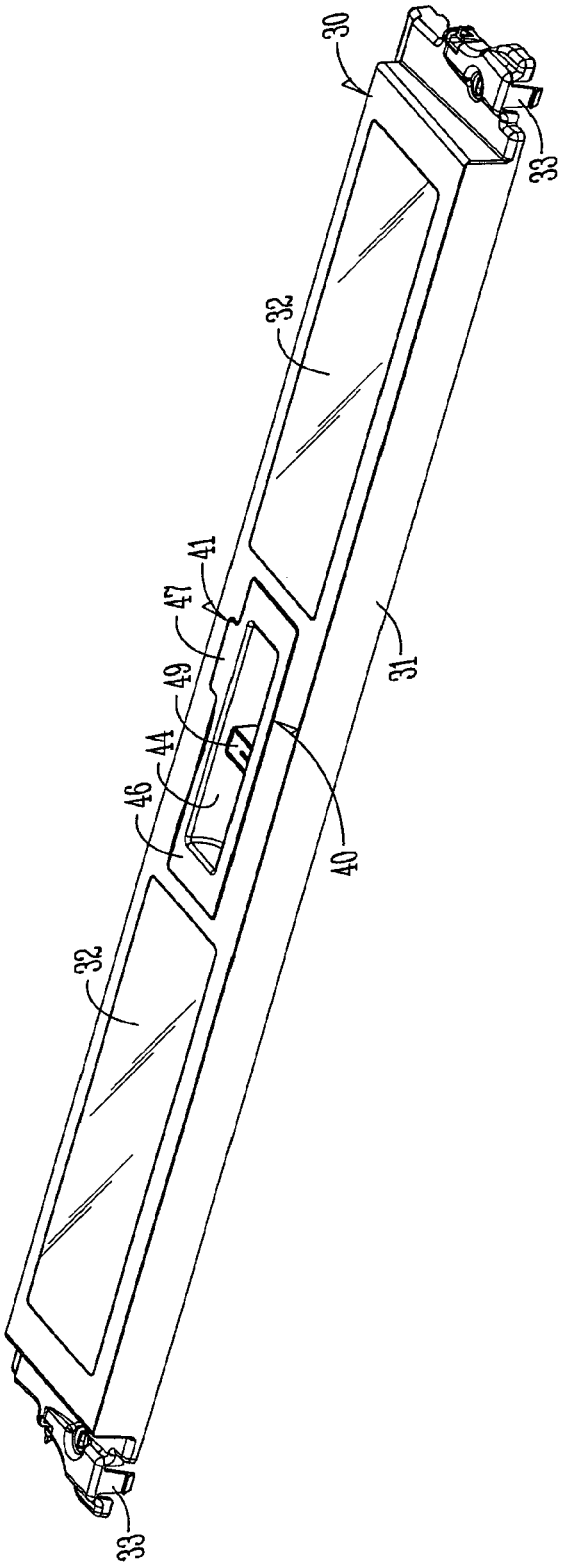


Fig. 5

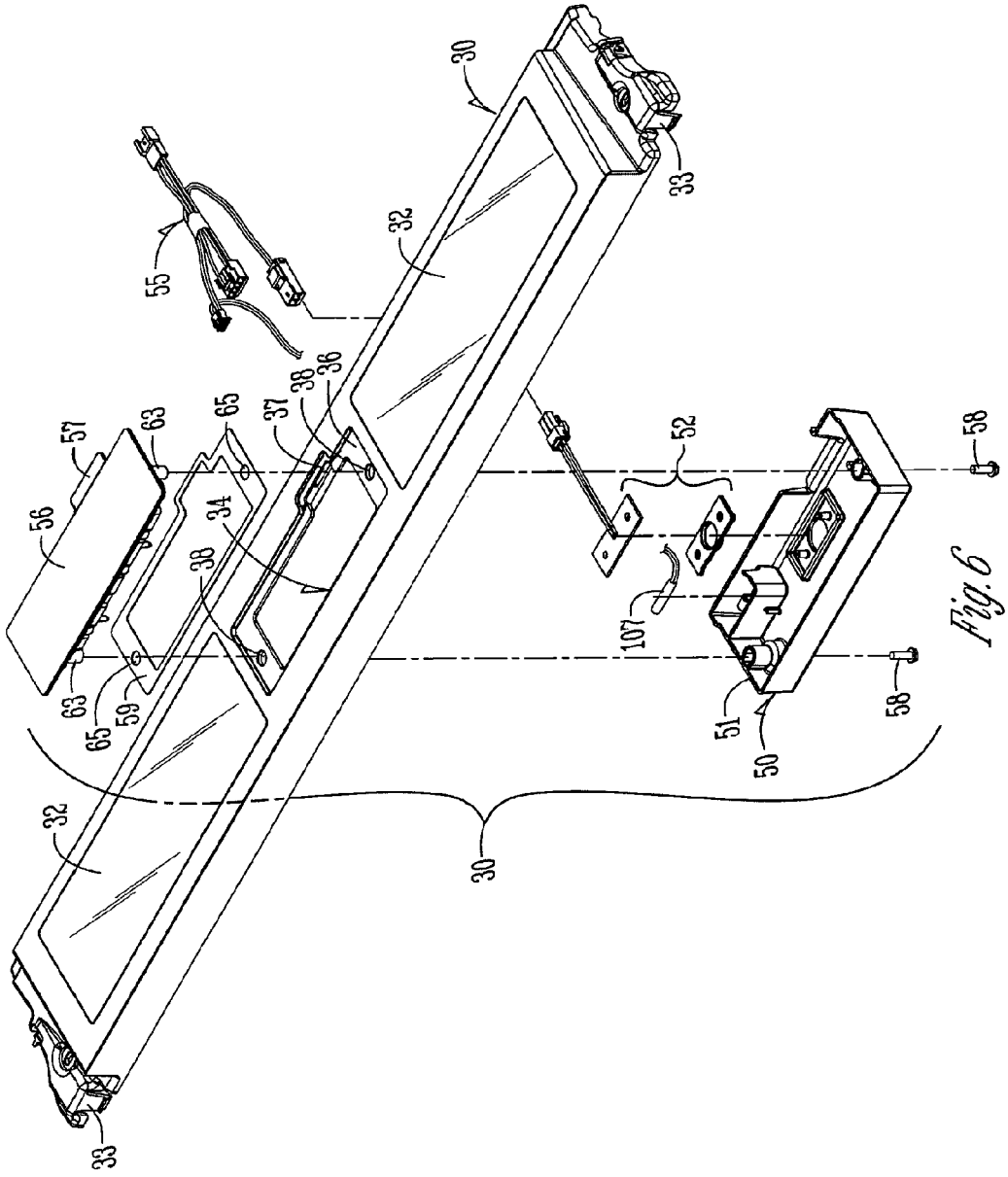


Fig. 6

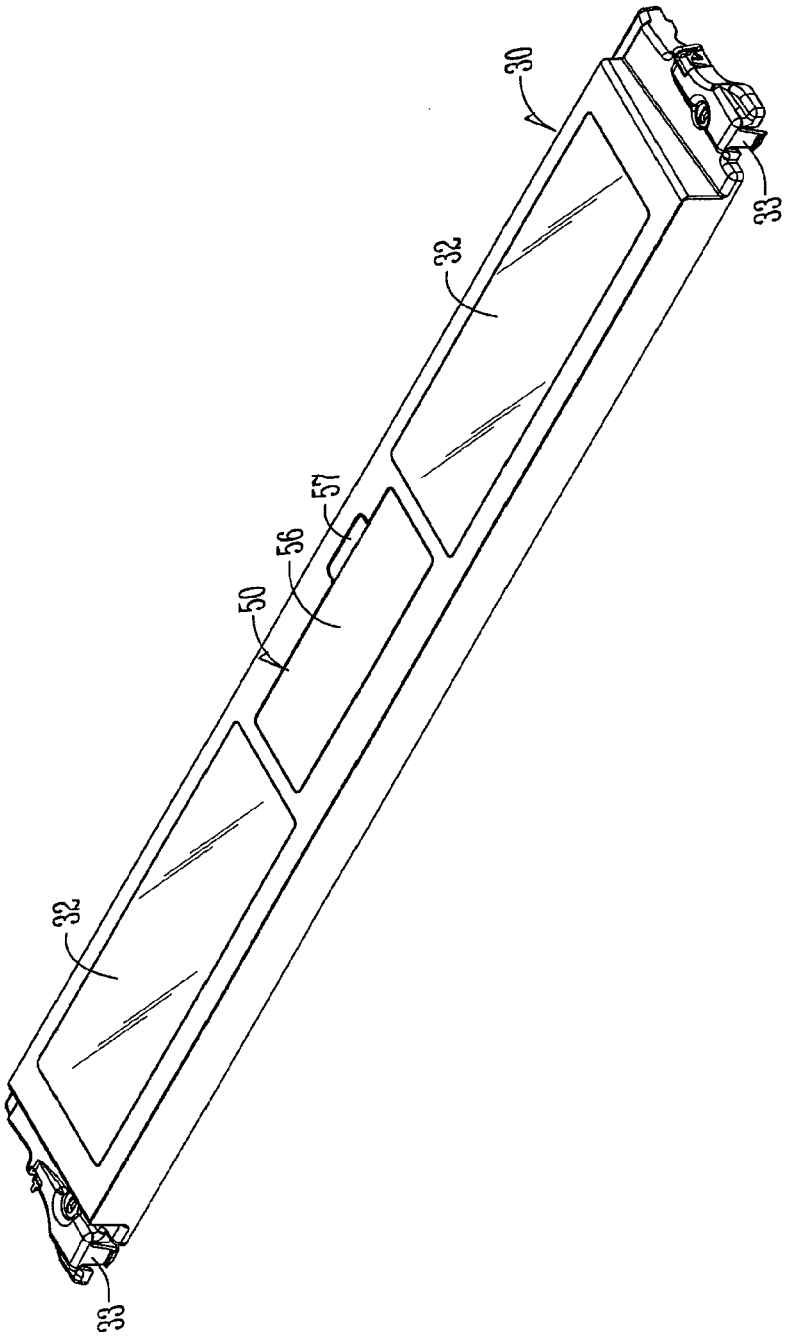


Fig. 7

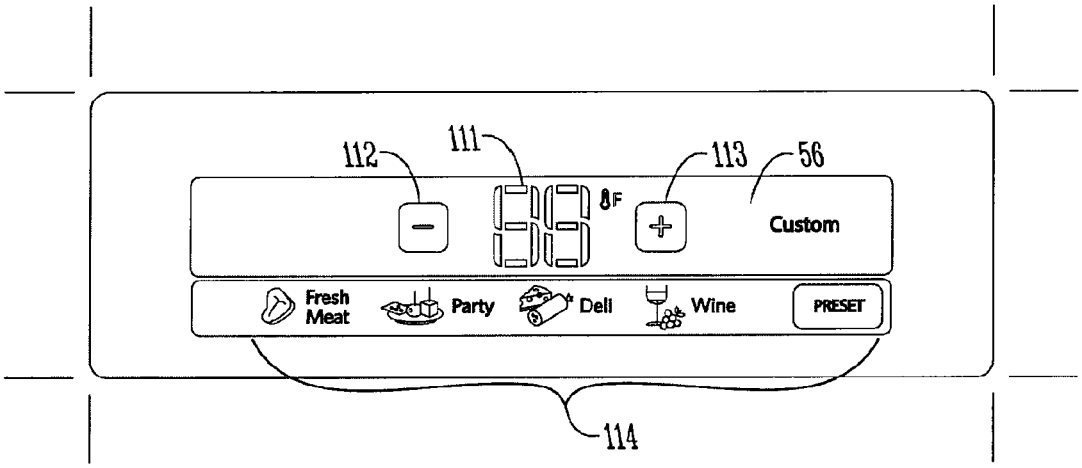

112
111
113
56
8F
Custom
Fresh Meat
Party
Deli
Wine
PRESET
114

Fig. 8

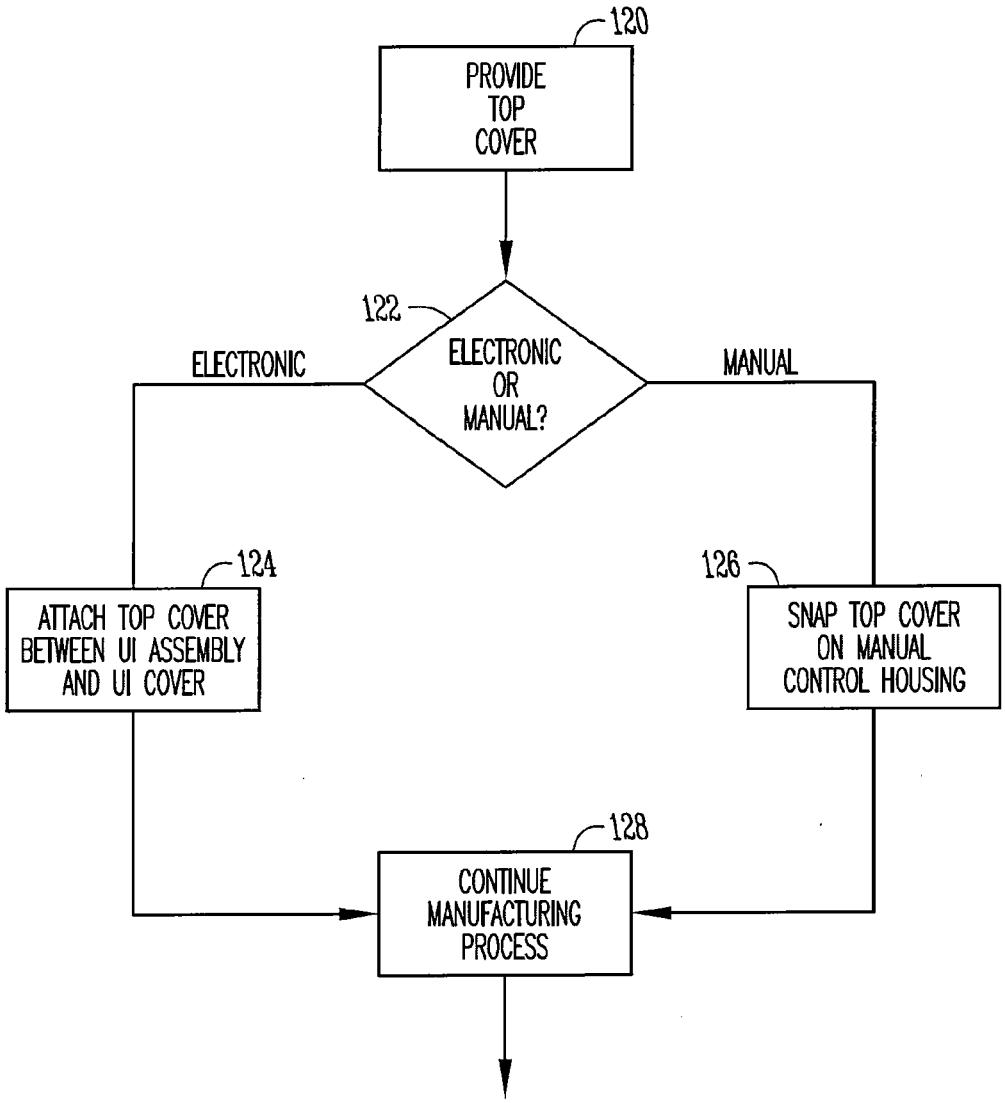

120
PROVIDE TOP COVER
122
ELECTRONIC OR MANUAL?
ELECTRONIC
MANUAL
124
ATTACH TOP COVER BETWEEN UI ASSEMBLY AND UI COVER
126
SNAP TOP COVER ON MANUAL CONTROL HOUSING
128
CONTINUE MANUFACTURING PROCESS

Fig. 9

MODULAR INTERFACE FOR PANTRY TEMPERATURE CONTROL

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application represents a divisional application and claims priority to U.S. patent application Ser. No. 13/685,746 entitled "MODULAR INTERFACE FOR PANTRY TEMPERATURE CONTROL", currently pending.

FIELD OF THE INVENTION

[0002] The present invention relates to refrigerators and the manufacturing thereof. More particularly, the present invention relates to refrigerators with drawers configured for manual or electronic temperature control.

BACKGROUND

[0003] Refrigerators may have multiple enclosed spaces in the form of compartments or drawers. Where drawers are present, in the refrigerator, it may be desirable to allow a user of the refrigerator to separately control temperature of the drawer. Yet there are problems in manufacturing such refrigerators.

[0004] One of the problems associated with manufacturing such refrigerators relates to the desire to provide for standardization of parts across different platforms. For example, refrigerators with a refrigerator drawer with a manual temperature control will use significantly different parts then a refrigerator with an electronic temperature control. What is needed is a refrigerator and a method of manufacturing a refrigerator which allow for standardization of component parts associated with an interface for pantry temperature control regardless of whether manual or electronic temperature control is used.

SUMMARY OF THE INVENTION

[0005] Therefore it is a primary object, feature, or advantage of the present invention to improve upon the state of the art.

[0006] It is a further object, feature, or advantage of the present invention to provide a refrigerator with a pantry drawer with separate temperature control.

[0007] It is a still further object, feature, or advantage of the present invention to provide a pantry drawer which may be configured for either electronic or manual temperature control.

[0008] Another object, feature, or advantage of the present invention is to provide for standardization of parts across different platforms for refrigerators.

[0009] Yet another object, feature, or advantage of the present invention is to provide for manufacturing refrigerators with drawers with different types of temperature controls in a manner that is cost effective and efficient.

[0010] One or more of these and/or other objects, features, or advantages of the present invention will become apparent from the Specification and claims that follow. No single embodiment need meet all of these objects, features, or advantages and different embodiments may meet different objects, features, or advantages. The present invention is not to be limited by or to these objects, features, or advantages.

[0011] According to one aspect of the present invention, a refrigerator is provided. The refrigerator includes a refrigerator cabinet, a refrigerator compartment disposed within the refrigerator compartment, a drawer within the refrigerator compartment, a cover on a top of the drawer, a plurality of apertures in the cover, and controls on the cover for controlling temperature within the drawer. The cover is configured to be positioned between a user interface assembly and a user interface cover with screws through the apertures in a first configuration wherein the controls are electronic controls for controlling temperature within the drawer. The cover is further configured to be snapped to a control housing using the plurality of apertures for alignment in a second configuration wherein the controls are manual controls for controlling the temperature within the drawer.

[0012] According to another aspect of the present invention, a method of manufacturing a refrigerator is provided. The method includes determining if a pantry of the refrigerator is to provide manual controls or electronic controls and providing a top cover for the pantry. If the pantry of the refrigerator is to provide the manual controls, the method provides for snapping the top cover to a manual control housing. If the pantry of the refrigerator is to provide the electronic controls, the method further provides for attaching the top cover between a user interface assembly and a user interface cover.

[0013] According to another aspect of the present invention, a method of manufacturing a plurality of refrigerators, each having a pantry drawer disposed within a refrigerator compartment. The method includes providing a top cover for each of the pantry drawers, the top cover having a plurality of apertures therein including a receiver opening and through holes on opposite sides of the receiver opening. For a first subset of the plurality of refrigerators, the method further provides for assembling each of the first subset of the plurality of refrigerators by snapping the top cover to a manual control housing. For a second subset of the plurality of refrigerators, the method provides for assembling each of the second subset of the plurality of refrigerators by attaching the top cover between a user interface assembly and a user interface cover.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The above mentioned objects, feature, or advantages of this invention, and the methods of attaining them, will become more apparent and the invention itself will be better understood by reference to the following description of embodiments of the invention taken in conjunction with the accompanying figures, wherein:

[0015] FIG. **1** is a front perspective view of a French door refrigerator with a bottom-mount freezer with a pantry drawer.

[0016] FIG. **2** is an isolated view of a pantry drawer with a manual temperature control.

[0017] FIG. **3** is an isolated view of the pantry drawer with a manual temperature control with the drawer extended outwardly.

[0018] FIG. **4** is an isolated and exploded view of a pantry drawer top where manual temperature control is provided.

[0019] FIG. **5** is an isolated and assembled view of the pantry drawer top cover where manual temperature control is provided.

[0020] FIG. **6** is an isolated and exploded view of a pantry drawer top cover where electronic temperature control is provided.

[0021] FIG. **7** is an isolated and assembled view of the pantry drawer top cover where electronic temperature control is provided.

[0022] FIG. **8** illustrates one example of a screen display associated with the electronic temperature control.

[0023] FIG. **9** is a flow diagram illustrating one example of a method for manufacturing refrigerators which may include either manual or electronic temperature control for a drawer.

DETAILED DESCRIPTION

[0024] FIG. **1** illustrates a refrigerator **10**. The refrigerator **10** has a refrigerator cabinet **12**. There is a fresh food or refrigerator compartment **14** positioned above a freezer compartment with a freezer drawer **18** providing access to the freezer compartment and the French doors **16** providing access to the refrigerator compartment **14**. A pantry drawer **20** is shown. The pantry drawer **20** preferably extends the full width and depth of the refrigerator compartment **14** and may have one or more dividers **21** therein for organizing contents within the pantry drawer **20**. The pantry drawer **20** may have a temperature which is different from the refrigerator compartment **14** depending upon user preferences which may be based in part on the items which a user decides to store in the pantry drawer **20**.

[0025] The pantry drawer **20** has a top cover **30** which extends generally along its length. In a central portion of the top cover **30**, a receiver **34** is present in which user interface controls may be positioned to provide for either electronic or manual temperature control of the pantry drawer **20**.

[0026] FIG. **2** is an isolated view of a pantry drawer **20** with a control housing **40** present within the receiver **34** for providing manual temperature control of the pantry drawer **30**. The control housing **40** may include a slider **42** which may be moved along a linear axis to allow a user to select a temperature for the pantry drawer **30**. Although a slider is shown, the present invention contemplates that other types of manual controls may be used such as knobs, selector switches, or other types of manual controls. A cold air housing **62** may be located at the back of the pantry drawer **20** to provide for circulating cold air in the direction of arrow **60** into the pantry drawer **20** in order to maintain the temperature within an acceptable range set by the user

[0027] FIG. **3** is an isolated view of the pantry drawer **20** with a manual temperature control with the drawer **20** extended outwardly. The drawer **20** has first and second opposite side walls **23**, **25**, a front wall **22**, and an opposite back wall **24**. Rails **26** may be used to allow the drawer **40** to slide to an outward position as shown in FIG. **3** from or to the inward position shown in FIG. **2**.

[0028] FIG. **4** is an isolated and exploded view of a pantry drawer top cover **30** where a control housing **40** is provided to allow for manual temperature controls to be used. The control housing **40** includes a frame assembly **41** and a manual control assembly **42** which fits within an opening **44** of the frame assembly **41**. A slide **49** or other manual user control is positioned on the control assembly. Flanges **45** may be inserted into the opening **43** on the frame assembly in order to secure the manual control assembly **42** to the frame assembly **41**. The control housing **40** may be snapped to the cover **30** using a plurality of apertures **38** which extend through the top surface of the cover **30** for alignment purposes. The apertures **38** may be through holes which extend through the frame **31** of the drawer cover **30**.

[0029] The frame **31** of the drawer cover **30** also has end members **33** which allow the pantry drawer top cover **30** to be connected at opposite ends such as by snap fitting in place. The pantry drawer top cover **30** may have transparent windows **32** on opposite sides of the receiver or opening **34**. The transparent windows **32** allow a user of the refrigerator to see inside the pantry drawer without necessarily needing to open the pantry drawer. The receiver **34** as shown is generally centrally located in the cover **30** although, it could be otherwise placed. The manual control assembly may be inserted into the frame assembly **41** of the control housing **40** which may then be snap fit to the cover using the plurality of apertures **38** for alignment purposes such that the ends **46** of the manual control assembly **42** are aligned over the apertures or holes **38** within a recess **35** of the frame **31** and the tab **47** fits against the shoulder **37**.

[0030] FIG. **5** is an isolated and assembled view of the pantry drawer top cover **30** where manual temperature control is provided. As shown here, the control housing **40** is secured in place, with the slider **49** or other manual control accessible to a user of the refrigerator.

[0031] FIG. **6** is an isolated and exploded view of a cover **30** for the top of a pantry drawer where electronic temperature control is provided. Note that the structure of the frame **31** of the pantry drawer top cover is the same as shown in FIG. **4** and FIG. **5**. Here, however, the manual control housing is not present and instead a user interface module **50** is provided. The user interface module **50** includes a user interface cover **56** and a user interface assembly **51** which sandwich the pantry drawer top cover **30** at the receiver **34**. The user interface module **50** allows for electronic controls to be used for controlling temperature within a drawer. At top of the cover **30** of the pantry drawer, a user interface cover **56** with a tab **57** is provided. Posts **63** extend downwardly from the top cover **56**. The user interface cover **56** may then fit against a gasket **59** and intro the receiver **45** with the tab **57** fitting into the shoulder **37**. The posts **63** align with corresponding apertures **65** in the gasket and the apertures **38** in the cover **30**. Screws or bolts **58** may extend through the user interface assembly **51** and into the posts **63** for securing the user interface cover **56** to the user interface assembly **51**.

[0032] A wiring harness **55** may connect with other components such as a thermistor **107** and LED assembly **53** associated with the user interface module **50**. Thus, temperature associated with the pantry drawer may be sensed at the cover **30** and illumination may be provided. In addition, the user interface cover may provide for displaying information associated with the pantry drawer such as temperature information.

[0033] FIG. **7** is an isolated and assembled view of the pantry drawer top cover **30** where electronic temperature control is provided with the user interface module **50**.

[0034] FIG. **8** illustrates one example of a screen display associated with the electronic temperature control. A temperature **111** associated with the pantry drawer is shown. The user can adjust this setting such as by selecting the on-screen button **112** to decrease temperature or selecting the on-screen button **113** to increase temperature. The user may do so by touching the appropriate portion of the user interface cover **56** which protects the display or screen beneath it. The user may also select temperature or other settings based on the contents of the pantry drawer such as by selecting "Fresh Meat", "Party", "Deli", or Wine" or the associated "Preset"

button or screen area. Although one particular user interface is shown, it is contemplated that what is displayed and the manner in which temperature settings are made may vary widely.

[0035] FIG. **9** is a flow diagram illustrating one example of a method for manufacturing refrigerators which may include either manual or electronic temperature control for a drawer. In step **120** a top cover is provided. In step **122** a determination is made as to whether the top cover is to have electronic or manual controls. This may be based on a model number of the refrigerator being manufactured or otherwise. If the refrigerator being manufactured is to have manual user temperature controls on the drawer, then in step **126** the top cover is snapped or otherwise affixed. Then in step **128** the manufacturing process can continue with the manual control housing in place. Returning to step **122**, if the refrigerator being manufactured is to have electronic temperature controls on the drawer, then in step **125** the top cover is attached between the user interface assembly and the user interface cover. Then in step **128** the manufacturing process can continue with electronic control housing in place. Regardless of whether there are electronic or manual controls on the top cover, the same top cover may be used thus efficiencies in the manufacturing process are realized.

[0036] Although the invention has been described and illustrated with respect to preferred embodiments thereof, it is not to be so limited since changes and modifications may be made therein which are within the full intended scope of the invention. For example, the present invention contemplates variations in the sizes, shapes, configurations, and inclusion or exclusion or various component parts, the manner in which parts are connected, the specific type of manual controls or the specific type of electronic controls being used.

What is claimed is:

1. A refrigerator comprising:
a refrigerator cabinet;
a refrigerator compartment disposed within the refrigerator compartment;
a drawer within the refrigerator compartment;
a cover on a top of the drawer;
a plurality of apertures in the cover;
controls on the cover for controlling temperature within the drawer;
wherein the cover is configured to be positioned between a user interface assembly and a user interface cover with screws through the apertures in a first configuration wherein the controls are electronic controls for controlling temperature within the drawer;
wherein the cover is configured to be snapped to a control housing using the plurality of apertures for alignment in a second configuration wherein the controls are manual controls for controlling the temperature within the drawer.

2. The refrigerator of claim **1** wherein the plurality of apertures comprise a receiver opening for the controls and through holes on opposites sides of the receiver opening.

3. The refrigerator of claim **2** wherein the receiver opening is substantially centered along a length of the cover.

4. The refrigerator of claim **3** wherein the receiver opening and the holes extend through a top surface of the cover.

5. The refrigerator of claim **4** wherein the cover further comprises a first window on one side of the plurality of apertures and a second window on an opposite side of the plurality of apertures.

6. The refrigerator of claim **5** wherein the drawer is a pantry drawer and wherein the cover is a pantry drawer top cover.

7. The refrigerator of claim **1** wherein the refrigerator compartment is a fresh food compartment.

* * * * *