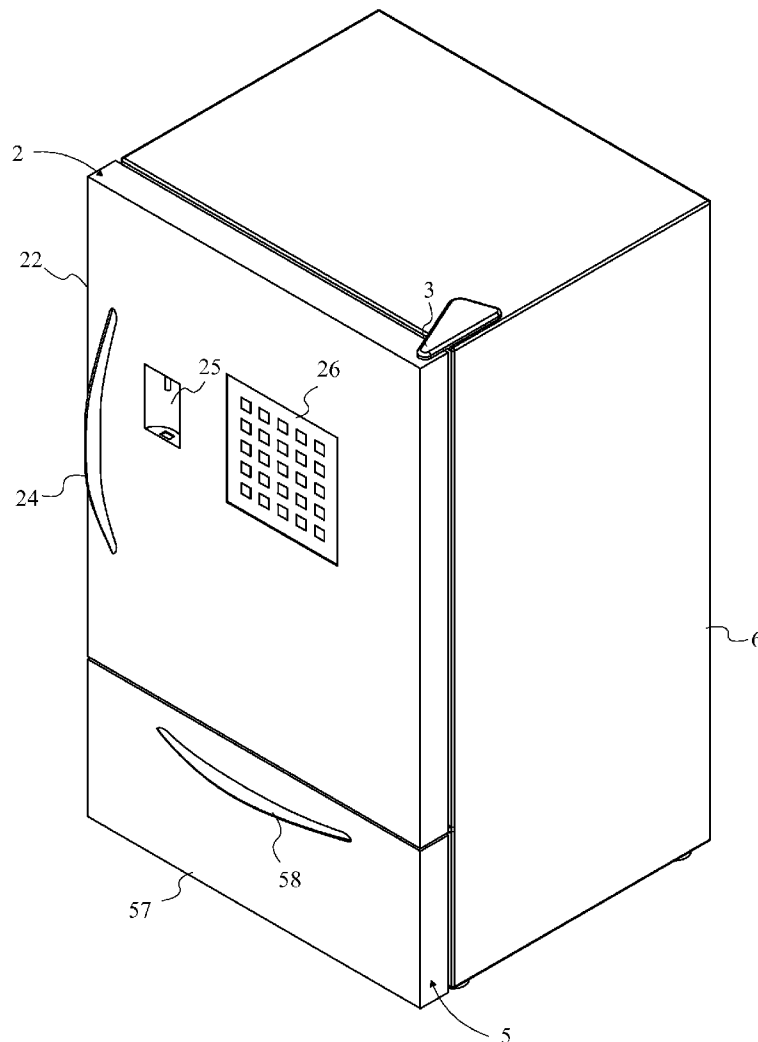




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(19) **United States**(12) **Patent Application Publication**
Olson(10) **Pub. No.: US 2013/0111936 A1**(43) **Pub. Date: May 9, 2013**(54) **REFRIGERATOR WITH INDIVIDUALIZED
LOCKING DRAWERS**(52) **U.S. Cl.**
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(US)(57) **ABSTRACT**(72) Inventor: **Timothy John Olson**, San Diego, CA
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A refrigerator with individualized locking drawers is similar in size and shape to a standard refrigerator, with a plurality of drawers in the refrigerator compartment that can be personalized. The drawers have a locking mechanism, a name placard displaying the user's name, a use frequency display, and a spoilage display. A digital control interface on the refrigerator door allows users to register for and manage drawers, and a network connection device allows users to manage their drawer through a website interface or a mobile application. A community storage shelf below the individual drawers and shelves on the inside face of the refrigerator door provides space for large items or community items, and a freezer compartment below the refrigerator compartment provides storage for items that require lower temperatures than the refrigerator compartment.



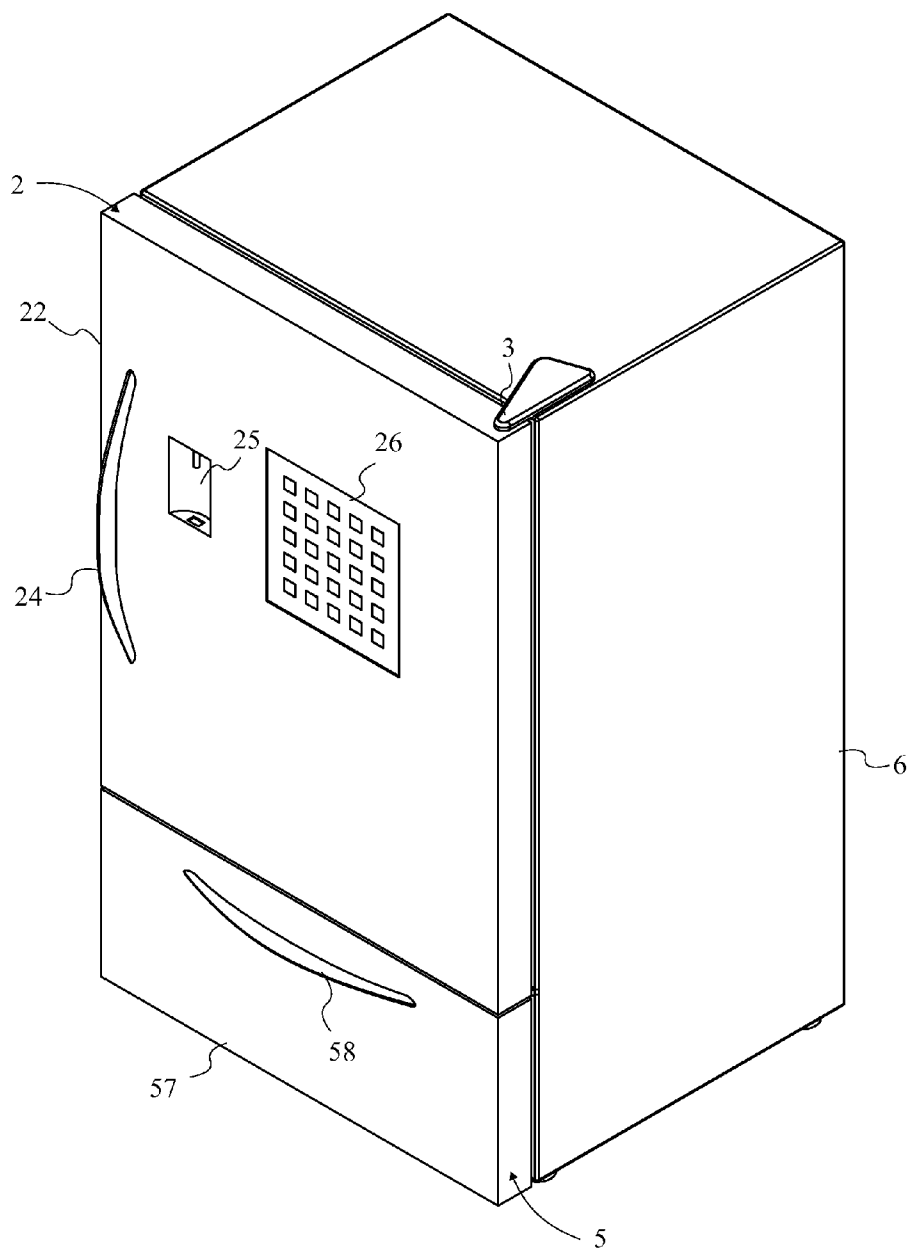


FIG. 1

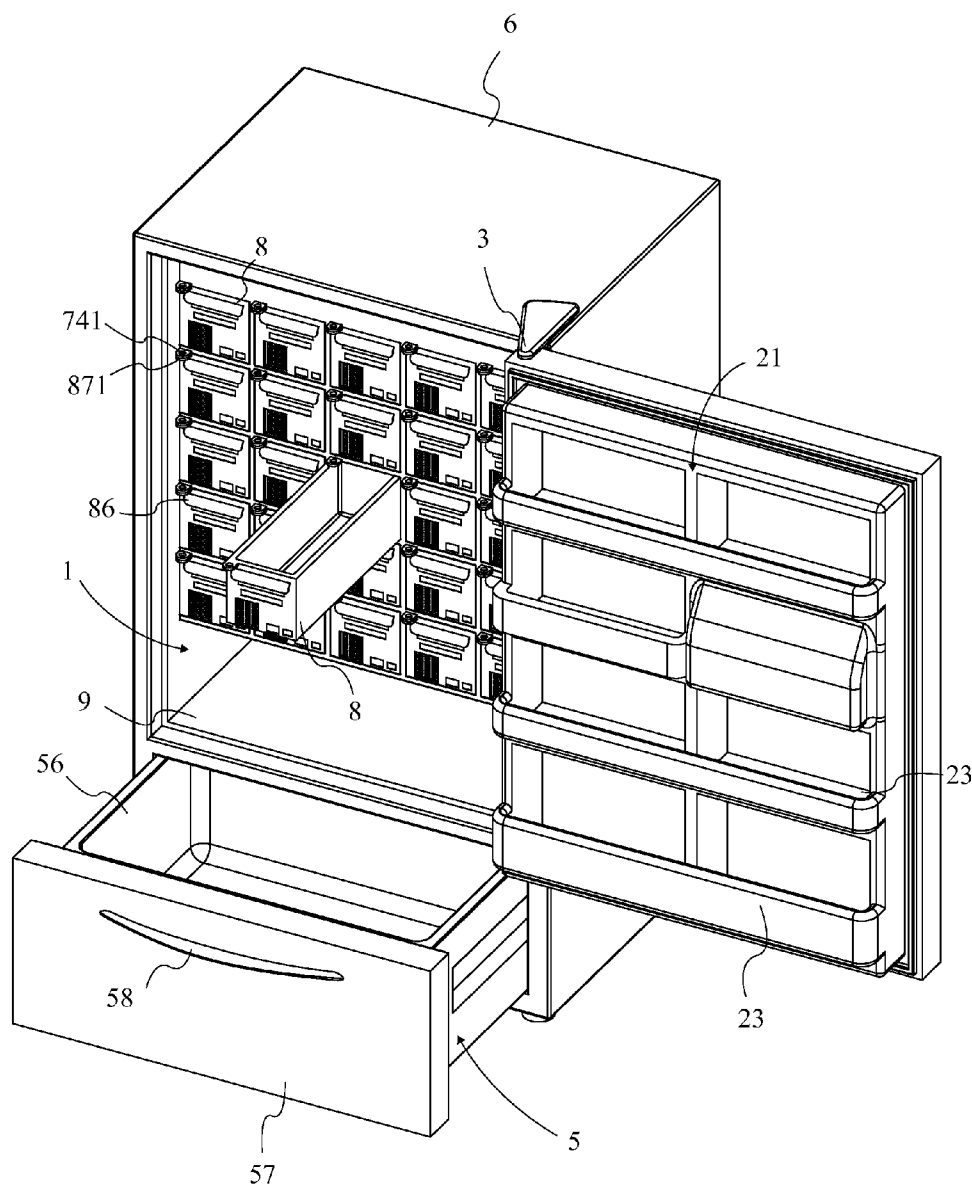


FIG. 2

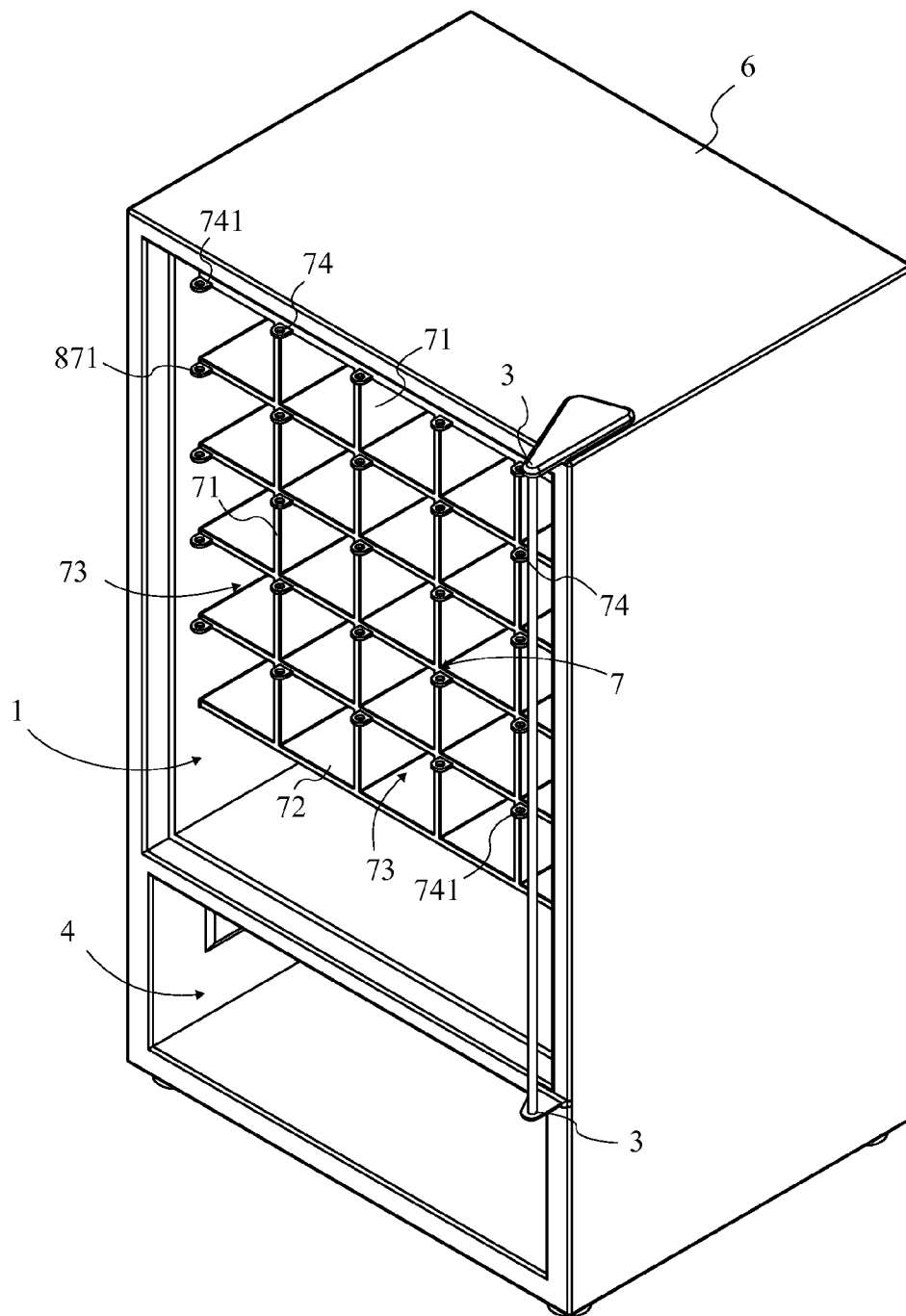


FIG. 3

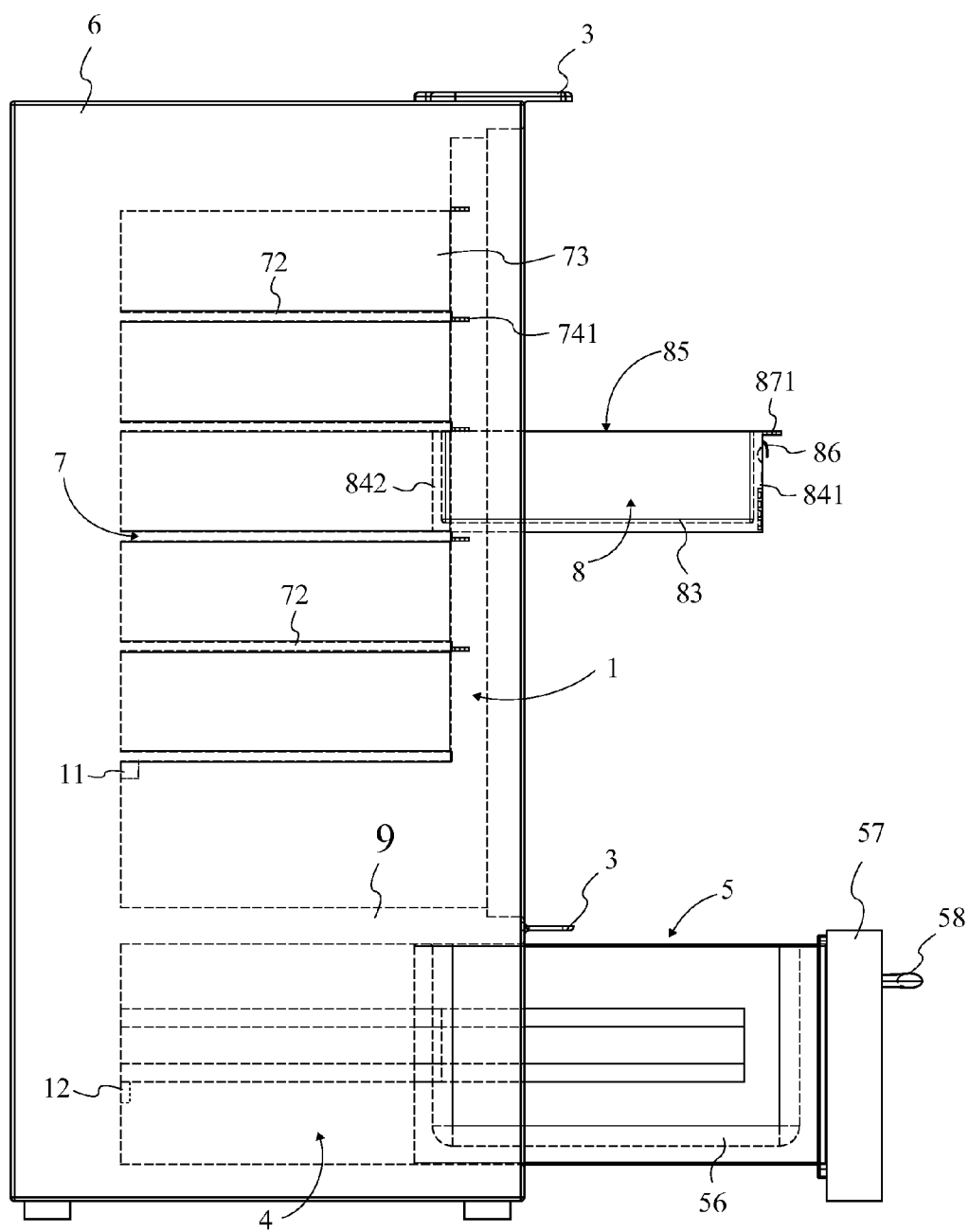


FIG. 4

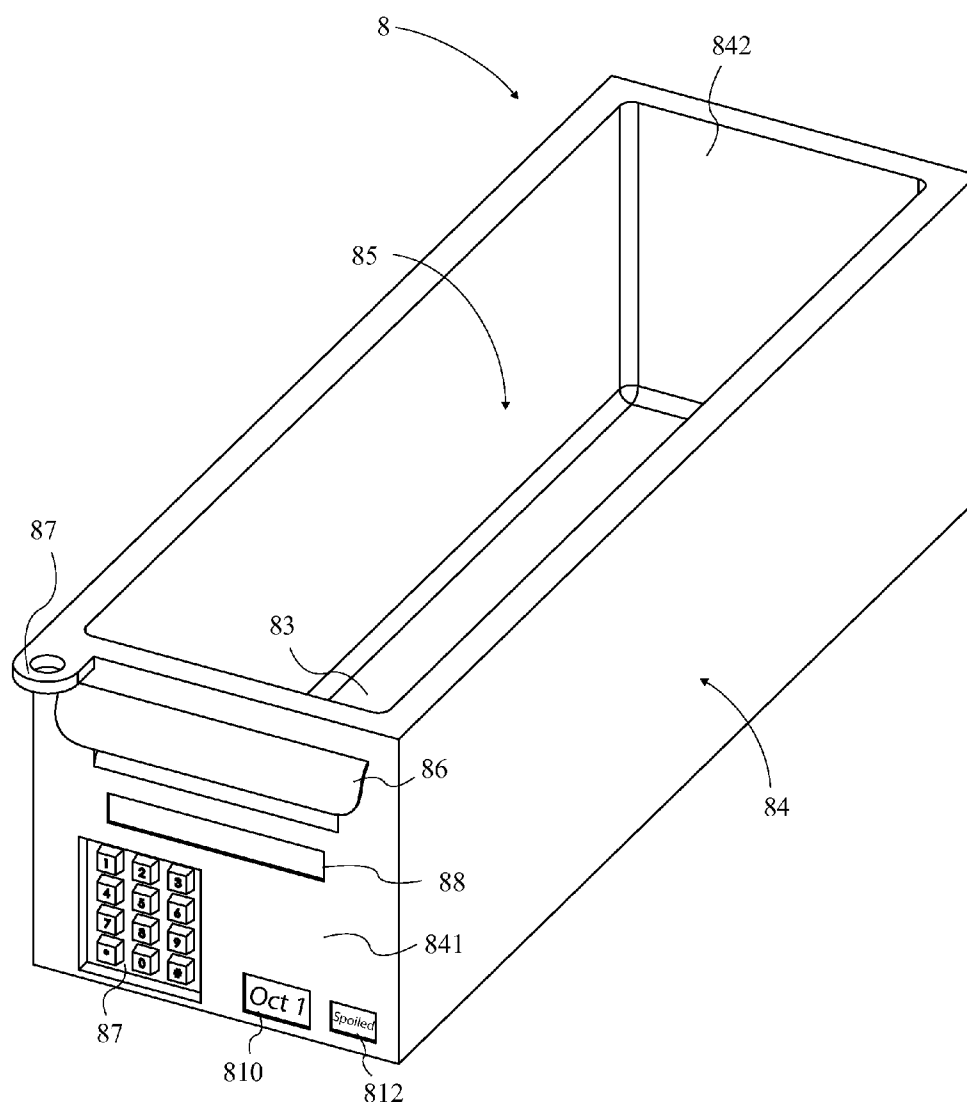


FIG. 5

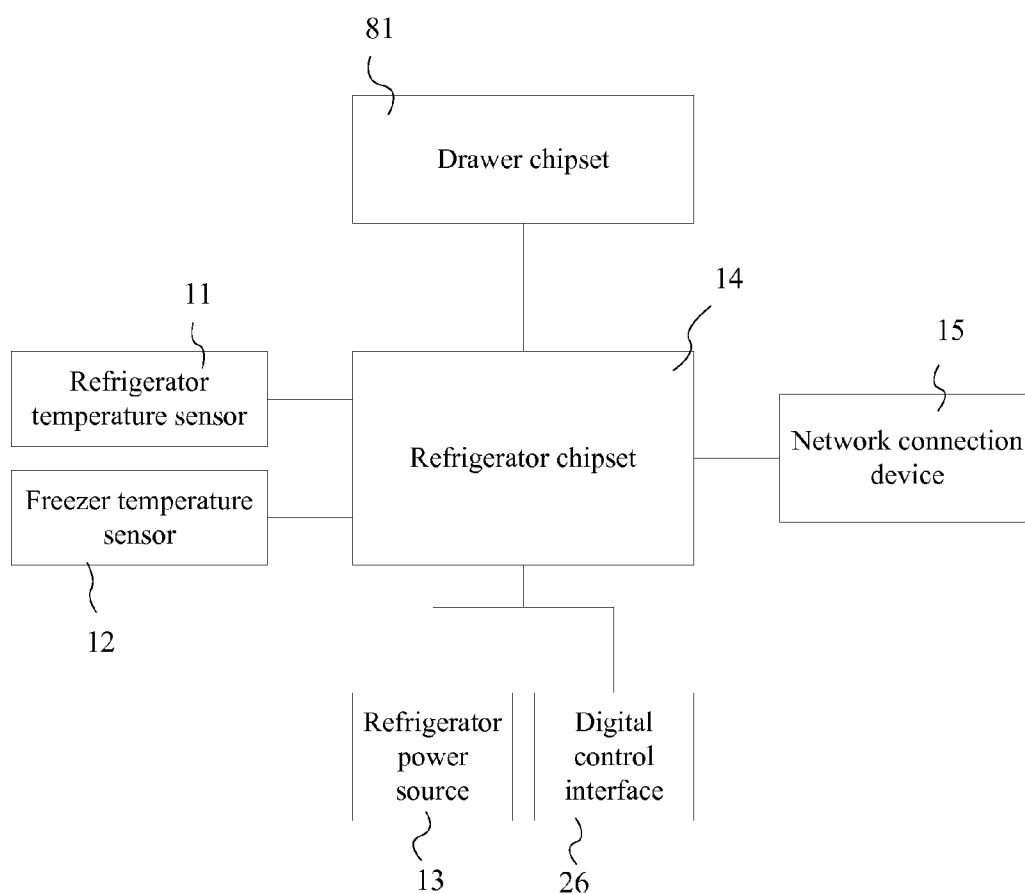


FIG. 6

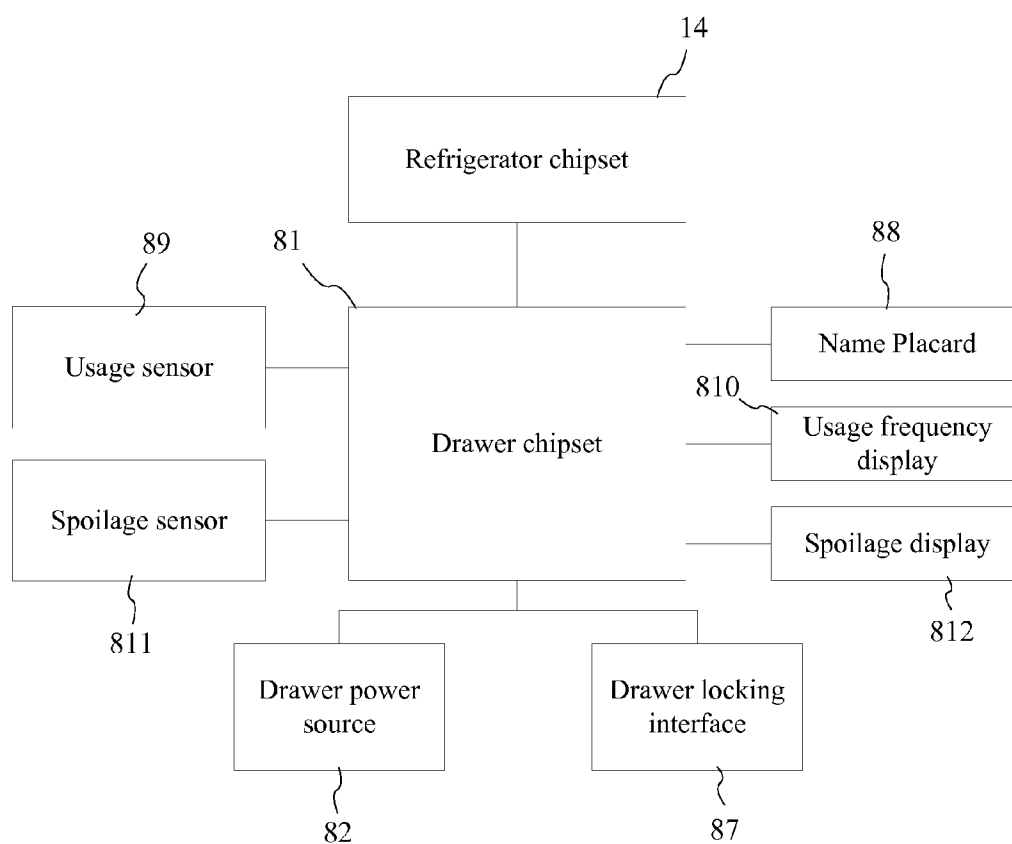


FIG. 7

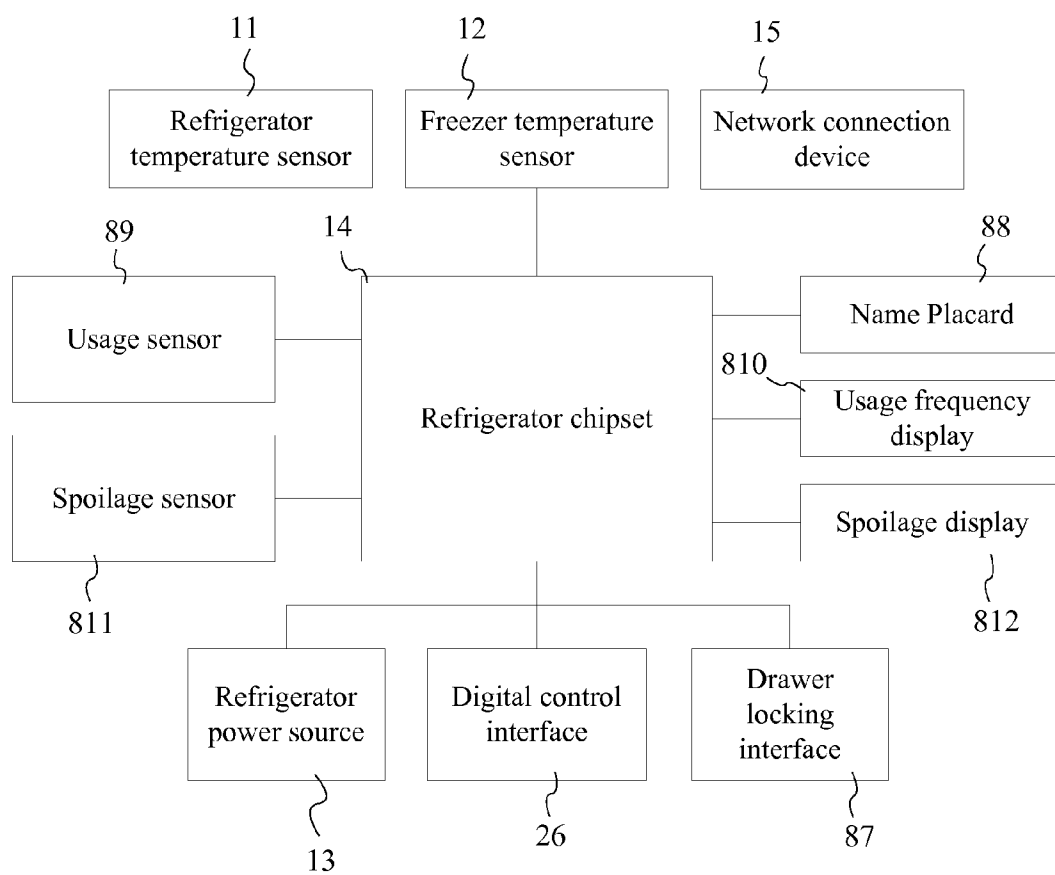


FIG. 8

REFRIGERATOR WITH INDIVIDUALIZED LOCKING DRAWERS

[0001] The current application claims a priority to the U.S. Provisional Patent application Ser. No. 61/557,467 filed on Nov. 9, 2011.

FIELD OF THE INVENTION

[0002] The present invention relates generally to an apparatus for a refrigerator. More particularly, the present invention is a refrigerator which provides personal locking compartments for use by multiple individuals.

BACKGROUND OF THE INVENTION

[0003] A refrigerator, colloquially known as a fridge, is a common household appliance that consists of a thermally insulated compartment and a mechanical, electronic, or chemical heat pump that transfers heat from the inside of the fridge to its external environment so that the inside of the fridge is cooled to a desired temperature below the ambient temperature of the room. A fridge is useful for storing food, since lower temperatures in a confined volume lowers the reproduction rate of bacteria, which has the result of reducing the rate of food spoilage. A fridge typically maintains a temperature a few degrees above the freezing point of water. Many refrigerators also include a freezer compartment separate from the refrigerator compartment that maintains a temperature below the freezing point of water.

[0004] Refrigerators exist in many places of employment for the use of the employees who bring their meals to work. The refrigerators that are used in these multi-person environments are standard refrigerators that generally include multiple shelves, a few drawers, a door with shelving and a freezer with one or more shelves. This standard refrigerator design is widely used throughout the world in, to name a few, homes, schools and places of employment.

[0005] The design and function of the standard refrigerator has been improved in various ways over the years; however, there is not a refrigerator that specifically exists for exclusive use by multiple individuals in a multi-person office environment. Because the conventional refrigerator storage space is communal, items may be mistakenly or intentionally taken or misplaced which can cause distrust or unrest among those sharing the storage space. In addition, there is a considerable amount of food waste that occurs due to individuals forgetting that they have placed food items in the fridge.

[0006] It is therefore an object of the present invention to provide a refrigerator that eliminates the possibility of conflict or animosity in an office caused by one person misplacing or disturbing another person's food items by providing compartmentalized and personalized storage drawers that secure individuals' items against misuse, and to reduce instances of wasted food by having drawers that notify a person when they have forgot they have food in a drawer.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. 1 is a perspective view of the present invention with the refrigerator door and the freezer drawer closed.

[0008] FIG. 2 is a perspective view of the present invention with the refrigerator door, the freezer drawer and one of the plurality of refrigerator drawers open.

[0009] FIG. 3 is a perspective view of the present invention without the refrigerator door, the freezer drawer and the refrigerator drawers.

[0010] FIG. 4 is a side cross-sectional view of the present invention without the refrigerator door and with only one of the refrigerator drawers, with the refrigerator drawer and the freezer drawer opened.

[0011] FIG. 5 is a perspective view of one of the refrigerator drawers.

[0012] FIG. 6 is a block diagram of the electrical connections between the refrigerator chipset and other electronic components in the preferred embodiment of the present invention.

[0013] FIG. 7 is a block diagram of the electrical connections between the drawer chipset and the other electronic components in the preferred embodiment of the present invention.

[0014] FIG. 8 is a block diagram of the electrical connections between the refrigerator chipset and other electronic components in an alternate embodiment of the present invention.

DETAIL DESCRIPTIONS OF THE INVENTION

[0015] All illustrations of the drawings are for the purpose of describing selected versions of the present invention and are not intended to limit the scope of the present invention.

[0016] The present invention is a refrigerator with a number of individually controlled locking drawers and a communal shelf in the refrigerator compartment 1, and a freezer compartment 4. The present invention is similar in size to a typical refrigerator, but may be larger or smaller.

[0017] Referring to FIGS. 1, 2, 3, 4, and 6, the present invention generally comprises a refrigerator compartment 1, a refrigerator door 2, a plurality of hinges 3, a freezer compartment 4, a freezer drawer 5, a back enclosure 6, a drawers section 7, a plurality of refrigerator drawers 8, a storage shelf 9, a plurality of cooling tubes, a refrigerator temperature sensor 11, a freezer temperature sensor 12, a refrigerator power source 13, a refrigerator chipset 14, and a network connection device 15.

[0018] As can be seen in FIGS. 2-4, the refrigerator compartment 1 is a rectangular cuboid with one open face in a manner typical of refrigerators and is the primary storage space of the present invention. The refrigerator compartment 1 is positioned within the back enclosure 6. The refrigerator compartment 1 is cooled to a typical refrigerator temperature, approximately 35 to 40 degrees Fahrenheit, and the refrigerator compartment 1 comprises insulating materials that impede heat transfer between the inside of the refrigerator compartment 1 and the outside environment. The refrigerator's dimensions can be described in a manner common to refrigerators. The horizontal direction normal to the open face of the refrigerator compartment 1 is hereinafter known as depth. The vertical direction parallel to the force due to gravity is hereinafter known as height, and the horizontal direction perpendicular to both the depth and the height is hereinafter known as width.

[0019] The refrigerator door 2 is a thick rectangular structure that functions to block the entirety of the open face of the refrigerator door 2 to prevent cold air from escaping the refrigerator compartment 1. The refrigerator door 2 is connected at one extremity of the width of refrigerator door 2 to a matching extremity of the width of the back enclosure 6 by the plurality of hinges 3 adjacent to the open face of the

refrigerator compartment 1, about which the refrigerator door 2 rotates to open and close the refrigerator door 2. The refrigerator door 2 comprises insulating materials that impede heat transfer between the inside of the refrigerator compartment 1 and the outside environment.

[0020] The freezer compartment 4, similarly to the refrigerator compartment 1, is a rectangular cuboid with one open face. The freezer compartment 4 has similar dimensions to the refrigerator compartment 1 except for the height. In the preferred embodiment of the present invention, the freezer compartment 4 is positioned adjacently below the refrigerator compartment 1, though in alternate embodiments the freezer compartment 4 may be positioned above or beside the refrigerator compartment 1. The freezer compartment 4 is connected within the back enclosure 6. The freezer compartment 4 is cooled to a temperature below 32 degrees Fahrenheit, and the freezer compartment 4 comprises insulating materials that impede heat transfer between the inside of the freezer compartment 4 and the outside environment.

[0021] The freezer drawer 5 is a box-shaped container that traverses into the freezer compartment 4 utilizing wheels and wheel tracks or another method in such a way that the freezer drawer 5 can be drawn out horizontally to access items stored within the freezer drawer 5. In an alternate embodiment of the present invention, the freezer compartment 4 does not utilize the freezer drawer 5 to store items within the freezer compartment 4, but instead comprises a hinged door similar to the refrigerator door 2.

[0022] The back enclosure 6 is the outer covering of the present invention that encloses and supports the majority of the components of the present invention including common components necessary for refrigeration, such as a compressor, condenser, and evaporator, as well as the refrigerator power source 13, refrigerator chipset 14, and the network connection device 15. In an alternate embodiment of the present invention, the refrigerator chipset 14 and network connection device 15 are positioned within the refrigerator door 2. In the preferred embodiment of the present invention, the back enclosure 6 is perimetrically connected to the refrigerator compartment 1 and the freezer compartment 4, though in alternate embodiments the back enclosure 6 may have different dimensions or different placements as appropriate. The back enclosure 6 comprises insulating materials that impede heat transfer between the inside of the refrigerator compartment 1 and the freezer compartment 4 and the outside environment.

[0023] Referring to FIGS. 3-4, the drawers section 7 comprises a plurality of vertical dividers 71, a plurality of horizontal dividers 72, a plurality of drawer cubbies 73, and a plurality of divider locking interfaces 74. The drawers section 7 is a framework of interconnected dividers positioned within the refrigerator compartment 1, the empty space of which between the plurality of vertical dividers 71 and the plurality of horizontal dividers 72 delineates the plurality of drawer cubbies 73 that receive the plurality of refrigerator drawers 8.

[0024] Referring to FIGS. 4-5, each of the plurality of refrigerator drawers 8 is an elongated, box-shaped container that traverses into the depth of the plurality of drawer cubbies 73. The plurality of refrigerator drawers 8 is made out of clear plastic similar to existing refrigerator drawers. Each of the plurality of refrigerator drawers 8 is supported by tracks in the molding of the plurality of vertical dividers 71 such that each of the plurality of refrigerator drawers 8 may be drawn out horizontally to access the contents in a manner common to

refrigerator drawers. In the preferred embodiment of the present invention, the refrigerator compartment 1 may include, but is not limited to, a range of 20 to 50 of the plurality of refrigerator drawers 8, depending on the dimensions of the present invention. The following description of dimensions is not intended to limit the present invention, but rather to demonstrate the spirit of the present invention. Each of the plurality of refrigerator drawers 8 preferably has the dimensions of 6 inches in width, 8 inches in height and 18 inches in depth. In the preferred embodiment of the present invention, horizontal rows of drawers may be removed and replaced with a standard refrigerator shelf to adjust the number of drawers and capacity for community items.

[0025] The storage shelf 9 is a flat horizontal surface similar to standard refrigerator shelves. The storage shelf 9 traverses the width of the refrigerator compartment 1 and is positioned within the refrigerator compartment 1 between the drawers section 7 and the freezer compartment 4, providing a community shelf for storing items that do not belong to any individual person. The storage shelf 9 is supported at each lateral extremity by tracks in the side molding of the inside of the refrigerator compartment 1.

[0026] In one embodiment of the present invention, the temperature of each of the plurality of refrigerator drawers 8 is independently controlled by the plurality of cooling tubes. One of the plurality of cooling tubes is positioned within each of the plurality of refrigerator drawers 8. The plurality of cooling tubes is connected to the main refrigeration system of the present invention. The cooling of each of the plurality of refrigerator drawers 8 by the plurality of cooling tubes is controlled by the refrigerator chipset 14. The refrigerator chipset 14 controls the temperature and/or mass flow rate or other variables related to the air flow through each of the plurality of refrigerator drawers 8. In this embodiment, each of the plurality of refrigerator drawers 8 comprises a drawer temperature sensor that is connected to the drawer chipset or the refrigerator chipset 14. Each individual user is able to modify the temperature of their drawer through a digital control interface 26, or through the network connection device 15 by a website interface or a mobile phone or tablet device application. For example, each user is able to send a text message or an email to the refrigerator administrator to inform them that they will be out of town and to throw away or not throw away the contents of the drawer. The refrigerator administrator is a person who has a special account associated with the present invention that has special privileges related to modifying or controlling user accounts or other aspects of the present invention that other users are not provided with.

[0027] One method of implementing control of the temperature of each of the plurality of refrigerator drawers 8 independently of each other by the plurality of cooling tubes is to have the plurality of cooling tubes extending from the back of the refrigerator compartment 1 in a pattern such that one of each of the plurality of cooling tubes is associated with one of the plurality of drawer cubbies 73. Each of the plurality of cooling tubes traverses through a hole in the back of one of the plurality of refrigerator drawers 8 when the said one of the plurality of refrigerator drawers 8 is in the closed position. Each of the plurality of refrigerator drawers 8 may be lined with insulating material in order to facilitate more precise temperature control of each of the plurality of refrigerator drawers 8 and to reduce heat exchange interference among drawers. If necessary, a second tube may be utilized to allow egress of air from the drawer.

[0028] Referring to FIGS. 6 and 8, the refrigerator temperature sensor 11 is any previously known apparatus capable of measuring temperature in typical refrigerator temperatures and electronically communicating the temperature to the refrigerator chipset 14. The refrigerator temperature sensor 11 is positioned within the refrigerator compartment 1.

[0029] The freezer temperature sensor 12 is any previously known apparatus capable of measuring temperature in typical freezer temperatures and electronically communicating the temperature to the refrigerator chipset 14. The freezer temperature sensor 12 is positioned within the freezer compartment 4.

[0030] The refrigerator power source 13 is any source of electrical power that suits the application of the present invention, preferably a dedicated three-pronged power cord designed to plug into a standard 15 amp, 120 volt wall power outlet. The refrigerator power source 13 is electrically connected to the digital control interface 26, any typical necessary refrigerator components and any other electronic components which require electrical power in specific embodiments of the present invention. For example, in one embodiment of the present invention, the refrigerator power source 13 is also electrically connected to the hand sanitizer dispenser 25 that is motion sensor operated. In the case that each of the plurality of refrigerator drawers 8 do not comprise a drawer power source 82, the refrigerator power source 13 is also electrically connected to the name placard 88 for each of the plurality of refrigerator drawers 8 that is a digital screen, and other components of each of the plurality of refrigerator drawers 8 that require electrical power, such as the usage frequency display 810 and the spoilage display 812.

[0031] The refrigerator chipset 14 is a component or combination of components of the electronic variety such as, but not limited to, circuit boards, wires, storage devices, and processors necessary to facilitate the translation of electrical input signals into desired effects and electrical output signals in the operation of the system. The chipset receives electrical inputs from various sources, such as, but not limited to, the refrigerator temperature sensor 11, the freezer temperature sensor 12, the network connection device 15, and the digital control interface 26, processes the input, and sends electrical output signals to various appropriate electrical components as dictated by the chip set's programming. The refrigerator chipset 14 either has its own storage device for storing data, or the refrigerator chipset 14 is connected to a separate network storage device or cloud storage device through the network connection device 15.

[0032] If the refrigerator chipset 14 does not receive a signal from a usage sensor 89 of one of the plurality of refrigerator drawers 8 for an extended period of time, the refrigerator chipset 14 notifies the user and/or refrigerator administrator through the network connection device 15. If the refrigerator chipset 14 detects, through the refrigerator temperature sensor 11 or the freezer temperature sensor 12, that the temperature of the refrigerator compartment 1 or the freezer compartment 4 is greater or lower than a set value by a set margin, the refrigerator chipset 14 contacts the refrigerator administrator through the network connection device 15 with a malfunction message.

[0033] The network connection device 15 is an electrical component that allows the refrigerator chipset 14 to communicate with a digital network such as the Internet. The network connection device 15 may be an ethernet port or a radio transceiver that utilizes well-known wireless radio commu-

nication technology to establish and maintain a connection to a wireless local area network, preferably utilizing the Institute of Electrical and Electronics Engineers' 802.11 standards, or another appropriate communication method. The refrigerator chipset 14 is able to utilize the network connection to communicate with a network in order to send and receive messages and commands from users or the administrator regarding the status of the plurality of refrigerator drawers 8 or other characteristics.

[0034] Referring to FIGS. 1-2, the refrigerator door 2 comprises a plurality of door shelves 23, an inside door surface 21 and an outside door surface 22. The inside door surface 21 and the outside door surface 22 are positioned parallel and opposite to each other on the refrigerator door 2. When the refrigerator door 2 is closed, the inside door surface 21 is adjacent to the refrigerator compartment 1 so that the plurality of door shelves 23 is refrigerated when the present invention is in use. The outside surface is on the opposite side of the refrigerator door 2, so that when the refrigerator door 2 is closed the outside surface is exposed to the environment.

[0035] The refrigerator door 2 also comprises a refrigerator door handle 24, the hand sanitizer dispenser 25, and the digital control interface 26. The plurality of door shelves 23 is positioned on the inside door surface 21 and is for storing condiments, bottles, or other taller or community items. The refrigerator door handle 24 is a protrusion connected to the outside door surface 22 opposite the plurality of hinges 3 for a user to grip in order to open the refrigerator door 2 by rotating the refrigerator door 2 about the plurality of hinges 3. The hand sanitizer dispenser 25 is a well-known device that pumps sanitizing solution from a reservoir through an egress tube onto a user's hand. The hand sanitizer dispenser 25 is positioned on the outside door surface 22, adjacent to the refrigerator door handle 24. In the preferred embodiment of the present invention, the hand sanitizer dispenser 25 has a previously known method of replacing or refilling the reservoir of hand sanitizer, such as, but not limited to, a push button release. The hand sanitizer dispenser 25 may use any desired previously known method or mechanism for dispensing hand sanitizer solution, including, but not limited to, a manual hand pump mechanism or automatic dispensing of hand sanitizer solution triggered by a motion detector.

[0036] The digital control interface 26 is positioned on the outside door surface 22. In the preferred embodiment of the present invention, the digital control interface 26 comprises a liquid crystal display (LCD) touch screen, or any other known technology that facilitates a digital touch screen. The digital control interface 26 displays the current status of the plurality of refrigerator drawers 8. The digital control interface 26 displays available drawers and prompts users to register an available drawer. A user selects an available drawer by touching the drawer on the digital control interface 26, and then selects their name from a list of all registered users, or enters their name as a new entry. The user is then prompted to enter a password, such as a four-digit numerical password or other combinations of alphanumeric or symbolic characters. Each user also enters contact information, such as, but not limited to, their name, telephone number, and/or e-mail address through the digital control interface 26, which is stored in the refrigerator chipset 14 or on a separate network database.

[0037] Referring to FIGS. 2 and 4, the freezer drawer 5 comprises a freezer drawer shell 56, a freezer door 57 and a freezer drawer handle 58. The freezer drawer shell 56 is the box-shaped physical enclosure that holds items and com-

prises the majority of the freezer drawer **5**. The freezer drawer shell **56** is approximately a rectangular cuboid, with one open face at the top for placing items within and retrieving items from the freezer drawer shell **56**. The freezer drawer shell **56** is preferably made of clear plastic, or another suitable material.

[0038] The freezer door **57** is a thick rectangular structure connected to the freezer drawer shell **56** that comprises insulating material to prevent heat exchange from the freezer compartment **4** to the outside environment when the freezer drawer **5** is closed. In the preferred embodiment of the present invention, the freezer door **57** is opened by applying a linear horizontal force on the freezer door **57**. In an alternate embodiment of the present invention, the freezer door **57** is opened by rotating the freezer door **57** about a hinge connection to the freezer compartment **4** in a manner similar to the refrigerator door **2**.

[0039] The freezer drawer handle **58** is a protrusion connected to the freezer door **57** opposite the freezer drawer shell **56** for a user to grip in order to open the freezer door **57** and access items inside the freezer drawer shell **56**.

[0040] Referring to FIGS. 2-4, the geometry of the drawers section **7** is generally defined by the horizontal rows of drawer cells. In the preferred embodiment of the present invention, each row of the drawers section **7** shelving is independently removable in order to replace the row with a standard refrigerator shelf if additional community storage space is desired, for events such as a potluck, for example. Each row of the drawers section **7** comprises a T-bar shape, with one flat, horizontal shelf being supported at each lateral extremity by tracks in the inside molding of the refrigerator compartment **1**, and the plurality of vertical dividers **71** hanging vertically from the horizontal shelf at equal spacing from each other. The horizontal shelf portions of the T-bar shapes are the plurality of horizontal dividers **72**, and the vertical hanging portions are the plurality of vertical dividers **71**. Preferably, each row of the drawers section **7** has a mechanism to lock the row in place within the refrigerator compartment **1**, such as matching eyelets through which a padlock is engaged, or a pin connection interface with the side or back molding of the inside of the refrigerator compartment **1**.

[0041] Each of the plurality of drawer cubbies **73** is associated with one of the plurality of divider locking interfaces **74**, such that each of the plurality of refrigerator drawers **8** may be independently locked to the drawers section **7** within one of the plurality of drawer cubbies **73**. In one embodiment of the present invention, each of the plurality of divider locking interfaces **74** comprises a divider eyelet **741**. In another embodiment of the present invention, each of the plurality of divider locking interfaces **74** comprises a pin receiving hole, a latch receiving cavity, or another appropriate interface depending on the type of the plurality of drawer locking interfaces.

[0042] Each of the plurality of refrigerator drawers **8** is removably positioned within one of the plurality of drawer cubbies **73**.

[0043] Referring to FIGS. 4, 5 and 7, each of the plurality of refrigerator drawers **8** comprises a drawer shell **84**, a drawer chipset **81**, a drawer power source **82**, a drawer liner **83**, an opening **85**, a refrigerator drawer handle **86**, a drawer locking interface **87**, a name placard **88**, a usage sensor **89**, a usage frequency display **810**, a spoilage sensor **811**, and a spoilage display **812**. The drawer shell **84** comprises a first face **841** and a second face **842**.

[0044] The first face **841** and the second face **842** are vertical faces of the drawer shell **84** positioned opposite the opening **85** from each other. The first face **841** is the face the user sees and interacts with to unlock or open the drawer. When the refrigerator door **2** is closed, the first face **841** is positioned between the inside door surface **21** and the opening **85**. The refrigerator drawer handle **86** is connected on the first face **841** opposite the opening **85**.

[0045] The drawer chipset **81** is a component or combination of components of the electronic variety such as, but not limited to, circuit boards, wires, and processors necessary to facilitate the translation of electrical input signals into desired effects and electrical output signals in the operation of the system. The drawer chipset **81** receives electrical inputs from and sends electrical outputs to various sources, such as, but not limited to, the digital control interface **26**, the usage sensor **89**, the usage frequency display **810**, the spoilage sensor **811**, the spoilage display **812**, a digitally controlled locking mechanism, and the name placard **88** in the case that the name placard **88** is a digital touch screen, as dictated by the chipset's programming. The drawer chipset **81** is preferably positioned adjacent to or within the second face **842**. The drawer chipset **81** is electronically connected to the refrigerator chipset **14** by either a previously known wireless radio frequency communication device, or by a wired connection.

[0046] In one embodiment of the present invention, each of the plurality of refrigerator drawers **8** does not comprise a drawer chipset **81**, and any comprised electronic components of each of the plurality of refrigerator drawers **8** are electronically connected to and controlled by the refrigerator chipset **14**, as can be seen in FIG. 8.

[0047] The drawer power source **82** may be any electrical power source that is useful and appropriate for providing electrical power to the electronic components of each of the plurality of refrigerator drawers **8**, such as, but not limited to, a battery or multiple batteries, an arrangement of photovoltaic cells, or having the electronic components of each of the plurality of refrigerator electrically connected to the refrigerator power source **13**. In one embodiment of the present invention, each of the plurality of refrigerator drawers **8** does not comprise a drawer power source **82**, and any comprised electronic components of each of the plurality of refrigerator drawers **8** are electrically connected to the refrigerator power source **13**.

[0048] The drawer liner **83** is a disposable liner made of cloth or other materials with absorption and odor neutralizing qualities in order to counteract spills or rotting and/or pungent food. The drawer liner **83** is laid on the bottom of each of the plurality of refrigerator drawers **8** opposite the opening **85** in the drawer.

[0049] The drawer shell **84** is the box-shaped physical enclosure that holds items and comprises the majority of each of the plurality of refrigerator drawers **8**. The drawer shell **84** is approximately a rectangular cuboid. The drawer shell **84** is preferably made of clear plastic, or another suitable material. The opening **85** is the top face of the drawer shell **84** that is empty or negative space for placing items within and retrieving items from the drawer shell **84**. In one embodiment of the present invention, the drawer shell **84** has a pattern of holes or cutouts, preferably approximately $\frac{3}{4}$ inch holes, on the side walls and second face **842** in order to facilitate air flow throughout the refrigerator compartment **1**.

[0050] In the preferred embodiment of the present invention, the drawer locking interface **87** is a pin or latch that is

pushed or otherwise moved into contact with one of the plurality of divider locking interfaces **74** in order to secure the drawer in place. In another embodiment of the present invention, the drawer locking interface **87** may also comprise a drawer eyelet **871** which, when the drawer is in the closed position, is concentrically positioned with a matching divider eyelet **741** so that a lock may be inserted through the drawer eyelet **871** and the divider eyelet **741** to secure the two eyelets together. The drawer locking interface **87** may utilize a number of other previously known locking systems, such as a push-button lock interface **872**, a rotary combination lock, a digital lock control system, a key lock system, a fingerprint scanner, a key card reader, a radio frequency identification (RFID) tag reader, or any other suitable mechanism or technology. Where appropriate, such as with a digital locking interface, fingerprint scanner, magnetic card reader, or RFID system, the locking system is electronically connected to and controlled by either the drawer chipset **81** or the refrigerator chipset **14** and powered by the drawer power source **82** or the refrigerator power source **13**. Multiple locking systems may be incorporated in the same embodiment.

[0051] The name placard **88** is a sign positioned on the first side opposite the opening **85** that announces current ownership of each of the plurality of refrigerator drawers **8**. The name placard **88** may utilize a number of methods for displaying an assigned user's name, including, but not limited to, a dry-erase board or whiteboard, a digital screen, or another well-known or suitable technology that allows a user's name to be temporarily displayed. In the embodiment where the name placard **88** is a digital screen, the digital screen may be electronically connected to and controlled by the drawer chipset **81** or the refrigerator chipset **14** and powered by the drawer power source **82** or the refrigerator power source **13**.

[0052] The usage sensor **89** is an electronic component that detects the use of one of the plurality of refrigerator drawers **8** by producing an electrical signal when the drawer is opened. In one embodiment of the present invention, the usage sensor **89** is a button at the back of the refrigerator compartment **1** that is depressed by a protrusion on the second face **842** opposite the opening **85** when the drawer is closed, and which released upon opening the drawer. In another embodiment of the present invention, the usage sensor **89** is a motion sensor. In another embodiment of the present invention, the usage sensor **89** is a laser distance sensor, or any other sensor useful for recognizing when a drawer has been opened. In the preferred embodiment of the present invention, upon detecting that the drawer has been opened, the usage sensor **89** sends a signal to the drawer chipset **81** or to the refrigerator chipset **14**.

[0053] In the preferred embodiment of the present invention, the usage frequency display **810** is a light emitting diode (LED) text display that shows the last date and/or time the drawer was opened, or time elapsed since last opening **85**, utilizing a matrix of LEDs or a matrix of LED segments. The usage frequency display **810** is controlled by the drawer chipset **81**, if used, or the refrigerator chipset **14**, if the drawer chipset **81** is not included. The usage frequency display **810** is positioned on the first face **841** opposite the opening **85**. The usage frequency display **810** is powered by any suitable power source, including, but not limited to, a battery, the drawer power source **82**, the refrigerator power source **13**, a matrix of photovoltaic cells, or another power source. The usage frequency display **810** is only comprised in embodiments of the present invention that do not include the digital

control interface **26**. In embodiments that include the digital control interface **26**, the usage sensor **89** is electronically connected to the refrigerator chipset **14**, which stores usage data for each of the plurality of drawers and displays said data on the digital control interface **26**.

[0054] The spoilage sensor **811** detects whether the contents of the drawer have gone bad or begun rotting. The spoilage sensor **811** may be any suitable, previously known technology that detects spoiled food. In the preferred embodiment of the present invention, the spoilage sensor **811** is a molecularly imprinted polymer (MIP) that may be adhered to the inside of the drawer shell **84** that may be tailored to selectively detect a particular amine, multiple amines or other substances or characteristics such as, but not limited to, pH or methane concentrations in the drawer. The spoilage sensor **811** is preferably located on the first face **841** opposite the refrigerator drawer handle **86**. The spoilage sensor **811** may be electronically connected to the appropriate chipset in order to facilitate a digital spoilage display **812**.

[0055] The spoilage display **812** shows the spoilage status of the contents of the drawer. In one embodiment of the present invention, the spoilage sensor **811** is a sticker or strip with MIP material that changes color depending on the concentration of detected substances in the drawer. For example, a green spoilage display **812** represents unspoiled drawer contents, yellow represents mild spoilage, and red represents heavy spoilage. In another embodiment of the present invention, the spoilage display **812** is a digital display, such as, but not limited to, an LED matrix or screen, or liquid crystal display (LCD) screen that receives a signal from the appropriate chipset upon receipt of a spoilage signal from the spoilage sensor **811** and displays a message such as "Spoiled" or "Rotten".

[0056] Although the invention has been explained in relation to its preferred embodiment, it is to be understood that many other possible modifications and variations can be made without departing from the spirit and scope of the invention as hereinafter claimed.

What is claimed is:

1. A refrigerator with individualized locking drawers comprises,

- a refrigerator compartment;
- a refrigerator door;
- a plurality of hinges;
- a freezer compartment;
- a freezer drawer;
- a back enclosure;
- a drawers section;
- a plurality of refrigerator drawers;
- a storage shelf;
- a refrigerator temperature sensor;
- a freezer temperature sensor;
- a refrigerator chipset;
- a network connection device;

the refrigerator door comprises an inside door surface, an outside door surface, a plurality of door shelves, a refrigerator door handle, a hand sanitizer dispenser, and a digital control interface;

the drawers section comprises a plurality of vertical dividers, a plurality of horizontal dividers, a plurality of drawer cubbies, and a plurality of divider locking interfaces; and

each of the plurality of refrigerator drawers comprises a drawer shell, a drawer chipset, a drawer liner, an open-

ing, a refrigerator drawer handle, a drawer locking interface, a name placard, a usage frequency display, a spoilage sensor, and a spoilage display.

2. The refrigerator with individualized locking drawers as claimed in claim 1 comprises,

the refrigerator compartment and the freezer compartment being adjacently positioned to each other within the back enclosure;

the refrigerator compartment being connected within the back enclosure;

the refrigerator door being positioned adjacent to the refrigerator compartment opposite the back enclosure;

the refrigerator door being connected by the plurality of hinges to the back enclosure;

the refrigerator temperature sensor being positioned within the refrigerator compartment; and

the refrigerator chipset and the network connection device being positioned within the back enclosure.

3. The refrigerator with individualized locking drawers as claimed in claim 1 comprises,

the freezer drawer comprises a freezer drawer shell, a freezer door and a freezer drawer handle;

the freezer compartment being connected within the back enclosure;

the freezer drawer shell being positioned between the freezer door and the back enclosure;

the freezer door being connected to the freezer drawer shell opposite the back enclosure;

the freezer drawer traversing into the freezer compartment;

the freezer drawer handle being connected to the freezer door opposite the freezer drawer; and

the freezer temperature sensor being positioned within the freezer compartment.

4. The refrigerator with individualized locking drawers as claimed in claim 1 comprises,

the drawers section being positioned within the refrigerator compartment;

the plurality of vertical dividers being equally spaced apart from each other;

the plurality of horizontal dividers being equally spaced apart from each other;

the plurality of vertical dividers perpendicularly intersecting the plurality of horizontal dividers;

the plurality of drawer cubbies being delineated by the plurality of vertical dividers and the plurality of horizontal dividers;

the plurality of refrigerator drawers traversing into the plurality of drawer cubbies; and

the storage shelf being positioned within the refrigerator compartment between the drawers section and the freezer compartment.

5. The refrigerator with individualized locking drawers as claimed in claim 1 comprises,

the inside door surface being positioned parallel and opposite to the outside door surface;

the plurality of door shelves being positioned on the inside door surface;

the refrigerator door handle being connected to the outside door surface opposite the plurality of hinges; and

the hand sanitizer dispenser and the digital control interface being positioned on the outside door surface.

6. The refrigerator with individualized locking drawers in claim 1 comprises,

the opening being positioned adjacent to the drawer shell; the drawer shell comprises a first face and a second face; the first face and the second face being oriented parallel to each other;

the first face and the second face being oppositely positioned from each other;

the second face being positioned between the first face and the back enclosure;

the second face and the opening of each of the plurality of refrigerator drawers traversing into each of the plurality of cubbies;

the opening being perpendicularly positioned between the first face and the second face;

the drawer liner being positioned opposite the opening;

the refrigerator drawer handle, the name placard, the usage frequency display, and the spoilage display being positioned on the first face opposite the opening; and

the spoilage sensor being positioned on the first face adjacent to the opening.

7. The refrigerator with individualized locking drawers in claim 1 comprises,

the refrigerator chipset being electronically connected to the digital control interface, the network connection device, the refrigerator temperature sensor, and the freezer temperature sensor.

8. The refrigerator with individualized locking drawers in claim 1 comprises,

the refrigerator chipset being electronically connected to the drawer chipset for each of the plurality of refrigerator drawers.

9. The refrigerator with individualized locking drawers in claim 1 comprises,

the drawer chipset being electronically connected to the name placard, the drawer locking interface, the usage sensor, the usage frequency display, the spoilage sensor, and the spoilage display.

10. The refrigerator with individualized locking drawers in claim 1 comprises,

the refrigerator chipset being electronically connected to the name placard, the drawer locking interface, the usage sensor, the usage frequency display, the spoilage sensor, and the spoilage display for each of the plurality of refrigerator drawers.

11. The refrigerator with individualized locking drawers in claim 1 comprises,

the plurality of divider locking interfaces being engaged with the drawer locking interface for each of the plurality of refrigerator drawers.

12. A refrigerator with individualized locking drawers comprises,

a refrigerator compartment;

a refrigerator door;

a plurality of hinges;

a freezer compartment;

a freezer drawer;

a back enclosure;

a drawers section;

a plurality of refrigerator drawers;

a storage shelf;

a refrigerator temperature sensor;

a freezer temperature sensor;

a refrigerator chipset;

a network connection device;

the refrigerator door comprises an inside door surface, an outside door surface, a plurality of door shelves, a refrigerator door handle, a hand sanitizer dispenser, and a digital control interface;

the drawers section comprises a plurality of vertical dividers, a plurality of horizontal dividers, a plurality of drawer cubbies, and a plurality of divider locking interfaces;

each of the plurality of refrigerator drawers comprises a drawer shell, a drawer chipset, a drawer liner, an opening, a refrigerator drawer handle, a drawer locking interface, a name placard, a usage frequency display, a spoilage sensor, and a spoilage display;

the drawers section being positioned within the refrigerator compartment;

the plurality of vertical dividers being equally spaced apart from each other;

the plurality of horizontal dividers being equally spaced apart from each other;

the plurality of vertical dividers perpendicularly intersecting the plurality of horizontal dividers;

the plurality of drawer cubbies being delineated by the plurality of vertical dividers and the plurality of horizontal dividers;

the plurality of refrigerator drawers traversing into the plurality of drawer cubbies;

the opening being positioned adjacent to the drawer shell; the drawer shell comprises a first face and a second face; the first face and the second face being oriented parallel to each other;

the first face and the second face being oppositely positioned from each other;

the second face being positioned between the first face and the back enclosure;

the second face and the opening of each of the plurality of refrigerator drawers traversing into each of the plurality of cubbies;

the opening being perpendicularly positioned between the first face and the second face;

the drawer liner being positioned opposite the opening;

the refrigerator drawer handle, the name placard, the usage frequency display, and the spoilage display being positioned on the first face opposite the opening;

the spoilage sensor being positioned on the first face adjacent to the opening;

the refrigerator chipset being electronically connected to the digital control interface, the network connection device, the refrigerator temperature sensor, and the freezer temperature sensor; and

the plurality of divider locking interfaces being engaged with the drawer locking interface for each of the plurality of refrigerator drawers.

13. The refrigerator with individualized locking drawers as claimed in claim **12** comprises,

the refrigerator compartment and the freezer compartment being adjacently positioned to each other within the back enclosure;

the refrigerator compartment being connected within the back enclosure;

the refrigerator door being positioned adjacent to the refrigerator compartment opposite the back enclosure;

the refrigerator door being connected by the plurality of hinges to the back enclosure;

the refrigerator temperature sensor being positioned within the refrigerator compartment;

the refrigerator chipset and the network connection device being positioned within the back enclosure;

the freezer drawer comprises a freezer drawer shell, a freezer door and a freezer drawer handle;

the freezer compartment being connected within the back enclosure;

the freezer drawer shell being positioned between the freezer door and the back enclosure;

the freezer door being connected to the freezer drawer shell opposite the back enclosure;

the freezer drawer traversing into the freezer compartment;

the freezer drawer handle being connected to the freezer door opposite the freezer drawer;

the freezer temperature sensor being positioned within the freezer compartment;

the inside door surface being positioned parallel and opposite to the outside door surface;

the plurality of door shelves being positioned on the inside door surface;

the refrigerator door handle being connected to the outside door surface opposite the plurality of hinges;

the hand sanitizer dispenser and the digital control interface being positioned on the outside door surface; and

the storage shelf being positioned within the refrigerator compartment between the drawers section and the freezer compartment.

14. The refrigerator with individualized locking drawers in claim **12** comprises,

the refrigerator chipset being electronically connected to the drawer chipset for each of the plurality of refrigerator drawers.

15. The refrigerator with individualized locking drawers in claim **12** comprises,

the drawer chipset being electronically connected to the name placard, the drawer locking interface, the usage sensor, the usage frequency display, the spoilage sensor, and the spoilage display.

16. The refrigerator with individualized locking drawers in claim **12** comprises,

the refrigerator chipset being electronically connected to the name placard, the drawer locking interface, the usage sensor, the usage frequency display, the spoilage sensor, and the spoilage display for each of the plurality of refrigerator drawers.

17. A refrigerator with individualized locking drawers comprises,

a refrigerator compartment;

a refrigerator door;

a plurality of hinges;

a freezer compartment;

a freezer drawer;

a back enclosure;

a drawers section;

a plurality of refrigerator drawers;

a storage shelf;

a refrigerator temperature sensor;

a freezer temperature sensor;

a refrigerator chipset;

a network connection device;

the refrigerator door comprises an inside door surface, an outside door surface, a plurality of door shelves, a refrigerator door handle, a hand sanitizer dispenser, and a digital control interface;

the drawers section comprises a plurality of vertical dividers, a plurality of horizontal dividers, a plurality of drawer cubbies, and a plurality of divider locking interfaces;

each of the plurality of refrigerator drawers comprises a drawer shell, a drawer chipset, a drawer liner, an opening, a refrigerator drawer handle, a drawer locking interface, a name placard, a usage frequency display, a spoilage sensor, and a spoilage display;

the refrigerator compartment and the freezer compartment being adjacently positioned to each other within the back enclosure;

the refrigerator compartment being connected within the back enclosure;

the refrigerator door being positioned adjacent to the refrigerator compartment opposite the back enclosure;

the refrigerator door being connected by the plurality of hinges to the back enclosure;

the refrigerator temperature sensor being positioned within the refrigerator compartment;

the refrigerator chipset and the network connection device being positioned within the back enclosure;

the freezer drawer comprises a freezer drawer shell, a freezer door and a freezer drawer handle;

the freezer compartment being connected within the back enclosure;

the freezer drawer shell being positioned between the freezer door and the back enclosure;

the freezer door being connected to the freezer drawer shell opposite the back enclosure;

the freezer drawer traversing into the freezer compartment;

the freezer drawer handle being connected to the freezer door opposite the freezer drawer;

the freezer temperature sensor being positioned within the freezer compartment;

the drawers section being positioned within the refrigerator compartment;

the plurality of vertical dividers being equally spaced apart from each other;

the plurality of horizontal dividers being equally spaced apart from each other;

the plurality of vertical dividers perpendicularly intersecting the plurality of horizontal dividers;

the plurality of drawer cubbies being delineated by the plurality of vertical dividers and the plurality of horizontal dividers;

the plurality of refrigerator drawers traversing into the plurality of drawer cubbies;

the storage shelf being positioned within the refrigerator compartment between the drawers section and the freezer compartment;

the inside door surface being positioned parallel and opposite to the outside door surface;

the plurality of door shelves being positioned on the inside door surface;

the refrigerator door handle being connected to the outside door surface opposite the plurality of hinges;

the hand sanitizer dispenser and the digital control interface being positioned on the outside door surface;

the opening being positioned adjacent to the drawer shell;

the drawer shell comprises a first face and a second face;

the first face and the second face being oriented parallel to each other;

the first face and the second face being oppositely positioned from each other;

the second face being positioned between the first face and the back enclosure;

the second face and the opening of each of the plurality of refrigerator drawers traversing into each of the plurality of cubbies;

the opening being perpendicularly positioned between the first face and the second face;

the drawer liner being positioned opposite the opening;

the refrigerator drawer handle, the name placard, the usage frequency display, and the spoilage display being positioned on the first face opposite the opening;

the spoilage sensor being positioned on the first face adjacent to the opening;

the refrigerator chipset being electronically connected to the digital control interface, the network connection device, the refrigerator temperature sensor, and the freezer temperature sensor; and

the plurality of divider locking interfaces being engaged with the drawer locking interface for each of the plurality of refrigerator drawers.

18. The refrigerator with individualized locking drawers in claim **17** comprises,

the refrigerator chipset being electronically connected to the drawer chipset for each of the plurality of refrigerator drawers.

19. The refrigerator with individualized locking drawers in claim **17** comprises,

the drawer chipset being electronically connected to the name placard, the drawer locking interface, the usage sensor, the usage frequency display, the spoilage sensor, and the spoilage display.

20. The refrigerator with individualized locking drawers in claim **17** comprises,

the refrigerator chipset being electronically connected to the name placard, the drawer locking interface, the usage sensor, the usage frequency display, the spoilage sensor, and the spoilage display for each of the plurality of refrigerator drawers.

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