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(54) SYSTEM FOR PROVIDING TEMPERATURE CONTROLLED STORAGE

(57) Disclosed is a system for providing temperature controlled storage. The system comprises a housing having a first, second, third and fourth wall in connection with each other, and a ceiling. The ceiling is arranged on top of the walls and is arranged to have at least one slit between the ceiling and first wall, and ceiling and third wall. The system includes a group of cabinets arranged inside the housing. The group of cabinets comprises at least one set of cabinets. The system further includes a compressor unit, for each of the at least one set of cabinets, comprising a first fan and second fan. The first fan is configured to provide cooled air to a respective set of cabinets via a pipe system connected to each of cabinet, and the second air fan is configured to blow heat from the compressor unit to a direction of the first wall.

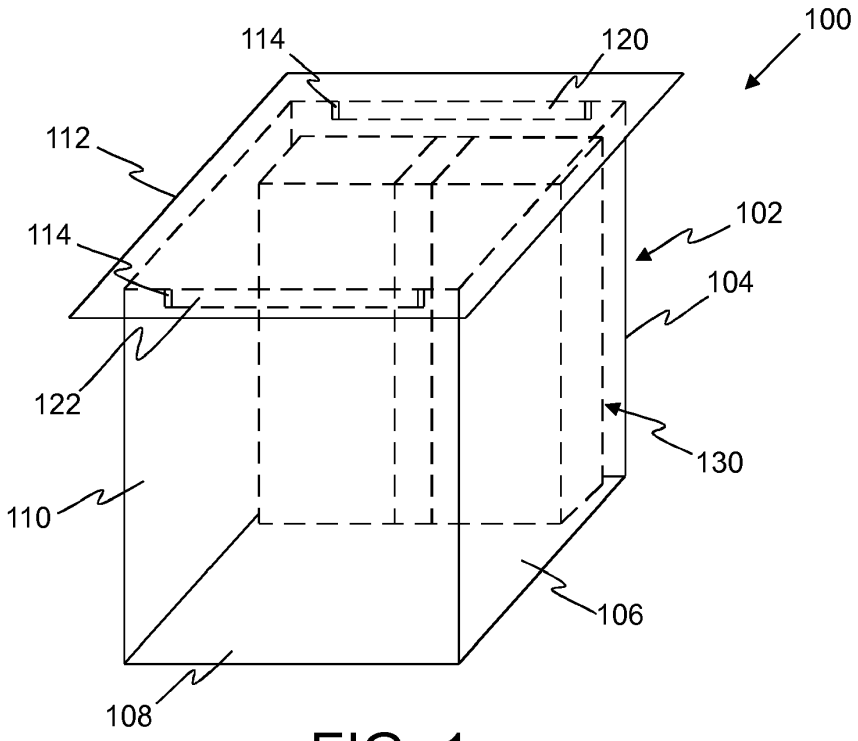

FIG. 1

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Description

TECHNICAL FIELD

[0001] The present disclosure relates generally to storages; and more specifically, to a system for providing temperature controlled storage.

BACKGROUND

[0002] With technological advancement, lifestyle of people is getting faster and busier. Consequently, such fast and busy lifestyle has left people with very little time to do daily chores like cooking, shopping grocery and medicines, cleaning, laundry and so forth. Therefore, people who do not get time to attend to such daily chores may use online services or mobile phone to order things (or items). For example, people may order food or medicine using such online services or mobile phone.

[0003] Typically, delivery people are employed to deliver the ordered items. Mostly, a delivery person needs to co-ordinate time and location with a customer for the delivery of the ordered items. Many a times, it happens that the person who ordered the items is not physically available to collect the same. In such instance, the delivery person has to either wait or take back the items, which may cause dissatisfaction either for the delivery person or the customer. Additionally, in such situation, if the ordered item belongs to a perishable section, such as food or medicine, that requires to be maintained at a certain prescribed temperature till physical delivery of the same, the process of delivering such items becomes more challenging. Moreover, foreseeing such challenges people may refrain from ordering in case they are not physically available to collect the ordered items.

[0004] Therefore, in light of the foregoing discussion, there exists a need to overcome the aforementioned drawbacks of ordering and collecting ordered items that need to be maintained at a prescribed temperature.

SUMMARY

[0005] The present disclosure seeks to provide a system for providing a temperature controlled storage. The present disclosure seeks to provide a solution to the existing problem of ordering and collecting items that needs to be maintained at a prescribed temperature. An aim of the present disclosure is to provide a solution that overcomes at least partially the problems encountered in prior art and provides efficient way of ordering and collecting ordered items that needs to be maintained at a prescribed temperature.

[0006] In one aspect, an embodiment of the present disclosure provides a system for providing temperature controlled storage, the system comprises

- a housing having a first wall, a second wall, a third wall, a fourth wall in connection with each other, and a ceiling, wherein
  - the first wall and the third wall are parallel and facing each other;
  - the second wall and the fourth wall are parallel and facing each other;
  - the first and third walls are perpendicular to the second and fourth walls; and
  - the ceiling is arranged on top of the walls and is arranged to have at least a first slit between the ceiling and the first wall and at least a second slit between the ceiling and the third wall, wherein the at least first slit and second slit has a first height and a first width;
- a group of cabinets arranged inside the housing in parallel with the first wall at a first distance from the first wall and a second distance from a third wall, wherein
  - the first distance is smaller than the second distance;
  - the group of cabinets has a second height and a second width, the second height being such that a third distance between top of the group of cabinets and the ceiling is smaller than the first height; and
  - the group of cabinets comprises at least one set of cabinets; and
- a compressor unit for each of the at least one set of cabinets, the compressor unit having a first fan and a second fan, wherein
  - the first fan is configured to provide cooled air to a respective set of cabinets via a pipe system connected to each of cabinet of the set of cabinets; and
  - the second air fan is configured to blow heat from the compressor unit to a direction of the first wall.

[0007] Embodiments of the present disclosure substantially eliminate or at least partially address the aforementioned problems in the prior art and enable an efficient way of collecting items without being physically present to collect the same.

[0008] Additional aspects, advantages, features and objects of the present disclosure would be made apparent from the drawings and the detailed description of the illustrative embodiments construed in conjunction with the appended claims that follow.

[0009] It will be appreciated that features of the present disclosure are susceptible to being combined in various combinations without departing from the scope of the present disclosure as defined by the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The summary above, as well as the following detailed description of illustrative embodiments, is better understood when read in conjunction with the appended drawings. For the purpose of illustrating the present disclosure, exemplary constructions of the disclosure are shown in the drawings. However, the present disclosure is not limited to specific methods and instrumentalities disclosed herein. Moreover, those skilled in the art will understand that the drawings are not to scale. Wherever possible, like elements have been indicated by identical numbers.

[0011] Embodiments of the present disclosure will now be described, by way of example only, with reference to the following diagrams wherein:

FIG. 1 is a schematic perspective view of a system for providing temperature controlled storage, in accordance with an embodiment of the present disclosure;
FIG. 2 is a schematic front view of a group of cabinets of the system of FIG. 1, in accordance with an embodiment of the present disclosure;
FIG. 3 is a schematic front view of a set of cabinets of the group of cabinets of FIG. 2, in accordance with an embodiment of the present disclosure;
FIG. 4 is a schematic sectional view of the system of FIG. 1, in accordance with an embodiment of the present disclosure; and
FIG. 5 is a block diagram depicting exemplary implementation of the system of FIG. 1, in accordance with an embodiment of the present disclosure.

[0012] In the accompanying drawings, an underlined number is employed to represent an item over which the underlined number is positioned or an item to which the underlined number is adjacent. A non-underlined number relates to an item identified by a line linking the non-underlined number to the item. When a number is non-underlined and accompanied by an associated arrow, the non-underlined number is used to identify a general item at which the arrow is pointing.

DETAILED DESCRIPTION OF EMBODIMENTS

[0013] The following detailed description illustrates embodiments of the present disclosure and ways in which they can be implemented. Although some modes of carrying out the present disclosure have been disclosed, those skilled in the art would recognize that other embodiments for carrying out or practicing the present disclosure are also possible.

[0014] In one aspect, an embodiment of the present disclosure provides a system for providing temperature controlled storage, the system comprises

- a housing having a first wall, a second wall, a third wall, a fourth wall in connection with each other, and a ceiling, wherein
  - the first wall and the third wall are parallel and facing each other;
  - the second wall and the fourth wall are parallel and facing each other;
  - the first and third walls are perpendicular to the second and fourth walls; and
  - the ceiling is arranged on top of the walls and is arranged to have at least a first slit between the ceiling and the first wall and at least a second slit between the ceiling and the third wall, wherein the at least first slit and second slit has a first height and a first width;
- a group of cabinets arranged inside the housing in parallel with the first wall at a first distance from the first wall and a second distance from a third wall, wherein
  - the first distance is smaller than the second distance;
  - the group of cabinets has a second height and a second width, the second height being such that a third distance between top of the group of cabinets and the ceiling is smaller than the first height; and
  - the group of cabinets comprises at least one set of cabinets; and
- a compressor unit for each of the at least one set of cabinets, the compressor unit having a first fan and a second fan, wherein
  - the first fan is configured to provide cooled air to a respective set of cabinets via a pipe system connected to each of cabinet of the set of cabinets; and
- the second air fan is configured to blow heat from the compressor unit to a direction of the first wall.

[0015] The system of the present disclosure provides an efficient and effective way of delivering and collecting ordered items. Furthermore, the system of the present disclosure provides a temperature controlled environment for storing the ordered items. Moreover, the system disclosed herein provides an efficient way of collecting ordered items. For example, the system disclosed herein provides a robust, a more energy efficient, secured and better temperature controlled environment as compared to a conventional temperature controlled storage that may include a refrigerator and the like. Beneficially, the system of the present disclosure provides a mode for delivering items even when a user who has ordered the item is not physically present to collect the ordered item. Consequently, such a mode of ordering and collecting

items may enable a person to manage his or her time effectively while attending to daily chores. The system further enables efficiently managing an overall delivery-chain business and enables in increasing business opportunities associated therewith.

[0016] Throughout the present disclosure the term "temperature controlled storage" refers either to a refrigerated storage for preservation of any perishable item that needs to be kept within a prescribed temperature when ambient temperature (temperature outside of the storage) is higher than the prescribed temperature, or to a heated storage for preservation of any item when ambient temperature is below the prescribed temperature. The temperature controlled storage preferably also includes uniform air circulation, relative humidity and the like. Furthermore, the temperature controlled storage is typically a closed area made from a metal, non-metal, alloy or combination thereof capable of maintaining the prescribed temperature. Additionally, the temperature controlled storage is configured to have any shape that suitably accommodates the items to be received therein. Moreover, the system for temperature controlled storage comprises a housing that separates the temperature controlled storage from an external environment. The housing can be made of any metal, non-metal, alloy or combination thereof. Furthermore, the housing may have a door arranged to let a user enter the housing for using the temperature controlled storage and/or leave the housing thereafter. Additionally, the housing may be capable of accommodating one or more users therein for using the temperature controlled storage.

[0017] As mentioned previously, the system comprises the housing having the first wall, the second wall, the third wall, the fourth wall in connection with each other. The first, second, third and fourth walls are mounted on a base that acts as a floor. Furthermore, the first wall and the third wall are parallel and facing each other. The first wall and the third wall have a predetermined distance therebetween. For example, the distance between the first wall and the third wall defines a length of the housing. Alternatively, the distance between the first wall and the third wall may define a width of the housing. Moreover, the second wall and the fourth wall are parallel and facing each other. The second wall and the fourth wall also have a predetermined distance therebetween. At one instance, a distance between the second wall and the fourth wall may define a length of the housing, and alternatively the distance between the second wall and the fourth wall may define a width of the housing. Consequently, a size of the housing depends upon the distance between the first and third walls and the distance between the second and fourth walls.

[0018] As mentioned previously, the first and third walls are perpendicular to the second and fourth walls. In other words, the first wall is perpendicular to the second wall and the fourth wall, and similarly the third wall is perpendicular to the second wall and the fourth wall. It will be appreciated that the first, second, third and fourth walls are configured to form a closed area defining interior space of the housing.

[0019] In an embodiment, the distance between the first and third walls and the distance between the second and fourth walls are fixed in nature and define a housing having a fixed size. Alternatively, the first, second, third and fourth walls are configured to be moved from one position to another position. Consequently, the distances between the first, second, third and fourth walls may be adjustable and may be changed when required. Subsequently, size of the housing may be changed when required.

[0020] Furthermore, the housing comprises the ceiling, wherein the ceiling is arranged on top of the first, second, third and fourth walls. The ceiling is attached to the top of each of the first, second, third and fourth walls forming a separation between the interior space within the housing and outer environment. In an example, the ceiling acts as a shade for the interior space within the housing. In an embodiment, the ceiling is arranged on top of the walls with supports. The ceiling may be arranged on top of the walls by means of supports like clamps, nut bolts, screws and so forth.

[0021] In an embodiment, the ceiling may be made from tampered glass. The tampered glass provides thermal resistance to the housing, i.e. does not allow heat (generated by sunrays falling on the ceiling) to affect a temperature inside the housing. Also, beneficially the tampered glass, when broken, crumbles into small granular chunks that are less likely to cause injury to a user inside the housing.

[0022] The ceiling is arranged to have at least one slit between the ceiling and the first wall and at least one slit between the ceiling and the third wall. In an example, the first wall includes a first cut-out defining the at least one slit between the ceiling and the first wall, and the third wall includes a second cut-out defining the at least one slit between the ceiling and the third wall. Further, the at least one slit between the ceiling and the first wall, and the at least one slit between the ceiling and the third wall are positioned in the middle (facing each other) of the first and third walls, respectively. Alternatively, the at least one slit between the ceiling and the first wall and the at least one slit between the ceiling and the third wall may be positioned diagonally. The at least one slit between the ceiling and the first wall and the at least one slit between the ceiling and the third wall facilitate flow of air from outside of the housing into the housing and from within the housing to the outside. Additionally, the at least one slit between the ceiling and the first wall and the at least one slit between the ceiling and the third wall are arranged or configured face to face to allow proper flow of air therethrough.

[0023] The at least one slit (between the ceiling and the first wall, and the ceiling and the third wall) have a first height and a first width that defines size thereof. It may be appreciated that the at least one slit may be configured to have a rectangular shape or any other suitable

shape, such as rectangle with rounded corners. Further, the size of the at least one slit determines an amount of air flowing into the housing and flowing outside the housing. In an embodiment, the first height is 20 cm and the first width is at least 80 % of a width of the first wall and the third wall. For example, when each of the first and third walls includes a width of about 300 cm, then the first width is 240 cm. Further, in an example, each of the second and fourth walls includes a width of about 400 cm. In this embodiment the width of the second and fourth walls defines a length of the housing, whereas the width of the first and third walls defines a width of the housing. Moreover, each of the first, second, third and fourth walls include a height of about 300 cm. In an example, the housing may be configured to have a standard size of a shipping container.

[0024] As mentioned previously, the system comprises the group of cabinets arranged inside the housing in parallel with the first wall at the first distance from the first wall and the second distance from a third wall. The group of cabinets includes a number of cabinets having similar or dissimilar size and shape. Each of the cabinets in the group of cabinets is configured to receive and store an ordered item or thing therewithin. Additionally, the group of cabinets is arranged within the housing at a distance from each of the first, second, third and fourth walls. For example, as mentioned herein, the first distance is smaller than the second distance. Consequently, the group of cabinets is closer to the first wall as compared to the third wall. Additionally, an area (or region) between the first wall and the group of cabinets is smaller in comparison with an area between the third wall and the group of cabinets.

[0025] The group of cabinets has the second height and the second width, the second height being such that the third distance between top of the group of cabinets and the ceiling is smaller than the first height. The second height is smaller than height of the first, second, third and fourth walls. In an example, when the walls include a height of 300 cm and the first height is 20 cm (i.e. the height of the at least one slit), then the second height of the group of cabinets would be more than 280 cm and less than 300 cm. Further, in an example, the third distance is 5 cm, therefore the second height of the group of cabinets may be 295 cm. Additionally, the second width of the group of cabinets is smaller than width of the first and third walls. Further, the group of cabinets is spaced apart from the first, the second and the fourth walls by a distance of about 30 to 50 cm. Moreover, the group of cabinets is spaced apart from the third wall by a distance of about 200 to 300 cm. Additionally, when the width of the second and fourth walls is 400 cm, the second width of the group of cabinets may lie in a range of 50 cm to 150 cm. Similarly, a second length of the group of cabinets may lie in a range of 200 cm to 240 cm. In an example, the group of cabinets may be configured to have following dimensions, i.e. a height of 295 cm, a width of 75 cm and a length of 200 cm. The area or region between the group of cabinets and the third wall provides room for one or more users inside the housing. Moreover, the space between the group of cabinets and the third wall provides room for air to enter the housing. As is obvious to a person skilled in the art, the numbering of the walls and the location of the cabinets can vary from what has been disclosed above, and still be within the scope of the present description. Likewise, a group of cabinets may be arranged on more than one wall of the housing.

[0026] In another embodiment, the housing comprises a front access door arranged on a wall (such as the third wall) and at least one maintenance door arranged on a wall (typically a wall different from the one comprising the front access wall, such as a first wall). Furthermore, the front access door may be used by the one or more users to enter the housing for accessing the group of cabinets. Additionally, the maintenance door arranged on the first wall may be used to access a rear side of the group of cabinets for maintenance or loading thereof. Indeed, the present system may be arranged in such a manner that the loading is done via a different side of the cabinets than the side the items area collected therefrom.

[0027] As mentioned previously, the group of cabinets comprises at least one set of cabinets. In an example, the at least one set of cabinets comprises a pair of sets of cabinets, and each of the pair of sets of cabinets includes a pair of columns of vertically stacked cabinets. For example, each of the pair of set of cabinets forms a matrix structure, i.e. the cabinets may be arranged adjacent and one above another. Further, each of the cabinets in the at least one set of cabinets may be associated to a user, using such cabinets for collecting ordered items.

[0028] As mentioned previously, the system further comprises the compressor unit for each of the at least one set of cabinets. Furthermore, the compressor unit for each of the at least one set of cabinets works individually in order to maintain the prescribed temperature for each cabinet in the at least one set of cabinets. Specifically, the compressor unit is operatively attached to each cabinet of the at least one set of cabinets.

[0029] The compressor unit includes the first fan and the second fan. The first fan is configured to provide cooled air to the respective set of cabinets via the pipe system connected to each cabinet of the set of cabinets. For example, the first fan is operable to blow cooled air generated by the compressor unit to the respective set of cabinets. In an example, the pipe system includes one or more pipes operable to provide cooled air to each of the cabinets. However, the second fan is configured to blow out heat or hot air from the compressor unit towards a direction of the first wall. The second fan blows out heat generated during cooling of air in the compressor unit. Consequently, the second fan keeps temperature of the compressor unit balanced and prevents the compressor unit from over-heating. The blown out heat from the compressor unit towards the direction of the first wall increases temperature of rear of the group of cabinets. In such

instance, the at least one slit between the ceiling and the first wall lets the blown out heat to leave the housing.

[0030] In an embodiment, the pipe system includes at least one central pipe extending between the pair of columns of vertically stacked cabinets, the at least one central pipe includes a plurality of connecting pipes and each of the plurality of connecting pipes is coupled to a respective cabinet of the vertically stacked cabinets. Furthermore, the central pipe is operable to carry the cooled air to each of the cabinets in the pair of columns of vertically stacked cabinets. Typically, the central pipe enables in providing the cooled air generated by the compression unit to the cabinets with help of plurality of connecting pipes. In an example, a cross-sectional shape of the central pipe and the connecting pipes may be one of circular or rectangular.

[0031] Optionally, a cross-sectional size of each of the plurality of connecting pipes increases with a distance between the respective cabinet and the compressor unit. It will be appreciated that a volume of cooled air to be provided by the connecting pipe decreases as the distance between the respective cabinet and the compressor unit increases. Consequently, increasing the cross-sectional size of each of the plurality of connecting pipes (with increased distance between the respective cabinet and the compressor unit) provides desired amount of cool air for uniform cooling within the cabinets.

[0032] Alternatively, the pipe system further comprises a plurality of valve arrangements, each of the plurality of valve arrangements being operatively coupled to a respective connecting pipe of the plurality of connecting pipes for regulating a size of an opening through the respective connecting pipe. The valve arrangement may regulate the size of opening (through the connecting pipes) for regulating the amount of cool air to be delivered by the connecting pipe into the cabinets.

[0033] In an embodiment, the system comprises a control unit operatively coupled to the compressor unit for controlling operations thereof. The control unit may be operable to start and stop function of the first and the second fan of the compressor unit. Additionally, the control unit may be operable to control functioning of other components of the compressor unit, which will be explained herein later. It will be appreciated that the control unit may include electronic components, such as a processor, memory, integrated circuits and so forth, integrated and designed to control the function of the compressor unit. In an example, the control unit may be operable to control function of the compressor unit based on a sensor output. Alternatively, the control unit may be operable to control function of the compressor unit based on a user command.

[0034] In yet another embodiment, the compressor unit further comprises a compressor, a condenser and an evaporator, the compressor unit being operable to provide cooled air flow to the pipe system. It will be appreciated that the compressor unit of the present disclosure relates to a compressor unit of a refrigeration system, i.e. the compressor is operable to compress a cooling medium, whereafter the compressed cooling medium is fed to the condenser to cool the compressed cooling medium, and the cooled compressed cooling medium is fed to the evaporator. It will be appreciated that the evaporator is operatively coupled to the pipe system, for example, the evaporator may be arranged within the central pipe and the first fan is operable to direct air towards the evaporator. This allows the compressor unit to provide cool air flow to the pipe system and further to the cabinets coupled to the pipe system.

[0035] In an embodiment, the compressor unit further comprises a heating unit to provide heat air flow to the pipe system. In an example, the heating unit may include an electric coil that may be heated by allowing electric current to pass there-through. The electric coil is operatively coupled to the pipe system, i.e. the electric coil may be arranged within the central pipe and the first fan is operable to direct air towards the electric coil. This allows the compressor unit to provide heat air flow to the pipe system and further to the cabinets coupled to the pipe system. It will be appreciated that the compressor unit of the present disclosure is operable to provide either the cold or hot air flow to the pipe system based on user need and/or atmospheric condition.

[0036] In an embodiment, each of the cabinets includes a temperature sensor, the temperature sensor being operatively coupled to the control unit and operable to sense temperature of the cabinets for controlling operations of the compressor unit. Accordingly, as soon as temperature of the cabinets reaches a predefined threshold temperature, the temperature sensor may communicate with the control unit to provide cooled air flow from the compressor unit towards the cabinets by the pipe system or heated air flow from the heating unit. It will be appreciated that the predefined threshold temperature relates to a desired temperature of a cabinet, to be maintained when the cabinet receives an item therein, wherein the desired temperature may depend upon the prescribed temperature of the perishable items to be kept in the cabinets. Moreover, as soon as temperature of the cabinets reaches the predefined threshold temperature, the temperature sensor may communicate with the control unit to stop cooled air flow from the compressor unit or heated air flow from the heating unit.

[0037] In an example, the control unit comprises a user interface operable to receive the user commands for controlling operations of the compressor unit. The user interface may include buttons, touch screen and other mediums of providing user commands to the control unit. In an example, the user command may include setting the predefined threshold temperature for cabinets. Further, the user command may include setting time-periods for auto-operation of the first fan, the second fan and the compressor unit for maintaining the desired temperatures for the cabinets.

[0038] Optionally, the cabinets include an electronic door and the electronic door is operable via the control

unit with a user command. The user command may be an access code (for example, an alpha-numeric code) for opening the electronic door. In an example, a delivery person may be provided with the access code for accessing a cabinet and delivering an ordered into the cabinet.

[0039] In an embodiment, the system comprises a communication module communicably coupled to a plurality of user devices that are associated with a delivery person or a user ordering an item, for allowing communication therebetween. The communication module may include components that enable the system to connect with a network that further enables the system to connect with the plurality of user devices (namely, user device of a delivery person or user device of a user who has ordered an item). Optionally, the communication module may be operable to establish an internet connection using a wired communication interface. Additionally, the wired communication interface is to be employed to communicably couple the system with user devices. In such a case, the wired communication interface is implemented by way of an electrical connector (for example, such as a connector receptacle commonly known as a '*jack*', a '*socket*', and the like). In operation, the wired communication interface of the communication module engages with a first connector plug of a connector cable, and another wired communication interface of the communication module engages with a second connector plug of the connector cable, to establish a wired connection between the system and the devices. Examples of the wired communication interface include, but are not limited to, a Universal Serial Bus (USB) connector receptacle (namely, a USB port). More optionally, the communication module may be operable to establish the internet connection using a wireless communication interface. Additionally, the wireless communication interface allows the system and the plurality of user devices to exchange information therebetween via a wireless network (for example, such as a Near-field communication network, a Bluetooth network, Internet, a WiFi Direct network, and the like). The wireless communication interface is implemented by way of a wireless network adapter (for example, such as a Near-field communication chip, a Bluetooth adapter, a WiFi adapter, a WiFi Direct adapter, and the like) that is compatible with a desired wireless network. The communication module is operable to connect to the network via the wired or wireless communication interface. The network further has user devices connected thereto. Furthermore, the system communicates with the user devices via the communication module. It is to be understood that the network acts as a mediator between the communication module of the system and the plurality of user devices. Also, the user devices may also be operable to communicate therebetween via the network. In an example, a user device being used by a person for ordering a food item may communicate with another user device associated with a delivery person of the food item via the network for sharing delivery address and access code for delivering the food item to the respective cabinet.

[0040] In another embodiment, the communication module is communicably coupled to the control unit for communicating status of each of the cabinets and the compressor unit to the user devices. For example, the status may include a temperature of a cabinet, i.e. the temperature of the cabinet may be communicated to the user device associated with a person that owns the cabinet. Further, the status may include whether the cabinet is empty or occupied. For example, each of the cabinets may include a weight sensor, which is operatively coupled to the communication module, therefore based on the weight sensor reading the control unit determines presence of an item within the cabinet. Further, the control unit communicates with the communication module for communicating status (whether the cabinet is empty or occupied) to user device associated with the person that owns the cabinet. For example, the communication module may communicate whether the ordered item is delivered or not to the cabinet.

[0041] In one embodiment, during operation, the at least one slit between the ceiling and the first wall and the at least one slit between the ceiling and the third wall facilitate a flow of an air-stream through the housing for reducing temperature around the compressor unit. The flow of the air-stream is caused due to temperature and pressure differences at various regions around the group of cabinets and the housing. For example, the temperature outside the housing may be higher as compared to the temperature inside the housing, particularly, in the front portion of the housing between the third wall and the group of cabinets. It will be appreciated that air moves from a higher temperature towards a lower temperature. Therefore, the air tends to flow from outside the housing towards the inside the housing through the at least one slit between the ceiling and the third wall.

[0042] Further, as mentioned above, the second fan is operable to blow out the hot air from within the compression unit towards the first wall. It will be appreciated that the cold air flow, provided by the compression unit to the cabinets through the pipe system, leaves the cabinets with the heat of the cabinet. Each of the cabinets includes at least one opening configured at top portions thereof for releasing the air from within the cabinets. It will be appreciated that air from within the cabinets may be directly released from an opening in a rear portion thereof towards the first wall. Otherwise, the pipe system may include a separate pipe connected to the openings of the cabinets for allowing the air from within the cabinets to be released by the pipe towards the at least one slit between the ceiling and the first wall. This may cause accumulation of hot air at a rear portion of the housing, i.e. behind the group of cabinets. However, as mentioned above, the second fan is configured to blow heat from the compressor unit to the direction of the first wall, particularly towards the at least one slit between the ceiling and the first wall. Therefore, the hot air from the rear portion of the housing leaves the housing through the at least one slit between the ceiling and the first wall. The

release of air from the rear portion causes a pressure difference between the rear and the front portion of the housing. This causes the air in the front portion of the housing to flow towards rear portion of the housing and over top of the group of cabinets. In simple words, the temperature and pressure differences at various regions around the group of cabinets and the housing forms the flow of the air-stream, i.e. the air enters into the house through the at least one slit between the ceiling and the third wall, thereafter the air flows over the compression unit between the top of the group of cabinets and the ceiling, and finally the air leaves the housing through the at least one slit between the ceiling and the first wall. Therefore, the flow of the air-stream through the housing enables in providing a cooling effect around the compression unit. Beneficially, the cooling effect produced by the flow of air creates a comparatively lower temperature around the compressor unit. In addition to the flow of the air-stream, humidity due to the presence of the users inside the housing further enables lowering the temperature within the housing. Consequently, the compressor unit consumes less power for functioning thereof in order to maintain the prescribed temperature within the set of cabinets.

[0043] According to an embodiment, in use, the cabinets may be provided with cool air to keep perishable items that need to be maintained at lower temperature, for example, at about 3 to 5 degree Celsius. In an example, the perishable items may include food, cold drinks, ice-cream, fruits, salad, medicine and so forth. Alternatively, the cabinets may be provided with hot air to keep items that need to be maintained at a higher temperature, for example, at about 60 to 80 degree Celsius. In an example, such ordered item may include soup, tea, coffee, pizza, noodles, curry and so forth.

[0044] According to an optional embodiment the system can be arranged in a top of a platform. The platform can be moved using a truck from place to place, thus enabling easy moving and deployment of the system.

DETAILED DESCRIPTION OF THE DRAWINGS

[0045] FIG. 1 is a schematic perspective view of a system **100** for providing temperature controlled storage, in accordance with an embodiment of the present disclosure. The system **100** includes a housing **102** having a first wall **104**, a second wall **106**, a third wall **108**, a fourth wall **110** in connection with each other, and a ceiling **112**. The ceiling is arranged on top of the walls with supports **114**. The ceiling **112** is arranged on top of the walls **104-110** and is arranged to have at least one slit **120** between the ceiling **112** and the first wall **104** and at least one slit **122** between the ceiling **112** and the third wall **108**. The system **100** also includes a group of cabinets **130** arranged inside the housing **102**.

[0046] FIG. 2 is a schematic front view of the group of cabinets **130** of the system **100** of FIG. 1, in accordance with an embodiment of the present disclosure. The group of cabinets **130** includes at least one set of cabinets, i.e. a pair of sets of cabinets **202**, and each of the pair of sets of cabinets **202** includes a pair of columns of vertically stacked cabinets **204**. The each of the pair of sets of cabinets **202** also includes a compressor unit, such as compressor units **206**. As shown, each of the compressor units **206** comprises a first fan **210** and a second fan **212**. The system **100** also includes a pipe system **220** connected to each of the cabinets **204** of the set of cabinets **202**. The pipe system **220** includes a central pipe **222** extending between the pair of columns of vertically stacked cabinets **204**. The central pipe **222** includes a plurality of connecting pipes **224** and each of the plurality of connecting pipes **224** is coupled to a respective cabinet of the vertically stacked cabinets **204**.

[0047] The system **100** (shown in FIG. 1) also includes a control unit **230** operatively coupled to the compressor unit **206** for controlling operations thereof. Further, as shown, each of the cabinets **204** includes an electronic door, such as an electronic door **240**, operable via the control unit **230** with a user command. The control unit includes a user interface **232** operable to receive the user command. Each of the cabinets **204** includes a temperature sensor **242**. The system **100** (shown in FIG. 1) further includes a communication module **250** communicably coupled to user devices for allowing communication therebetween, this will be explained in greater detail in conjunction with subsequent FIG. 5.

[0048] Referring now to FIG. 3, illustrated is a schematic front view of the set of cabinets **202** of the group of cabinets **130** of FIG. 1, in accordance with an embodiment of the present disclosure. As shown, the compressor unit **206**, of the set of cabinets **202**, comprises a compressor **302**, a condenser **304** and an evaporator **306**. The compressor unit **206** is operable to provide cool air flow to the pipe system **220**. Additionally, the compressor unit **206** further comprises a heating unit **310** to provide heat air flow to the pipe system **220**. Further, as shown, a cross-sectional size of each of the plurality of connecting pipes **320** increases with a distance between the respective cabinet and the compressor unit **206**. Alternatively, a pipe system, such as the pipe system **220** of FIG. 2, further comprises a plurality of valve arrangements (not shown), and each of the plurality of valve arrangements is operatively coupled to a respective connecting pipe of the plurality of connecting pipes **224** of FIG. 2 for regulating a size of an opening through the respective connecting pipe.

[0049] FIG. 4 is a schematic sectional view of the system **100** of FIG. 1, in accordance with an embodiment of the present disclosure. As shown, the housing **102** comprises a front access **402** door arranged on the third wall **108** and at least one maintenance door, such as doors **404**, arranged on the first wall **102**. In operation, the slit **120** between the ceiling **112** and the first wall **102**, and the slit **122** between the ceiling **112** and the third wall **108** facilitate a flow of an air-stream, represented by an arrow **X**, through the housing **102** for reducing temperature

around the compressor unit **206**. The flow of the airstream **X** is caused due to temperature and pressure differences at various regions around the group of cabinets **130** and the housing **102**. The flow of air stream **X** enables in lowering a temperature around the compressor unit **206**, and simultaneously the temperature sensors **242** sense the temperature of the cabinets **204** and communicate the same to the control unit **230** (shown in FIG. 2) for controlling operations of the compressor unit **206**. This allows efficient ways of managing amount of cooled air to be provided via the pipe system **220** (shown in FIG. 2) to regulate temperature of the cabinets **204**, and thereby maintaining desired temperature for food **410** stored in the cabinet **204** by a user **420**.

[0050] FIG. 5 is a block diagram depicting exemplary implementation of the system **100** of FIG. 1, in accordance with an embodiment of the present disclosure. As shown, the communication module **250** of the system **100** is communicably coupled to user devices **502** and **504** for allowing communication therebetween. The user devices **502**, **504** are communicably coupled to the communication module **250** via a communication network **510**. The communication module **250** is communicably coupled to the control unit **230** (shown in FIG. 2) for communicating status of the cabinets **204** (shown in FIG. 2) and the compressor unit **206** (shown in FIG. 2) to the user devices **502**, **504**. It will be appreciated that the user device **502** is associated with a food delivery person, and the user device **504** is associated with a person that orders the food.

[0051] Modifications to embodiments of the present disclosure described in the foregoing are possible without departing from the scope of the present disclosure as defined by the accompanying claims. Expressions such as "including", "comprising", "incorporating", "have", "is" used to describe and claim the present disclosure are intended to be construed in a non-exclusive manner, namely allowing for items, components or elements not explicitly described also to be present. Reference to the singular is also to be construed to relate to the plural.

Claims

1. A system (100) for providing temperature controlled storage, the system comprising

- a housing (102) having a first wall (104), a second wall (106), a third wall (108), a fourth wall (110) in connection with each other, and a ceiling (112), wherein
  - the first wall and the third wall are parallel and facing each other;
  - the second wall and the fourth wall are parallel and facing each other;
  - the first and third walls are perpendicular to the second and fourth walls; and
  - the ceiling is arranged on top of the walls and is arranged to have at least a first slit (120) between the ceiling and the first wall and at least a second slit (122) between the ceiling and the third wall, wherein the at least one slit has a first height and a first width;
- a group of cabinets (130) arranged inside the housing in parallel with the first wall at a first distance from the first wall and a second distance from a third wall, wherein
  - the first distance is smaller than the second distance;
  - the group of cabinets has a second height and a second width, the second height being such that a third distance between top of the group of cabinets and the ceiling is smaller than the first height; and
  - the group of cabinets comprises at least one set of cabinets (202); and
- a compressor unit (206) for each of the at least one set of cabinets, the compressor unit having a first fan (210) and a second fan (212), wherein
  - the first fan is configured to provide cooled air to a respective set of cabinets via a pipe system (220) connected to each of cabinet of the set of cabinets; and
  - the second fan is configured to blow heat from the compressor unit to a direction of the first wall.

2. A system (100) according to claim 1, wherein the ceiling (112) is arranged on top of the walls with supports, and the first wall (104) includes a first cut-out defining the at least first slit (120) between the ceiling and the first wall, and the third wall (108) includes a second cut-out defining the at least second slit (122) between the ceiling and the third wall.

3. A system (100) according to anyone of the claims 1 or 2, wherein the first height is 20 cm and the first width is at least 80 % of a width of the first wall (104) and the third wall (108), and optionally the third distance is 5 cm.

4. A system (100) according to any one of the preceding claims, wherein the housing (102) comprises a front access door (402) arranged on the third wall (108) and at least one maintenance door (404) arranged on the first wall (104).

5. A system (100) according to any one of the preceding claims, wherein the at least one set of cabinets comprises a pair of sets of cabinets, each of the pair of

sets of cabinets (202) including a pair of columns of vertically stacked cabinets (204).

6. A system (100) according to claim 5, wherein the pipe system includes at least one central pipe (222) extending between the pair of columns of vertically stacked cabinets (204), the at least one central pipe includes a plurality of connecting pipes (224, 320) and each of the plurality of connecting pipes is coupled to a respective cabinet of the vertically stacked cabinets.

7. A system (100) according to claim 6, wherein a cross-sectional size of each of the plurality of connecting pipes (224, 320) increases with a distance between the respective cabinet and the compressor unit (206).

8. A system (100) according to claim 6 or 7, wherein the pipe system (220) further comprises a plurality of valve arrangements, each of the plurality of valve arrangements being operatively coupled to a respective connecting pipe (224, 320) of the plurality of connecting pipes for regulating a size of an opening through the respective connecting pipe.

9. A system (100) according to any one of the preceding claims, further comprising a control (230) unit operatively coupled to the compressor unit (206) for controlling operations thereof.

10. A system (100) according to claim 9, wherein each of the cabinets includes an electronic door (204), the electronic door being operable via the control unit (230) with a user command.

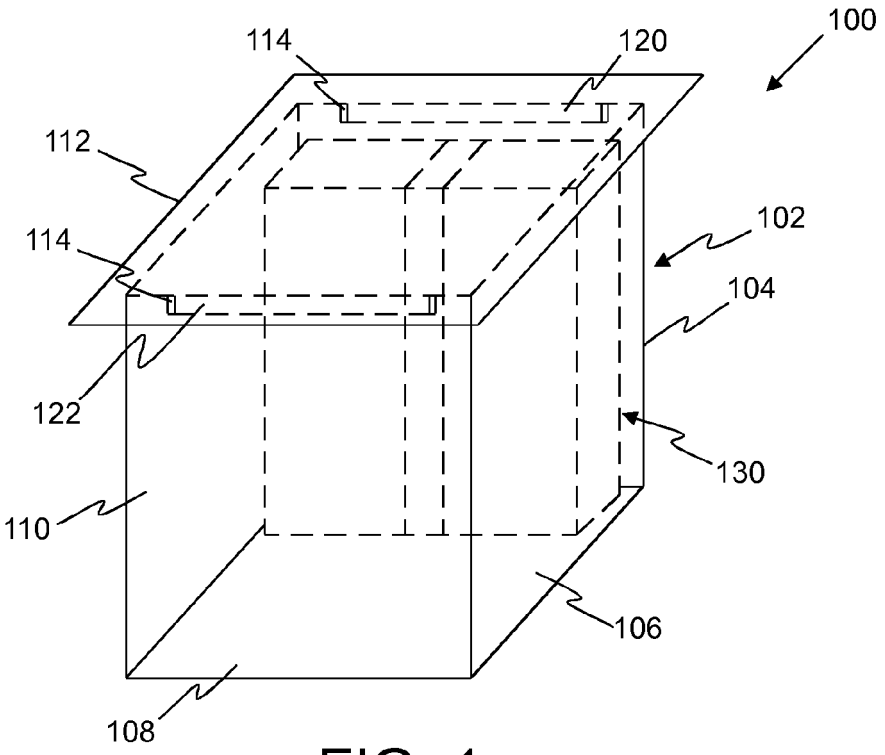
11. A system (100) according to claim 9 or 10, wherein each of the cabinets includes a temperature sensor (242), the temperature sensor being operatively coupled to the control unit (230) and operable to sense temperature of the cabinets for controlling operations of the compressor unit (206).

12. A system (100) according to any of the claims 9-11, further comprising a communication module (250) communicably coupled to user devices (502, 504) for allowing communication therebetween.

13. A system (100) according to claim 12, wherein the communication module (250) is communicably coupled to the control unit (230) for communicating status of each of the cabinets and the compressor unit to the user devices.

14. A system (100) according to any one of the preceding claims, wherein the compressor unit (206) further comprises a compressor (302), a condenser (304) and an evaporator (306), the compressor unit being operable to provide a cool air flow to the pipe system (220).

15. A system (100) according to any of the preceding claims, wherein the compressor unit (206) further comprises a heating unit (310) to provide a heated air flow to the pipe system.


100
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114
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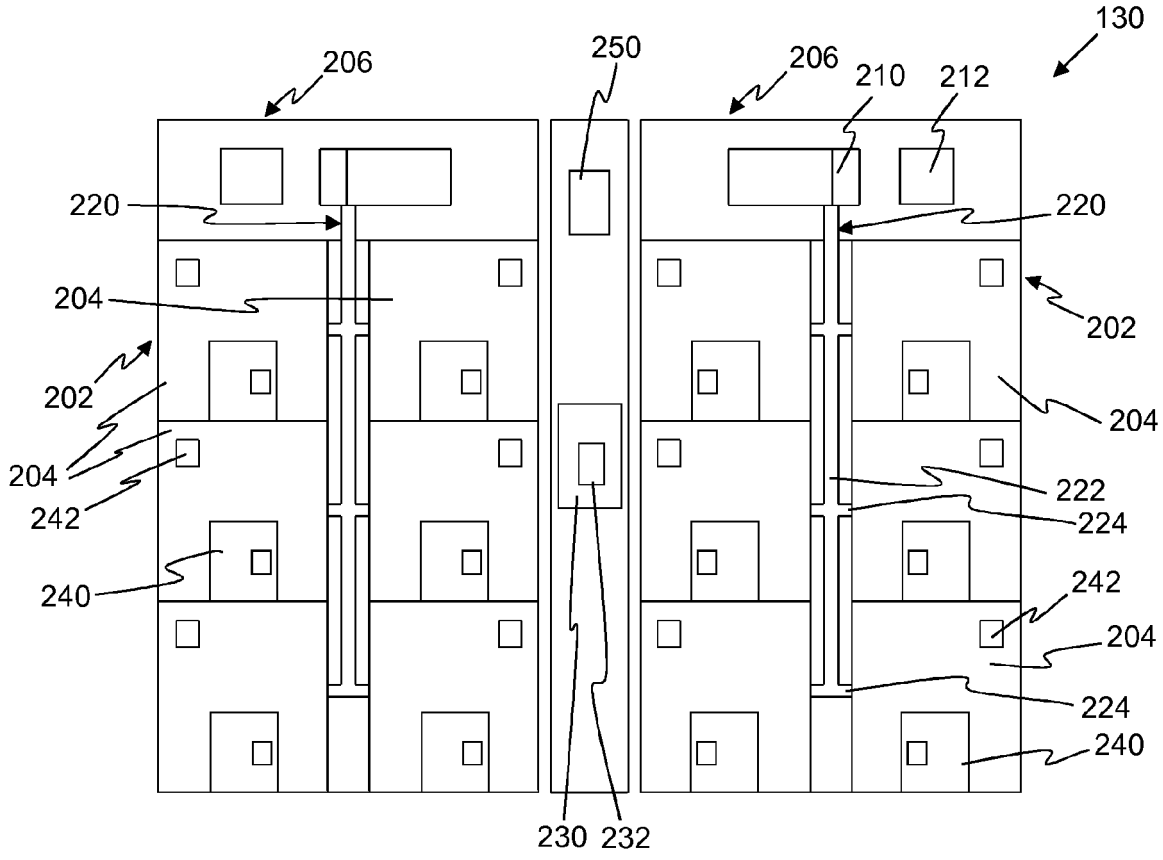
122
130
110
106
108

FIG. 1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206
250
206
210
212
220
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202
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222
224
242
240
242
204
224
240
230
232

FIG. 2

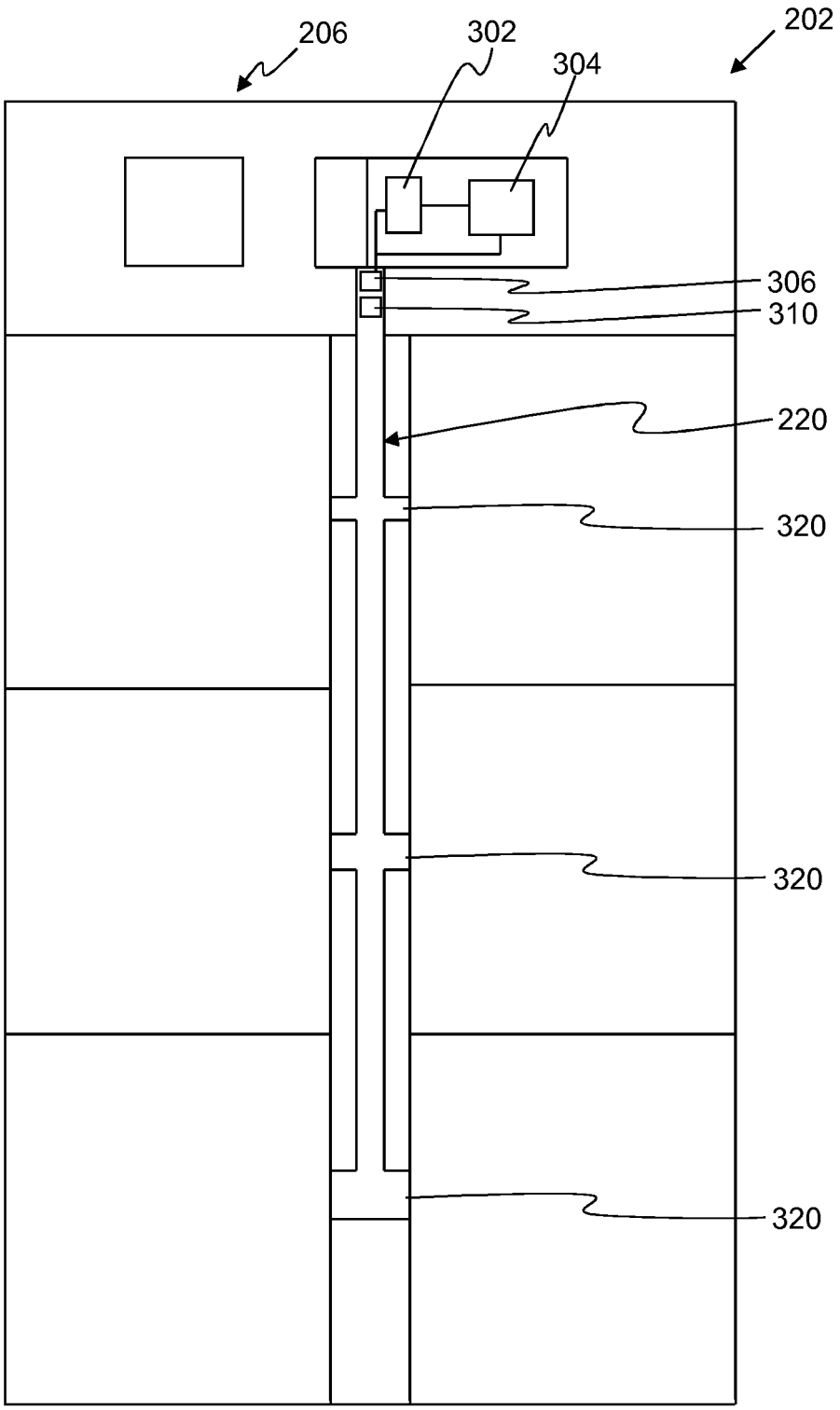
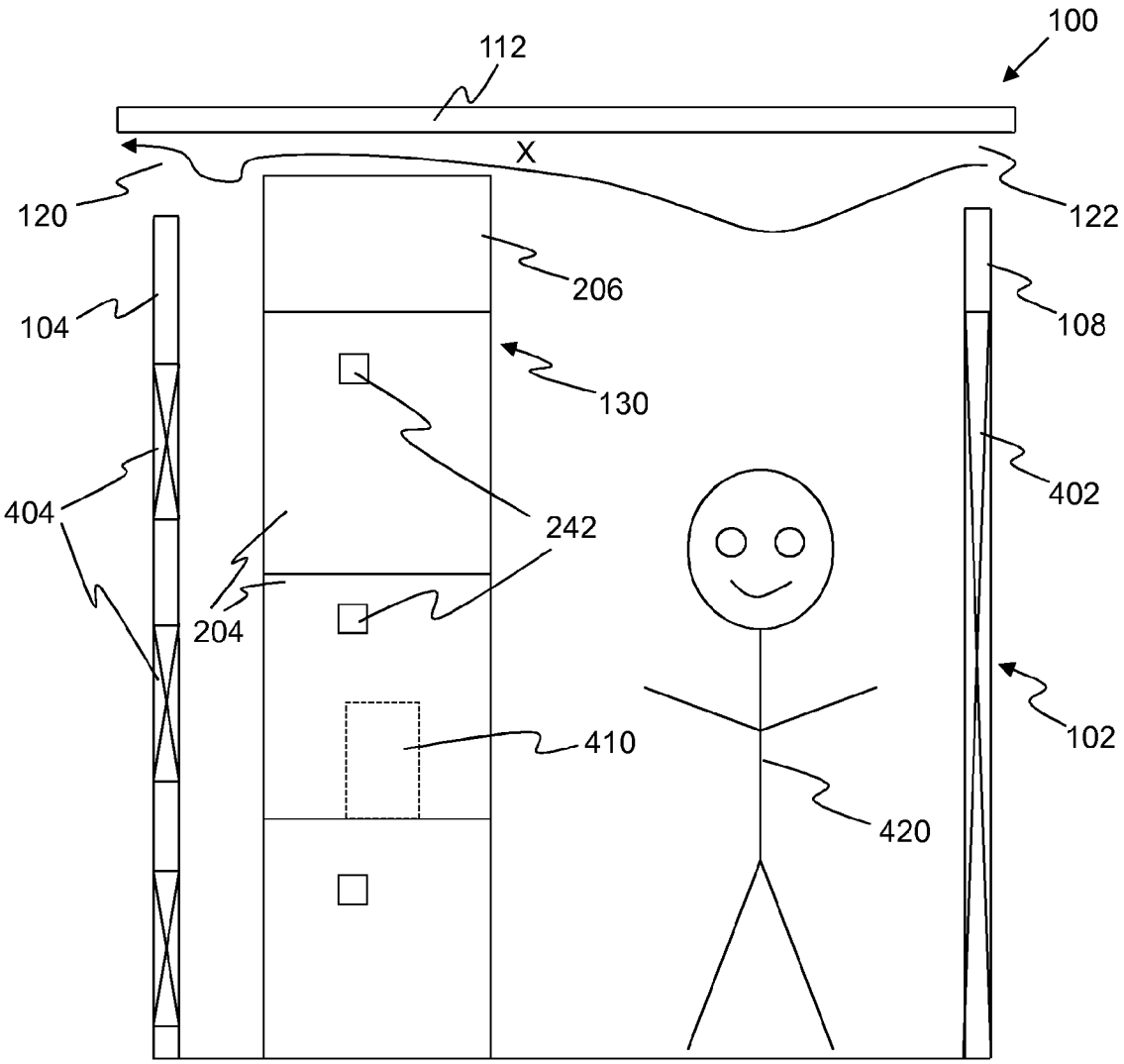


FIG. 3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X
120
122
206
104
108
130
402
404
242
204
102
410
420

FIG. 4

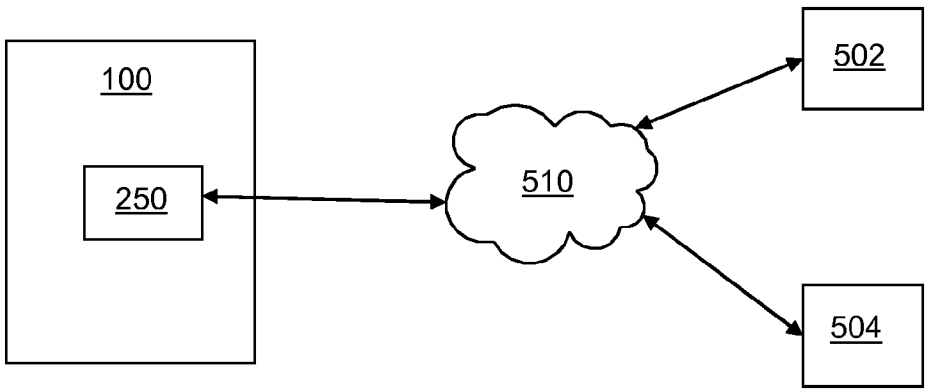
100
250
510
502
504

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 19 17 7629

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Place of search	Date of completion of the search	Examiner
The Hague	24 October 2019	Guivol, Ouri

CATEGORY OF CITED DOCUMENTS

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