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(54) **Delivery box system**

(57) The invention relates to a delivery box system for grocery products comprising a number of delivery boxes (25), which are arranged to box modules (11, 12, 13) and comprise a lockable door. The delivery box system

(10) comprises more than one box modules (11, 12, 13) and at the least one of the box modules is a temperature controlled delivery box module (12; 13).

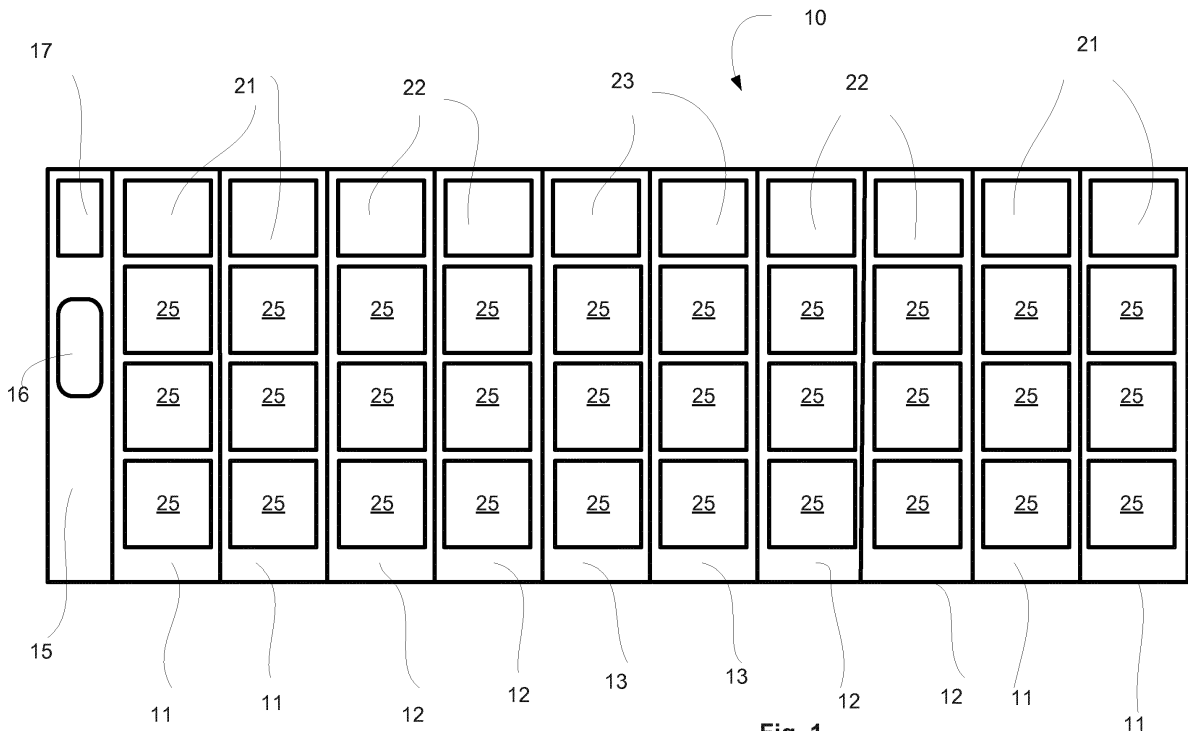


Fig. 1

Description

[0001] The present invention relates to a delivery box system, especially the invention relates to a delivery box system according to the preamble of claim 1.

[0002] Different types of delivery box systems are known from prior art. In utility model publication CN 202512636 is disclosed an automatic sending/receiving express delivery arrangement capable of replacing a traditional method of delivering and receiving express parcels at fixed points and regular time by utilizing man power. This delivery arrangement comprises a temporary storage box system from which people by giving their parcel information and verification code to open doors of the respective cabinet boxes can collect their parcel. This known arrangement has modularized design and different box sizes for adjusted flexibly in order to fit different environments. In patent application publication WO 2013148123 is disclosed a pickup location that includes a control station and one or more storage compartment modules providing the ability for items to be ordered and delivered for pickup by a user without having to pack those items in a shipping package prior to shipping from a materials handling facility. In patent application publication US 2001045449 is disclosed a temporary storage device system associated with a home or office building for use in temporarily storing delivered goods comprising a compartment having an access door provided with a locking device, a switch means connected to said locking device for causing unlocking of the locking device.

[0003] During recent times internet shopping and thereby shipment of goods for delivery to a customer, for example to a home or to an office has increased significantly. Typically, goods purchased via the internet are delivered to the customer by a courier or like, which requires that the customer or the intended recipient be present at the time of delivery. In the absence of the recipient, it is necessary for the carrier to return the package to a temporary storing place and await personal pickup by the customer or sometimes the courier just drops the package in an unsecured area near the front entrance of a building, such as near the front porch area of a home or an office. However, this practice carries the risk that the unsecured parcel may be stolen or possibly damaged by exposure to environmental elements.

[0004] In recent times also internet shopping of grocery products, such as food stuff products and other products typically sold at grocery stores and supermarkets has increased. Typically the grocery products needed are selected at an internet site and then collected from a grocery store or a supermarket (in the following referred as the store) by its personnel and then delivered to the customer at agreed time interval, which requires the customer to be present at the delivery location, or the customer picks up the products from the store at agreed time interval, which in turn requires that the products are timely collected and also that the pick-up time is during opening hours of the store. This practice is very delicate and cum-

bersome especially in cases of products, such as food stuffs, beverages and like that must be kept in cooled or subzero temperatures i.e., in temperatures below +8 °C.

[0005] An object of the present invention is to create a delivery box system in which the disadvantages of prior art arrangements are eliminated or at least minimized.

[0006] A particular object of the invention is to create a delivery box system, in which it is ensured that those products that must be kept in refrigerated temperatures i.e. in temperatures below +8 °C or subzero temperatures i.e. in temperatures below +0 °C are stored without break in the temperature chain.

[0007] A particular object of the invention is to create a modifiable delivery box system.

[0008] In order to achieve the above objects and those that will come apparent later the delivery box system is mainly characterized by the features of the characterizing part of claim 1. Advantageous embodiments and features are defined in dependent claims.

[0009] According to the invention the delivery box system for grocery products comprises a number of delivery boxes, which are arranged to box modules and comprise a lockable door, and the delivery box system comprises more than one box modules and at least one of the box modules is a temperature controlled delivery box module.

[0010] According to an advantageous feature the delivery box system comprises at least one control module comprising a control panel and a control unit.

[0011] The temperature controlled delivery box modules of the delivery box system, i.e. cooler box modules and freezer box modules comprise frame structure and delivery boxes with doors for customers to access the ordered products. The temperature controlled delivery box modules comprise temperature control units such as cooling equipment with blowing devices to create temperature controlled gas flows, usually air flows to the interior of the module in order to keep inside and the products inside in the required temperature to ensure the required shelf life of the ordered products. The temperature control equipment typically comprises a cooler, an evaporator, a blower and/or a compressor located at equipment space next to the temperature controlled product space formed of the delivery boxes in the temperature controlled box module with shelves for products.

[0012] According to an advantageous feature of the invention the delivery box system comprises at least one ambient box module and at least one cooler box module and at least one freezer box module.

[0013] According to an advantageous feature of the invention each box module comprises at least one delivery box, advantageously at least three delivery boxes.

[0014] According to an advantageous feature of the invention each box module comprises an extra space that is a temperature control unit space for temperature control unit of the temperature controlled delivery box module.

[0015] According to an advantageous feature of the invention the temperature controlled box modules com-

prise temperature control units such as cooling equipment with blowing devices to create temperature controlled gas flows to the interior of the module in order to keep inside and the products inside in the required temperature to ensure the required shelf life of the grocery products.

[0016] According to an advantageous feature of the invention at least one cooler box module and at least one freezer box modules are located next to each other.

[0017] According to an advantageous feature of the invention delivery box system comprises box modules in ratio of ambient box modules to cooler box modules to freezer box modules 2:2:1.

[0018] According to an advantageous feature of the invention the delivery box system is a stand-alone temperature controlled unit.

[0019] According to an advantageous feature of the invention the delivery box system is located in connection with a grocery store or a supermarket or corresponding grocery products supply and advantageously such that it is accessible for the customer pick-up also during closing hours of the grocery store.

[0020] According to an advantageous feature of the invention the box modules are arranged in line next to each other to form a continuous delivery box system.

[0021] According to an advantageous feature of the invention size and construction of box modules is such that the box modules interchangeable.

[0022] In the following the invention is described in detail with reference to the accompanying drawings, in which

in figure 1 is shown schematically one advantageous example of a delivery box system and

in figures 2A - 2C is shown examples of advantageous box modules of the delivery box system.

[0023] During the course of the following description of figures 1 - 2C like numbers and signs will be used to identify like elements according to the different views which illustrate the invention. Some repetitive reference signs have been omitted from the figures for the sake of clarity.

[0024] In figure 1 is schematically shown an advantageous example of a delivery box system 10 comprising several delivery boxes 25 for temporary storage of remote ordered, especially internet ordered grocery products. Each delivery box 25 comprises a lockable door at least on the customer side of the delivery box 10 for customer to pick-up his/hers ordered grocery products. The delivery boxes 25 may also comprise two doors one on the customer side and done on the back side for filling in the ordered grocery products. In case the delivery box 25 has only the customer side door, the filling of the delivery box 25 will be performed via the same door.

[0025] In the delivery box system 10 the boxes 25 are arranged to box modules 11, 12, 13 each of which com-

prises at least three delivery boxes 25. The number and size of boxes 25 in each module 11, 12, 13 can vary depending on the requirements of the temporary storage location and its needs. There are at least three types of box modules 11, 12, 13 in the delivery box system 10. One type of a box module 11 is for grocery products that can be kept in ambient temperature, typically in room temperature, which will be discussed in the following by term the ambient box module 11. One type of a box module 12 is for grocery products that are to be kept in cooled temperature, typically below +8 °C, which will be discussed in the following by term the cooler box module 12. One type of box module 13 is for grocery products that are to be kept in subzero temperature, typically below 0 °C, which will be discussed in the following by term freezer box module. The cooler box module 12 and the freezer box module 13 are temperature controlled box modules 12, 13.

[0026] The delivery box system comprises at least one ambient box module 11, at least one cooler box module 12 and at least one freezer box module 13 arranged in line next to each other to form a continuous delivery box system 10. Advantageously cooler box modules 12 and freezer box modules 13 are located next to each other for better temperature efficiency. The delivery box system 10 shown in figure 1 comprises four ambient box modules 11, four cooler box modules 12 and two freezer box modules 13. The two freezer box modules 13 are located in the middle and followed towards the end of the continuous delivery box system 10 by two cooler box modules 12 into each direction and at each end of the delivery box system are located two ambient box modules 11. The number and order of the box modules 11, 12, 13 of the delivery box system 10 can vary depending on the requirements of the temporary storage location and its needs. Advantageously the ratio of ambient box modules 11 to cooler box modules 12 to freezer box modules 13 is 2:2:1.

[0027] The cooler and freezer box modules 12, 13 also comprise an equipment space 22, 23 for the cooling or chilling equipment, advantageously located on top of the boxes 25, of the respective box module 12, 13. By this easy service of the cooling / chilling equipment is possible. In order for the box modules 11, 12, 13 interchangeable and with corresponding appearance also the ambient box module 11 has a corresponding extra space 21, which can be used for example as equipment or spare parts space or can also be used as a delivery box location.

[0028] The delivery box system 10 is advantageously a stand-alone temperature controlled unit such that it has its own equipment for providing the cooled or subzero temperatures of delivery boxes 25. The delivery box system can also be a central temperature controlled unit.

[0029] The delivery box system 10 also comprises at least one control module 15 that comprises a control unit 17 and a control panel 16 for operating the opening of the lockable doors of the delivery boxes 25 such that the respective doors can be opened for filling in the grocery

products of an internet order and for pick-up of the ordered grocery products by the customer. The delivery box system 10 may also comprise more control modules 15, especially when the number of box modules 11, 12, 13 increases.

[0030] The delivery box system 10 is advantageously located in connection with a grocery store or a supermarket or corresponding grocery products supply, for example in a garage of the store or in a separate pick-up hall of the store or in an entrance hall of the store. It can also be located in connection with a whole-sale business or for example in a subway station or like. Important is the availability of the grocery products orderable by the internet so that it is convenient to fill in the ordered goods into the delivery box system by personnel and such that the cold chain of those food products that are to be kept at a certain temperature is unbreakable. Advantageously the delivery box system 10 is located such that it is accessible for the customer pick-up also during closing hours of the grocery store.

[0031] In figures 2A - 2C is shown examples of advantageous box modules 11, 12, 13 of the delivery box system 10.

[0032] In figure 2A is shown a schematic example of an ambient box module 11, which has delivery boxes 25 that are in ambient temperature for products that can be temporarily stored in ambient temperature. The ambient box module has an extra space 21 that in this example is usable as storage space.

[0033] In figure 2B is shown a schematic example of a cooler box module 12, which has delivery boxes 25 that are in cooled temperature, typically below + 8 °C, for grocery products that are to be temporarily stored at cooled temperatures. The cooling equipment 41, 42, such as a cooler 41 and a blower 42 for air circulation for the temperature control of the cooler box module 12 is located in an equipment space 22.

[0034] In figure 2C is shown a schematic example of a freezer box module 13, which has delivery boxes 25 that are in chilled temperature, typically below 0 °C, for frozen grocery products. The chilling equipment 43, such as compressor 43, for the temperature control of the freezer box module 13 is located in an equipment space 22. The freezer module 13 also advantageously comprises cold pipes in the air channel 32 and a condenser in the equipment space 23.

[0035] The box module 11, 12, 13 comprises at least one deliver box 25. Advantageously the box module 11, 12, 13 comprises three on top of each other located delivery boxes 25 and a temperature control unit space 22, 23 or corresponding extra space 21, such as extra storage space, located on top of the delivery boxes 25. The delivery box 25 can be divided to smaller size-boxes, advantageously to half-size boxes by using further shelves 26. The shelf 26 of delivery box 25, advantageously of the cooler box module 12 comprises a draining tray for collecting condensate. The shelf 26 advantageously of the cooler box module 12 or of the freezer box

module 13 also comprises openings for ensuring the circulation of cooling / chilling air flow.

[0036] Then the door number for each module is increased correspondingly for forming individual delivery boxes with smaller size or the door size is kept the same and only the delivery box 25 has two parts for facilitating the placement of grocery products into the box. The number and size of boxes 25 in each module 11, 12, 13 can vary depending on the requirements of the temporary storage location and its needs but such that the module size remains interchangeable so that order of modules can be changed freely for required combination of box modules 11,12, 13 in the delivery box system 10.

[0037] The box modules 11, 12, 13 have means for connecting it to the next module/- s or to control module and for releasing the modules 11, 12, 13 in case one module is to be removed and replaced for example to create a new module order, as indicated by arrows.

[0038] The cabinet like frame structure of the box module 11, 12, 13 comprising typically insulation is indicated by reference sign 31. The box module 11, 12, 13 also comprises a ventilation and/or cooling/chilling air flow channel 32 for the ventilation and/or for the temperature control of the delivery boxes 25.

[0039] When the grocery store has received information about an order of a customer including information about the pick-up time from the internet ordering site, the ordered products are collected before the indicated pick-up time and placed in one or several delivery boxes 25 of the delivery box system 10 depending on the amount and type or ordered grocery products and the lockable doors of the delivery boxes are locked. The control unit 17 is provided with the information about the delivery box / delivery boxes corresponding to the order and corresponding order number or like indication of the order provided by the internet site also for the customer. When the customer comes to pick-up the order, he/she gives the order number or like information indicating the order by the control panel 16 to the control unit 17 which then provides access to corresponding delivery box / delivery boxes for the customer to pick-ups his/hers ordered grocery products from the delivery box/delivery boxes.

[0040] The doors, especially those of delivery boxes of cooler or freezer modules 12, 13 may have automatic closing means that close the door after a certain time interval in order to efficient temperature control.

[0041] The delivery boxes may have a time indication means for indicating overdue pick-ups in order to ensure that temporary storing time is not exceeded.

[0042] Above only some advantageous examples of the invention have been described to which the invention is not to be narrowly limited. It is clear to one skilled in the art that many modifications and variations are possible with in the invention as defined in the following claims.

Reference signs used in the drawing

[0043]

10 delivery box system
 11 ambient box module
 12 cooler box module
 13 freezer box module
 15 control module
 16 control panel
 17 control unit
 21 extra storage space
 22 temperature control unit space
 23 temperature control unit space
 25 delivery box
 26 shelf
 31 frame structure
 32 air flow channel
 41 cooling equipment
 42 cooling equipment
 43 chilling equipment

Claims

1. Delivery box system for grocery products comprising a number of delivery boxes (25), which are arranged to box modules (11, 12, 13) and comprise a lockable door, **characterized in that** the delivery box system (10) comprises more than one box modules (11, 12, 13) and at the least one of the box modules is a temperature controlled delivery box module (12; 13).
2. Delivery box system according to claim 1, **characterized in that** the delivery box system comprises at least one control module (15) comprising a control panel (16) and a control unit (17).
3. Delivery box system according to claim 1 or 2, **characterized in that** the delivery box system (10) comprises at least one ambient box module (11) and at least one cooler box module (12) and at least one freezer box module (13).
4. Delivery box system according to any of claims 1 - 3, **characterized in that** each box module (11, 12, 13) comprises at least one delivery box (25), advantageously at least three delivery boxes (25).
5. Delivery box system according to any of claims 1 - 4, **characterized in that** each box module comprises an extra space (21, 22, 23) that is a temperature control unit space (22, 23) for temperature control unit (41, 42; 43) of the temperature controlled delivery box module (12, 13).
6. Delivery box system according to any of claims 1 - 5, **characterized in that** the temperature controlled box modules (11, 12) comprise temperature control units (41, 42; 43) such as cooling equipment with blowing devices to create temperature controlled gas flows to the interior of the module (12; 13) in

order to keep inside and the products inside in the required temperature to ensure the required shelf life of the grocery products.

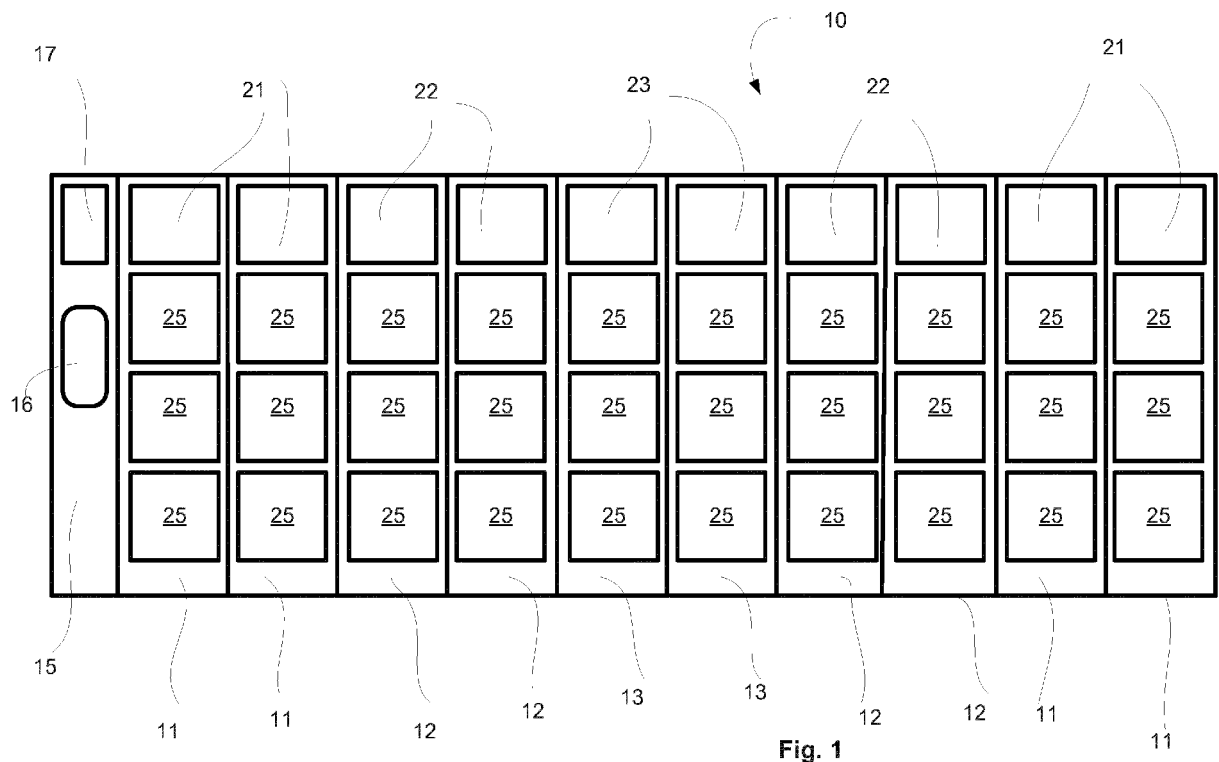
- 5 7. Delivery box system according to any of claims 2 - 6, **characterized in that** at least one cooler box module (12) and at least one freezer box modules (13) are located next to each other.
- 10 8. Delivery box system according to any of claims 2 - 7, **characterized in that** the delivery box system (10) comprises box modules (11, 12, 13) in ratio of ambient box modules (11) to cooler box modules (12) to freezer box modules (13) 2:2:1.
- 15 9. Delivery box system according to any of claims 1 - 8, **characterized in that** the delivery box system (10) is a stand-alone temperature controlled unit.
- 20 10. Delivery box system according to any of claims 1 - 9, **characterized in that** the delivery box system (10) is located in connection with a grocery store or a supermarket or corresponding grocery products supply and advantageously such that it is accessible for the customer pick-up also during closing hours of the grocery store.
- 25 11. Delivery box system according to any of claims 1 - 10, **characterized in that** the box modules (11, 12, 13) are arranged in line next to each other to form a continuous delivery box system (10).
- 30 12. Delivery box system according to any of claims 1-11, **characterized in that** size and construction of box modules (11, 12, 13) is such that the box modules interchangeable.

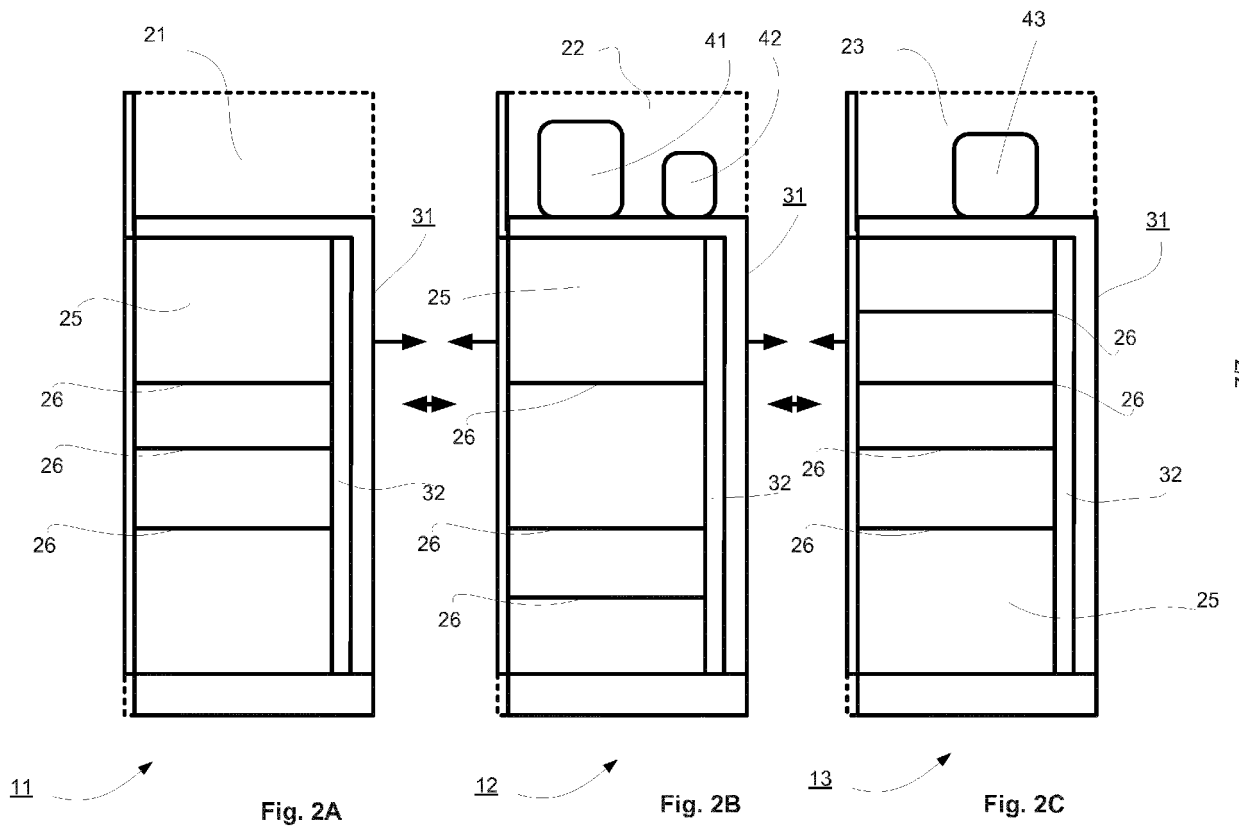
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EUROPEAN SEARCH REPORT

Application Number
EP 15 16 7249

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2005/104730 A1 (YANG SUNNEY [US]) 19 May 2005 (2005-05-19) * paragraphs [0011] - [0012]; figure 1 * -----	1-12	INV. A47G29/14
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			A47G
2	Place of search	Date of completion of the search	Examiner
	The Hague	5 November 2015	Van Bastelaere, Tiny
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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