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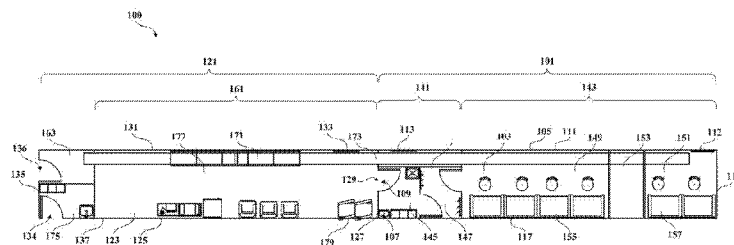


Figure 1

(57) Abstract: A mobile pharmacy compounding system is provided. The system includes a first module (101) having a first housing (105) defining a first inner space (103), in which at least a portion of the first inner space has a first cleanliness class. The first housing has a first opening (109) on a first wall (107) and a second opening (113) on a second wall (111). The system further includes a second module (121) having a second housing (125) defining a second inner space (123) of a second cleanliness class, wherein the first cleanliness class is higher than the second cleanliness class. The second module has a third opening (129) on a third wall (127) and a fourth opening (133) on a fourth wall (131). One of the first opening and the second opening of the first housing can be connected to one of the third opening and the fourth opening of the second housing by moving one of the first wall and the second wall of the first housing close to one of the third wall and the fourth wall of the second housing so that the first inner space is communicated with the second inner space.

MOBILE PHARMACY COMPOUNDING SYSTEM

Cross Reference to Related Application

[0001] The present application claims priority to Chinese Patent Application No. 201410328963.4 filed on July 11, 2014, which is incorporated herein by reference in its entirety.

Field of the Invention

[0002] The present application relates to the field of pharmacy admixture devices, and more specifically, to a mobile pharmacy compounding system.

Background of the Invention

[0003] Pharmacy Intravenous Admixture Service (PIVAS) is a medical service and facility operated in an operating environment designed for intravenous medication and in compliance with the GMP standards. Trained pharmaceutical technicians or paramedics can process pharmacy intravenous admixture or compounding including, for example, total parenteral nutrition, intravenous cytotoxic drugs and antibiotics in PIVAS by strictly following prescriptive operating procedures to provide the clinical intravenous medication. The PIVAS sets up a centralized management model for compounding, inspecting and distributing the intravenous pharmacies in a clean environment, which steps were formerly processed in separate wards of a hospital, so as to provide standardized, safe and effective pharmacy intravenous compounding service to the clinic.

[0004] The traditional PIVAS is usually placed in an outpatient/emergency building, pharmacy or ward of the hospital according to the hospital's actual needs for diagnosis and treatment services. In order to comply with the quality controls, standards and operating procedures of centralized pharmacy intravenous compounding, a variety of adaptive transformations to the buildings are often needed, which significantly increases the costs for constructing and using the PIVAS. In addition, it is difficult to carry on large-scale transformations and expansions once the PIVAS is built as a fixed

construction. Therefore, the traditional PIVAS is usually unable to meet the increasing demands for pharmacy intravenous compounding. Moreover, the traditional PIVAS will use the very limited construction area in the hospital, which may affect the scale of the diagnostic and treatment services of the hospital.

[0005] Therefore, there is a need for a new pharmacy compounding system to solve the problems in the traditional PIVAS, including but not limited to, that the traditional PIVAS is difficult to transform and upgrade, has strict requirements regarding the location and surrounding environment, and can not be widely used in different medical and healthcare service facilities.

Summary of the Invention

[0006] The present application provides a modularized and flexibly configurable mobile pharmacy compounding system that can fit into different locations and environments. It further provides a mobile pharmacy compounding system capable of conveniently increasing or decreasing or altering its space and structure according to actual needs so as to overcome the shortcomings of the traditional PIVAS of being difficult to transform and expand. In addition, medical and healthcare service organizations may choose pharmacy compounding systems of different sizes and combinations based on their actual diagnosis and treatment scale. Therefore, the mobile pharmacy compounding system of the present application can be widely used in various medical and healthcare service facilities. The mobile pharmacy compounding system of the present application also has other technical improvements to overcome defects and problems in the traditional PIVAS.

[0007] In one aspect, the present application provides a mobile pharmacy compounding system. The system comprises a first module having a first housing defining a first inner space, in which at least a portion of the first inner space has a first cleanliness class, the first housing having a first opening on a first wall and a second opening on a second wall; and the system comprises a second module having a second housing defining a second inner space of a second cleanliness class, the second module having a third opening on a third wall and a fourth opening on a fourth wall, wherein the first cleanliness class is higher than the second cleanliness class; wherein one of the first opening and the second opening of the first housing can be connected to one of the third opening and the fourth opening of the second housing by moving one of the first wall and the second wall of the first housing adjacent to one of the

third wall and the fourth wall of the second housing so that the first inner space is communicated with the second inner space.

[0008] The mobile pharmacy compounding system of the present application can be set up in an environment or location with certain area space such as a yard, parking lot or other places rather than constructed as a fixture in a building. Moreover, the overall layout of the mobile pharmacy compounding system may be altered by changing the connections of the first module, second module or, optionally, other modules, which improves the environmental adaptability and expansion capability of the system and makes the system flexibly placed in various spaces of different shapes and sizes. Furthermore, the modularized mobile pharmacy compounding system may be transformed and upgraded by replacing or adding different modules to meet special pharmacy compounding needs, thus enhancing the usability and service life of the system. Furthermore, due to its mobile and modularized structure, it is convenient to produce, install and maintain the mobile pharmacy compounding system of the present application, thereby reducing the production and use costs.

[0009] In another aspect, a mobile pharmacy compounding system is provided herein comprising a first module having a first housing defining a first inner space, at least a portion of the first inner space having a first cleanliness class, the first housing having a first opening on a first wall; and comprising a second module having a second housing defining a second inner space, the second housing having at least two openings on at least two walls, respectively, the second inner space having a second cleanliness class, wherein the first cleanliness class is higher than the second cleanliness class; wherein the first opening can be connected to one of the at least two openings of the second housing by moving the first wall of the first housing adjacent to one of the walls having an opening/openings of the second housing so that the first inner space is communicated with the second inner space.

[0010] The foregoing has outlined, rather broadly, features of the present application. Additional features of the present application will be described, hereinafter, which form the subject of the claims of the present application. It should be appreciated by those skilled in the art that the conception and specific embodiments disclosed herein may be readily utilized as a basis for modifying or designing other structures or processes for carrying out the objectives of the present application. It should also be realized by those skilled in the art that such equivalent constructions do not depart from the spirit and scope of the present application as set forth in the appended claims.

Brief Description of Drawings

[0011] The aforementioned features and other features of the application will be further described in the following paragraphs by referring to the accompanying drawings and the appended claims. It will be understood that, the accompanying drawings merely illustrate certain embodiments in accordance with the present application and should not be considered as limitation to the scope of the present application. Unless otherwise specified, the accompanying drawings need not be proportional, and similar reference characters generally denote similar elements.

[0012] Figure 1 shows a plan view of a mobile pharmacy compounding system 100 according to an embodiment of the application;

[0013] Figure 2 shows a plan view of the mobile pharmacy compounding system 100 of Figure 1 arranged in another configuration;

[0014] Figure 3 shows a plan view of the mobile pharmacy compounding system 100 of Figure 1 arranged in a further configuration;

[0015] Figure 4 shows a configuration of a ventilation duct used in a first module of the mobile pharmacy compounding system 100 of Figure 1;

[0016] Figure 5 shows a plan view of a mobile pharmacy compounding system 200 according to another embodiment of the application;

[0017] Figure 6 shows a plan view of a mobile pharmacy compounding system 300 according to another embodiment of the application;

[0018] Figure 7 shows a plan view of a mobile pharmacy compounding system 400 according to another embodiment of the application;

[0019] Figure 8 shows a plan view of a mobile pharmacy compounding system 500 according to another embodiment of the application;

[0020] Figure 9 shows a plan view of a mobile pharmacy compounding system 600 according to another embodiment of the application;

[0021] Figure 10 shows a plan view of a mobile pharmacy compounding system 700 according to another embodiment of the application.

Detailed Description of the Embodiments

[0022] The following detailed description refers to the accompanying drawings as a part of the present application. The illustrative embodiments described in the detailed

description, the accompanying drawings and the claims are not limiting, and other embodiments may be adopted, or modifications may be made without deviating from the spirit and subject of the application. It would be appreciated that the various aspects of the application described and graphically presented herein may be arranged, replaced, combined, divided and designed in many different configurations, and these different configurations are implicitly comprised in the application.

[0023] Figure 1 shows a plan view of a mobile pharmacy compounding system 100 according to an embodiment of the application. The mobile pharmacy compounding system 100 can be used to provide space for placement of pharmacy compounding or admixing related facilities and devices, intravenous drugs and/or other materials, and to provide working space for pharmacy compounding related operators (e.g. pharmacists, pharmacy compounding staffs, doctors, nurses and assisting staffs, etc.).

[0024] As shown in Figure 1, the mobile pharmacy compounding system 100 includes a first module 101 having a first housing 105 defining a first inner space 103. At least a portion of the first inner space 103 has a first cleanliness class. The first housing 105 has a first opening 109 on a first wall 107, and a second opening 113 on a second wall 111. The first wall 107 is adjacent to the second wall 111. In certain embodiments, when seen from above, the first housing 105 may be rectangular, square or hexagon in shape, or have other suitable shapes.

[0025] Unless specified otherwise, the shape of the first housing 105 or other housings described herein refers to the shape of the housings in the plan view (seen from above, as shown in Figure 1), which is substantially the same as the shape of the bottom side of the first housing 105. Accordingly, the first housing 105 may have other walls besides the first wall 107 and the second wall 111. For example, when the first housing 105 is rectangular or square in shape, it further includes a wall 115 opposite to the first wall 107, a wall 117 opposite to the second wall 111, and the top side and the bottom side (not shown). In the embodiment shown in Figure 1, the first wall 107 and the second wall 111 are both side walls of the first housing 105. It would be appreciated that in certain embodiments, the first wall may be the top side or bottom side of the first housing 105, and the second wall is the side wall adjacent to the top side or bottom side of the first housing 105.

[0026] The mobile pharmacy compounding system 100 further includes a second module 121 having a second housing 125 defining a second inner space 123. The inner space 123 has a second cleanliness class. The first cleanliness class of the first inner space 103 is higher than the second cleanliness class. The second housing 125 has a third opening 129 on

a third wall 127, and a fourth opening 133 on a fourth wall 131. The third wall 127 is adjacent to the fourth wall 131. In certain embodiments, when seen from above, the second housing 125 may be rectangular, square or hexagon in shape, or have other suitable shapes.

[0027] Similarly, the second housing 125 may have other walls besides the third wall 127 and the fourth wall 131. For example, when the third housing 125 is rectangular or square in shape, it further has a wall 135 opposite to the third wall 127 and a wall 137 opposite to the fourth wall 131, the top side and the bottom side (not shown). Similar to the first housing 101, in the embodiment shown in Figure 1, the third and fourth walls may be the bottom side, the top side or a side wall of the second housing 125, respectively.

[0028] The first module 101 and the second module 121 of the mobile pharmacy compounding system 100 can be connected to each other to connect one of the first opening 109 and the second opening 113 of the first housing 105 to one of the third opening 129 and the fourth opening 133 of the second housing 125, thus allowing the communication between the first inner space 103 and the second inner space 123. For example, one of the first opening 109 and the second opening 113 can be connected to one of the third opening 129 and the fourth opening 133 of the second housing 125 by moving one of the first wall 107 and the second wall 111 of the first housing 105 to be adjacent to one of the third wall 127 and the fourth wall 131 of the second housing 125.

[0029] Specifically, a connection structure such as a flexible channel can be disposed between the first wall 107 or the second wall 111 and the third wall 127 or the fourth wall 131, which are adjacent to each other, to connect the opening 109 or 113 with the opening 129 or 133, thus allowing the communication between the first inner space 103 and the second inner space 123. The flexible channel can be a structure similar to the connection structure between train carriages. Furthermore, the flexible channel can be sheathed with a tubular channel made of rubber or other resilient materials to keep the flexible channel sealed. For example, the flexible channel may include two connecting plates at its bottom side, each connecting to the lower edge of one of the openings. These two connecting plates are elastically connected with each other (e.g. connected via a spring) and partially overlapped such that the lower edges of the two openings can be completely connected. The connecting plates are constructed that the operators or materials can be supported thereon, and to allow the operators or materials-loading devices to pass through the flexible channel. The flexible channel can further include a sealing tubular channel whose two ends are connected to the two openings, respectively. Then the two openings can be hermetically connected. Optionally, the openings can be properly shaped and sized to ensure the sealing connection

between the first housing 105 and the second housing 125. For example, the openings can be identical or different in shape and/or size. When connecting the two openings, one of the openings 109 or 113 can be aligned and engaged with one of the openings 129 or 133, thereby allowing the communication between the first inner space 103 and the second inner space 123. A sealing piece may be disposed between the two connected openings when needed. In certain embodiments, the two openings is hermetically connected so as to prevent external air from entering into the first inner space 103 and/or the second inner space 123 through the connected openings.

[0030] As to the first module 101 and the second module 121, the openings on the two adjacent walls of the housings allow the two modules to be connected in different directions, thus forming different connection configurations and arrangement. In addition, the first housing 105 and the second housing 125 can be identical or different in shape and/or size. For example, when the first housing 105 and the second housing 125 are both rectangularly shaped, the first opening 109 and the second opening 113 are on the side walls 107 and 111 of the first housing 105 corresponding to a width side (short side) and a length side (long side) of the rectangular shape, respectively. The third opening 129 and the fourth opening 133 are on the side walls 127 and 131 of the second housing 125 corresponding to its width side and length side. Accordingly, the first housing 105 and the second housing 125 can be connected to each other along the length side to form a “—” shaped arrangement, i.e. the width side (i.e. the first wall 107) having the first opening 109 is connected to the width side (i.e. the third wall 127) having the third opening 129, as is shown in Figure 1.

[0031] In some examples, the first housing 105 and the second housing 125 can be connected to each other in a configuration different from that shown in Figure 1. The plan views in Figure 2 and 3 are two other connection configurations of the mobile pharmacy compounding system 100 of Figure 1.

[0032] As shown in Figure 2, the length side (i.e. the second wall 111) having the second opening 113 can be moved adjacent to the width side (i.e. the third wall 127) having the third opening 129 to form an L-shaped arrangement. Similarly, the width side (i.e. the first wall 107) having the first opening 109 and the length side (i.e. the fourth wall 131) having the fourth opening 133 can be connected with each other to form an L-shaped arrangement (not shown). Furthermore, when the fourth opening 133 is located in the middle of the second housing 125, the width side having the first opening 109 can be connected with the length side having the fourth opening 133 to form a T-shaped arrangement. It should be noted that in practice, the internal layouts and structures of the first module 101 and the second module

121 can be modified and adjusted based on the different configuration and arrangement of the first housing 105 and the second housing 125.

[0033] In certain embodiments, the first housing 105 and the second housing 125 may further have one or more material delivery openings on their side walls, respectively. The material delivery openings are sized to allow materials passing therethrough, but not to allow people to pass therethrough or at least making it difficult for people to pass therethrough. For example, the material delivery openings can be sized to pass through a conveyer belt, or to install a two-way interlock transferring window. The conveyer belt and the two-way interlock transferring window can be loaded with the materials or allow the materials passing through the material delivery openings. Thus, the material delivery openings provide an independent material delivery channel for materials to be delivered between the two modules through the connected material delivery openings of the first module 101 and the second module 121, making it more convenient to choose the connection between the first module 101 and the second module 121 based on the actual needs when installing the pharmacy compounding system 100. For example, compared with the connection arrangement shown in Figure 1, the pharmacy compounding system 100 arranged in the configuration shown in Figure 2 only needs to adjust the positions of the material delivery opening on the first housing 105 and the second housing 125 and dispose the conveyer device accordingly. These material delivery openings allow the conveyer device to connect the first housing 105 and the second housing 125. For example, a portion of the conveyer device can be disposed in the first housing 105 and the other portion of the conveyer device can be disposed in the second housing 125.

[0034] Also as shown in Figure 3, the first housing 105 and the second housing 125 can be connected to each other along the length side of the rectangular housings, thereby the first housing 105 is connected with the second housing 125 in parallel. That is, the length side (i.e. the second wall 111) of the first housing having the second opening 113 is connected to the length side of the second housing (i.e. the fourth wall 131) having the fourth opening 133. Since the second opening 113 is generally located at one end of the second wall 111, and the fourth opening 133 is located at one end of the fourth wall 131, the second wall 111 substantially overlaps with the fourth wall 131 after connecting the second opening 113 with the fourth opening 133. Under such configuration, the first housing 105 is connected to the second housing 125 to form a “=”-shaped arrangement. In certain other embodiments, the second opening 113 may be located in the middle or at the other end of the second wall 111 so that the second wall 111 and the fourth wall 131 only partially overlap with each other.

Compared with the connection shown in Figure 1, the pharmacy compounding system 100 arranged in the connection configuration shown in Figure 3 only needs to adjust the conveyer devices and the positions of the material delivery openings.

[0035] With reference to Figures 1-3, the first housing 105 and the second housing 125 of the pharmacy compounding system 100 can be flexibly connected due to the configuration of the first opening 109 and the second opening 113 on the adjacent walls of the first housing 105, and the third opening 129 and the fourth opening 133 on the adjacent walls of the second housing 125. The pharmacy compounding system 100 can be installed and arranged based on the actual needs, thus significantly increases the configuration flexibility of the system and decreases the requirements to the environmental space.

[0036] In certain other embodiments, the first housing 105 and the second housing 125 can have different shapes and connection arrangements. For example, when the first housing 105 has a rectangular shape and the second housing 125 has a square shape, an opening on one side of the second housing 125 can be connected to the first opening 107 on the width side of the first housing 105 to form a “—”-shaped arrangement (when the length of the second housing 125 is not longer than the width of the first housing 105) or a T-shaped arrangement (when the length of the second housing 125 is longer than the width of the first housing 105). Furthermore, an opening on one side of the second housing 125 can be connected to the second opening 113 on the length side of the first housing 105 to form an L-shaped arrangement. It would be appreciated that the specific shapes, sizes and connection arrangements of the first housing 105 and the second housing 125 can be designed or adjusted based on the actual needs of the environment where the system is installed, which significantly increases the configuration flexibility of the system and decreases the requirements to the environmental space. Furthermore, the various functional areas, structures and facilities in the first inner space 103 and the second inner space 123 can be adjusted based on the different connection arrangement of the first module 101 and the second module 121.

[0037] Moreover, in certain embodiments, the first module 101 and the second module 121 may be vertically stacked together. For example, the first module 101 and the second module 121 can be connected to each other along the vertical direction by stacking one of the first module 101 and the second module 121 onto the other. Accordingly, the connected openings of the first and second housing are disposed at the bottom side of the upper housing and at the top side of the lower housing. An elevator or stair can be installed between the two housings. The vertically stacked structure can further reduce the operating area taken

up by the system, which especially fits for use in medical and healthcare places of limited space.

[0038] Still referring to Figure 1, in some examples, the first module 105 may only have the first opening 109 but not the second opening 113; and the third opening 129 and the fourth opening can be disposed on two non-adjacent walls of the second housing 125. For example, the third opening 129 is disposed on the wall 127 while the fourth opening is on the wall 135 opposite to the wall 127 (e.g. in the position of the opening 136 in Figure 1). In this case, the first housing 105 and the second housing 125 can be connected to each other along the length side to connect the first opening 109 to the third opening 129 or the opening 136, thereby communicating the first inner space 103 with the second inner space 123. Thus, the operators can enter into the first inner space 103 through the second inner space 123. Similarly, although Figure 1 shows that the two openings 109 and 113 of the first housing 105 are on the two adjacent walls of the first housing 105, in certain other embodiments, these two openings 109 and 113 can be disposed on two opposite walls. For example, the first opening 109 is on the wall 107 and the second opening is on the wall 115.

[0039] In certain other embodiments, the first housing 105 can have the first opening 109 on the first wall 107 and the second opening 113 on the second wall 111. The second housing 125 can have the third opening 129 on the third wall 127 and the opening 136 on the wall 135 and/or an opening 134 on the wall 137, but may not have the fourth opening 133 on the fourth wall 131. In this case, the first housing 105 and the second housing 125 can be connected to each other in the arrangement shown in Figure 1 or 2. The opening 136 can be used for delivering materials and the opening 135 is for the operators to enter or exit the first housing 105.

[0040] In certain embodiments, the sizes of the first opening 109, the second opening 113, the third opening 129, the fourth opening 133 and the additional openings 134, 136 at least allow people to pass therethrough such that the operators can move between the first inner space 103 and the second inner space 123, or enter or exit the first inner space 103 or the second inner space 123. Preferably, the sizes of these openings may allow the materials (e.g. drugs to be compounded or compounded drugs) to pass therethrough. For example, the materials can be delivered between the first inner space 103 and the second inner space 123 using the conveyer device.

[0041] In certain embodiments, besides the first opening 109 and the second opening 113, the first wall 107 and/or the second wall 111 may have one or more additional openings. Furthermore, besides the first wall 107 and the second wall 111, other walls of the first

housing 105 can have one or more additional openings. These additional openings may allow for the connection of the first module 101 to one or more additional modules, or allow the operators (or preferably the operators and materials) moving between the first inner space 103 and the external space. In certain embodiments, a door can be provided at the openings of the first housing 105, including the first opening 109 and the second opening 113, so as to close the first housing 105 when it is not connected to the second module 121 or other modules. The openings are preferably hermetically closed. For example, an additional opening 112 is disposed on the first housing 105, which serves as an emergency exit for evacuation in case of emergency or serves as an extended opening for connection with an extended module (additional module). Similarly, besides the third opening 129 and the fourth opening 133, the second module 121 may have one or more additional openings on its walls. These additional openings allow for the connection of the second module 121 to one or more additional modules, or allow the operators (or preferably the operators and materials) moving between the second inner space 123 and the external space. For example, the additional openings 134 and 136 can be disposed on the second housing 125 for people and materials to move in and out of the second inner space 123.

[0042] In certain embodiments, an additional module may have a functional room or functional area for pharmacy compounding. The mobile pharmacy compounding system 100 may expand the pharmacy compounding area by connecting to the additional module so as to increase the pharmacy compounding capacity of the system. In certain embodiments, the additional module may have a functional area for storing pharmacy. The drug storage space of the mobile pharmacy compounding system can be increased by connecting to the additional module. In certain embodiments, the additional module may have other needed functional areas, e.g. a functional area for training purpose. To be brief, the expansibility of the mobile pharmacy compounding system 100 can be significantly improved by providing additional openings and connecting the additional openings to the additional modules.

[0043] In addition, in certain embodiments, at least a portion of the internal space of the first housing 105 and the second housing 125 can be provided with electricity, water, communication and/or ventilation ducts or wires (not shown). Electricity, water, communication or air can be provided through these ducts or wires from outside to the facilities or devices in the first module 101 and the second module 121. These ducts may be disposed inside or outside the housings, or in an interlayer of the walls of the housings.

[0044] The internal space of the first module 101 and the second module 121 can accommodate the facilities and devices, drugs or other materials of the mobile pharmacy

compounding system 100, and provide working space for the operators. A specific configuration of the mobile pharmacy compounding system 100 of the present application is described in the following paragraphs with reference to Figure 1.

[0045] In the mobile pharmacy compounding system 100, the first module 101 is mainly used as the pharmacy compounding area, and the air cleanliness class (i.e. the first cleanliness class) of at least a portion of the first inner space 103 should generally meet the cleanliness requirement under relevant pharmacy compounding controls or standards. In certain embodiments, the first cleanliness class is equal to or higher than Class ISO 8 under the ISO 14644-1 standard (unless specified otherwise, the cleanliness classes mentioned below all refer to the cleanliness class in accordance to the ISO 14644-1 standard). Furthermore, the first inner space 103 can be further divided into different functional areas or functional rooms, e.g. gowning rooms, pharmacy compounding rooms, etc. These functional areas or functional rooms can have different cleanliness classes to meet different operational needs. For example, the cleanliness class of the gowning room may be equal to or higher than Class ISO 8, the cleanliness class of the pharmacy compounding room may be equal to or higher than Class ISO 7, and the cleanliness class of a horizontal laminar flow clean workbench and a biological safety cabinet in the pharmacy compounding room may be equal to or higher than Class ISO 5, etc. It should be noted that, the first cleanliness class described herein and other cleanliness classes mentioned below refer to the internal cleanliness class at corresponding places when the mobile pharmacy compounding system operates normally, but not the cleanliness class when the system does not operate or operate abnormally (e.g. during transportation).

[0046] The air cleanliness class of the first inner space 103 can be adjusted by configuring a ventilation system of the mobile pharmacy compounding system 100. Figure 4 shows a ventilation duct configuration fit for use with the first module 101. As shown in Figure 4, a ventilation system 180 includes air inlet ducts 181, 182 and an exhaust duct 183. The air inlet duct 181 is connected to air conditioning units 184A and 184B, the air inlet duct 182 is connected to air conditioning units 185A and 185B, and the exhaust duct 183 is connected to an exhaust unit 186. A fresh air inlet 187 of the air inlet duct 181 and a fresh air inlet 188 of the air inlet duct 182 are disposed outside the first housing as inlets of the fresh air. The fresh air inlets 187 and 188 should be disposed at an outdoor place that is relatively clean. In order to avoid the influence of the ground activity on the dust concentration, the fresh air inlets 187 and 188 should be disposed at least one meter higher than the ground, preferably at least three meters higher than the ground. When needed, the height of the fresh air inlets

187 and 188 can be elevated through a ventilation structure like a chimney. The air inlet ducts 181 and 182 have several air outlets inside the first housing, respectively, to communicate the first inner space with the outside environment and introduce the fresh air thereinto. The exhaust duct 183 has several air inlets inside the first inner space and an air outlet 189 outside the first housing. The exhaust unit 186 operates to remove air from the first inner space to the outside environment via the air outlet 189.

[0047] In the embodiment shown in Figure 4, the first inner space has a first pharmacy compounding room and a second pharmacy compounding room which are separated from each other. The second pharmacy compounding room is used for handling controlled drugs. The air outlet of the air inlet duct 181 is located in the first pharmacy compounding room, the air outlet of the air inlet duct 182 is located in the second pharmacy compounding room, and the air inlet of the exhaust duct 183 is located in the second pharmacy compounding room. Preferably, an exhausting volume per unit time of the exhaust unit 186 is substantially equal to an air inlet volume per unit time of the air conditioning units 185A and/or 185B so that the air introduced into the second pharmacy compounding room is substantially exhausted to avoid the accumulation of evaporated or leaked controlled drugs or other residual substances in the second pharmacy compounding room. In certain embodiments, the ventilation system 180 may include another exhaust duct (not shown) and an accompanying exhaust unit (not shown), whose air inlet is located in the first pharmacy compounding room to exhaust the air out of the first pharmacy compounding room.

[0048] The air conditioning units 184A, 184B and the air conditioning units 185A, 185B regulate the air conditions in the first inner space through the air inlet ducts 181 and 182, respectively. In some examples, the air conditions include air cleanliness, temperature, humidity and/or air pressure. For example, the air conditioning units 184A, 184B and the air conditioning units 185A, 185B may regulate the air cleanliness of the first inner space. Preferably, the air conditioning units 184A, 184B and the air conditioning units 185A, 185B can be integral air conditioning units. That is, except for controlling the air cleanliness, the air conditioning units 184A, 184B and the air conditioning units 185A, 185B can further control the temperature, humidity and/or air pressure in the first inner space. In certain embodiments, the temperature within the first inner space is maintained between 18 to 26°C, and the relative humidity is maintained between 40% and 65%. The air conditioning units 184A, 184B and the air conditioning units 185A, 185B can be in a master-backup configuration. For example, the air conditioning units 184A and 185A operate as the master air conditioning units, and the air conditioning units 184B and 185B operate as the backup air

conditioning units. Typically, the master air conditioning units 184A and 185A are activated first and used for controlling the air conditions of the first inner space. The backup air conditioning units 184B and 185B are activated when the master air conditioning units fail to maintain the air conditions in the first inner space at predetermined levels. For example, when the master air conditioning units 184A and 185A fail to maintain one or more of the cleanliness, temperature, humidity or air pressure in the first inner space at the predetermined levels, the backup air conditioning units 184B and 185B are activated. Such master-backup configuration significantly improves the reliability of the air conditioning system, and ensures the air conditions in the first inner space 103 meet the requirements of normal operation.

[0049] In certain embodiments, the first module 101 further has a filtering device (not shown), which are, for example, placed inside the air inlet or exhaustion ducts to filter the air flowing into or out of the first module 101, thus preventing or reducing the air contaminants from the external environment from entering into the first module 101 and preventing controlled drug volatiles compounded in the first module 101 from being released into the external environment. In certain embodiments, the filtering device may include one or more filters placed sequentially in the air flow direction, while the filtering effects of these filters may be the same or different. In an embodiment, the filters may include a primary efficiency filter, a medium efficiency filter and a high efficiency filter placed sequentially in the air flow direction.

[0050] As shown in Figure 1, in certain embodiments, the first module 101 includes a first functional room 141 and a second functional room 143 in the first housing 105. The first functional room 141 is located between the opening (the first opening 109 or the second opening 113 in Figure 1) of the first housing 105 for connecting to the second module 121 or other modules and the second functional room 143. In certain embodiments, the cleanliness class of the first functional room 141 is equal to or higher than Class ISO 8, and the cleanliness class of the second functional room 143 has a cleanliness class equal to or higher than that of the first functional room 141, e.g. equal to or higher than Class ISO 7.

[0051] In the embodiment shown in Figure 1, the first functional room 141 is located between the first opening 109 (or the second opening 113) and the second functional room 143. The operators or materials entering into the first inner space 103 through the first opening 109 need to enter into the second functional room 143 through the first functional room 141. It should be noted that the adjacency of the first functional room 141 with the opening of the first housing 105 described herein includes embodiments where there is or is not a buffering area between the first functional room 141 and the opening. In the

embodiment shown in Figure 1, there is no buffering area between the first functional room 141 and the first opening 109. Embodiments with the buffering area between the first functional room and the opening will be further explained below.

[0052] In certain embodiments, the first functional room 141 includes a gowning room for the operators to change clothes suitable for the second functional room 143, thereby avoiding bringing dusts, germs or other contaminants into the second functional room 143. For example, the operators can wash hands, wear hats and masks, change shoes and clean clothes, and wear gloves in the gowning room. Preferably, the first functional room 141 may have an air shower device. In certain embodiments, the first functional room 141 may include a first gowning room 145 and a second gowning room 147. The first gowning room 145 is adjacent to the first opening 109 and/or the second opening 113, and the second gowning room 147 is adjacent to the second functional room 143. In the embodiment shown in Figure 1, the first gowning room 145 is adjacent to the first opening 109. The first gowning room 145 is for the operators to wash hands, wear hats and masks, change shoes and clothes, etc. The cleanliness class of the first gowning room 145 can be equal to or higher than Class ISO 8. The second gowning room 147 is for the operators to change clean clothes, wear gloves and re-disinfect their hands, etc. The cleanliness class of the second gowning room 147 can be equal to or higher than Class ISO 7. Correspondingly, the first functional room 141 can have water tanks, lockers, cabinets etc. In certain embodiments, the devices of the first functional room can be secured to the walls of the first housing 105. The term “secure” used herein includes removable fixation, e.g. secured by a fastener (e.g. bolts), and irremovable fixation, e.g. secured by welding. Therefore, based on the needs of the actual arrangement, the devices can be detached from certain places and secured to other places of the first housing 105.

[0053] In certain embodiments, the second functional room 143 includes a pharmacy compounding room for the operators to conduct pharmacy compounding. The air pressure of the second functional room 143 is higher than that of the first functional room 141, for example, 5-10 Pa higher, to prevent the air in the first functional room 141 with lower cleanliness from flowing into the second functional room 143 and affecting the air cleanliness of the second functional room 143. In certain embodiments, as shown in Figure 1, the second functional room 143 includes a first pharmacy compounding room 149 and a second pharmacy compounding room 151. The operators can compound or admix non-controlled drugs in the first pharmacy compounding room 149 and compound or admix controlled drugs in the second pharmacy compounding room 151.

[0054] The term “controlled drugs” used herein means drugs to be compounded that contain one or more cytotoxic drugs or antibiotics, and the drugs to be compounded may or may not contain one or more other drug components. The term “non-controlled drugs” used herein means drugs to be compounded that do not contain any cytotoxic drugs and antibiotics.

[0055] In the embodiment shown in Figure 1, the first pharmacy compounding room 149 is adjacent to the first functional room 141, and the second pharmacy compounding room 151 is adjacent to the additional opening 112. The additional opening 112 can be used for connecting an additional module. When the additional opening 112 is not connected to the additional module, it is hermetically closed, for example, by a door. Preferably, the second functional room 143 may also include a buffering room 153 between the first pharmacy compounding room 149 and the second pharmacy compounding room 151. In certain embodiments, the air pressure in the first pharmacy compounding room 149 is higher than that of the second pharmacy compounding room 151. Thus, the air in the second pharmacy compounding room 151, in which a small amount of controlled drugs may be contained, will not diffuse or leak into the first pharmacy compounding room 149. Similarly, in certain embodiments, the air pressure in the first pharmacy compounding room may be higher than its external pressure to prevent the external air with low cleanliness from flowing thereinto. The air pressure in the second pharmacy compounding room can be lower than its external pressure to prevent the toxic substances in the second pharmacy compounding room from leaking or diffusing out.

[0056] In order to compound the drugs, the first pharmacy compounding room 149 may have a horizontal laminar flow clean workbench 155 secured to the walls of the first housing 105, e.g. the side walls, bottom and/or top side of the first housing 105. For example, the bottom of the horizontal laminar flow clean workbench 155 can be secured by nuts to the bolts at the bottom side of the first housing 105. When transporting the first housing 105, in order to prevent the horizontal laminar flow clean workbench 155 from falling, safety hooks (not shown) can be disposed on the upper portion of the horizontal laminar flow clean workbench 155 and the hooks can be connected to the side walls of the first housing 105 through ropes. Thus, the secured horizontal laminar flow clean workbench 155 will not move relative to the first housing 105, avoiding shaking or shifting of the horizontal laminar flow clean workbench 155 when moving the first module 101 or transporting the mobile pharmacy compounding system 100. The cleanliness class of the horizontal laminar flow clean workbench is equal to or higher than Class ISO 5. Similarly, the second pharmacy compounding room 151 may have a biological safety cabinet 157 secured to a wall of the first

housing 105, e.g. the side walls, bottom and/or top side of the first housing. For example, the bottom of the biological safety cabinet 157 can be secured by nuts to the bolts at the bottom of the first housing 105 using bolts. Furthermore, the safety hooks can be disposed on an upper portion of the biological safety cabinet 157 for securing the biological safety cabinet 157 to the side walls of the first housing 105 using ropes when transporting the mobile pharmacy compounding system 100. Alternatively, the top of the biological safety cabinet 157 can be secured to the top of the first housing 105 using hooks.

[0057] The second module 121 is mainly used as an area for preparing and distributing drugs. Hence the second cleanliness class of the second inner space 123 can be lower than the first cleanliness class of the first inner space 103. For example, the second cleanliness class may be substantially equal to or slightly higher than the cleanliness of the external air. In certain embodiments, an independent air conditioning system can be provided for the second module 121 to regulate the air conditions inside (e.g. temperature, humidity and cleanliness class, etc). It should be noted that in certain other embodiments, the areas for preparing and distributing drugs can be arranged in the first module, e.g. in the area between the first functional room and the opening of the first housing 105 connected to the second module (see the embodiment shown in Figure 8).

[0058] In certain embodiments, the second module 121 includes a third functional area 161 in the second housing 125 as shown in Figure 1. In the third functional area 161, pharmacists or doctors can review the prescription and/or dispense drugs (including preparing the drugs to be compounded and/or distributing the compounded drugs). The third functional area 161 can have tables, chairs, computers, printers and/or other office equipment. At least a portion of the equipment, e.g. tables and chairs, can be secured to the corresponding walls of the second housing 125. In certain embodiments, the second module 121 may further include a fourth functional area 163 in the second housing 125. The fourth functional area 163 may have shelves such as medicine racks, medicine cabinets or storage cabinets. The operators in the fourth functional area 163 can do some preparation work such as unpacking and sorting the materials such as drugs, medical devices or other consumables, and placing them on the corresponding places of the shelves. It should be noted that in certain embodiments, the third functional area 161, the fourth functional area 163 or other functional areas in the second housing 125 can be separated by dividers (with or without doors, windows and material delivery openings) so as to separate the functional areas in a relatively closed manner. In certain other embodiments, the functional areas in the second housing 125 can be separated by arranging the tables and chairs, and office equipment,

without using dividers. In the embodiment shown in Figure 1, the fourth functional area 163 is adjacent to the wall 135 having the additional opening 136 as a drug input window for transferring drugs or other materials into the fourth functional area 163 from the outside.

[0059] Besides the third functional area 161 and the fourth functional area 163, the second module 121 may have other functional areas. For example, the second module 121 may further have a fifth functional area in the second housing 125 for training purpose. Pharmacy compounding staffs can be trained in the fifth functional area. Accordingly, the fifth functional area can have tables, chairs, projectors, computers or other training facilities or equipment. These facilities or equipment can be secured to the second housing 125 to avoid damage from movement during transportation of the second module 121.

[0060] In operation, the drugs or other materials stored in the second module 121 need to be delivered to the first module 101 to conduct compounding in the first module 101. Furthermore, the compounded drugs need to be delivered into the second module 121 so as to be dispensed to medical staffs of relevant departments through a drug output window 179, for example. The drug output window 179 can be adjacent to the third functional area 161. In addition, the mobile pharmacy compounding system 100 may have a conveyer device disposed between the first module 101 and the second module 121 for conveying materials between these two modules, e.g. the drugs to be compounded or the compounded drugs. In the embodiment shown in Figure 1, the conveyer device is a conveyer belt 171, which passes through the side walls of the first housing 105 and the second housing 125. Two material delivery openings 173 (for simplicity, the two connected material delivery openings are labeled by one symbol; unless otherwise stated, two connected material delivery openings in other drawings of the present application are labeled similarly) that can be operably opened or closed can be disposed at the corresponding positions of the first wall 107 of the first housing 105 and the third wall 127 of the second housing 125, respectively, to allow the conveyer belt 171 to pass through the first wall 107 and the third wall 127 therethrough. Preferably, an air shower device can be disposed at the material delivery opening 173 for cleaning the conveyer belt 171 and the materials delivered thereon at the material delivery opening 173, thereby avoiding or reducing the introduction of contaminants into the first module 101 during the conveying process.

[0061] Specifically, the conveyer belt 171 has an input channel from the second module 121 to the first module 101, and an output channel from the first module 101 to the second module 121. The input channel has a start point located in the second module 121, e.g. in the third functional area 161 or the fourth functional area 163, and an end point located in the

first module 101, e.g. in the second functional room 143. In the embodiment shown in Figure 1, the second functional room 143 has the first pharmacy compounding room 149 and the second pharmacy compounding room 151. Accordingly, the input channel of the conveyer belt 171 successively passes through the third functional area 161, the first gowning room 145, the second gowning room 147, the first pharmacy compounding room 149, the buffering room 153 and the second pharmacy compounding room 151.

[0062] In certain other embodiments, the input channel does not extend into the second pharmacy compounding room 151 but ends at the first pharmacy compounding room 149. In this case, other conveyer devices can be disposed between the first pharmacy compounding room 149 and the buffering room 153 and between the buffering room 153 and the second pharmacy compounding room 151. For example, the controlled drugs or other materials can be delivered into the second pharmacy compounding room 151 through a two-way interlock transferring window. In certain embodiments, the input channel may end at the buffering room 153, and other conveyer device such as the two-way interlock transferring window can be disposed between the buffering room 153 and the second pharmacy compounding room 151 to deliver the controlled drugs or other materials into the second pharmacy compounding room 151.

[0063] Similarly, the output channel may have a start point located in the first module 101, e.g. in the first pharmacy compounding room 149 or the second pharmacy compounding room 151, and an end point located in the second module 121, e.g. in the third functional area 161, preferably at the adjacent drug output window 179. Thus, the operators can dispense the compounded drugs conveyed by the conveyer belt 171 directly through the drug output window 179. Alternatively, the conveyer device may be the two-way interlock transferring window or other similar structures, which are disposed on the corresponding walls through which the material delivering channel passes, e.g. on the walls between the first pharmacy compounding room 149 and the buffering room 153 (specifically, at the material delivery opening), or the walls between the buffering room 153 and the second pharmacy compounding room 151. In this way, cross contamination between different areas or modules in delivering drugs or other materials between different functional areas or modules can be significantly reduced.

[0064] It should be noted that the conveyer belt used herein can be a draper conveyer belt with a traction member, a roller conveyer belt without a traction member, or other suitable structures. In certain embodiments, the conveyer belt may be segmented, and different conveyer belt segments may be connected with each other to form the complete conveyer belt.

The lengths and positions of the different conveyer belt segments can be configured according to the positions of the material delivery openings. For example, the conveyer belt can be segmented according to the positions of the material delivery openings, i.e. the positions of the joints of the conveyer belt segments may correspond to the positions of the material delivery openings. Thus it can be determined whether or not to retain a portion or all of the conveyer belt segments according to the connection of the first module 101 and the second module 121. For example, when the first module 101 and the second module 121 are connected in the manner as shown in Figure 1, the conveyer belt needs to pass through the material delivery openings on the first wall 107 and the second wall 127 hence the conveyer belt needs to extend to the first wall 107 and the second wall 127. For another example, when the first module 101 and the second module 121 are connected in the manner as shown in Figure 2, the conveyer belt segments in the second module 121 need to extend to the second wall 127 while the conveyer belt segments in the first module 101 only need to extend to the second gowning room, and may then be connected to the conveyer belt segments in the second module 121 through the material delivery opening close to the second gowning room and the material delivery opening on the second wall 127. For yet another example, when the first module 101 and the second module 121 are connected in the manner as shown in Figure 3, the conveyer belt segments in the first module 101 only need to extend to the second gowning room while the conveyer belt segments in the second module 121 only need to extend to the material delivery opening located a specific distance away from the third wall 127 (this material delivery opening corresponds to the material delivery opening of the second gowning room of the first module 101), and may then be connected to the conveyer belt segments in the first module 101 through these two material delivery openings. As can be seen, the segmented conveyer belt is more flexible and more convenient to install.

[0065] Still referring to Figure 1, uses of the mobile pharmacy compounding system 100 will be further elaborated below.

[0066] Drugs and other materials can be stored in the fourth functional area 163, and the operators can enter into the second housing 125 through the additional opening 134. A gowning room 175 can be disposed adjacent to the additional opening 134, where the operators can change shoes and wash hands. The operators may work in the third functional area 161, the first pharmacy compounding room 149 and the second pharmacy compounding room 151. Doctors or pharmacists responsible for prescription review, drug arrangement and dispense may work in the third functional area 161, and pharmacists (or compounding

staffs) responsible for compounding controlled drugs may work in the second pharmacy compounding room 151.

[0067] In certain embodiments, a portion of the uncompounded drugs (and/or other materials) can be delivered from the fourth functional area 163 to the third functional area 161, e.g. in a drug sorting area 177 adjacent to the conveyer belt 171, to facilitate the drug compounding preparation. After the pharmacist responsible for reviewing the prescription confirms the prescription, the pharmacist responsible for sorting the drugs takes the drugs to be compounded from the drug sorting area 177 according to the confirmed prescription and puts the drugs onto the conveyer belt 171. Then the conveyer belt 171 delivers the drug to be compounded to the first module 101. Specifically, the non-controlled drugs to be compounded can be delivered to the first pharmacy compounding room 149, picked up by the compounding staffs and placed on the horizontal laminar flow clean workbench 155. The compounding staffs can process compounding of the non-controlled drugs on the horizontal laminar flow clean workbench 155 to complete the pharmacy compounding. Moreover, the controlled drugs to be compounded can be delivered to the second pharmacy compounding room 151, picked up by the compounding staffs there and placed in the biological safety cabinet 157. The controlled drugs can be processed by the compounding staffs at the biological safety cabinet 157 to complete the pharmacy compounding. After compounding, the compounding staffs in the first pharmacy compounding room 149 and in the second pharmacy compounding room 151 can put the compounded controlled drugs and non-controlled drugs into respective containers (e.g. baskets, plates or boxes). The containers may have different colors, shapes, marks or sizes to indicate the controlled drugs and the non-controlled drugs distinctively. The compounded drugs in the containers can be put back on the conveyer belt 171, specifically, on the output channel of the conveyer belt 171. Then the conveyer belt 171 conveys the compounded drugs from the first module 101 to the second module 121. Finally, the distributing pharmacists can take the compounded drugs from the conveyer belt 171 and dispense the drugs through the drug output window 179 according to the prescription information. Then the whole process of pharmacy compounding is completed.

[0068] In certain embodiments, the first and the second modules have light-pervious structures on or inside the housings. For example, the light-pervious structures can be constructed as doors or windows where the light-pervious structures are made of explosion-proof glass. Preferably, the above light-pervious structures may be covered by an

explosion-proof film to reduce the risk of burst of the light-pervious structures during transportation or installation, thus enhancing the safety during use.

[0069] In certain embodiments, the mobile pharmacy compounding system of the present application can be made by re-configuring used containers, or constructed *de novo* using suitable boards. For example, the boards for constructing the side walls, top or bottom sides of the first housing or the second housing can be made of steel, aluminum alloy or fiber glass-reinforced plastics. Preferably, these boards can be formed as foldable structures so that they can be folded or disassembled easily, in which case the boards can be folded during transportation and re-assembled for installation and use. In addition, different numbers of dividers can be included in the housings to separate different functional areas or spaces. The dividers may have doors and/or windows that can allow people or materials moving between different functional areas. It should be noted that, for simplicity, the drawings attached hereto may not show all the openings, doors or windows on the housing walls or the dividers inside the housings.

[0070] As can be seen from above, the mobile pharmacy compounding systems of the present application can be put in any environment or place with certain area such as a yard, parking lot or other places rather than fixed or constructed in a building. Moreover, the overall layout of the mobile pharmacy compounding systems may be altered by changing the connections between the first module, the second module or other modules, thus improving the configuration flexibility and environment adaptability of the systems. Furthermore, the modularized mobile pharmacy compounding systems may be transformed and upgraded by replacing some modules, thus further enhancing the expansibility, usability and service life of the systems.

[0071] The methods of connection of the mobile pharmacy compounding systems of the present application may be altered according to actual needs. The internal space of the systems may be increased by adding additional modules to the systems, thereby improving the compounding capacity of the systems. The advantages of the present application will be further elaborated with reference to the following embodiments of the application.

[0072] Figure 5 shows a plan view of a mobile pharmacy compounding system 200 according to another embodiment of the application.

[0073] As shown in Figure 5, the mobile pharmacy compounding system 200 includes a first module 201 and a second module 221. The first module 201 has a first housing 205 defining a first inner space 203, and at least a portion of the first inner space 203 has a first cleanliness class. The first housing 205 has first openings 209A and 209B on a first wall

207, and a second opening 213 on a second wall 211. The first wall 207 is adjacent to the second wall 211.

[0074] The second module 221 has a second housing 225 defining a second inner space 223, and the second inner space 223 has a second cleanliness class. The first cleanliness class of the first inner space 203 is higher than the second cleanliness class. The second housing 225 has third openings 229A and 229B on a third wall 227, and a fourth opening 233 on a fourth wall 231. The third wall 227 is adjacent to the fourth wall 231. In addition, the second housing 225 has a wall 235 opposite to the third wall 227, and a wall 237 opposite to the fourth wall 231. An additional opening 239 can be provided on the wall 237.

[0075] In the embodiments shown in Figure 5, the first wall 207 of the first housing 205 and the third wall 227 of the second housing 225 are moved adjacent to each other so that the first opening 209A and the third opening 229A can be connected to each other, and the first opening 209B and the third opening 229B can be connected to each other. The first openings 209A and 209B are disposed in the middle of the first wall 207, and the third openings 229A and 229B are disposed in the middle of the third wall 227. Thus, the first opening 209A and the third opening 229A are connected to each other, and the first opening 209B and the third opening 229B are connected to each other, thereby making the first housing 205 and the second housing 225 connected to each other to form a “=”-shaped arrangement.

[0076] The first inner space 203 has two independent pharmacy compounding rooms. For example, a first pharmacy compounding room 243 shown on the left part of Figure 5 is for processing non-controlled drugs, and a second pharmacy compounding room 244 shown on the right part of Figure 5 is for processing controlled drugs.

[0077] Specifically, the first inner space 203 has a first functional room 241 and a second functional room 243 on its left part, and a first functional room 242 and a second functional room 244 on its right part. The second functional room 243 serves as the first pharmacy compounding room, while the second functional room 244 serves as the second pharmacy compounding room. The first functional room 241 may have a first gowning room adjacent to the first opening 209A, and a second gowning room between the first gowning room and the second functional room 243. In Figure 5, the two first gowning rooms for use with the first functional rooms 241 and 242 are connected to the second housing 225 via the first opening 209A and the first opening 209B, respectively. In certain embodiments, the two first gowning rooms can be connected to the second housing 225 via a common opening. Alternatively, the two gowning rooms may be integrated together, and correspondingly the

first openings 209A and 209B are integrated together. The integrated first gowning room can be connected to two second gowning rooms via two different openings.

[0078] The first pharmacy compounding room 243 has a horizontal laminar flow clean workbench 255, and the operators may process the drugs to be compounded on the horizontal laminar flow clean workbench 255 and complete the pharmacy compounding.

[0079] Similar to the first functional room 241, the first functional room 242 may have a first gowning room adjacent to the first opening 209B, and a second gowning room between the first gowning room and the second functional room 244. The second pharmacy compounding room 244 has a biological safety cabinet 257, and the operators can process the controlled drugs to be compounded in the biological safety cabinet 257 and complete the pharmacy compounding. The opening 213 is disposed in the second pharmacy compounding room 244 and serves as an emergency exit or an expansion opening. In the layout shown in Figure 5, the operators may enter into the pharmacy compounding rooms 243 and 244 through separate passages to conduct pharmacy compounding, thus avoiding cross contamination between the controlled drugs and non-controlled drugs.

[0080] Still referring to Figure 5, the first wall 207 of the first housing 205 and the third wall 227 of the second housing 225 are adjacent to each other. Except for the connected first opening 209A, 209B and the third openings 229A, 229B, one or more material delivery openings 273 and 274 may be disposed between the first wall 207 and the third wall 227. These material delivery openings may be mounted with two-way interlock transferring windows. For example, the material delivery opening 273 connects the first pharmacy compounding room 243 with the second inner space 223 to allow for the delivery of the non-controlled drugs or other materials therebetween. The material delivery opening 274 connects the second pharmacy compounding room 244 and the second inner space 223 to allow for the delivery of the controlled drugs or other materials therebetween. Such layout does not need to use a conveyer belt, thus reducing the production cost.

[0081] The second inner space 223 has a third functional area 261 and a fourth functional area 263 in the second housing 225. In the third functional area 261, pharmacists or doctors can review the prescription and sort the drugs. Drug shelves can be disposed in the fourth functional area 263 to store materials, e.g. drugs, medical devices or other consumables. The third functional area 261 and the fourth functional area 263 may be divided by arranging the layout of shelves, devices, tables and chairs, rather than separated by clapboards, division plates or walls.

[0082] The fourth opening 233 on the wall 231 can be used as a passage for the operators and the additional opening 239 on the wall 237 can be used as a passage for the materials, to allow the operators or materials passing in and out of the second housing 225, respectively. In addition, the wall 235 has a drug output window 279, through which the compounded drugs delivered into the second module 221 can be dispensed to the outside.

[0083] In certain embodiments, the first opening 209A or 209B of the first housing 205 can be connected to the fourth opening 233 or the additional opening 239 of the second housing 225, thus making the first inner space 203 and the second inner space 223 communicated with each other. The first module 201 and the second module 221 substantially form a T-shaped arrangement. Accordingly, the openings of the second housing 225, i.e. the third openings 229A, 229B and the fourth opening 233, or the additional opening 239 that is not connected to the first housing 205, can be used as the passages for the operators and the materials passing in and out of the second housing 225.

[0084] The embodiments above describe mobile pharmacy compounding systems having two modules. As mentioned above, in some examples, the two modules may be connected with other additional modules via additional openings, thus improving the expansibility of the system. Figure 6 to Figure 10 show mobile pharmacy compounding systems having three or more modules according to certain other embodiments of the application.

[0085] Figure 6 shows a plan view of a mobile pharmacy compounding system 300 according to another embodiment of the application.

[0086] As shown in Figure 6, the mobile pharmacy compounding system 300 includes a first module 301 and a second module 321. The internal structures and layouts of the two modules and the connection arrangement therebetween are substantially similar to those of the first module 101 and the second module 121 in the mobile pharmacy compounding system 100 shown in Figure 1. The second module 321 has an additional opening 336 on its wall 335.

[0087] Except for the first module 301 and the second module 321, the mobile pharmacy compounding system 300 further includes a third module 391 having a third housing 392, which has an opening 394 on its side wall 393. The second module 321 and the third module 391 of the mobile pharmacy compounding system 300 can be connected to each other by connecting the additional opening 336 of the second housing 325 to the opening 394 of the third housing 392 so that the second inner space 323 can be communicated with an inner space of the third housing 392. For example, the wall 335 of the second housing 325 can be moved adjacent to the side wall 393 of the third housing 392, and the additional opening 336

of the second housing 325 is hermetically connected to the opening 394 of the third housing 392 to connect the second module 321 and the third module 391. Thus, the additional third module 391 can provide extra functional space for the mobile pharmacy compounding system 300. For example, the inner space of the third housing 392 can be used for storing materials or for training purpose. Staffs and materials in the second inner space 323 can enter into the third module 391 through the additional opening 336 and the opening 394. In certain embodiments, the third module 391 may further have additional openings (not shown), for example, disposed on the side wall 395, to facilitate direct communication between the third module 391 and the outside through the additional opening.

[0088] In certain embodiments, the third module 391 may be connected to the first module 301 to expand the compounding space of the mobile pharmacy compounding system 300. For example, the connection between the third module 391 and the first module 301 can be accomplished by setting an additional opening 312 on a side wall 311 of the first housing 301 and hermetically connecting the opening 394 of the third housing 392 with the opening 312.

[0089] In certain embodiments, the third module 391 can be slidably attached to the second housing 325 via a sliding device (not show) such as a slide guide, and the third module 391 can be accommodated in the second inner space 323. The third module 391 can move between a retracted position and an expanded position. The third module 391 is accommodated in the second housing 325 in the retracted position, and at least partially slides out of the second housing 325 in the expanded position. Other modules similar to the third module 391 can be accommodated in the first inner space 303 and slidably attached to the first housing 305 via a sliding device. For example, an additional module attached to the third module 391 can move between a retracted position and an expanded position. The additional module is accommodated in the first housing 305 in the retracted position, and at least partially slides out of the first housing 305 in the expanded position. Such configuration further increases the expansibility of the system.

[0090] Figure 7 shows a plan view of a mobile pharmacy compounding system 400 according to another embodiment of the application.

[0091] As shown in Figure 7, the mobile pharmacy compounding system 400 includes a first module 401, a second module 421 and a third module 491. The second module 421 has a second housing 425 defining a second inner space 423. The second housing 425 has a third opening 429 on a third wall 427 and a fourth opening 433 on a fourth wall 431. The second module 421 is connected to a first opening 409 of the first module 401 at the third

opening 429. In addition, an additional opening 434 is disposed on the other end of the fourth wall 431 away from the fourth opening 433. The second module 421 is connected to the opening 494 of the third module 491 at the additional opening 434. The internal structure and layout of the second module 421 is substantially similar to that of the second module 121 of the mobile pharmacy compounding system 100 shown in Figure 1. The layouts and structures of the first module 401 and the third module 491 will be elaborated below.

[0092] The first module 401 and the third module 491 are connected to the second module 421 at the third opening 429 and the additional opening 434, respectively. The first module 401 and the third module 491 are used for compounding non-controlled drugs and controlled drugs, respectively. The relatively independent working areas of the first module 401 and the third module 491 can avoid cross contamination between the first module 401 and the third module 491, thereby increasing the spatial configuration flexibility of the mobile pharmacy compounding system 400. For example, the first module 401 and the third module 491 may have a relatively short length compared with the first module 101 shown in Figure 1.

[0093] In certain embodiments, the first module 401 has a first housing 405 defining a first inner space 403. The first housing 405 has a first opening 409 on a first wall 407 and a second opening 413 on a second wall 411. The first wall 407 is adjacent to the second wall 411. The air cleanliness class of at least a portion of the inner space 403 is higher than the air cleanliness class of the second inner space 423. The first wall 407 can be moved adjacent to the third wall 427 of the second housing 425 to connect the first opening 409 to the third opening 429 so that the first inner space 403 is communicated with the second inner space 423 and the first module 401 is connected to the second module 421.

[0094] The first module 401 includes a first functional room 441 and a second functional room 443 located in the first housing 405. The first functional room 441 is located between the first opening 409 and the second functional room 443. The first functional room 441 may further include a first gowning room 445 and a second gowning room 447. The first gowning room 445 is adjacent to the first opening 409, and the second gowning room 447 is adjacent to the second functional room 443. The second functional room 443 includes a first pharmacy compounding room for the operators to compound non-controlled drugs. The second opening 413 is disposed in the second functional room 443 to connect additional modules or serve as an emergency exit for the operators. The second functional room 443 may have a horizontal laminar flow clean workbench 455 secured to the first housing 405 for

pharmacy compounding. The cleanliness class of the horizontal laminar flow clean workbench is equal to or higher than Class ISO 5. A first conveyer device 471 can be disposed between the first module 401 and the second module 421 for delivering materials. The first conveyer device 471 is, for example, a conveyer belt connecting the first inner space 403 and the second inner space 423 through the material delivery openings 473 on the first wall 407 and the third wall 427.

[0095] In the embodiment shown in Figure 7, the third module 491 may have a structure and layout similar to that of the first module 401. The third module 491 has a third housing 493 defining a third inner space 492, and the third housing 493 has openings 494 and 495 on two adjacent walls, respectively. The air cleanliness class of at least a portion of the third inner space 492 is higher than the air cleanliness class of the second inner space 423. By connecting the opening 494 with the additional opening 434 on the second housing 425, the third inner space 492 can be communicated with the second inner space 423 to connect the third module 491 with the second module 421. It would be appreciated that the third module 491 may have a structure and layout different from that of the first module 401.

[0096] In the embodiment shown in Figure 7, the third module 491 includes a first functional room 496 and a second functional room 497 in the third housing 493, and the first functional room 496 is located between the opening 494 and the second functional room 497. The first functional room 496 may further include a first gowning room and a second gowning room. The first gowning room is adjacent to the opening 494, and the second gowning room is adjacent to the second functional room 497. The second functional room 497 includes a second pharmacy compounding room for the operators to compound controlled drugs. The opening 495 is disposed in the second functional room 497 to connect additional modules or serve as an emergency exit for the operators. The second functional room 497 may have a horizontal laminar flow clean workbench 457 secured to the third housing 493 for pharmacy compounding. A second conveyer device 472 for delivering materials is disposed between the third module 491 and the second module 421. In certain embodiments, the second conveyer device 472 is a conveyer belt connecting the third inner space 492 and the second inner space 423 through the material delivery openings 474 on the adjacent walls of the third housing 493 and the second housing 425.

[0097] In the embodiment, the compounding staffs need to enter into the pharmacy compounding room through the second module of the mobile pharmacy compounding system. In certain embodiments, the module of the mobile pharmacy compounding system where the

pharmacy compounding room is located may further provide an independent opening for the compounding staffs to enter or exit.

[0098] Figure 8 shows a plan view of a mobile pharmacy compounding system 500 according to another embodiment of the application.

[0099] As shown in Figure 8, the mobile pharmacy compounding system 500 includes a first module 501, a second module 521 and a third module 591. The second module 521 has a second housing 525 defining a second inner space 523, and the second housing 525 has a third opening 529 on a third wall 527 and a fourth opening 533 on a fourth wall 531. The second module 521 is connected to a first opening 509 of the first module 501 at the third opening 529. In addition, an additional opening 534 is disposed on the third wall 527. The second module 521 is connected to the opening 594 of the third module 591 at the additional opening 534. The second module 521 has a third functional area 561 and a fourth functional area 563. In the third functional area 561, pharmacists can review the prescription and dispense drugs. The fourth functional area 563 can be used for storing materials. The fourth opening 533 is adjacent to the fourth functional area 563, through which materials can be delivered into the fourth functional area 563. The second module 521 has an additional opening 536 opposite to the fourth opening 533 for the operators to enter or exit the third functional area 561.

[00100] The first module 501 and the third module 591 are connected to the second module 521 at the third opening 529 and the additional opening 534, respectively. The compounding staffs can compound non-controlled drugs and controlled drugs in the first module 501 and the third module 591, respectively. The relatively independent working areas can avoid cross contamination of the drugs in the first module 501 and the third module 591, thereby increasing the spatial configuration flexibility of the mobile pharmacy compounding system 500. In Figure 8, the first module 501 and the third module 591 are both rectangular and connected to each other in parallel. The parallelly connected first module 501 and third module 591 are connected to the second module 521 at their ends, respectively.

[00101] In certain embodiments, the first module 501 has a first housing 505 defining a first inner space 503, and the first housing 505 has a first opening 509 on a first wall 507 and a second opening 513 on a second wall 511. The first wall 507 is adjacent to the second wall 511. The air cleanliness class of at least a portion of the inner space 503 is higher than the air cleanliness class of the second inner space 523. The first wall 507 is moved adjacent to the third wall 527 of the second housing 525 to connect the first opening 509 to the third

opening 529. In this way, the first inner space 503 is communicated with the second inner space 523 to connect the first module 501 with the second module 521. The third module 591 may have a structure and layout similar to that of the first module 501. The third module has a third housing 593 defining a third inner space 592, and the third housing 593 has openings 594 and 595 on two adjacent walls, respectively. The air cleanliness class of at least a portion of the third inner space 592 is higher than the air cleanliness class of the second inner space 523. By connecting the opening 594 with the additional opening 534 on the second housing 525, the third inner space 592 is communicated with the second inner space 523 to connect the third module 591 with the second module 521.

[00102] The first module 501 includes a first functional room 541 and a second functional room 543 disposed in the first housing 505. The first functional room 541 is disposed between the opening 513 and the second functional room 543. The first functional room 541 may further include a first gowning room 545 and a second gowning room 547. Similarly, the third module 591 includes a first functional room 596 and a second functional room 597 in the third housing 593, and the first functional room 596 is located between the opening 595 and the second functional room 597. The first functional room 596 further includes a first gowning room 598 and a second gowning room 599.

[00103] Buffering areas 577A and 577B are disposed at the two ends of the first module 501 and the third module 591 that are away from the second module 521, which serve as passages for the operators. Specifically, the buffering area 577A in the first housing 505 is located between the second opening 513 and the first functional room 541, and the buffering area 577B in the third housing 593 is located between the opening 595 and the first functional room 596. Preferably, the two buffering areas 577A and 577B can be communicated with each other, for example, through additional openings 538 on the adjacent walls of the two modules.

[00104] In addition, buffering areas 578A and 578B can be disposed at the two ends of the first module 501 and the third module 591 that are close to the second module 521, respectively. Specifically, the buffering area 578A in the first housing 505 is adjacent to the first opening 509, and the buffering area 578A is separated from the second functional room 543 and is communicated with it merely through a first conveyer device 571. The first conveyer device 571 is a two-way interlock transferring window for transferring drugs between the buffering area 578A and the second functional room 543. For example, the uncompounded drugs can be transferred from the buffering area 578A to the second functional room 543, and the compounded drugs can be transferred from the second

functional room 543 to the buffering area 578A. A drug output window 579 is disposed on the first housing 505 for distributing the compounded drugs out of the buffering area 578A.

[00105] Similarly, the buffering area 578B of the third housing 591 is adjacent to the opening 594, and the buffering area 578B is separated from the second functional room 547 and is communicated with it merely through a second conveyer device 572. The second conveyer device 572 is a two-way interlock transferring window. A drug output window 580 is disposed on the third housing 593 for distributing the compounded drugs out of the buffering area 578B. Preferably, the two buffering areas 578A and 578B can be communicated with each other, for example, through additional openings 537 between the adjacent walls of the two modules.

[00106] The first module 501 and the third module 591 are used for handling the compounding of non-controlled and controlled drugs, respectively. Accordingly, the second functional room 543 may have a horizontal laminar flow clean workbench 555 secured to the first housing 505. The second functional room 597 may have a biological safety cabinet 557 secured to the third housing 593.

[00107] As shown in Figure 6 to Figure 8, the additional modules included in the mobile pharmacy compounding systems of the embodiments increase the spatial configuration flexibility of the system. In certain embodiments, the spaces in different modules may be shared for use and form a complete functional area in each of the different modules. For example, the first gowning room and the second gowning room adjacent to the pharmacy compounding room can be located between two modules. Such examples are shown in Figures 9 to 10.

[00108] Figure 9 shows a plan view of a mobile pharmacy compounding system 600 according to another embodiment of the application.

[00109] As shown in Figure 9, the mobile pharmacy compounding system 600 includes a first module 601, a second module 621 and a third module 691. The second module 621 has a second housing 625 defining a second inner space 623, and the second housing 625 has a third opening 629 on a third wall 627 and a fourth opening 633 on a fourth wall 631. The second module 621 is connected to the first opening 609 of the first module 601 at the third opening 629. The operators can enter or exit the second housing 625 through the fourth opening 633. An additional opening 634 is further disposed on the fourth wall 631 to deliver materials in and out of the second housing 625, for example, the materials may be delivered into the functional area for storing materials. In addition, a drug output window 679 is

disposed on the second housing 625, through which the compounded drugs can be dispensed to the outside.

[00110] The first module 601 has a first housing 605 defining a first inner space 603, and the first housing 605 has a first opening 609 on a first wall 607 and a second opening 613 on a second wall 611. The first wall 607 is adjacent to the second wall 611. The air cleanliness class of at least a portion of the inner space 603 is higher than the air cleanliness class of the second inner space 623. The first wall 607 is moved adjacent to the third wall 627 of the second housing 625 to hermetically connect the first opening 609 with the third opening 629. In this way, the first inner space 603 is communicated with the second inner space 623 to connect the first module 601 with the second module 621. In Figure 9, the first module 601 and the second module 621 are parallelly connected, i.e. the first wall 607 is a length side of the first housing 605, and the third wall 627 is a length side of the second housing 625.

[00111] The third module 691 has a third housing 693 defining a third inner space 692. The third housing 693 has openings 694 and 695 on two adjacent walls, respectively. The air cleanliness class of at least a portion of the third inner space 692 is higher than the air cleanliness class of the second inner space 623. By connecting the opening 694 to the second opening 613 on the first housing 605, the third inner space 692 can be communicated with the second inner space 623 to connect the third module 691 with the second module 621. Another additional opening 695 on the third housing 693 can be used as an emergency exit.

[00112] The first module 601 includes a first functional room 641 and a second functional room 643 located in the first housing 605. The first functional room 641 is located between the first opening 609 and the second functional room 643. The first functional room 641 includes a first gowning room 645 and a second gowning room 647. Compounding staffs can enter into the second functional room 643 through the first gowning room 645 and the second gowning room 647. In addition, the first functional room 641 further includes a first gowning room 646 adjacent to the first gowning room 645, and the second opening 613 is located in the first gowning room 646. In certain embodiments, the adjacent first wall 607 and third wall 627 may have additional openings at the first gowning room 646 to allow the operators entering into the first gowning room 646 through the second inner space 623, and further into the third housing 692 through the second opening 613 and the opening 694. In certain embodiments, an internal opening can be disposed between the first gowning room 645 and the first gowning room 646 (not shown). Thus, the operators can enter into the first gowning room 646 through the first gowning room 645, and further into the third housing 692 through the second opening 613 and the opening 694. In certain embodiments, the first

gowning room 645 and the first gowning room 646 can be combined to form an integral first gowning room.

[00113] The third module 691 includes a first functional room 696 and a second functional room 697 in the third housing 693. The second functional room 697 is used as a space for compounding controlled drugs, and the first functional room 696 is used as a gowning room. Specifically, the first functional room 696 is located between the opening 694 and the second functional room 697 as a second gowning room. Since there are two first gowning rooms 645 and 646 in the first module 601, the first gowning room 646 adjacent to the first functional room 696 may be used in combination with the second gowning room 696 to provide a complete gowning room (provide two-stage cloth changing function). In such layout, the third module 691 may have a small size, for example, a size smaller than that of the first module 601.

[00114] Since the first module 601 and the third module 691 both have a wall adjacent to the second module 621, conveyer devices can be disposed on the adjacent walls of the modules. For example, a first conveyer device 671 such as a two-way interlock transferring window is disposed between the adjacent first wall 607 and third wall 627 for transferring drugs between the second functional room 643 and the second inner space 623. Similarly, a second conveyer device 672 such as the two-way interlock transferring window can be disposed between the adjacent walls of the second housing 621 and the third housing 692 for transferring drugs between the second functional room 697 and the second inner space 623. It would be appreciated that, the second housing 625 and the first housing 605 have two connected material delivery openings at the two-way interlock transferring window 671, and the second housing 625 and the third housing 693 have two connected material delivery openings at the two-way interlock transferring window 672.

[00115] Figure 10 shows a plan view of a mobile pharmacy compounding system 700 according to another embodiment of the application. The mobile pharmacy compounding system 700 includes four connected modules. Therefore, each of the four modules may have a relative small size, thus further improves the configuration flexibility of the system.

[00116] As shown in Figure 10, the mobile pharmacy compounding system 700 includes a first module 701, a second module 721, a third module 791 and a fourth module 796. The first module 701 and the third module 791 are used for compounding controlled drugs and non-controlled drugs, respectively.

[00117] Specifically, the second module 721 and the fourth module 796 are arranged in parallel, and connected with each other through connected openings 736, 737 and connected

openings 738, 739. The second module 721 has a second housing 725 defining a second inner space 723, and the second housing 725 has at its width side openings 729 and 730 to connect with the opening 709 of the first module 701 and the opening 710 of the third module 791, respectively. In addition, the second housing 725 further has openings 733 and 734 at its length side away from the fourth module 796, which serve as passages for operators and materials. The two ends along the length direction of the second housing 725 have the first gowning rooms 745 and 746.

[00118] The first module 701 includes a first functional room 741 and a second functional room 743. The first functional room 741 is used as a second gowning room, and the second functional room 743 is used as a pharmacy compounding room. One side of the first functional room 741 is connected to the first gowning room 745 of the second module 721 via the opening 709 and the opening 729. Thus, the first gowning room 745 and the first functional room 741 form a complete second gowning room for use with the second functional room 743.

[00119] The third module 791 includes a first functional room 742 and a second functional room 744. The first functional room 742 is used as a second gowning room, and the second functional room 744 is used as a pharmacy compounding room. One side of the first functional room 742 is connected to the first gowning room 746 of the second module 721 via the opening 710 and the opening 730. Thus, the first gowning room 746 and the first functional room 742 form a complete second gowning room for use with the second functional room 744.

[00120] The first module 701 and the third module 791 can further have openings 713 and 714 as emergency exits or expansion openings for connecting to additional modules.

[00121] The fourth module 796 includes functional areas for drug preparation and distribution. The drugs can be transferred via a first conveyer device 771 between the fourth module 796 and the first module 701. A second conveyer device 772 can be used for transferring drugs between the third module 791 and the fourth module 796. The first conveyer device 771 or the second conveyer device 772 may be a conveyer belt or a two-way interlock transferring window. In addition, a drug output window 779 can be disposed on the fourth module 796 for distributing the compounded drugs to the outside.

[00122] Various embodiments of the present application are illustratively described above with reference to the drawings. It will be readily appreciated by people skilled in the art that, the connections and combinations of the modules disclosed by the embodiments may be

modified or adjusted based on actual needs, the type, quantity and layout of the devices inside the modules can be adjusted or changed without departing from the spirit of the application.

[00123] Other variations to the disclosed embodiments can be understood and effected by those skilled in the art in practicing the claimed invention from a study of the drawings, the disclosure, and the appended claims. In the claims, the word "comprising" does not exclude other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality. Any reference signs in the claims should not be construed as limiting the scope. The scope and spirit of the present application is defined by the appended claims.

What is claimed is:**1. A mobile pharmacy compounding system comprising:**

a first module having a first housing defining a first inner space, in which at least a portion of the first inner space has a first cleanliness class, the first housing having a first opening on a first wall and a second opening on a second wall; and

a second module having a second housing defining a second inner space of a second cleanliness class, the second module having a third opening on a third wall and a fourth opening on a fourth wall, wherein the first cleanliness class is higher than the second cleanliness class;

wherein one of the first opening and the second opening can be connected to one of the third opening and the fourth opening by moving one of the first wall and the second wall of the first housing adjacent to one of the third wall and the fourth wall of the second housing so that the first inner space is communicated with the second inner space.

2. The mobile pharmacy compounding system of claim 1, further comprising a flexible channel for connecting the first opening or the second opening of the first housing to the third opening or the fourth opening of the second housing.

3. The mobile pharmacy compounding system of claim 2, wherein the flexible channel is a hermetical channel.

4. The mobile pharmacy compounding system of claim 1, wherein both of the first housing and the second housing have a rectangular shape, and the first module and the second module can be connected with each other to form a “—” shaped arrangement or a “=” shaped arrangement.

5. The mobile pharmacy compounding system of claim 1, wherein one of the first housing and the second housing has a rectangular shape, and the other housing has a square shape, and the first module and the second module can be connected with each other at a length side or a width side of the module having the rectangular shape.

6. The mobile pharmacy compounding system of claim 1, wherein both of the first housing and the second housing have a rectangular shape, and the first module and the second module

can be connected with each other to form an L-shaped arrangement or a T-shaped arrangement.

7. The mobile pharmacy compounding system of claim 1, wherein one of the first housing and the second housing has a rectangular shape, and the other housing has a square shape, and the first module and the second module can be connected with each other to form an L-shaped arrangement or a T-shaped arrangement.

8. The mobile pharmacy compounding system of claim 1, wherein the first module and the second module can be connected with each other by stacking one of the two modules onto the other so that the first inner space is communicated with the second inner space.

9. The mobile pharmacy compounding system of claim 1, wherein the first housing has a first door for hermetically closing the first opening and a second door for hermetically closing the second opening.

10. The mobile pharmacy compounding system of claim 1, wherein the second housing has a third door for hermetically closing the third opening and a fourth door for hermetically closing the fourth opening.

11. The mobile pharmacy compounding system of claim 1, wherein the first cleanliness class is equal to or higher than Class ISO 8 under the ISO 14644-1 standard.

12. The mobile pharmacy compounding system of claim 1, wherein the first module comprises a first functional room and a second functional room located in the first housing, and wherein the first functional room is located between the first opening or the second opening and the second functional room.

13. The mobile pharmacy compounding system of claim 12, wherein the first functional room comprises a first gowning room adjacent to the first opening or the second opening and a second gowning room adjacent to the second functional room.

14. The mobile pharmacy compounding system of claim 13, wherein the first gowning room has a cleanliness class equal to or higher than Class ISO 8 under the ISO 14644-1 standard.

15. The mobile pharmacy compounding system of claim 13, wherein the second gowning room has a cleanliness class equal to or higher than Class ISO 7 under the ISO 14644-1 standard.

16. The mobile pharmacy compounding system of claim 12, wherein the first functional room comprises a gowning room.
17. The mobile pharmacy compounding system of claim 16, wherein the first functional room comprises an air shower device.
18. The mobile pharmacy compounding system of claim 12, wherein the second functional room comprises a pharmacy compounding room.
19. The mobile pharmacy compounding system of claim 12, wherein the first functional room has an air pressure lower than that of the second functional room.
20. The mobile pharmacy compounding system of claim 12, wherein the second functional room comprises a first pharmacy compounding room and a second pharmacy compounding room.
21. The mobile pharmacy compounding system of claim 20, wherein the second functional room comprises a buffering room between the first pharmacy compounding room and the second pharmacy compounding room.
22. The mobile pharmacy compounding system of claim 20, wherein the first pharmacy compounding room is configured that non-controlled drugs are processed therein, and the second pharmacy compounding room is configured that controlled drugs are processed therein.
23. The mobile pharmacy compounding system of claim 22, wherein the first pharmacy compounding room is adjacent to the first functional room.
24. The mobile pharmacy compounding system of claim 22, wherein the first pharmacy compounding room comprises a horizontal laminar flow clean workbench.
25. The mobile pharmacy compounding system of claim 24, wherein the horizontal laminar flow clean workbench has a cleanliness class equal to or higher than Class ISO 5 under the ISO 14644-1 standard.
26. The mobile pharmacy compounding system of claim 25, wherein the horizontal laminar flow clean workbench is secured to the first housing.
27. The mobile pharmacy compounding system of claim 26, wherein the horizontal laminar

flow clean workbench is secured to a side wall and/or a bottom side of the first housing.

28. The mobile pharmacy compounding system of claim 22, wherein the second pharmacy compounding room comprises a biological safety cabinet.

29. The mobile pharmacy compounding system of claim 28, wherein the biological safety cabinet is secured to a side wall, a bottom side, and/or a top side of the first housing.

30. The mobile pharmacy compounding system of claim 22, wherein the first pharmacy compounding room has an air pressure higher than that outside the first pharmacy compounding room.

31. The mobile pharmacy compounding system of claim 22, wherein the second pharmacy compounding room has an air pressure lower than that outside the second pharmacy compounding room.

32. The mobile pharmacy compounding system of claim 1, wherein the first module has an air filtering device for filtering the air flowing into or out of the first module.

33. The mobile pharmacy compounding system of claim 1, wherein the second module comprises in the second housing a third functional area where prescriptions are reviewed and/or drugs are dispensed.

34. The mobile pharmacy compounding system of claim 33, wherein the second module further comprises a fourth functional area where materials are stored.

35. The mobile pharmacy compounding system of claim 33, wherein the second module further comprises a fifth functional area for training purpose in the second housing.

36. The mobile pharmacy compounding system of claim 1, further comprising a conveyer device for conveying materials between the first module and the second module.

37. The mobile pharmacy compounding system of claim 36, wherein the conveyer device comprises a conveyer belt or a two-way interlock transferring window.

38. The mobile pharmacy compounding system of claim 36, wherein the conveyer device comprises a segmented conveyer belt.

39. The mobile pharmacy compounding system of claim 1, wherein there are light-pervious

structures at or inside the first housing and the second housing, and wherein the light-pervious structures are made of explosion-proof glass.

40. The mobile pharmacy compounding system of claim 39, wherein the light-pervious structures are covered by explosion-proof films.

41. The mobile pharmacy compounding system of claim 1, further comprising an air conditioning system for controlling air conditions in the first inner space.

42. The mobile pharmacy compounding system of claim 41, wherein the air conditioning system comprises a master air conditioning unit and a backup air conditioning unit.

43. The mobile pharmacy compounding system of claim 42, wherein the backup air conditioning unit is configured to be activated when the master air conditioning unit fails to maintain the cleanliness of the first inner space to a predetermined level.

44. The mobile pharmacy compounding system of claim 1, wherein the first module further comprises on its wall or walls one or more additional openings to allow the first module to be connected with one or more additional modules.

45. The mobile pharmacy compounding system of claim 44, wherein the one or more additional openings are hermetically closed when not being connected with the one or more additional modules.

46. The mobile pharmacy compounding system of claim 1, wherein the first module further comprises a third module accommodated in the first inner space, the third module is slidably attached to the first housing to be moved between a retracted position and an expanded position by a sliding device, and wherein the third module is accommodated in the first housing when located in the retracted position, and the third module at least partially slides out of the first housing when located in the expanding position.

47. The mobile pharmacy compounding system of claim 1, wherein the second module further comprises a third module accommodated in the second inner space, the third module is slidably attached to the second housing to be moved between a retracted position and an expanded position by a sliding device, and wherein the third module is accommodated in the second housing when located in the retracted position, and the third module at least partially slides out of the second housing when located in the expanding position.

48. The mobile pharmacy compounding system of claim 1, wherein the first wall is adjacent to the second wall and the third wall is adjacent to the fourth wall.

49. The mobile pharmacy compounding system of claim 48, wherein the first module comprise a first functional area and a second functional area in the first housing, and wherein the first opening and the second opening are positioned in the first functional room.

50. The mobile pharmacy compounding system of claim 1, wherein the first module further comprises one or more material delivery openings on one or more walls of the first housing, and the second module further comprises one or more material delivery openings on one or more walls of the second housing, and wherein the one or more material delivery openings of the first module and the one or more material delivery openings of the second module are sized to allow materials to pass therethrough so that materials can be transferred between the first module and the second module through material delivery openings of the first module and the second module that are connected with each other.

51. The mobile pharmacy compounding system of claim 50, further comprising a segmented conveyer belt passing through the first housing and the second housing, and wherein the segmented conveyer belt is segmented in accordance with positioning of the material delivery openings of the first housing and the second housing.

52. The mobile pharmacy compounding system of claim 1, wherein the first module comprises a first functional room and a second functional room in the first housing, and the first functional room is located between the first opening and the second functional room, and

wherein the first functional room comprises a first gowning room adjacent to the first opening or the second opening and a second gowning room adjacent to the second functional room; and

the second functional room comprises a first pharmacy compounding room where non-controlled drugs are processed and a second pharmacy compounding room where controlled drugs are processed.

53. The mobile pharmacy compounding system of claim 52, wherein the first pharmacy compounding room is adjacent to the first functional room.

54. The mobile pharmacy compounding system of claim 53, wherein the second module comprises in the second housing a third functional area where prescriptions are reviewed

and/or drugs are dispensed and a fourth functional area where materials are stored.

55. The mobile pharmacy compounding system of claim 54, wherein the first module further comprises one or more material delivery openings on one or more walls of the first housing, and the second module further comprises one or more material delivery openings on one or more walls of the second housing, and wherein the one or more material delivery openings of the first module and the one or more material delivery openings of the second module are sized to allow materials to pass therethrough so that the materials can be transferred between the first and the second modules through material delivery openings of the first module and the material delivery openings of the second module that are connected with each other.

56. The mobile pharmacy compounding system of claim 55, further comprising a conveyer device which passes through the connected material delivery openings of the first module and the second module so as to transfer materials between the first module and the second module.

57. The mobile pharmacy compounding system of claim 56, further comprising an air conditioning system for controlling air conditions in the first inner space; wherein the air conditioning system comprises a master air conditioning unit and a backup air conditioning unit, and wherein the backup air conditioning unit is activated when the master air conditioning unit fails to maintain the first cleanliness in the first inner space at a predetermined level.

58. The mobile pharmacy compounding system of claim 57, wherein the first wall is adjacent to the second wall and the third wall is adjacent to the fourth wall.

59. A mobile pharmacy compounding system comprising:

a first module having a first housing defining a first inner space, in which at least a part of the first inner space has a first cleanliness class, and the first housing having a first opening on a first wall thereof; and

a second module having a second housing defining a second inner space, the second housing has at least two openings on at least two walls of the second housing, respectively, the second inner space having a second cleanliness class lower than the first cleanliness class;

wherein the first opening is connected to one of the at least two openings of the

second housing by moving the first wall of the first housing adjacent to one of the walls of the second housing having the openings so as to allow communication between the first inner space and the second inner space.

60. The mobile pharmacy compounding system of claim 59, wherein the first housing further comprises a second opening on a second wall, wherein the second opening is connected to one of the at least two openings of the second housing by moving the second wall adjacent to one of the walls of the second housing having the openings so as to allow communication between the first inner space and the second inner space.

61. The mobile pharmacy compounding system of claim 59, wherein the first module comprises a first functional room and a second functional room in the first housing, wherein the first functional room is located between the first opening and the second opening.

62. The mobile pharmacy compounding system of claim 61, wherein the first functional room comprises a first gowning room adjacent to the first opening and a second gowning room adjacent to the second functional room.

63. The mobile pharmacy compounding system of claim 61, wherein the second functional room comprises a first pharmacy compounding room where non-controlled drugs are processed and a second pharmacy compounding room where controlled drugs are processed.

64. The mobile pharmacy compounding system of claim 63, wherein the first pharmacy compounding room is adjacent to the first functional room.

65. The mobile pharmacy compounding system of claim 59, wherein the second module comprises in the second housing a third functional area where prescriptions are reviewed and/or drugs are dispensed and a fourth functional area where materials are stored.

66. The mobile pharmacy compounding system of claim 59, wherein the first module further comprises one or more material delivery openings on one or more walls of the first housing, and the second module further comprises one or more material delivery openings on one or more walls of the second housing, the one or more material delivery openings of the first module and the one or more material delivery openings of the second housing are sized to allow materials to pass therethrough so that the materials can be transferred between the first module and the second module through the material delivery openings of the first module and the second module that are connected with each other.

67. The mobile pharmacy compounding system of claim 66, further comprising a conveyer device passing through the connected material delivery openings of the first module and the second module so as to transfer materials between the first module and the second module.

68. The mobile pharmacy compounding system of claim 59, further comprising an air conditioning system for controlling air conditions in the first inner space; wherein the air conditioning system comprises a master air conditioning unit and a backup air conditioning unit, and wherein the backup air conditioning unit is activated when the master air conditioning unit fails to maintain the first cleanliness class in the first inner space at a predetermined level.

69. The mobile pharmacy compounding system of claim 60, wherein the first wall is adjacent to the second wall and the walls of the second housing having the openings are adjacent to each other.

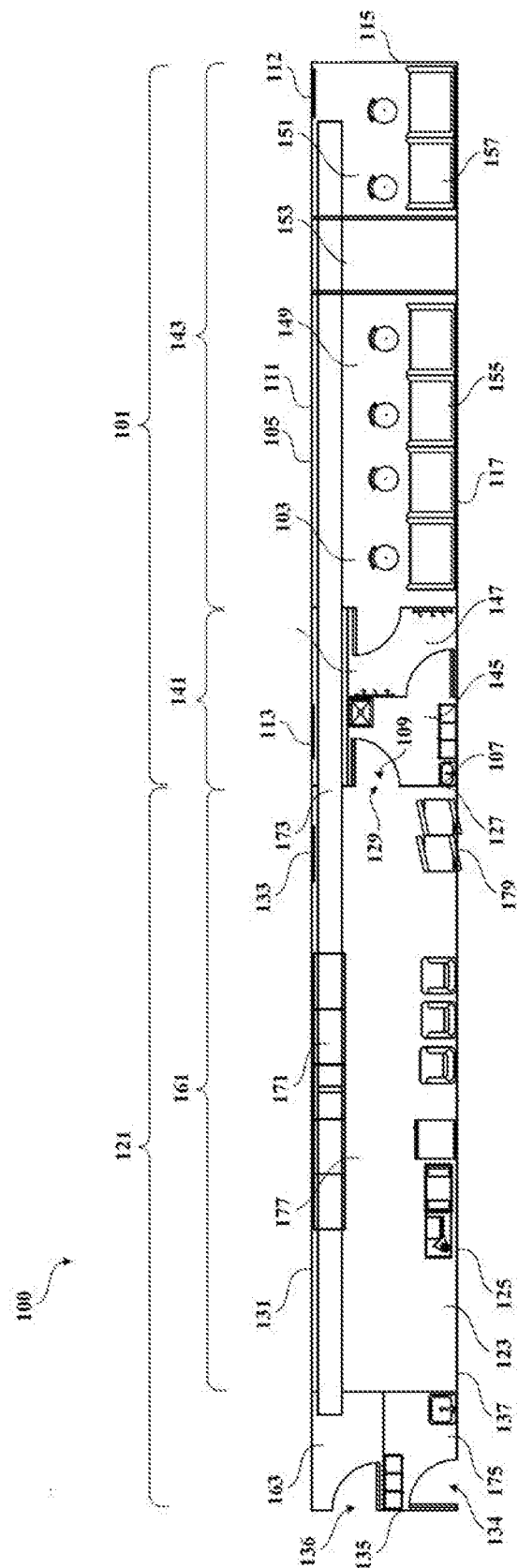


Figure 1

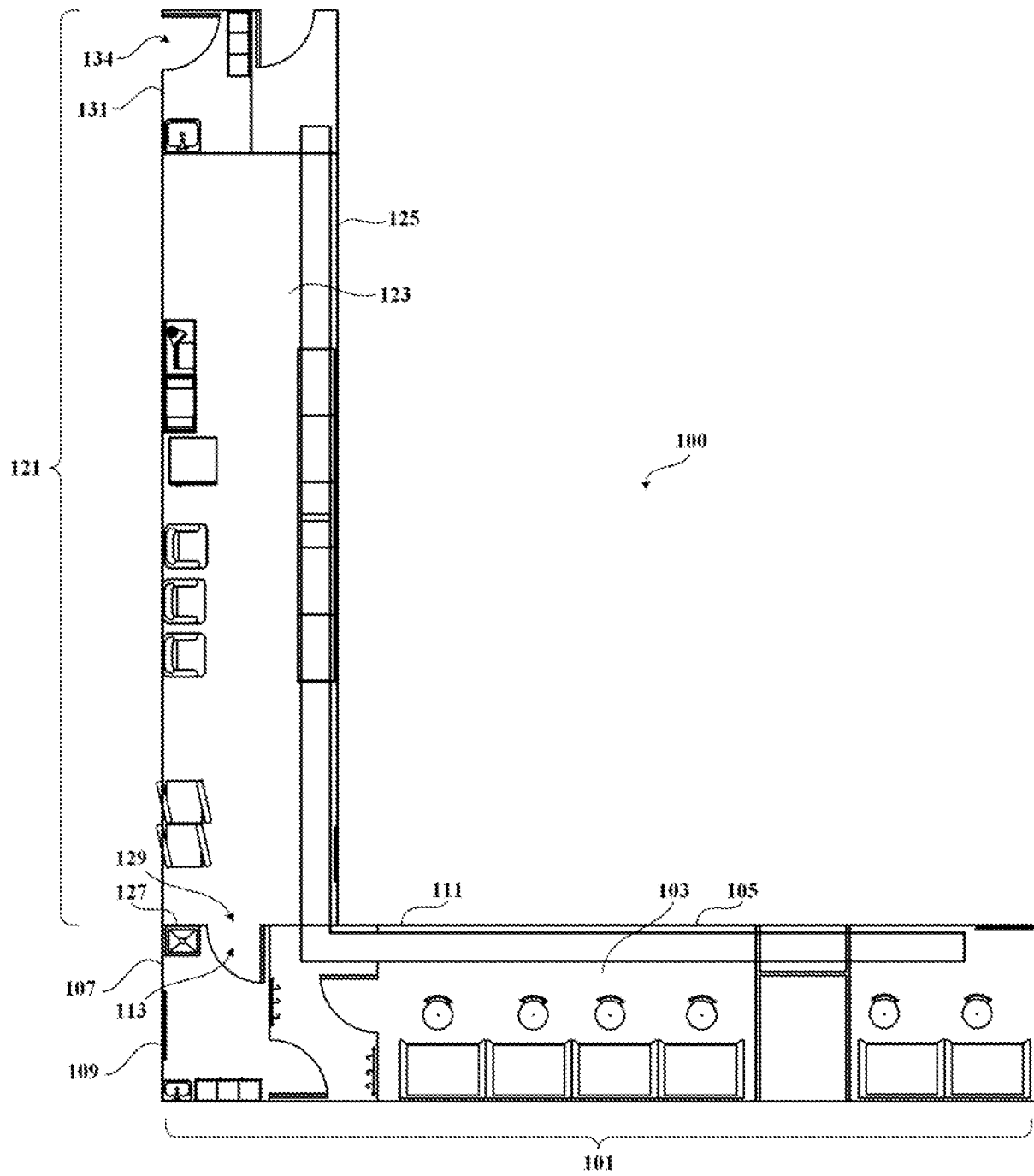


Figure 2

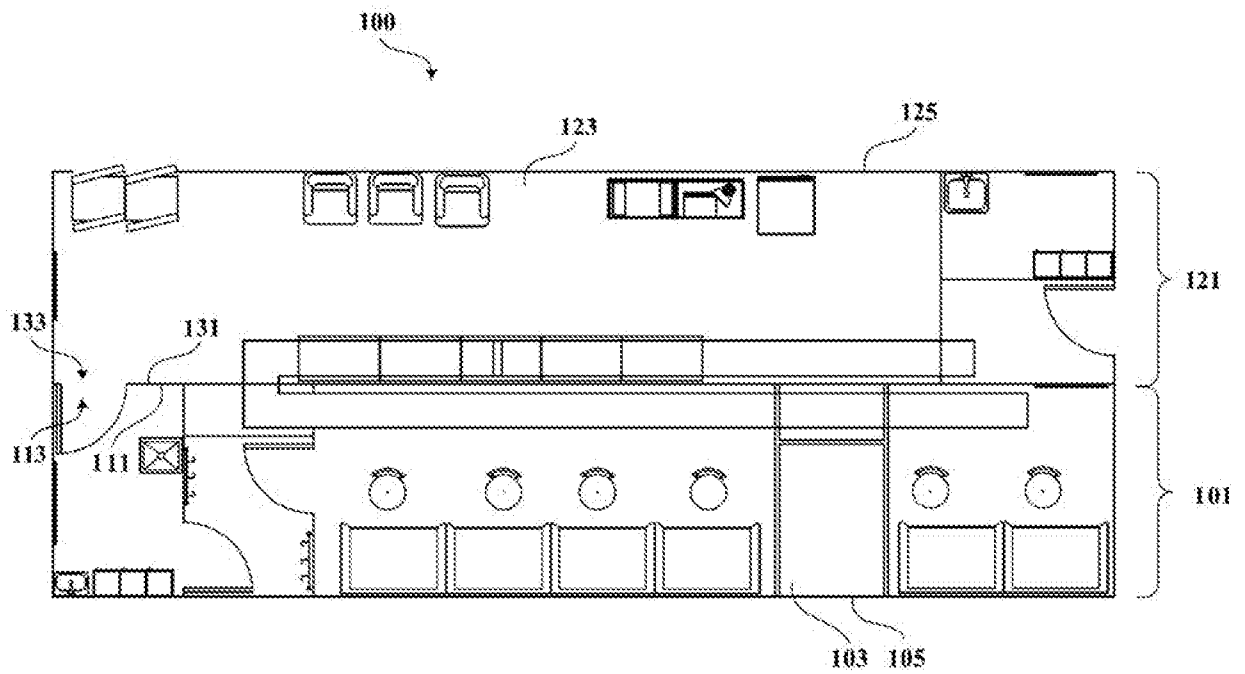


Figure 3

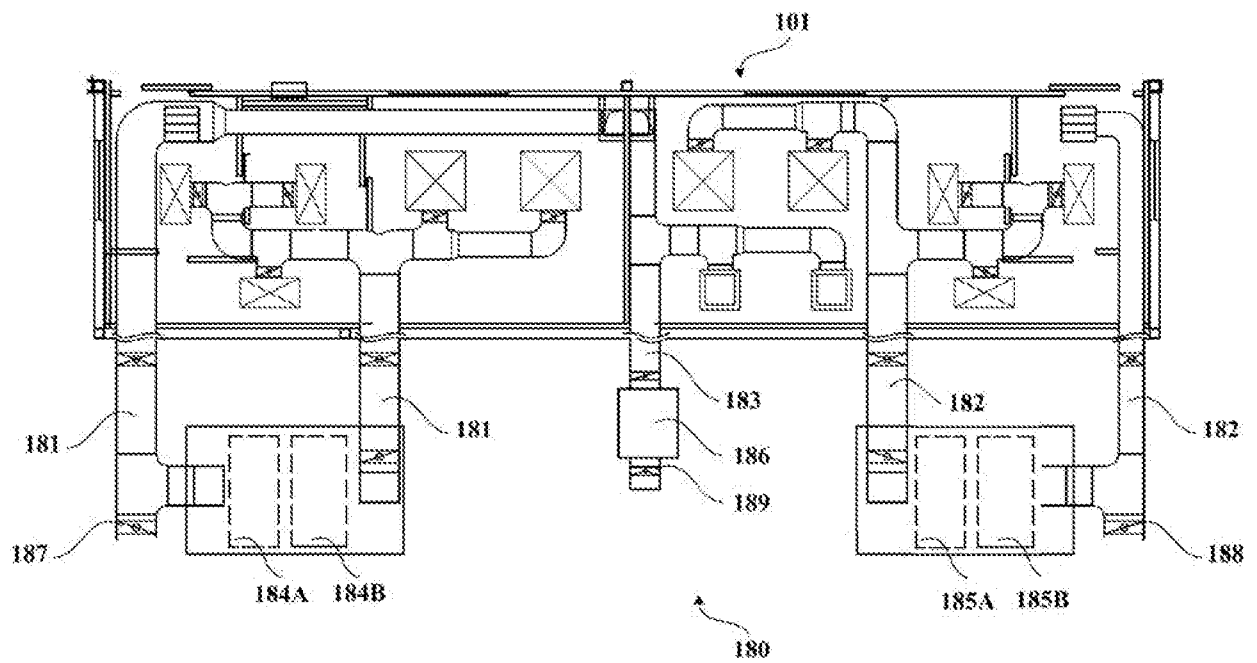


Figure 4

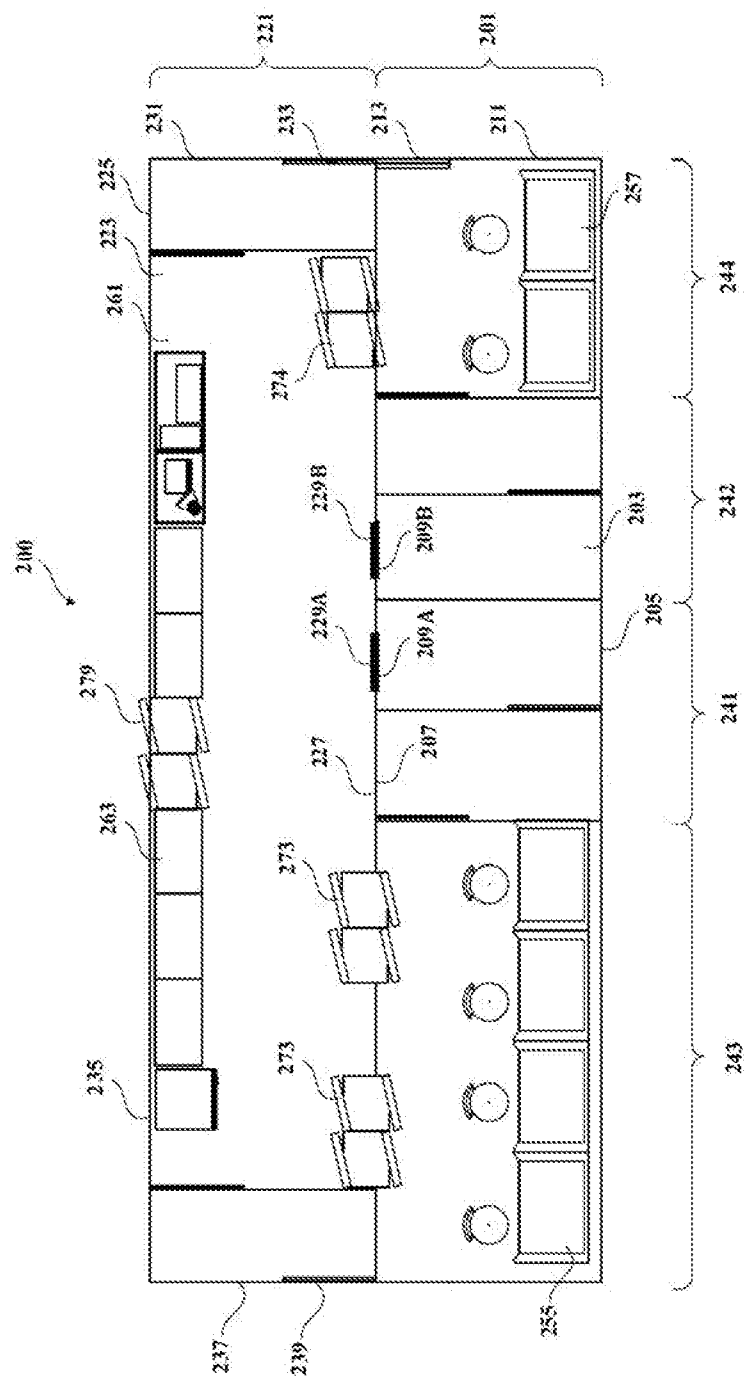


Figure 5

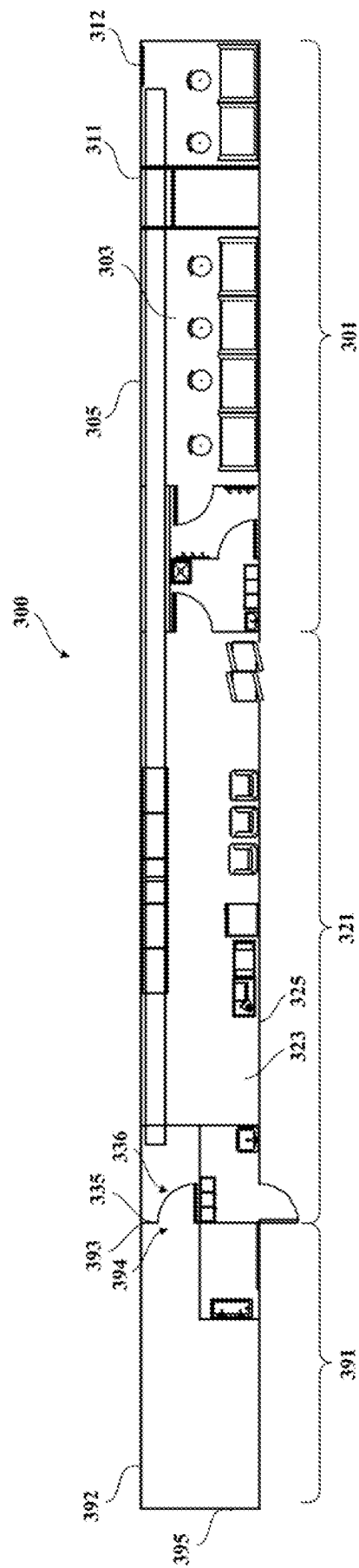


Figure 6

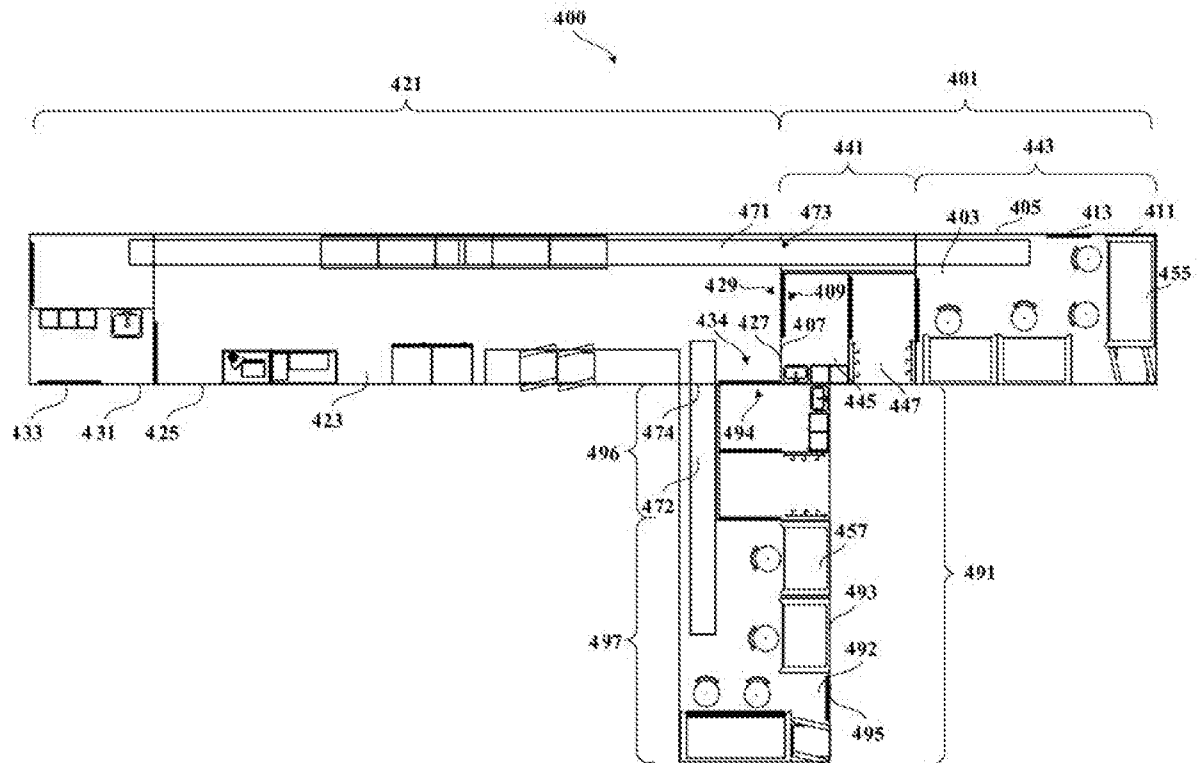


Figure 7

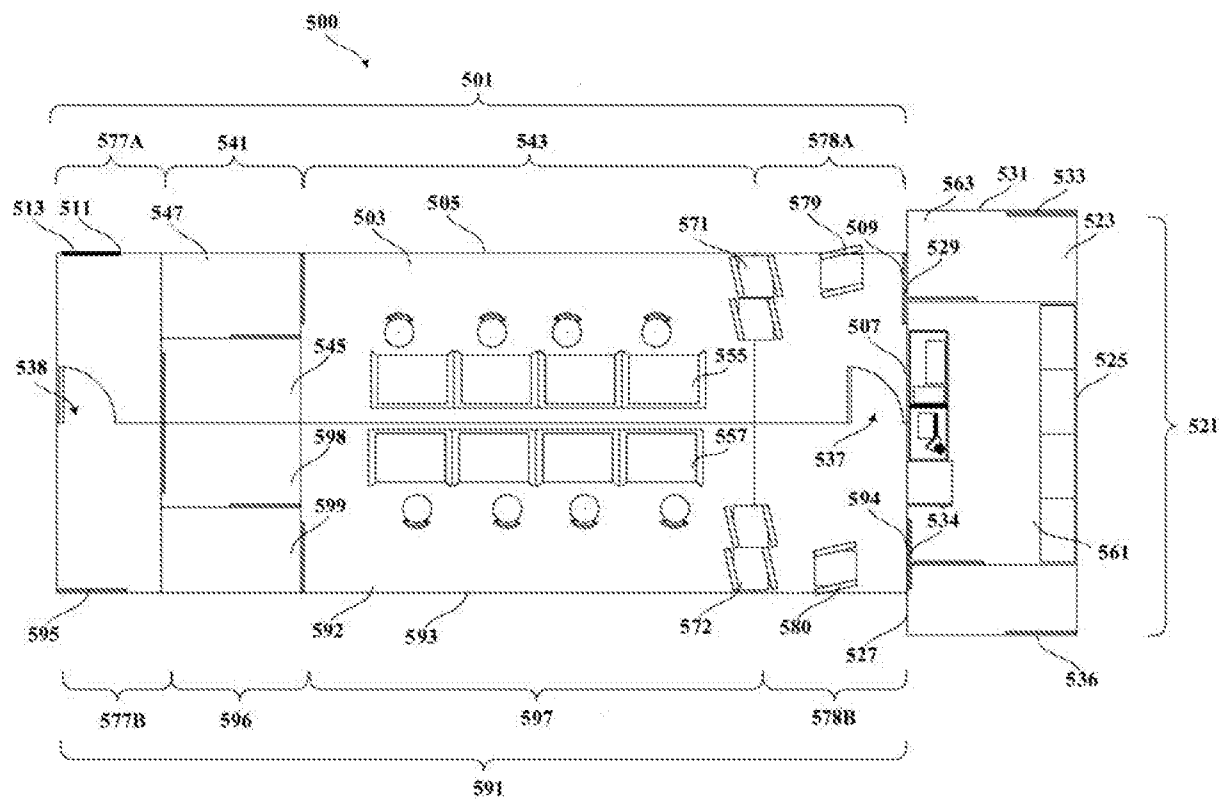


Figure 8

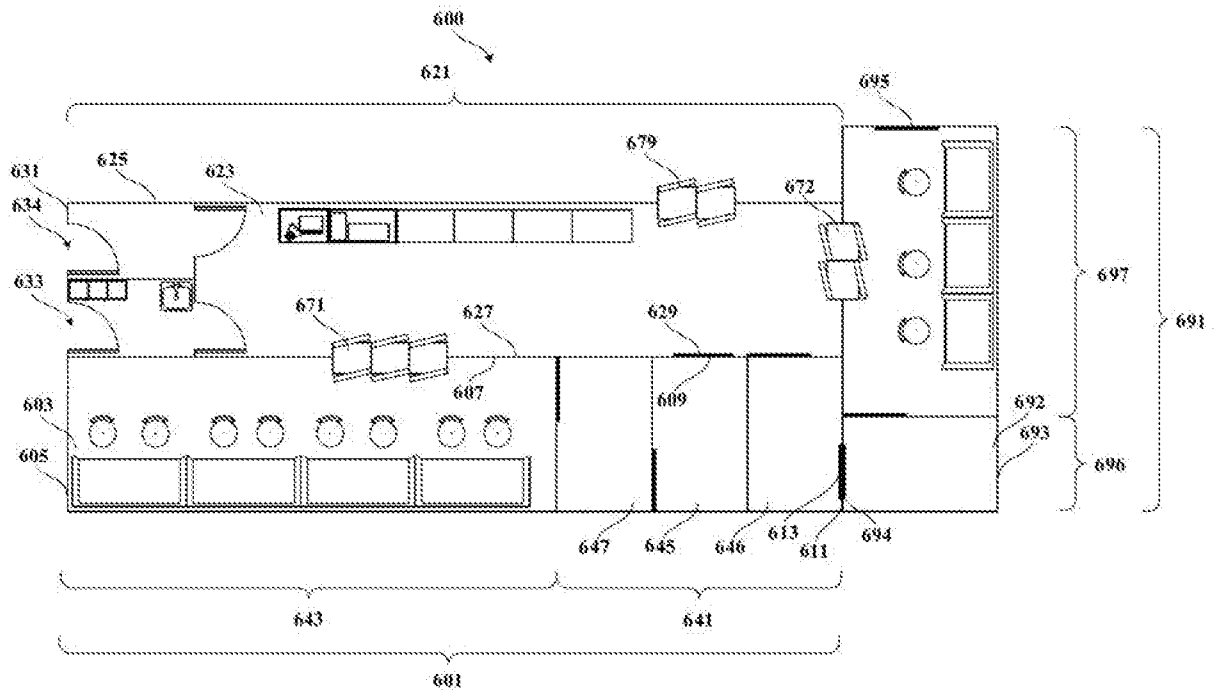


Figure 9

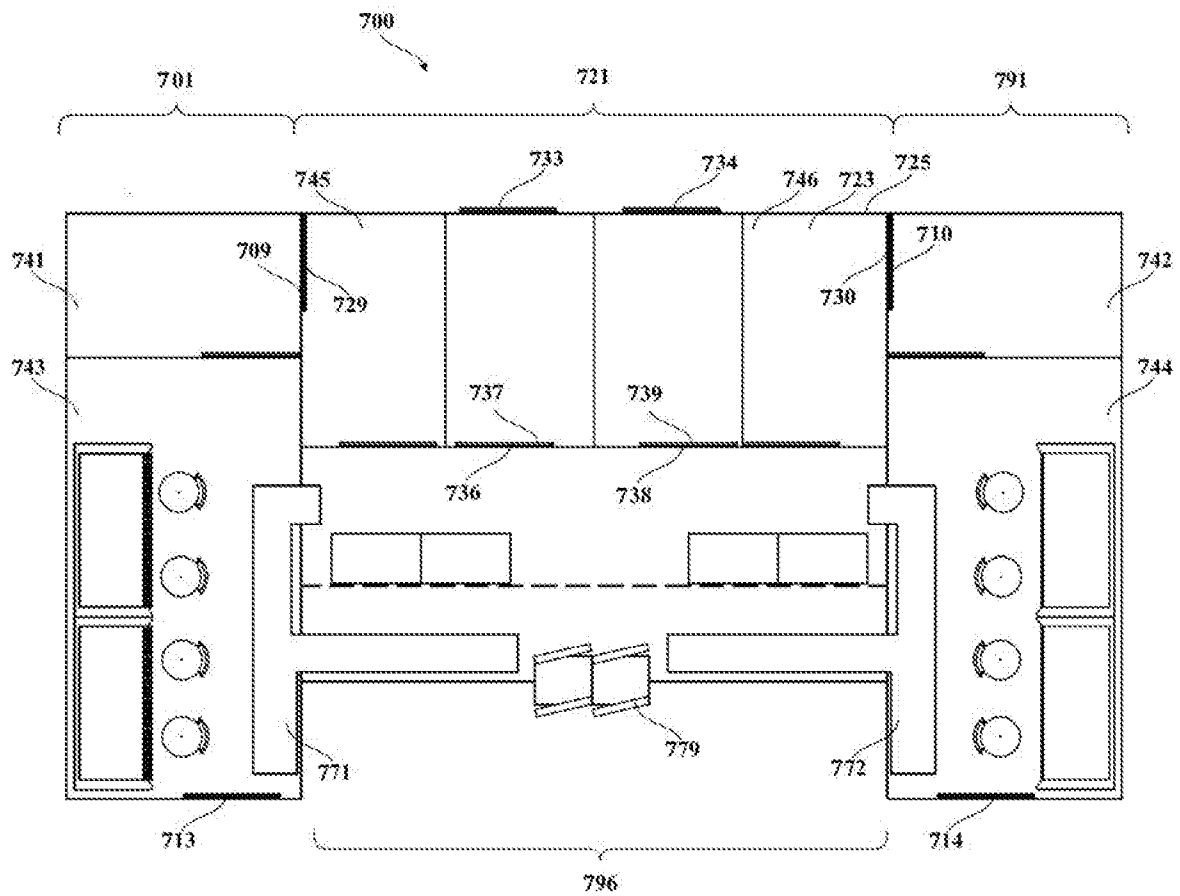


Figure 10

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2015/083596

A. CLASSIFICATION OF SUBJECT MATTER

A61G 12/00(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A61, E04H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI, CNPAT, CNKI, CNTXT: pharmaceutical, pharmacy, admixture, compound, system, room, wall, layout, vein

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 204252583 U (BAXTER CHINA INVESTMENT CO LTD) 08 April 2015 (2015-04-08) claims 1-69	1-69
A	CN 202207355 U (HUO, YINGNUO) 02 May 2012 (2012-05-02) the whole document	1-69
A	CN 103655095 A (LIAONING JIUZHOU LONGYUE MEDICAL PURIFYING TECHNOLOGY CO LTD) 26 March 2014 (2014-03-26) the whole document	1-69
A	US 5511594 A (BOHN W S ET AL.) 30 April 1996 (1996-04-30) the whole document	1-69
A	CN 2738771 Y (BOTAI INSECTICIDE SPREADING IN) 09 November 2005 (2005-11-09) the whole document	1-69



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

“A” document defining the general state of the art which is not considered to be of particular relevance

“E” earlier application or patent but published on or after the international filing date

“L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

“O” document referring to an oral disclosure, use, exhibition or other means

“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search

11 September 2015

Date of mailing of the international search report

23 September 2015

Name and mailing address of the ISA/CN

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2015/083596

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN	204252583	U	08 April 2015	None	
CN	202207355	U	02 May 2012	None	
CN	103655095	A	26 March 2014	None	
US	5511594	A	30 April 1996	None	
CN	2738771	Y	09 November 2005	None	