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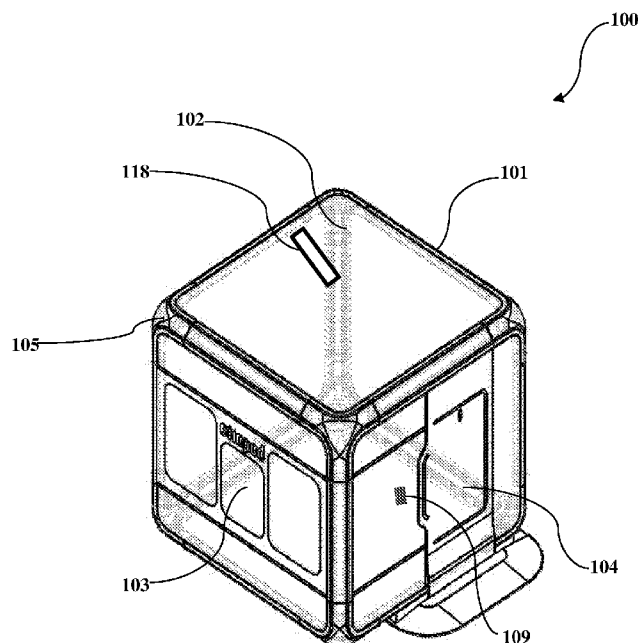


Figure 1a

(57) Abstract: The present invention provides a micro-environment for personal comfort and work. The micro-environment comprises one or more extruded edge elements (101), panel (102), window (103), entry door (104) and plurality of corner elements (105). The present invention also comprises a climate control system to regulate air temperature and humidity levels. A luggage auto-lift system (150) is used to raise the luggage at a predetermined height. A shelving system (170) is arranged on the inner side of the micro-environment (100). A low-noise heat exchange system (112) is used to exchange heat between high pressure systems (111) and the micro-environment (100) via one or more flexible hoses (113). An auto-deodorization system (160) is used to maintain hygiene inside the micro-environment (100). Further, the micro-environment provides a pleasant place for better quality of sleep and work.



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TITLE OF THE INVENTION**A micro-environment for personal comfort and work****PREAMBLE TO THE DESCRIPTION:**

[0001] The following specification particularly describes the invention and the manner in which it is to be performed:

DESCRIPTION OF THE INVENTION:**5 Technical field of the invention**

[0002] The present invention relates to a structural system and structural components thereof, to build a micro-environment for personal comfort and work. More particularly, the present invention relates to interlocking of one or more edge and corner elements with panels to form the walls, doors, windows, etc. and their
10 multi-utility as cable and airflow paths to build a clean and aesthetically pleasing micro-environment with special features to enhance the quality of stay within the micro-environment.

[0003] The present invention further emphasizes on advantages of having flexibility to determine the exact dimensions, layout and facilities provided in the
15 environment based on in-situ conditions. It therefore provides a flexible architecture that can extend to various possibilities of application of a micro-environment

Background of the invention

[0004] There are several situations of work or rest wherein humans are in environments that are harsh, lack cleanliness and/or do not provide sufficient
20 privacy. In congested places such as transportation stations, construction sites, conferences, bus stands & airports, the large volume of open space makes it impossible to create a controlled clean atmosphere for human beings without excessive expense and infrastructure. Further, it is not always possible to build

permanent structures and hotels or rest points at all such venues without significant location alteration and expense. Thus people either suffer the conditions of the environment or feel compelled to move to hotels or other support systems to find comfort, privacy, and a workspace, sleep or other such needs.

- 5 **[0005]** Further, in cities with harsh/humid climates, there exists a need to provide a micro-environment within the home/hostel/dorm environments that provides privacy, comfortable climatic conditions and personal zones that cost much lower to maintain due to their reduced but sufficiently comfortable size with respect to the rest of the room.
- 10 **[0006]** For both public and private places, it is beneficial to have smart and smaller structures that can independently be placed in localized pockets that may exist in the current layout of the larger space. Further, special events may occur in large campuses, exhibition centres, etc. where there might be requirements for leasing temporary and transportable controlled environments for meetings, work, resting,
- 15 etc.

- [0007]** In existing tents and thin-walled pods structures, sounds and other disturbances get transmitted unhindered through walls, further incapacitating the ability of the guest to eliminate mental fatigue from their body due to the constant disturbances. This permittance of sounds and other disturbances also creates a
- 20 feeling of reduced privacy, the prohibition of which is of critical importance to people who wish to spend their time in solidarity and work in peace.

- [0008]** The patent application number **US20100043309A1** titled “*Expeditionary pod construction*” discloses a modular pod assembly capable of being readily assembled and disassembled for transportation includes a plurality of modular
- 25 panels and a plurality of connectors. Each said modular panel includes a rigid and substantially planar structure delimited along one or more edges by respective coupling portions, each coupling portion formed to define a plurality of preconfigured access points for receiving respective connectors. Multiple connectors are provided to securely fasten a coupling portion of a given modular

panel to a coupling portion of another adjacent modular panel at a selected access point. The plurality of modular panels may be provided in an assembled state to include at least one top panel, bottom panel, and a plurality of respective side walls, all securely fastened together at respective coupling portions with the plurality of
5 connectors to form an integrated enclosure.

[0009] The patent application number **US8544226B2** titled “*Modular interior partition for a structural frame building*” discloses an interior partition system for a structural frame building is disclosed. The structural frame building has a ceiling line that defines a ceiling height of occupiable space within the structural frame
10 building. The interior partition system includes a first, or upper, modular partition assembly and a second, or lower, modular partition assembly. A receptor structure is configured to connect the first modular partition assembly to the second modular partition assembly. The first modular partition assembly has a vertical dimension that exceeds the ceiling height.

15 [0010] The patent application number **US5660005A** titled “*High strength, light weight, portable building*” discloses a portable steel framed building which can be rapidly assembled and disassembled. Components of a typical building include at least one ridge beam connected between two spaced ridge receivers with two rafters also secured to the ridge receiver. The rafters extend through hip receivers each of
20 which is connected to a hip beam and a post. Thus, two identical ridge receivers and four identical hip receivers, plus a ridge beam, two hip beams and four posts are sufficient to construct a complete building. With additional identical components, the size of the building may be extended and other configurations, such as valley, shed or gable roofs may be constructed. If desired, purlins may be
25 provided between rafters and crosspieces may be provided between posts.

[0011] Hence, there is a need for a micro-environment where the micro-environment comprises provisions to facilitate organized cable layouts and airflow patterns. Further, there is a need for a micro-environment to provide privacy, safety and luxury which is modular in nature and can be varied in physical size according

to user requirements. There is also a need for a micro-environment that provides variable temperature profiles within the micro-environment and may house additional devices for enhancing the facilities offered by the micro-environment.

Summary of the Invention

5 [0012] The present invention provides a micro-environment for performing work-related and recreational activities. The micro-environment comprises an extruded edge element, panel, window, entry door and plurality of corner elements. The corner elements comprise multiple locking protrusions. The extruded edge element is connected to the corner elements by means of the locking protrusions. The panel
10 comprises a top panel, bottom panel and side panels that are detachably disposed between the extruded edge element and the corner elements. The extruded edge element comprises an inner cavity through which power lines and fluids are passed. The extruded edge element has a deliberate flat surface to accommodate mechanisms and other important custom elements as per the design requirements
15 of the user between the side panels and inner walls.

[0013] The present invention also provides a climate control system to regulate air temperature and humidity levels. The climate control system comprises air-conditioning systems which circulate conditioned air through the plurality of holes provided in the extruded edge element to required sides of the environment through
20 the corner elements. Similarly, one or more holes placed on alternate extruded elements are used to transfer the air within the micro-environment to the air-conditioning system. Different regions can be isolated or separated to have different sources of air flow feeding it. This way the separation of temperature zones can be done by having multiple loops of air flow within the system. The air-conditioning
25 systems of the micro-environment may be used to cool the interior region as well as the exterior region within which the micro-environment is placed.

[0014] A luggage auto-lift is used to raise the luggage at a predetermined height and comprises a driving system which is placed behind the side panel. Additionally, a shelving system is arranged on the inner side of the micro-environment. The

shelving system is used to provide an aesthetically appealing corner and a stacking space inside the micro-environment.

[0015] An auto-deodorization system is used to maintain hygiene inside the micro-environment. The auto-deodorization system may comprise a high-efficiency particulate air (HEPA) filter or similar technologies, deodorizer, sliding vent, and blower. The blower is placed at the entry door of the micro-environment. The deodorizer is placed in between the sliding vent and the HEPA filter.

[0016] Thus, the invention provides a micro-environment for performing work-related and recreational activities. The micro-environment provides a place for working, holding conferences, engaging in recreational activities and for occupants to eliminate fatigue and stress form themselves by providing a secure, private and pleasant environment.

Brief Description of Drawings

[0017] The foregoing and other features of embodiments will become more apparent from the following detailed description of embodiments when read in conjunction with the accompanying drawings. In the drawings, like reference numerals refer to like elements.

[0018] **Fig. 1a** illustrates a micro-environment for work-related and recreational activities, according to one embodiment of the present invention.

[0019] **Fig. 1** illustrates a sectional view of one or more panel elements installed in a corner element, according to one embodiment of the present invention.

[0020] **Fig. 2** illustrates corner elements and extruded edge elements, according to one embodiment of the present invention.

[0021] **Fig. 3** illustrates one or more extruded edge elements which may assembled together to form a longer extruded edge element, according to one embodiment of the present invention.

[0022] **Fig. 4a** illustrates a three-pronged corner element into which one or more extruded edge elements may be assembled, according to one embodiment of the present invention.

5 [0023] **Fig. 4b** illustrates a sectional view of a corner element with one or more installed extruded edges elements and a panel element, according to one embodiment of the present invention.

[0024] **Fig. 5** illustrates a panel element for housing power lines and conduits, according to one embodiment of the present invention.

10 [0025] **Fig. 6** illustrates an air conditioning system to convey air into the extruded edge element through a flexible pipe, leading to a low-noise system, according to one embodiment of the present invention.

[0026] **Fig. 7** illustrates an air-conditioning system based on local Peltier modules installed within the extruded edge elements, according to one embodiment of the present invention.

15 [0027] **Fig. 8** illustrates a low-noise fan in individual vents to create airflow traction, according to one embodiment of the present invention.

[0028] **Fig. 9a** and **Fig. 9b** illustrate the cooling effect of air-conditioning systems inside and outside the micro-environment, according to one embodiment of the present invention.

20 [0029] **Fig. 10** illustrates a differential heating and cooling system to create variable temperature zones using vents and/or ducts, according to one embodiment of the present invention.

[0030] **Fig. 11** illustrates a luggage auto-lift, according to one embodiment of the present invention.

25 [0031] **Fig. 12** and **Fig. 13** illustrates an auto-deodorization system, according to one embodiment of the present invention.

[0032] **Fig. 14** illustrates a shelving system, according to one embodiment of the present invention.

[0033] **Fig. 15** illustrates a shelving system according to one embodiment of the present invention.

5 [0034] **Fig. 16** illustrates a flexible bed, according to one embodiment of the present invention.

[0035] **Fig. 17a** and **Fig. 17b** illustrate an electronic control system to change the position television display, according to one embodiment of the present invention.

10 [0036] **Fig. 18** illustrates an electric power point of one or more configurations, according to one embodiment of the present invention.

Detailed description of the invention

[0037] Reference will now be made in detail to the description of the present subject matter, one or more examples of which are shown in figures. Each example is provided to explain the subject matter and not a limitation. Various changes and
15 modifications obvious to one skilled in the art to which the invention pertains are deemed to be within the spirit, scope and contemplation of the invention.

[0038] The present invention overcomes the drawbacks of the present technology available in the state of the art by providing a micro-environment for performing work-related and recreational activities. The micro-environment comprises an air
20 filtration system, temperature control system, humidity system, oxygen supply system, control system and other systems. The systems are used to provide a secure place that facilitates privacy and provides a habitable place to do office work, hold conferences and meetings, and to provide a place for pursuing recreational activities. The systems also provide a pleasant place for resting. Further, the micro-
25 environment is removably provided with a smart bed, television, computer, pair of headphones, alarm system to enable occupants to plan their schedule and signal sleeping occupants to wake up, telephone, fire extinguisher, dresser, table, video

gaming provision, game provision, medical kit, plurality of security sensors, plurality of temperature control sensors, humidity sensor, oxygen supply, aroma system, light control system and other systems.

[0039] Further, the micro-environment comprises of a low-noise system, air-conditioning system, low-noise fan, luggage auto-lift system, automatic cleaning system, auto-deodorization system, stacking/shelving provision, smart bed and smart bin. The low-noise system is used to transfer the vibrations from the high-pressure system to the micro-environment by physically isolating the micro-environment from the noisy elements which ensures a quiet comfort zone. In one embodiment, the air-conditioning system is a Peltier system that is used to generate hot and cold surfaces simultaneously, which aids in dispersion of conditioned air at required temperature on demand. The low-noise fans are incorporated with the Peltier air-conditioning systems to create the required flow conditions and the fluid is dispersed into the micro-environment. The low-noise fans are used to eliminate the need for heavy and noisy high-pressure air-conditioning systems. The luggage auto-lift is used to lift a luggage to a certain height so that no effort is needed from the occupant to raise the luggage. The auto-deodorization is used to maintain hygiene in the micro-environment. The shelving system is used to create a horizontal shelf space in the micro-environment on a need basis.

[0040] Fig. 1 illustrates a micro-environment for performing work-related and recreational activities. In one embodiment, the micro-environment comprises one or more extruded edge elements (101), panel (102), window (103), entry door (104) and plurality of corner elements (105). The extruded edge elements (101) are made from extruded polymer or aluminium. The extruded edge elements (101) have a wire path, air path, conditioned fluid path and panel (102) mounting space. The extruded edge elements (101) are connected to the corner elements (105) by means of locking protrusions (106). The extruded edge elements' (101) primary function is to bear load. Additionally, the extruded edge elements (101) also provide pathways between which there may be circulation of conditioned air and cables. The entry door (104) has a tab, facial recognition system, biometric system and a

braille-accessible finger scanning system (109) for providing the entry to the micro-environment (100). The tab is provided with a one-time password (OTP) system for entry to the micro-environment. A facial recognition or biometric entry (109) can be an alternate form of entry to the micro-environment (100). A Radio Frequency
5 Identification (RFID) system or Near-Field Communication (NFC) system is incorporated in the tab for safe and secure entry which is an alternate way of gaining access to the micro-environment (100). The entry door (104) provides a braille-accessible entry (109) for differently abled people for gaining entry to the micro-environment (100).

10 [0041] The entry door (104) has a screen when any of the scanning systems such as tab, facial recognition system, biometric system and a braille-accessible finger scanning system (109) is used by the occupant, after which a welcome sign glows up. The sign indicates the authenticity of the entry.

[0042] A sliding entry door is provided at the entry door (104) to reduce the
15 acoustic volume of the door opening. Also, the sliding entry door enables to highlight the suitcase stacking feature on the right side of the entry door (104).

[0043] An emergency exit is provided by a manual push button on the inside of the entry door (104). A second exit is provided from the connecting door and is operable only in the event of an emergency. A third exit is by the window (103)
20 provided with a small hammer to break the glass at the time of emergency.

[0044] The micro-environment provides an entertainment section with a 3-Dimensional imaging and a gaming screen (118) for an occupant.

[0045] Further, the micro-environment has an occupant display bar that lights up when the occupant is inside the micro-environment (100). The occupant display bar
25 aids maintenance personnel to assess the occupancy status of the micro-environment. The occupant display bar indicating the occupancy status also serves as a visual aid to prevent people unnecessarily knocking and operating the door handle.

[0046] **Fig. 2, Fig. 3a and Fig. 3b** illustrate a corner element. In an embodiment, the corner element (105) comprises at least three-locking protrusions (106a, 106b and 106c). The locking protrusions (106a, 106b and 106c) can be circular, square, rectangular or of any other shape. The locking protrusions (106a, 106b and 106c) have three or more pins which go into a hollow portion (107) of the extruded edge element (101). The corner element (105) has conduits for power lines (211a and 211b), grooves for panel (102) and paths for air (212) and fluid. The corner element (105) comprises a separable cap (108) which allows access to conduit path and permits late point modifications.

10 [0047] **Fig. 4** illustrates a panel element. In one embodiment, the panel (102) comprises a planar surface. The planar surface is used to fit the grooves of the extruded edge elements (101) within the corner elements (105).

[0048] **Fig. 5** illustrates a panel element for housing power lines and conduits. In one embodiment, the panel (102) comprises of an inner metal or polymer wall, outer metal or polymer wall with sound and thermal insulating material. The sound and thermal insulating material is provided in and around the inner metal or polymer wall and outer metal or polymer wall. The panel (102) is used for housing power lines (115) and conduits. The panel (102) has a local pathway which is made to route power lines (115), fit small design elements and mechanisms within the panel (102). The power lines are routed through the panel (102) to end use point, giving clean, flushed aesthetic look to the micro-environment (100). The panel (102) has Light Emitting Diode (LED) smart lights and glass panels which are concealed within the panel (102) to create a lit ceiling panel. The glass panel (102) is used to allow the occupant to view across the wall. The panel (102) is further integrated with thin display and power plug board (116), etc. Additionally, the panel (102) may be constructed from impact resistant materials to shield the occupants from harmful projectiles or substances outside the micro-environment (100)

[0049] Further, the extruded element (101) has deliberate flat surfaces inside the panel (102) area to add aesthetic sheets to create hidden space for various drives

and mechanisms. The extruded edge elements (101) also comprise provisions for creating customized internal partitions within the micro-environment (100) to further provide privacy for multiple occupants within the micro-environment (100). The working mechanisms are hidden behind an aesthetic wall and within the
5 external panel so that no mechanisms and drives are visible within or outside the micro-environment (100).

[0050] Fig. 6 illustrates a low-noise system. In one embodiment, the low-noise system (110) comprising a high-pressure system (111) and a low-pressure system (112). The high-pressure system (111) of the air-conditioning unit comprises a
10 compressor, condenser and expansion valve which are isolated from the micro-environment and thus prevent the transfer of vibrations across the system. An intermediate low-pressure low-noise heat exchange system (112) comprises an evaporator which is used to exchange heat between high pressure system (111) and the micro-environment (100) via hoses (113) that allows airflow without the
15 occurrence of whistling. The low-noise system (110) employs processes by which the cooling effect is efficient and thus consumes less power to operate. The micro-environment (100) has a side duct for airflow through the hoses (113). The low-noise system (112) prevents the transfer of vibrations from the high-pressure system (111) to the micro-environment by physically isolating the micro-environment
20 (100) from the noisy elements by means of acoustic insulators placed within the walls of the micro-environment (100) which ensures a comfort zone. The high-pressure system (111) and low-pressure systems (112) can be both placed outside the physical barrier, for example micro-environment walls (100). The hose (113) can be used to transfer the fluid into the micro-environment (100) via side-ducts
25 (114).

[0051] Fig. 7 illustrates an air-conditioning system. In one preferred embodiment, the air-conditioning system (120) is a Peltier air-conditioning system and is placed within a hole. The holes are provided in the extruded edge element (101) at a predetermined distance. The Peltier air-conditioning system (120) comprises a
30 Peltier module (121) sandwiched between heat sinks and brushless fans. The Peltier

- module (121) is supplied with specified power to generate hot and cold surfaces. One side of the Peltier air-conditioning system (120) is used to direct cold air into the micro-environment (100) and the other end of the Peltier air-conditioning system (120) removes heat from the Peltier module (121). The Peltier module (121)
- 5 is connected to a conduit to remove the hot or cold air (fluid) as required from the Peltier air-conditioning system (120). The hot and cold surfaces of the Peltier module (121) are switched by changing the polarity of the power supply. This in turn enables the Peltier air-conditioning system (120) to blow cold or hot air (fluid) into the micro-environment (100) through vents (141).
- 10 **[0052] Fig. 8** illustrates a low-noise fans on individual vents to create airflow traction. In one embodiment, the low-noise fans (131) are placed on the extruded edge element (101) at a predetermined distance. The noiseless operation of the air-conditioning system (130) is using a noiseless brushless fan (131) which circulates fluid into the micro-environment (100). In one preferred embodiment, the circulated
- 15 fluid is conditioned within the extruded edge element (101) by the use of thermoelectric Peltier systems or can be conditioned outside the micro-environment (100). The low-noise fans (131) are incorporated with the Peltier systems to create the required fluid conditions and then the fluid is circulated into the micro-environment (100). This air-conditioning system (130) eliminates the need for
- 20 heavy and noisy high-pressure air-conditioning systems. The fluid is conditioned outside the micro-environment (100) to keep elements of noise away from the micro-environment (100). The low-noise fans (131) are operated in parallel to fulfil the fluid conditioning requirement in the event that any of the individual low-noise fans (131) fail.
- 25 **[0053] Fig. 9a and Fig. 9b** illustrate a vent used for air quality control. In one embodiment, the vents (141) are used to supply conditioned fluid into the micro-environment (100) and the surrounding environment at the same time. The vents (141) are connected to the air-conditioning system and facilitate the circulation of hot or cold air within the micro-environment (100) as per the wishes of the
- 30 occupant. The vents are placed upon the extruded edge element (101).

[0054] **Fig. 10** illustrates a differential heating and cooling system using vents and ducts. In one embodiment, the differential heating and cooling system enables creation of separate temperature and humidity zones for multiple occupants (**151a** and **151b**) within the same micro-environment (**100**). The differential heating and cooling system also provides control over the rate of fluid flow at specific locations by using the vents (**141a, 141b, 141c and 141d**).

[0055] **Fig. 11** illustrates a luggage auto-lift system. In one embodiment, the luggage auto-lift system (**150**) comprises a driving system. The driving system has two pulleys (**151 and 152**) which are connected using a flexible member (**153**). The pulley (**151**) is connected to a motor (**154**) and the flexible member (**153**) is connected to lift a smart bed (**155**) using a slider (**156**). The slider (**156**) is free to slide over a surface (**157**) and the entire driving system is placed behind the side panel (**102**). The operator of the motor (**154**) causes the pulley (**151**) to rotate anti-clockwise, which in turn moves the flexible member (**153**). The flexible member (**153**) raises the slider (**156**), causing the smart bed (**155**) to rise. A provision to clear the smart bed (**155**) of unwanted clutter is provided to minimize manual labour required for maintenance of the smart bed (**155**). Further, the luggage is lifted by the driving system and is made accessible to occupants without forcing them to physically exert themselves.

[0056] **Fig. 12 and Fig. 13** illustrate an auto-deodorization system. In one embodiment, the auto-deodorization system (**160**) comprises a blower (**161**) placed at the entry door (**104**) of the micro-environment (**100**). A deodorizer (**162**) is placed in between the sliding vent (**163**) and HEPA filter (**164**). The auto-deodorization system (**160**) works to gush out/ evacuate air inside the micro-environment (**100**) between usages, thereby refreshing the micro-environment (**100**). The auto-deodorization system (**160**) ensures and helps to maintain a hygienic micro-environment (**100**). The auto-deodorization system (**160**) also prevents entry of foreign bodies such as dust, insects and pests. This is achieved with the help of a blower (**161**) at the entrance of the door which maintains an air curtain. The auto-deodorization system (**160**) is also used to evacuate the air inside the micro-

environment (100) in case of any emergency. The auto-deodorization system (160) may also be used as an air curtain. The flow direction of the blower (161) is controlled using a vent (165) to direct airflow.

[0057] Fig. 14 illustrates a shelving system. In one embodiment, the shelving system (170) comprises of two panels (172 and 174), hinge (173), pivot (175) and sliding block (171). The panels (172 and 174) are connected through the hinge (173). The panel (172) is connected to sliding block (171). The panel (172) is pivoted at pivot (175) attached to the side panel (102) of the micro-environment (100). The shelving system (170) in the collapsed state positions the two panels (172 and 174) in line. The shelving system (170) causes the panel (172) to fold in a sitting state when triggered. The translation is aided by the sliding block (171).

[0058] Fig. 15 illustrates a shelving system. In one embodiment, the shelving system (180) comprises of two panels (181 and 182) and hinge (183). The panels (181 and 182) are connected through the hinge (183). The panel (182) is mounted onto the side panel (102) of the micro-environment (100). The shelving system (180) in the collapsed state positions the two panels (181 and 182) parallel to each other. The stacking/ shelving system (180) is triggered causing the panel (181 and 182) to close and open at 90 degrees. The shelving system (180) automatically creates a horizontal shelf space on the occupant command. The occupant gets additional shelf area in required zones as per his or her preference. The shelving system (180) is provided with an aesthetically appealing corner for the traveller and a stacking space for the occupant accessories.

[0059] Fig. 16 illustrates a flexible bed. In one embodiment, the flexible bed (191) comprises the flexibility to change shape into a lounge chair (192) and in multiple forms (193).

[0060] Fig. 17 illustrates an electronic control system to change the position of television display. In one embodiment, the electronic control system comprises a button through which an occupant changes position (204, 205 and 206) on the flexible bed (191) with respect to a television display (205). The electronic control

system helps to avoid stress on the occupant's neck by providing a comfortable position to get a view. The television display (205) is mounted on a linear slide (201) and is pivoted at the top end of the micro-environment (100). The middle section of a chair (203) is used to move forward. In one embodiment, a rope (204) is used to pull the television display (205) closer to the occupant. A simple rack and pinion mechanism is used to ensure the television display (205) movement, rotation and change of angle.

[0061] Fig. 18 illustrates an electric power point. In one embodiment, the electric power points (210) comprise a multiple plug which provides the right amount of charge according to the demography of the ports for e.g. UK - port with 240v to 50Hz. The sockets provide variability with regards to gadgetry requirements for electronics of U.S/ U.K / JAPAN/ India and other countries. The electric power points (210) provide an automatic switchable plug with the connecting ports. The plug point is concealed on the wall shelf. The electric power points (210) eliminate the need for carrying travel adapters by the occupant.

[0062] The micro-environment is used for multiple purposes. The micro-environment work-zone can be further converted from a work desk to a sleep zone by stretching the convertible sofa. The convertible sofa gives an aesthetic look to the micro-environment and lessens the cognitive load to a small footer area. The micro-environment structures can be connected to other structures to create a bigger space for a greater number of occupants. The micro-environment is a multi-functional and variable structure. The micro-environment utilises artificial intelligence and machine learning systems to determine the optimal habitable conditions for one or more occupants within the micro-environment. The side panels of the micro-environment can be altered to create a different micro-environment for different usages.

[0063] The micro-environment may be used for providing domestic accommodations with habitable rooms, providing payment-based accommodations such as hotels and paying guest (PG) accommodations. The micro-environment also

comprises cleaning and maintenance provisions that utilise artificial intelligence and machine learning systems to scan the micro-environment for any personal belongings left behind after occupancy. The micro-environment may alert the occupant in the event that a belonging has been left behind. The cleaning and maintenance provisions also ensure the hygiene and cleanliness of the micro-environment is restored after occupancy, thus minimizing requirement of manual labour. Other structures that may be built include providing facilities for corporate purposes such as conferences, yoga sessions, lounge areas, meditation rooms and other recreational activities, providing exhibition spaces, hospitals, wildlife researchers' camping sites/ forest rangers habitats, airports, railway stations, bus stops, phone booths and others. Additionally, one or more micro-environments may be connected together to form larger structures with more functionalities. The micro-environment is portable and may be moved from one place to another. The micro-environment is equipped with provisions to alter the acoustic and visual experience of an occupant within the micro-environment for extra comfort for the occupant.

[0064] Thus, the present invention discloses a micro-environment for work-related and recreational activities. The advantages of the micro-environment include security and privacy provisions, office workplace, place for holding conferences and a place for pursuing recreational activities.

[0065] The many features and advantages of the invention are apparent from the detailed specification, and thus, it is intended by the appended claims to cover all such features and advantages of the invention which fall within the true spirit and scope of the invention. Further, since numerous modifications and variations will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation illustrated and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

CLAIMS

We claim:

1. A micro-environment (**100**) for personal comfort and work, comprising:
 - a. one or more extruded edge elements (**101**), have deliberate flat
5 surfaces to mount aesthetic wall accessories to provide aesthetic appeal for the micro-environment (**100**) and form one or more cavities to permit movement of fluids and components of the micro-environment (**100**);
 - b. one or more panels (**102**), wherein the panels (**102**) comprise a top
10 panel, bottom panel and side panels which are detachably attached in-between the extruded edge elements (**101**);
 - c. one or more windows (**103**), wherein the windows (**103**) provide an opening in one or more panels (**102**) and enable an occupant to visually survey the interior or exterior of the micro-environment
15 (**100**) from outside or inside the micro-environment (**100**);
 - d. one or more entry doors (**104**), wherein the entry doors (**104**) provide an occupant a means to gain entry to the micro-environment (**100**);
 - e. one or more corner elements (**105**), wherein the corner elements
20 (**105**) comprise one or more locking protrusions (**106a**, **106b** and **106c**) and form one or more cavities to mechanically connect with one or more extruded edge elements (**101**).
2. The micro-environment (**100**) as claimed in claim 1, wherein the micro-environment (**100**) comprises a climate control system to regulate air
25 temperature and humidity levels within the micro-environment (**100**) and cavities of the extruded edge elements (**101**), wherein the climate control system comprises one or more air-conditioning systems (**120**) which are

placed within cavities of the micro-environment and one or more cavities provided in the extruded edge elements (101).

3. The micro-environment (100) as claimed in claim 1, wherein the micro-environment (100) comprises a luggage auto-lift (150) used to raise luggage at a predetermined height, wherein the luggage auto-lift (150) has a driving system which is placed behind the side panel (102).
5
4. The micro-environment (100) as claimed in claim 1, wherein the extruded edge elements (191) and panels (102) form one or more partitions within the micro-environment (100) to provide one or more temperature and humidity zones within the micro-environment (100).
10
5. The micro-environment (100) as claimed in claim 1, wherein the micro-environment (100) comprises a low-noise heat exchange system (112) used to exchange heat between a high pressure system (111) and the micro-environment (100) via one or more hoses (113), wherein the hoses (113) are connected to side ducts and utilised to allow airflow without the occurrence of whistling.
15
6. The micro-environment (100) as claimed in claim 1, wherein the micro-environment (100) comprises an auto-deodorization system (160) used to maintain hygiene inside the micro-environment (100), wherein the auto-deodorization system (160) comprises an air filter (164), deodorizer (162), sliding vent (163), and blower (161), wherein the blower (161) is placed at the entry door (104) of the micro-environment (100) and the deodorizer (162) is placed in between the sliding vent (163) and the HEPA filter (164).
20
7. The micro-environment (100) as claimed in claim 1 & 2, wherein the extruded edge elements (101) further comprise one or more vents which are used to control airflow and direction of air inside and outside the micro-environment (100).
25

- 5 8. The micro-environment **(100)** as claimed in claim 1 & 2, wherein the micro-environment **(100)** further comprises a differential heating and cooling system which enables the creation of separate temperatures and humidity zones for multiple occupants **(151a and 151b)** within the same micro-environment **(100)** by using one or more vents **(141a, 141b, 141c, 141d)** to control the rate of fluid flow within the micro-environment **(100)** at specific locations.
- 10 9. The micro-environment **(100)** as claimed in claim 1 & 2, wherein the micro-environment **(100)** comprises a flexible bed **(191)** which changes shape to form a lounge chair **(192)** and further comprises provisions to maintain hygienic and habitable conditions for one or more occupants.
- 15 10. The micro-environment **(100)** as claimed in claim 1, wherein the windows **(103)** comprise a transparent smart glass which is used to change relative visibility of the inner environment of the micro-environment **(100)** from transparent to translucent or opaque.
11. The micro-environment **(100)** as claimed in claim 1, wherein the micro-environment further comprises an entertainment section with an audio-visual and human interface device for the occupant.
- 20 12. The micro-environment **(100)** as claimed in claim 1, wherein the micro-environment **(100)** further comprises one or more control units, cloud-based storage systems, data logistic systems, analytic systems and computing unit platforms to provide an enhanced user experience for one or more occupants in the micro-environment **(100)**.

25

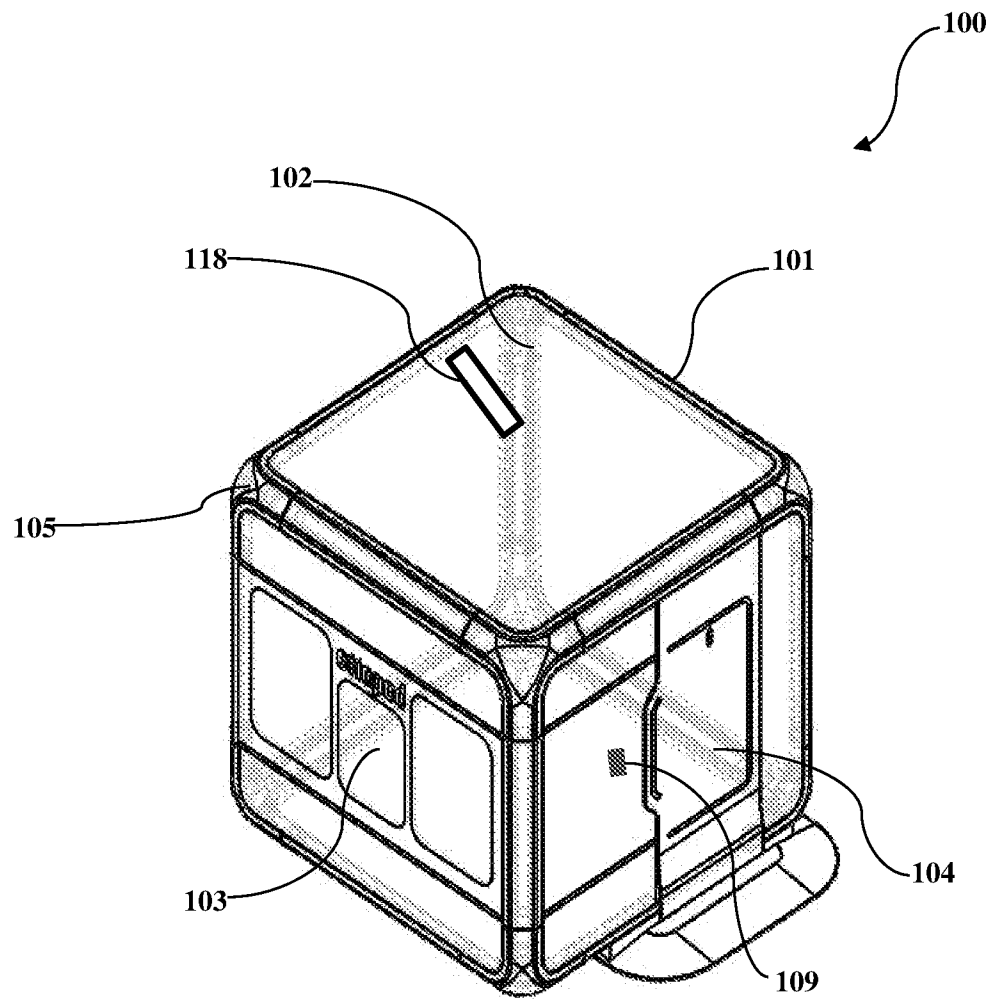


Figure 1a

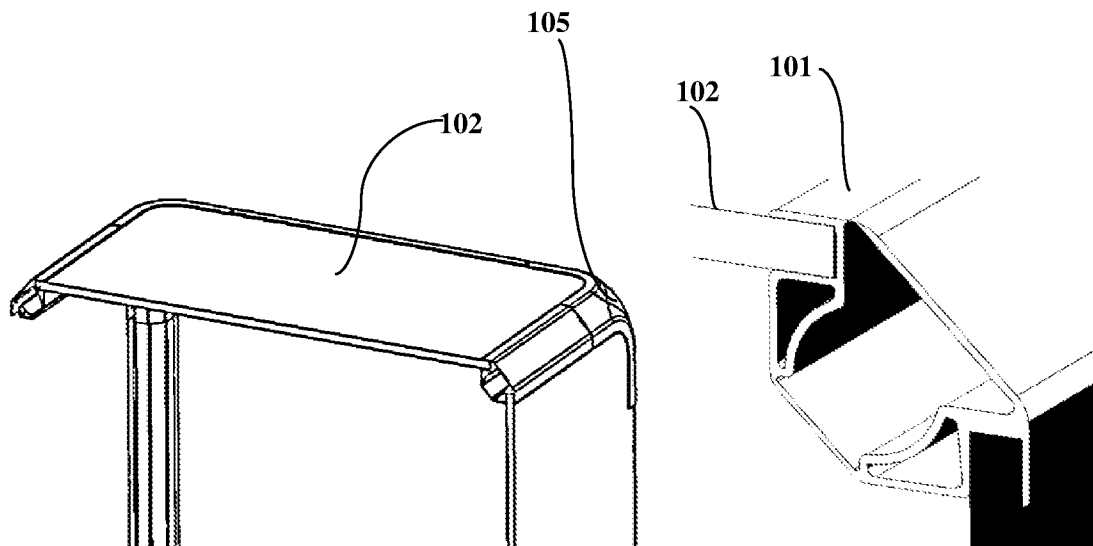


Figure 1b

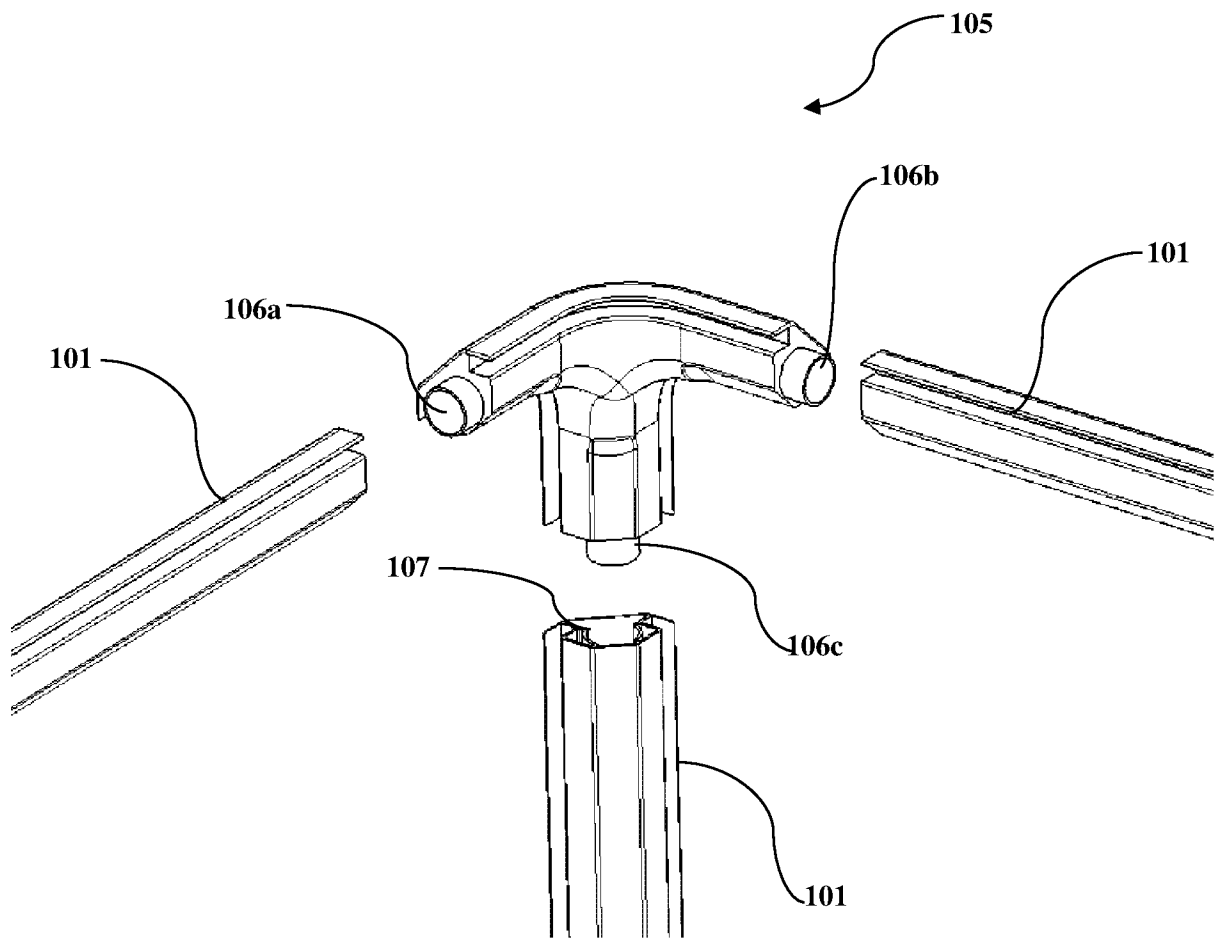


Figure 2

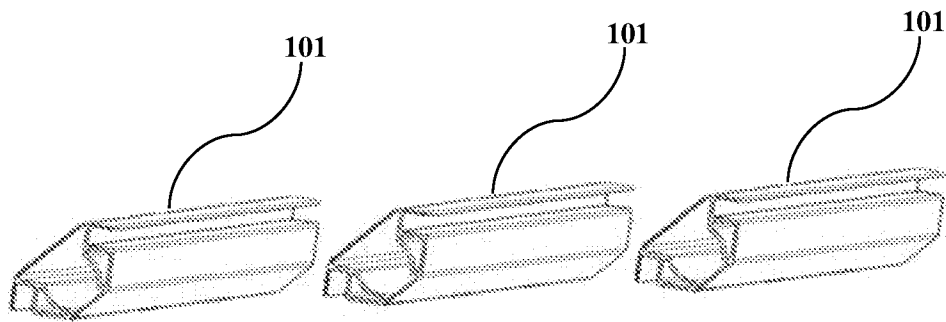


Figure 3

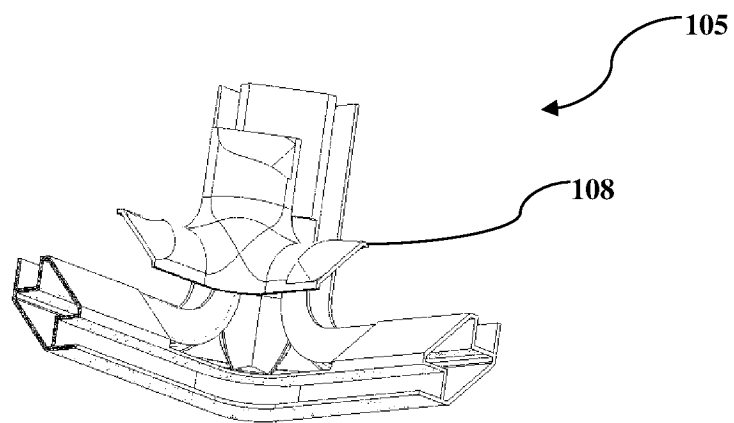


Figure 4a

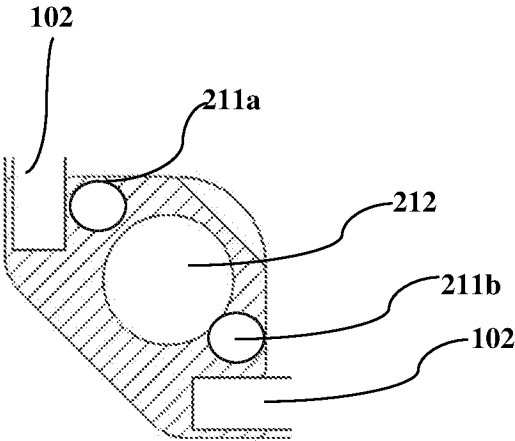


Figure 4b

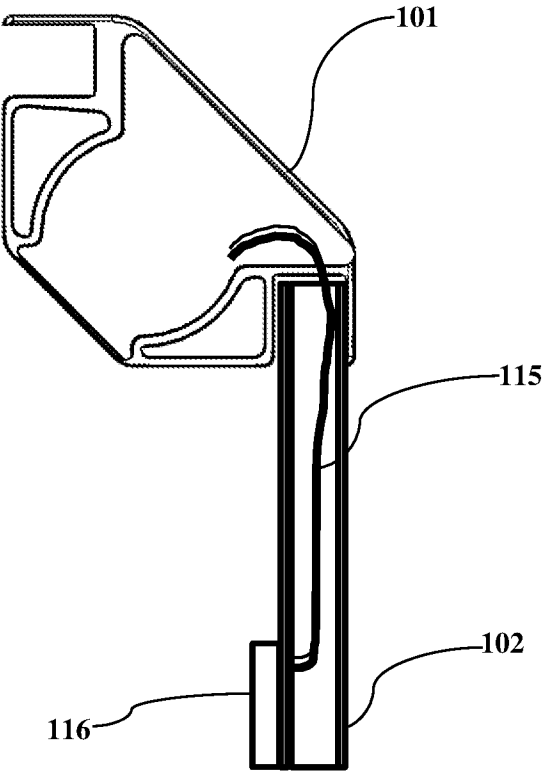


Figure 5

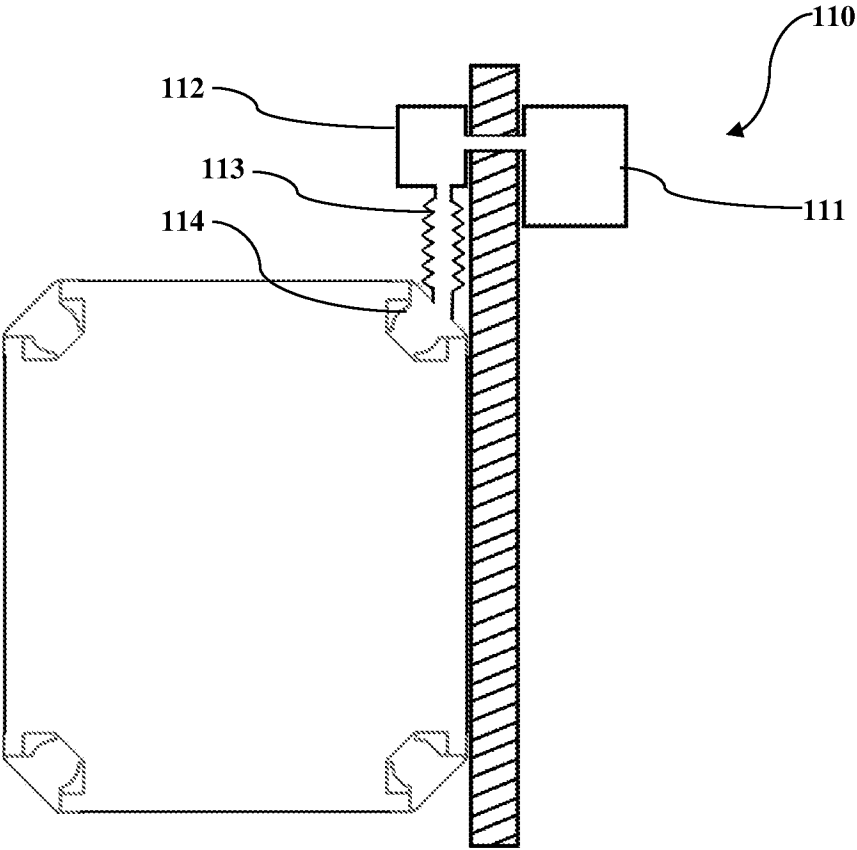


Figure 6

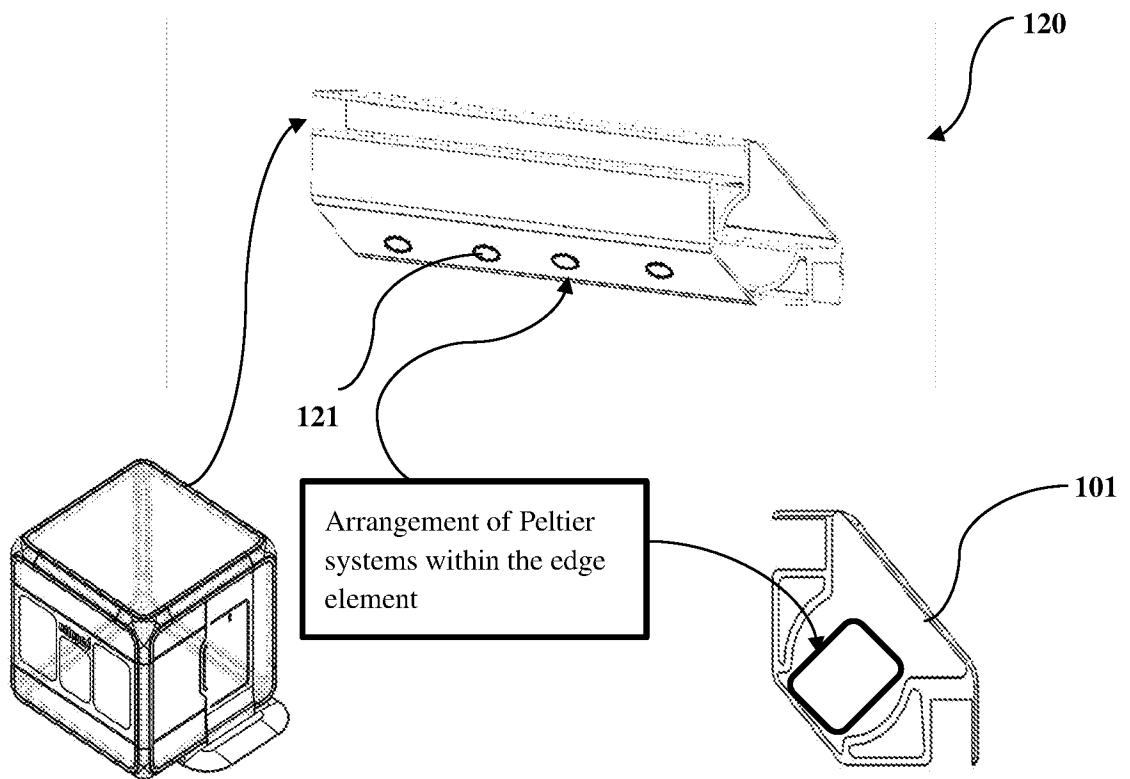
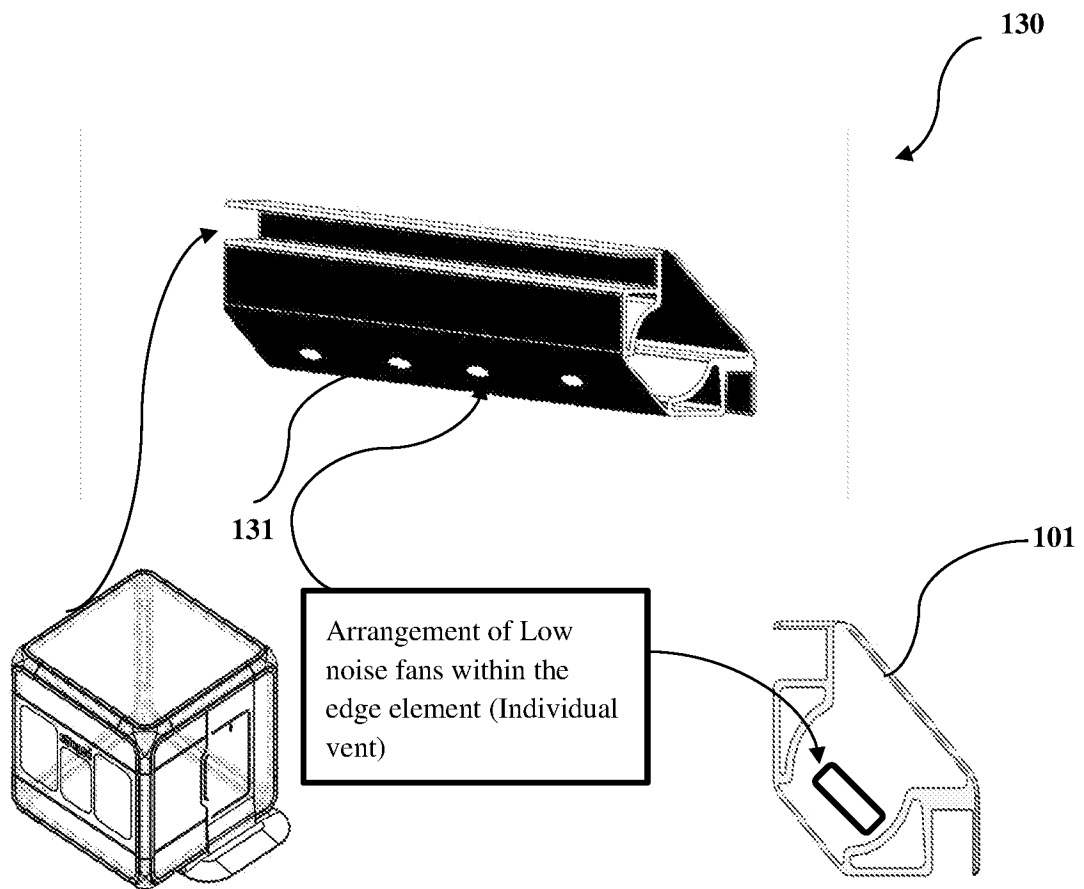


Figure 7

**Figure 8**

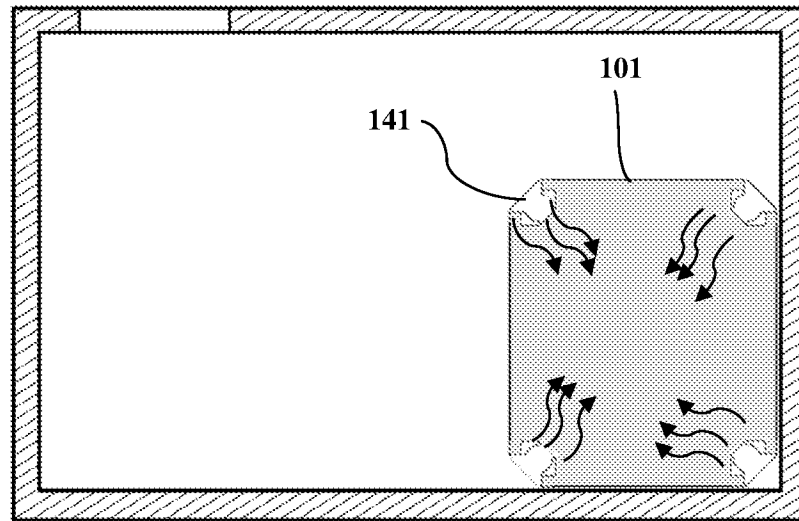


Figure 9a

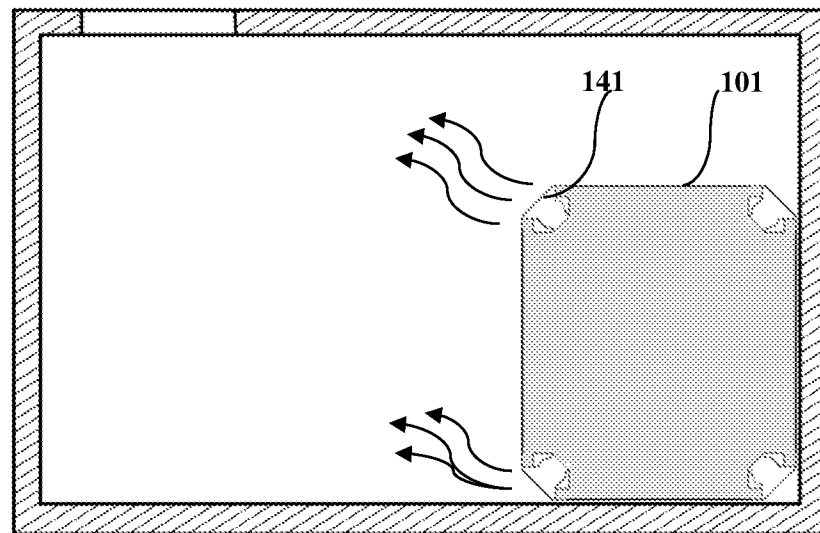


Figure 9b

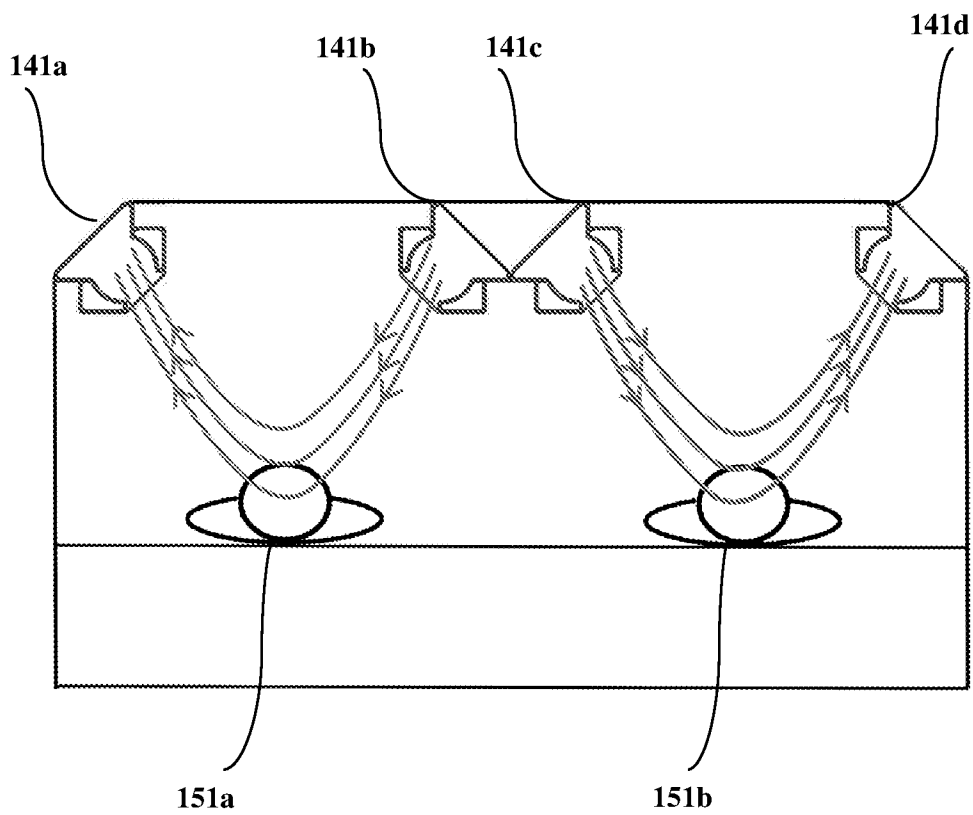


Figure 10

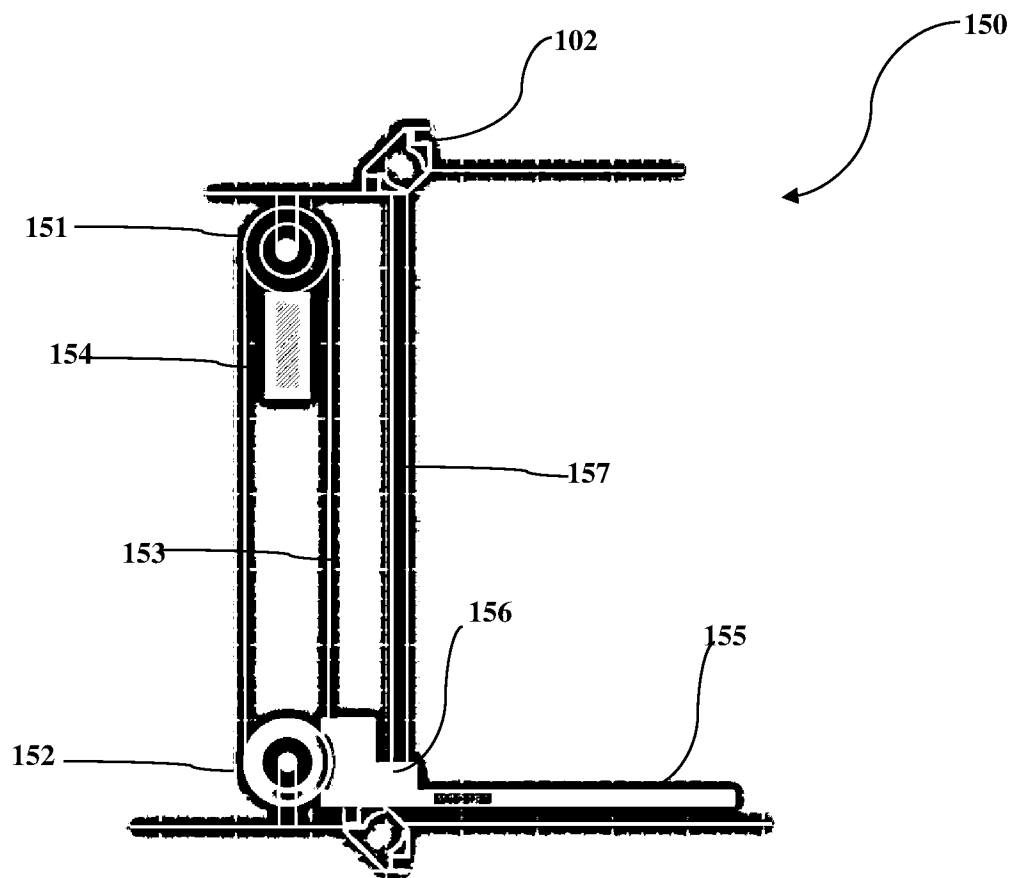


Figure 11

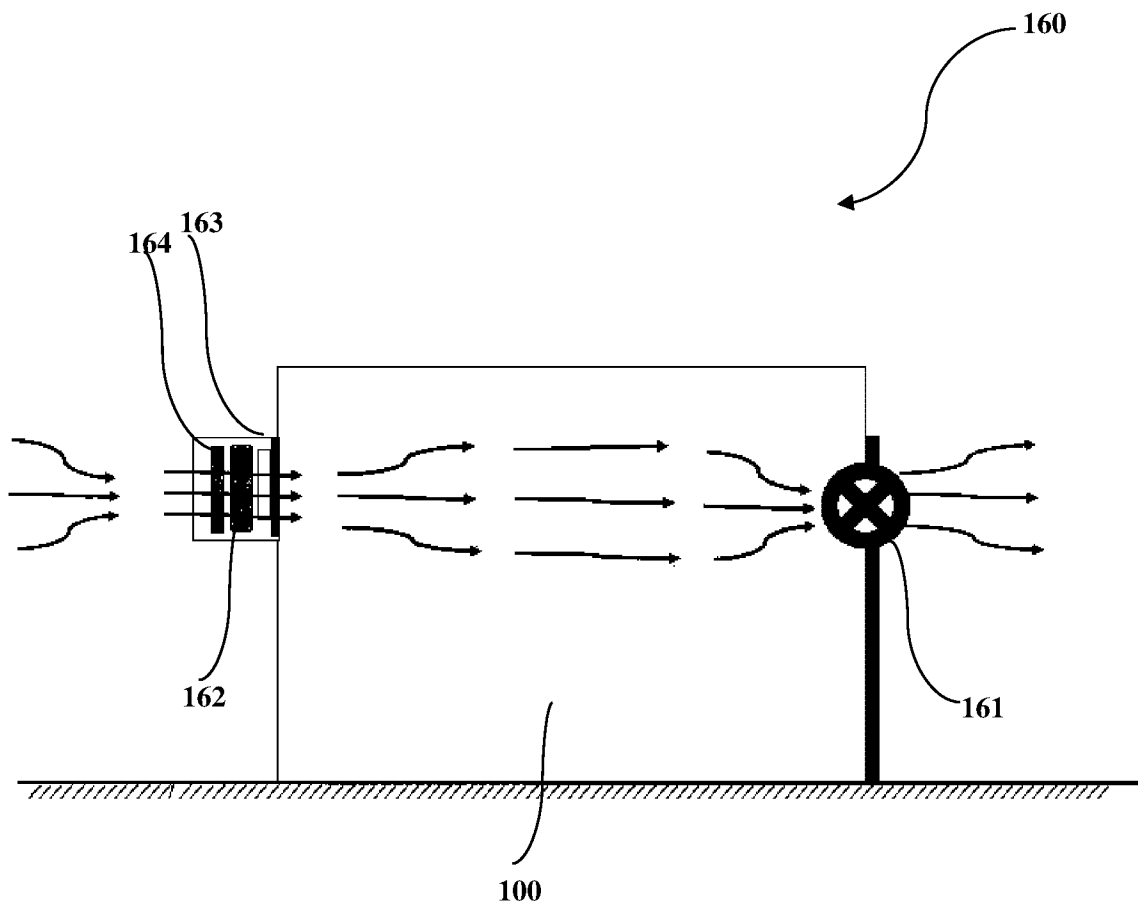


Figure 12

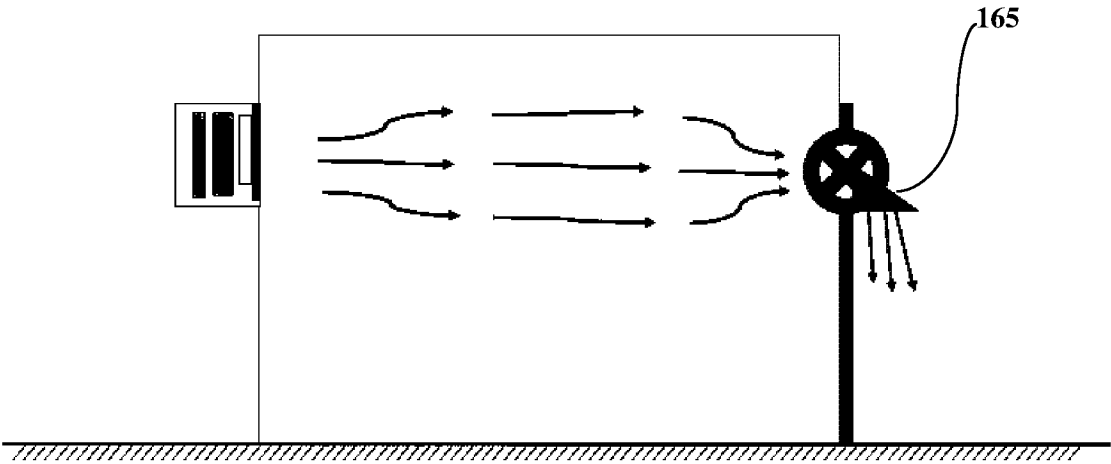


Figure 13

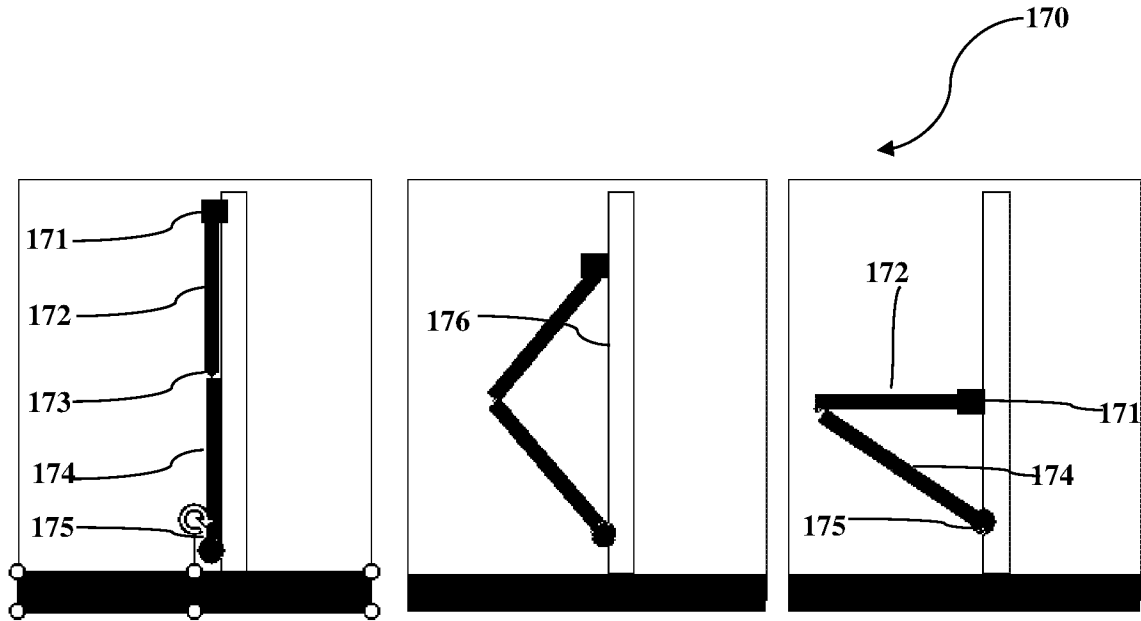


Figure 14

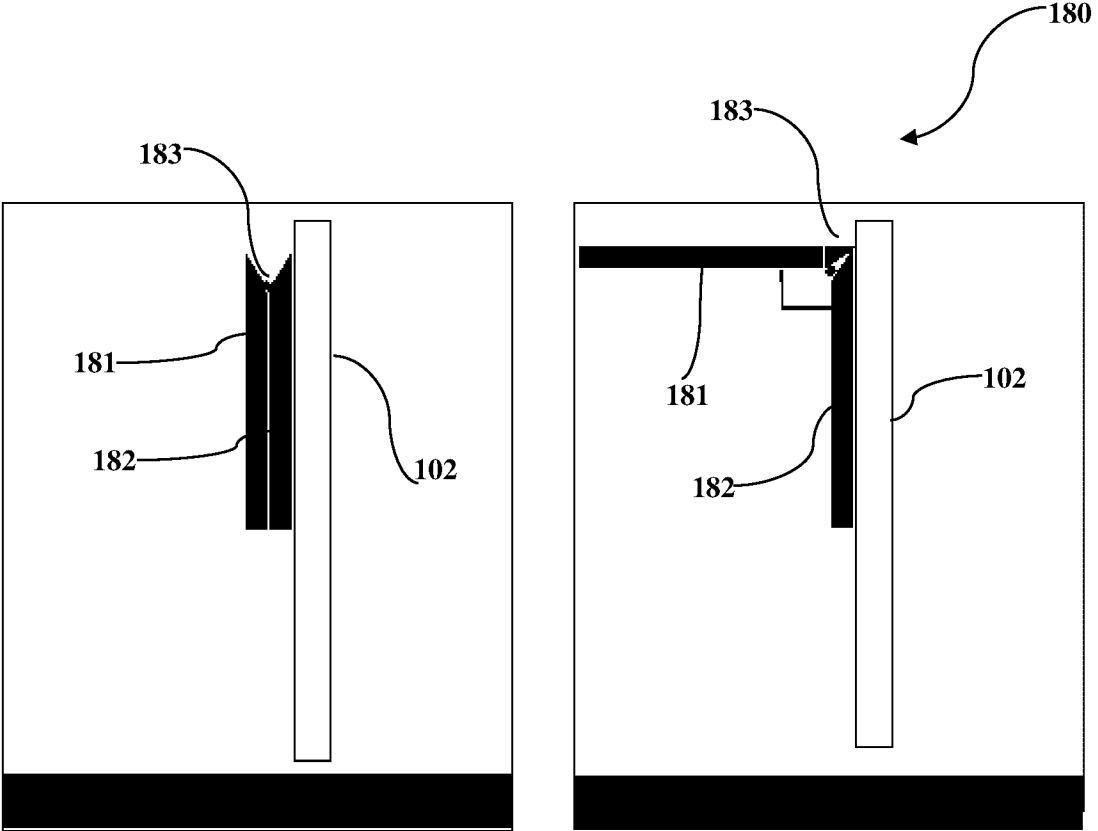


Figure 15

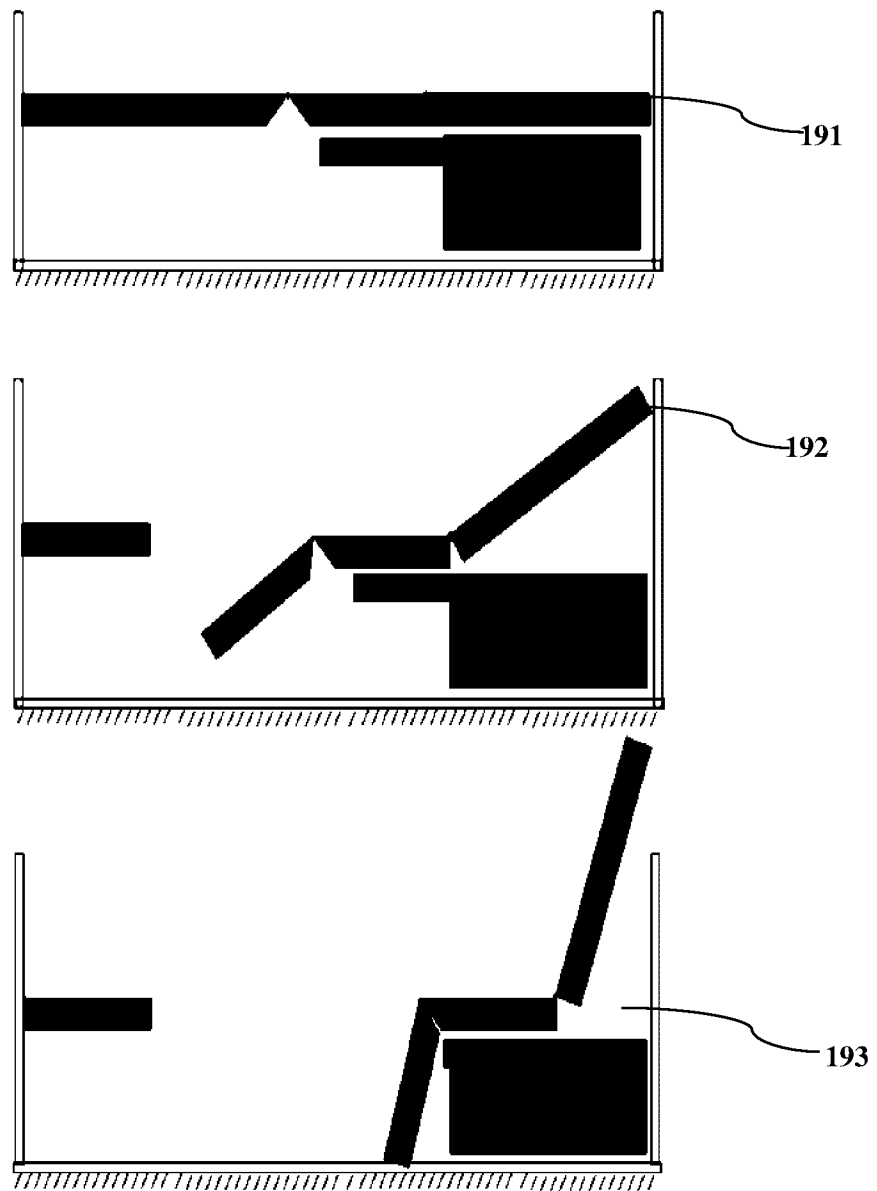


Figure 16

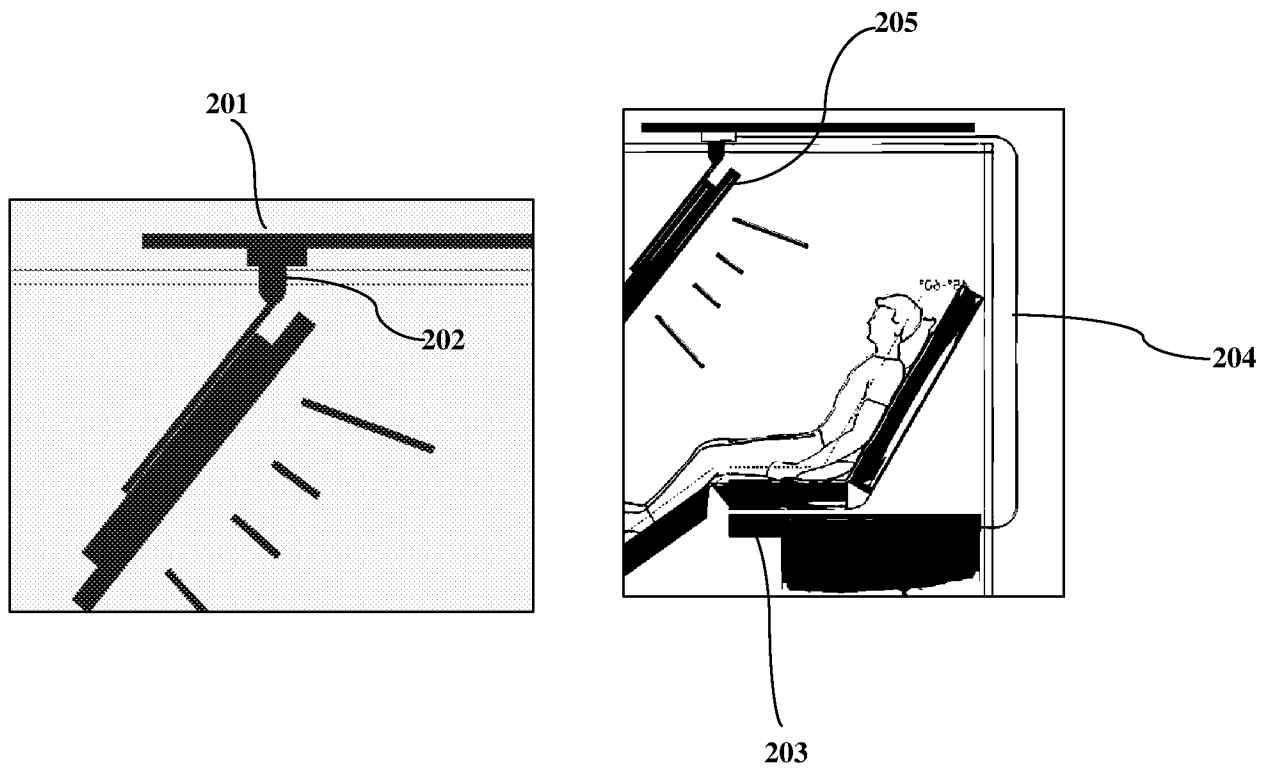


Figure 17a

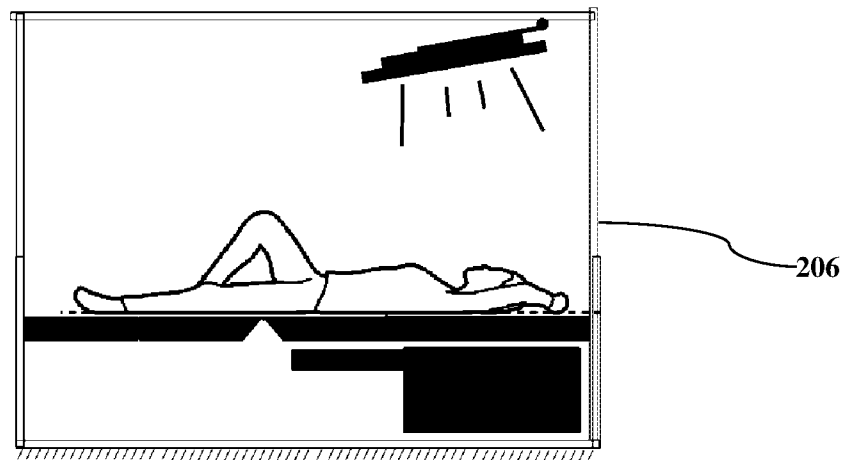
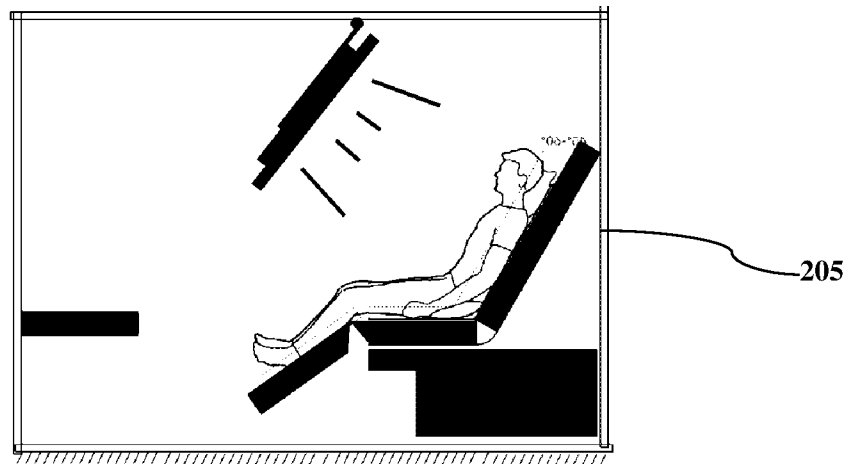
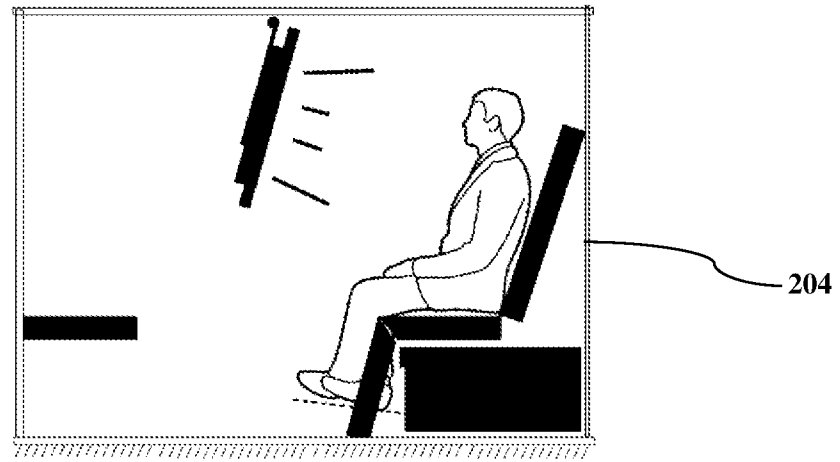
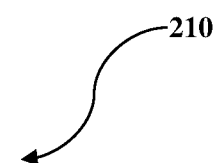


Figure 17b



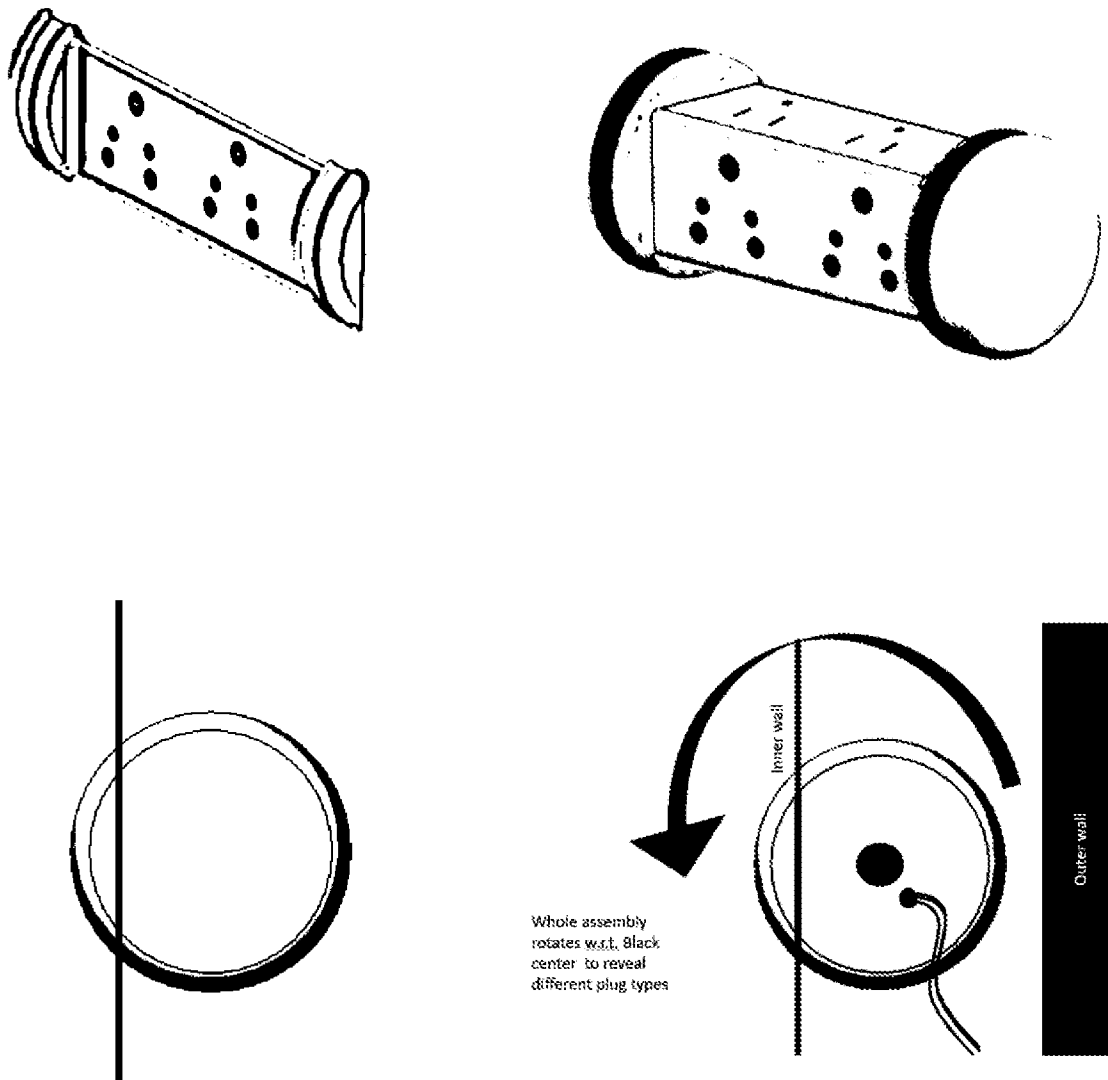


Figure 18

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2020/052598

A. CLASSIFICATION OF SUBJECT MATTER
E04B1/348 Version=2020.01

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)

E04B1/348

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)

TotalPatent One, IPO Internal Database

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US8356446B2 Cosmonde Corp 22 January 2013 (22.01.2013) column 7, lines- 29-42; column 14, lines- 10-18; Figure 2 and Claim 1	1
A	JP2000273966A SEKISUI CHEMICAL CO LTD 03 October 2000 (03.10.2000) Whole document	2-8
A	US6109189A TARVER SAMUEL ALLEN 29 August 2000 (29.08.2000) Figures 8-12	9-12

☐ 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

"D" document cited by the applicant in the international application

"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

18-08-2020

Date of mailing of the international search report

18-08-2020

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Authorized officer

Sai Sandeep Venkata Palakolanu
Telephone No. +91-1125300200

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/IB2020/052598

Citation	Pub.Date	Family	Pub.Date
US 8356446 B2	22-01-2013	CN 101858154 B	07-11-2012
		JP 5435211 B2	05-03-2014
		KR 101147688 B1	23-05-2012
US 6109189 A	29-08-2000	CA 2225143 A1	18-06-1998