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3,302,547

GENERAL PURPOSE PORTABLE ROOM WITH VENTILATING MEANS

Filed Sept. 2, 1964

5 Sheets-Sheet 1

FIG.-1

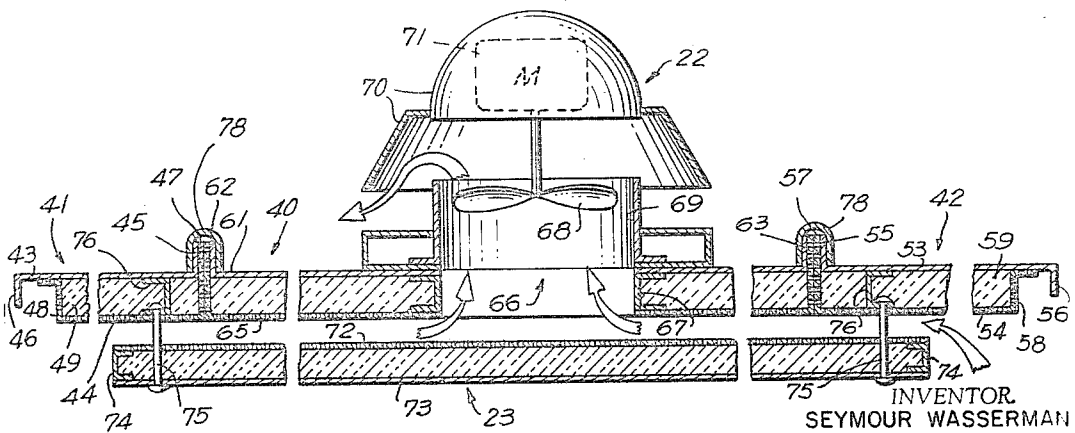
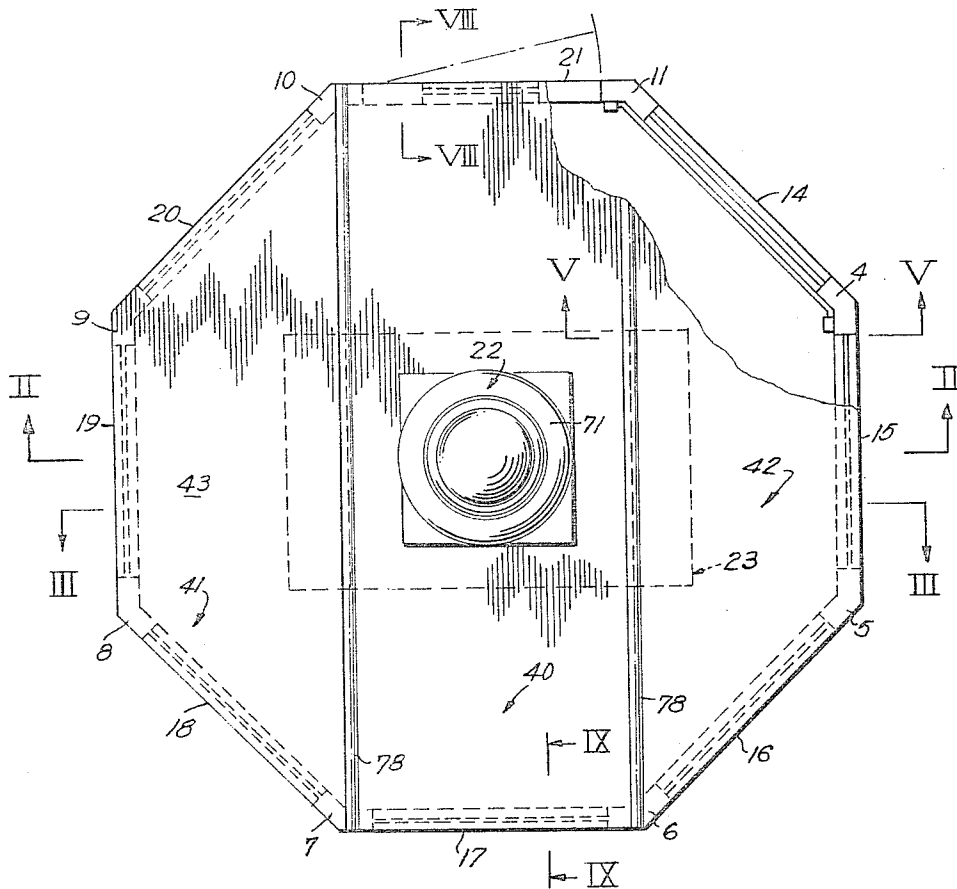


FIG.-2

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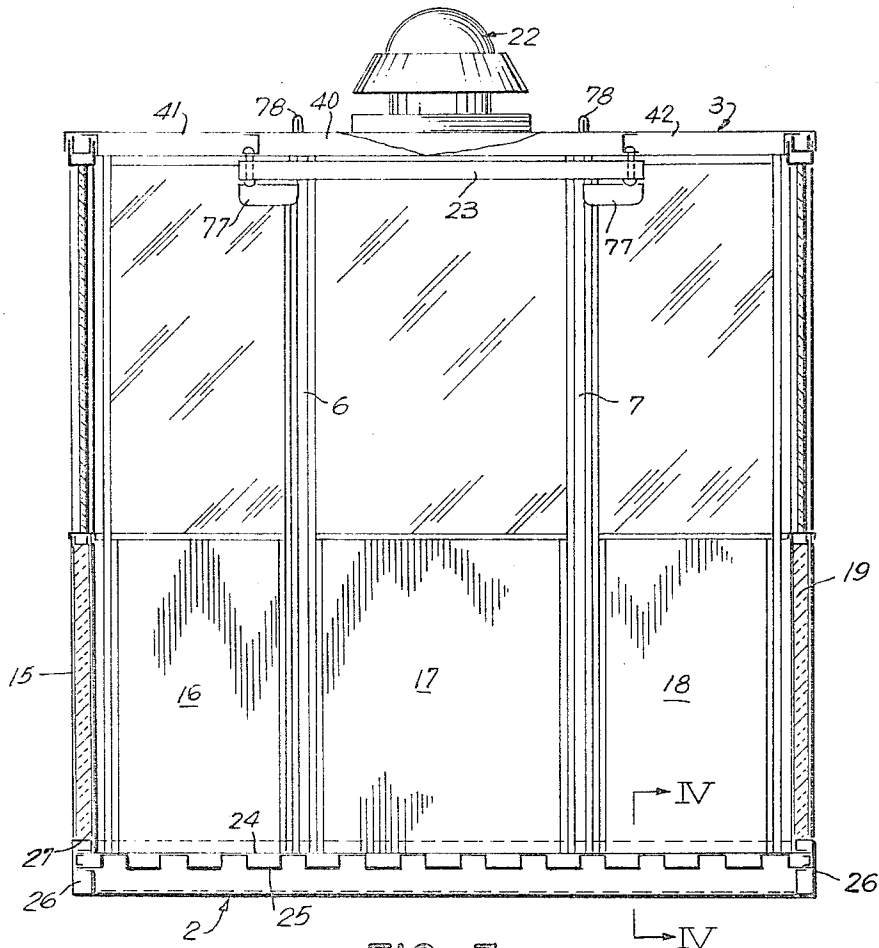


FIG.-3

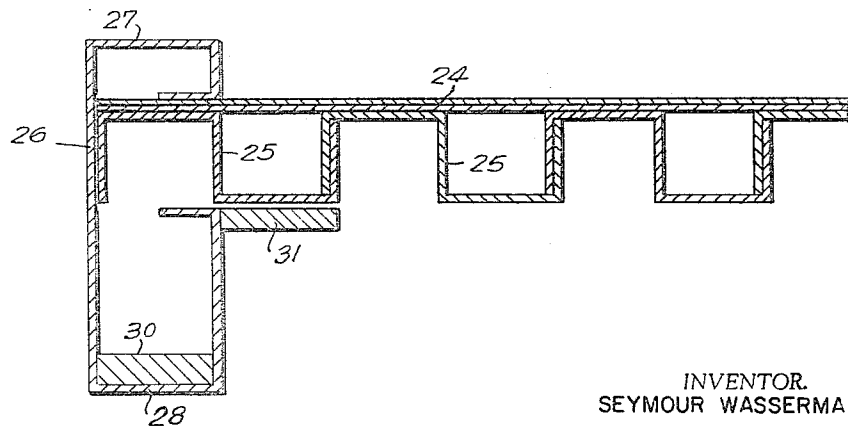


FIG.-4

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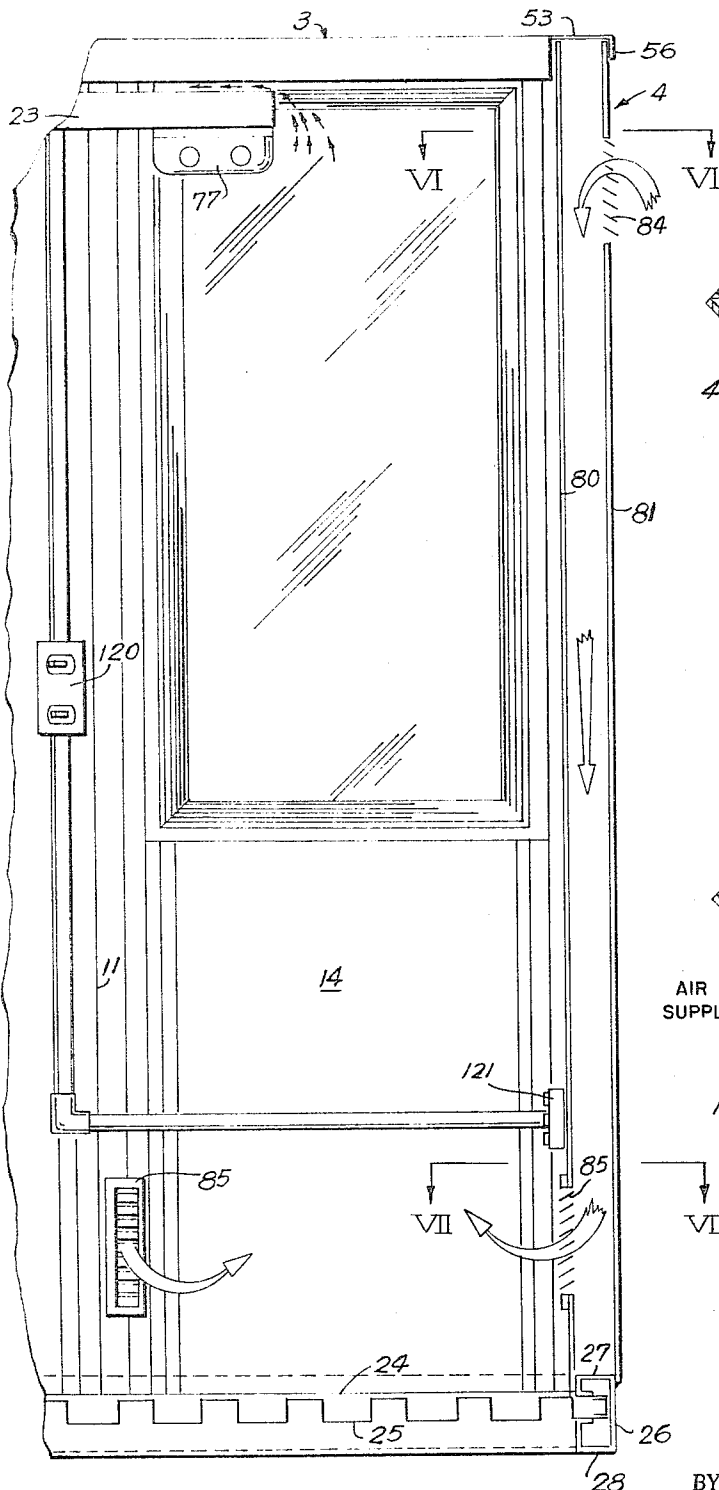


FIG.-5

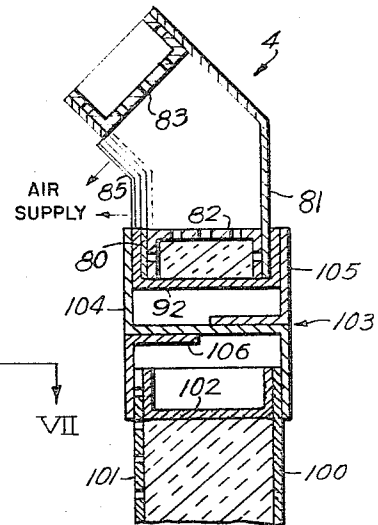
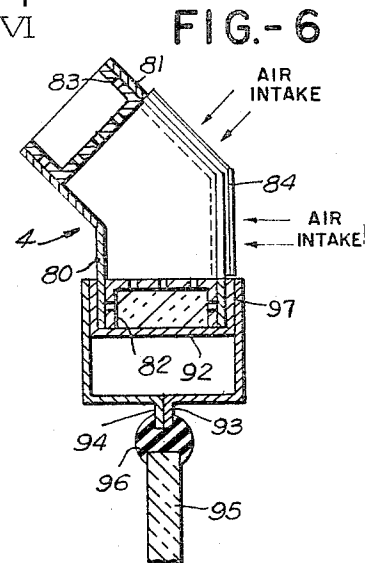


FIG.-7

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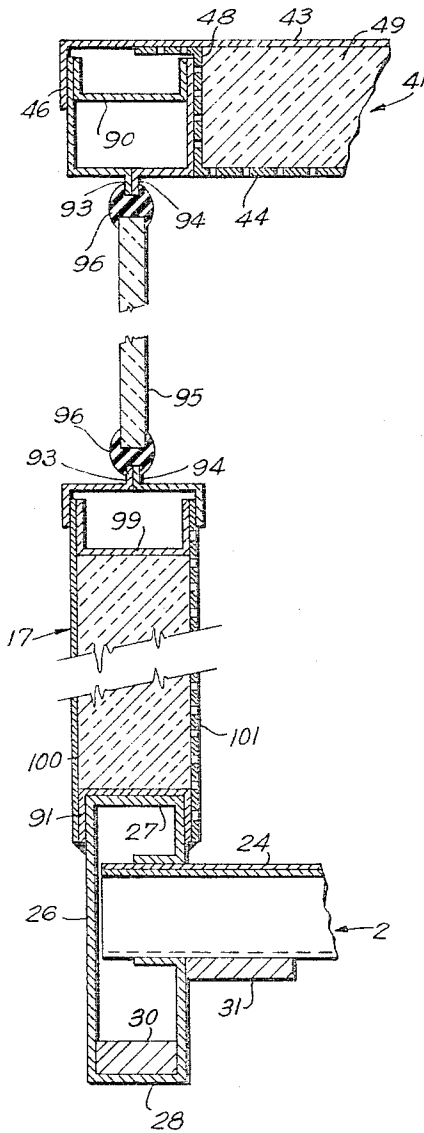


FIG.-9

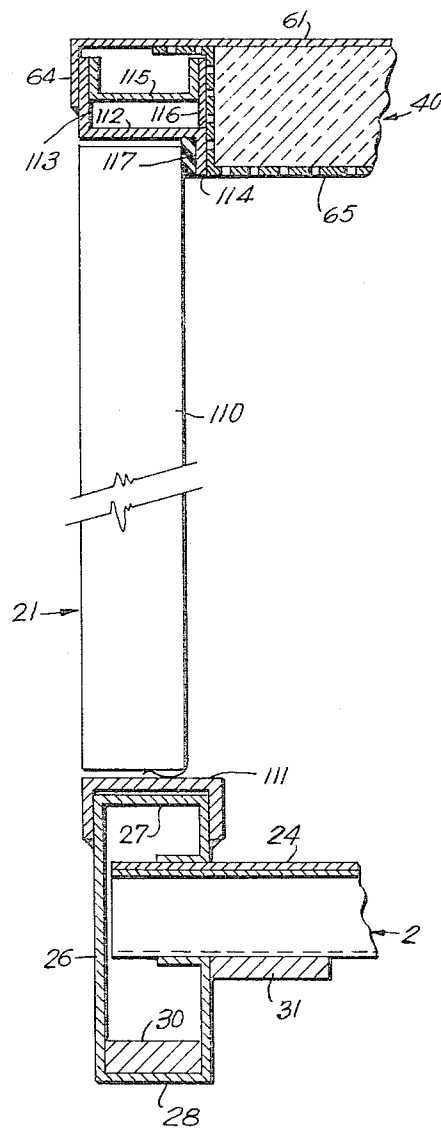


FIG.-8

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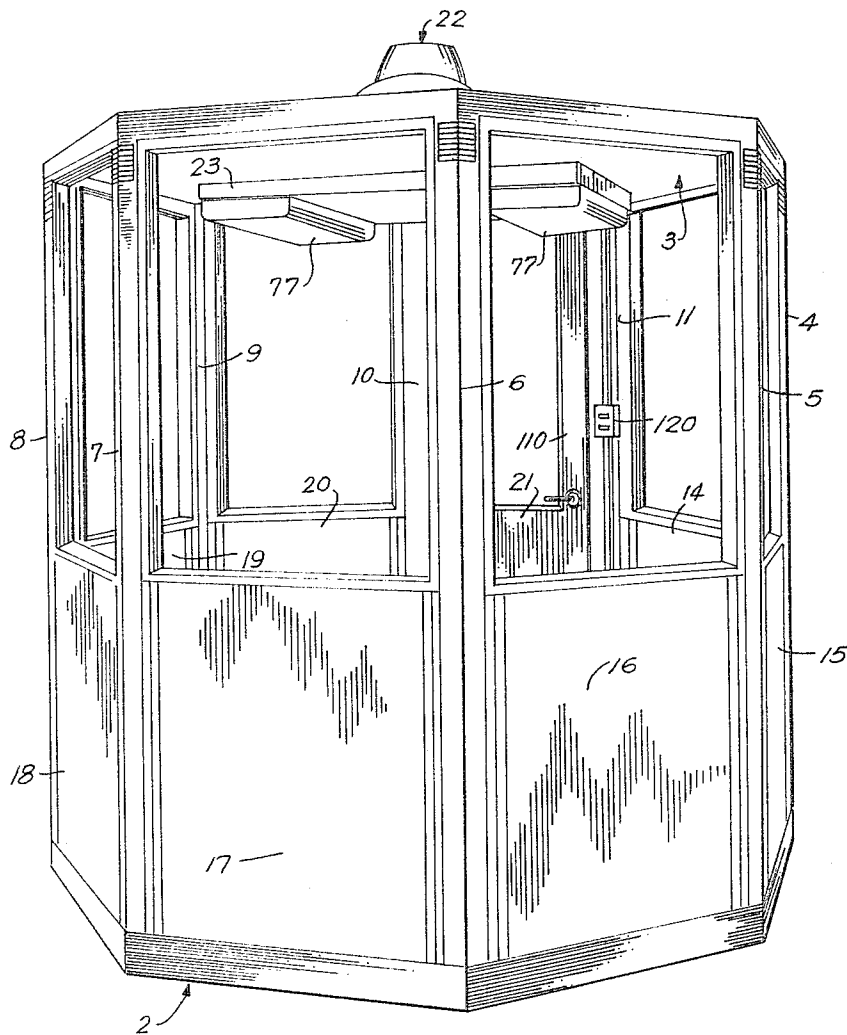


FIG.-10

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GENERAL PURPOSE PORTABLE ROOM WITH VENTILATING MEANS

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7 Claims. (Cl. 98—33)

This invention relates to building structures and more particularly, to general purpose portable rooms.

There are numerous instances which arise where a room is required and there is insufficient time to permit designing and building such a room. Examples of such room requirements occur with regard to the need for information offices, recruiting and interviewing offices, first aid stations and traffic control centers. There are many situations which require a portable room which can easily be moved from location to location. Examples of such portable room requirements are with respect to construction offices, tool cribs, shipping and receiving offices, observation posts for railroad towers, highways and parking lots. Another category of uses for a general purpose room includes those requiring a relatively permanent installation where it is desirable to utilize a well designed and well constructed pre-fabricated room to minimize the expense of design and construction of a comparable room on a custom basis. Examples include foreman and supervisory offices, control rooms, communication centers, guard houses, quality control and product testing points, conference rooms and waiting rooms.

Thus, an object of this invention is to provide a general purpose portable room which satisfies a large number of the varied requirements for installations such as those previously mentioned.

Another object is to provide a general purpose portable room which is acoustically insulated and which therefore provides a relatively quiet room enclosure not substantially affected by ambient noise.

Another object is to provide a general purpose portable room which includes a built in ventilation system which is constructed so that ambient acoustic energy cannot enter the room enclosure via the ventilation system.

Another object is to provide a general purpose portable room which is easily and inexpensively constructed and which derives maximum benefit from the various structural components.

Still another object is to provide a general purpose room including interlocking panel components so that the room can be assembled without the need of mechanical fasteners.

Yet another object is to provide a general purpose portable room which can be extended to provide additional room space.

The manner in which the foregoing and other objects are achieved in accordance with this invention is set forth more particularly in the following specification which describes a few illustrative embodiments within the scope of this invention. The drawings form a part of this specification wherein:

FIG. 1 is a plan view looking down upon a general purpose portable room constructed in accordance with this invention;

FIG. 2 is a partial cross sectional view taken along line II—II illustrating structural details of the ceiling structure;

FIG. 3 is a cross sectional elevation view taken along line III—III as shown in FIG. 1;

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FIG. 4 is a cross sectional view taken along line IV—IV as shown in FIG. 3 illustrating structural details of the floor panel;

FIG. 5 is an elevation view of the interior of the room enclosure as seen from line V—V shown in FIG. 1;

FIG. 6 is a horizontal cross sectional view showing the details of the air intake portion of a support column and illustrating the manner in which the corner column is coupled to an adjacent wall panel;

FIG. 7 is a horizontal cross sectional view of a support column illustrating the air supply portion which communicates with the room enclosure;

FIG. 8 is a vertical cross sectional view illustrating the wall panel including the door and the manner in which this wall panel is coupled to the floor and ceiling panels;

FIG. 9 is a vertical cross sectional view illustrating a wall panel including a window and the manner in which this wall panel is coupled to the floor and ceiling panels.

FIG. 10 is a perspective view illustrating the assembled general purpose portable room.

The general purpose portable room in accordance with this invention includes an octagonal floor panel 2, and a three piece octagonal ceiling panel 3 supported above the floor panel by means of corner support columns 4—11.

The octagonal room enclosure is completed by wall panels 14—21 which are disposed between the adjacent corner columns. The individual wall panels are essentially the same including a window, except for wall panel 21 which includes a door. Preferably, the ceiling and wall panels are filled with an acoustic energy absorbing material and are provided with perforated inner surfaces so that the room enclosure is acoustically insulated and not substantially affected by ambient noise.

The corner support columns are hollow, and in addition to providing structural support, also serve as air intake ducts. Each column is provided with an air intake opening or grill near the top, and an air supply opening or grill communicating with the interior of the room located near the bottom. The columns are lined with acoustic energy absorbent material so that ambient noise cannot enter the room enclosure via the air intake ducts. An exhaust fan 22 is mounted on the ceiling panel directly above a baffle panel 23. The baffle panel is constructed so that air leaving the room enclosure travels along an acoustically lined labyrinth path to thus prevent ambient noise from entering the room enclosure via the air exhaust path.

Floor panel 2 includes a deck panel 24 in the shape of an octagon. The deck panel can be a single sheet of material, or can comprise several interconnected deck sheets. A corrugated structure made up of interconnected channel-like members 25 is positioned below deck panel 24 so that the corrugated structure provides rigid support for the deck panel. A flat sheet of material is bent to provide an edge molding 26 having a generally rectangular cross section which is closed except for a flanged opening in the inner vertical surface, this opening being suitably dimensioned to accept the deck panel and supporting structure. Edge molding 26 follows the octagonal periphery of deck panel 24, and is secured in position to provide an upwardly extending guide projection 27 for positioning the wall panels, and a downwardly extending support projection 28 which supports the floor a suitable distance above the underlying support surface. The edge molding is secured to deck panel 24 and its supporting structure in any suitable fashion, such as by welding. Reinforcing members 30 and 31 are secured, respectively, within the

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lower portion of edge molding 26 and between the edge molding and the deck supporting structure to reinforce the structure at the fork lift pick-up points.

Ceiling panel 3 includes a rectangular center panel portion 40 and a pair of side panel portions 41 and 42, which are shaped so that the combined ceiling panel structure is in the shape of a regular octagon as shown in FIG. 1.

Side panel portion 41 includes an upper panel 43 and a lower perforated panel 44. The long edge of panel 43, which lies closest to center panel 40 is bent upwardly to provide a securing flange 45, and the remaining edges of the upper panel are bent downwardly to provide flanges 46. All the edges of the perforated lower panel 44 are bent upwardly to provide securing flanges. Flange 47, along the longest edge of panel 44, is secured to flange 40, and the free ends of the remaining flanges 48 are bent outwardly and secured to the lower surface of panel 43 as shown in FIG. 2. The space between flanges 46 and 48 provides a groove for positioning the wall panels. The space between panels 43 and 44 is filled with a suitable acoustic energy absorbing fibrous material 49. Side panel portion 42 is identical to side panel portion 41 and includes an upper panel 53, a lower perforated panel 54, flanges 55-58 and a fibrous filler material 59.

Center panel portion 40 includes an upper panel 61 having its longer edges bent upwardly to provide securing flanges 62 and 63 and the shorter edges bent downwardly to provide flanges 64. A perforated panel 65, spaced below panel 61, has all its edges bent upwardly. The longer edges of panel 65 lie adjacent flanges 62 and 63 and the shorter edges are bent outwardly at their free ends and are secured to the lower surface of panel 61. The space between flanges 64 and the upwardly extended flange portion of panel 65 provides a groove for positioning the wall panels similar to that previously described with respect to flanges 46 and 48. Thus, it should be noted that when panel portions 40-42 are assembled, a wall positioning groove extends around the entire periphery of ceiling panel 3.

A circular opening 66 is provided in the center of panel portion 40 and passes through the upper and lower panels 61 and 65, respectively. A circular flanged member 67 is secured between panels 61 and 65 surrounding opening 66. A suitable exhaust fan is mounted upon center panel 40 so that it communicates with opening 66. The exhaust fan can be of any suitable type such as those including a fan blade 68 disposed within a circular duct 69 and driven by an electric motor 70. The motor, and an annular covering structure 71, are suitably supported above duct 69.

Centered below opening 66 is a rectangular baffle panel 23 consisting of an upper perforated panel 72 and a lower panel 73, these panels being secured to one another at their edges by means of suitable channel members 74. The baffle panel is dimensioned so that any air drawn from within the room enclosure must pass between the ceiling panel and the baffle panel, or in other words, between perforated panels 65 and 72. Center panel portion 40 and baffle panel 23 are each filled with acoustic energy absorbing fibrous material. Thus, a labyrinth, acoustically lined, exhaust path is provided which prevents the ambient noise from entering the room enclosure via the exhaust system. The baffle panel is suspended from the ceiling panel using suitable bolts 75 secured to the flange of a suitable channel member 76 secured within side panel portions 41 and 42 respectively. Suitable light fixtures 77 can be secured to the lower surface of baffle panel as desired.

As shown in FIG. 2, side panel portion 41 is secured to center panel portion 40 by means of securing flanges 45 and 62 with the upwardly extending flanged portions of perforated panels 65 and 44 therebetween. The securing flanges can be secured in any suitable fashion as with

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bolts or by welding. A strip 78, having a semi-closed arcuate cross section, is placed over the ends of the flanges to weatherproof the structure along the seam. Side panel portion 42 is secured to the center panel portion in essentially the same manner.

The corner support columns, best illustrated in FIGS. 5-7, each include an inner wall 80 and an outer wall 81, walls 80 and 81 being bent along their longitudinal center line providing an angle of 135 degrees. The inner and outer walls are secured to one another by means of channel members 82 and 83, the flanges of these channel members extending outwardly toward the edges of walls 80 and 81. Channel members 82 and 83 are provided with perforations passing through the bridge portion joining the flanges. This can be achieved either by constructing the channel member from a sheet of perforated material or by drilling holes through the bridge portion of a prefabricated channel member. An opening is provided near the top of outer wall 81 and is dimensioned to accommodate an air intake grill 84. An opening is also provided near the bottom of inner wall 80, this opening being dimensioned to accommodate air supply grill 85.

The eight support columns 4-11 are each the same and are positioned vertically between the corresponding vertices of octagonal floor panel 2 and ceiling panel 3. Channel members 82 and 83 stop short of the lower edge of inner and outer walls 80 and 81 so that the support columns can be properly positioned straddling guide projection 27 extending upwardly from floor panel 2. The upper end of each of these support columns fits within the peripheral groove extending around ceiling panel 3.

Wall panels 14-20, which include the windows, are each the same and are adapted to straddle guide projection 27 extending upwardly from the floor panel, and to fit within the peripheral groove in the ceiling panel. The edges of the wall panels also partially surround the adjacent support columns.

As illustrated in FIGS. 6, 7 and 9, a wall panel includes a rectangular frame consisting of four channel members including an upper channel member 90, a lower channel member 91, these channel members being joined at their ends by a pair of vertical channel members 92. The flanges of these channel members all extend outwardly.

A window frame is formed by a number of interconnected Z-shaped members having a short flange and a long flange. The window frame is constructed from eight such Z-shaped members, or from two such members bent to provide a generally rectangular configuration. In either structure, the window frame is formed by securing short flanges 93 and 94 together to form an inner frame opening slightly larger than window 95. Window 95 is mounted within the window frame by means of a suitable grooved rubber sealing ring 96. The long flanges 97 and 98 straddle upper channel member 90 and the upper portion of vertical channel members 92, thus properly positioning the window frame.

The wall panel also includes a horizontal channel member 99 positioned somewhat below the window opening, the flange portions of this channel extending upwardly. An outer wall 100 and a perforated inner wall 101 are secured respectively to the outer and inner flanges of channel members 91 and 99. A pair of vertical channel members 102 are secured between the vertical edges of inner and outer walls 101 and 100. A pair of vertical members 103, having an H-shaped cross section, are disposed so that the flanges thereof overlie the vertical edges of walls 100 and 101, and the flanges of vertical channel members 92. Vertical members 103 are composite structures including a Z-shaped member 104 and a pair of angle members 105 and 106 secured to the bridge portion of the Z-member.

Wall section 21 includes a door frame and a door 110 secured to the door frame by means of suitable hinges.

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The door frame is constructed including a channel member 111 dimensioned to straddle guide projection 27 of floor panel 2 as shown in FIG. 8. The upper cross piece of the door frame includes a Z-member 112 having a long flange 113 and a short flange 114. A channel member 115 is secured between long flange 113 and a closure panel 116, the closure panel being secured to the flange of channel member 115 and the bridge portion of Z-member 112. Short flange 114 provides a door jamb and has a rubber sealing strip 117 secured thereto. The distance between the outer surface of flange 113 and closure panel 116 is slightly less than the lateral dimension of the peripheral groove in ceiling panel 3. The upright portions of the door frame are similar to the upper cross piece. The inner dimension between the flanges of channel member 115 is sufficient so that the flange will overlie inner and outer walls 80 and 81 of the adjacent support columns when the door frame is placed in position.

As shown in FIG. 9, lower channel member 91 is dimensioned so that it will straddle guide projection 27 of the floor panel and thus properly position the wall panel with respect to the floor panel. Upper channel member 90 is dimensioned so that it, and the portion of the window frame secured thereto, fits within the peripheral groove provided in ceiling panel 3. As shown in FIGS. 6 and 7, vertical channel members 92 are dimensioned so that they overlie inner and outer walls 80 and 81 of the adjacent support columns. Thus, all of the component portions of the general purpose room are designed to fit together with tongue and groove type fittings, thus providing a rigid weatherproof structure. The joints between component portions provide labyrinth paths which substantially reduce the quantity of ambient noise which can enter the room enclosure via the joints.

The room structure in accordance with this invention is completely interlocking and can therefore be assembled without requiring any mechanical fasteners. The room is assembled by first positioning the upright corner columns so that they straddle upwardly extending guide projection 27 of the floor structure. Next, the wall panels are lowered into position between the corner columns until the recess in the lower edge of the wall panel straddles guide projection 27. The corner columns cooperate with the vertical recesses of the wall panels. Finally, ceiling panel 3 is lowered into position so that the upper edges of the wall panels and corner columns are captured by the groove extending around the periphery of the ceiling panel.

The ventilation system is designed to minimize the flow of ambient noise into the room enclosure. The ventilation system draws air into the room enclosure via air intake ducts formed by support columns 4-11. Thus, the air flows from air intake grills 84, through the support columns, and into the room via air supply grills 85. The space between the flanges of channel members 82 and 83 is filled with a fibrous acoustic energy absorbing material. Thus, the air intake ducts are acoustically lined due to the perforations in channel members 82 and 83 and the acoustic energy absorbing material adjacent these channel members. As a result, any acoustic energy attempting to enter the room enclosure via the air intake duct is substantially attenuated. As previously mentioned, air is exhausted from the room via an acoustically lined labyrinth path extending between the ceiling panel 40 and baffle panel 23 and thus any acoustic energy attempting to enter the room enclosure via the exhaust system is also substantially attenuated.

Also, it should be noted that the room structure is designed so that it can easily be expanded. For example, referring to FIG. 1, an additional rectangular center panel portion can be inserted between side panel portions 42 and 43 of the ceiling panel. The floor panel would be extended in similar fashion and a pair of additional wall panels would be inserted between the floor and ceiling panel.

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The complete room structure may be furnished in any desirable fashion. Preferably, electrical switches and electrical outlets, such as switches 120 for lighting fixtures 77, and electrical outlets 121 are permanently wired into the room structure.

While only one advantageous embodiment of the invention has been described in detail, it should be obvious that there are an unlimited number of variations within the scope of this invention. The invention is more particularly defined in the appended claims.

What is claimed is:

1. In a general purpose portable room, the combination of

a floor member and a ceiling member, the peripheries thereof being in the shape of similar polygons;

a plurality of like column members disposed between the vertices of said polygons and adapted to structurally support said ceiling member,

at least one of said column members being hollow and acoustically lined;

wall sections disposed between said columns to provide a room enclosure;

an air supply port communicating between the interior of said lined column and said room enclosure;

an air intake port spaced above said air supply port and communicating with the interior of said lined column; and fan means operative to draw fresh air into said room enclosure via said air intake port, the acoustically lined hollow column, and said air supply port.

2. A general purpose portable room in accordance with claim 1 wherein each of said columns is substantially identical being hollow, acoustically lined, and having a ventilation air supply port and an air intake port associated therewith.

3. A general purpose portable room in accordance with claim 1 wherein said fan means is mounted in said ceiling member.

4. A general purpose portable room in accordance with claim 3 further comprising means defining an acoustically lined labyrinth path coupling said fan means to said room enclosure.

5. In a general purpose portable room, the combination of

a floor panel provided with guide means extending about the periphery thereof;

a ceiling panel provided with guide means extending about the periphery thereof;

a plurality of support columns secured between said panels to support said ceiling panel and positioned by said guide means;

a plurality of identical wall panels each disposed between a pair of support columns and positioned by said support columns, said guide means provided by said floor panel and said guide means provided by said ceiling panel;

the edges of said wall panels and the adjoining portions of said columns, floor panel and ceiling panel being formed to provide a tongue and groove fitting extending around the entire periphery of each wall panel to provide sound attenuating labyrinth paths therebetween.

6. In a general purpose portable room, the combination of

a floor panel provided with guide means extending about the periphery thereof;

a ceiling panel provided with guide means extending about the periphery thereof;

a plurality of support columns secured between said panels to support said ceiling panel and positioned by said guide means;

a plurality of identical wall panels each disposed between a pair of said support columns and positioned by said support columns, said guide means provided

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by said floor panel and said guide means provided by said ceiling panel;
exhaust fan means mounted in said ceiling panel; and
a baffle panel disposed beneath said ceiling panel leaving an air space in-between through which air can be exhausted from the room via said exhaust fan means, adjacent portions of said baffle panel and ceiling panel being constructed to provide an acoustically lined path through said air space.
7. A general purpose portable room in accordance with claim 6 wherein at least one of said support columns is a hollow acoustically lined column including an air supply

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port communicating with the room enclosure, and an air intake port spaced therefrom.

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MEYER PERLIN, Primary Examiner.