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(54) **MILITARY HOUSING SYSTEM**

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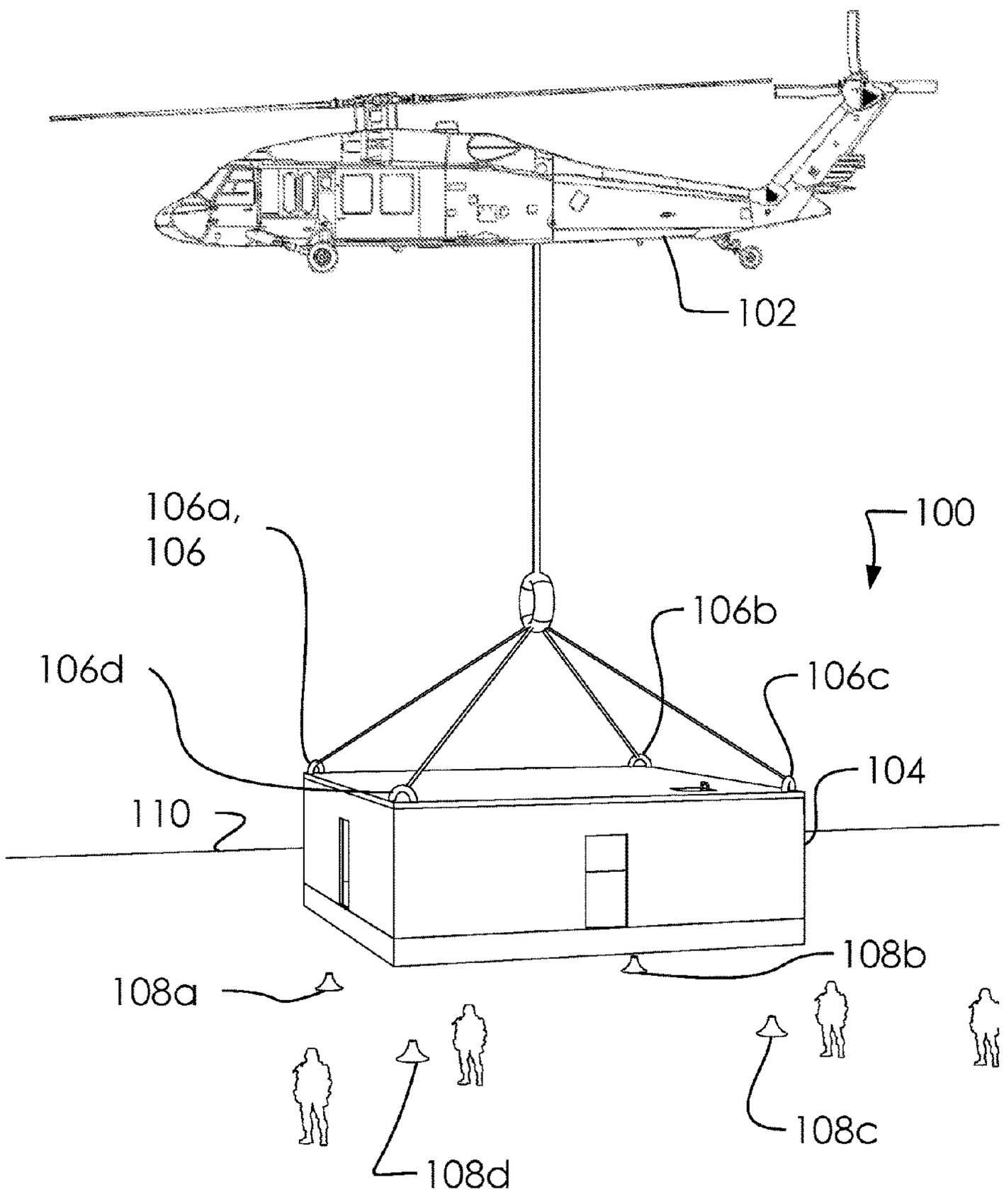
CPC ***E04B 1/34347*** (2013.01); ***E04H 1/1205*** (2013.01)

(57) **ABSTRACT**

A shelter system is disclosed. Said shelter system comprises a shelter, a one or more ground anchors and a life support system. Said shelter comprises a plurality of hooks, a one or more sockets, a frame, said life support system, a plurality of walls, a roof and a floor. Said shelter weighs less than 8000 pounds. Said frame is a metal frame. Said life support system comprises a plumbing system, an electrical system, an air filter system and a HVAC system. Said shelter system comprises a suspension system. Said suspension system comprises a ring, an upper tether cables and a lower tether cables. Said frame comprises a roof support, a roof studs, a first set of studs, a second set of studs and a one or more wall studs. Said floor comprises said one or more sockets, an outer layer, a floor support, a vertical supports and a horizontal supports.



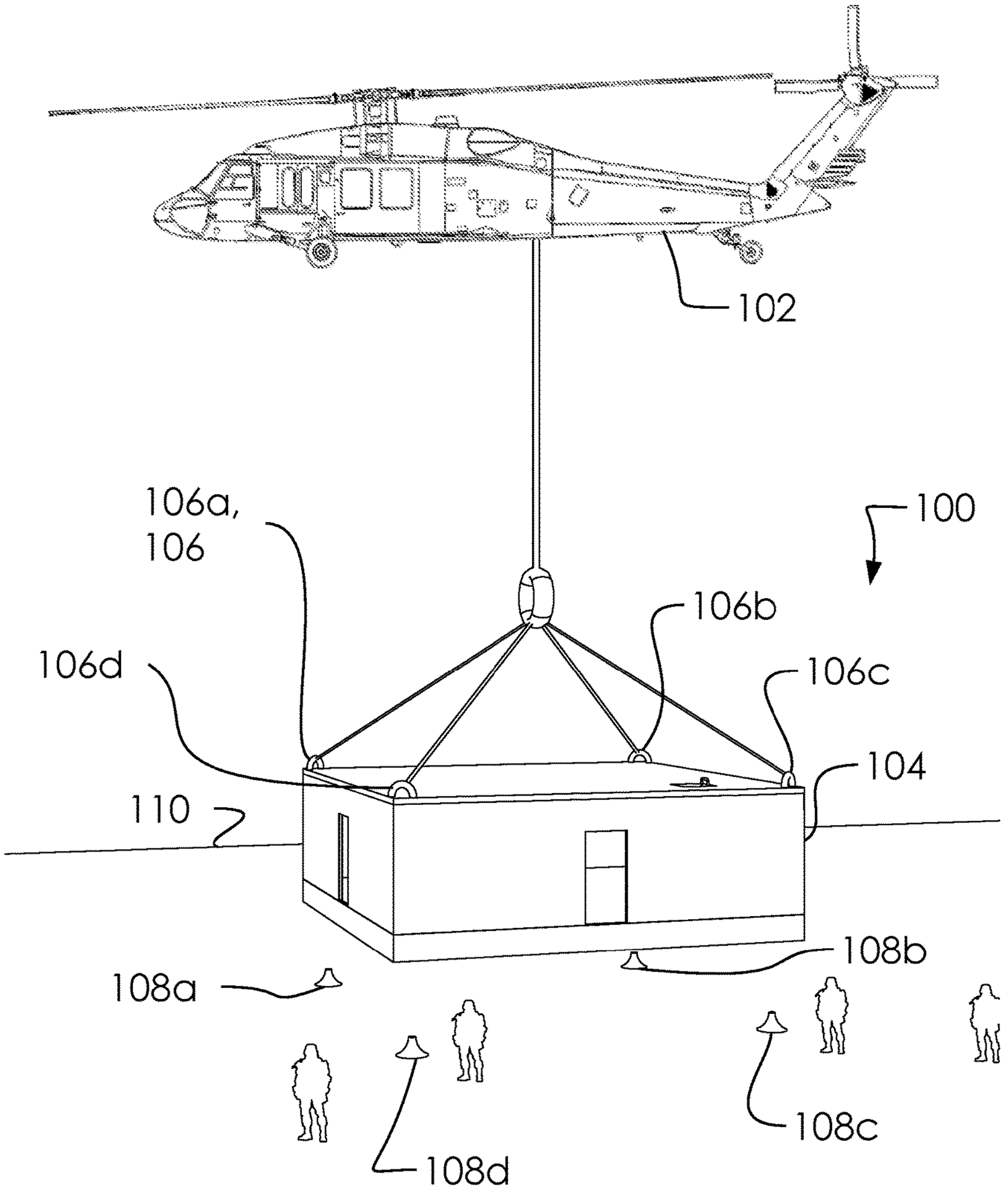


FIG. 1

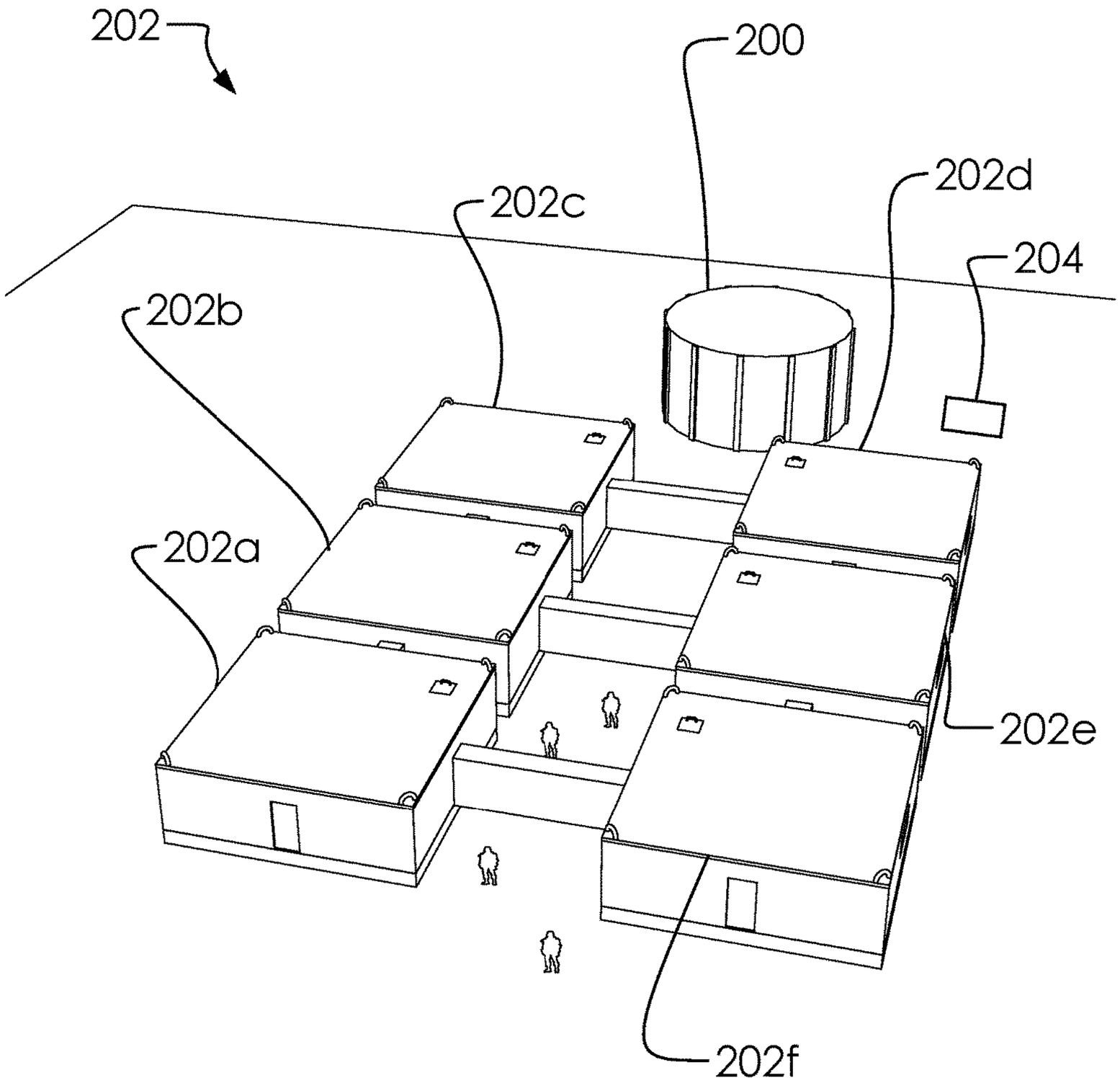


FIG. 2

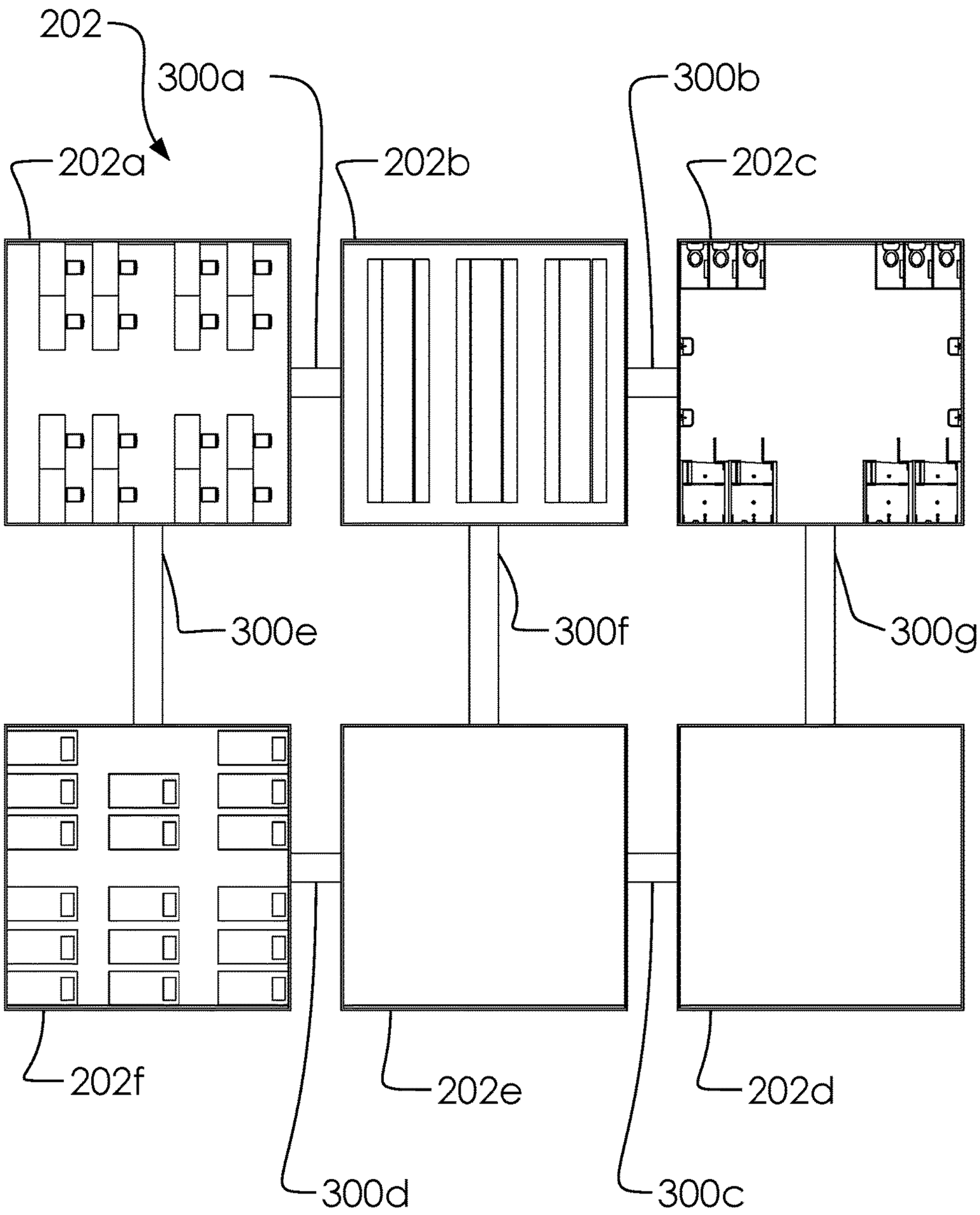

202
300a
300b
202a
202b
202c
300e
300f
300g
202f
202e
202d
300d
300c

FIG. 3

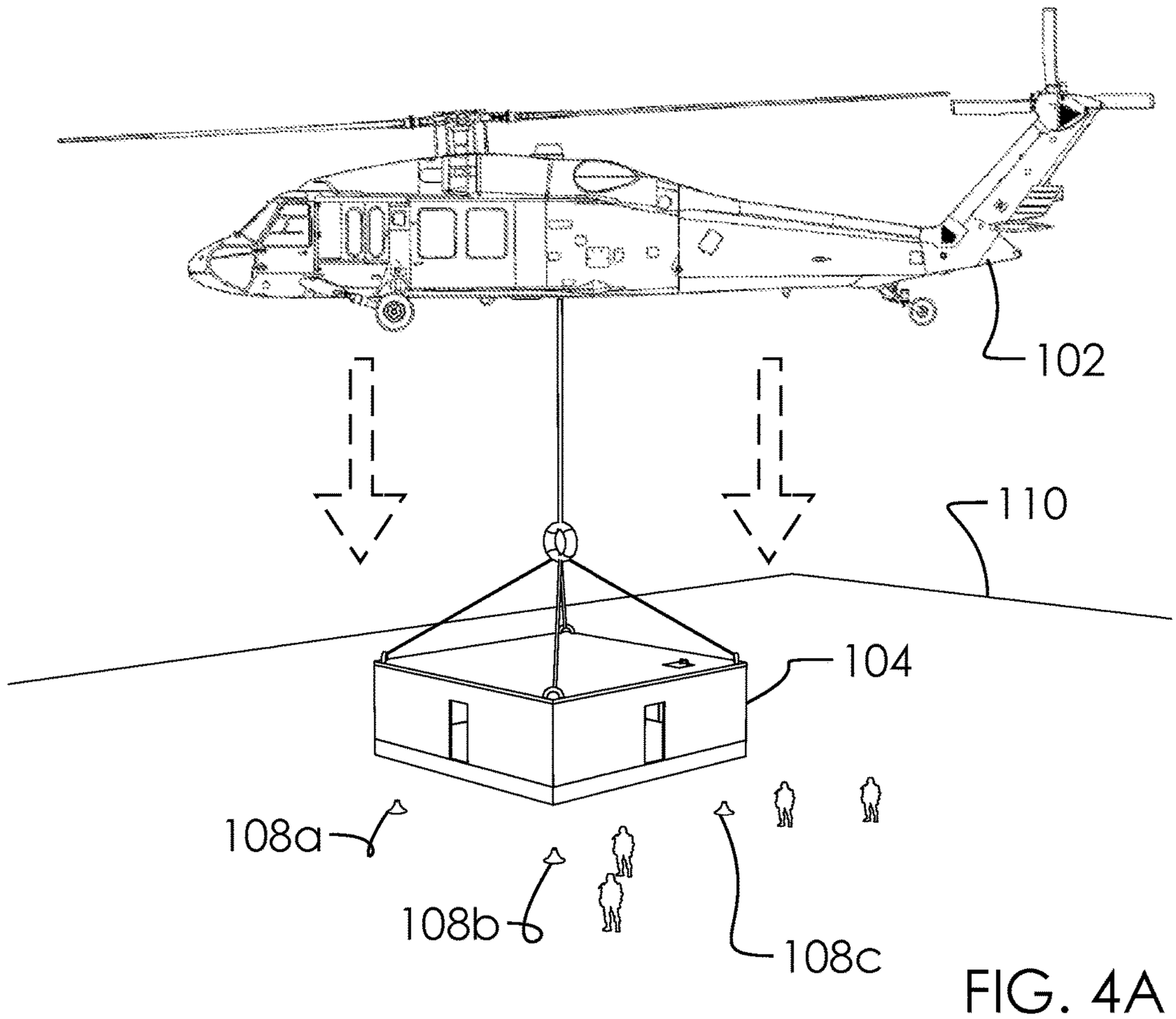

102
110
104
108a
108b
108c

FIG. 4A

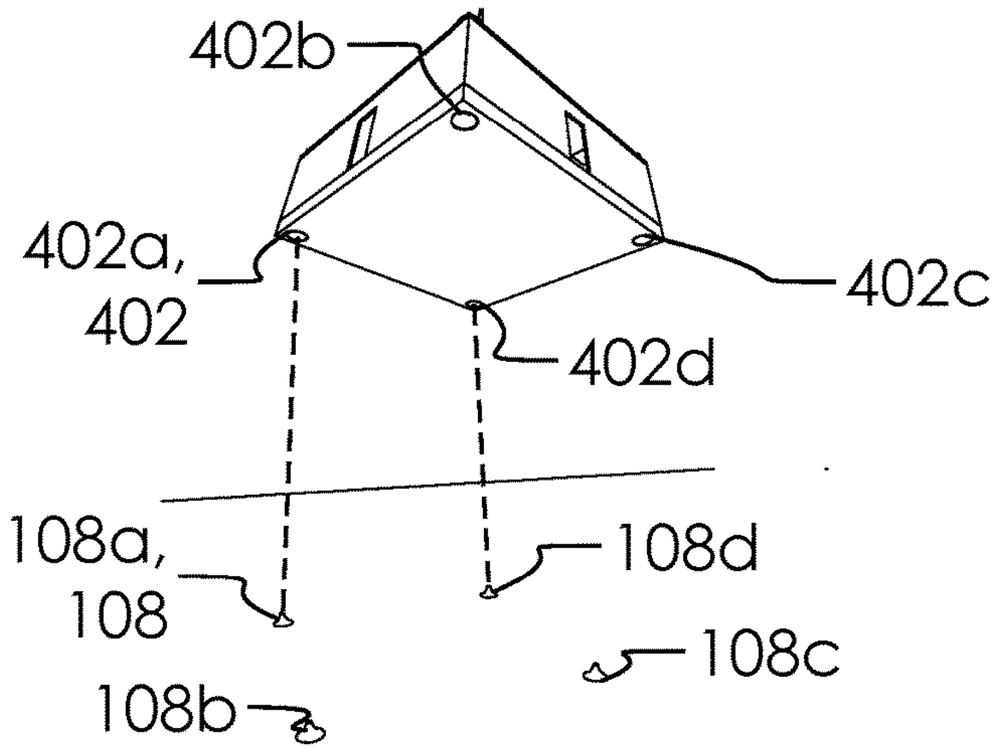

402b
402a,
402
402c
402d
108a,
108
108d
108c
108b

FIG. 4B

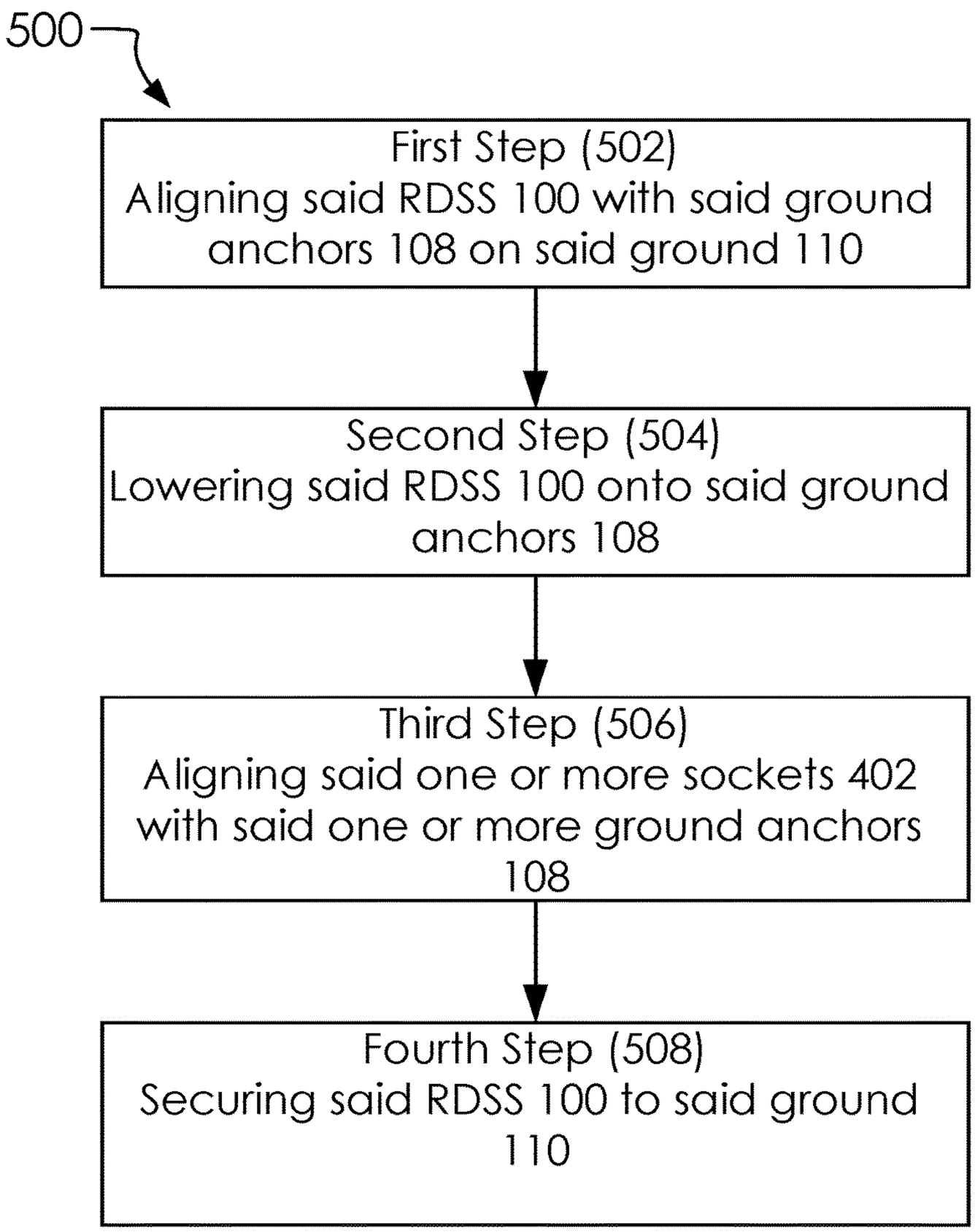

500
First Step (502)
Aligning said RDSS 100 with said ground anchors 108 on said ground 110
Second Step (504)
Lowering said RDSS 100 onto said ground anchors 108
Third Step (506)
Aligning said one or more sockets 402 with said one or more ground anchors 108
Fourth Step (508)
Securing said RDSS 100 to said ground 110

FIG. 5

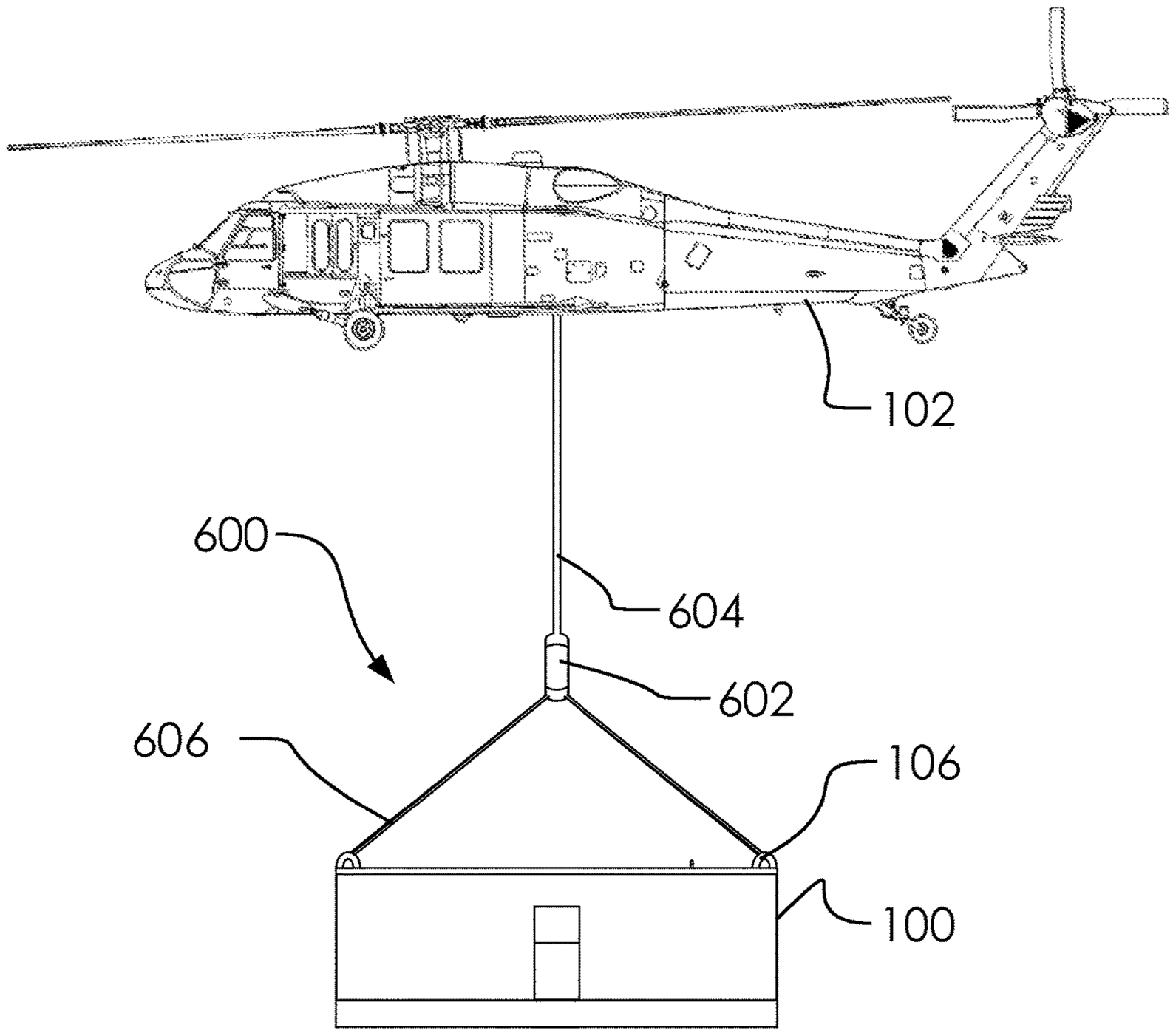


FIG. 6

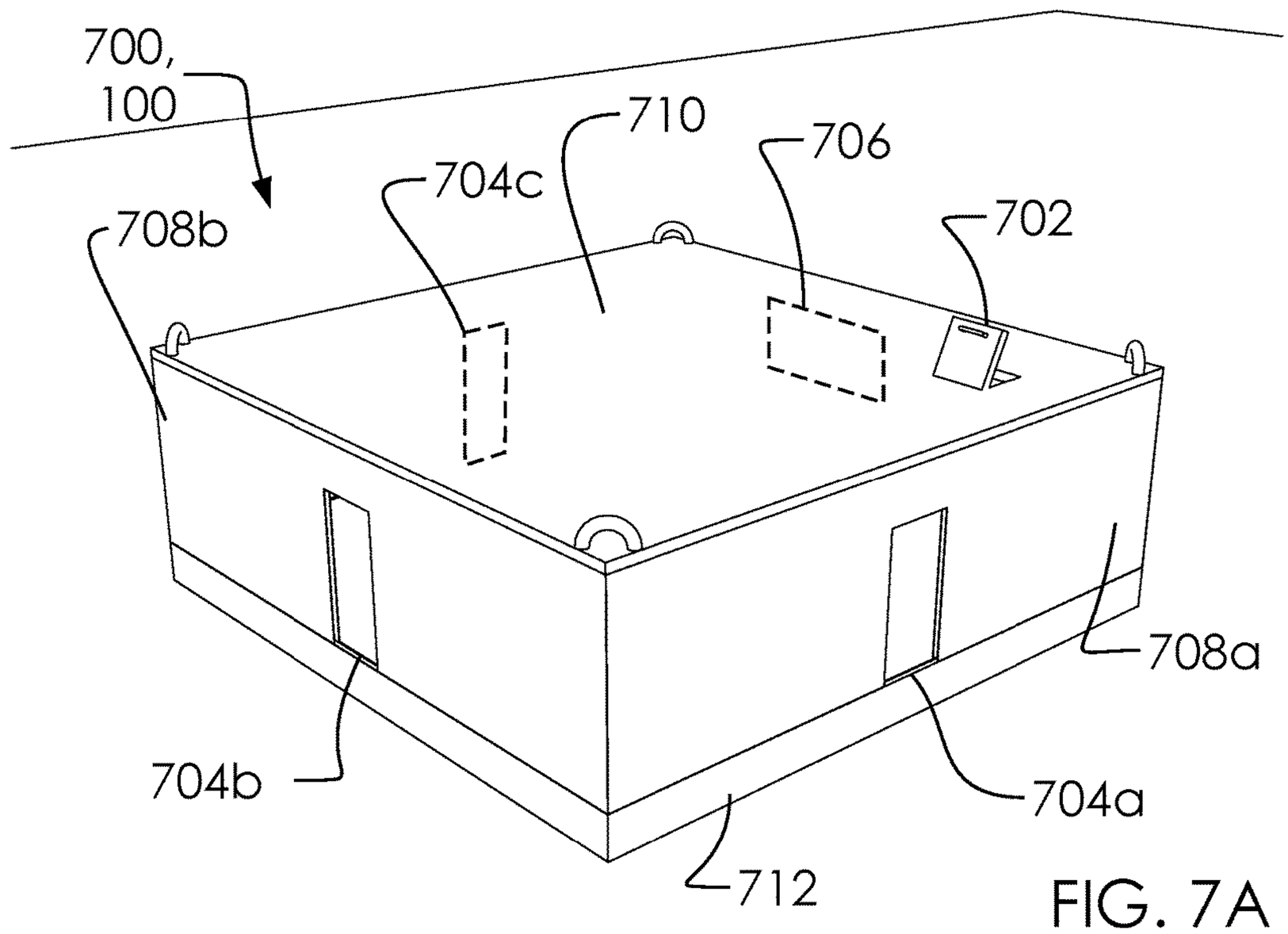

700,
100
710
706
704c
702
708b
708a
704b
704a
712

FIG. 7A

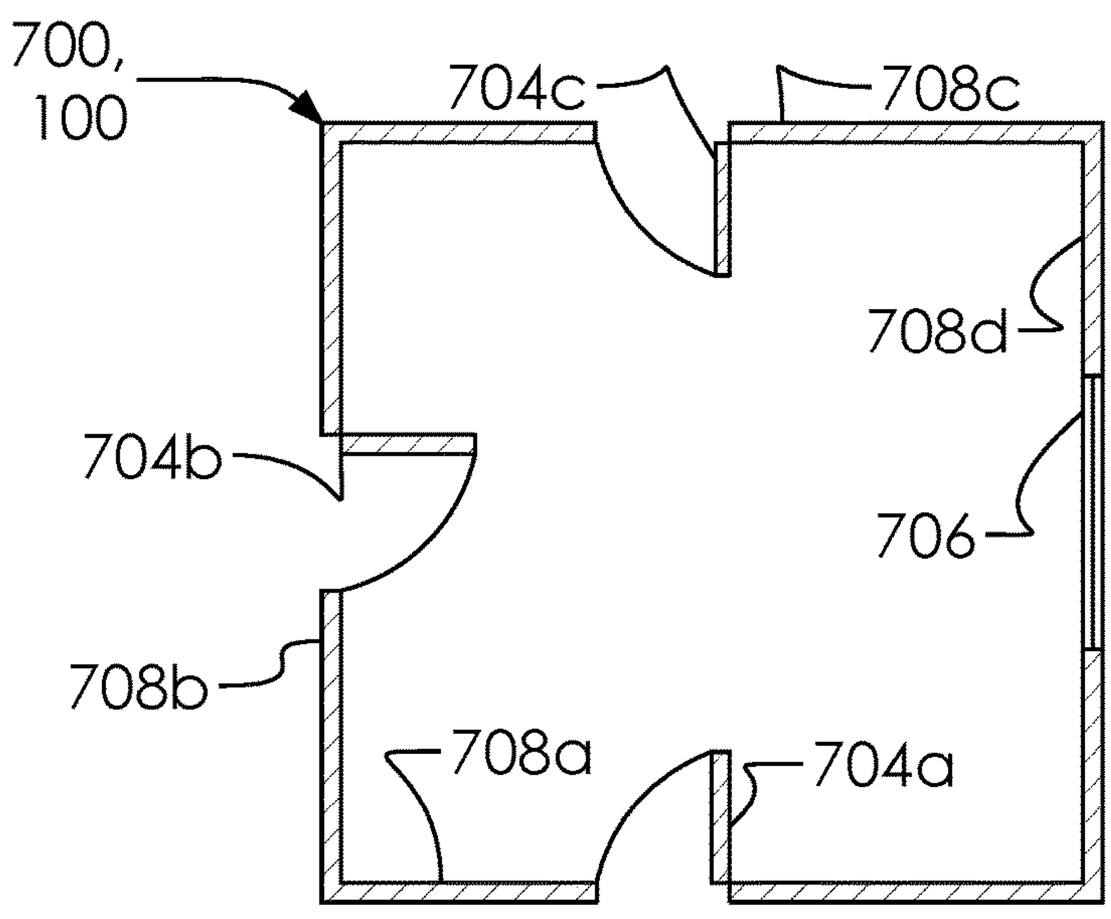

700,
100
704c
708c
708d
704b
706
708b
708a
704a

FIG. 7B

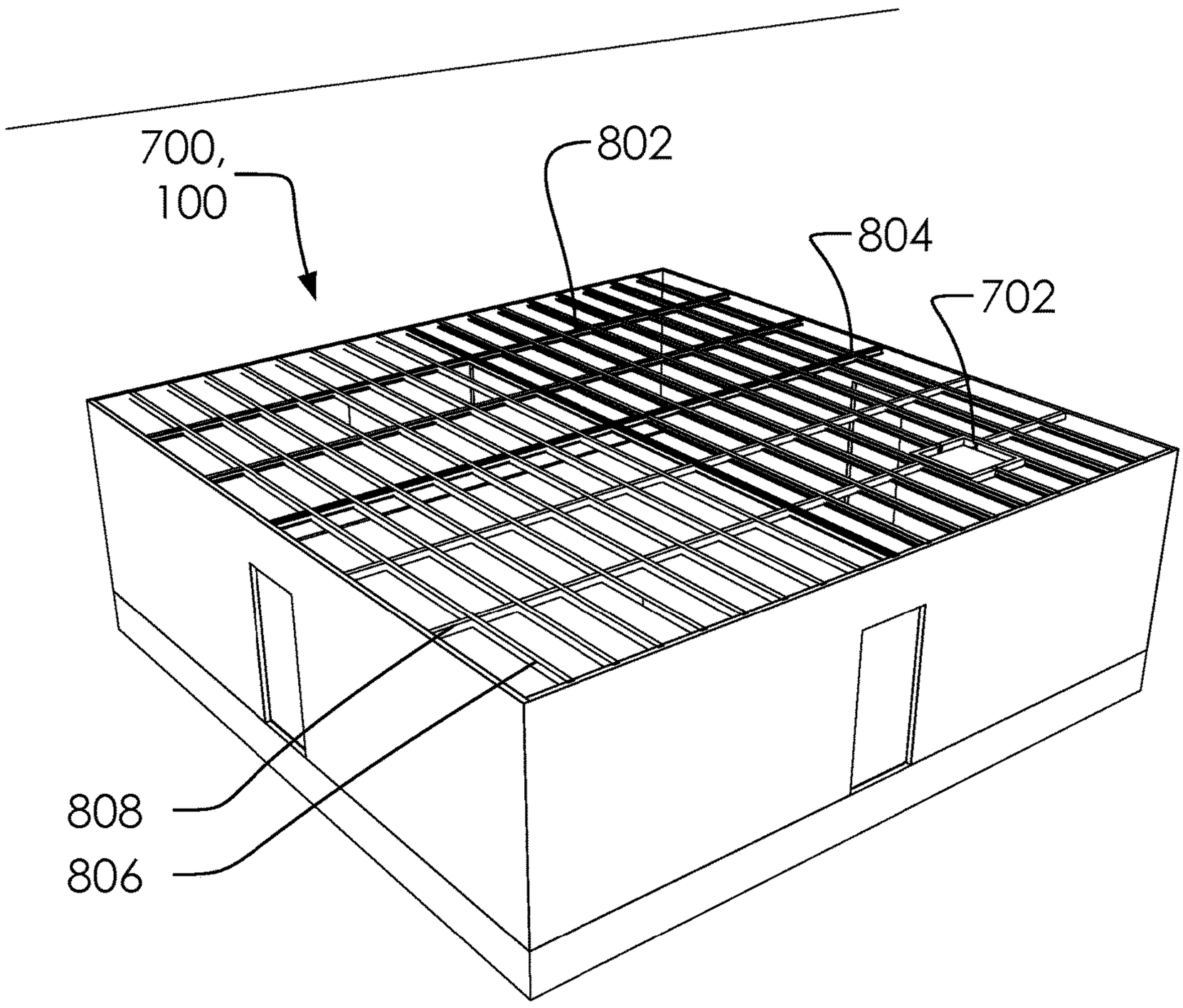


FIG. 8

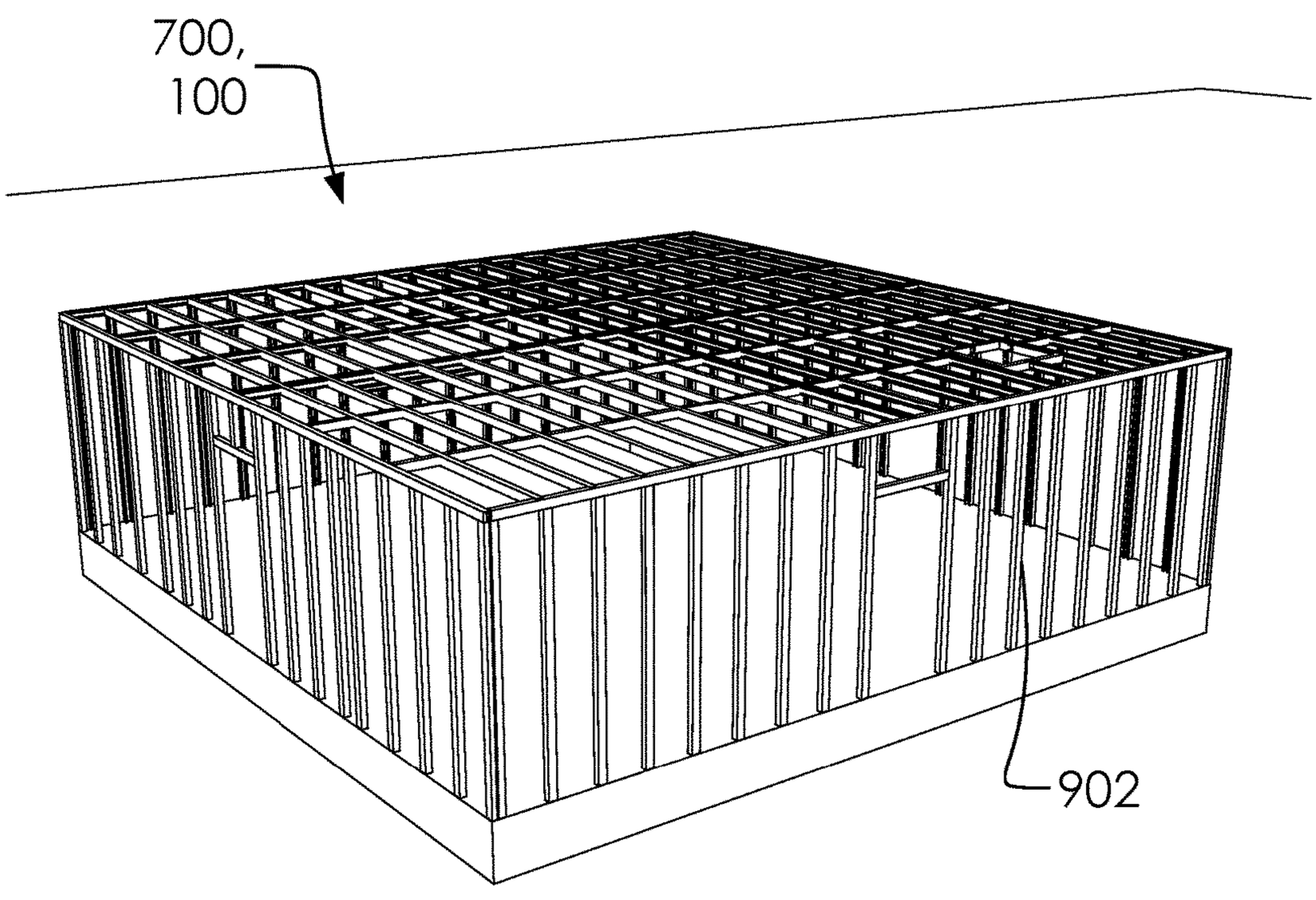


FIG. 9

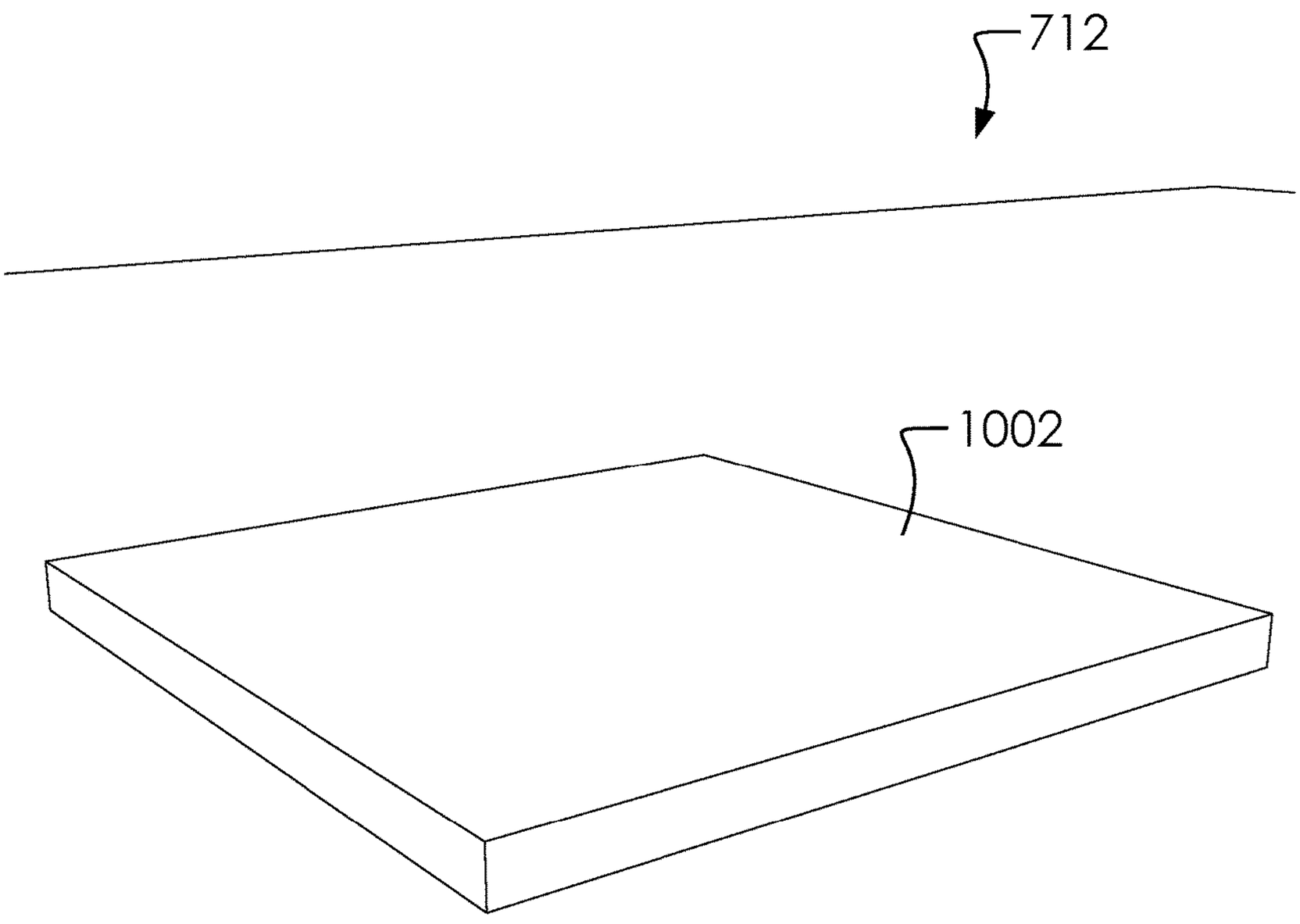


FIG. 10

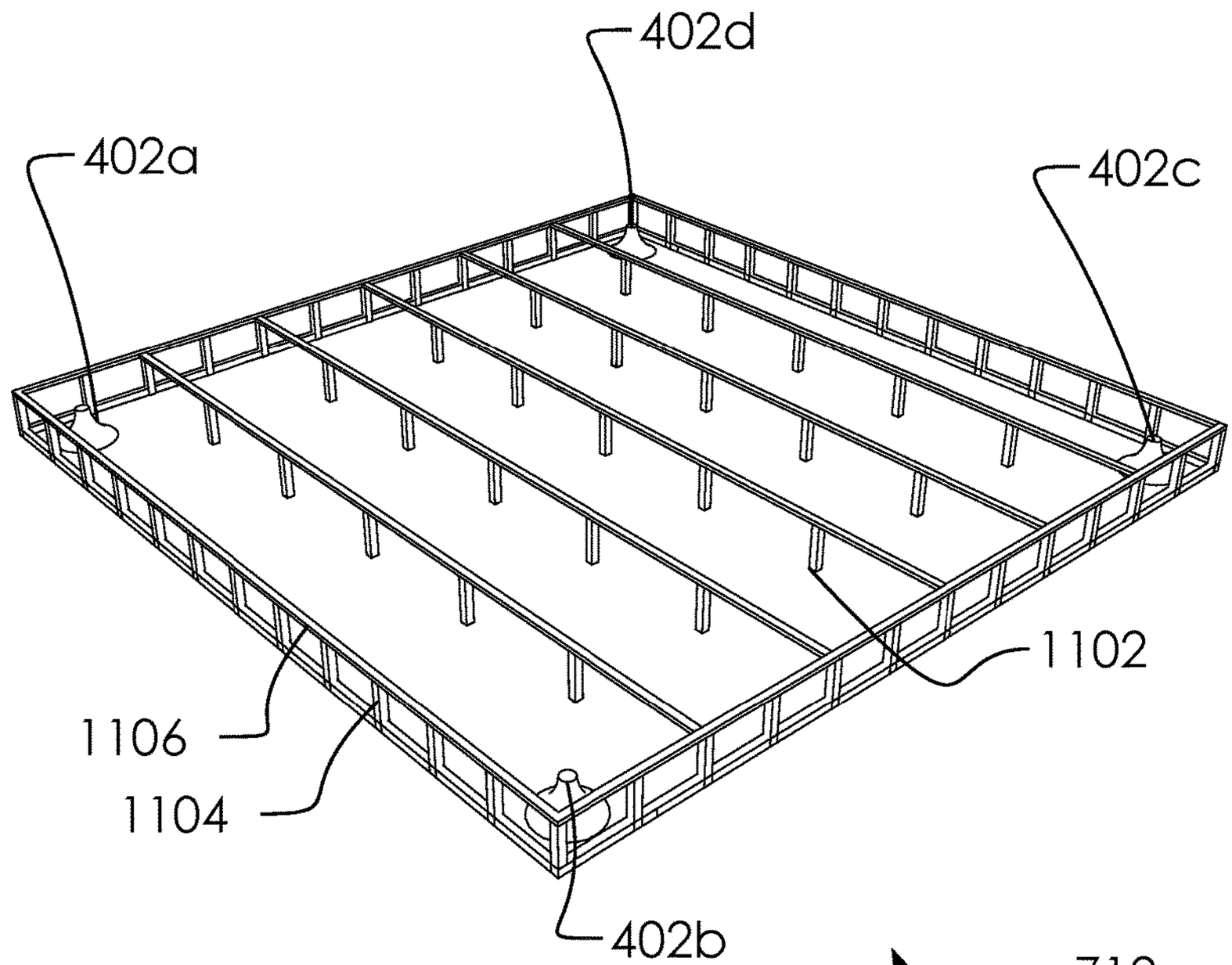


FIG. 11

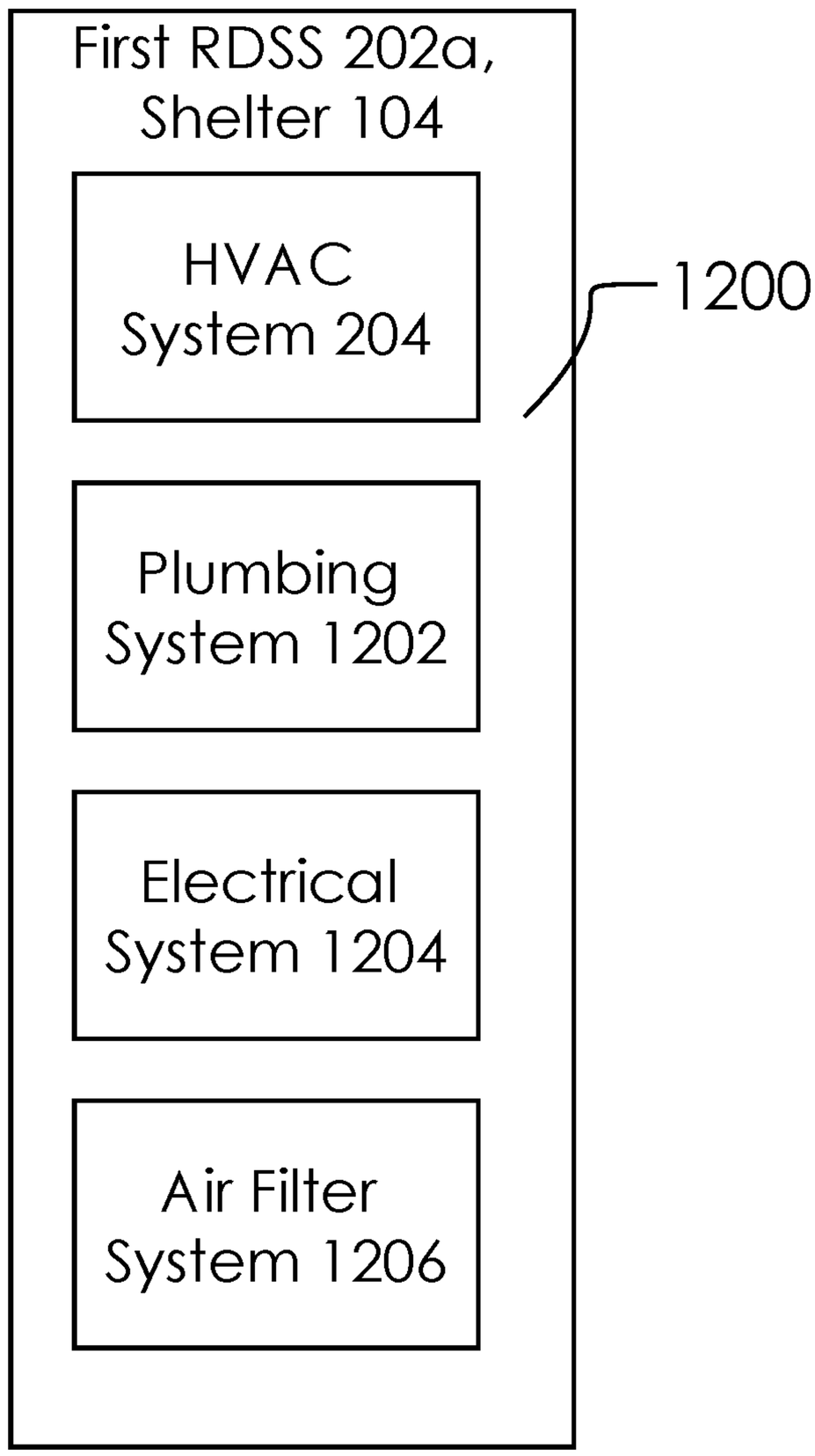

First RDSS 202a,
Shelter 104
HVAC
System 204
1200
Plumbing
System 1202
Electrical
System 1204
Air Filter
System 1206

FIG. 12

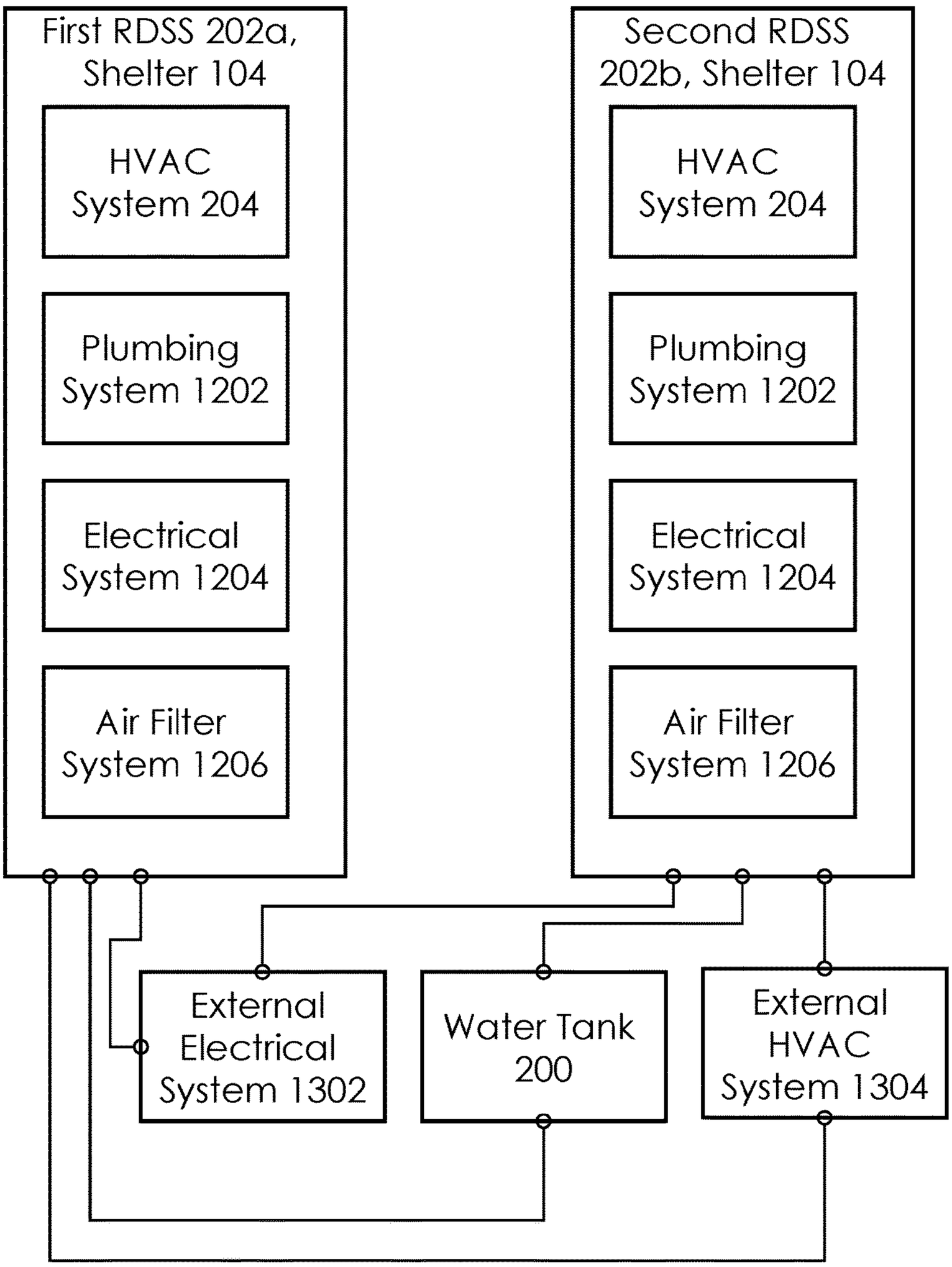

First RDSS 202a, Shelter 104
HVAC System 204
Plumbing System 1202
Electrical System 1204
Air Filter System 1206
Second RDSS 202b, Shelter 104
HVAC System 204
Plumbing System 1202
Electrical System 1204
Air Filter System 1206
External Electrical System 1302
Water Tank 200
External HVAC System 1304

FIG. 13

MILITARY HOUSING SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims benefit to U.S. Patent Application No. 62/334,035 filed on May 10, 2016.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT (IF APPLICABLE)

[0002] Not applicable.

REFERENCE TO SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISC APPENDIX (IF APPLICABLE)

[0003] Not applicable.

BACKGROUND OF THE INVENTION

[0004] "RDSS", a.k.a. "Rapid Deployment Shelter System" or DRASH (Deployable Rapid Assembly Shelter) is a portable, geodesic shelter that can be set up within minutes of arriving on site with no special tools. The structure is supported by composite struts. DHS Systems LLC handles all the manufacturing, maintenance, training and sales for these shelters. https://en.wikipedia.org/wiki/DRASH

[0005] Quoting further from Wikipedia:

[0006] "DHS Systems founder and CEO A. Jon Prusmack began building DRASH shelters more than 20 years ago after being inspired by pop-up geodesic domes he came across at trade shows. He founded the company in 1984 and DRASH shelters quickly started to be purchased by military units for use as command posts, tactical operations centers, communications centers, battalion aid stations, and forward surgical support stations.

[0007] "In 2004, the Carlyle Group invested in DHS Systems and formed its new parent company DHS Technologies. In 2009, it was reported that the company was working on a line of shelters that better matched power supply to demand.

[0008] The company also plans to begin incorporating a new energy efficient insulation barrier, insect repellents and a shelter that can protect sensitive equipment from electromagnetic pulses and radio frequency interference.

[0009] "The United States Military and NATO are using DRASH shelters in place of the various tents and shelters used in the past. The Department of Defense has awarded DRASH several contracts.

[0010] Most notably, in 2008, the U.S. Army contracted DRASH manufacturer DHS Systems and Northrop Grumman Corporation to provide a family of trailer-mounted support systems under its Standard Integrated Command Post System (SICPS) program. Under the contract, DHS is manufacturing DRASH shelters, while Northrop will be responsible for program management and integrated logistics support.

[0011] "DRASH shelters have been deployed extensively since the beginning of the wars in Iraq and Afghanistan. DRASH is also currently in use with troops stationed around the world, including the Third Army in Kuwait, and Joint Task Force Bravo's Mobile Surgical Team in Honduras. DRASH has logistics teams on site in Iraq, Kuwait, Germany and Eastern Europe. These teams do all of the repair and support work for the shelters, generators and trailers."

[0012] One objective of this disclosure is to establish a safer RDSS to protect military personnel, and personnel in harm's way, from NBC (Nuclear Biological and Chemical) harm.

[0013] Further, it is objective that this improved RDSS be quickly deployed, as discussed below.

[0014] Now, quoting the FEMA 453 (May 2006):

[0015] "The attack against the Alfred P. Murrah Federal Office Building in Oklahoma City and the anthrax attacks in October 2001 made it clear that chemical, biological, radiological, and explosive (CBRE) attacks are a credible threat to our society."

[0016] Accordingly, CBRE and NBC can be read as similar threats which this system aims to protect from a range of risks. However, it is not required that the disclosed system protect from all CBRE and NBC threats.

[0017] Prior art known to the Applicant includes U.S. Pat. No. 2,877,508 A, EP1033451 A2, and US 20050066590 A1.

[0018] None of the known inventions and patents, taken either singularly or in combination, is seen to describe the instant disclosure as claimed.

BRIEF SUMMARY OF THE INVENTION

[0019] A shelter system is disclosed. Said shelter system comprises a shelter, a one or more ground anchors and a life support system. Said shelter comprises a plurality of hooks, a one or more sockets, a frame, said life support system, a plurality of walls, a roof and a floor. Said shelter weighs less than 8000 pounds. Said frame is a metal frame. Said life support system comprises a plumbing system, an electrical system, an air filter system and a HVAC system. Said shelter system comprises a suspension system. Said suspension system comprises a ring, an upper tether cables and a lower tether cables. Said frame comprises a roof support, a roof studs, a first set of studs, a second set of studs and a one or more wall studs. Said floor comprises said one or more sockets, an outer layer, a floor support, a vertical supports and a horizontal supports.

[0020] A shelter system is disclosed. Said shelter system comprises a shelter, a one or more ground anchors and a life support system. Said shelter comprises a plurality of hooks, a one or more sockets, a frame, said life support system, a plurality of walls, a roof and a floor.

[0021] A shelter system is disclosed. Said shelter system comprises a one or more ground anchors, a life support system and a plurality of shelters. A shelter comprises a plurality of hooks, a one or more sockets, a frame, said life support system, a plurality of walls, a roof and a floor. Said life support system comprises a plumbing system, an electrical system, an air filter system and a HVAC system. Said life support system comprise a shared resource between a plurality of said shelters.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

[0022] FIG. **1** illustrates a perspective overview view of a shelter system **100**.

[0023] FIG. **2** illustrates a perspective overview view of a plurality of shelters **202**.

[0024] FIG. **3** illustrates an elevated top side view of a plurality of shelters **202**.

[0025] FIG. **4**A illustrates a perspective overview view of a shelter system **100**.

[0026] FIG. **4**B illustrates a perspective bottom side view of a shelter system **100**.

[0027] FIG. **5** illustrates a flow chart view of an installation procedure **500**.

[0028] FIG. **6** illustrates an elevated front side view of a suspension system **600**.

[0029] FIG. **7**A illustrates a perspective overview view of an exemplary RDSS **700**.

[0030] FIG. **7**B illustrates an elevated top side view of an exemplary RDSS **700** in cross-section view.

[0031] FIG. **8** illustrates a perspective overview view of an exemplary RDSS **700** being partially disassembled.

[0032] FIG. **9** illustrates a perspective overview view of an exemplary RDSS **700** being partially disassembled.

[0033] FIG. **10** illustrates a perspective overview view of a floor **712**.

[0034] FIG. **11** illustrates a perspective overview view of a floor **712** being partially disassembled.

[0035] FIG. **12** illustrates a flow chart view of a first shelter **202***a*.

[0036] FIG. **13** illustrates a flow chart view of a plurality of shelters **202**.

DETAILED DESCRIPTION OF THE INVENTION

[0037] The following description is presented to enable any person skilled in the art to make and use the invention as claimed and is provided in the context of the particular examples discussed below, variations of which will be readily apparent to those skilled in the art. In the interest of clarity, not all features of an actual implementation are described in this specification. It will be appreciated that in the development of any such actual implementation (as in any development project), design decisions must be made to achieve the designers' specific goals (e.g., compliance with system- and business-related constraints), and that these goals will vary from one implementation to another. It will also be appreciated that such development effort might be complex and time-consuming, but would nevertheless be a routine undertaking for those of ordinary skill in the field of the appropriate art having the benefit of this disclosure. Accordingly, the claims appended hereto are not intended to be limited by the disclosed embodiments, but are to be accorded their widest scope consistent with the principles and features disclosed herein.

[0038] These parts are illustrated in the figures and discussed below:

[0039] a shelter system **100**

[0040] a helicopter **102**

[0041] a shelter **104**

[0042] a plurality of hooks **106**

[0043] a first hook **106***a*

[0044] a second hook **106***b*

[0045] a third hook **106***c*

[0046] a fourth hook **106***d*

[0047] a one or more ground anchors **108**

[0048] a first ground anchor **108***a*

[0049] a second ground anchor **108***b*

[0050] a third ground anchor **108***c*

[0051] a fourth ground anchor **108***d*

[0052] a ground **110**

[0053] a water tank **200**

[0054] a plurality of shelters **202**

[0055] a first shelter **202***a*

[0056] a second shelter **202***b*

[0057] a third shelter **202***c*

[0058] a fourth shelter **202***d*

[0059] a fifth shelter **202***e*

[0060] a sixth shelter **202***f*

[0061] a HVAC system **204**

[0062] a one or more passages **300**

[0063] a first passageway **300***a*

[0064] a second passageway **300***b*

[0065] a third passageway **300***c*

[0066] a fourth passageway **300***d*

[0067] a fifth passageway **300***e*

[0068] a sixth passageway **300***f*

[0069] a one or more sockets **402**

[0070] a first socket **402***a*

[0071] a second socket **402***b*

[0072] a third socket **402***c*

[0073] a fourth socket **402***d*

[0074] an installation procedure **500**

[0075] a first step **502**

[0076] a second step **504**

[0077] a third step **506**

[0078] a fourth step **508**

[0079] a suspension system **600**

[0080] a ring **602**

[0081] an upper tether cables **604**

[0082] a lower tether cables **606**

[0083] an exemplary RDSS **700**

[0084] a hatch **702**

[0085] a one or more doors **704**

[0086] a first door **704***a*

[0087] a second door **704***b*

[0088] a third door **704***c*

[0089] a one or more windows **706**

[0090] a first window **706***a*

[0091] a plurality of walls **708**

[0092] a first wall **708***a*

[0093] a second wall **708***b*

[0094] a third wall **708***c*

[0095] a fourth wall **708***d*

[0096] a roof **710**

[0097] a floor **712**

[0098] a frame **800**

[0099] a roof support **802**

[0100] a roof studs **804**

[0101] a first set of studs **806**

[0102] a second set of studs **808**

[0103] a one or more wall studs **902**

[0104] an outer layer **1002**

[0105] a floor support **1102**

[0106] a vertical supports **1104**

[0107] a horizontal supports **1106**

[0108] a life support system **1200**

[0109] a plumbing system **1202**

[0110] an electrical system **1204**

[0111] an air filter system **1206**

[0112] an external electrical system **1302**

[0113] an external HVAC system **1304**

[0114] FIG. **1** illustrates a perspective overview view of a shelter system **100**.

[0115] In one embodiment, said shelter system **100** can comprise said helicopter **102**, said shelter **104**, said plurality of hooks **106**, said one or more ground anchors **108** and said ground **110**.

[0116] In one embodiment, said plurality of hooks **106** can comprise said first hook **106***a*, said second hook **106***b*, said third hook **106***c* and said fourth hook **106***d*.

[0117] In one embodiment, said one or more ground anchors **108** can comprise said first ground anchor **108***a*, said second ground anchor **108***b*, said third ground anchor **108***c* and said fourth ground anchor **108***d*.

[0118] As noted in the background section above, "RDSS", a.k.a. "Rapid Deployment Shelter System" or DRASH (Deployable Rapid Assembly Shelter) is a portable, geodesic shelter that can be set up within minutes of arriving on site with no special tools. The structure is supported by composite struts. DHS Systems LLC handles all the manufacturing, maintenance, training and sales for these shelters.

[0119] Said shelter system **100** can comprise a system designed for quick deployment in high risk theaters. One potential means of moving said shelter system **100** around quickly can comprise a helicopter **102**, as illustrated.

[0120] In one embodiment, said shelter system **100** can comprise said plurality of hooks **106** for selectively attaching said helicopter **102** to said shelter system **100**.

[0121] In one embodiment, said one or more ground anchors **108** can be used to guide and secure said shelter **104** to said ground **110** quickly and securely. Wherein, said ground **110** can be prepped ahead of the arrival of said helicopter **102** with said one or more ground anchors **108**.

[0122] FIG. **2** illustrates a perspective overview view of a plurality of shelters **202**.

[0123] In one embodiment, said plurality of shelters **202** can comprise said water tank **200**, said first shelter **202***a*, said second shelter **202***b*, said third shelter **202***c*, said fourth shelter **202***d*, said fifth shelter **202***e* and said sixth shelter **202***f*.

[0124] In one embodiment, said shelter system **100** can comprise said water tank **200** and said HVAC system **204**.

[0125] In one embodiment, said RDSS **100** can comprise a plurality of said shelter **104** being linked together as now discussed with said RDSS compound **202**. Further, in one embodiment, said RDSS **100** can comprise said water tank **200** for life support.

[0126] In one embodiment, said water tank **200** can be linked through plumbing into and out of said RDSS compound **202**.

[0127] FIG. **3** illustrates an elevated top side view of a plurality of shelters **202**.

[0128] In one embodiment, said one or more passages **300** can comprise said first passageway **300***a*, said second passageway **300***b*, said third passageway **300***c*, said fourth passageway **300***d*, said fifth passageway **300***e* and said sixth passageway **300***f*.

[0129] In one embodiment, said shelter system **100** can comprise said one or more passages **300**.

[0130] In one embodiment, said plurality of shelters **202** can comprise said one or more passages **300**.

[0131] In one embodiment, said RDSS compound **202** can be connected to one another with said one or more passages **300**, as illustrated. Said first RDSS **202***a* is connected to said second RDSS **202***b* with said first passageway **300***a*, said sixth RDSS **202***f* with said fifth passageway **300***e*; said second RDSS **202***b* to said fifth RDSS **202***e* with said sixth passageway **300***f* and said third RDSS **202***c* with said second passageway **300***b*; said third RDSS **202***c* is connected to said fourth RDSS **202***d* with said **300***g*/; said sixth RDSS **202***f* to said fifth RDSS **202***e* with said fourth passageway **300***d*; and said fifth RDSS **202***e* to said fourth RDSS **202***d* with said third passageway **300***c*.

[0132] Said RDSS compound **202** can comprise a variety of shelter types can be landed and linked within said RDSS compound **202**. For example, in one embodiment, said first RDSS **202***a* can comprise a workspace, said second RDSS **202***b* can comprise a dining hall, said third RDSS **202***c* can comprise a washroom, said fourth RDSS **202***d* can comprise a sleeping bunk, and so on.

[0133] FIG. **4**A illustrates a perspective overview view of a shelter system **100**.

[0134] FIG. **4**B illustrates a perspective bottom side view of a shelter system **100**.

[0135] In one embodiment, said one or more sockets **402** can comprise said first socket **402***a*, said second socket **402***b*, said third socket **402***c* and said fourth socket **402***d*.

[0136] In one embodiment, said shelter **104** can comprise said one or more sockets **402**.

[0137] In one embodiment, said helicopter **102** can deliver said shelter **104** to said RDSS compound **202**, as discussed above.

[0138] In one embodiment, said shelter **104** can each comprise said one or more sockets **402** for selectively mating with said one or more ground anchors **108**.

[0139] FIG. **5** illustrates a flow chart view of an installation procedure **500**.

[0140] In one embodiment, said installation procedure **500** can comprise said first step **502**, said second step **504**, said third step **506** and said fourth step **508**.

[0141] In one embodiment, said shelter system **100** can comprise said installation procedure **500**.

[0142] In one embodiment, attaching said one or more sockets **402** to said one or more ground anchors **108** can comprise using said installation procedure **500**.

[0143] Said first step **502** can comprise aligning said RDSS **100** with said one or more ground anchors **108** on said ground **110**; said second step **504** can comprise lowering said RDSS **100** onto said one or more ground anchors **108**; said third step **506** can comprise aligning said one or more sockets **402** with said one or more ground anchors **108**; and said fourth step **508** can comprise securing said RDSS **100** to said ground **110**.

[0144] In another embodiment, said shelter **104** can be placed on said ground **110** without said one or more sockets **402** and said one or more ground anchors **108**. In another embodiment, said shelter **104** can be delivered without use of said helicopter **102**.

[0145] FIG. **6** illustrates an elevated front side view of a suspension system **600**.

[0146] In one embodiment, said suspension system **600** can comprise said ring **602**, said upper tether cables **604** and said lower tether cables **606**.

[0147] In one embodiment, said shelter system **100** can comprise said suspension system **600**.

[0148] In one embodiment, said RDSS **100** can comprise said suspension system **600** for delivery by said helicopter **102**. In one embodiment, said suspension system **600** can selectively attach to said plurality of hooks **106**.

[0149] In one embodiment, said upper tether cables **604** attaches to said helicopter **102** and said ring **602**; said lower tether cables **606** attaches to said plurality of hooks **106** and said ring **602**. Other means for holding and delivering cargo

may be known to persons in the art and/or be treated as incorporated by reference by this application.

[0150] FIG. **7**A illustrates a perspective overview view of an exemplary RDSS **700**.

[0151] FIG. **7**B illustrates an elevated top side view of an exemplary RDSS **700** in cross-section view.

[0152] In one embodiment, said exemplary RDSS **700** can comprise said hatch **702**, said one or more doors **704**, said one or more windows **706**, said plurality of walls **708**, said roof **710** and said floor **712**.

[0153] In one embodiment, said one or more doors **704** can comprise said first door **704***a*, said second door **704***b* and said third door **704***c*.

[0154] In one embodiment, said one or more windows **706** can comprise said first window **706***a*.

[0155] In one embodiment, said plurality of walls **708** can comprise said first wall **708***a*, said second wall **708***b*, said third wall **708***c* and said fourth wall **708***d*.

[0156] In one embodiment, said shelter system **100** can comprise said exemplary RDSS **700**.

[0157] In one embodiment, said shelter **104** can be designed to be linked together through said one or more doors **704** and/or hatch **702** and/or one or more windows **706**.

[0158] FIG. **8** illustrates a perspective overview view of an exemplary RDSS **700** being partially disassembled.

[0159] In one embodiment, said roof studs **804** can comprise said first set of studs **806** and said second set of studs **808**.

[0160] In one embodiment, said shelter system **100** can comprise said frame **800**.

[0161] In one embodiment, said exemplary RDSS **700** can comprise said roof support **802** and said roof studs **804**.

[0162] FIG. **8-11** can comprise one construction means for the current system. Other construction methods may be known in the art and implemented under the current disclosure's parameters.

[0163] As a study into the feasibility of this system, we have calculated that a similar vessel may be a recreational vehicle which has a ratio of weight to square feet of 21.3 pounds per square feet of living space. Provided that materials used in military environments are lighter and stronger than those of RVs, it is possible that this ratio can be improved. Further a Chinook helicopter has a cargo capacity of 14000-28000 pounds. Taking an average of each variable, it is plausible to lift a 986 square foot structure and deliver it by air in this fashion. With advancements in carbon fiber, this may be an under estimate. FIGS. **8-11** show a conventional construction approach, but advanced materials enable new and different designs, as is known in the art.

[0164] In one embodiment, said shelter **104** can be built with a metal frame.

[0165] FIG. **9** illustrates a perspective overview view of an exemplary RDSS **700** being partially disassembled.

[0166] In one embodiment, said exemplary RDSS **700** can comprise said one or more wall studs **902**.

[0167] FIG. **10** illustrates a perspective overview view of a floor **712**.

[0168] In one embodiment, said floor **712** can comprise said outer layer **1002**.

[0169] FIG. **11** illustrates a perspective overview view of a floor **712** being partially disassembled.

[0170] In one embodiment, said shelter system **100** can comprise said floor support **1102**, said vertical supports **1104** and said horizontal supports **1106**.

[0171] In one embodiment, said floor **712** can comprise said floor support **1102**, said vertical supports **1104** and said horizontal supports **1106**.

[0172] Now, quoting from FEMA 453, we address the design approach and best practices proposed by that publication for this project. That FEMA publication is hereby incorporated by reference:

[0173] "Manmade threats include threats of terrorism, technological accidents, assassinations, kidnappings, hijackings, and cyber-attacks (computer-based), and the use of CBRE weapons. High-risk targets include military and civilian government facilities, international airports, large cities, and high-profile landmarks. Terrorists might also target large public gatherings, water and food supplies, utilities, and corporate centers. Further, they are capable of spreading fear by sending explosives or chemical and biological agents through the mail . . . [herein it is considered where a shelter] may be located. It discusses how shelter use (either single or multiple) may affect the type of shelter selected and the location of that shelter on a particular site. The chapter describes key operations zones in and around a shelter that need to be taken into consideration as a means to provide safe ingress and egress and medical assistance to victims of a manmade event (terrorist attack or technological accident). The decision to enter a shelter is made by the senior management staff based on notification of a credible threat or as a result of an actual disaster. The National Incident Management System (NIMS) and the Catastrophic Incident Supplement (CIS) to the NRP established the procedures to respond to and recover from a CBRE event."

[0174] Further, said RDSS **100** can comprise a single use shelter under the FEMA guidelines:

[0175] "Single-use shelters. Single-use shelters are used only in the event of a hazard event. One advantage of single-use shelters is a potentially simplified design that may be readily accepted by the authority having local jurisdiction. These shelters typically have simplified electrical and mechanical systems because they are not required to provide normal daily accommodations for people. Single-use shelters are always ready for occupants and will not be cluttered with furnishings and storage items, which is a concern with multi-use shelters. Simplified, single-use shelters may have a lower total cost of construction than multi-use shelters.

[0176] "The cost of building a single-use shelter is much higher than the additional cost of including shelter protection in a multiuse room. Existing maintenance plans will usually consider multi-use rooms, but single-use shelters can be expected to require an additional annual maintenance cost."

[0177] Said RDSS **100** can comprise lighting and emergency design considerations under section 1.8 of FEMA 453.

[0178] Further:

[0179] "Heating and cooling the safe room. A safe room does not require heating and cooling; however, in extreme weather, the conditions in the safe room may become uncomfortable due to the lack of ventilation or the introduction of outdoor air that is not tempered. In hot weather, this can be worsened by the temperature rise that occurs as air passes through the filter unit. Because of the relatively high pressure drop across the high efficiency filters, the

temperature of the air typically increases by 5 to 10 degrees Fahrenheit as it passes through the filter unit. The use of inefficient fans, such as brush-type high-speed fans, should be avoided for this reason, because a temperature rise of 15 degrees can result.

[0180] "Control system. An interlocking system should be considered for closing automatic dampers (as shown in FIG. **3-2**), turning off air-handling units, exhaust fans, and ventilation fans serving the building's unprotected spaces while the safe room is in the protective mode. This increases the level of protection the safe room provides against an outdoor release of agent.

[0181] "Heating system safety. If a fuel-fired indirect heater (i.e., heat exchanger) is used to heat the safe room, a carbon monoxide detector with a visual display and an audible alarm should be installed in the safe room. Electric coil and hot water coil systems do not require a carbon monoxide detector.

[0182] "Pressure gauge. For Class 1 Safe Rooms, the pressure gauge is the indicator that the system is operating properly. This gauge displays the pressure in the safe room relative to outdoors or outside the safe room indoors. If the reference pressure is measured indoors, the readings can be subject to variations caused by fan pressures unless other building heating, ventilation, and air conditioning (HVAC) fans are turned off when the safe room is in use. Reading the reference pressure outdoors can be subject to positive and negative variations caused by air flows over and around the building. If the pressure sensor is outdoors, it should be shielded from the wind. Indoors is the best location if the building HVAC fans are turned off when the safe room is in use.

[0183] "Status indicators. For safe rooms that require multiple automatic dampers to isolate the safe room from the HVAC ducts in the protective mode, status lights and/or visual indicators should be used to show the position of each damper. Indicators can also be used to show door position, if there are multiple boundary doors in the safe room. Each status light should be marked with a reference number corresponding to a diagram so an operator can easily determine the location of any damper/door and conduct troubleshooting if problems occur. The indicator lights should have push-to-test capability for the light bulbs of the status lights."

[0184] Next:

[0185] "Maintenance of the Class 1 Safe Room consists primarily of serviceability checks and replacing filters. Serviceability checks should be performed about every 2 months by turning the system on and checking for the following while it is operating:

[0186] "System pressure. The system pressure is indicated by a gauge typically mounted on the control panel, with the correct operating range marked on the gauge. If the pressure is outside this range while the system operates, troubleshooting should be initiated.

[0187] "Isolation dampers. Correct damper positioning is indicated by damper status lights on the control panel. Troubleshooting should be initiated if the status lights indicate a damper is not properly positioned.

[0188] "Relief damper. If the system contains a pressure-relief damper, it should be visually inspected while the system is operating. A properly functioning relief damper should be open when the safe room is pressurized, and it should close immediately when a door is opened into the safe room, releasing pressure.

[0189] "HEPA filter resistance. The differential pressure across the HEPA filter is measured by a gauge mounted on the filter unit with taps on either side of the HEPA filter. If the pressure across the filter is greater than specified (approximately 3 iwg or higher), it is an indication that the HEPA filter has become loaded with dust and its higher resistance is reducing the flow rate of the filter unit. If such is the case, the HEPA filter should be changed.

[0190] "Cooling system. If the safe room supply air is cooled and heated, the temperature of the air flowing from the supply register should be checked with a thermometer during serviceability checks. In warm weather, this should be approximately 55 degrees if the cooling system is operating properly.

[0191] "Door latches. All doors into the safe room should be adjusted to latch automatically with the force of the door closer. For safe rooms with multiple doors, leakage past unlatched doors can cause internal pressure to fall below the specified operating range.

[0192] "Weather stripping. The weather stripping on each door on the boundary of the safe room should be visually inspected to ensure it has not been removed or damaged through wear and tear. For wipe seals at the bottom of the door, the alignment and height of the seal above the floor should be inspected and adjusted as necessary.

[0193] "Filters. Routine maintenance includes replacing filters. If a canister-type filter is used, it is replaced as a unit at its expiration date. For other types of filter units, three types of filters are replaced: the pre-filter, HEPA filter, and carbon absorber. Ideally, with only intermittent operation, all three types of filters should be replaced at the same time, every 3 to 4 years. This period is defined mainly by the service life of the adsorbed.

[0194] "Each time the CBR filters are replaced, in-place leakage testing should be performed, except in the case of canister filters (see FIG. **3-4**), to ensure the critical seals between the filters and/or between the mounting frame and the filters are established properly (i.e., there is no leakage past the filters' peripheral seals). To test the seals of the HEPA filter, the unit is challenged with an aerosol; poly-alpha olefin (PAO) is the industry standard. To test the seals of the absorbers requires a chemical that is loosely adsorbed in the filter bed. Halide gases are typically used for this purpose. For the absorber, the criterion is that the leak must be less than 0.1 percent of the upstream concentration. For the HEPA filter, the criterion is 0.03 percent. Procedures for both tests are described in American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME) N510, Testing of Nuclear Air Treatment Systems.

[0195] FIG. **12** illustrates a flow chart view of a first shelter **202***a*.

[0196] In one embodiment, said shelter system **100** can comprise said life support system **1200**, said plumbing system **1202**, said electrical system **1204** and said air filter system **1206**.

[0197] Said RDSS compound **202** can be self-contained shelters, as illustrated in FIG. **12**. Here, all life support systems are self-contained within said shelter **104**.

[0198] FIG. **13** illustrates a flow chart view of a plurality of shelters **202**.

[0199] In one embodiment, said plurality of shelters **202** can comprise said external electrical system **1302** and said external HVAC system **1304**.

[0200] In one embodiment, said RDSS compound **202** can comprise a plurality of said shelter **104** which can be attached to one another, as illustrated.

[0201] In one embodiment, said RDSS compound **202** can share life support systems such as said external electrical system **1302**, said water tank **200**, and said external HVAC system **1304**

[0202] The following sentences are included for completeness of this disclosure with reference to the claims.

[0203] A shelter system is disclosed. Said shelter system comprises a shelter, a one or more ground anchors and a life support system. Said shelter comprises a plurality of hooks, a one or more sockets, a frame, said life support system, a plurality of walls, a roof and a floor. Said shelter weighs less than 8000 pounds. Said frame is a metal frame. Said life support system comprises a plumbing system, an electrical system, an air filter system and a HVAC system. Said shelter system comprises a suspension system. Said suspension system comprises a ring, an upper tether cables and a lower tether cables. Said frame comprises a roof support, a roof studs, a first set of studs, a second set of studs and a one or more wall studs. Said floor comprises said one or more sockets, an outer layer, a floor support, a vertical supports and a horizontal supports.

[0204] A shelter system is disclosed. Said shelter system comprises a shelter, a one or more ground anchors and a life support system. Said shelter comprises a plurality of hooks, a one or more sockets, a frame, said life support system, a plurality of walls, a roof and a floor.

[0205] Said floor comprises said one or more sockets, an outer layer, a floor support, a vertical supports and a horizontal supports.

[0206] Said shelter system comprises a suspension system. Said frame comprises a roof support, a roof studs, a first set of studs and a second set of studs.

[0207] A suspension system comprises a ring, an upper tether cables and a lower tether cables.

[0208] Said life support system comprises a plumbing system, an electrical system, an air filter system and a HVAC system.

[0209] A shelter system is disclosed. Said shelter system comprises a one or more ground anchors, a life support system and a plurality of shelters. A shelter comprises a plurality of hooks, a one or more sockets, a frame, said life support system, a plurality of walls, a roof and a floor. Said life support system comprises a plumbing system, an electrical system, an air filter system and a HVAC system. Said life support system comprise a shared resource between a plurality of said shelters.

[0210] Said frame is a metal frame.

[0211] Said shelter weighs less than 8000 pounds.

[0212] Said frame is a metal frame.

[0213] A suspension system comprises a ring, an upper tether cables and a lower tether cables.

[0214] Said plurality of shelters comprises said shelter or a plurality of said shelters.

[0215] Said floor comprises said one or more sockets, an outer layer, a floor support, a vertical supports and a horizontal supports.

[0216] Said frame comprises a roof support, a roof studs, a first set of studs, a second set of studs and a one or more wall studs.

[0217] Said shelter system comprises a suspension system.

[0218] Said shelter weighs less than 8000 pounds.

[0219] Said plurality of shelters comprises a one or more passages. Said one or more passages are configured to link said plurality of shelters.

[0220] Said shelter comprises a hatch.

[0221] Said floor comprises a floor support, a vertical supports and a horizontal supports.

[0222] Various changes in the details of the illustrated operational methods are possible without departing from the scope of the following claims. Some embodiments may combine the activities described herein as being separate steps. Similarly, one or more of the described steps may be omitted, depending upon the specific operational environment the method is being implemented in. It is to be understood that the above description is intended to be illustrative, and not restrictive. For example, the above-described embodiments may be used in combination with each other. Many other embodiments will be apparent to those of skill in the art upon reviewing the above description. The scope of the invention should, therefore, be determined with reference to the appended claims, along with the full scope of equivalents to which such claims are entitled. In the appended claims, the terms "including" and "in which" are used as the plain-English equivalents of the respective terms "comprising" and "wherein."

1. A shelter system, wherein:
said shelter system comprises a shelter, a one or more ground anchors and a life support system;
said shelter comprises a plurality of hooks, a one or more sockets, a frame, said life support system, a plurality of walls, a roof and a floor;
said shelter weighs less than 8000 pounds;
said frame is a metal frame;
said life support system comprises a plumbing system, an electrical system, an air filter system and a HVAC system;
said shelter system comprises a suspension system;
said suspension system comprises a ring, an upper tether cables and a lower tether cables;
said frame comprises a roof support, a roof studs, a first set of studs, a second set of studs and a one or more wall studs; and
said floor comprises said one or more sockets, an outer layer, a floor support, a vertical supports and a horizontal supports.

2. A shelter system, wherein:
said shelter system comprises a shelter, a one or more ground anchors and a life support system; and
said shelter comprises a plurality of hooks, a one or more sockets, a frame, said life support system, a plurality of walls, a roof and a floor.

3. The shelter system of claim **2** wherein:
said floor comprises said one or more sockets, an outer layer, a floor support, a vertical supports and a horizontal supports.

4. The shelter system of claim **2** wherein:
said shelter system comprises a suspension system; and
said frame comprises a roof support, a roof studs, a first set of studs and a second set of studs.

5. The shelter system of claim **2** wherein:
a suspension system comprises a ring, an upper tether cables and a lower tether cables.
6. The shelter system of claim **2** wherein:
said life support system comprises a plumbing system, an electrical system, an air filter system and a HVAC system.
7. A shelter system, wherein:
said shelter system comprises a one or more ground anchors, a life support system and a plurality of shelters;
a shelter comprises a plurality of hooks, a one or more sockets, a frame, said life support system, a plurality of walls, a roof and a floor;
said life support system comprises a plumbing system, an electrical system, an air filter system and a HVAC system; and
said life support system comprise a shared resource between a plurality of said shelters.
8. The shelter system of claim **2** wherein:
said frame is a metal frame.
9. The shelter system of claim **2** wherein:
said shelter weighs less than 8000 pounds.
10. The shelter system of claim **11** wherein:
said frame is a metal frame.
11. The shelter system of claim **11** wherein:
a suspension system comprises a ring, an upper tether cables and a lower tether cables.
12. The shelter system of claim **11** wherein:
said plurality of shelters comprises said shelter or a plurality of said shelters.
13. The shelter system of claim **11** wherein:
said floor comprises said one or more sockets, an outer layer, a floor support, a vertical supports and a horizontal supports.
14. The shelter system of claim **11** wherein:
said frame comprises a roof support, a roof studs, a first set of studs, a second set of studs and a one or more wall studs.
15. The shelter system of claim **11** wherein:
said shelter system comprises a suspension system.
16. The shelter system of claim **11** wherein:
said shelter weighs less than 8000 pounds.
17. The shelter system of claim **11** wherein:
said plurality of shelters comprises a one or more passages; and
said one or more passages are configured to link said plurality of shelters.
18. The shelter system of claim **2** wherein:
said shelter comprises a hatch.
19. The shelter system of claim **9** wherein:
said floor comprises a floor support, a vertical supports and a horizontal supports.

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