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(54) **MODULAR ENCLOSURE SYSTEM FOR INDUSTRIAL GENERATOR SETS**

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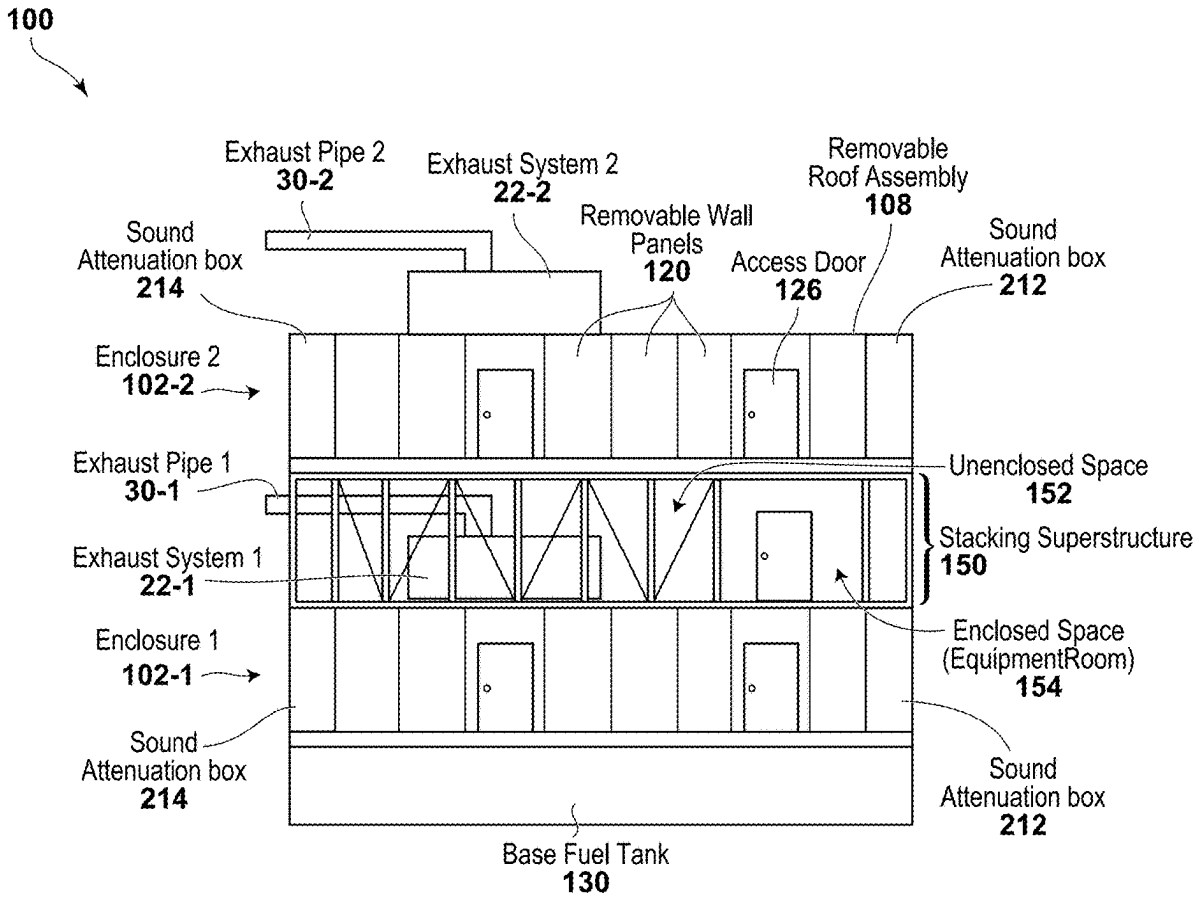
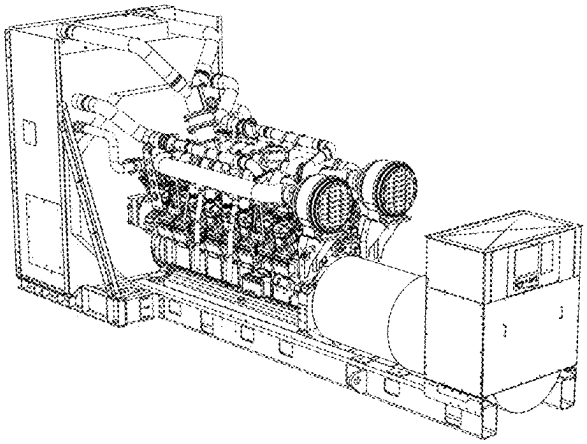
(52) **U.S. Cl.**

CPC ***F02B 63/044*** (2013.01); ***F02B 77/13*** (2013.01); *F02B 2063/045* (2013.01)

(57) **ABSTRACT**

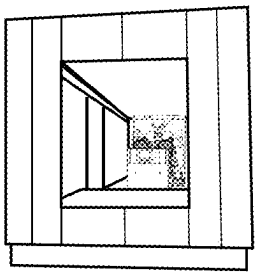
A modular enclosure system for industrial generator sets, which provides for a stacked arrangement of MegaWatt gas or diesel generators. A double-stack enclosure system comprises a first enclosure housing a first generator, a second enclosure housing a second generator, and a stacking superstructure. The stacking superstructure is supported by the first enclosure and the second enclosure is supported on the stacking superstructure. Each generator enclosure is modular, comprising a base, a skeletal frame, removable modular wall panels, and removable roof structure, which are attached externally to the skeletal frame. Removable end wall panels comprise sound attenuation boxes. The stacking superstructure has a skeletal frame that provides space for equipment, including an exhaust system for the first generator, and optional other equipment. Each generator is operated and exhausted independently. Removable wall and roof panels, and/or a removable rail mounting system, facilitate access to and removal of equipment for maintenance or swap-out.





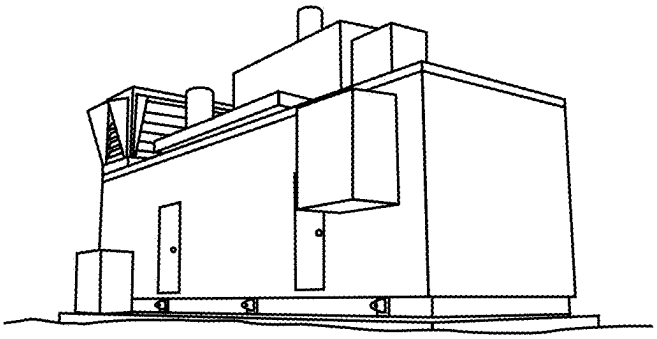
Example 2MW Generator

FIG. 1



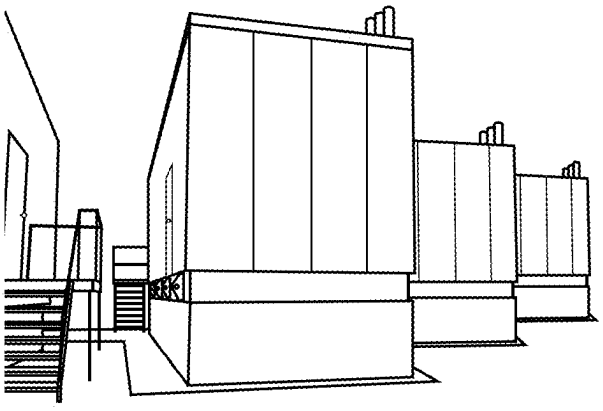
Example 2MW Generator Mounted Inside Enclosure

FIG. 2



Example Industrial Generator in Custom Enclosure

FIG. 3



Example Side-by-Side Arrangement of Multiple Generator Enclosures

FIG. 4

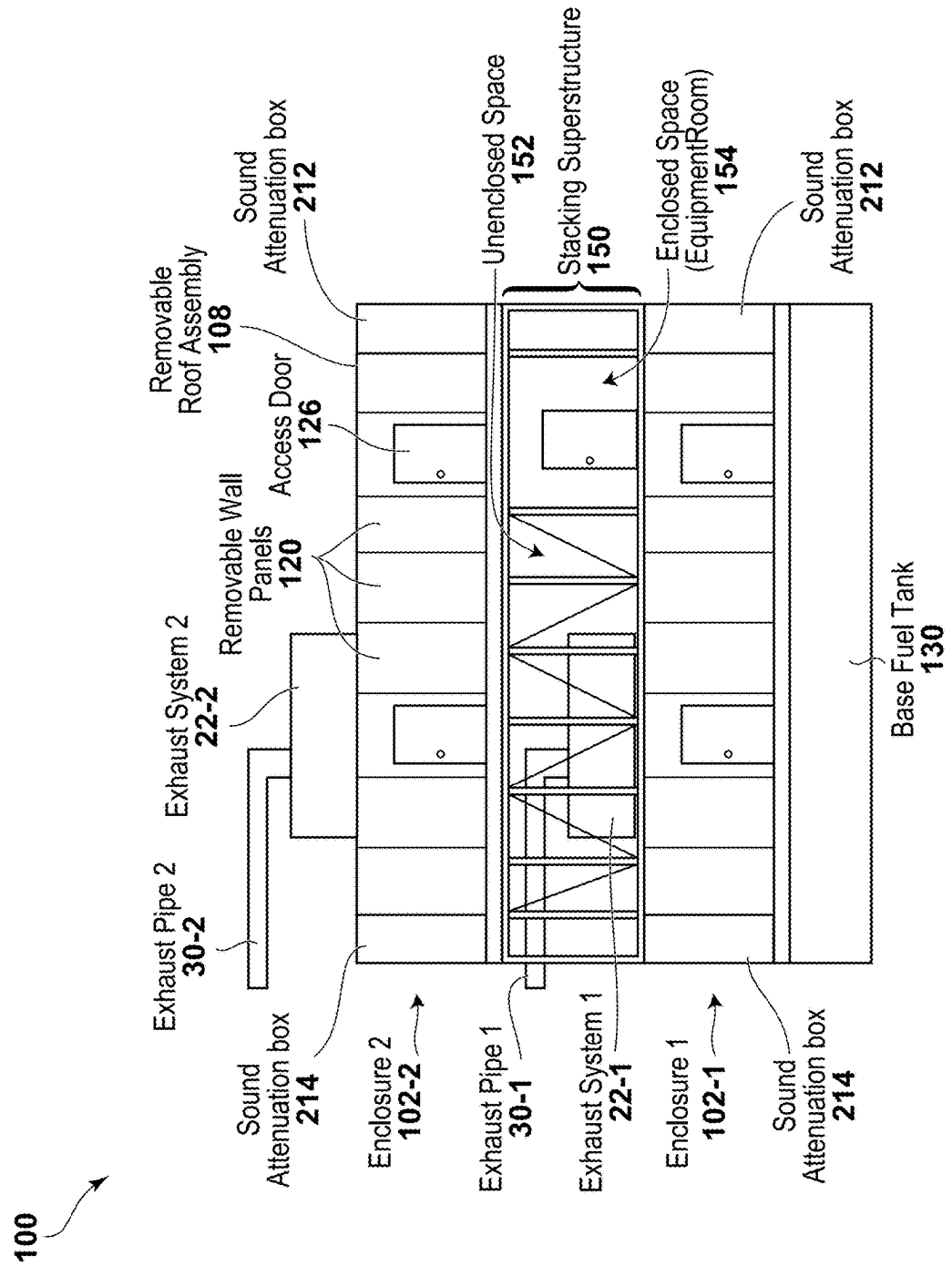

100
Exhaust Pipe 2
30-2
Exhaust System 2
22-2
Removable Wall Panels
120
Access Door
126
Removable Roof Assembly
108
Sound Attenuation box
212
Unenclosed Space
152
Stacking Superstructure
150
Enclosed Space (EquipmentRoom)
154
Sound Attenuation box
212
Base Fuel Tank
130
Sound Attenuation box
214
Enclosure 2
102-2
Exhaust Pipe 1
30-1
Exhaust System 1
22-1
Enclosure 1
102-1
Sound Attenuation box
214

FIG. 5

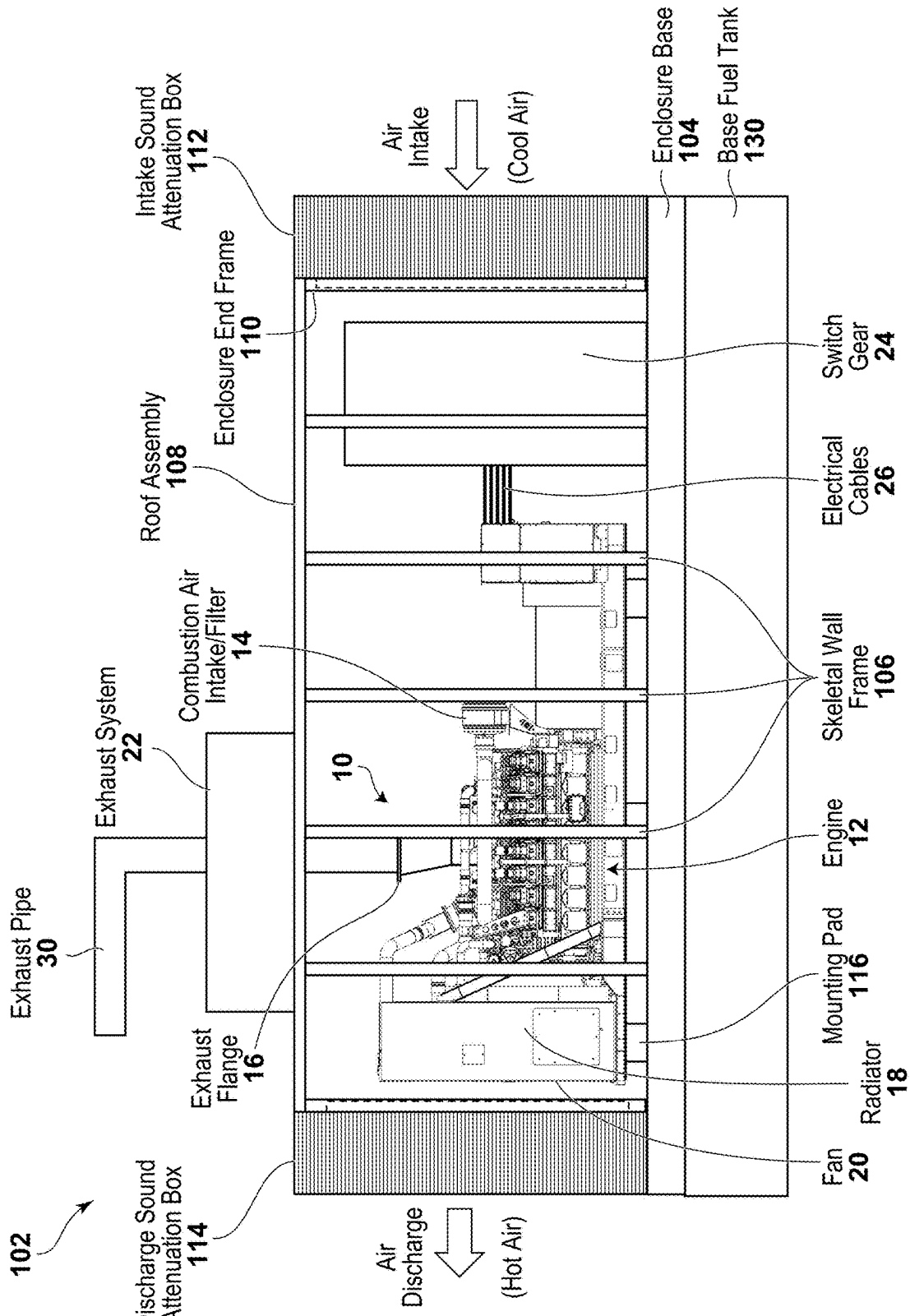

Intake Sound Attenuation Box 112
Air Intake
(Cool Air)
Enclosure Base 104
Base Fuel Tank 130
Enclosure End Frame 110
Switch Gear 24
Roof Assembly 108
Electrical Cables 26
Combustion Air Intake/Filter 14
Skeletal Wall Frame 106
Exhaust System 22
10
Engine 12
Exhaust Pipe 30
Mounting Pad 116
Exhaust Flange 16
Radiator 18
Fan 20
102
Discharge Sound Attenuation Box 114
Air Discharge
(Hot Air)

FIG. 6

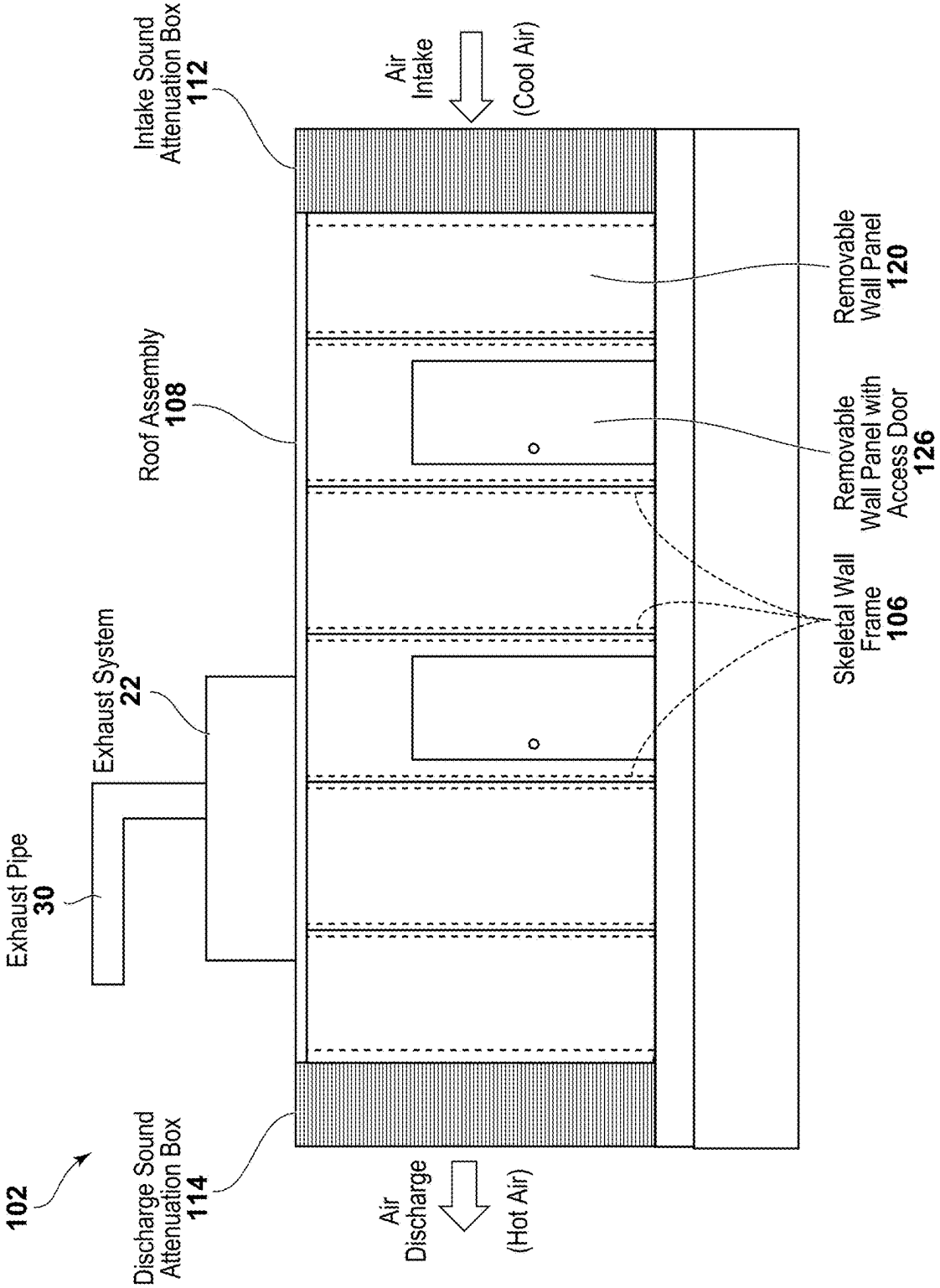

Intake Sound Attenuation Box 112
Air Intake
(Cool Air)
Roof Assembly 108
Removable Wall Panel 120
Removable Wall Panel with Access Door 126
Skeletal Wall Frame 106
Exhaust System 22
Exhaust Pipe 30
102
Discharge Sound Attenuation Box 114
Air Discharge
(Hot Air)

FIG. 7

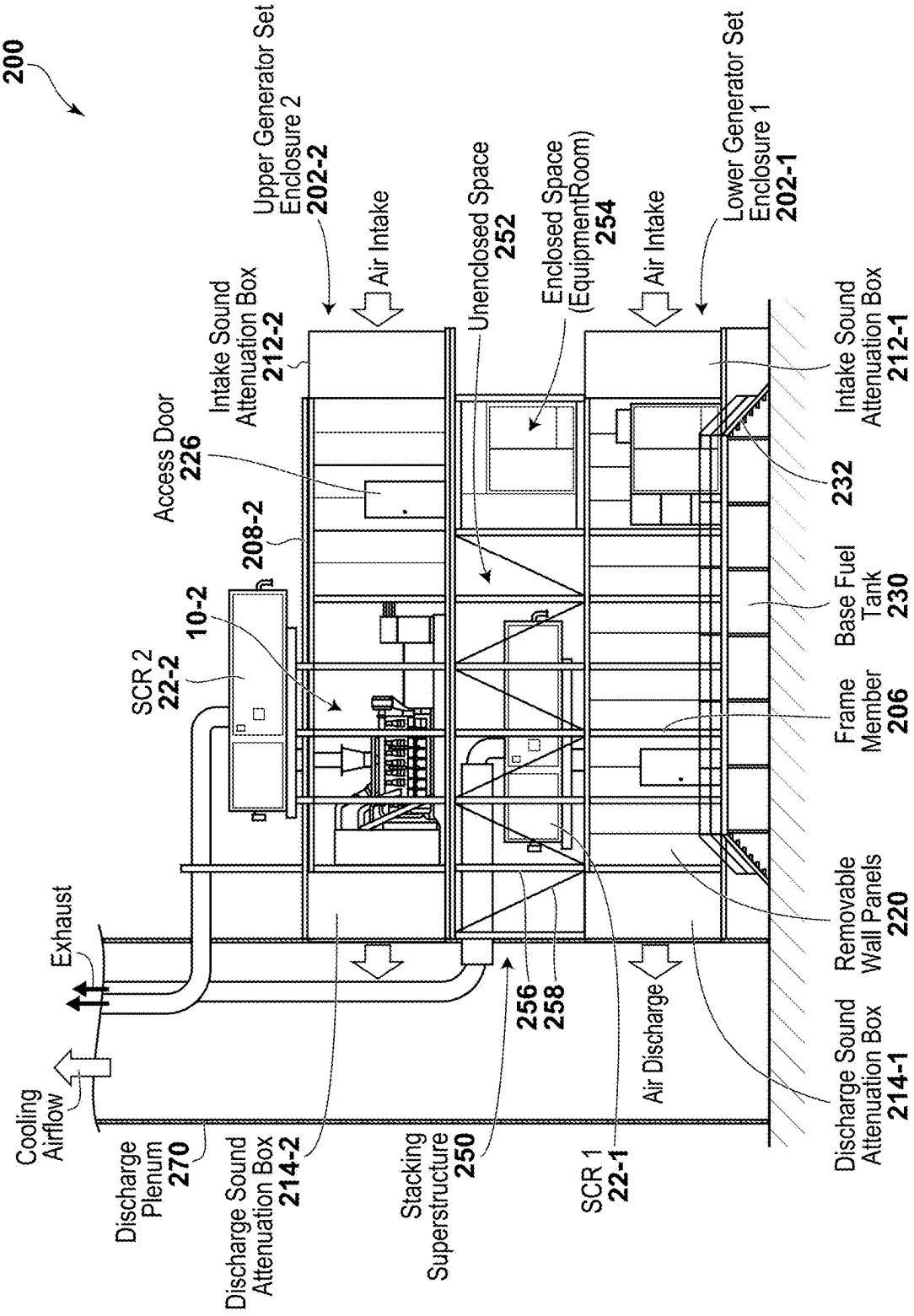

200
Upper Generator Set Enclosure 2 202-2
Air Intake
Unenclosed Space 252
Enclosed Space (EquipmentRoom) 254
Air Intake
Lower Generator Set Enclosure 1 202-1
Intake Sound Attenuation Box 212-2
Intake Sound Attenuation Box 212-1
Access Door 226
208-2
10-2
SCR 2 22-2
232
Base Fuel Tank 230
Frame Member 206
Removable Wall Panels 220
Exhaust
Cooling Airflow
256
258
Air Discharge
Discharge Sound Attenuation Box 214-1
Discharge Plenum 270
Discharge Sound Attenuation Box 214-2
Stacking Superstructure 250
SCR 1 22-1

FIG. 8

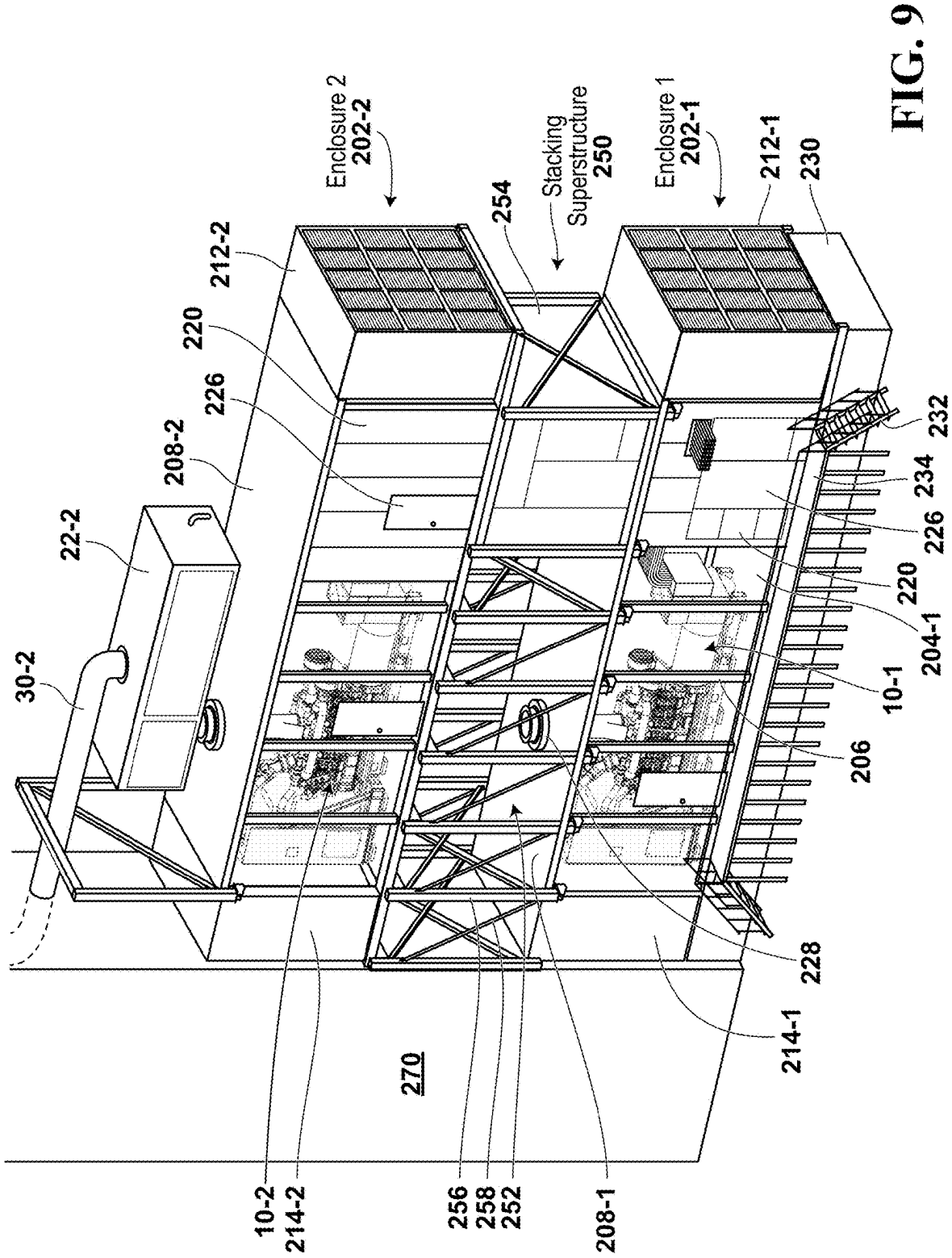

Enclosure 2
202-2
Stacking
Superstructure
250
Enclosure 1
202-1
212-1
230
254
212-2
220
226
208-2
22-2
30-2
232
234
226
220
204-1
10-1
206
228
214-1
270
10-2
214-2
256
258
252
208-1

FIG. 9

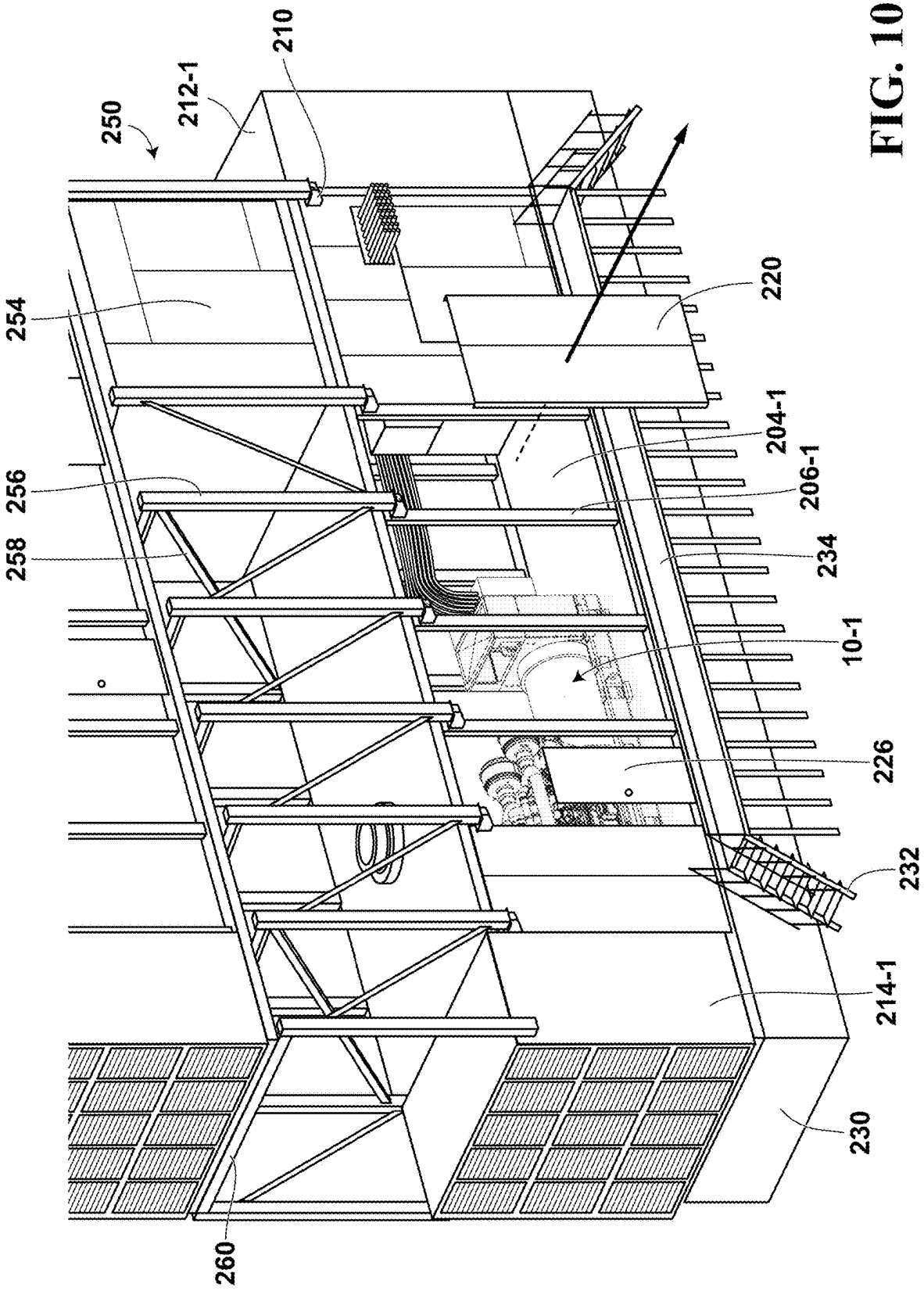

210
212-1
250
254
220
204-1
206-1
256
258
234
10-1
226
232
214-1
230
260

FIG. 10

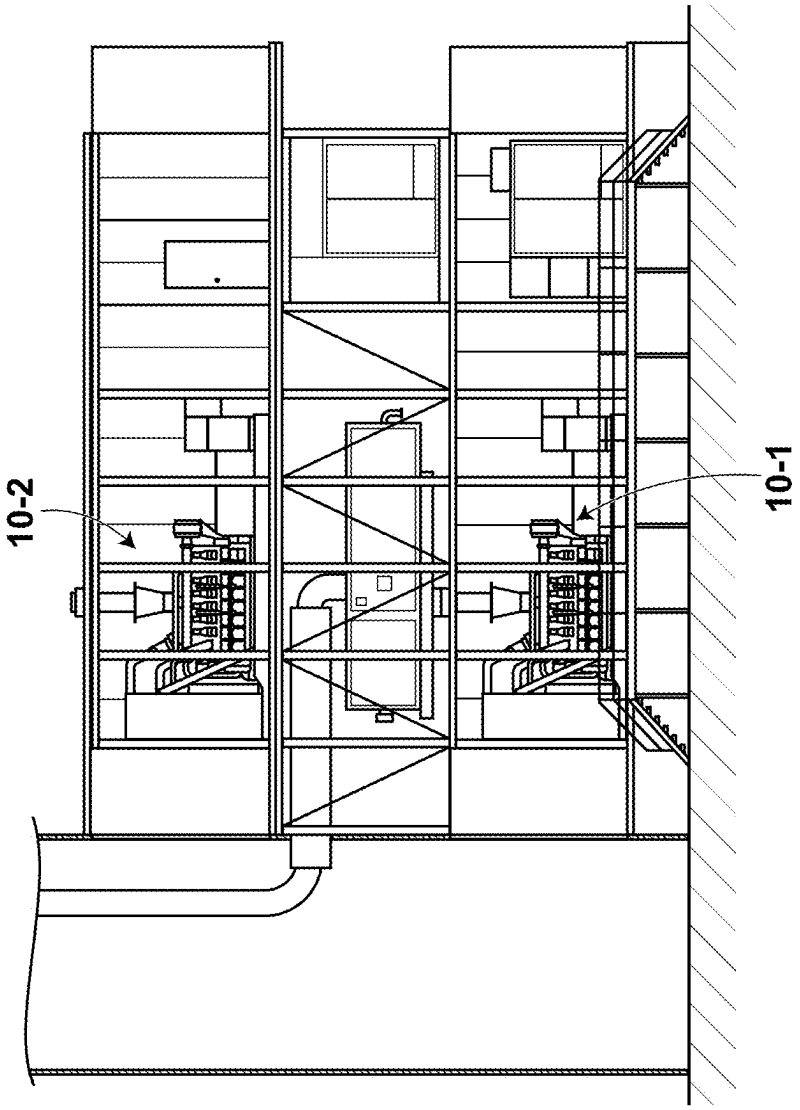


FIG. 11

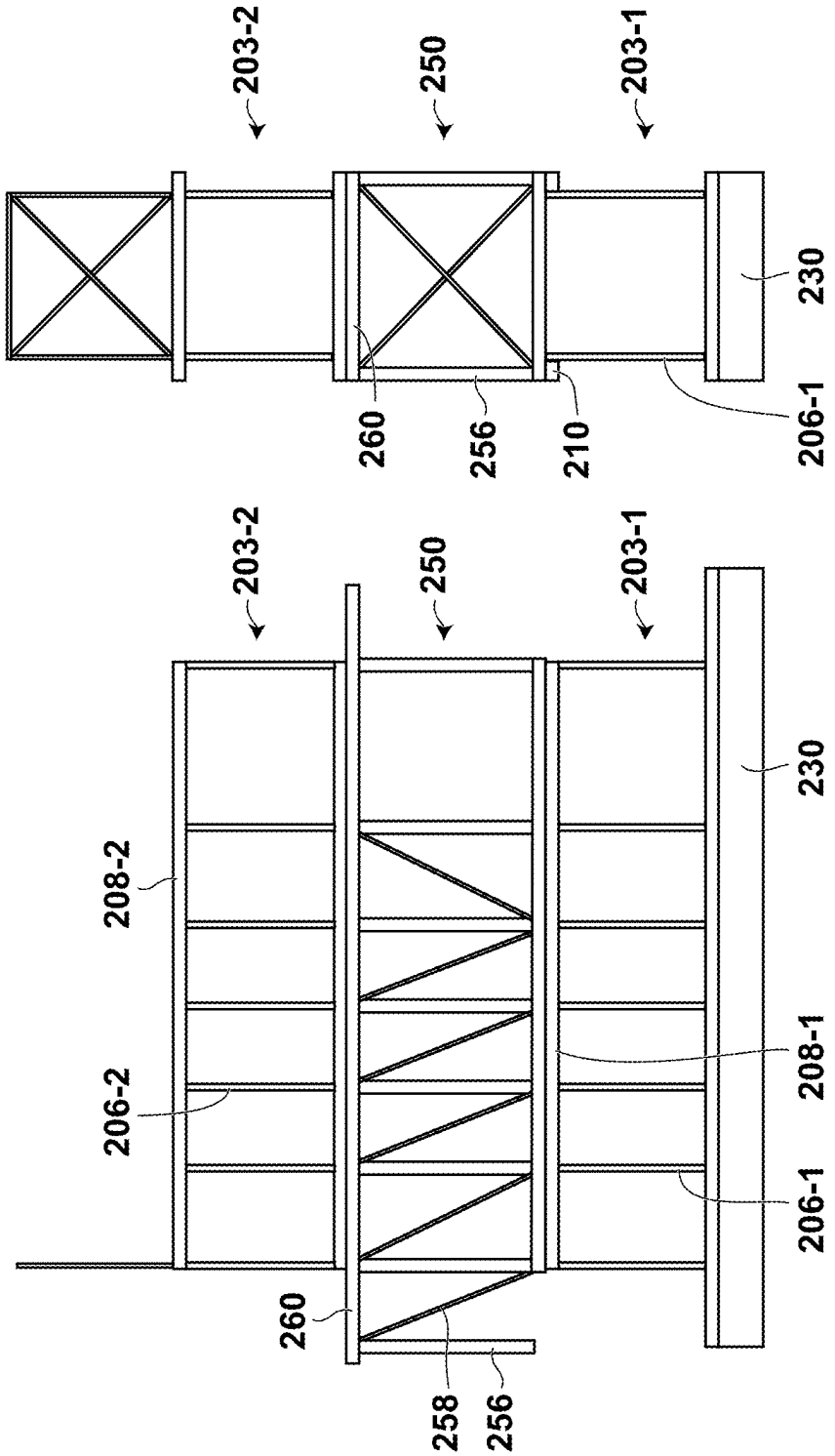


FIG. 12B

FIG. 12A

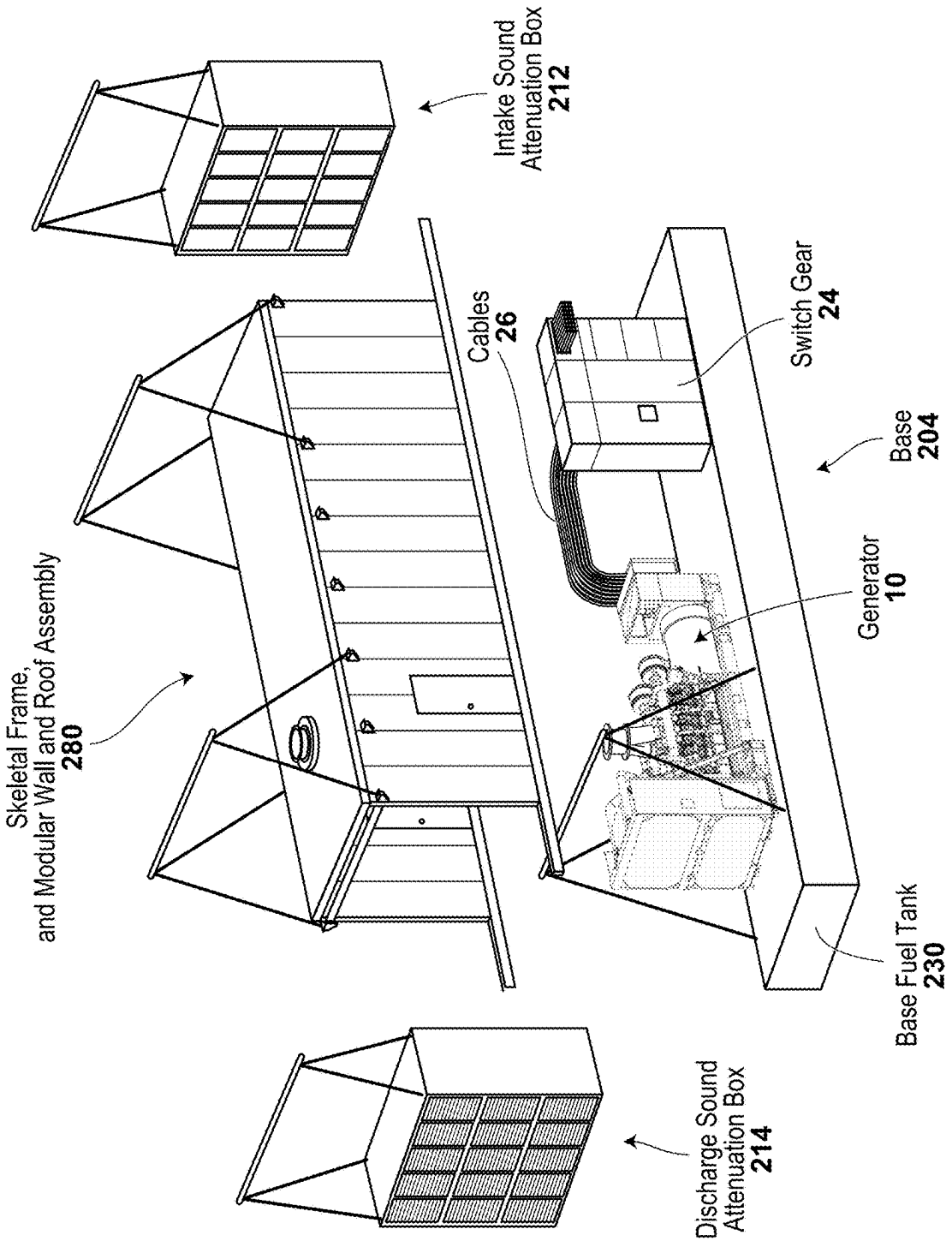

Intake Sound Attenuation Box 212
Cables 26
Switch Gear 24
Skeletal Frame, and Modular Wall and Roof Assembly 280
Base 204
Generator 10
Base Fuel Tank 230
Discharge Sound Attenuation Box 214

FIG. 13

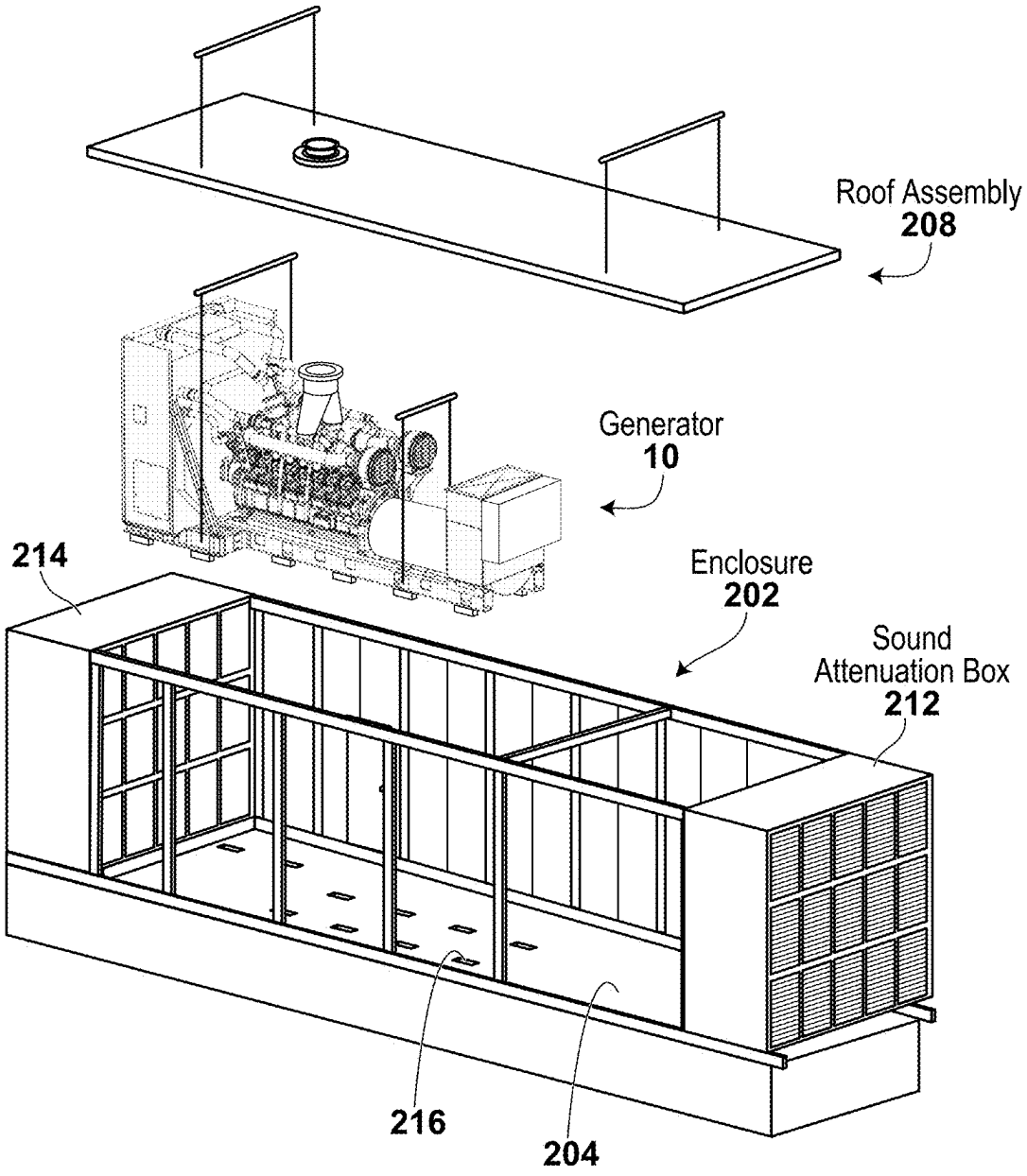

Roof Assembly
208
Generator
10
214
Enclosure
202
Sound
Attenuation Box
212
216
204

FIG. 14

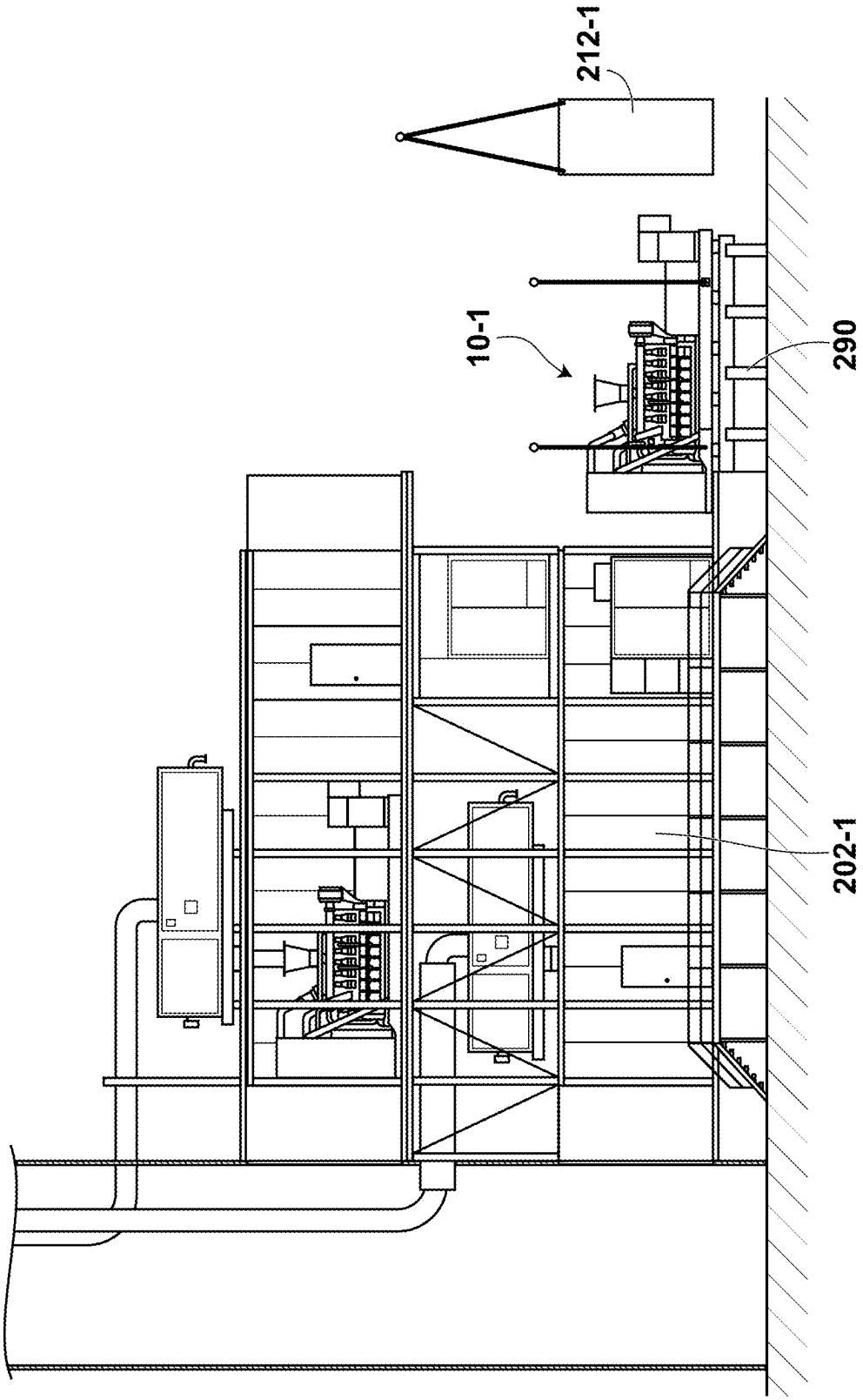


FIG. 15

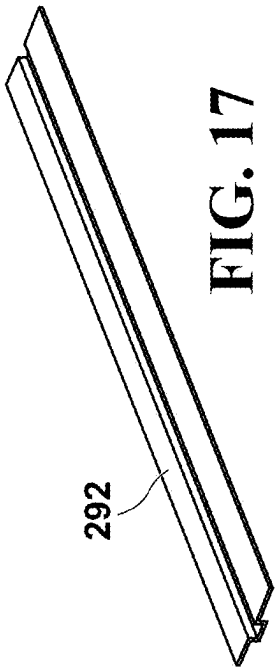


FIG. 17

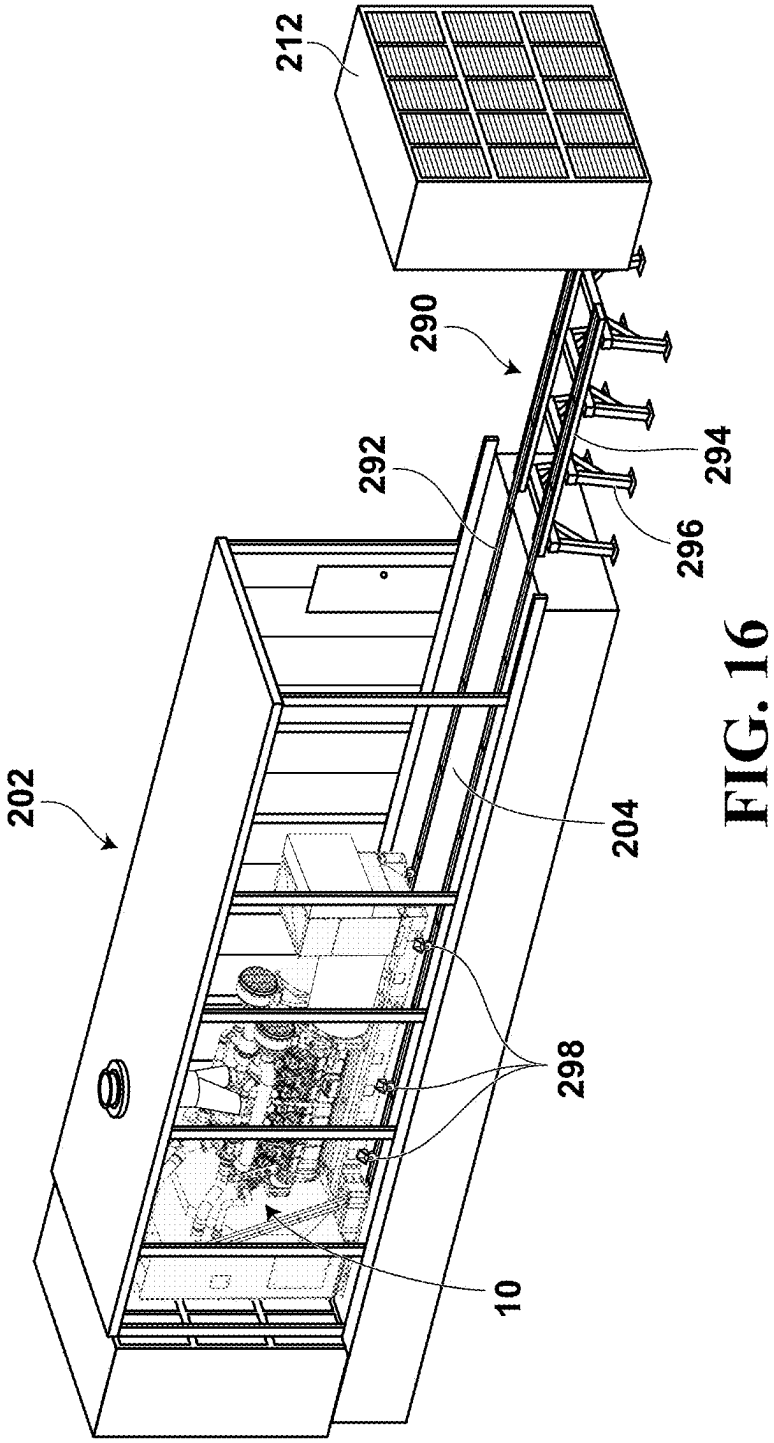


FIG. 16

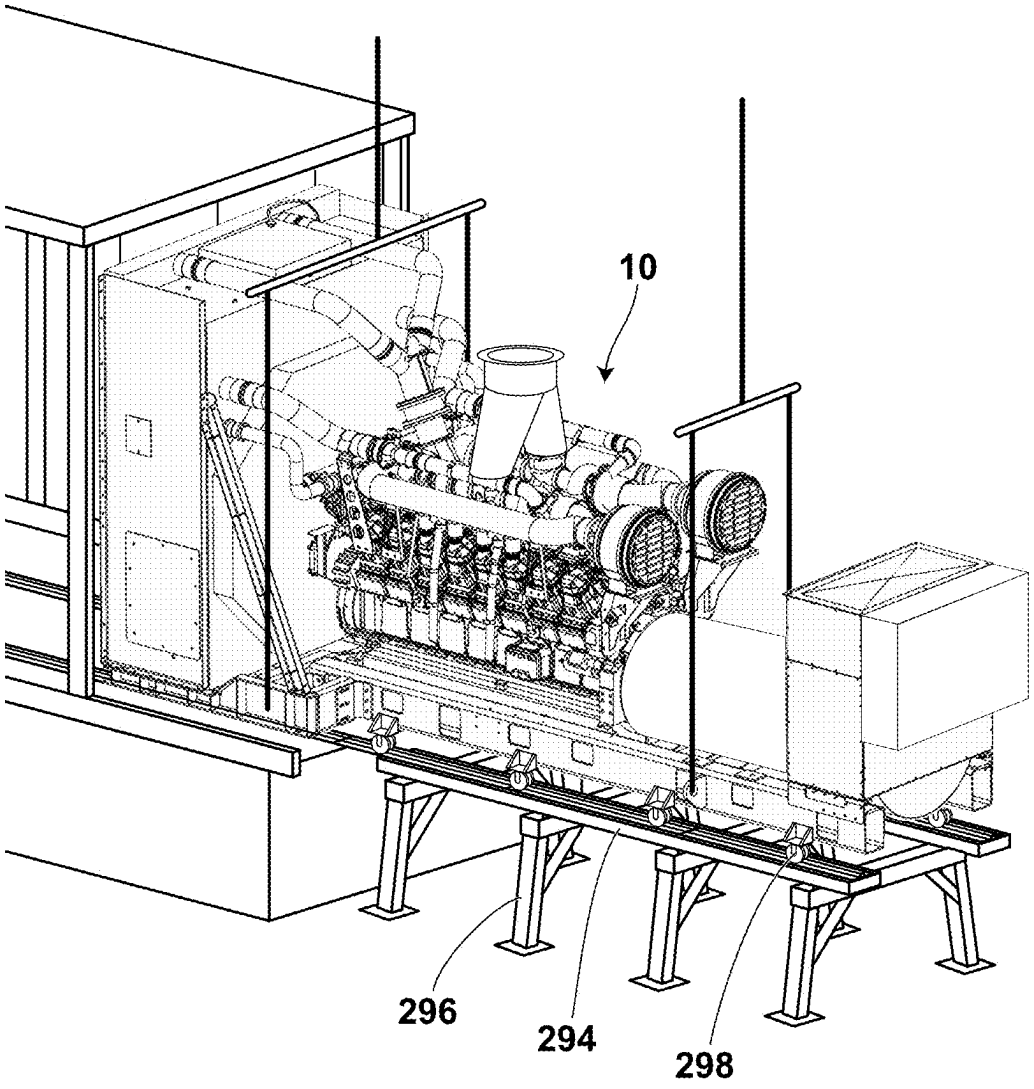


FIG. 18

MODULAR ENCLOSURE SYSTEM FOR INDUSTRIAL GENERATOR SETS

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority from U.S. provisional patent application No. 63/554,731, filed Feb. 16, 2024, entitled "Modular Enclosure System for Industrial Generator Sets", which is incorporated herein in its entirety.

TECHNICAL FIELD

[0002] This invention relates to enclosure systems for industrial generator sets, for standby power or prime power applications.

BACKGROUND

[0003] Containerized generator sets (gensets) for industrial applications may be used for standby power or prime power applications. For example, data centers, hospitals, airports, manufacturing plants, et al. may require generators capable of providing MegaWatts (MW) of electrical power for uninterruptible power in the event of a power grid failure. Off-grid, remote locations may require MW generators for prime power source applications. MW generators, powered by natural gas or diesel, may be containerized for a fixed installation, or trailer mounted for mobile systems.

[0004] Containers may be based on ISO shipping containers, e.g. 40 foot high-cube containers, or they may be fully custom enclosures. Enclosures may be customized to provide weatherproof protection, even in harsh environments. Enclosures may be sized to house the generator and associated switch gear, control systems, cooling equipment and noise abatement (acoustic insulation). The enclosure may be integrated with a fuel system and exhaust system. Walk-in enclosures include additional equipment to comply with applicable workplace safety standards.

[0005] In some scenarios, to provide redundant standby power in event of generator failure or during maintenance, two or more generator systems may be mounted side-by-side. Multiple generator systems may be needed for higher power applications. Dual generator installations or multi-generator installations arranged side-by-side require significant real-estate. Multi-generator installations may share some of the operating components to reduce cost and save space; this can be an issue in the event of failure or maintenance of a shared component, which would require all generators to be shut-down.

[0006] Alternative solutions are needed to overcome one or more of these issues.

SUMMARY OF INVENTION

[0007] The present invention seeks to provide an improved or alternative enclosure system for industrial generator sets.

[0008] Aspects of the invention provide a modular enclosure system for industrial generator sets, which allows for a double-stack or multi-stack arrangement.

[0009] One aspect provides a modular enclosure system for industrial generator sets comprising:

[0010] a first enclosure for a first generator set;

[0011] a second enclosure for a second generator set;

[0012] a stacking superstructure;

[0013] the stacking superstructure being supported on the first enclosure and the second enclosure being supported on the stacking superstructure; and

[0014] the stacking superstructure providing separation between the first and second enclosure frames comprising space for access and equipment.

[0015] For example, a modular enclosure system for industrial generator sets comprises a double stack skeletal frame with a stacking superstructure between upper and lower generator enclosure frames.

[0016] Another aspect provides a modular enclosure system for industrial generator sets comprising:

[0017] a first enclosure comprising a first skeletal frame for a first generator set;

[0018] a second enclosure comprising a second skeletal frame for a second generator set;

[0019] a stacking superstructure;

[0020] the stacking superstructure being supported on the first skeletal frame and the second skeletal frame being supported on the stacking superstructure;

[0021] the stacking superstructure having a skeletal frame providing vertical separation between the first and second enclosures comprising space for access and equipment.

[0022] The space between the first (lower) enclosure and second (upper) enclosure accommodates an exhaust system of the lower generator, which allows for lateral routing of an exhaust pipe. This configuration avoids routing of the exhaust pipe of the lower generator up through the second (upper) enclosure frame, and assists with thermal management (reduces overheating). The stacking superstructure provides room for other equipment, e.g. a fuel tank for the upper unit, or switch gear. This space also provides sufficient height for walk-in access for maintenance of the equipment.

[0023] For example, part of the skeletal stacking superstructure is unenclosed to provide space for an exhaust system of the first generator set. Another part of the skeletal stacking superstructure may be enclosed by modular sidewall panels, e.g. to provide an equipment enclosure.

[0024] In some embodiments each generator enclosure is modular, comprising a base, a skeletal frame, removable modular wall panels, and a removable roof structure; the skeletal frame is supported by the base; the wall panels and roof structure are attached externally to the skeletal frame. One or more of the wall panels may comprise sound attenuation boxes.

[0025] For example: the first enclosure is modular comprising a base, supporting a first skeletal frame, and modular sidewall panels are removably attached to side supports of the first skeletal frame, end panels comprising sound attenuation boxes are removably attached to end supports of the first skeletal frame, and a first roof assembly is supported by the first skeletal frame; and

[0026] the second enclosure is modular comprising a base, supporting a second skeletal frame, and modular sidewall panels are removably attached to side supports of the second skeletal frame, end panels comprising sound attenuation boxes are removably attached to end supports of the second skeletal frame; and a second roof assembly is supported by the second skeletal frame.

[0027] The removable sidewall panels and endwall panels are mounted externally, e.g., attached to external surfaces of the first and second skeletal frames. At least one of the

removable sidewall panels of each enclosure comprises an access door. The sidewall panels and endwall panels are removably secured to external surfaces of the first and second skeletal frame by releasable fasteners, such as bolts or latches.

[0028] The removable sidewall panels may be provided with various thicknesses, and may comprise at least one of thermal insulation and acoustic insulation.

[0029] In some embodiments, the first and second enclosures are configured for longitudinal airflow from an air intake through a sound attenuation box at one end of the enclosure and an air discharge through a sound attenuation box at an opposite end, and a discharge tower is provided for receiving said air discharge.

[0030] The base of each of the first and second enclosures comprises mounting pads for the respective generator set.

[0031] Yet another aspect provides a modular enclosure system for industrial generators comprising:

[0032] a first enclosure comprising a first skeletal frame housing a first generator set;

[0033] a second enclosure comprising a second skeletal frame housing a second generator set;

[0034] a stacking superstructure;

[0035] the stacking superstructure being supported on the first skeletal frame and the second skeletal frame being supported on the stacking superstructure;

[0036] the stacking superstructure providing space between the first and second skeletal frames for access and equipment;

[0037] a first exhaust system of the first generator set being mounted on the first enclosure in said space provided by the stacking superstructure; and

[0038] a second exhaust system of the second generator set being mounted on the second enclosure.

[0039] For example, the exhaust pipe of the first exhaust system is routed longitudinally, along a length, through the stacking superstructure.

[0040] Part of the stacking superstructure is unenclosed to provide space accommodating the exhaust system of the first generator set which allows for its exhaust pipe to be routed longitudinally.

[0041] Another part of the stacking superstructure may be enclosed by modular sidewall panels to provide an equipment enclosure.

[0042] The first and second exhaust systems may comprise any one of a Selective Catalytic Reduction (SCR) system, a muffler, or another type of exhaust treatment system or exhaust filtration system.

[0043] The exhaust pipes from the first and second exhaust systems may be routed into and through a discharge tower, and vented at an appropriate height into the atmosphere.

[0044] In some embodiments, the first enclosure is modular comprising a base, supporting the first skeletal frame, and modular sidewall panels removably attached to side supports of the first skeletal frame, end panels comprising sound attenuation boxes removably attached to end supports of the first skeletal frame, and a roof assembly supported by the first skeletal frame; and

[0045] the second enclosure is modular comprising a base, supporting the second skeletal frame, and modular sidewall panels removably attached to side supports of the second skeletal frame, end panels comprising sound attenuation boxes removably attached to end supports of the second skeletal frame; and a roof assembly supported by the second skeletal frame.

[0046] The removable sidewall panels and endwall panels are attached externally to the first and second skeletal frame. For example, the removable sidewall panels and endwall panels are removably secured to external surfaces of the first and second skeletal frame by releasable fasteners, such as bolts or latches. The removable sidewall panels may comprise at least one of thermal insulation and acoustic insulation. For walk-in enclosures, at least one of the removable sidewall panels of each enclosure comprises a walk-in access door. Staircases and walkways may be provided for access to each access door.

[0047] The base of each of the first and second enclosures comprises mounting pads, the respective generator set being mounted on the mounting pads, and secured thereto.

[0048] The roof assembly of the second (upper) enclosure may be removable for installation or removal of the second generator set by lifting.

[0049] The base of the first enclosure may be mounted on a base fuel tank.

[0050] When part of the stacking superstructure is enclosed by modular sidewall panels to provide an equipment enclosure, equipment such as switch gear of the second generator set may be enclosed within said equipment enclosure, or a day tank to supply fuel to the upper generator may be contained within the equipment enclosure.

[0051] For walk-in enclosures, access doors to the first and second enclosures, and staircases may be provided for accessing the access doors of the first and second enclosures and the space in the stacking superstructure between the first and second skeletal frames.

[0052] For example, the first enclosure is sized to accommodate the first generator with associated switch gear; and the second enclosure is sized to accommodate the second generator with associated switch gear. A fuel system including a fuel storage tank may be integrated with the modular enclosure system or provided separately.

[0053] In some embodiments, the first and second enclosures are configured for longitudinal

[0054] airflow from an air intake through a sound attenuation box at one end of the enclosure and an air discharge through a sound attenuation box at an opposite end of the enclosure. The enclosure system may comprise a discharge tower for receiving said air discharge from the first and second enclosures, and venting said air discharge at a top of the discharge tower. Exhaust pipes from each of the first and second exhaust systems are routed longitudinally into and through the discharge tower and vent at the top of the discharge tower.

[0055] In some embodiments, the base of the first enclosure comprises means for accepting a removable rail system for mounting of the first generator set, for slidable installation or removal of the first generator set after removing an end panel. In some embodiments, the base of the second enclosure comprises means for accepting a rail system for mounting of the second generator set, for slidable installation or removal of the second generator set after removing an end panel. For example, the rail system comprises mounting means such as slots, recesses or other rail mountings in the enclosure base for receiving removable rails. For example, the rail units are modular lengths of rail, and a pair of slots is provided in the base to receive a pair of rails comprising the modular lengths of rail. The removable rail

system comprises a rail extension and support module that extends beyond the end of the first enclosure, the rail extension and support module having a length that accommodates the first generator outside the first enclosure. In use of the rails, the generator is supported on wheels or other rolling means so it can be moved along the rails, for installation or removal.

[0056] A further aspect provides an enclosure for an industrial generator set having a modular construction comprising a base, a skeletal frame, removable modular wall panels and a removable roof structure, wherein the skeletal frame is supported by the base and the removable modular wall panels and removable roof structure are mounted externally to the skeletal frame. For example, the skeletal frame comprises a plurality of side support members and end support members, and the removable modular wall panels comprise sidewall panels attached to side support members and end panels attached to the end support members, wherein the end panels comprise sound attenuation boxes removably attached to the end support members.

[0057] Yet a further aspect provides an enclosure for an industrial generator set having a modular construction comprising a base, a skeletal frame, modular wall panels and a roof structure, wherein the skeletal frame is supported by the base and the modular wall panels are attached to the skeletal frame, the modular wall panels comprising removable end panels comprising sound attenuation boxes which are removably attached to end support members of the skeletal frame, and the base of the enclosure comprising mounting means, such as recesses or slots, for receiving a removable rail system which is configured to slideably remove or install the generator set from an end of the enclosure after removing one of the removable end panels.

[0058] The foregoing and other features, aspects and advantages will be more apparent from the following detailed description, taken in conjunction with the accompanying drawings, of example embodiments, which description is by way of example only.

BRIEF DESCRIPTION OF THE DRAWINGS

[0059] FIG. **1** is a schematic view of an example 2MW diesel generator;

[0060] FIG. **2** is a schematic view of an example 2MW diesel generator mounted inside a custom enclosure;

[0061] FIG. **3** is a schematic view of an example industrial generator set housed in a custom enclosure;

[0062] FIG. **4** is a schematic view of an example side-by-side installation of multiple generator enclosures;

[0063] FIG. **5** shows a simplified schematic side view of components of a stacked modular enclosure system of example embodiments comprising first and second enclosures and a stacking superstructure between the first and second enclosures;

[0064] FIG. **6** shows a simplified schematic side view of a modular enclosure for an industrial generator set of a first embodiment, with sidewall panels removed;

[0065] FIG. **7** shows a simplified schematic side view of the modular enclosure for an industrial generator set of the first embodiment with sidewall panels installed;

[0066] FIG. **8** is a schematic side view of components a modular enclosure system of a second example embodiment for double stacking of generator sets, comprising first and second modular enclosures and a stacking superstructure between the first and second enclosures;

[0067] FIG. **9** is a schematic isometric view of the modular enclosure system of FIG. **8** in which the exhaust system of the first generator set is omitted to show the frame structure of the stacking superstructure between the first and second enclosures, and some of the sidewall panels are omitted to show the frame structure of the first and second enclosures;

[0068] FIG. **10** is a schematic view showing an enlarged view of part of the structure shown in FIG. **9** to illustrate the frame structure of the modular enclosure comprising removable exterior wall panels;

[0069] FIG. **11** is a schematic side view of the modular enclosure system of FIG. **8** with some of the wall panels removed;

[0070] FIG. **12**A and FIG. **12**B, respectively, show a simplified schematic side view and a simplified schematic end view of the skeletal frame structure only;

[0071] FIG. **13** is a schematic view showing disassembled components of a modular enclosure of a third embodiment;

[0072] FIG. **14** is a schematic view of a modular enclosure of a fourth embodiment, wherein the enclosure roof assembly is removable;

[0073] FIG. **15** is a schematic side view of a double stack modular enclosure system of a fifth embodiment wherein the generator is mounted on a rail system to enable the generator to be removed and replaced for service or swap-out; and

[0074] FIG. **16** is a schematic isometric view a modular enclosure system of the fifth embodiment wherein the generator is mounted on a rail system to enable the generator to be removed and replaced for service or swap-out;

[0075] FIG. **17** shows an isometric view of a rail unit for the rail system illustrated in FIG. **15** and FIG. **16**; and

[0076] FIG. **18** is a schematic isometric view of part of the modular enclosure system of FIG. **16**, wherein the generator is supported on part of the rail system extending from the enclosure.

DETAILED DESCRIPTION

[0077] FIG. **1** is a schematic view of an example 2MW diesel generator, and FIG. **2** shows a schematic view of an example of 2MW diesel generator mounted inside a custom enclosure, to illustrate the size of the generator. For example, a 2MW generator may be 3 m high, 3 m wide and 4 m long. As shown, the enclosure is sized to accommodate the generator and associated equipment, with an opening at one end for intake air flow, and side access doors for service technicians.

[0078] FIG. **3** is a schematic view of an example generator set housed in a custom enclosure for a fixed deployment. There is a side air intake and a roof mounted air discharge. An exhaust system is mounted on the roof.

[0079] FIG. **4** is a schematic view of an example side-by-side installation of multiple generator enclosures at a data centre, to illustrate that significant real estate is required for this type of multi-generator installation.

[0080] FIG. **5** shows a simplified schematic side view of a modular enclosure system **100** of a first example embodiment comprising a first enclosure **102-1**, a second enclosure **102-2** and a stacking superstructure **150** between the first and second enclosures. For example, each of the first (lower) enclosure **102-1** and the second (upper) enclosure **102-2** comprise modular enclosures housing an industrial generator set. In the double stack modular enclosure system of this embodiment, the first (lower) enclosure **102-1** is mounted on a base fuel tank **130**, which stores fuel for both the upper and

lower generator sets. The skeletal frame of the lower enclosure is engineered to support the stacking superstructure **150** and the upper enclosure **102-2**. The stacking superstructure **150** comprises a skeletal frame which provides an unenclosed space **152** between the lower enclosure **102-1** and upper enclosure **102-2**, which accommodates the exhaust system **22-1** of the generator housed in the lower enclosure **102-1**. The stacking superstructure may include an enclosed space **154**, to be used as an equipment room to house equipment, such as switch gear, or a day fuel tank to feed fuel to the upper generator set. The exhaust systems **22-1** and **22-2** may comprise a Selective Catalytic Reduction (SCR) system, another type of exhaust filtration or treatment system, or simply a muffler (silencer), depending on local environmental air quality requirements. The space **152** provided by the stacking superstructure allows for the exhaust pipe **30-1** from the lower generator to be routed laterally, e.g. longitudinally through the stacking superstructure **150**. This arrangement avoids routing of the exhaust pipe **30-1** up through the upper enclosure **102-2**. The modular skeletal frame construction allows for a double-stack configuration in which each of the lower and upper generator sets has a separate exhaust system, so that the two generators can be operated independently, and separately shut down for maintenance or overhaul. Each of the enclosures **102-1** and **102-2** may have a skeletal frame structure, with removable side wall panels **120**, and removable end panels which comprise intake sound attenuation boxes **212** and discharge sound attenuation boxes **214**. One or more of the wall panels may comprises an access door **126**. To access the upper generator for overhaul or swap out, the roof assembly **108** of the second enclosure is removable. The lower generator may be accessed by removing the end panel comprising sound attenuation box **212**. These features are described in more detail with reference to FIG. **6** and FIG. **7**

[0081] FIG. **6** shows a simplified schematic side view of a modular enclosure **102** for an industrial generator set of a first example embodiment, with sidewall panels removed. FIG. **7** shows a simplified schematic side view of the modular enclosure **102** of the first example embodiment, with sidewall panels installed. Referring to FIG. **6**, the generator **10** comprises an engine **12** and associated components, which are mounted in the modular enclosure **102**. The enclosure **102** comprises an enclosure base **104**, which supports a skeletal wall frame comprising a plurality of vertical supports **106**, and a roof assembly **108**. In this example, the enclosure base **104** is mounted on a base fuel tank **130**. In use, the enclosure comprises side wall panels **120** (not shown in FIG. **6**), which are removably attached to the exterior of the skeletal wall frame **106**, as shown in FIG. **7**. The enclosure end frames **110** are open for airflow and covered by removable end panels comprising sound attenuation boxes **112** and **114** for the air intake and air discharge, respectively. The generator set **10** is mounted on mounting pads **116** on the base **104**. The air intake, through intake sound attenuation box **112**, is for cooling air and combustion air. Combustion air is drawn into the engine through the combustion air intake and filter **14**. Cooling air flow is drawn through the radiator **18** by the fan **20** and discharged through the discharge sound attenuation box **114**. The direction of airflow, longitudinally through the enclosure, is indicated by the large arrows. The exhaust flange **16** of the engine **12** is connected to an exhaust system **22** mounted on the roof **108** of the enclosure **102**. The exhaust system **22** may be a simple muffler, or if required to meet local air quality requirements, an exhaust treatment or filtration system, such as a Selective Catalytic Reduction (SCR) unit which removes NOx. As illustrated in FIG. **6**, the enclosure **102** includes space for the generator **10** and associated switch gear **24** and electrical cabling **26**.

[0082] As illustrated in FIG. **7**, which shows sidewall panels **120** installed, the side wall panels are removably attached externally to vertical supports of the skeletal wall frame, e.g. using bolts, latches or other releasable fasteners. For a walk-in enclosure, one or more of the side wall panels include an access door **126**, to provide access for service technicians. For compliance with occupational health and safety regulations (e.g. OHSA), walk-in enclosures must meet various safety requirements, e.g.: clearance requirements; avoidance of trip hazards; electrical safety requirements (e.g. include an NGR (Neutral Ground Resistor)); provide separation between the fuel tank and electrical switch gear to reduce fire risk; and fire suppression components.

[0083] FIG. **8** is a schematic side view of a components a stacked modular enclosure system **200** of a second example embodiment comprising a first modular enclosure **202-1** containing a first generator set and a second modular enclosure **202-1** containing a second generator set, and a stacking superstructure **250**. This is a double-stack arrangement comprising a first (lower) generator set and a second (upper) generator set. The first modular enclosure **202-1** is mounted on a base fuel tank **230**. The stacking superstructure **250** is mounted on the first modular enclosure **202-1**, and the second modular enclosure **202-2** is mounted on the stacking superstructure **250**. Each of the first modular enclosure **202-1**, and the second modular enclosure **202-2** comprises a skeletal frame comprising vertical support members **206** and modular wall panels **220**. The skeletal frame of the first modular enclosure **202-1** is engineered to support the stacking superstructure **250** and the second modular enclosure **202-2**. The stacking superstructure **250** supports the second modular enclosure **202-2**. The stacking superstructure **250** provides a space between the first and second modular enclosures to accommodate an exhaust system **22-1** of the first generator set, which is mounted on the roof **208-1** of the first enclosure **202-1**. Part of the stacking structure which accommodates the exhaust system **22-1** is an unenclosed space **252**, and the exhaust pipe **30-1** is routed longitudinally through the stacking superstructure **250**, into and through a discharge plenum (discharge tower) **270** to direct the exhaust upwards to be vented at the top of the plenum at an appropriate height in the atmosphere. The exhaust system **22-2** for the second (upper) generator set is mounted on the roof **208-2** of the second modular enclosure **202-2**, and the exhaust pipe **30-2** is directed longitudinally into and through the discharge plenum **270**, and vented at the top of the plenum.

[0084] The stacking superstructure includes an enclosed space **254**, which provides an equipment room to house equipment such as switch gear for the upper generator, or a day fuel tank to feed fuel pumped from the base fuel tank **230** to the upper generator.

[0085] The stacking superstructure **250** provides for each of the upper and lower gensets to have separate exhaust systems **22-1** and **22-2**. The unenclosed space **252** provided by the stacking superstructure allows for the exhaust pipe **30-1** from the lower generator to be routed laterally through

the stacking superstructure **250**, which avoids routing the exhaust from the lower generator through the upper generator enclosure. The exhaust systems **22-1** and **22-2** may comprise a SCR, or simply a muffler (silencer) depending on local environmental air quality requirements. The modular skeletal frame construction allows for a double stack configuration in which each of the lower and upper generators has its own exhaust system, so that the generators can be operated independently, and separately shut down for maintenance or swap-out.

[0086] The first modular enclosure **202-1** comprises a removable intake sound attenuation box **212-1** and a removable discharge sound attenuation box **214-1** mounted on respective enclosure end frames; and the second modular enclosure **202-2** comprises a removable intake sound attenuation box **212-2** and a removable discharge sound attenuation box **214-2** mounted on respective enclosure end frames. Cooling and combustion air is drawn in through the intake sound attenuation box and cooling air is discharged through the discharge sound attenuation box into the discharge plenum, as indicated by the large white arrows. Some of the upper wall panels are shown as transparent (omitted) to show the positioning of the second (upper) generator **10-2** within the upper enclosure **202-2**.

[0087] FIG. **9** is a schematic isometric view of the modular enclosure system of FIG. **8**, in which the exhaust system of the lower genset is omitted, to show the frame structure of the stacking superstructure **250** between upper and lower genset enclosures **202-1** and **202-2**. Some of the removable sidewall panels are omitted to show the frame structure of the upper and lower genset enclosures **202-1** and **202-2**. The stacking superstructure **250** has a skeletal frame structure comprising a plurality of vertical support members **256** and cross-bracing members **258**. The space **252** within the stacking superstructure **250** for the lower exhaust system is unenclosed to provide for mounting of the lower exhaust system on the roof **208-1** of the lower enclosure **202-1**. Since the lower exhaust system is omitted in this view, the exhaust port **228** in the roof **208-1** is visible. Another part of the space within the stacking superstructure **250** is enclosed by modular wall panels to form an enclosed space **254**, e.g. an equipment room. For example, this enclosed space **254** may be used for equipment such as switch gear for the upper generator set, or for a day tank to feed fuel from the base fuel tank to the upper generator. Other parts are labelled with the same reference numerals as shown in FIG. **8**.

[0088] FIG. **10** shows an enlarged view of part of the structure shown in FIG. **9** to illustrate the frame structure of the modular enclosure **202-1** with removable exterior sidewall panels **220**. The sidewall panels **220** are removably attached to vertical support members **206** of the skeletal frame of the first enclosure **202-1**, using fasteners such as bolts or latches, so that the sidewall panel can be removed for access to equipment within the enclosure. For example, the removable modular sidewall panels, may be provided with various thicknesses, e.g. 2 inch or 6 inch. The side wall panels are mounted on the exterior of the skeletal frame to maximize uscable interior space. They are designed to removable during maintenance, e.g. bolted or latched to the skeletal frame, instead of welded. The removable sidewall panels and the roof assembly may comprise one or both of thermal insulation and acoustic insulation.

[0089] Since enclosures **202-1** and **202-2** are walk-in enclosures, as illustrated in FIG. **8**, FIG. **9**, and FIG. **10**, some of the sidewall panels comprise an access door **226**. For example, to access the first enclosure **202-1**, a walkway **234** with railing and staircase **232** is provided. Fixed or movable staircases (not shown) may be provided to access the second enclosure **202-1**, the space **252** within the stacking superstructure **250**, and the enclosed space **254** within the stacking superstructure **250**. Walk-in enclosures must also comply with applicable workplace safety standards, for example: with respect to clearances; avoidance of trip hazards; electrical safety standards, e.g. a neutral ground return (NGR); separation between fuel sources and electrical switching equipment to reduce fire risk; fire suppression systems; et al.

[0090] FIG. **11** is a schematic a side elevation view of part of the modular enclosure system of the second embodiment, with some of the side wall panels omitted to show the skeletal frame structure of the first and second enclosures, and the placement of the lower and upper generators **10-1** and **10-2**.

[0091] The modular structure of the enclosures and the stacking superstructure of example embodiments, comprising a skeletal frame with a multilevel structure, and removable sidewall panels, and removable endwall panels comprising sound attenuation boxes, is customizable and scalable for stacking of at least two industrial generator sets, having a range of different sizes and power outputs. The modular enclosure structure with removable sidewall panels and endwall panels, which are removably attached to external surfaces of the skeletal frame allows for quick removal of panels for access to equipment for maintenance, and quick replacement, to reduce maintenance service turnaround. The usable space within the enclosures and within the stacking structure is increased by attaching the removable panels to the exterior of the skeletal frame. The modular construction allows for reconfiguration, e.g. adding, removing or moving an access door, enclosing part of the space within the stacking structure to create an equipment room, or to change the size of an equipment room.

[0092] FIG. **12**A and FIG. **12**B, respectively, show a schematic simplified side-view and a simplified schematic end-view of components of a skeletal frame of a modular enclosure system, mounted on a base fuel tank **230**. The skeletal frame of the modular enclosure system for a double-stack arrangement comprises a lower enclosure frame **203-1**, a stacking superstructure **250**, and an upper enclosure frame **203-2**. The stacking superstructure **250** (Level 2) is engineered to support the upper enclosure (Level 3) comprising the upper enclosure frame **203-2**, sidewall panels, sound attenuation boxes, roof structure and generator equipment within the upper enclosure, and its exhaust system. The lower enclosure frame **203-1** (Level 1) is engineered to support both the stacking superstructure **250** (Level 2), including any equipment or components within the stacking superstructure and the upper enclosure (Level 3) comprising the upper generator equipment, and the upper enclosure and its equipment. The Level 4 frame is provided simply to support the exhaust pipe from the exhaust system of the upper generator (e.g. as shown in FIG. **9**). Each of the upper and lower enclosure frames **203-1** and **203-2** comprise a plurality of vertical support members **206-1** and **206-2**, which support respective roof assemblies **208-1** and **208-2**. The base of the lower enclosure frame **203-1** is mounted on the base fuel tank **230**, or may be integral with the base fuel tank **230**. The stacking superstructure **250** comprises a

plurality of vertical support members **256**, and cross-bracing members **258**, and horizontal members **260**. For example, as illustrated in FIG. **10**, the vertical support members **256** of the stacking superstructure **250** are supported by lateral extensions **210** of the vertical members **206-1** of the frame structure **203-1** of the first (lower) enclosure **202-1**; the second (upper) enclosure **202-2** is supported by the horizontal members **260** of the stacking superstructure **250**.

[0093] FIG. **13** is a schematic view showing disassembled components of a modular enclosure of the second embodiment, wherein the sound attenuation boxes **212-1** and **214-1** are removed from endwalls of the skeletal frame, and the skeletal frame, sidewalls and roof assembly are removed from the base **204** and base fuel tank **230** as a unit **280**, e.g., to access the generator and associated equipment, or to separate the components for shipping. For example, the base unit assembly comprises the enclosure base **204** and the base fuel tank **230**, and the generator **10**, switch gear **24** and cables **26** are mounted on the base **204** for shipping. Since the sound attenuation boxes are modular, and can be provided with different levels of sound attenuation, they may be switched out to provide different levels of sound attenuation to meet local by-law requirements. For a single enclosure installation, the modular construction of the enclosure allows for the enclosure to be disassembled as shown in FIG. **13** for access to the generator and associated equipment for maintenance or replacement.

[0094] FIG. **14** is a schematic view showing a modular enclosure of a third embodiment wherein the enclosure roof assembly **208** is removable from the frame of the second (upper) enclosure **202** for access to lift-out or replace the generator **10**. For example, a removable roof assembly may be provided to facilitate access to the generator, and/or other equipment, in the upper enclosure of a double stack modular enclosure system, or in a single enclosure installation. FIG. **14** illustrates schematically how the roof assembly **208** can be lifted off by crane to provide access for lifting out the generator **10** after it is unfastened from mounting pads **216** in the base **204** of the enclosure **202**. Since the roof assembly **208** is removable the sound attenuation boxes **212** and **214** may be left in place during removal or installation of the generator.

[0095] FIG. **15** is a schematic view showing a side view of a double stack modular enclosure system of a fourth embodiment, wherein the generator in the first (lower) enclosure **202-1** is mounted on a rail system **290** to enable the generator **10-1** to be removed and replaced for service or swap-out. To remove the generator **10-1**, the intake sound attenuation box **212-1** is unfastened and lifted away from the intake end of the enclosure **202-1**. Any other equipment, such as switch gear, can also be removed through the open end of the enclosure. A removable rail system **290** is positioned at the end of the enclosure **202-1** to enable the generator **10-1** to be pulled out through the end of the enclosure, and then lifted by crane.

[0096] FIG. **16** is a schematic isometric view a modular enclosure of a fifth embodiment, wherein the generator is mounted on a rail system to enable the generator to be removed and replaced for service or swap-out. The wall panels of one side of the enclosure **202** are omitted to show the internal structure, in which a pair of rails **292** are inserted in the base **204** of the enclosure **202**. An example rail unit **292** is shown in FIG. **17**. The rails **292** are inserted into slots in the base **204**. For example, the generator **10** is unfastened from its mounting pads, and jacked up to insert a set of wheels **298**, or rollers, casters, a sled, truck, or other rolling means to move the generator along the rails. One or more rail units are inserted into the slots or recesses in the base **204**, to provide a pair of rails extending from the open end of the base and underneath the generator. The generator is then lowered to engage the wheels on the rails. Part of the rail system **290**, comprising external rails portions **294** and supports **296** extends beyond the end of the enclosure so that the generator can be winched out of the enclosure onto the external rail portions **294**, from where it can then be lifted off the rails by crane. FIG. **18** is a schematic isometric view of part of the modular enclosure system shown in FIG. **16**, wherein the generator **10** is supported on wheels **298** on part of the rail system **290** comprising support members **296** and rail units **294** extending out from the enclosure.

[0097] The rail removal process is reversed to replace or swap-out the generator. After the generator is repositioned over its mounting pads, and jacked up off the rails, the rails can be removed from the slots. Providing removable rails facilitates removal and replacement of the generator, while avoiding a potential tripping hazard which would be presented by permanent rails provided within the enclosure. The removal rails can be provided as modular rail units. The rail system allows for removal and replacement of the generator in enclosures where it is not feasible to have a removable roof structure, e.g. the first (lower) enclosure of a double-stack modular enclosure systems as described herein. Optionally, a similar rail system could be used for the second (upper) enclosure of a double-stack modular enclosure system.

[0098] In principle, it is envisaged that a multi-stack modular enclosure system comprising more than two generator enclosures may be feasible, e.g. a stack of three generator enclosures, with a first stacking superstructure between first and second generator enclosures and a second stacking superstructure between second and third generator enclosures. In practice, a multi-stack arrangement with more than two generator enclosures requires the lower levels to be engineered to support the additional weight of the overlying structures, and the additional height makes walk-in access to the upper levels more challenging. Also, the fuel system may require additional fuel pumps and day fuel tanks to supply fuel to the third generator. There is a trade-off between the cost of adding a third generator enclosure in a stacked configuration, vs. additional real-estate cost of a side-by-side installation.

[0099] The modular construction of the enclosures of example embodiments as described herein provides for at least one of the following features:

[0100] Modular wall panels can be provided with various thicknesses, e.g. 2 inch or 6 inch, which are removably mounted on an exterior of the skeletal frame; the wall panels are designed to be removable for maintenance (e.g. bolted or latched, instead of welded in place); external mounting of the wall panels maximizes useable interior space within the enclosure; wall panels may comprise thermal and/or acoustic insulation.

[0101] A removable roof panel, or roof assembly, allows the generator and/or other equipment to be lifted in and out by crane for maintenance or swap-out.

[0102] The sound attenuation boxes on each end of the generator enclosures are removable modules; they can be selected or replaced with modules having different levels of

sound attenuation based on local sound bylaws. For example, local bylaw requirements may specify permissible sound levels, e.g. 65 dB at 7 metres, or 85 dB at 7 metres.

[0103] The fuel system may comprise an integrated fuel tank or a separate fuel tank. The main fuel tank may be a base fuel tank. For a double-stack modular enclosure system, the base fuel tank is sized to supply both the upper and lower generators, e.g. a base fuel tank which is 4 ft to 5 ft high. A day tank may be provided to assist with start-up for the upper generator; for example, a day tank with a capacity sized for e.g. 24 hr or 48 hr run-time may be provided within the stacking superstructure, to avoid having to pump fuel directly from the base fuel tank at start-up.

[0104] The exhaust system for each generator can be a simple muffler (silencer) or some type of exhaust filtration and treatment system, such as, an SCR (Selective Catalytic Reduction) unit which removes NOx, depending on the fuel source (natural gas or diesel) and on environmental requirements at site.

[0105] Removable wall panels comprising walk-in access doors, and fixed or movable staircases and walkways can be configured for access to upper and lower enclosures, and the space in the stacking superstructure, as appropriate.

[0106] In modular enclosure systems of other embodiments and variants, one or more of these features may be combined in various configurations.

[0107] Modular enclosure systems of example embodiments described herein are configured as walk-in enclosures, and as such, would be configured to meet relevant occupational health and safety regulations.

[0108] For other applications, it is envisaged that the enclosures of other embodiments may be configured as skin-fit enclosures having a skeletal frame with removable wall panels, removable end panels comprising sound attenuation boxes, and optionally a removable roof assembly, to provide access for maintenance or swap-out of the generator and associated equipment.

[0109] Although example embodiments have been described and illustrated in detail, it is to be clearly understood that the same is by way of illustration and example only and not to be taken by way of limitation, the scope of the present invention being limited only by the appended claims.

1. A modular enclosure system for industrial generator sets comprising:
- a first enclosure for a first generator set;
- a second enclosure for a second generator set;
- a stacking superstructure;
- the stacking superstructure being supported on the first enclosure and the second enclosure being supported on the stacking superstructure; and
- the stacking superstructure providing vertical separation between the first and second enclosures comprising space for access and equipment.

2. A modular enclosure system for industrial generator sets comprising:
- a first enclosure comprising a first skeletal frame for a first generator set;
- a second enclosure comprising a second skeletal frame for a second generator set;
- a stacking superstructure;
- the stacking superstructure being supported on the first skeletal frame and the second skeletal frame being supported on the stacking superstructure; and
- the stacking superstructure having a skeletal frame providing vertical separation between the first and second enclosures comprising space for access and equipment.

3. The modular enclosure system of claim **2**, wherein part of the skeletal frame of the stacking superstructure is unenclosed to provide space for an exhaust system of the first generator set.

4. The modular enclosure system of claim **2**, wherein part of the skeletal frame of the stacking superstructure is enclosed to provide an equipment enclosure.

5. The modular enclosure system of claim **2**, wherein:
- the first enclosure is modular comprising a base, supporting the first skeletal frame, and modular sidewall panels removably attached to side supports of the first skeletal frame, end panels comprising sound attenuation boxes removably attached to end supports of the first skeletal frame, and a roof assembly supported by the first skeletal frame; and
- the second enclosure is modular comprising a base, supporting the second skeletal frame, and modular sidewall panels removably attached to side supports of the second skeletal frame, end panels comprising sound attenuation boxes removably attached to end supports of the second skeletal frame; and a roof assembly supported by the second skeletal frame.

6. The modular enclosure system of claim **5**, wherein at least one of the removable sidewall panels comprises an access door.

7. The modular enclosure system of claim **5**, wherein the removable sidewall panels and endwall panels are attached externally to surfaces of the first skeletal frame and the second skeletal frames.

8. The modular enclosure system of claim **5**, wherein the removable sidewall panels and endwall panels are mounted externally to surfaces of the first and second skeletal frame and secured by bolts, latches, or other releasable fasteners.

9. The modular enclosure system of claim **5**, wherein the removable sidewall panels comprise at least one of thermal insulation and acoustic insulation.

10. The modular enclosure system of claim **5**, wherein the base of each of the first and second enclosures comprises mounting pads for the respective generator set.

11. The modular enclosure system of claim **5**, wherein a roof assembly of the second enclosure is removable for installation or removal of the second generator set by lifting.

12. The modular enclosure system of claim **5**, wherein the base of the first enclosure is mounted on a base fuel tank.

13. The modular enclosure system of claim **5**, wherein the base of the first enclosure is part of a base fuel tank.

14. The modular enclosure system of claim **2**, comprising walk-in access doors to the first and second enclosures.

15. The modular enclosure system of claim **2**, comprising walk-in access doors to the first and second enclosures, and at least one of fixed and movable staircases to access the walk-in access doors and the space within the stacking superstructure.

16. The modular enclosure system of claim **2**, wherein each of the first and second enclosures are configured for longitudinal airflow from an air intake through a sound attenuation box at one end of the enclosure and an air discharge through a sound attenuation box at an opposite end of the enclosure.

17. The modular enclosure system of claim **2**, wherein each of the first and second enclosures are configured for

longitudinal airflow from an air intake through a sound attenuation box at one end of the enclosure and an air discharge through a sound attenuation box at an opposite end of the enclosure, and comprising a discharge tower for receiving said air discharge from the first and second enclosures, and venting said air discharge at a top of the discharge tower.

18. The modular enclosure system of claim **2**, wherein a base of the first enclosure comprises means for accepting a removable rail system for rail mounting of the first generator set

19. The modular enclosure system of claim **2**, wherein a base of the second enclosure comprises means for accepting a removable rail system for rail mounting of the second generator set.

20. The modular enclosure system of claim **2**, wherein part of the skeletal frame of the stacking superstructure is unenclosed to provide space for an exhaust system of the first generator set; and part of the skeletal frame of the stacking superstructure is enclosed to provide an equipment enclosure.

21. The modular enclosure system of claim **2**, wherein: the first enclosure is modular comprising a base, supporting the first skeletal frame, and modular sidewall panels removably attached to side supports of the first skeletal frame, end panels comprising sound attenuation boxes removably attached to end supports of the first skeletal frame, and a roof assembly supported by the first skeletal frame; and the second enclosure is modular comprising a base, supporting the second skeletal frame, and modular sidewall panels removably attached to side supports of the second skeletal frame, end panels comprising sound attenuation boxes removably attached to end supports of the second skeletal frame; and a roof assembly supported by the second skeletal frame; and two or more of the following features:

a) wherein at least one of the removable sidewall panels comprises an access door;

b) wherein the removable sidewall panels and end wall panels are attached to external surfaces of the first skeletal frame and the second skeletal frames;

c) wherein the removable sidewall panels and end wall panels are secured to external surfaces of the first and second skeletal frame by bolts, latches, or other releasable fasteners;

d) wherein the removable sidewall panels comprise at least one of thermal insulation and acoustic insulation;

e) wherein the base of each of the first and second enclosures comprises mounting pads for the respective generator set;

f) wherein a roof assembly of the second enclosure is removable for installation or removal of the second generator set by lifting;

g) wherein the base of the first enclosure is mounted on a base fuel tank;

h) wherein the base of the first enclosure is part of a base fuel tank;

j) comprising walk-in access doors to the first and second enclosures; and

k) comprising walk-in access doors to the first and second enclosures, and at least one of fixed and movable staircases to access the walk-in access doors and the space within the stacking superstructure.

22. A modular enclosure system for industrial generators comprising:

a first enclosure comprising a first skeletal frame and housing a first generator set;

a second enclosure comprising a second skeletal frame and housing a second generator set;

a stacking superstructure;

the stacking superstructure being supported on the first skeletal frame and the second skeletal frame being supported on the stacking superstructure;

the stacking superstructure having a skeletal frame providing vertical separation between the first and second enclosures comprising a space for access and equipment;

a first exhaust system of the first generator set being mounted on the first enclosure in said space provided by the stacking superstructure; and a second exhaust system of the second generator set being mounted on the second enclosure.

23. The modular enclosure system of claim **22**, wherein an exhaust pipe of the first exhaust system is routed longitudinally through the stacking superstructure.

24. The modular enclosure system of claim **22**, wherein the first exhaust system is mounted within part of the stacking superstructure that is unenclosed, and an exhaust pipe the first exhaust system is routed longitudinally through the stacking superstructure.

25. The modular enclosure system of claim **22**, wherein part of the stacking superstructure is enclosed by modular sidewall panels to provide an equipment enclosure.

26. The modular enclosure system of claim **22**, wherein the first and second exhaust systems each comprise a Selective Catalytic Reduction system.

27. The modular enclosure system of claim **22**, wherein the first and second exhaust systems each comprise a muffler.

28. The modular enclosure system of claim **22**, wherein:

the first enclosure is modular comprising a base, supporting the first skeletal frame, and modular sidewall panels removably attached to side supports of the first skeletal frame, end panels comprising sound attenuation boxes removably attached to end supports of the first skeletal frame, and a roof assembly supported by the first skeletal frame; and

the second enclosure is modular comprising a base, supporting the second skeletal frame, and modular sidewall panels removably attached to side supports of the second skeletal frame, end panels comprising sound attenuation boxes removably attached to end supports of the second skeletal frame; and a roof assembly supported by the second skeletal frame.

29. The modular enclosure system of claim **28**, wherein at least one of the removable sidewall panels comprises an access door.

30. The modular enclosure system of claim **28**, wherein the removable sidewall panels and endwall panels are attached to external surfaces of the first and second skeletal frame.

31. The modular enclosure system of claim **28**, wherein the removable sidewall panels and endwall panels are secured to external surfaces of the first skeletal frame and second skeletal frame by bolts, latches or other releasable fasteners.

32. The modular enclosure system of claim **28**, wherein the removable sidewall panels comprise at least one of thermal insulation and acoustic insulation.

33. The modular enclosure system of claim **28**, wherein the base of each of the first and second enclosures comprises mounting pads, the respective generator set being mounted on the mounting pads.

34. The modular enclosure system of claim **22**, wherein a roof assembly of the second enclosure is removable for installation or removal of the second generator.

35. The modular enclosure system of claim **22**, wherein a base of the first enclosure is mounted on a base fuel tank.

36. The modular enclosure system of claim **22**, wherein a base of the first enclosure is part of a base fuel tank.

37. The modular enclosure system of claim **22**, wherein a day tank for fuel for the second generator is mounted within the space of the stacking superstructure.

38. The modular enclosure system of claim **22**, wherein a day tank for fuel for the second generator is mounted within the second enclosure.

39. The modular enclosure system of claim **22**, wherein part of the stacking superstructure is enclosed by modular sidewall panels to provide an equipment enclosure, and switch gear of the second generator set is enclosed within said equipment enclosure.

40. The modular enclosure system of claim **22**, comprising walk-in access doors to the first and second enclosures.

41. The modular enclosure system of claim **22**, comprising walk-in access doors to the first and second enclosures, and comprising fixed or mobile staircases for accessing the walk-in access doors and the space within the stacking superstructure.

42. The modular enclosure system of claim **22**, wherein: the first enclosure is sized to accommodate the first generator set and associated switch gear; and the second enclosure is sized to accommodate the first generator set and associated switch gear.

43. The modular enclosure system of claim **22**, wherein the first and second enclosures are configured for longitudinal airflow from an air intake through a sound attenuation box at one end of the enclosure and an air discharge through a sound attenuation box at an opposite end of the enclosure.

44. The modular enclosure system of claim **22**, wherein each of the first and second enclosures are configured for longitudinal airflow from an air intake through a sound attenuation box at one end of the enclosure and an air discharge through a sound attenuation box at an opposite end of the enclosure, and comprising a discharge tower for receiving said air discharge from the first and second enclosures, and venting said air discharge at a top of the discharge tower.

45. The modular enclosure system of claim **44**, wherein exhaust pipes from each of the first and second exhaust systems are routed longitudinally into and through a discharge tower and vent at a top of the discharge tower.

46. The modular enclosure system of claim **28**, wherein the base of the first enclosure comprises means for receiving a removable rail system for slidable installation or removal of the first generator set from an end of the first enclosure.

47. The modular enclosure system of claim **46**, wherein the removable rail system comprises a plurality of rail units, and the means for receiving the removable rail system comprises one of slots, recesses, and other types of rail mountings for mounting the rail units.

48. The modular enclosure system of claim **47**, wherein the removable rail system comprises a rail extension and support module that extends beyond the end of the first enclosure, the rail extension and support module having a length that accommodates the first generator outside the first enclosure.

49. The modular enclosure system of claim **47**, wherein the rail units are modular lengths of rail, and a pair of slots is provided in the base to receive a pair of rails comprising the modular lengths of rail.

50. The modular enclosure system of claim **49**, wherein the removable rail system comprises rolling means supporting the first generator on the pair of rails.

51. The modular enclosure system of claim **28**, wherein the base of the second enclosure comprises means for receiving a removable rail system for slidable installation or removal of the second generator set from an end of the second enclosure.

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