

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

**EP 1 655 538 A1**

(12)

**EUROPEAN PATENT APPLICATION**

(43) Date of publication:

**10.05.2006 Bulletin 2006/19**

(51) Int Cl.:

**F23G 1/00 (2006.01)**(21) Application number: **05256808.6**(22) Date of filing: **03.11.2005**

(84) Designated Contracting States:

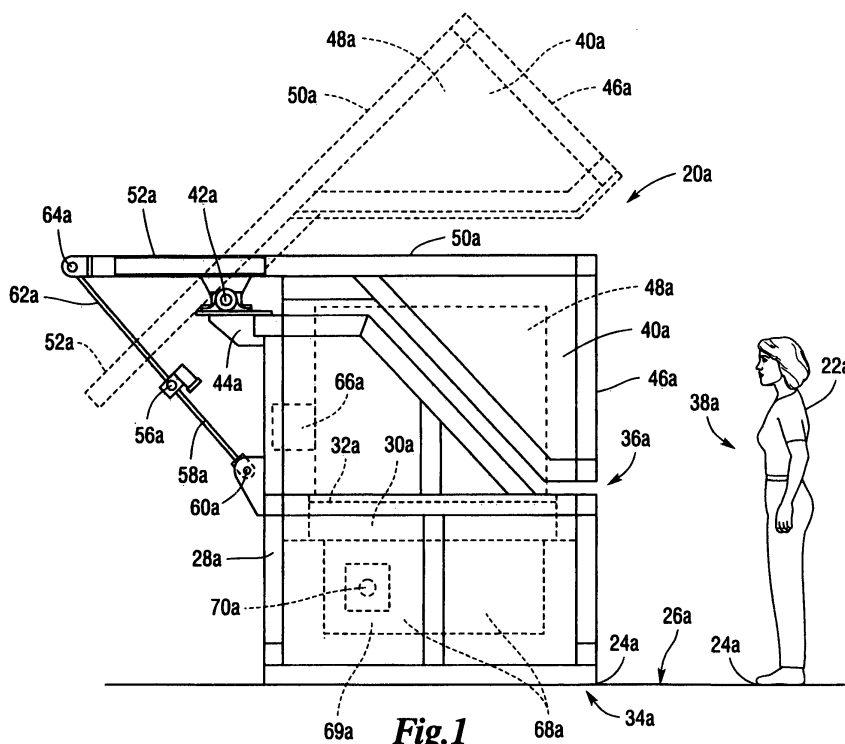
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI  
SK TR**

Designated Extension States:

**AL BA HR MK YU**(30) Priority: **03.11.2004 US 624900 P**(71) Applicant: **Onex, Inc.****Erie, PA 16506 (US)**(72) Inventor: **Puth, Marvin W.****New Galilee, PA 16141 (US)**(74) Representative: **Freeman, Avi****Beck Greener****Fulwood House,****12 Fulwood Place,****London WC1V 6HR (GB)****(54) Crematory and method of cremation**

(57) A crematory (20a) having a plurality of sides is constructed around a base section (28a). A cremation surface (32a) is located at a position within the base section (28a) that allows the loading of a body from a loading level, no higher than about a person's waist level above a floor from which loading of the crematory takes place, at at least one of the sides of the crematory. A crematory door (40a) is mounted to move to closed and open posi-

tions. When in the closed position, the crematory door (40a) covers at least substantially one side of the crematory (20a) above the cremation surface (32a) and extends substantially over the cremation surface (32a) from about the loading level. When in the open position, the crematory door allows a body to be cremated to be loaded onto the cremation surface from the loading level at at least one of the sides of the crematory.

**Fig.1**

## Description

**[0001]** The present invention relates to a crematory and a method of cremation.

**[0002]** Crematories are used in a variety of applications where it is desirable to cremate dead bodies, including animal carcasses, the remains of deceased humans, and other organic materials. The initial cremation operation, in which a body is placed into a hearth and then consumed by intense heating, can typically require that the crematory achieve hearth temperatures of up to 1600° F (approx. 870°C) to 2000° F (approx. 1100°C) or more. Crematories also typically include an incinerator to receive flue products from the crematory hearth. The incinerator burns particles contained in the flue products from the hearth to ensure, for environmental purposes, that all matter coming from the hearth has been totally consumed. The incineration operation can typically require that the incinerator itself achieve temperatures of up to 1825° F (approx. 1000°C) to 2000° F (approx. 1100°C) or more.

**[0003]** In many cremation facilities, especially those employed by animal welfare and control organizations, it is common for bodies to vary greatly in size prior to cremation. Due to such body size variations, it is also common for multiple bodies of different sizes to be loaded (or "charged") into a crematory at one time so that the multiple bodies can be simultaneously cremated during a single cremation cycle, reducing overall operation times and costs. Thus, an operator will frequently charge a crematory with a small number of larger bodies along with any number of smaller bodies to maximize the amount of biomass that is cremated during a single cremation cycle.

**[0004]** Consequently, even if many small bodies are to be simultaneously cremated during a single cremation cycle, it is also highly likely that an operator will eventually need to charge the crematory with one or more larger bodies. However, the bodies of larger animals can weigh more than a hundred pounds and therefore be extremely difficult to lift for charging. Many previous crematories require that charging be performed from above the crematory apparatus or from other positions that are either highly impractical or inconvenient for charging by hand, requiring the operator to utilize a crane, pallet, or other loading device to complete the charging operation. Some loading devices, such as wood pallets or cardboard liners, may be consumable and require replacement after each cremation cycle, increasing the overall operating cost of a facility. Regardless of the charging method that is used, the crematory design must allow for both hearth accessibility and an ability to withstand high temperatures associated with the cremation and incineration operations.

**[0005]** According to a first aspect of the present invention, there is provided a crematory comprising: a base section, said base section having a hearth positioned therein, said crematory having a plurality of sides, said

hearth having a cremation surface; said cremation surface being located at a position within said base section that allows for the loading of a body onto said cremation surface from at least one of said plurality of sides of said crematory and from a loading level that is no higher than about a person's waist level relative to a floor level where loading of said crematory takes place; a crematory door, said crematory door being mounted to be moveable between a closed position and an open position, said crematory door covering at least substantially one side of said crematory above said cremation surface when said crematory door is in said closed position, said crematory door extending substantially over said cremation surface from about said loading level when said crematory door is in said closed position; said crematory door being positioned to allow a body to be loaded on to said cremation surface from about at least one of said sides of said crematory and from about said loading level when said crematory door is in said open position.

**[0006]** In one embodiment, a crematory door is provided mounted to rotate around a door pivot to move between closed and open positions. In another embodiment, the crematory door is vertically liftable from said closed position to said open position.

**[0007]** According to a second aspect of the present invention, there is provided a method of cremating a body in a crematory, the method comprising: providing a crematory according to the first aspect of the present invention; opening the crematory door thereby providing access to the hearth; and positioning one or more bodies within the crematory for cremation.

**[0008]** In embodiments, the invention provides a crematory having a plurality of sides is constructed around a base section having a hearth with a cremation surface.

The cremation surface is located at a position within the base section that allows the loading of a body to be cremated onto the cremation surface from a loading level at at least one of the sides of the crematory. The loading level is no higher than about a person's waist level above a floor from which loading of the crematory takes place (preferably at a person's waist level above a floor from which loading of the crematory takes place).

**[0009]** A crematory door is mounted on the crematory to move to closed and open positions. When the crematory door is in the closed position, the crematory door covers at least substantially one side of the crematory above the cremation surface and extends substantially over the cremation surface from about the loading level. When the crematory door is in the open position, the crematory door allows a body to be cremated to be loaded onto the cremation surface from the loading level at at least one of the sides of the crematory.

**[0010]** Some embodiments of the invention allow the crematory door to be lifted vertically from the closed position to the open position. In other embodiments, the crematory door is mounted to rotate about a pivot point, from the closed position to the open position and back from the open position to the closed position. The cre-

matory door may have an insulated clamshell type configuration. Many embodiments will also include an actuator to move the crematory door between the closed and open positions. Since the cremation operation can typically occur at temperatures above 1600°F (approx. 870°C), the insulated crematory door will generally be constructed to withstand such high temperatures for extended periods of time.

**[0011]** Some embodiments of the invention may also include an incinerator for further consuming waste gases and particles that pass out of the hearth during a cremation process before the waste particles and gases exit from the crematory. Such an incinerator can include an additional burner to incinerate effluents as they pass through a fluid path of the incinerator. The fluid path of an incinerator can assume various shapes and often leads to a flue and/or chimney for channeling the waste gases away from the crematory after incineration.

**[0012]** According to a further aspect of the present invention, there is provided a crematory comprising: a base section, said base section having a hearth positioned therein, said crematory having a plurality of sides, said hearth having a cremation surface; said cremation surface being located at a position within said base section that allows for the loading of a body onto said cremation surface from at least one of said plurality of sides of said crematory the cremation surface being substantially at floor level; a crematory door, said crematory door being mounted to be moveable between a closed position and an open position, said crematory door covering at least substantially one side of said crematory above said cremation surface when said crematory door is in said closed position, said crematory door extending substantially over said cremation surface from about said loading level when said crematory door is in said closed position; said crematory door being positioned to allow a body to be loaded on to said cremation surface from about at least one of said sides of said crematory when said crematory door is in said open position.

**[0013]** Those skilled in the art will realize that this invention is capable of embodiments that are different from those shown and that details of the structures of the disclosed crematories can be changed in various manners without departing from the scope of this invention. Accordingly, the drawings and descriptions are to be regarded as including such equivalent crematories as do not depart from the scope of the invention.

**[0014]** Examples of embodiments of the present invention will now be described in detail with reference to the accompanying drawings, in which:

FIG. 1 is a side view of a crematory according to an example of one embodiment of the invention;

FIG. 2 is a top view of the crematory of FIG. 1;

FIG. 3 is a front view of the crematory of FIG. 1;

FIG. 4 is a front perspective view of a crematory according to an example of one embodiment of the invention having a crematory door in an open position;

FIG. 5 is a front perspective view of the crematory of FIG. 4 having the crematory door in a closed position;

FIG. 6 is a rear perspective view of the crematory of FIG. 4;

FIG. 7 is a rear view of the crematory of FIG. 4;

FIG. 8 is a side view of the crematory of FIG. 4;

FIG. 9 is a cutaway perspective view of an incinerator positioned within a base section of the crematory of FIG. 4;

FIG. 10A is a side conceptual view of a crematory according to an example of one embodiment of the invention, a crematory door being in a closed position;

FIG. 10B is a side conceptual view of the crematory of FIG. 10A, the crematory door being in an open position;

FIG. 11A is a side conceptual view of a crematory according to an example of one embodiment of the invention, a crematory door being in a closed position;

FIG. 11B is a side conceptual view of the crematory of FIG. 11A, the crematory door being in an open position;

FIG. 12A is a side conceptual view of a crematory according to an example of one embodiment of the invention, a crematory door being in a closed position;

FIG. 12B is a side conceptual view of the crematory of FIG. 12A, the crematory door being in an open position;

FIG. 13A is a side conceptual view of a crematory according to an example of one embodiment of the invention, a crematory door being in a closed position;

FIG. 13B is a side conceptual view of the crematory of FIG. 13A, the crematory door being in an open position;

FIG. 14A is a side conceptual view of a crematory according to an example of one embodiment of the

invention, a crematory door being in a closed position;

FIG. 14B is a side conceptual view of the crematory of FIG. 14A, the crematory door being in an open position;

FIG. 15A is a side conceptual view of a crematory according to an example of one embodiment of the invention, a crematory door being in a closed position;

FIG. 15B is a side conceptual view of the crematory of FIG. 15A, the crematory door being in an open position;

FIG. 16A is a side conceptual view of a crematory according to an example of one embodiment of the invention, a crematory door being in a closed position;

FIG. 16B is a side conceptual view of the crematory of FIG. 16A, the crematory door being in an open position;

FIG. 17 is a front perspective conceptual view of an arrangement of a crematory with incinerator according to an example of one embodiment of the invention;

FIG. 18 is a front perspective conceptual view of an arrangement of a crematory with incinerator according to an example of one embodiment of the invention;

FIG. 19 is a front perspective conceptual view of an arrangement of a crematory with incinerator according to an example of one embodiment of the invention;

FIG. 20 is a front perspective conceptual view of an arrangement of a crematory with incinerator according to an example of one embodiment of the invention;

FIG. 21 is a front perspective conceptual view of an arrangement of a crematory with incinerator according to an example of one embodiment of the invention; and

FIG. 22 is a front perspective conceptual view of an arrangement of a crematory with incinerator according to an example of one embodiment of the invention.

**[0015]** Referring to the drawings, similar reference numerals are used to designate the same or corresponding parts throughout the several figures. Specific embodi-

ment variations in corresponding parts are denoted with the addition of lower case letters to reference numerals.

**[0016]** FIGS. 1 through 3 depict side, top, and front cross sectional views of a conceptual crematory 20a of the invention. FIGS. 1 and 3 include depictions of a human operator 22a standing on a floor level 24a that is the level of a floor 26a that is in front of the crematory 20a. In FIGS. 1 and 3, the crematory 20a is also depicted as being positioned on the floor 26a. To provide a better understanding of the invention, the operator 22a is depicted to provide a general comparison of the size of the crematory 20a and a reference for the approximate relative positioning of crematory components with respect to the floor level 24a and a person who is the operator 22a during a typical cremation cycle. However, it will be appreciated that the relative sizes of the crematory 20a and human operator 22a, as well as the relative positioning of crematory components with respect to the individual operator 22a, can vary greatly, such variations being contemplated to exist within the intended scope of embodiments of the invention.

**[0017]** The crematory 20a is constructed around an insulated base section 28a that provides the major structural assembly of the crematory 20a. A hearth 30a is located within the base section 28a and includes a cremation surface 32a on which bodies are positioned during the cremation operation. The cremation surface 32a can be constructed of a high temperature withstanding metal, ceramic, or composite material and is slightly contoured to allow for the gathering of fluids, ash, and other combustion products that result during the cremation operation.

**[0018]** As best understood with reference to FIGS. 1 and 3, the crematory 20a includes a base section 28a and a front side 34a in front of which the floor 26a defines the floor level 24a. Typically, this area of the floor 26a in front of the crematory 20a provides a general working area in which the operator 22a "charges" the crematory 20a by placing bodies on the cremation surface 32a of the hearth 30a. The positioning of the cremation surface 32a in the hearth 30a is such that the cremation surface 32a is located at a position within the base section 28a that allows for the loading of a body onto the cremation surface 32a or "charging" of the crematory 20a from the front side 34a or another side of the crematory 20a.

**[0019]** The operator 22a charges the crematory 20a from a loading level 36a that is generally defined as being no higher than about a waist level 38a of most operators relative to where loading or "charging" of the crematory 20a is taking place. Thus, in the case of the crematory 20a of FIGS. 1-3, the waist level 38a is measured approximately with respect to the floor level 24a, from which loading or "charging" of the crematory 20a by the operator 22a takes place.

**[0020]** Preferably, the loading level is substantially at a typical user's waist level, i.e. between 0.6 and 1.2 m relative to the floor level from which loading takes place. Typically, the preferred loading level is between floor lev-

el and approximately 1.5 m. The maximum preferred loading level would be up to about 2.5 m. A more preferred range would be between about .45 metres and 1.5 m, more preferably between about 0.6 m and 1.2 m.

**[0021]** This general positioning of the loading level 36a is also convenient for use with a wheeled cart that may be used by the operator 22a to transport bodies to the location of the crematory 20a. When such a cart is moved to the front side 34a of the crematory 20a, the waist level positioning of the loading level 36a allows the operator 22a to easily charge the crematory 20a by simply moving bodies contained on the cart along a generally horizontal plane on to the cremation surface 32a of the hearth 30a, the cremation surface 32a being located at about or near the loading level 36a. This approximately in-line movement of bodies from the cart to cremation surface 32a at about the loading level 36a/waist level 38a of the operator 22a can often eliminate the need for additional lifting equipment for all but the largest bodies.

**[0022]** Access to the hearth 30a and cremation surface 32a is provided by a crematory door 40a. The crematory door 40a is mounted on a door pivot 42a that is located on a mounting 44a positioned in fixed relation to the base section 28a. The mounting 44a allows the door pivot 42a to be located relative to the base section 28a and thereby allows for the door 40a to be rotatable relative to both the door pivot 42a and base section 28a. Thus, the operator 22 is able to open the crematory door 40a from a closed position, as shown with solid lines in FIGS. 1-3, to an open position, as depicted with broken lines in FIG. 1.

**[0023]** Referring to FIG. 1, the crematory door 40a includes a face shield 46a, side shields 48a, top shield 50a, and a lever assembly 52a that is reinforced with lever supports 54a. This combined arrangement of the face, top, and side shields 46a, 48a, and 50a creates a "clam-shell configuration" of the crematory door 40a that allows direct access to the cremation surface 32a from the front side 34a of the crematory 20a when the door 40a is in the open position.

**[0024]** Consider the crematory door 40a in the closed position, as shown with solid lines in FIGS. 1-3. With the door 40a in the closed position, the face shield 46a of the crematory door 40a covers a substantial portion of one side, i.e. in FIGS. 1-3 the front side 34a, of the crematory 20a above the cremation surface 32a. The top shield 50a of the crematory door 40a also extends substantially over the cremation surface 32a from about the loading level 36a, when the door 40a is in the closed position.

**[0025]** An actuator 56a is connected to the base section 28a via a lower strut section 58a and base pivot 60a, and is further connected to the lever assembly 52a of the crematory door 40a with an upper strut section 62a and lever pivot 64a. It will be appreciated that electrical, mechanical, pneumatic, hydraulic, and other types of drive systems can be implemented with the depicted actuator 56a within the intended scope of examples of embodi-

ments of the invention.

**[0026]** Consider the crematory 20a prior to charging. The operator 22a raises the crematory door 40a by operating the actuator 56a to pull the lever pivot 64a and lever assembly 52a toward the base pivot 60a and base section 28a, causing the crematory door 40a to rotate around the door pivot 42a and raise the crematory door 40a to the open position as depicted with the broken lines in FIG. 1. This effectively raises the face shield 46a of the door 40a sufficiently high above the base section 28a at the front side 34a of the crematory 20a to allow for unobstructed access to the hearth 30a and cremation surface 32a from the front side 34a of the base section 28a at the loading level 36a. The operator 22a can then easily move a cart bearing the bodies to be cremated up to the front side 34a of the base section 28a and proceed to move each body on to the cremation surface 32 without substantial lifting of the bodies above the loading level 36. Thus, when the crematory door 40a is in the open position, this positioning of the crematory door 40a allows a body to be loaded onto the cremation surface 32a from about the loading level 36a and from about one side, i.e. in FIGS. 1-3 the front side 34a of the crematory 20a.

**[0027]** After the crematory 20a is charged, the operator 22a then uses the actuator 56a to lower the crematory door 40a prior to initiating the cremation operation. The unobstructed access to the hearth 30a and cremation surface 32a from the loading level 36a when the crematory door 40a is in the open position also facilitates maintenance of the internal components of the crematory 20a.

**[0028]** The cremation operation involves the heating of the hearth 30a with cremation burners 66a. However, before cremation begins, it may be required by applicable laws or regulations to initiate the operation of an incinerator for consuming waste particles and gases passing from the hearth 30a before the waste gases exit from the crematory 20a. As best understood by comparing FIGS. 1-3, an incinerator 68a is located beneath the hearth 30a in the base section 28a. The incinerator includes a u-shaped gas flow path 69a and a separate incinerator burner 70a, the u-shaped gas flow path 69a being positioned to receive waste particles and gases after they pass over the hearth 30a during the cremation operation. The u-shape of the gas flow path 69a of the incinerator 68a is best understood with reference to the top view of the crematory 20a in FIG. 2.

**[0029]** It is common in many jurisdictions for the incinerator 68a to be required during such cremations. There is also often an added statutory or regulatory requirement for the incinerator 68a to achieve from 1600° to 1825° F, or in some cases above 2000°F, prior to commencing the cremation operation. Once such incinerator temperatures are achieved, cremation may begin by heating the hearth 30a to 1600° (approx. 870°C) to 1800° F (approx. 980°C) or higher, with waste particles and gases passing from the hearth 30a to the incinerator 68a where particles and pollutant gases remaining in the waste gases flow through the u-shaped flow path 69a are further consumed

prior to the air exiting through the flue 72a. The base section 28a, as well as the face, side, and lever shields 46a, 48a, and 50a of the crematory door 40a must normally be heavily reinforced with ceramic or other appropriate materials to withstand such temperatures.

**[0030]** Both the cremation burners 66a and incinerator burner 70a are typically gas fired devices that rely on appropriate conduits and headers (hereinafter collectively referred to as "conduits") to provide gas and/or air. In some embodiments of the invention, structural tubing of the base section 28a or of other crematory components may be employed to serve as such air and gas supply conduits to conserve space and improve the overall aesthetic appearance of the crematory 20a. For example, heavy duty 4" structural square tube can be employed to serve such a dual function for appropriately implemented conduits.

**[0031]** The positioning of conduits and other components of the crematory can vary according to the specific application and available or desired types of energy. For example, FIGS. 4-8 depict a crematory 20b of the invention configured for operating with natural gas and air, with an electrically actuated crematory door 40b having an insulated clamshell type configuration.

**[0032]** FIG. 4 is a front perspective view of the crematory 20b with the crematory door 40b raised to the open position. High temperature thermal insulation, which can be fiberglass, ceramic fiber, composite, or any other thermally resistant material lines the inside of the crematory door 40b. Ceramic bricks 76b and a ceramic structural member 78b in the base section 28b form the inside walls of the hearth 30b, and are located along the outer edges of the cremation surface 32b. A sliding support bar 80b extends from the base section 28b and is connected with a support pivot 82b to the side shield 48b of the crematory door 40b. The support bar 80b provides additional support for the crematory door 40b when the door 40b is in the open position, and is locked into position relative to the base section 28b by the operator 22b with a handle lock 84b prior to charging or cleaning the hearth 30b. The operator 22b disengages the handle lock 84b prior to moving the crematory door 40b to the closed position, as depicted in FIG. 5., the sliding support bar 80b sliding through the handle lock 84b but remaining connected to the crematory door 40b at the support pivot 82b as the door 40b rotates on the door pivot 46b to the closed position.

**[0033]** As best understood with a comparison of FIGS. 4 and 5, when the crematory door 40b is in the closed position shown in FIG. 5, the face shield 46b of the crematory door 40b substantially covers one side, i.e. the front side 34b, of the crematory 20b above the cremation surface 32b. The side shield 48b visible in FIGS. 4 and 5 also covers a substantial portion of one side of the crematory 20b when the door 40b is closed. In the closed position, the top shield 50b of the crematory door 40b also extends substantially over the cremation surface 32b from about the loading level 36b.

**[0034]** As best understood by comparing FIG. 4 with the rear perspective view of the crematory 20b in FIG. 6, cremation burners 66b extend through the ceramic bricks 76b of the base section 28b to provide heat for cremation processes. The depicted cremation burners 66b are gas fired, utilizing natural gas supplied from an external utility conduit 88b. However, it will be appreciated that burners using other fuels can also be incorporated within the intended scope of the invention. Generally, suitable cremation burners for a crematory will be capable of heating a hearth from about 1600°F (approx. 870°C) to above 2000° F (approx. 1100°C), and will be either independently controllable or controllable via external controller valves to allow for adjustment in the level of heating within the hearth and crematory.

**[0035]** As best understood by comparing the rear perspective view of the crematory 20b in FIG. 6 with the rear view in FIG. 7, the utility conduit 88b supplies natural gas to a gas conduit 86b of the crematory 20b. The gas conduit 86b channels gas through a main gas regulator 89b that allows for the reduction of gas conduit pressure to levels that are compatible for use by the cremation burners 66b and incinerator burner 70b. The gas conduit 86b then channels gas through a conduit manual shutoff valve 90b that allows for manual interruption of gas flow to downstream components along the gas conduit 86b. Gas is further channelled by the gas conduit 86b through a dual valve manifold 91b that includes a pair of electrically operated block valves that allow for safe emergency shutoff of the fuel supply. Gas flowing through the gas conduit 86b diverges at a conduit tee 92b into a cremation burner leg 94b and an incinerator burner leg 96b.

**[0036]** The cremation burner leg 94b includes a cremation manual shutoff valve 98b that allows for manual interruption of gas flow to downstream components along the cremation burner leg 94b. Gas flows from the cremation manual shutoff valve 98b to a cremation automatic controller valve 100b that allows for controlled regulation of gas flow into the cremation burners 66b. Gas flowing through the cremation burner leg 94b again diverges at a burner tee 102b into separate burner conduits 104b, which directly supply gas to the individual cremation burners 66b if multiple cremation burners 66b are employed.

**[0037]** The incinerator burner leg 96b includes an incinerator manual shutoff valve 103b that allows for manual interruption of gas flow to downstream components along the incinerator burner leg 96b. Gas flows from the incinerator manual shutoff valve 103b to an incinerator automatic controller valve 106b that allows for controlled regulation of gas flow into the incinerator burner 70b. Comparing FIGS. 6 and 7 with the side view of the crematory 20b in FIG. 8, gas is then allowed to flow to an incinerator inlet valve 108b that regulates gas flowing into the incinerator burner 70b.

**[0038]** Air is supplied to the crematory 20b with an air blower 114b which feeds air into a main air conduit 116b, the air conduit 116b having a relatively large size cross

sectional diameter to allow for the accommodation of larger volumes of air. The incinerator burner air conduit 112b has a smaller cross sectional diameter and channels air from the main air conduit 116b to the incinerator burner 70b where it mixes with gas from the incinerator burner leg 96b and is consumed in the combustion process of the incinerator burner 70b. An incinerator air control valve 118b is positioned along the incinerator burner air conduit 112b to allow for limiting of air flow to the incinerator burner 70b.

**[0039]** The incinerator automatic controller valve 106b and incinerator air control valve 118b are remotely operated by a controller 142b that monitors incinerator temperatures with an incinerator thermocouple 144b. The controller 142b allows operator adjustment of a desired incinerator set point temperature, and then automatically adjusts the incinerator automatic controller valve 106b to allow an appropriate level of gas flow and adjusts the incinerator air control valve 118b to allow an appropriate level of air flow to cause the incinerator burner 70b to burn and therefore maintain the desired set point temperature.

**[0040]** An air curtain conduit 120b, also having a smaller cross sectional diameter than the main air conduit 116b, channels air from the main air conduit 116b to an air curtain manifold 122b. As best understood by comparing FIG. 6 with the front perspective view of the crematory 20b in FIG. 4, the air curtain manifold 122b supplies air to two air curtain nozzles 124b that are positioned to blow air across the incinerator entrance 126b toward the ceramic structural member 78b. This blowing of air by the air curtain nozzles 124b creates an air curtain, which creates an air damper between cremation processes occurring in the hearth 30b and incineration processes occurring in the incinerator 68b. The blowing air also provides additional oxygen for the incineration process as waste gases and particles pass from over the hearth 30b through the incinerator entrance 126b.

**[0041]** Referring again to the rear perspective view of the crematory 20b in FIG. 6 and the rear view of the crematory 20b in FIG. 7, an incinerator chamber air conduit 128b channels air from the main air conduit 116b directly to the incinerator 68b. The incinerator chamber air conduit 128b is divided into three segments. The first segment includes an upstream conduit tube 130b comprising a segment of tubing that channels air from the main air conduit 116b. The second segment comprises a structural square tube 132b of the base section 28b that is hollow along its length and that provides an internal channel for flowing air. The structural square tube 132b is sealed from other crematory components and from the surrounding atmosphere except at a first interconnection point 134b, where the structural square tube 132b is attached to receive flowing air from the upstream conduit tube 130b, and with reference to FIG. 4, at a second interconnection point 136b, where the structural square tube 132b is attached to channel flowing air into a downstream conduit tube 138b. Thus, the dual usage of the

structural square tube 132b as a structural member of the base section 28b and as part of the incinerator chamber air conduit 128b serves to reduce the number of components present along the exterior of the crematory 20b and simplifies the overall crematory design.

**[0042]** Referring now to the front perspective views of the crematory 20b in FIGS. 4 and 5, the downstream conduit tube 138b channels flowing air of the incinerator chamber air conduit 128b through a two position emergency incineration air control valve 139b and into an incinerator air inlet 140b leading directly to the incinerator 68b. The additional air flowing into the incinerator 68b provides additional oxygen for incineration processes within the incinerator 68b during operation. The air control valve 139b is connected to a solenoid control 141b that is operated by the controller 142b, which provides operational logic for the air control valve 139b.

**[0043]** Flowing air in the main air conduit 116b that does not enter the incinerator burner air conduit 112b, incinerator chamber air conduit 128b, or air curtain conduit 120b will continue to a reduced diameter portion 158b of the main air conduit 116b. The remaining flowing air is channelled by the main air conduit 116b to an air pressure switch 160b which constantly monitors the presence of air pressure to the air pressure switch 160b. In the event of a sudden loss of flowing air through the main air conduit 116b, the air pressure switch 160b detects the absence of air pressure and shuts down the crematory 20b.

**[0044]** The main air conduit 116b also channels flowing air through a two position air control valve 162b which typically incorporates a two position switch having HIGH and LOW switch settings and corresponding valve settings. The LOW switch and corresponding valve settings are normally used to restrict air flow from the main air conduit 116b through the main air conduit connection 164b and into the hearth 30b when the incinerator 68b is being heated but before a cremation process begins within the hearth 30b. The HIGH switch and corresponding valve settings are normally used to increase air flow from the main air conduit 116b through the main air conduit connection 164b and into the hearth 30b after the cremation burners 66b have been fired and a cremation process is underway.

**[0045]** Air fed into the hearth 30b by the main air conduit 116b provides oxygen that interacts with the heat from the cremation burners 66b and fuel provided by the bodies on the cremation surface 32b of the hearth 30b to cause the combustion of the cremation process. The operator 22b may manually adjust the controller 142b to achieve and maintain a particular set point temperature in the hearth 30b. Accordingly, the controller 142b automatically monitors the cremation temperatures within the hearth 30b with a cremation chamber thermocouple 157b and automatically adjusts the cremation automatic controller valve 100b to allow an appropriate level of gas flow to the cremation burners 66b to cause the cremation process to proceed at the desired set point temperature.

As the cremation process continues, this results in waste particles and gases that are generated and that pass over the cremation surface 32b, which are passed to the incinerator 68b for further consumption.

**[0046]** Comparing FIGS. 4 and 5 to the cutaway perspective view in FIG. 9 of the incinerator 68b within the base section 28b of the crematory 20b, the controller 142b operates the air control valve 139b depending on the temperature of the incinerator 68b as measured at the outlet of the flue 72b by a chimney thermocouple 156b. The general path of waste particles and gases passing over the cremation surface 32b in the hearth 30b and passing through the air curtain created by the air curtain nozzles 124b into the incinerator entrance 126b is depicted as a hearth gas flow 146b. The waste particles and gases continue as an incinerator flow 148b as they enter and continue along the u-shaped flow path 69b of the incinerator 68b, where the effluents are further consumed by the incinerator 68b. After being further consumed by the incinerator 68b, the remaining incinerated matter becomes an exhaust flow 150b as it enters and then passes through the flue 72b. The exhaust flow 150b subsequently exits the flue 72b and encounters an open, flared chimney 152b, suspended above the flue 72b with supports 154b. Natural updrafts from the surrounding environment force the heated incinerated matter up the chimney 152b and away from the crematory 20b.

**[0047]** During an incineration process, as the controller 142b monitors temperature within the incinerator 68b with the chimney thermocouple 156b, the controller 142b can sense fuel overload conditions within the hearth 30b that could lead to significant temperature jumps or "run-away incinerator" conditions developing within the incinerator 68b. If such temperature jumps or runaway incinerator conditions are determined by the controller 142b to be present, the controller 142b operates the solenoid control 141b to adjust the air control valve 139b to allow additional air flow from the incinerator chamber air conduit 128b to enter the incinerator 68b through the incinerator air inlet 140b. The additional air flow entering the incinerator 68b has the effect of controllably raising the temperature of the incineration process to incinerate more of the waste particles and gases in the incinerator flow 148b and prevent the temperature jumps or "run-away incinerator" conditions from occurring.

**[0048]** The controller 142b itself can be a programmable control system that allows for automatic and/or remote control, recognition, and integration of many crematory components, including but not limited to any or all of the air control valve 139b and solenoid control 141b, the dual valve manifold 91b, the cremation automatic controller valve 100b, the incinerator automatic controller valve 106b, the air pressure switch 160b, the two position air control valve 162b, the main gas regulator 89b, the chimney thermocouple 156b, the cremation chamber thermocouple 157b, the incinerator thermocouple 144b and/or the actuator 56b. Suitable controllers can include any of the Series 2300, 2500, 6300, 7000, or 9000 Uni-

versal Digital Control Systems (UDC) available from Honeywell, Inc. of Port Washington, Pennsylvania. Other suitable controllers include the 350 and 550 Series Systems available from Yokogawa Corp. of America of Newnan, Georgia. Frequently, such controllers can be programmed and a crematory configured to entirely automate an operable cycle of incineration and cremation without requiring further operator involvement between stages of the operable cycle. Depending on the specific programming and crematory configuration, this may include automatic movement of the crematory door 40b from open to closed positions at the start of an operable cycle and automatic movement of the crematory door 40b from closed to open positions at the completion of an operable cycle.

**[0049]** As best understood by comparing the rear perspective view of the crematory 20b in FIG. 6 to the side view of the crematory 20b in FIG. 8, actuated movement of the crematory door 40b to the open or closed positions is performed with an actuator 56b incorporating an electric motor 166b. The actuator 56b is mounted in fixed position relative to the base section 28b of the crematory 20b on an actuator mount 168b. An actuator rod 170b connects to the lever assembly 52b of the crematory door 40b at the lever pivot 64b. When the actuator 56b is operated to move the crematory door 40b from the closed position to the open position, the electric motor 166b drives the actuator 56b to pull the actuator rod 170b in a downward direction to move the lever pivot 64b toward the actuator mount 168b. This causes the crematory door 40b to rotate about its door pivot 42b upward to assume the open position shown in FIG. 6. When the actuator 56b is operated to move the crematory door 40b from the open position to the closed position, the actuator 56b pushes the actuator rod 170b in an upward direction to move the lever pivot 64b away from the actuator mount 168b. This causes the crematory door 40b to rotate about its door pivot 42b downward to assume the closed position shown in FIG. 8.

**[0050]** It will be appreciated that other actuators can be incorporated into crematories within the intended scope of the invention. For example, FIGS. 10A and B depict side conceptual views of a crematory 20c of the invention having an actuator 56c in which an electric motor 166c is positioned to operate a screw jack 172c that rotates internal female engagement threads (not shown) to engage male engagement threads 174c on an actuator rod 170c. The female engagement threads can be rotated counter clockwise to cause the actuator rod 170c to move upward and thereby cause the crematory door 40c to rotate around its door pivot 42c in a downward direction toward the base section 28c and assume the closed position, as shown in FIG. 10A. The female engagement threads can be rotated clockwise to cause the actuator rod 170c to move downward and retreat into a rod housing 176c, thereby causing the crematory door 40c to rotate around its door pivot 42c in an upward direction away from the base section 28c and assume the open position,

as shown in FIG. 10B.

**[0051]** FIGS. 11A and B depict side conceptual views of a crematory 20d of the invention having an actuator 56d in which an electric motor 166d is positioned to operate a ball screw jack 178d that causes the actuator rod 170d to move upward and thereby cause the crematory door 40d to rotate around its door pivot 42d in a downward direction toward the base section 28d and assume the closed position, as shown in FIG. 11A. The ball screw jack 178d can also cause the actuator rod 170d to move downward and retreat into a rod housing 176d, thereby causing the crematory door 40d to rotate around its door pivot 42d in an upward direction away from the base section 28d and assume the open position, as shown in FIG. 11B.

**[0052]** FIGS. 12A and B depict side conceptual views of a crematory 20e of the invention having a fluid operated actuator 56e mounted on the base section 28e with a cylinder mount 179e. A piston rod 180e of a fluid cylinder 182e is positioned to engage the lever assembly 52e of the crematory door 40e at a lever pivot 64e. The fluid cylinder 182e can be either hydraulically or pneumatically operated. When the fluid cylinder 182e causes the piston rod 180e to extend upward, this causes the lever assembly 52e to rotate the crematory door 40e in a downward direction and around its door pivot 42e toward the closed position, as shown in FIG. 12A. When the fluid cylinder 182e causes the piston rod 180e to retract into the fluid cylinder 182e, this causes the lever assembly 52e to rotate the crematory door 40e in an upward direction around its door pivot 42e toward the open position, as shown in FIG. 12B.

**[0053]** FIGS. 13A and B depict side conceptual views of a crematory 20f of the invention having a counterweighted lever assembly 52f attached to the crematory door 40f. A counterweight 184f is suspended from a distal end 185f of the lever assembly 52f with a counterweight hook 186f. A relatively small, manually operated fluid cylinder 182f is positioned relative to the base section 28f with an actuator mount 168f and includes a piston rod 180f that is connected to the lever assembly 52f of the crematory door 40f with a lever pivot 64f. The fluid cylinder 182f can be either hydraulically or pneumatically operated and is manually operated by an operator. When the operator manually activates the fluid cylinder 182f to cause the piston rod 180f to extend from the fluid cylinder 182f, this causes the lever assembly 52f to rotate the crematory door 40f in a downward direction around its door pivot 42f toward the closed position, as shown in FIG. 13A. The weight of the suspended counterweight 184f, which is pulled vertically out of its counterweight housing 188f, moderates the dropping force of the crematory door 40f as it moves toward the closed position.

**[0054]** When the operator activates the fluid cylinder 182f to retract the piston rod 180f into the fluid cylinder 182f, this causes the lever assembly 52f to rotate the crematory door 40f in an upward direction around its door pivot 42f toward the open position, as shown in FIG. 13B.

Due to the lever advantage of the lever assembly 52f with respect to the door pivot 42f and the weight of the suspended counterweight 184f, which is allowed to lower itself back into its counterweight housing 188f, a lower amount of force is required to be exerted by the fluid cylinder 182f to raise the crematory door 40f as it moves toward the open position depicted in FIG. 13B. Thus, the presence of the suspended counterweight 184f allows an operator to utilize a smaller fluid cylinder 182f than would otherwise be necessary for rotating the crematory door 40f around its door pivot 42f.

**[0055]** It will be appreciated that in some embodiments, such counter weighting of a crematory door may allow for other types of reduced size actuator mechanisms to be used in place of a fluid cylinder. In some embodiments, similar counter weighting may allow for an operator to move a crematory door to open and closed positions by hand.

**[0056]** It will be further appreciated that while the invention has been shown and described as having a crematory door having an insulated clamshell configuration, other types of crematory door configurations are possible and are within the contemplated scope of the invention. For example, FIGS. 14A and B depict a crematory 20g of the invention having a crematory door 40g that is vertically liftable from a closed position, as shown in FIG. 14A, to an open position, as shown in FIG. 14B. The crematory door 40g includes a face shield 46g and side shields 48g, the face shield 46g and side shields 48g each allowing the crematory door 40g to cover at least substantially one side of the crematory 20g above the cremation surface 32g when the crematory door 40g is in the closed position. The crematory door 40g is also aligned in position on the base section 28g with alignment pins 190g, each of different heights relative to the base section 28g, that are each positioned to extend upwards from the base section 28g to engage corresponding alignment holes 192g positioned on the crematory door 40g. The differing heights of the individual alignment pins 190g allow the crematory door 40g to engage each pin sequentially to facilitate alignment as the cremation door 40g is moved toward the closed position.

**[0057]** As best understood by comparing FIGS. 14A and B, when the crematory door 40g is in the closed position depicted in FIG. 14A, the top shield 50g of the crematory door 40g extends substantially over the cremation surface 32g from about the loading level 36g. When the crematory door 40g is vertically lifted to the open position depicted in FIG. 14B, a body can be loaded on to the cremation surface 32g from multiple sides of the crematory 20g and from about the loading level 36g, though the presence of the flue 72g and chimney 152g may obstruct access to the cremation surface 32g from the loading level 36g on one side.

**[0058]** FIGS. 15A and B depict a crematory 20h of the invention having a domed crematory door 40h that is also vertically liftable from a closed position, as shown in FIG. 15A, to an open position, as shown in FIG. 15B. The

domed crematory door 40h forms a face shield 46h as well as side shields 48h, the face shield 46h and side shields 48h also each allowing the crematory door 40h to cover at least substantially one side of the crematory 20h above the cremation surface 32h when the crematory door 40h is in the closed position. The crematory door 40h is also aligned in position on the base section 28h with alignment pins 190h to engage corresponding alignment holes 192h positioned on the crematory door 40h to facilitate alignment as the cremation door 40h is moved toward the closed position.

**[0059]** As best understood by comparing FIGS. 15A and B, when the crematory door 40h is in the closed position depicted in FIG. 15A, the top shield 50h of the crematory door 40h extends substantially over the cremation surface 32h from about the loading level 36h. However, the top shield 50h does not extend completely over the cremation surface 32h since the rolled surface of the top shield 50h transitions into the outer surfaces of the face shield 46h and side shields 48h. When the crematory door 40h is vertically lifted to the open position depicted in FIG. 15B, a body can be loaded on to the cremation surface 32h from multiple sides of the crematory 20h and from about the loading level 36h, though the presence of the flue 72h and chimney 152h also may obstruct access to the cremation surface 32h from the loading level 36h on one side.

**[0060]** Although the invention has been shown and described as having a loading level and cremation surface that are above a floor level where loading takes place, it will be appreciated that in some contemplated embodiments of the invention, either the loading level, cremation surface or both the loading level and cremation surface may be positioned lower than a floor level from which loading takes place. Such configurations may be appropriately implemented where a surrounding building has been constructed around a crematory of the invention after crematory installation or where the crematory or surrounding floor has been custom installed in the surrounding building to the extent that previous flooring or foundational materials have been removed. Such configurations may also be appropriately implemented where a crematory is oversized, such cremators intended for the cremation of significantly larger animals.

**[0061]** For example, FIGS. 16A and B depict side conceptual views of a crematory 20i of the invention in which the base section 28i is set into a surrounding floor 26i to the extent that the cremation surface 32i and loading level 36i are below a floor level 24i from which loading of the crematory 20i takes place. A clearance taper 194i is added to the surrounding floor 26i and can serve to facilitate crematory installation and/or the later loading of bodies onto the cremation surface 32i or "charging" of the crematory 20i. As is best understood with a comparison of FIGS. 16A with 16B, since the crematory door 40i also extends slightly below the floor level 24i when in the closed position as shown in FIG. 16A, the clearance taper 194i can also serve to provide additional clearance for

the crematory door 40i when the door 40i is rotated around its door pivot 42i to the open position, as depicted in FIG. 16B.

**[0062]** Although the invention has been shown and described as having an incinerator located within a base section of a crematory, it will be appreciated that other incinerator configurations are also possible and are within the contemplated scope of the invention. For example, FIG. 17 depicts a front perspective conceptual view of an arrangement of a crematory 20j with incinerator 68j of the invention in which the incinerator 68j extends from one side of the base section 28j and extends vertically. A linear shaped gas flow path (not shown in FIG. 21) extends vertically along approximately the height of the incinerator 68j leading to a flue 72j that exhausts the remaining incinerated material into the chimney 152j. With the incinerator 68j positioned at one side of the base section 28j, it is normally possible to lower the loading level 36j to a position that is substantially below a person's waist level 38j.

**[0063]** In operation, it is often considered optimal for waste particles and gases from the cremation process to remain within an incinerator for at least a predetermined minimum incineration time. For example, at normal incineration temperatures of from about 1600°F (approx. 870°C) to 2000°F (approx. 1100°C), an optimal predetermined incineration time for flowing effluents can be approximately one second before being expelled from the incinerator. However, the velocity of effluent flow through the incinerator will depend largely on the available cross sectional area of the incinerator with respect to the volume of waste particle and gas effluents entering the incinerator. Thus, for purposes of comparison, assume that the incinerator 68j of FIG. 17 has a flow path having a similar cross sectional area to the u-shaped flow path 69b of the incinerator 68b of FIG. 9. Consider that similar fuels and operating conditions are used for cremating and incinerating similar bodies in the crematories 20b and 20j. The vertical height of the incinerator 68j of FIG. 17 would normally need to be approximately equal to the total length of the u-shape flow path 69b of the incinerator 68b of FIG. 9 to achieve similar levels of incineration.

**[0064]** FIG. 18 depicts a front perspective conceptual view of an arrangement of a crematory 20k with incinerator 68k of an example of an embodiment of the invention in which the incinerator 68k extends from one side of the base section 28k and includes a linear shaped and horizontally extending gas flow path (not shown) that extends approximately the length of the incinerator 68k. The cross sectional shape of the incinerator 68k is slightly shorter in comparison to the cross sectional thickness of the flow path of the incinerator 68j of FIG. 17. However, the cross sectional width and overall flow path length of the incinerator 68k of FIG. 18 are accordingly increased to ensure that a similar volume of effluents, which would resultantly move through the incinerator 68k at greater velocity, remain within the incinerator 68k for a sufficiently

long period of time to ensure proper incineration.

**[0065]** FIG. 19 depicts a front perspective conceptual view of an arrangement of a crematory 201 with incinerator 681 of an example of an embodiment of the invention in which the incinerator 681 extends from one side of the base section 281 and includes a linear shaped and horizontally extending gas flow path (not shown) that is greatly shortened, extends approximately the shortened length of the incinerator 681. The cross sectional width and height of the incinerator 681. are correspondingly increased to account for the shortened gas flow path length. As a result, the velocity of effluents undergoing incineration within the incinerator 681 are correspondingly reduced, allowing for an appropriately long incineration period of time.

**[0066]** FIG. 20 depicts a front perspective conceptual view of an arrangement of a crematory 20m with incinerator 68m of an example of an embodiment of the invention in which the incinerator 68m extends from one side of the base section 28m and includes a u-shape gas flow path (not shown) that extends approximately along the u-shape length of the incinerator 68m. Like the incinerator 68b of FIG. 9, the u-shape gas flow path allows for incineration to occur along its u-shape length, the total u-shape length being adjusted to account for cross sectional sizing of the gas flow path to ensure a sufficiently long incineration period of time. However, by extending the incinerator 68m from one side of the base section, it becomes possible to lower the loading level 36m below the waist level 38m.

**[0067]** FIG. 21 depicts a front perspective conceptual view of an arrangement of a crematory 20n with incinerator 68n of an example of an embodiment of the invention in which the loading level 36n is maintained at about a waist level 38n by raising the vertical positioning of the base section 28n with base section legs 28n. A u-shaped incinerator 68n is suspended at a position that is substantially higher than the loading level 36n. However, the cross sectional sizing and u-shaped length of the gas flow path is appropriately selected to ensure that flowing effluents remain within the incinerator 68n for a sufficient amount of time to ensure proper incineration.

**[0068]** FIG. 22 depicts a front perspective conceptual view of an arrangement of a crematory 20o with incinerator 68o of an example of an embodiment of the invention in which the loading level 36o is also maintained at about a waist level 38o by raising the vertical positioning of the base section 28o with base section legs 28o. A linear shaped incinerator 68o is also suspended at a position that is substantially higher than the loading level 36o. Again, the cross sectional sizing and u-shaped length of the gas flow path is appropriately selected to ensure that flowing effluents are retained within the incinerator 68o for adequate incineration to take place.

**[0069]** This invention has been described with reference to several preferred embodiments. Many modifications and alterations will occur to others upon reading and understanding the preceding specification. It is in-

tended that the invention be construed as including all such alterations and modifications in so far as they come within the scope of the appended claims or the equivalents of these claims.

## Claims

### 1. A crematory comprising:

a base section, said base section having a hearth positioned therein, said crematory having a plurality of sides, said hearth having a cremation surface;  
said cremation surface being located at a position within said base section that allows for the loading of a body onto said cremation surface from at least one of said plurality of sides of said crematory and from a loading level that is no higher than about a person's waist level relative to a floor level where loading of said crematory takes place;  
a crematory door, said crematory door being mounted to be moveable between a closed position and an open position, said crematory door covering at least substantially one side of said crematory above said cremation surface when said crematory door is in said closed position, said crematory door extending substantially over said cremation surface from about said loading level when said crematory door is in said closed position; said crematory door being positioned to allow a body to be loaded on to said cremation surface from about at least one of said sides of said crematory and from about said loading level when said crematory door is in said open position said crematory door being mounted to rotate around a door pivot from said closed position to said open position and from said open position to said closed position.

2. A crematory according to claim 1, a floor level being at about the level of a floor adjacent said crematory.

3. A crematory according to claim 1 or 2, comprising an actuator being positioned to rotate said crematory door around said door pivot and to thereby move said crematory door to at least one of said closed position and said open position.

4. A crematory according to any of claims 1 to 3, wherein said door pivot is located relative to said base section; and wherein an actuator is positioned to rotate said crematory door around said pivot and to thereby move said crematory door to at least one of said closed position and said open position, said actuator being one or more of electrically operated, pneumatically operated, hydraulically operated and manually

operated.

5. A crematory according to any of claims 1 to 4, further comprising:

a lever assembly extending from said crematory door;  
a base pivot, lower strut section, upper strut section, and lever pivot, said upper strut section being connected to said lever assembly at said lever pivot, said lower strut section being connected to said base section at said base pivot, said lower strut section and said upper strut section being connected to an actuator, said actuator being capable of moving said crematory door to said open position by pulling said upper strut section to move said lever pivot and said lever assembly toward said base pivot and said base section to cause said crematory door to rotate around said door pivot and thereby move either away from or towards said hearth.

6. A crematory according to any of claims 1 to 5, further comprising:

an insulated crematory door;  
an insulated base section, said insulated base section providing a major structural assembly of said crematory; and  
said hearth being located within said insulated base section.

7. A crematory according to any of claims 1 to 6, said cremation surface comprising a high temperature withstanding material, selected from the group consisting of a high temperature withstanding ceramic material, a high temperature withstanding metal material, and a high temperature withstanding composite material.

8. A crematory according to any of claims 1 to 7, said crematory door having a face shield, side shield, top shield, and lever assembly.

9. A crematory according to any of claims 1 to 8, said crematory door having a dome shape.

10. A crematory according to any of claims 1 to 9, said crematory having at least one gas fired cremation burner for heating said hearth during a cremation process.

11. A crematory according to claim 10, further comprising:

at least one conduit for providing gas or air to said at least one cremation burner; and  
said base section having structural tubing, said

structural tubing serving as at least one of said at least one conduit.

12. A crematory according to any of claims 1 to 11, further comprising a flue for allowing waste gases to exit said crematory during a cremation process.

13. A crematory according to claim 12, further comprising:

a chimney for channelling waste gases that exit said crematory through said flue away from said crematory.

14. A crematory comprising:

a base section, said base section having a hearth positioned therein, said crematory having a plurality of sides, said hearth having a cremation surface;

said cremation surface being located at a position within said base section that allows for the loading of a body onto said cremation surface from at least one of said plurality of sides of said crematory and from a loading level that is no higher than about a person's waist level relative to a floor level where loading of said crematory takes place;

a crematory door, said crematory door being mounted to be moveable between a closed position and an open position, said crematory door covering at least substantially one side of said crematory above said cremation surface when said crematory door is in said closed position, said crematory door extending substantially over said cremation surface from about said loading level when said crematory door is in said closed position; said crematory door being positioned to allow a body to be loaded on to said cremation surface from about at least one of said sides of said crematory and from about said loading level when said crematory door is in said open position, said crematory door being vertically liftable from said closed position to said open position.

15. A crematory according to claim 14, comprising:

a plurality of alignment pins positioned on said base section;

a plurality of alignment holes positioned on said crematory door, said alignment holes positioned to engage said alignment pins and align said crematory door with respect to said base section when said crematory door is moved to said closed position.

16. A crematory according to claim 14 or 15, comprising

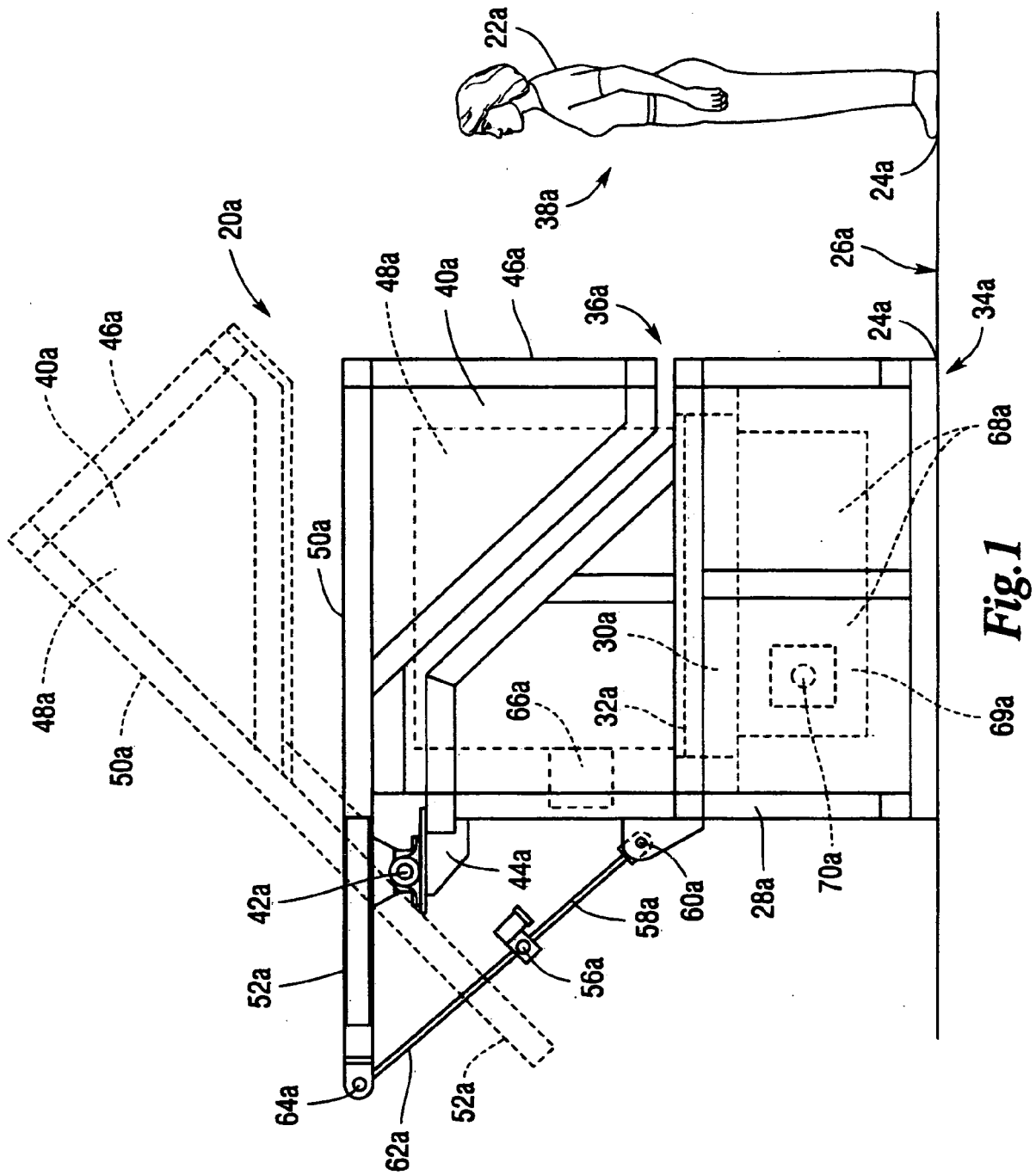
an actuator for moving said crematory door to at least one of said closed position and said open position.

17. A crematory according to any of claims 1 to 16, further comprising an incinerator for consuming waste particles and gases passing from said hearth before the waste particles and gases exit from said crematory. 5
  
18. A crematory according to claim 17, said incinerator being capable of achieving temperatures of from about 870°C (about 1600°F) to about 1100°C (about 2000°F) prior to the commencing of a cremation operation in said hearth. 10
  
19. A crematory according to claim 17 or 18, said incinerator having one or more of a u-shape gas flow path, a linear shape and vertically extending gas flow path, and a linear shape and horizontally extending gas flow path. 15
  
20. A crematory according to claim 18 or 19, said incinerator having a gas flow path that is suspended at a position that is substantially higher than said loading level. 20
  
21. A crematory according to any of claims 18 to 20, said incinerator having a separate incinerator burner. 25
  
22. A crematory according to claim 21, said incinerator burner being gas fired. 30
  
23. A method of cremating a body in a crematory, the method comprising: 35
  - providing a crematory according to any of claims 1 to 22;
  - opening the crematory door thereby providing access to the hearth; and
  - positioning one or more bodies within the crematory for cremation. 40

45

50

55



**Fig. 1**

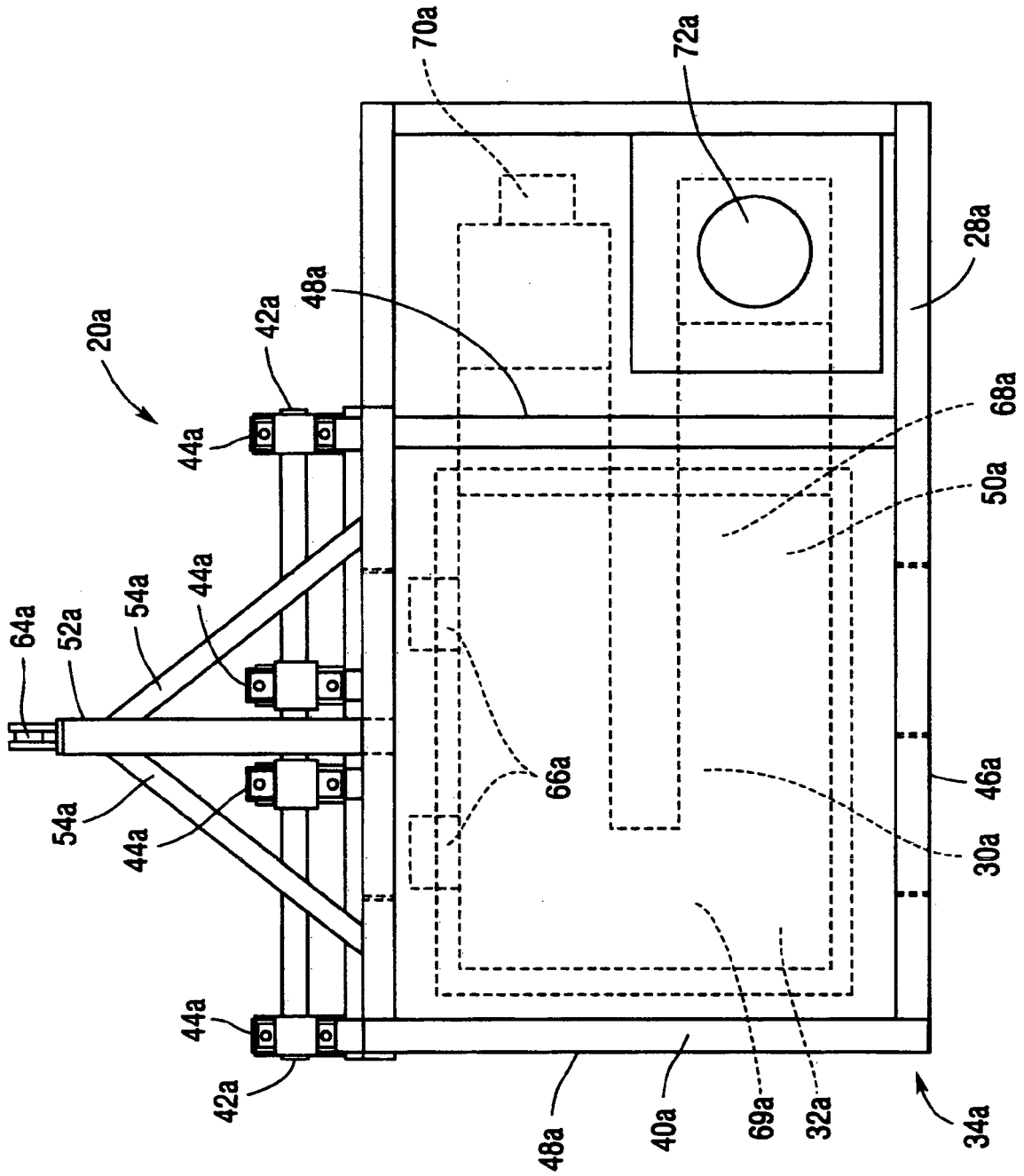


Fig. 2

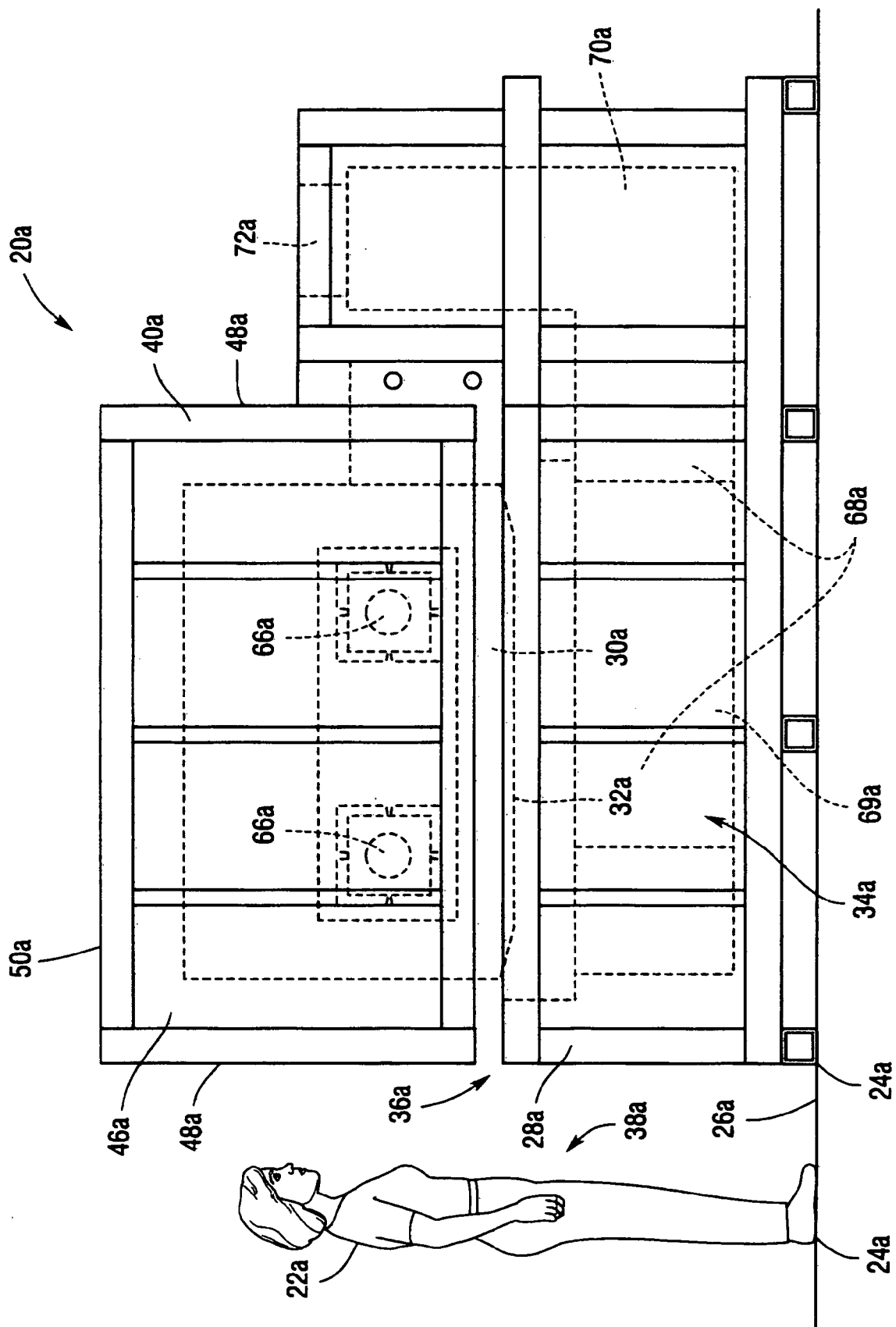
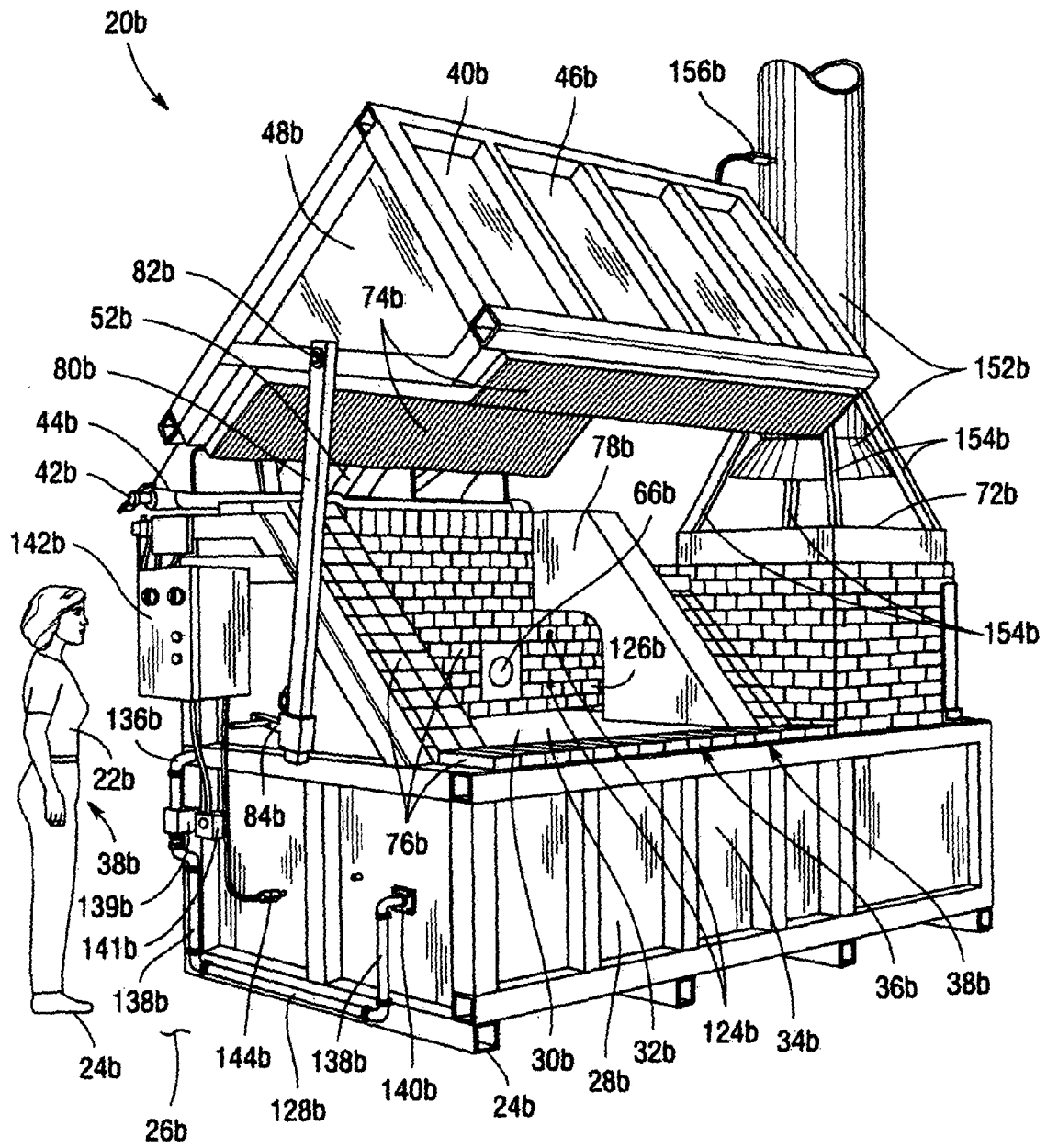
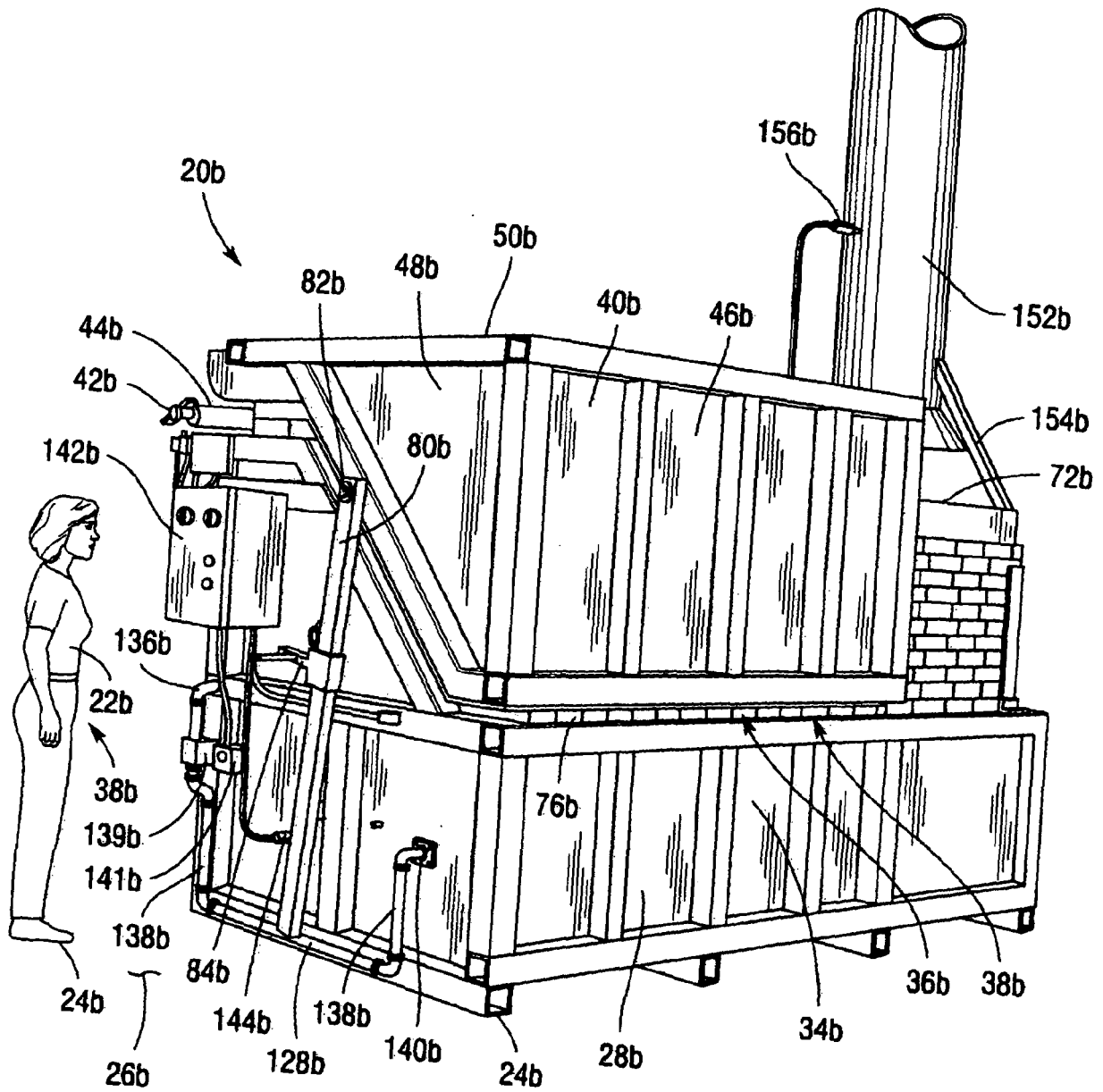


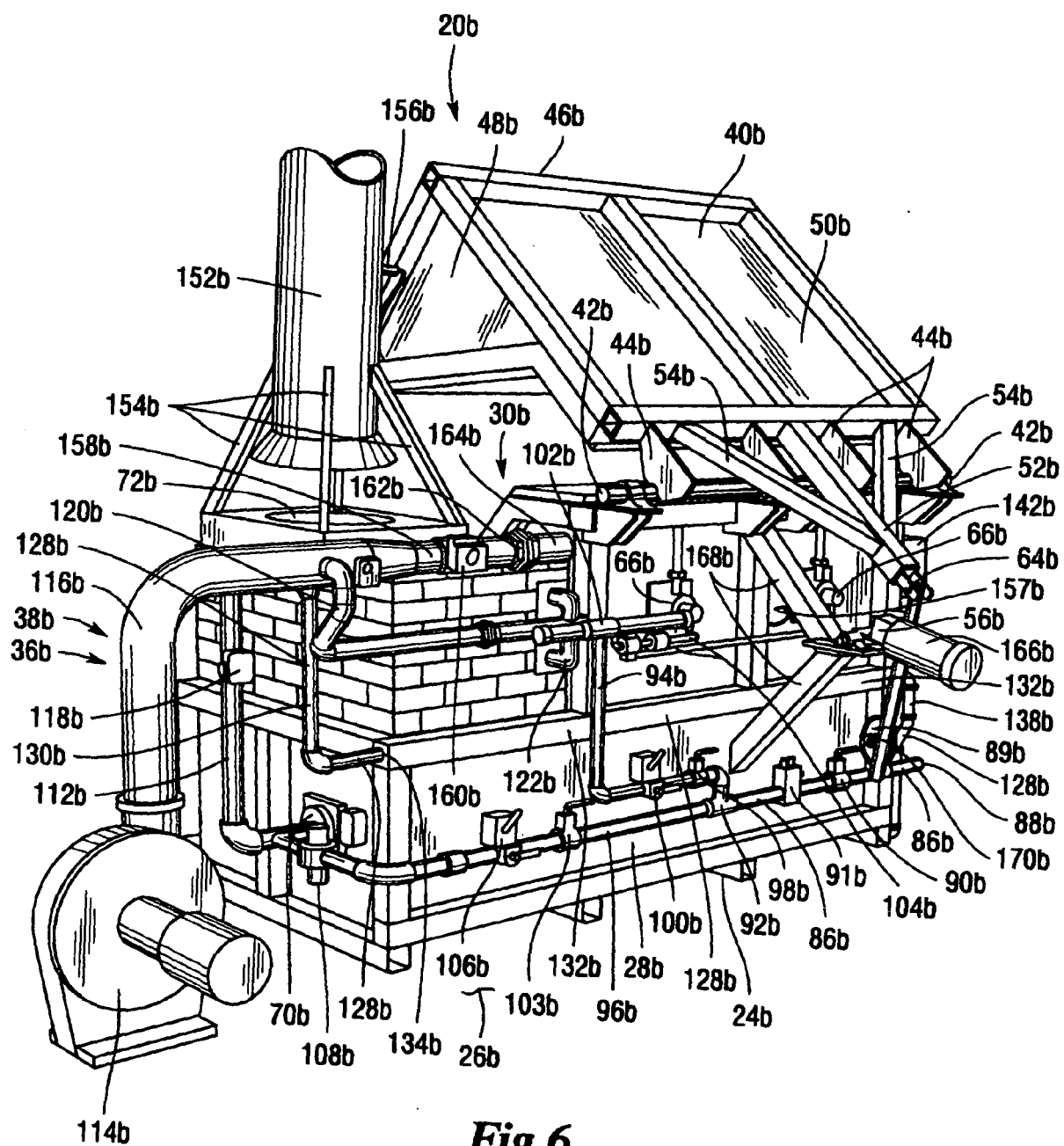
Fig. 3



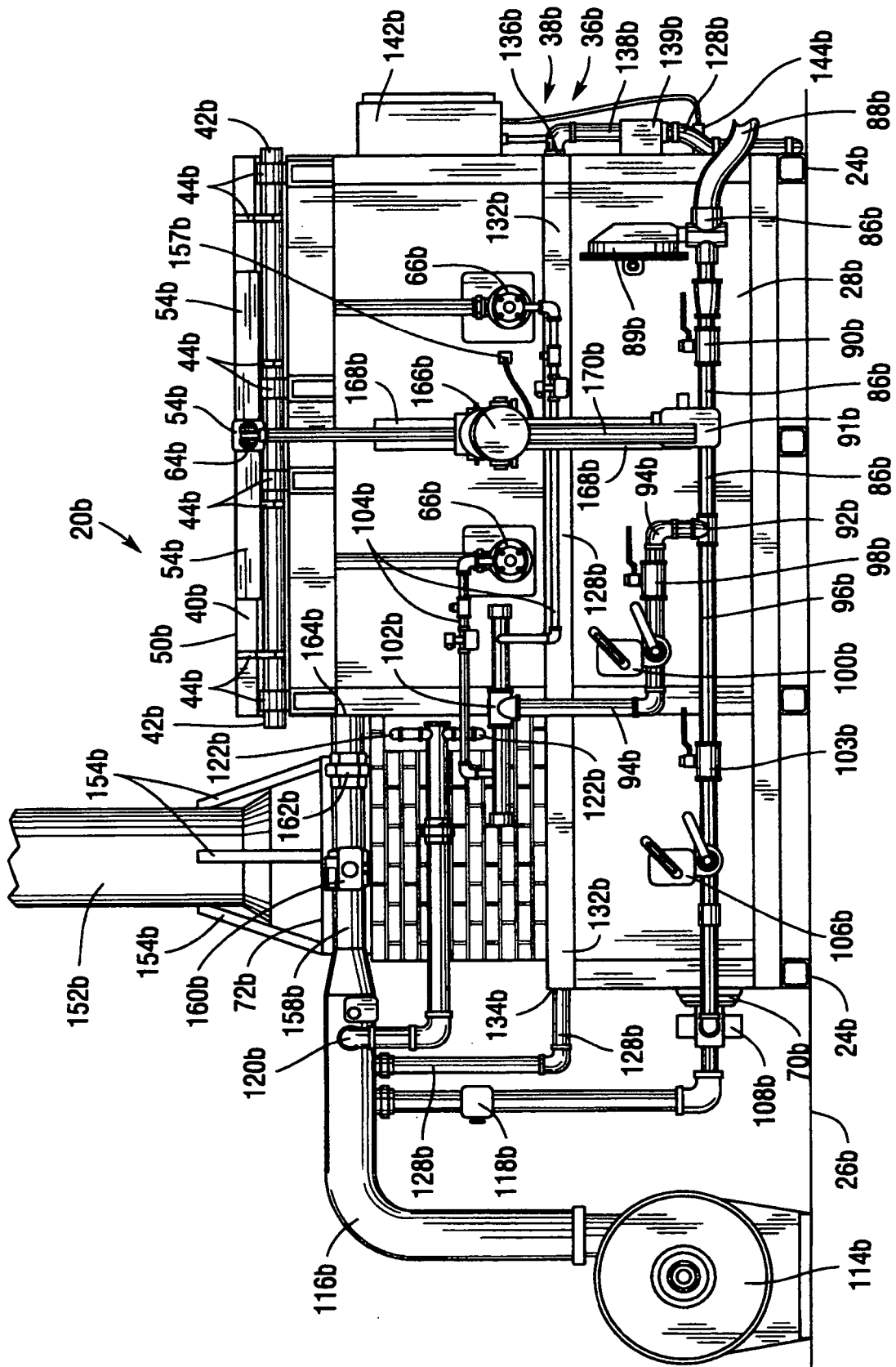
**Fig.4**



*Fig. 5*



**Fig.6**



*Fig. 7*

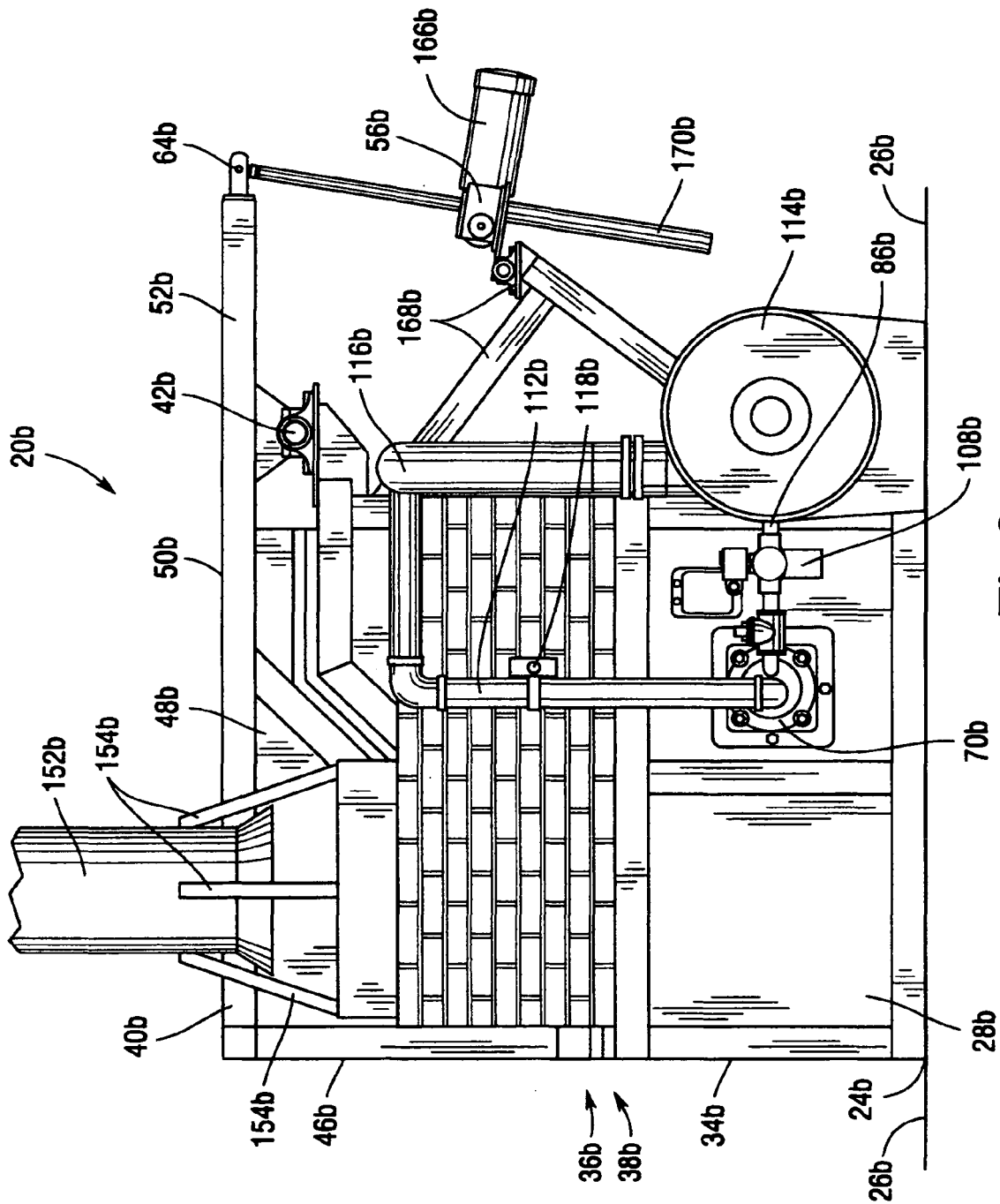
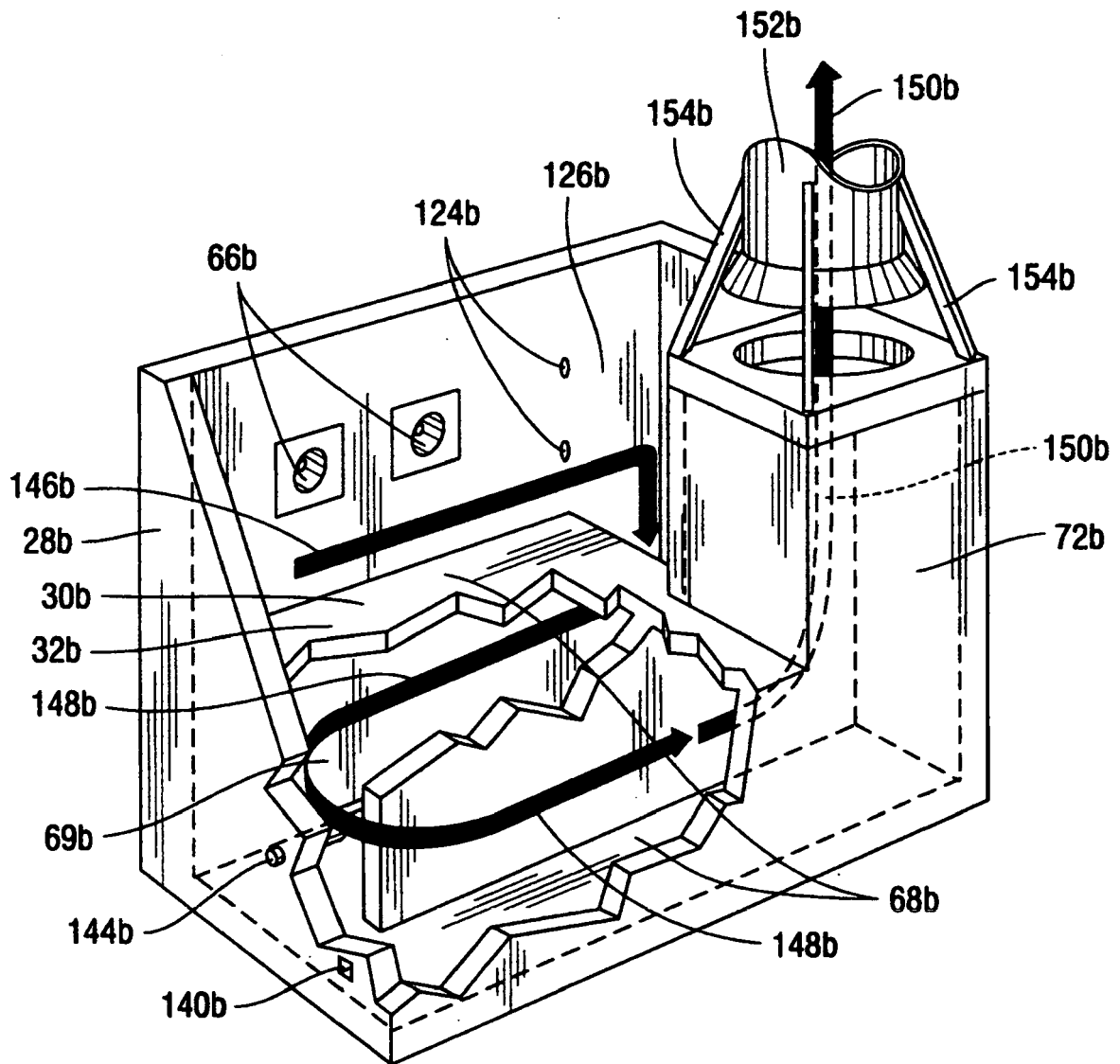
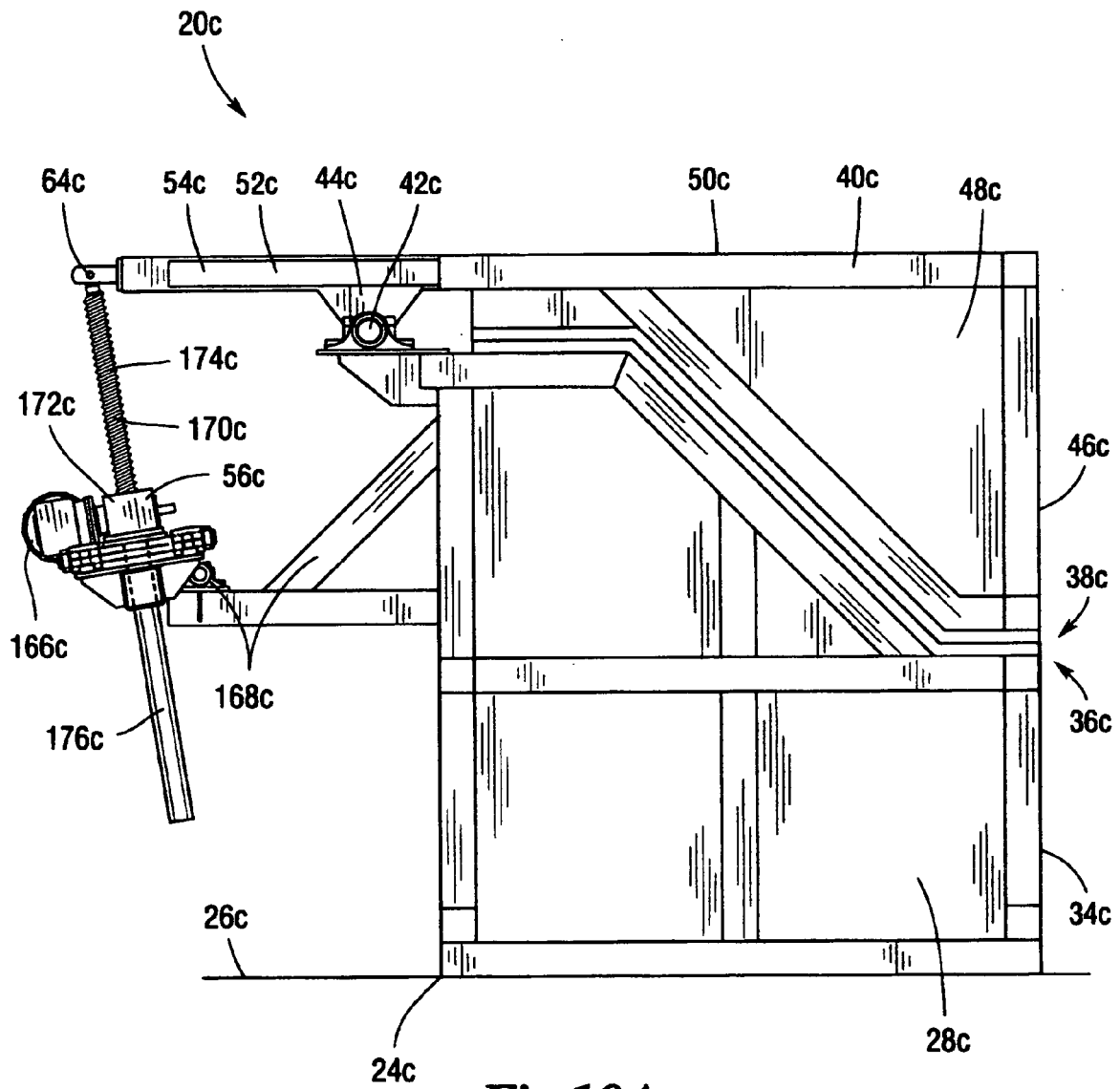


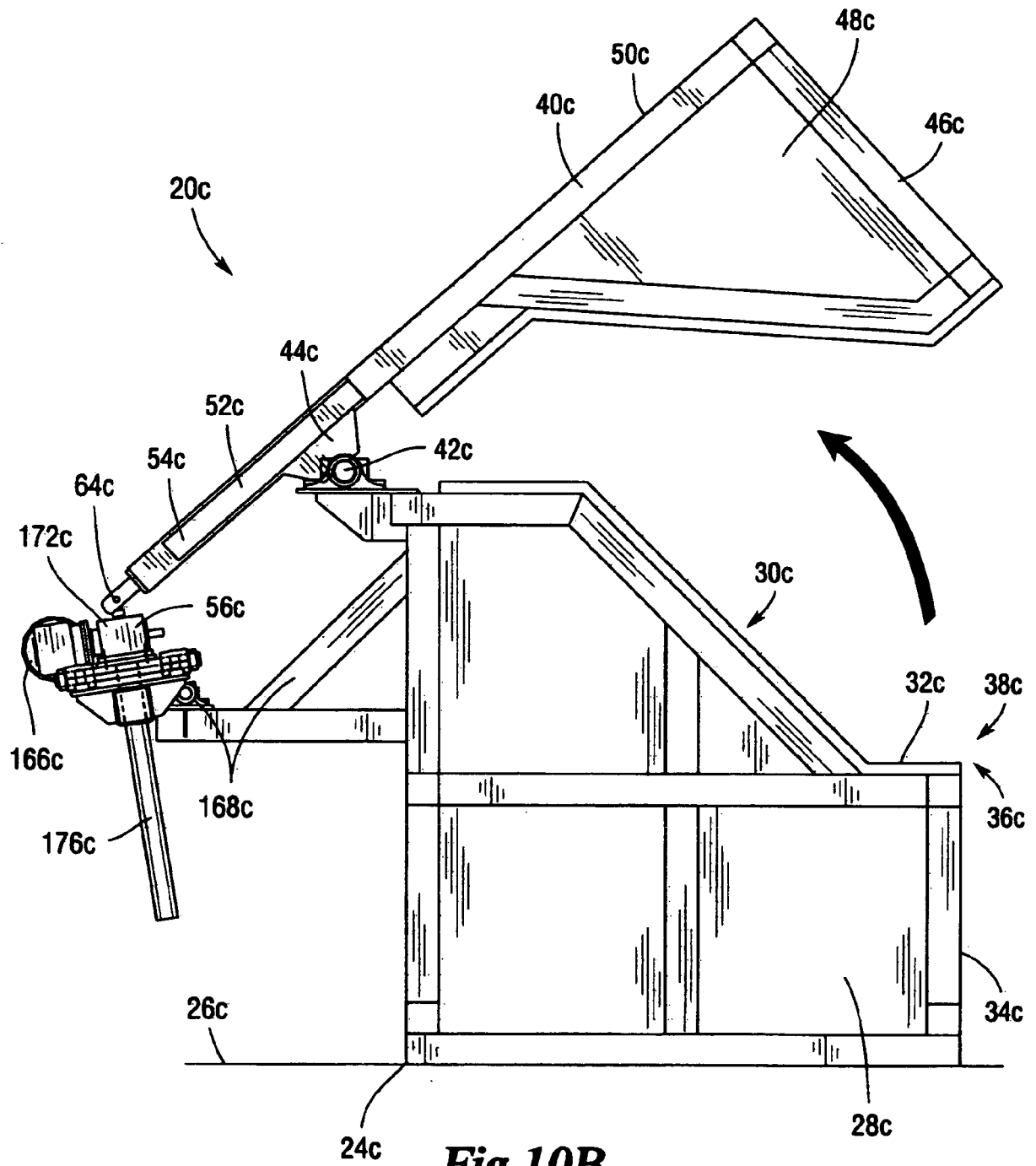
Fig. 8



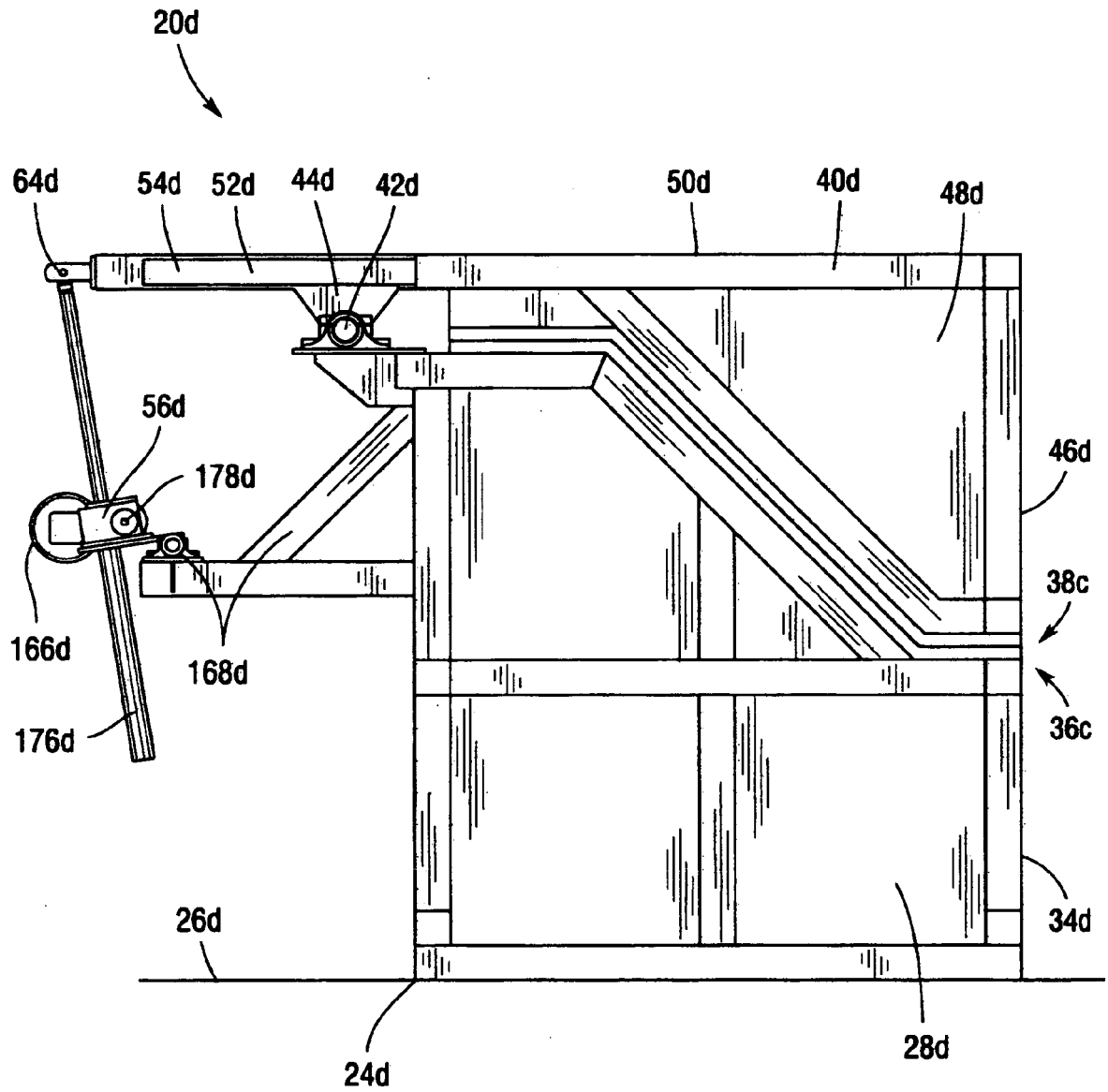
**Fig. 9**



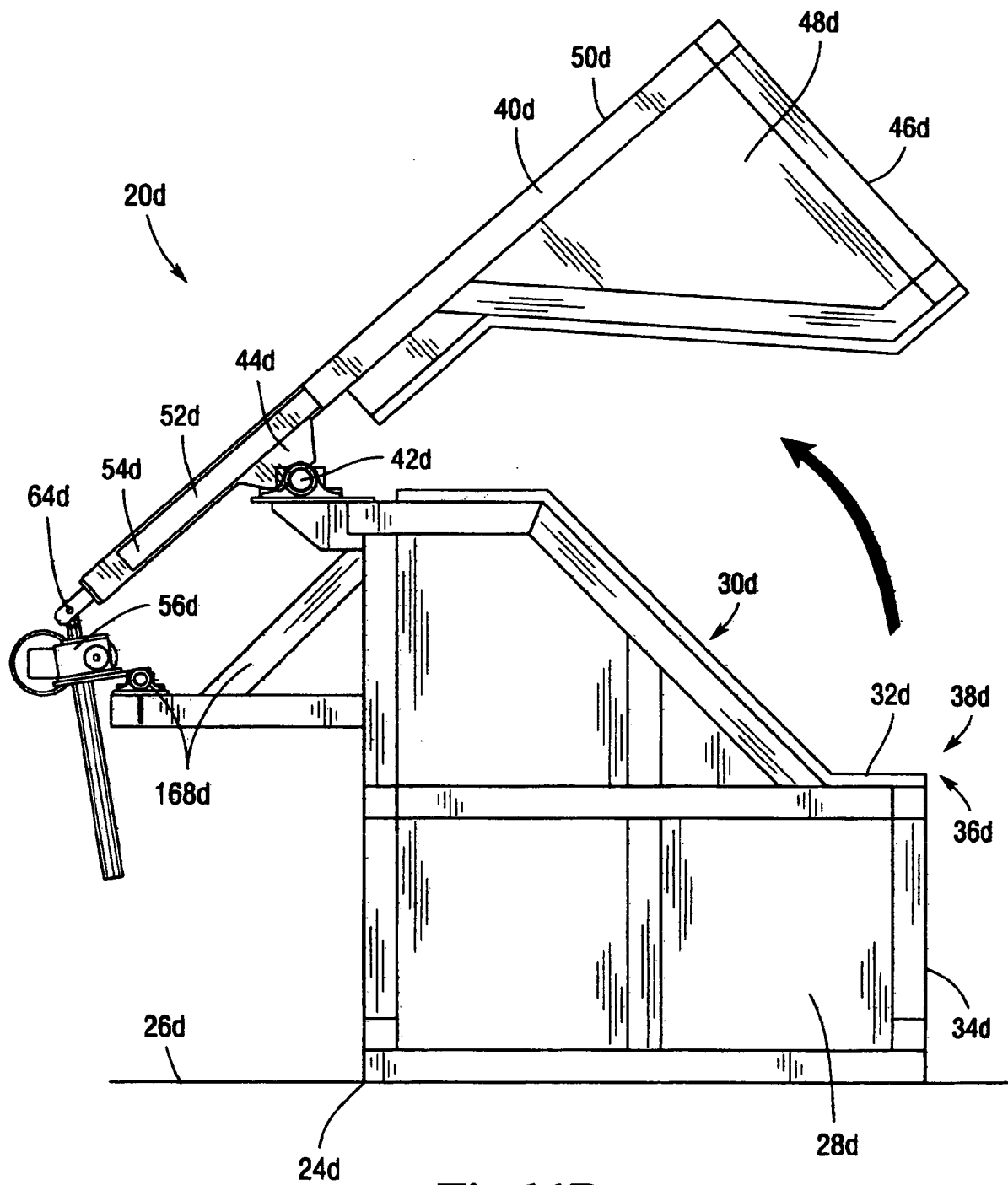
**Fig.10A**



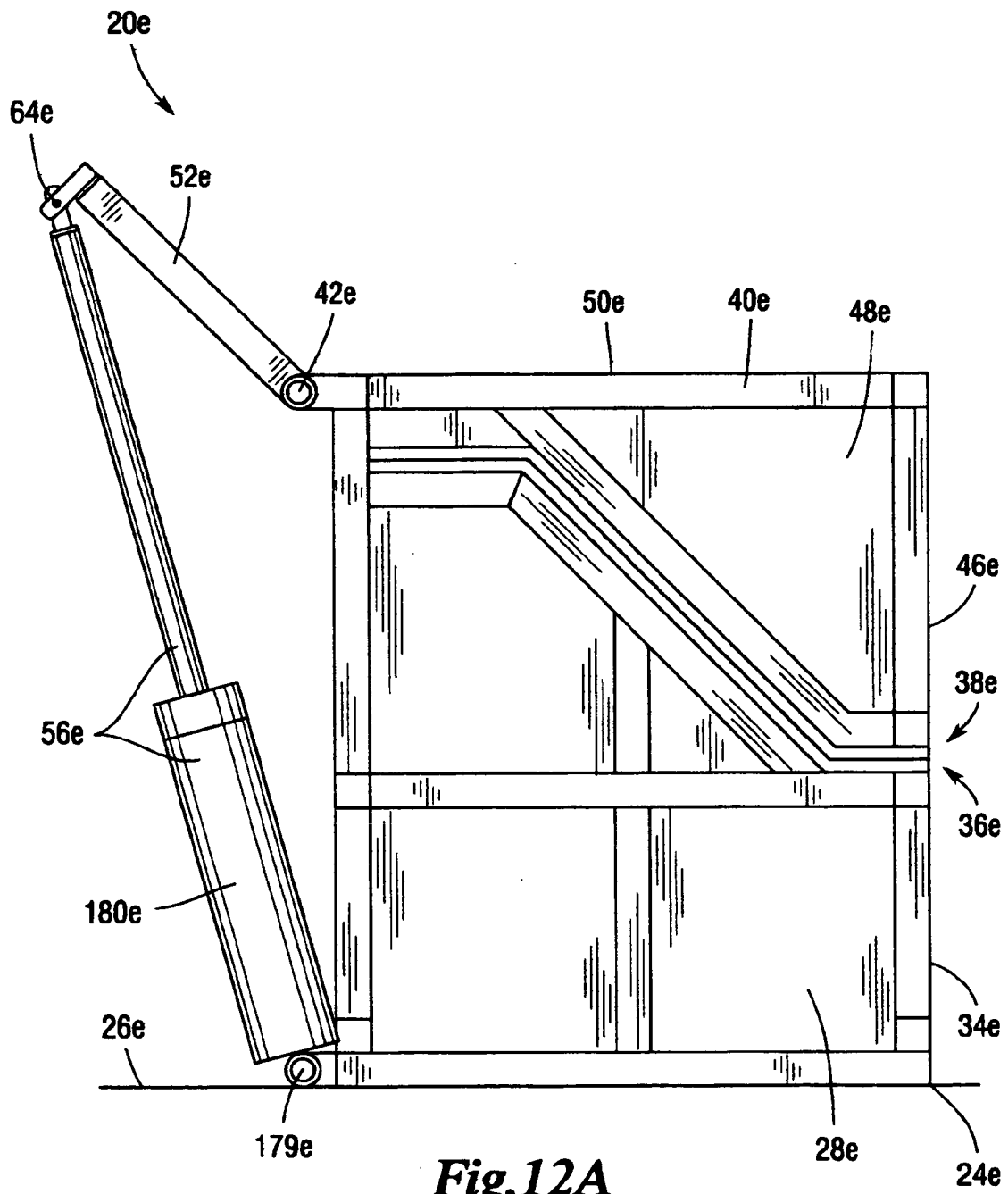
**Fig.10B**

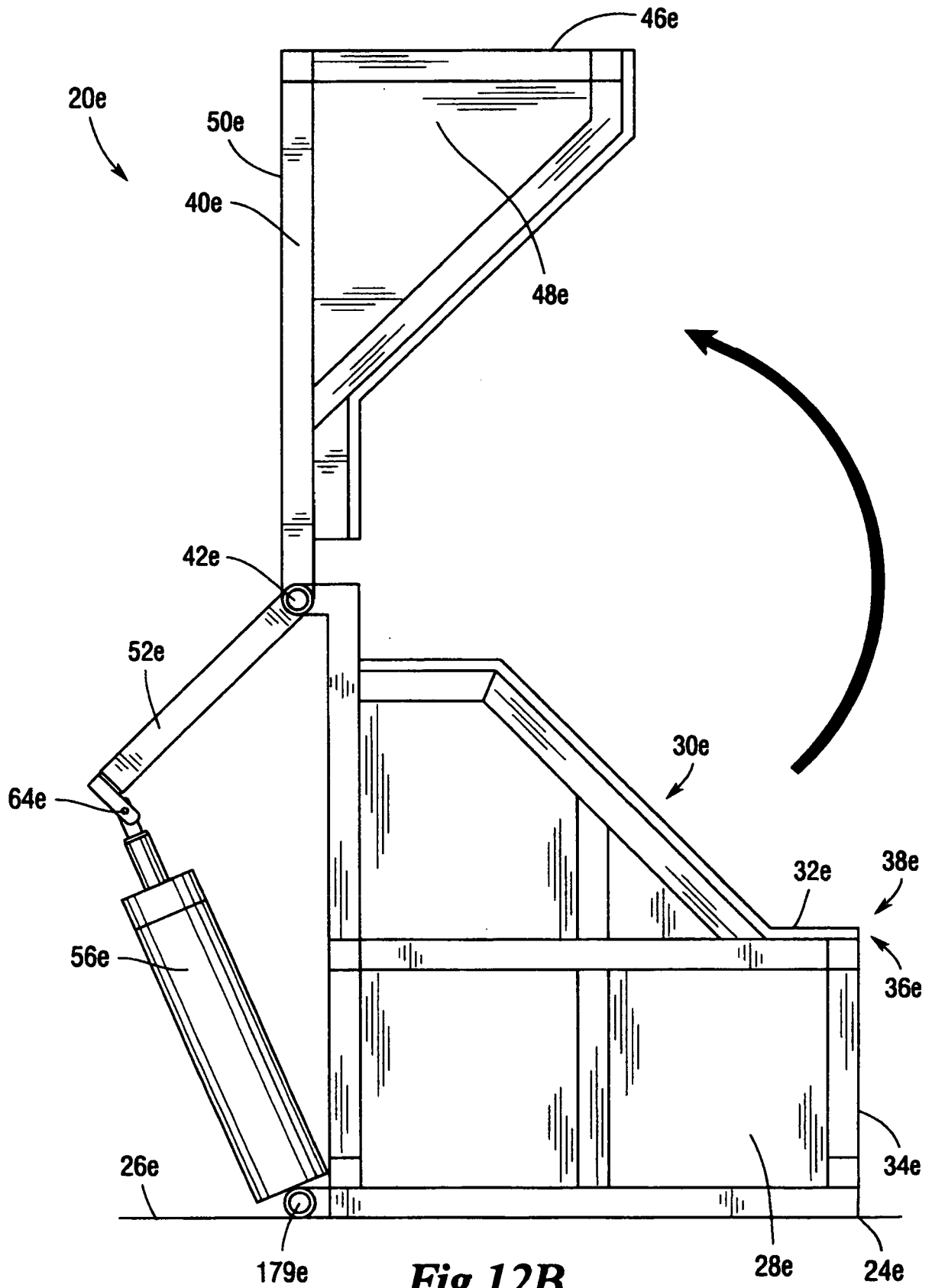


**Fig.11A**

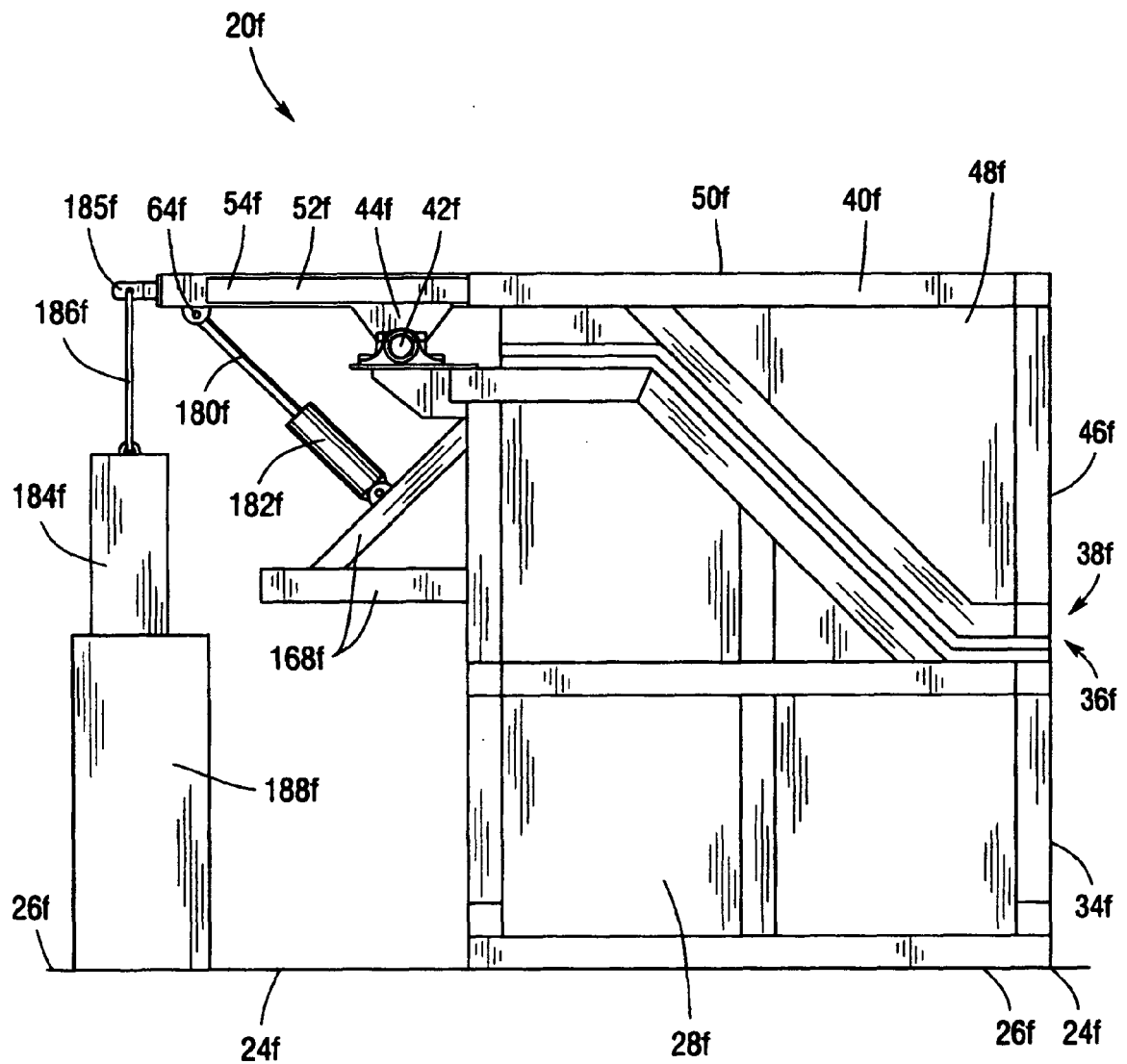


**Fig.11B**

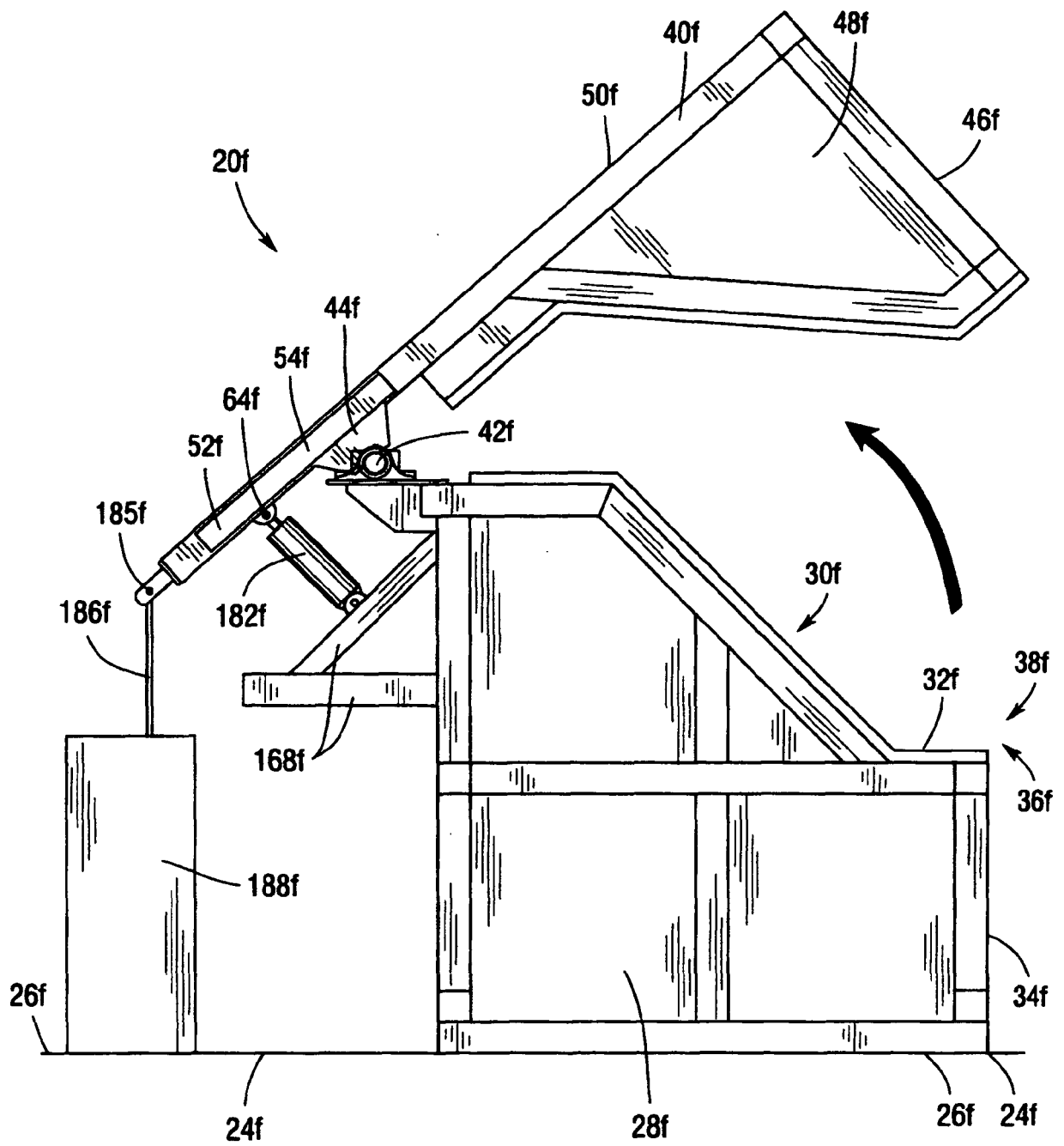




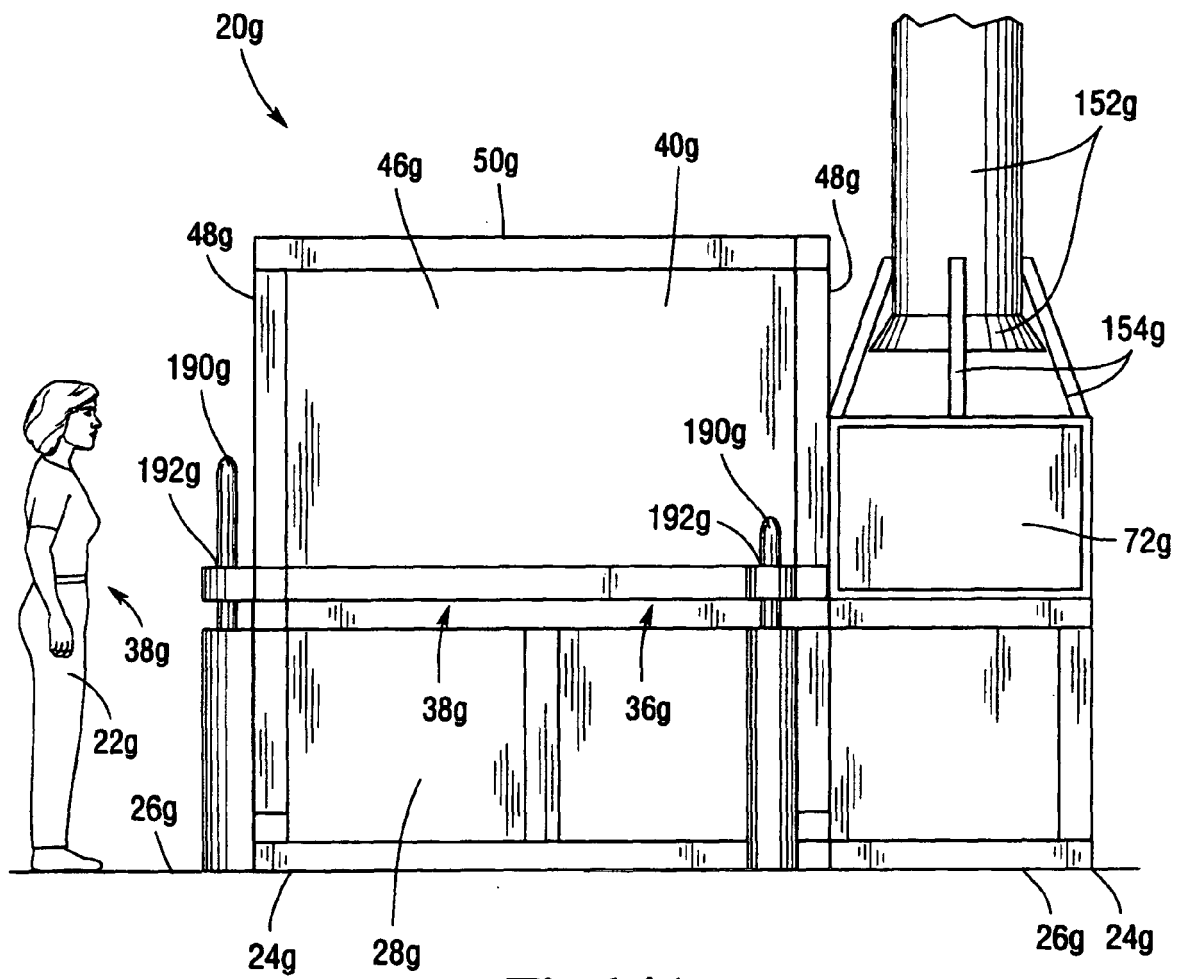
**Fig.12B**



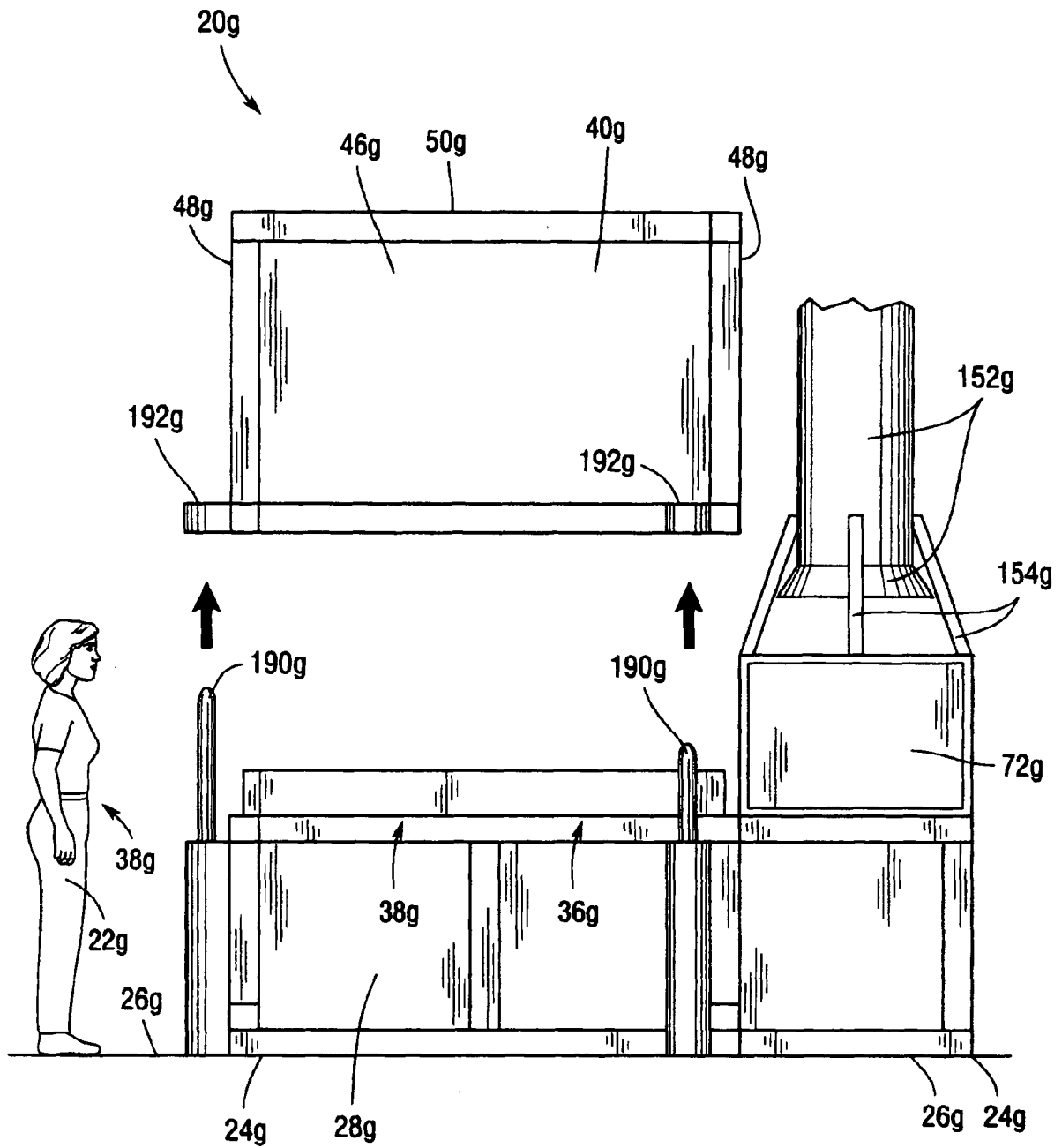
**Fig.13A**



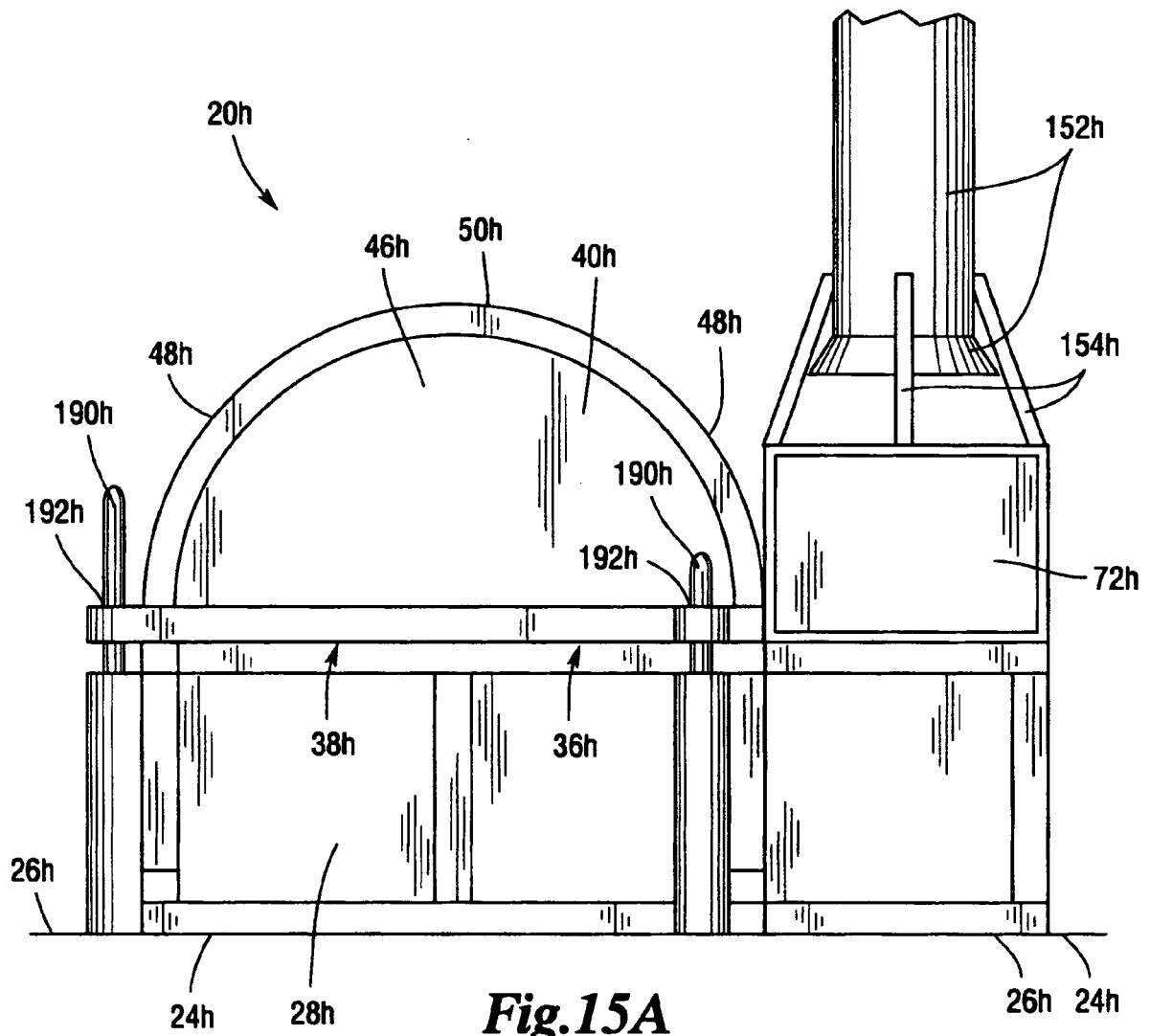
**Fig.13B**



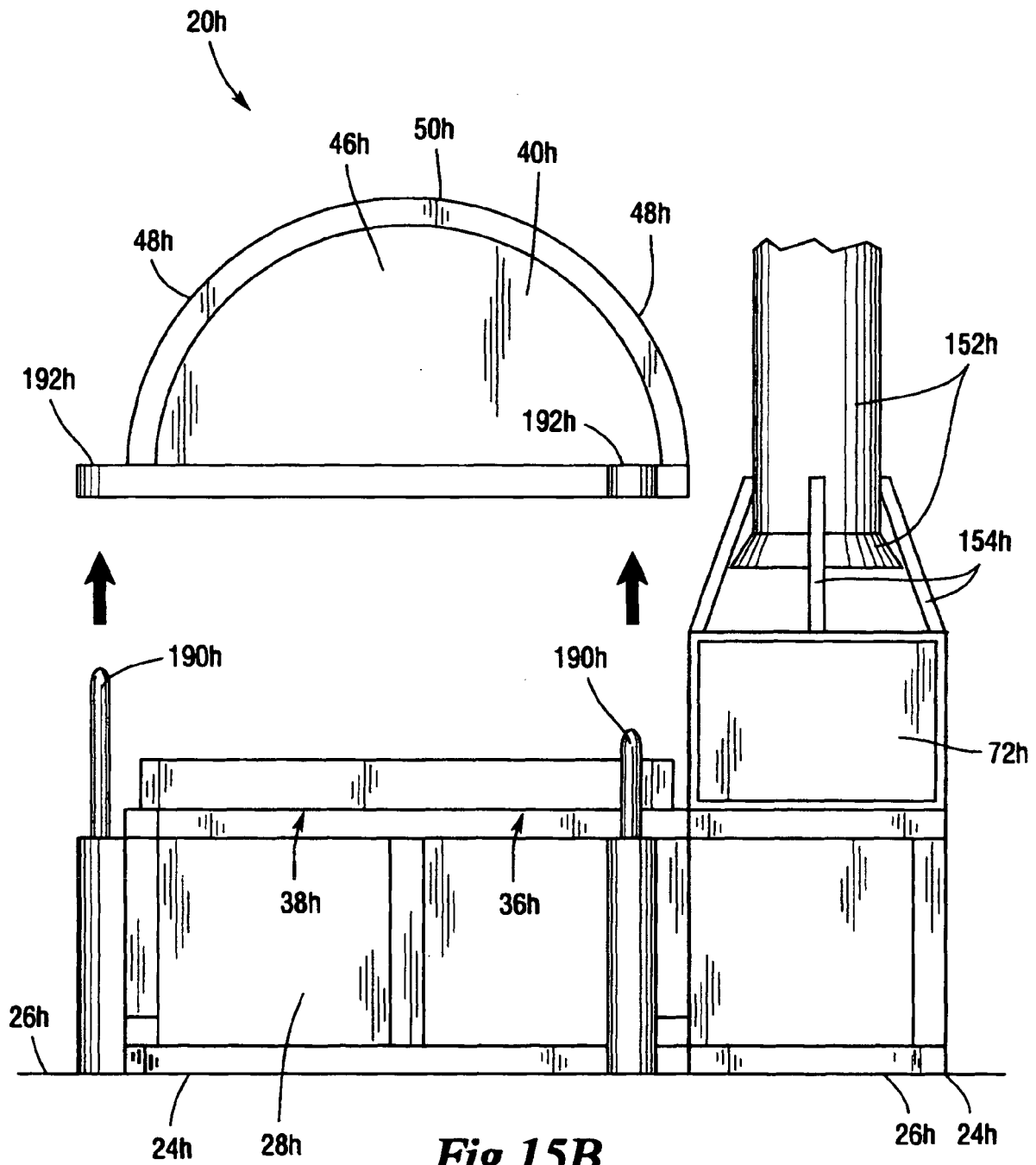
**Fig. 14A**

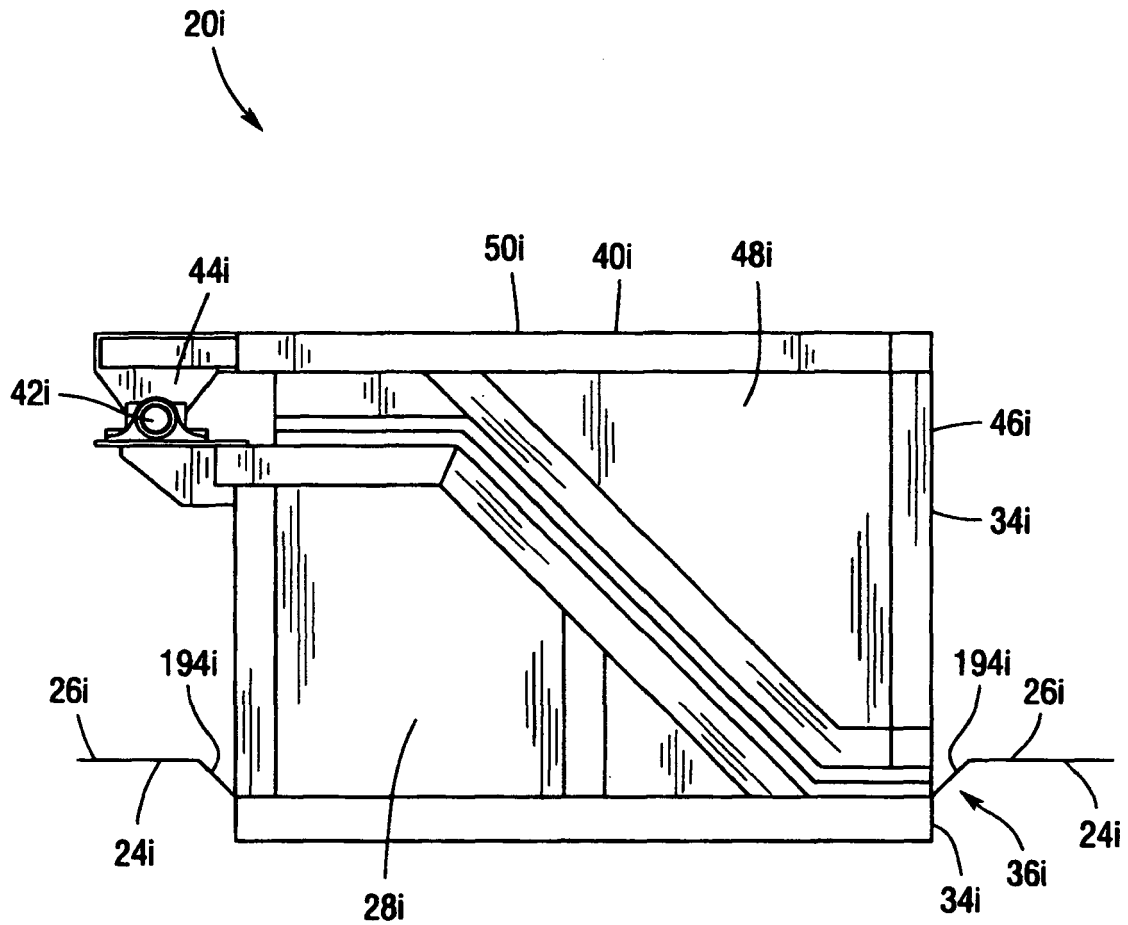


**Fig.14B**

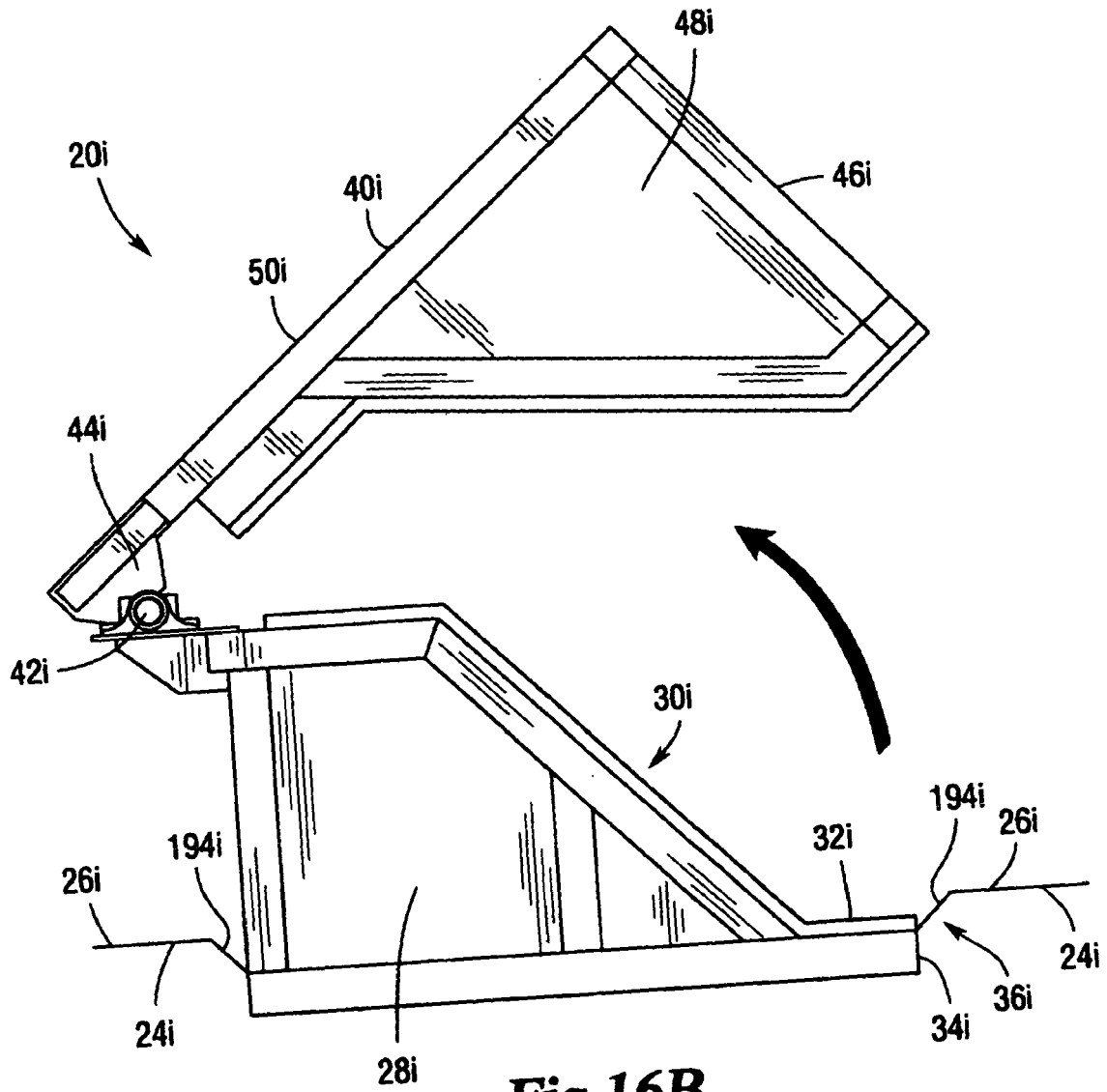


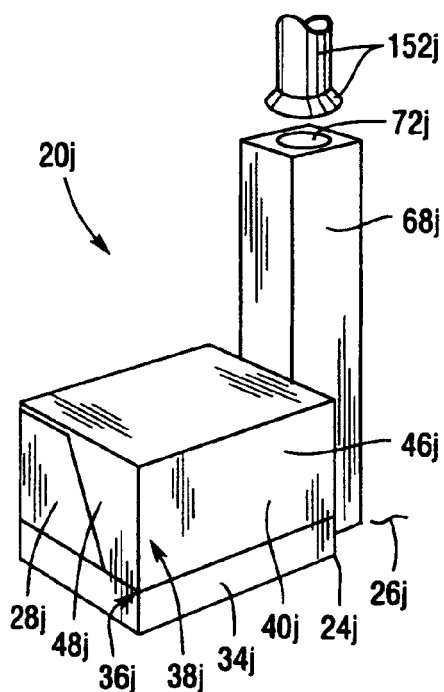
**Fig.15A**



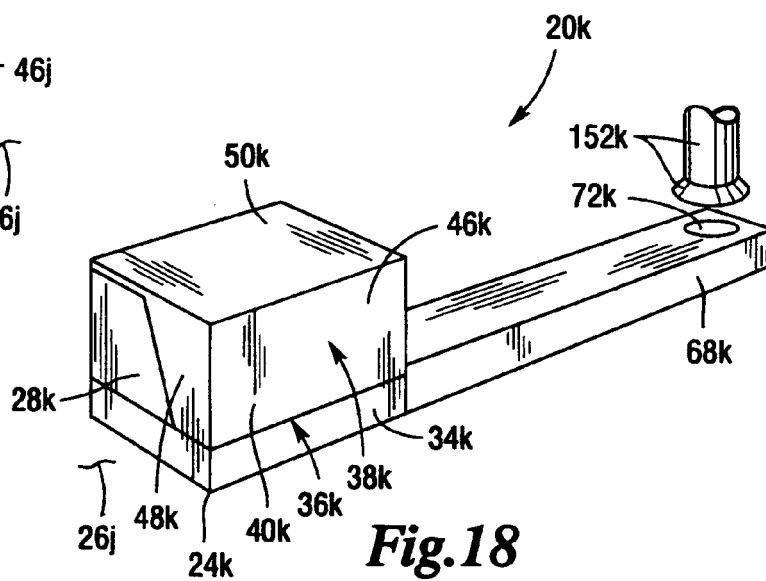


**Fig.16A**

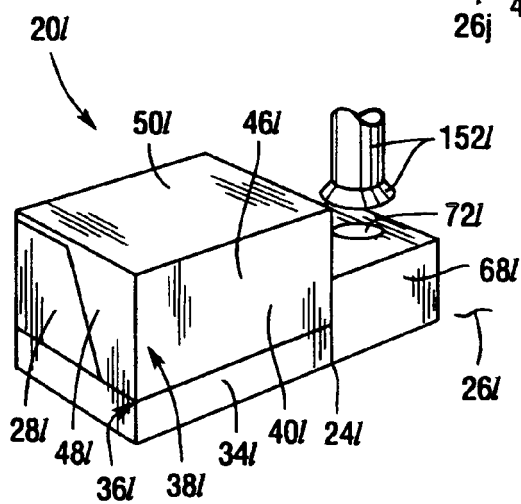




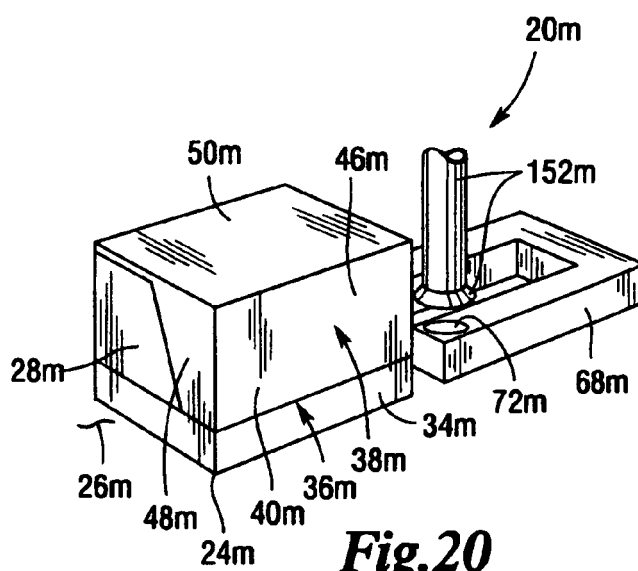
**Fig. 17**



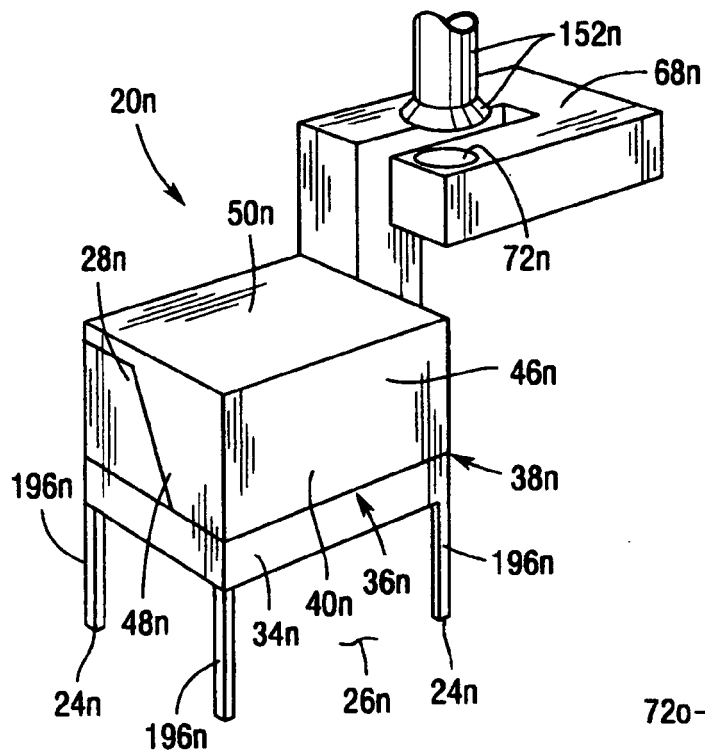
**Fig. 18**



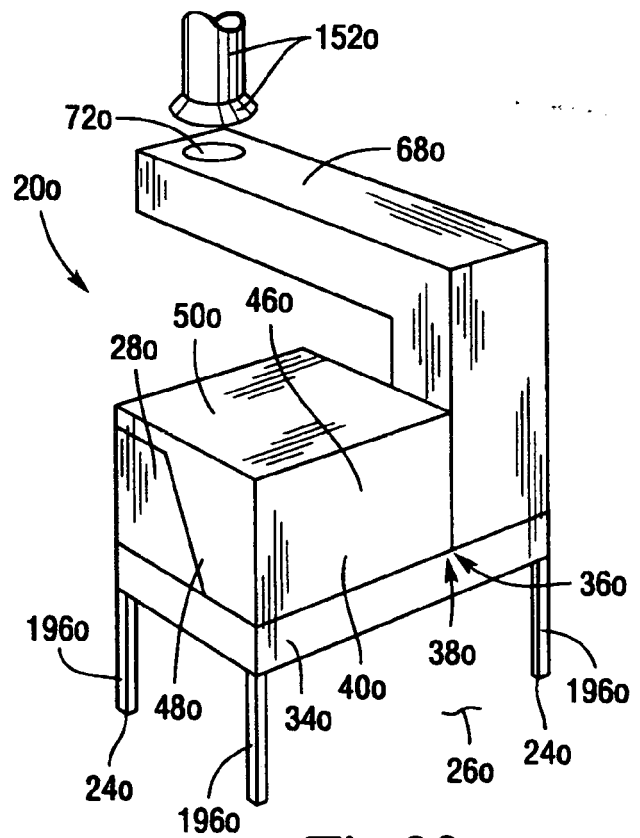
**Fig. 19**



**Fig. 20**



**Fig. 21**



**Fig. 22**



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 05 25 6808

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
P,X P,A	WO 2005/001339 A (HIERHOLZER, LAWRENCE, J) 6 January 2005 (2005-01-06)  * page 7, line 7 - line 11 * * page 10, line 2 - line 7 * * figures 1,2 *  -----	1,2,12, 13,23 17	F23G1/00
X	WO 92/20965 A (BOYD, ALASTAIR, JOHN) 26 November 1992 (1992-11-26) * page 11, paragraph 3 - page 15, paragraph 2 * * page 18, last paragraph - page 19, paragraph 2 * * figures 1,2,2A *	1-3,6, 10-13,23	
X	GB 2 349 448 A (* H HOLLIS ENGINEERS) 1 November 2000 (2000-11-01) * page 4, line 18 - page 7, line 10; figure 1 *	1,2, 10-13,23	
X	US 6 474 251 B1 (VIDALLET PIERRE ROBERT FRANCOIS ET AL) 5 November 2002 (2002-11-05)  * column 1, line 3 - line 14 * * column 3, line 19 - line 51 * * column 4, line 35 - line 39 * * claim 1; figures 1,2 *	14,16, 17,21,23  18	TECHNICAL FIELDS SEARCHED (IPC) F23G
A	-----		
X	WO 02/052195 A (LUECK, HARALD) 4 July 2002 (2002-07-04) * page 6, last paragraph - page 7, last paragraph * * figure 1 *	14,17,23  22	
A	-----		
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 7 February 2006	Examiner Gavriliu, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	

1  
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 05 25 6808

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

07-02-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2005001339 A	06-01-2005	NONE	
WO 9220965 A	26-11-1992	AU 1765592 A	30-12-1992
GB 2349448 A	01-11-2000	NONE	
US 6474251 B1	05-11-2002	AU 6840898 A	29-09-1998
		EP 1007883 A1	14-06-2000
		FR 2760514 A1	11-09-1998
		WO 9840671 A1	17-09-1998
WO 02052195 A	04-07-2002	EP 1348094 A1	01-10-2003