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(54) **SHOWER**

DUSCHE

DOUCHE

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Description

[0001] This disclosure relates to self-contained or "free-standing" emergency drench or deluge showers intended for use at sites where a mains supply of water is not available.

Background

[0002] Site safety requirements at quarries, mines, major excavations, construction sites, oil field pipelines, large chemical plants or the like industrial sites where workers may be exposed to spillage of biological or chemical contaminants or hazardous materials, require the presence of a walk-in water drench facility or deluge shower. Such a facility must be instantly accessible in any emergency and operate automatically or with minimal action, such as using a pull switch, to deliver a drench of flushing fluid for a certain minimum period of time. The purpose of this facility is to rinse off any contaminants or hazardous materials from a worker who has suffered a spillage upon the person as quickly and completely as possible.

[0003] Since the need for this safety measure is most often at a site where a guaranteed water supply cannot be economically installed, the most commonly used traditional designs rely on gravity feed of water from an overhead elevated tank. Due to the need to operate for a minimum period of time, it is important to have a reserve of sufficient water. Furthermore, in order to lessen the shock of a deluge or drench of water upon a person, and to ensure that the person remains under the water for an adequate period to rinse off the contaminating hazardous material it is important that the water is neither too cold nor too hot. Therefore there is also a requirement for the water to be "tepid" which makes water temperature control an essential consideration.

[0004] Current regulations such as the ANSI standards and their equivalents indicate that a suitable installation would be capable of delivering 75 litres per minute of tepid water, for example in the range of about 16°C to 25°C for a minimum period of 15 minutes. Therefore, a source of power to heat that volume of water sufficiently has become necessary in cold climates, or conversely in hot climates it may be necessary to cool the water, for example by use of heat exchangers or other forced cooling means. Usually, the current designs of emergency drench shower require large tanks accommodating up to about 2000 litres to be located over 2 metres above the shower head.

Installing such a cumbersome facility provides logistical problems including transport and on-site preparation for erection of the facility. Typically, the site is found to be unsuitable for erection of any structure, requiring the first step of installing a concrete base to which the structure required can be fixed. Even if these difficulties are overcome such a facility has a high centre of gravity making stability in high winds a safety concern. Known shower

enclosures include CH 282294, WO 2012135921 and US 3606618. CH 282294 describes a shower cubical in which a boiler 4 is mounted on an outside wall of the cubical. WO 2012135921 relates to a wall for use in building houses which includes a reservoir within the wall. US 2606618 describes a portable camping shower tray within which fluid can be stored and pumped to a shower head which is arranged above a user's head surrounded by a temporary shower curtain.

Summary

[0005] The present disclosure relates to a shower enclosure according to claim 1. A suitable flushing fluid discharge unit, which may comprise a shower head, is provided over the accessible space for drench washing of personnel with a flushing fluid.

[0006] An acceptable flushing fluid in accordance with ANSI standards would be tepid or tempered potable water, or a preserved buffered saline or the like physiologically benign fluid such as is used for medical purposes. The latter would normally be used for eye wash purposes. Therefore for the purposes of drench washing, which requires high volumes to be delivered, a potable water would be typically chosen but a preserved water would be suitable also.

[0007] Broadly this disclosure relates to compact "wrap-around" tank designs wherein a central accessible space is designed to accommodate a person requiring emergency flushing of contaminants off the person. The central accessible space is defined within the upright structure defined by the wall or walls of the tank for holding flushing fluid.

[0008] The tank of the apparatus may be supported upon the ground directly or upon a movable skid. In this way a low centre of gravity for the apparatus is achieved. Installation is easier due to there being no need to build an elevated support structure to achieve a head for gravity feed, and a reinforcement of the site to accept such an elevated support to raise the tank to a height is avoided. The shower enclosure has a rectilinear footprint, for example the base may square. The shower enclosure is formed with three upstanding side walls aligned with three sides of the square base and with abutting upright edges to form a sealed enclosure around the three sides. The upstanding side walls are inner walls of a tank having outer walls, between which inner and outer walls there is defined a volume for holding flushing fluid. The tank is assembled from three tank sections, each having an inner and an outer wall and configured to be fluidly connected directly or indirectly to a flushing fluid discharge unit so that the overall volume required for the specified tank capacity of flushing fluid for emergency drench use can be met by the combined volume of the respective tank sections. The tank extends upwardly from ground level. The tank is fluidly connected with an elevated flushing fluid discharge unit for discharging a flushing fluid into the enclosure. In all embodiments the bulk of the tank is

below the height of the fluid distribution means particularly the flushing fluid discharge unit. This configuration provides a stable structure by lowering the centre of gravity. The flushing fluid discharge unit may comprise one or more drench shower heads. The flushing fluid discharge unit may be positioned at a height exceeding average human height so that in use discharged flushing fluid achieves a downwards washing effect to remove contamination or hazardous materials from the person towards ground level. The flushing fluid discharge unit may comprise at least one shower head or at least one spray nozzle fluidly connected to the tank by suitable pipework or other fluid distribution system.

[0009] In a preferred embodiment the shower is mounted on a movable skid base. The skid base may be formed to provide a shower tray with drainage facility and a fluid trap volume for capture of contaminated flushing fluid for subsequent safe disposal or remediation of the flushing fluid for recycling. Alternatively the flushing fluid could be recirculated through a filter to remove contaminants and return the fluid to the tank for reuse. This feature extends the operational use of the unit by continually reusing the fluid in the tank.

[0010] The skid base may incorporate a fluid separator, and may house filters for removal of contaminants.

[0011] An electric pump may be used to deliver flushing fluid to the flushing fluid discharge unit.

[0012] An electric heater may be used to maintain an acceptable temperature of the flushing fluid.

[0013] A renewable energy apparatus may be used to power the electric pump and heater at sites where an electricity supply is not available. A solar panel arrangement together with a charge storage device may be used for example.

[0014] An embodiment of the emergency shower will now be described with reference to the accompanying drawings in which:

Figure 1 illustrates a known elevated tank shower; Figure 2 is a view from the front of an emergency drench shower facility as disclosed herein; Figure 3 is a view from above the emergency drench shower facility illustrated in Figure 1; Figure 4 is a view from one side of the emergency drench shower facility illustrated in Figures 2 and 3; and Figure 5 is a view from the opposite side of the emergency drench shower facility illustrated in Figure 4.

[0015] As illustrated in Figure 3 a walk-in emergency drench shower enclosure 10 is constructed from three tank wall sections 11, 12, 13. These wall sections are upstanding from the ground 100 (Fig. 2), and arranged to abut in a "C" or "U" configuration (Fig. 3), wherein the three tank wall sections 11, 12, 13 have inner side walls 21, 22, 23 which together define an internal area serving as an accessible space for a person to stand for the purpose of drench-washing the person with a flushing fluid.

[0016] Referring to Figure 2, the standing area surface may be formed as a shower tray 14 which is raised above ground level 100. The tray may cover a catchment zone 15 which may be a sufficient volume within a bunded pallet for containment of contaminated flushing fluid to be subsequently remediated such that contaminants can be safely disposed of within recommended regulations and recommendations for safe environmental practices.

[0017] An overhead flushing fluid discharge unit 30 is positioned centrally and fed by a flushing fluid delivery conduit 29 and riser 28. An electrically powered fluid pump 27 is provided to deliver flushing fluid to the overhead flushing fluid discharge unit 30. The flushing fluid discharge unit 30 may comprise a large diameter shower head 26, or multiple nozzles, for drenching a person with flushing fluid.

[0018] Each tank wall section 11, 12, 13 provides a reservoir volume for a flushing fluid, which volume is confined between inner wall 21, 22, 23, and outer wall 31, 32, 33 surfaces, and is substantially below the height of the flushing fluid discharge unit.

[0019] A flushing fluid flow maintenance ("stay open" type) and level control system which may include a float and link arm assembly may be included within at least one of the tank wall sections 11, 12, 13.

[0020] An electric heater may be installed to moderate the temperature of the flushing fluid. Alternatively a heat exchanger may be utilised for the same purpose.

[0021] The emergency drench shower enclosure 10 may be skid mounted for transport and ease of deployment with instant operational capability.

[0022] In embodiments a renewable energy system for delivering electrical power would be operatively associated with the emergency drench shower. The use of solar panels, or wind power devices, with associated charge storage devices is contemplated.

Claims

1. A shower enclosure (10) comprising a tank for holding a flushing fluid and an accessible space for drench-washing of personnel with the flushing fluid, **characterised in that** the tank is constructed from three tank wall sections (11,12,13) upstanding from the ground, arranged to abut in a "C" or "U" configuration, **in that** each tank wall section (11,12,13) has an inner side wall (21,22,23) and an outer side wall (31,32,33) between which is defined a volume for holding said flushing fluid, and **in that** the inner side walls (21,22,23) of the three tank wall sections (11,12,13) together define said accessible space.
2. The shower enclosure of claim 1, further comprising a discharge unit (30) for flushing fluid, the discharge unit being fluidly connected to the tank.
3. The shower enclosure of claim 2, wherein the dis-

charge unit is directed towards the central accessible space.

4. The shower enclosure of claim 2 or 3, wherein the discharge unit comprises one or more shower heads (26) or spray nozzles provided over the accessible space. 5
5. The shower enclosure of any of claims 2-4, further comprising a fluid pump (27) operatively connected into a conduit (28,29) for delivering flushing fluid from the tank to the discharge unit. 10
6. The shower enclosure of any of claims 2-5 further comprising a flow control mechanism for ensuring adequate duration of discharge of flushing fluid through the discharge unit. 15
7. The shower enclosure of any of claims 2-6, wherein the discharge unit is mounted in an elevated position in relation to the tank to achieve a downwards washing effect to remove contamination from an occupant of the shower. 20
8. The shower enclosure of any of the preceding claims comprising a removable skid upon which the tank is supported and wherein, the removable skid is formed to provide a shower tray (14) with drainage facilities. 25
9. The shower enclosure of claim 8, further comprising a fluid trap connected to the drainage facilities for subsequent safe disposal or remediation of the fluid for recycling and further comprising a filter for removing contaminants from the fluid. 30
10. The shower enclosure according to any preceding claim further comprising a heater to regulate the temperature of the flushing fluid. 35
11. The shower enclosure according to any of the preceding claims further comprising a pump (27) to deliver fluid from the tank into the enclosure. 40
12. The shower enclosure of claims 10 or 11, further comprising a renewable energy apparatus connectable to the pump and/or heater to provide power where an electricity supply is not available. 45
13. The shower enclosure of claim 12 wherein the renewable energy device is a solar panel arrangement and a charge storage device. 50

Patentansprüche

1. Eine Duschkabine (10), beinhaltend einen Tank zum Fassen eines Spülfluids und einen zugänglichen Raum zum Gusswaschen von Personal mit dem

Spülfluid, **dadurch gekennzeichnet, dass** der Tank aus drei vom Boden aufrecht stehenden Tankwandabschnitten (11, 12, 13) konstruiert ist, die angeordnet sind, in einer "C"- oder "U"-Konfiguration aneinandertzustoßen, dass jeder Tankwandabschnitt (11, 12, 13) eine innere Seitenwand (21, 22, 23) und eine äußere Seitenwand (31, 32, 33) aufweist, zwischen denen ein Volumen zum Fassen des Spülfluids definiert ist, und dass die inneren Seitenwände (21, 22, 23) der drei Tankwandabschnitte (11, 12, 13) zusammen den zugänglichen Raum definieren.

2. Duschkabine gemäß Anspruch 1, ferner beinhaltend eine Abgabeeinheit (30) für Spülfluid, wobei die Abgabeeinheit fluidisch mit dem Tank verbunden ist.
3. Duschkabine gemäß Anspruch 2, wobei die Abgabeeinheit zum mittleren zugänglichen Raum hin gerichtet ist.
4. Duschkabine gemäß Anspruch 2 oder 3, wobei die Abgabeeinheit einen oder mehrere Duschköpfe (26) oder Sprühdüsen beinhaltet, die über dem zugänglichen Raum bereitgestellt sind.
5. Duschkabine gemäß einem der Ansprüche 2-4, ferner beinhaltend eine Fluidpumpe (27), die betriebsbereit mit einer Leitung (28, 29) zum Befördern von Spülfluid aus dem Tank an die Abgabeeinheit verbunden ist.
6. Duschkabine gemäß einem der Ansprüche 2-5, ferner beinhaltend einen Flusssteuerungsmechanismus zum Sicherstellen einer adäquaten Dauer der Abgabe von Spülfluid durch die Abgabeeinheit.
7. Duschkabine gemäß einem der Ansprüche 2-6, wobei die Abgabeeinheit in einer erhöhten Position in Bezug auf den Tank montiert ist, um eine Abwärtswaschwirkung zum Entfernen einer Kontamination von einem Benutzer der Dusche zu erreichen.
8. Duschkabine gemäß einem der vorhergehenden Ansprüche, beinhaltend ein entfernbares Gestell, auf dem der Tank gestützt wird, und wobei das entfernbare Gestell gebildet ist, um eine Duschwanne (14) mit Ablaufeinrichtungen bereitzustellen.
9. Duschkabine gemäß Anspruch 8, ferner beinhaltend eine mit den Ablaufeinrichtungen verbundene Fluidfalle zur anschließenden sicheren Entsorgung oder Sanierung des Fluids zum Recycling und ferner beinhaltend einen Filter zum Entfernen von Kontaminanten aus dem Fluid.
10. Duschkabine gemäß einem der vorhergehenden Ansprüche, ferner beinhaltend eine Heizvorrichtung

zum Regulieren der Temperatur des Spülfluids.

11. Duschkabine gemäß einem der vorhergehenden Ansprüche, ferner beinhaltend eine Pumpe (27) zum Befördern von Fluid aus dem Tank in die Kabine.

12. Duschkabine gemäß Anspruch 10 oder 11, ferner beinhaltend ein mit der Pumpe und/oder der Heizvorrichtung verbindungs-fähiges Gerät erneuerbarer Energie, um Strom bereitzustellen, wo keine Stromversorgung verfügbar ist.

13. Duschkabine gemäß Anspruch 12, wobei die Vorrichtung erneuerbarer Energie eine Sonnenkollektoranordnung und eine Ladungsspeichervorrichtung ist.

Revendications

1. Une enceinte de douche (10) comprenant un réservoir pour retenir un fluide de rinçage et un espace accessible pour un lavage de décontamination du personnel avec le fluide de rinçage, **caractérisée en ce que** le réservoir est construit à partir de trois sections de paroi de réservoir (11, 12, 13) se tenant droite à partir du sol, agencées pour être en aboutement dans une configuration en « C » ou en « U », **en ce que** chaque section de paroi de réservoir (11, 12, 13) a une paroi latérale interne (21, 22, 23) et une paroi latérale externe (31, 32, 33) entre lesquelles il est défini un volume pour retenir ledit fluide de rinçage, et **en ce que** les parois latérales internes (21, 22, 23) des trois sections de paroi de réservoir (11, 12, 13) définissent ensemble ledit espace accessible.

2. L'enceinte de douche de la revendication 1, comprenant en outre une unité de décharge (30) pour le fluide de rinçage, l'unité de décharge étant raccordée de façon fluide au réservoir.

3. L'enceinte de douche de la revendication 2, dans laquelle l'unité de décharge est orientée vers l'espace accessible central.

4. L'enceinte de douche de la revendication 2 ou de la revendication 3, dans laquelle l'unité de décharge comprend une ou plusieurs pommes de douche (26) ou buses d'arrosage fournies par-dessus l'espace accessible.

5. L'enceinte de douche de n'importe lesquelles des revendications 2 à 4, comprenant en outre une pompe de fluide (27) raccordée de façon opérationnelle jusque dans un conduit (28, 29) pour délivrer du fluide de rinçage du réservoir à l'unité de décharge.

6. L'enceinte de douche de n'importe lesquelles des revendications 2 à 5 comprenant en outre un mécanisme de contrôle d'écoulement pour assurer une durée adéquate de décharge de fluide de rinçage à travers l'unité de décharge.

7. L'enceinte de douche de n'importe lesquelles des revendications 2 à 6, dans laquelle l'unité de décharge est montée dans une position surélevée relativement au réservoir afin d'obtenir un effet de lavage vers le bas pour retirer une contamination d'un occupant de la douche.

8. L'enceinte de douche de n'importe lesquelles des revendications précédentes comprenant un plateau à patins démontable sur lequel le réservoir est soutenu, et dans laquelle le plateau à patins démontable est formé afin de fournir un bac à douche (14) présentant des installations de drainage.

9. L'enceinte de douche de la revendication 8, comprenant en outre un siphon de fluide raccordé aux installations de drainage pour une élimination ou une réhabilitation sécurisée subséquente du fluide pour un recyclage et comprenant en outre un filtre pour retirer des contaminants du fluide.

10. L'enceinte de douche selon n'importe quelle revendication précédente comprenant en outre un élément chauffant pour réguler la température du fluide de rinçage.

11. L'enceinte de douche selon n'importe lesquelles des revendications précédentes comprenant en outre une pompe (27) pour délivrer du fluide du réservoir jusque dans l'enceinte.

12. L'enceinte de douche des revendications 10 ou 11, comprenant en outre un appareil d'énergie renouvelable pouvant être raccordé à la pompe et/ou à l'élément chauffant afin de fournir une puissance électrique là où une alimentation en électricité n'est pas disponible.

13. L'enceinte de douche de la revendication 12 dans laquelle le dispositif d'énergie renouvelable est un agencement de panneau solaire et un dispositif de stockage de charge.

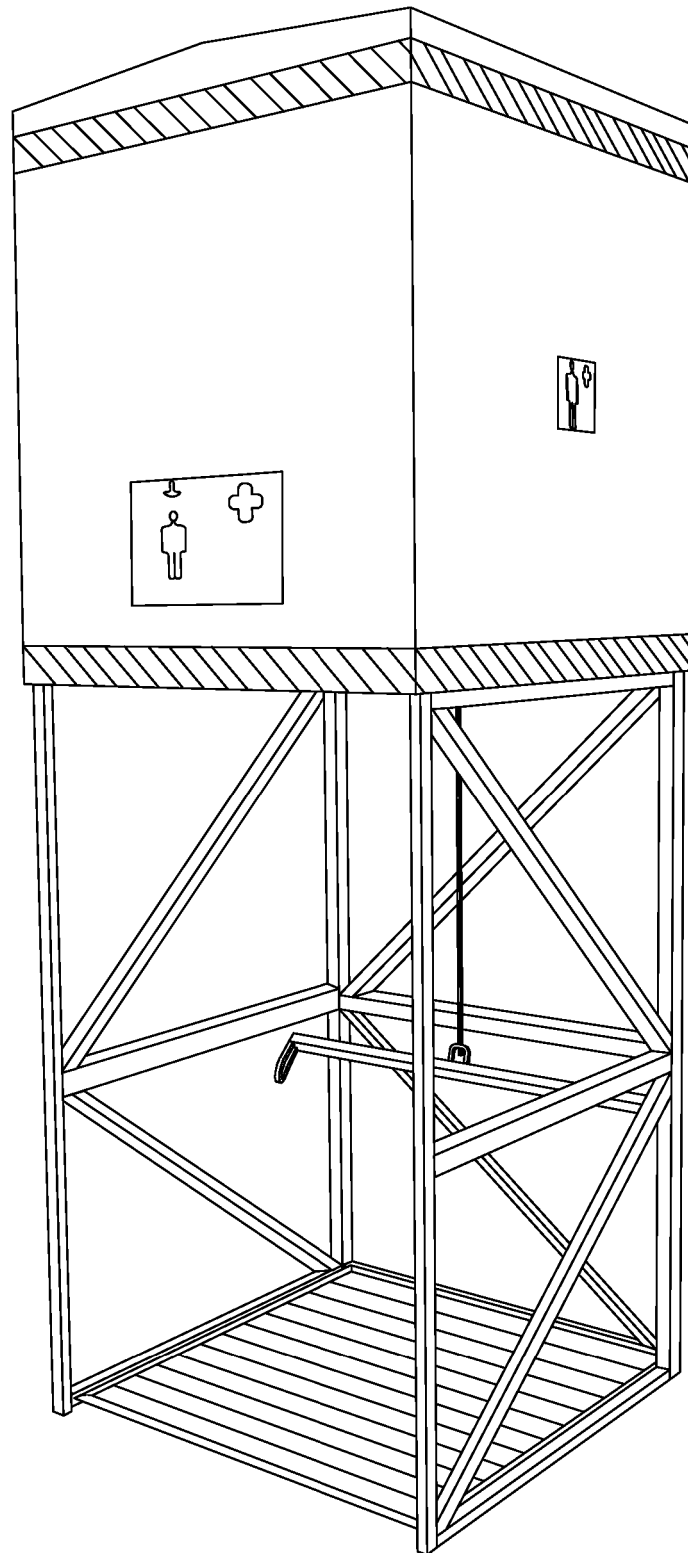


FIG. 1
(Prior Art)

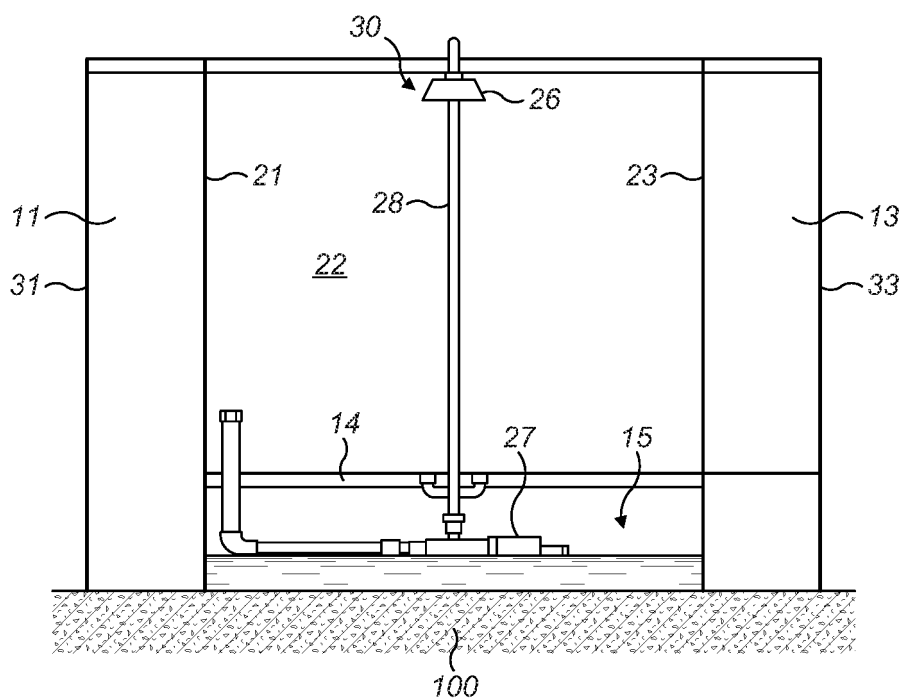


FIG. 2

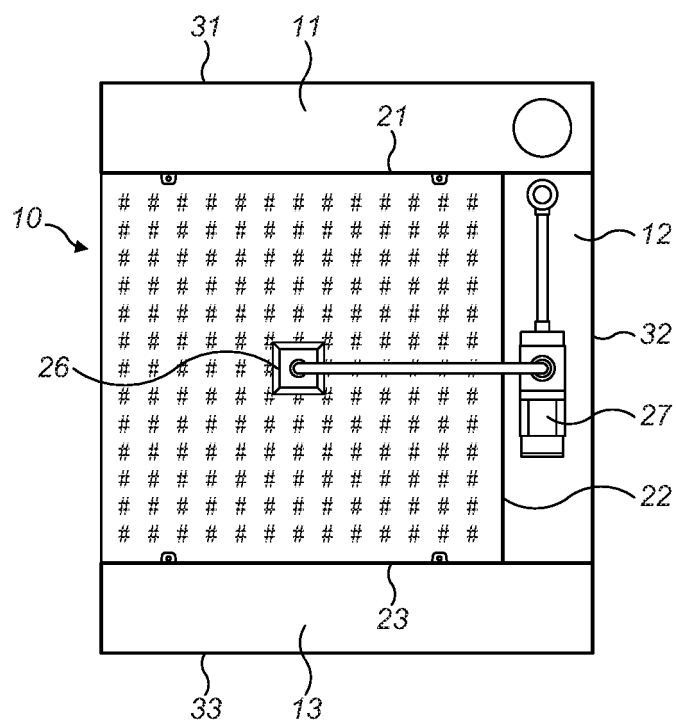


FIG. 3

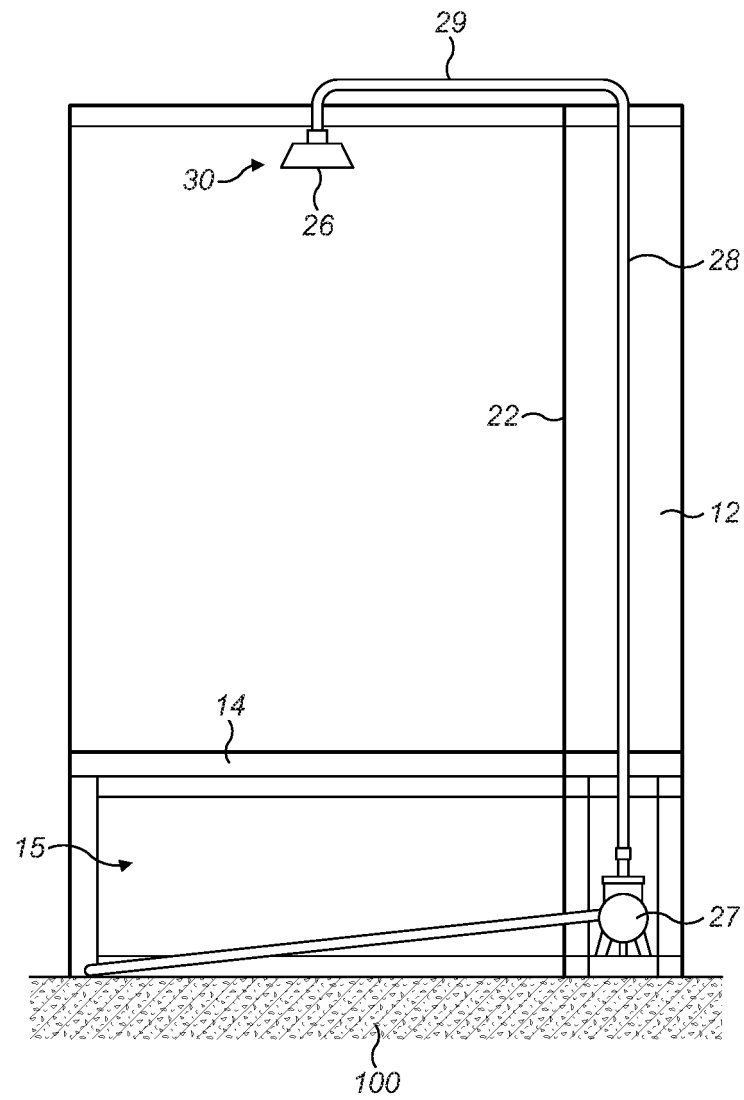


FIG. 4

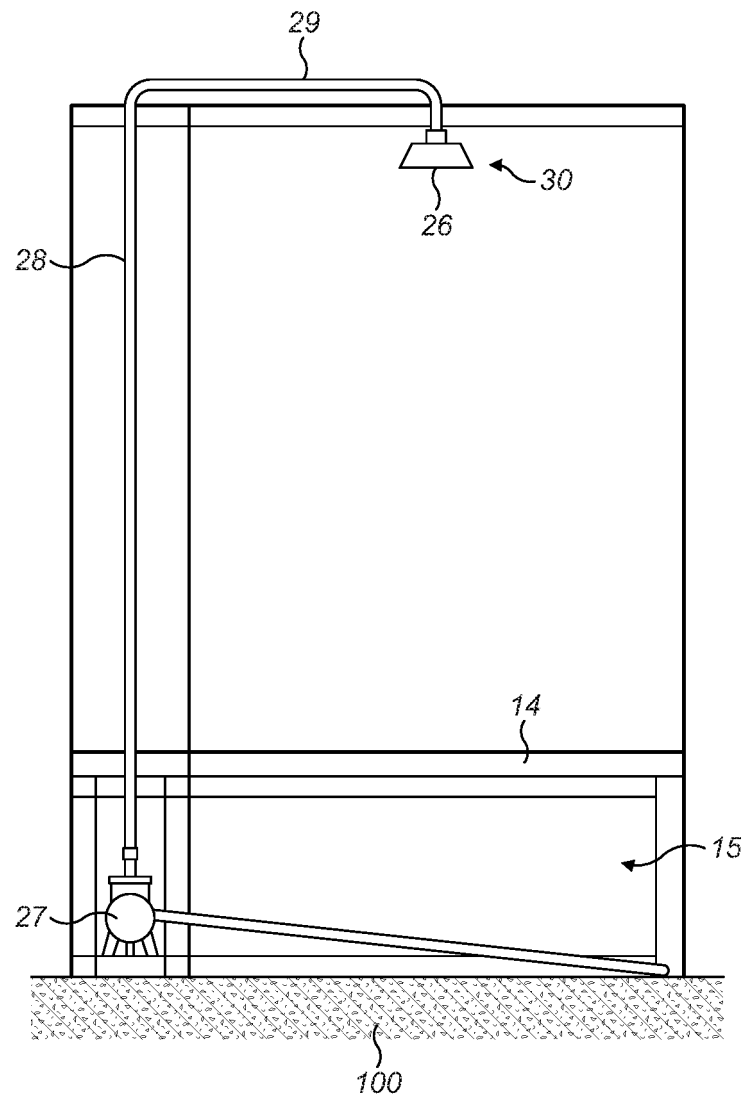


FIG. 5

REFERENCES CITED IN THE DESCRIPTION

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