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(54) **DEVICE FOR ANTI EXPLOSION, CONTAINMENT, FILTERING AND SANITATION OF LIQUIDS, MIASMA, ODOR AND GAS IN COFFINS**

(57) The present invention consists in applying on the lid of the mortuary zinc coffin an inlet valve and one or two vent valves, connected with two flexible pipes to a container inflatable air chamber container, which acts as a lung and as filter to gases and stench of decomposition. The air chamber container is composed of one or two inlet valves and a vent valve, and is positioned between the lid of the zinc coffin and the lid of the wooden

coffin. The air chamber container acts as a lung and lowers the internal pressure. An optional sanitizing purifying filter of shape and appropriate measure may be positioned between the cover inside of the zinc coffin and the lid of the wooden coffin and it is connected to the outlet valve, allowing the vent, the purification and the emission of sanitized air outside the coffin.

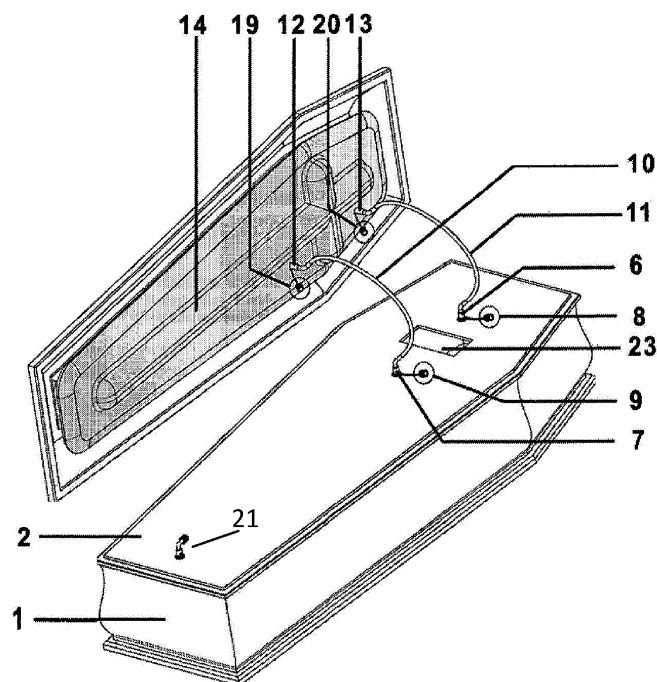


FIG. 2

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Description

Field of the Invention

[0001] The aim of the present invention is to solve the problem of the outbreak of the coffins and the stench nauseating procured in cemeteries from the decomposition of the dead, solving a serious environmental and health problem.

Summary of the Invention

[0002] The device is composed of:

[0003] A hose connected to a valve which is mounted on the lid of the zinc case, an inspection glass, two vent valves in the output, (in double for reasons of safety), connected via two flexible tubes at an inflatable bladder, which acts as a container, from lungs and from the filter to gases and stench of decomposition that originate from the zinc case. The air chamber container, being of a plastic material type micro perforated membrane, has the characteristic of being himself a filter, which is passing the odorless gas towards the outside and keeps malodorous gases.

[0004] The air chamber container is positioned between the cover of the zinc coffin and the coffin lid, receives gas from the coffin of zinc, swells and releases only water vapor slowly and odorless gas, retaining the nauseating gas produced by the decomposition inside. If the pressure increases and reaches the threshold of intervention of the outlet valve, the valve opens towards a further purifying filter sanitizing connected to the valve. This produces the effect that within the zinc case there are low pressures, thus eliminating the problem of the coffins' explosions.

Prior art

[0005] Currently the law provides for a series of standards for the burial and transport of corpses. The bodies may be affected by putrefaction processes (production of gas and liquid) after only a few hours after death, and are therefore locked in a zinc coffin. On the zinc coffin is placed a lid of zinc, and hermetically welded.

[0006] The law requires that on the lid of the zinc coffin be placed a safety valve, the absence of which may result in the outbreak of the coffin, because of the gases of decomposition.

[0007] This is due to the high pressures that are created within the zinc case, due to the fermentation of liquids and gases produced by the decomposition of the corpse.

[0008] Much more obvious phenomenon in the summer months, given high temperatures. This phenomenon is a problem known to insiders and to the Ministry of Health, and is regulated by laws.

[0009] The solution currently provided by law, or suggested, is a filter positioned within a zinc case with a vent

valve.

[0010] The pressure that is created inside the zinc case, is discharged through a filter positioned within the zinc case and a valve anchored to the lid of zinc case, and flows out through a hole made in the same cover.

[0011] When the pressure exceeds the valve sealing pressure filtered, fetid air escapes into the environment. The position within the filter zinc coffin creates several problems including sometimes, besides the stench, which still fails to contain, also causes the outbreak of the coffins.

[0012] The filter over time loses its filtering features, and the expelled gases contain also the sickening odours of decomposition gases.

[0013] The gases expand in the cemetery environments, creating an uncomfortable situation for all the people who would go to the cemetery to visit their loved ones, and aside from that, there is also a potential environmental hazard and sanitary of contagion, due to any infectious disease of the deceased.

[0014] This infection can be caused by the spread outside the coffin of nauseating odors of organic material putrefaction and stench. The most obvious problem is that the filter positioned inside the zinc casing cannot be replaced because it should open a zinc coffin. According to the known technique, the coffin is composed of a wooden box of Fig. 1 (1), by zinc coffin with the closing cover Fig. 1 (2), and a filter authorized by the Ministry of Health, inserted inside the zinc case, which is discharged through a vent valve positioned on the lid that closes the zinc case of Fig. 1 (2). Said purifier filter, Fig. 1 (3) contains the activated carbons that filter the odors, eliminating them and in part by limiting the discharge, to the outside, the all closed by the lid of the coffin Fig. 1 (4). This obviously is not enough system because odors that escape even if filtered and limited, will add up to the smells of the other dead rotting, that there are in the cemeteries of churches, giving off an unbearable stench.

[0015] It is cited as prior art also the Italian Patents No 0001413329 of Convertini Martino, Pct. No. PCT / IB20130530512 of Convertini Martino, which describe a container tank with the inlet valves connected by hoses to the cover of the zinc coffin and a vent outlet valve to the outside.

[0016] It is cited as prior art also PATENTS US 47313 A (ALFRED E. LYMAN) April 18, 1865, US 3,716,072 A (Criswell D) February 13, 1973

Object of the invention

[0017] Purpose and advantages of the present invention is to solve the problem of the outbreak of the coffins and the stench in cemeteries with a non-invasive device, which in addition to solving ii problem, makes possible the maintenance and the replacement of the various components, in complete environmental safety and health.

[0018] The device comprises an inflatable bladder,

which acts as a lung for the gases from the zinc case, through the connection between the two outlet valves, inserted on the zinc case cover and two inlet valves of the air chamber that inflates when you create the gases of decomposition. The gases, which escape from the zinc case, are contained in the air chamber and are kept within until the gas pressure does not exceed the set pressure of the outlet valve and vent of the air chamber. The gases contained in the air chamber are expelled through a vent valve set at adequate pressure, present in the air chamber. The outlet valve of the air chamber is connected to an additional filter, which after filtration of the residual gases, li disperses in 'environment, cleaned and sanitized. The container of air chamber defined henceforth also lung, can be placed inside the coffin in the available space between the lid of the coffin and the lid of the zinc case, or out of the coffin itself. Il substantial advantage compared to the prior art, is the constructive feature of the air chamber container, which can be produced of material with technical characteristics type micro perforated membranes so as to be used as a filter himself, which only passes the odorless gas produced by the decomposition of corpses and retains odorous gases.

[0019] Malodorous molecules are retained inside the air chamber.

[0020] In case of excessive pressure to the gases present inside the air chamber, they are expelled through an outlet vent valve calibrated to adequate pressure.

[0021] The relief valve present on the air chamber is connected to a filter having the characteristic of purifying the gases and sanitize. The filter retains odorous gases and passes the odorless gas. The filter has size and shape such as to be inserted between the cover of the zinc case and lid of the coffin. The filter can also be positioned outside the coffin. This no longer makes necessary to open the zinc coffin for replacing the filter or the air chamber. It makes easier to check the status of the device, its correct operation and replacement during a periodic inspection. This device allows an easy periodical maintenance without opening the zinc coffin and completely solves the problem of the outbreak of the coffins, air sanitizing and its social and environmental problem. This and other objects are achieved by the invention described in detail below. The claims describe preferred variants of the invention and form an integral part of the present description.

Brief description of the Figures

[0022] Figure 1 is a coffin according to the prior art. The remaining figures 2 - 5 refer instead to the present invention.

Detailed description of the Invention

[0023] The solution proposed by way of example, but not exhaustive, is composed as shown in Fig. 2, Fig. 3, Fig. 4, Fig. 5.

[0024] The wooden box, fig. 2 (1) contains the zinc coffin with its lid Fig. 2 (2). The cover of the coffin of zinc fig. 2 (2) contains two safety valves fig. 2 (8) - 2 (9) that can be directly connected, in total passage without any regulation of the pressure in output from zinc case, or calibrated, to adequate pressure, in duplicate, to increase the safety in case one of the two valves don't work , In fig 2 (10) - 2 (11) are represented two flexible tubes that connect the two vent valves Fig. 2 (8) - 2 (9) to the two input valves Fig. 2 (19) - 2 (20) of an air chamber container that serves as the lung, of adequate dimensions and suitable material to contain both the decomposition of the gas, both the pressure of the odorous gases of the decomposition itself, example given in an exhaustive but not limiting way.

[0025] The same air chamber container(lung) Fig. 2 (14), depending on the characteristics of the micro perforated materials of which it is produced, for example Microporous membranes, or a perforated plastic film which, depending on the size of the micro holes allows passage from one part of the water vapor membrane but not liquid water, may itself filter and leave inside odorous gases, odors and miasma, letting out only water vapor, the odorless gas and the purified and sanitized air, e.g. by way exhaustive but non-limiting.

[0026] The operating principle of the direct filtration of the air chamber is given by the characteristics of the materials of which it is produced. The air chamber is produced with particular materials, for example micro perforated membranes, which have the characteristic of passing molecules of a certain size and no other molecules. The size of the molecules of the gases produced by the decomposition of human and animal are of various sizes. The molecular mass of the gas produced by the decomposition is equal to the mass of the odorless gas, but it is much smaller than the molecular mass of the malodorous gases. This substantial difference of the masses allows a clear separation of the gases. The air chamber (lung), when it receives the decomposition gases coming from the zinc coffin it swells and, thanks to its breathable action, it releases outwards only the odorless molecules, which have a smaller molecular mass, and block instead the molecules of odorous gases, which have a higher molecular mass.

[0027] In case there are overpressures and the container could not contain the gas, the vent valve of Fig. 4 (15) is connected to a purifier filter sanitizer Fig. 4 (25), of size and shape as to be inserted between the lid of the wooden coffin (4) and the lid of the zinc case (2), or outside the coffin.

[0028] The air chamber keeps the malodorous gas inside and releases outside only the odorless gas, by way exhaustive example but not of limitation.

[0029] The output of the air chamber container (lung) Fig. 4 (15) can also be connected to a filter purifier sanitizer fig. 3 (26) positioned outside of the wooden coffin to be able to easily carry out the replacement. This filter location is convenient in the case of the filter efficiency

controls to carry out a possible rapid replacement. It becomes clear in this way that the device as a whole, with various connection options among themselves, allows different solutions, all to help resolve the problem of the outbreak of the coffins, air sanitizing and its social and environmental problem, example title exhaustive but not limitative.

[0030] All valves can also be used as pressure taps, to control with mechanical pressure gauges or electronic pressure sensors of the internal pressure value to the zinc case, or internal to the air chamber, by way exhaustive example but not of limitation. In fig. 2 (8) - 2 (9) include the valves on the cover of the zinc coffin, that if they are connected they put in communication the interior with the exterior of the zinc coffin. The valves and the attacks on the various elements of the device are of the quick coupler type. The filter purifier of fig. 4 (25), or of Fig. 3 (26), the hose of Fig. 2 (10) - 2 (11) of the hose fittings, fig. 2 (6,7,12,13), the case of valves of Fig zinc. 2 (8) - 2 (9), the two d'input valves Fig. 2 (19) - 2 (20) of the air chamber container of fig. 2. (14) The relief valve Fig. 4. (15) are connected between them with quick-connect coupling with inside sealing valves, that having the property, when connected to each other, to be open, allowing the gas to circulate from a component of the device to another. If they are not connected, the valves are closed hermetically and do not allow to pass the gas to the exterior of the valves of the various elements of the device. This causes that connect or disconnect between them the various elements of the device is very easy, without the possibility that there are spills of miasma or gases during the connection or disconnection between them. This feature facilitates the separation, insertion, or replacement of the device elements during periodic checks, if any. In this way, the operator is never in contact with the liquid or the decomposition of the gas, not being possible that these may exit from the inside of the respective elements making up the device object of the present invention, e.g. by way exhaustive, but not limitative.

[0031] The relief valve Fig. 4. (15) of the air chamber fig. 2. (14) comes out of the coffin as shown in fig. 3 (15) passing through the cover, locked by the washer of Fig. 3 (16) and the lock nut of Fig. 3 (17) but can exit at any other point of the wooden coffin so that it is easy to be connected to a sanitation system purifier filter as shown in fig. 3. (26), which filters gas, blocking those malodorous and by passing the odorless gas by way exhaustive example but not of limitation.

[0032] The output of the vent valve of Fig. 4 (15) of the air chamber it can be used as a safety valve, as the pressure outlet to read the value, as output to a further chamber outside air to the coffin, or connected to a sanitizing purifier filter, e.g. to title exhaustive, but not limitative.

[0033] In FIG. 3 (18) of the closure cap of any normal form, or that represent the religious symbols of the deceased, e.g. (Christianity, Buddhism, Islam, etc.) As by way exhaustive but not limiting.

[0034] You can also connect a flexible tube, of suitable

length and constructional characteristics suitable for use, to release or aspirate the miasmas and odors, store them in suitable containers and then filter them, e.g. by way exhaustive, but not limitative.

[0035] The inlet valve Fig. 5 (22) connected to the fig.5 tube (24) is used to introduce air into the zinc coffin from the outside, or enter chemicals to accelerate the decomposition of the dead.

[0036] According to a preferred variant of the air chamber it has two inlet valves Fig. 2 (19) - 2 (20) and a relief valve on the output Fig. 4 (15), calibrated to a suitable pressure, to which is connected a filter.

[0037] The filter has the characteristic to let pass the odorless gas outside and to block the inside odorous gases, fig.4 (25), and is positioned inside the coffin between the lid of the wooden coffin Fig. 1. (4) and the cover of the zinc coffin, fig. 1 (2).

[0038] The filter of Fig. 3 (26) may be positioned outside of the coffin and connected to the valve of Fig. 3 (15) for easy replacement of the filter itself, to title exhaustive example but not of limitation.

[0039] All device valves are of the type quick coupler, with direct connection. The valves have the characteristic that if they are connected are open and do pass the gas but, if instead are disconnected are closed hermetically, by way exhaustive example but not of limitation.

[0040] According to a preferred variant of the vent valves of Fig. 2 (8) - 2 (9) can be connected directly to the input valves of Fig. 2 (19) - 2 (20) of the air chamber Fig. 2 (14) even without the use of the hose. The vent valve of Fig. 2 (8) - 2 (9) can be connected directly to one or more filters, to be placed inside the coffin.

[0041] They can be positioned between the lid of the coffin dead, fig. 1 (4) and ii lid of the zinc case Fig. 1 (2). All the parts of the device can be produced and marketed in kit, produced separately or all at once. The relief valve 4 (15) can be connected to an external air chamber at the coffin to increase the total volume available to the expansion of the gases of decomposition or to a further filter to be positioned outside of the coffin itself.

Claims

1. A safety device anti deflagration, anti-escape of miasmas and odors from coffins, comprising: a tank container consisting of an inflatable air chamber (14), which acts as a lung, as a filter itself and as vent to any excess of pressure, of a material suitable to hold the odorous gases and to release only odorless gas, positioned between the cover of the zinc coffin (2), and the lid of the wooden coffin (4), with two inlet valves (19, 20) and an output vent valve (15),

- Two valves (8, 9) which bring into communication the inside of the zinc coffin with the exterior, inserted in the zinc coffin lid

- Two hoses (10, 11) equipped to the extremes from attacks (6, 7, 12, 13), that connect from one side to the valves of the zinc coffin (8, 9) and the other side with the input valves of the air chamber container (19, 20),
- Two Valves entrance to the air chamber (19,20) that put at passage the interior with the outside of the air chamber and an output valve to vent (15),

A filter (25) capable of blocking odorous gases and allow passage to the odorless gas, **Characterized in that:**

- a) The inflatable air chamber has the technology characteristics to be made with breathable material, type micro perforated membranes, e.g., Micro porous membranes which have the particular property to let pass only molecules of specific dimensions and to block molecules larger in size;
 - b) The valves quick coupling they have the characteristic of being closed if they are disconnected, and open if they are connected, in this way, if they are disconnected, all the parts that comprise the device are sealed and independent from each other, if they are connected the devices are communicating with each other;
2. Device according to claim 1 having a filter on the constructional characteristics such that it can be positioned outside the coffin, suitable to block the odorous gases and to pass only the odorless gas;
 3. Device according to one of the preceding claims, where the venting valve (15) is connected to a hose, which crosses the closed coffin, to be accessible from the outside, and can connect a filter purifier sterilizer (26);
 4. Device according to the preceding claims, where the venting valve (15) is connected to a filter (25) to be placed inside the coffin, in the space available between the zinc coffin lid (2) and the wooden coffin lid (4);
 5. Device according to any one of the preceding claims where the vent valves (8, 9) are connected directly to the filter (25) of size and shape such that they can also be inserted between the lid of the wooden coffin (4) and the zinc coffin lid (2);
 6. Device according to any one of the preceding claims where the valves (8,9) can be connected via hoses at one or more filters (26) of size and shape that it can be easily positioned on the outside of the coffin;
 7. Device according to any one of the preceding claims

where the valves (8, 9) can be connected to hoses that pass through the wooden coffin, and are connected to the air chamber container, positioned externally to the wooden coffin itself;

8. Device according to any one of the preceding claims where the valves (8, 9) can be connected via hoses, to the air chamber container, which in turn, via the outlet valve (15) is connected to a filter (26);
9. Device according to one of the preceding claims, wherein the valve (21), can be of the double type, with two quick couplings with valves, with separate internal paths, a flow towards the inside of the zinc coffin and a flow towards the outside of the zinc coffin;
10. Device according to one of the preceding claims, in which the valve (21) can be connected, via hoses to the outside of the cemetery niche, for introducing air in a natural way in the zinc coffin;
11. Device according to one of the preceding claims, in which the valve (21) can be connected via hose outside the cemetery niche, for introducing air in a forced manner, in the zinc coffin;
12. Device according to one of the preceding claims, wherein the air chamber (14) can be produced in multiple inner layers to increase the internal path of the gases between the inlet valve (19, 20) and the valve outlet (15);
13. Device according to one of the preceding claims, wherein the air chamber (14), can have an inner material suitable to retain moisture coming from the zinc coffin, via the valves (19, 20).

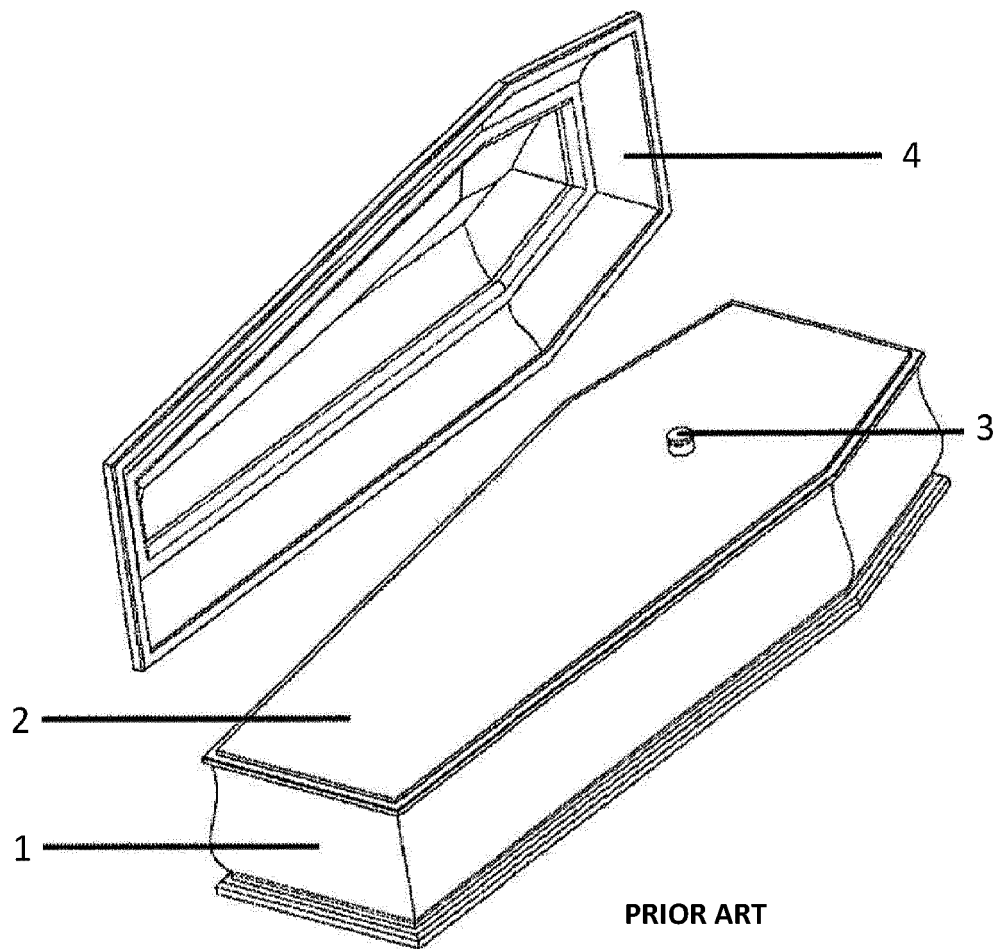


FIG. 1

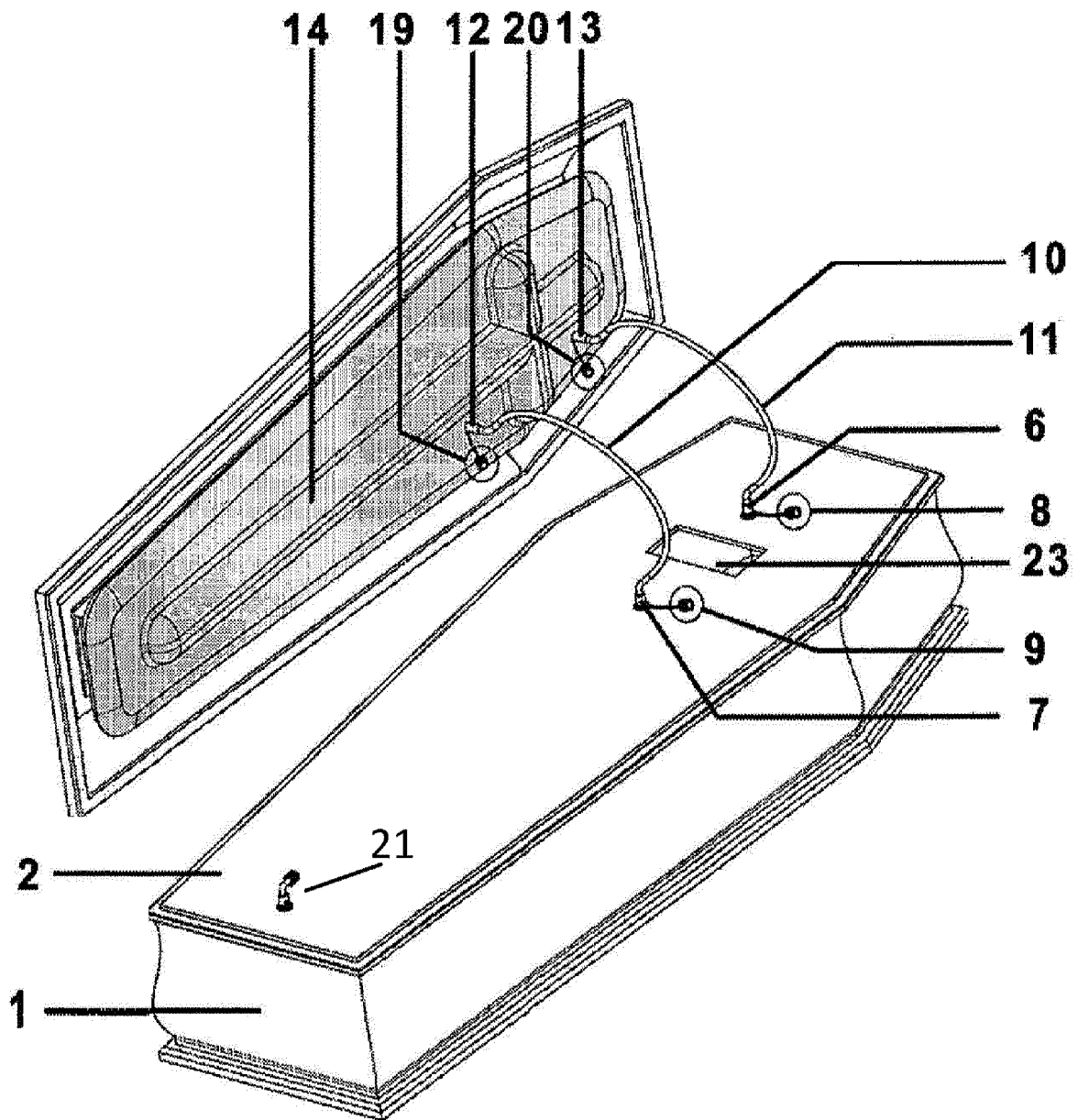


FIG. 2

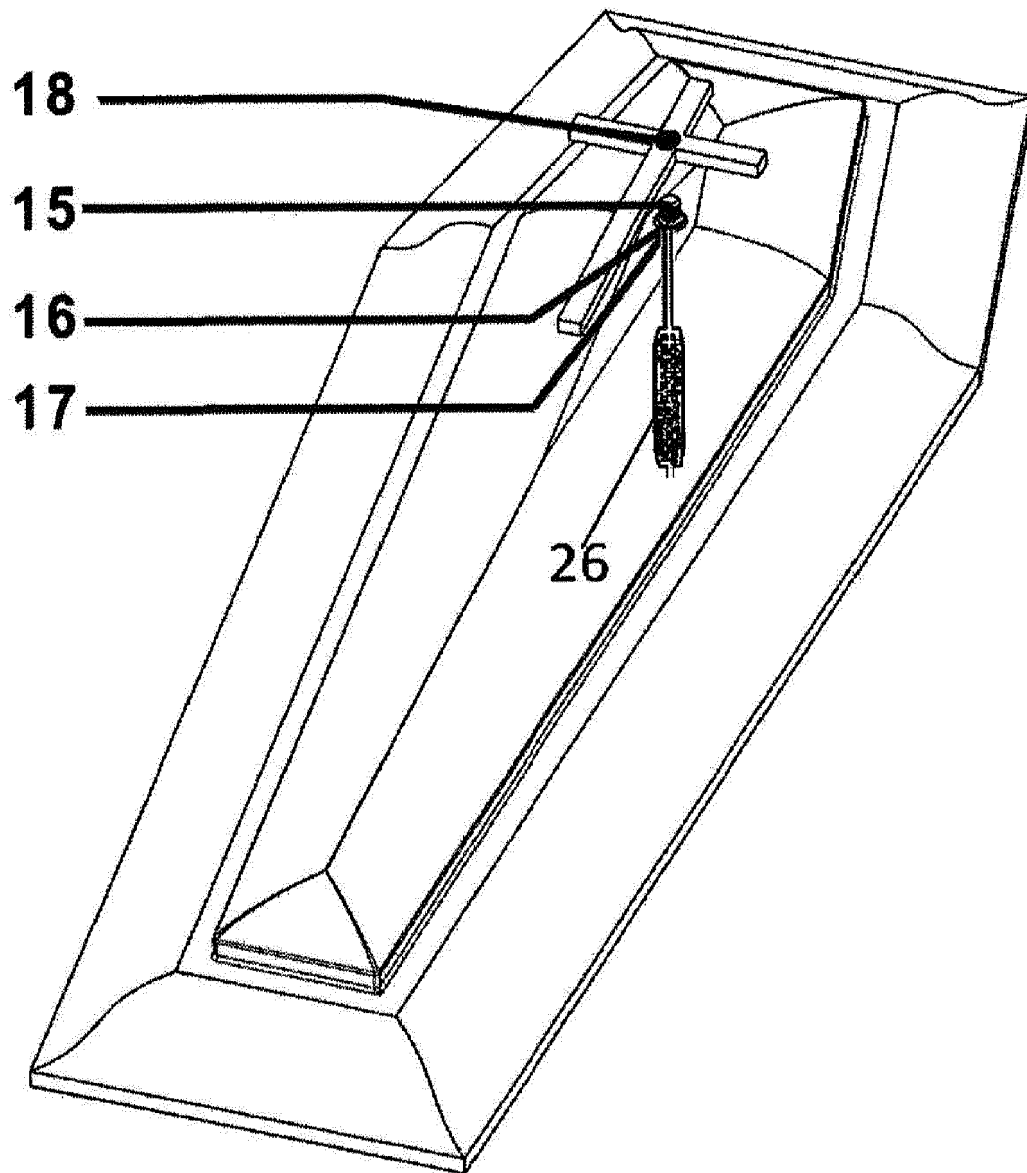


FIG. 3

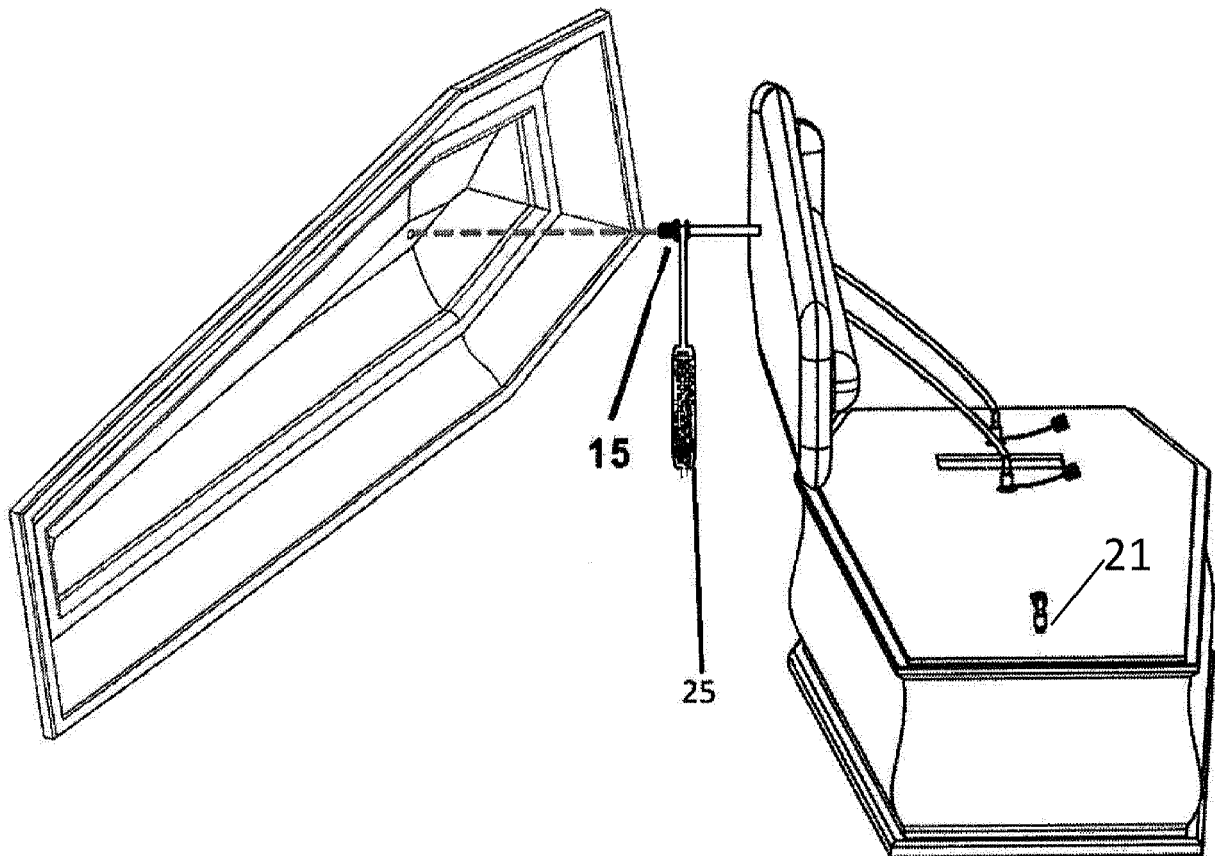


FIG. 4

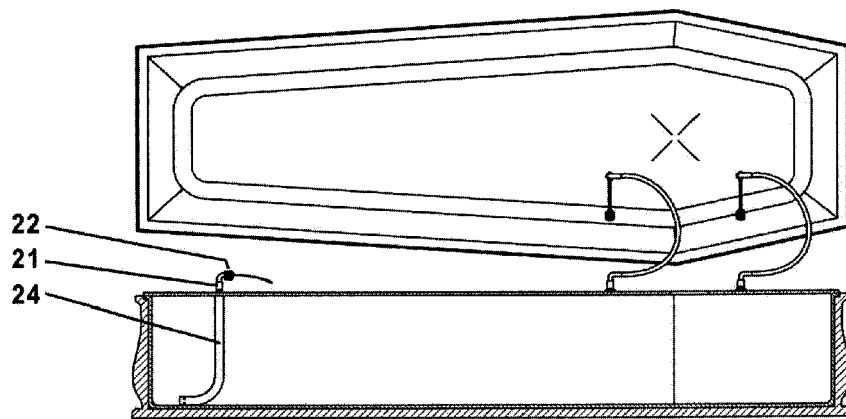


Fig. 5



EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2014/024166 A1 (CONVERTINI MARTINO [IT]) 13 February 2014 (2014-02-13) * the whole document *	1-13	INV. A61G17/00 A61G17/04
A	US 47313 A (A. LYMAN) 18 April 1865 (1865-04-18) * column 1, paragraph 1 - column 2, paragraph 5; figures *	1-13	
A	US 3 716 072 A (CRISWELL D) 13 February 1973 (1973-02-13) * abstract; figures *	1-13	
			TECHNICAL FIELDS SEARCHED (IPC)
			A61G
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 8 April 2016	Examiner Kousouretas, Ioannis
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