UNDERWATER COFFIN AND FILTER FOR SAME

Technical Field

The present invention relates to funeral accessories, namely to devices for underwater burying of bodies of deceased people or animals.

Background Art

It is known a capsule-coffin of a modular type for burying a body of a deceased person in different mediums [RU2403003, published 10.11.2010]. The capsule-coffin casted of ultrastrong glass or glass-fiber has a streamlined form and comprises upper and lower symmetrical parts that are connected to one another by a lock joint to be glued preliminary. The upper part of the capsule-coffin is provided with an insert part of plastic therein, and the insert part is provided with straps for fixing a body in a lying position. The insert part is also provided with a recess to fix the body which can have different sizes. The material used for manufacturing the capsule-coffin is non-decomposed, and the body in the capsule-coffin is insulated hermetically from the environment. This known capsule-coffin has such disadvantages as a labor-intensive manufacturing process requiring special molds; high costs of materials used for manufacturing; a risk of unsealing due to increasing an internal pressure and generating some heat energy during a process of decomposition of human body tissues; an absence of means for decontamination of decomposition products, that creates a risk of contamination of the environment; an absence of means to take out skeletal remains from the capsule-coffin for proposes of a reburial thereof on a minimal land area as well as to reuse the capsule-coffin for further burying.

Also, it is known an underwater burial capsule for underwater burying of a body of a deceased person [US5127112, published 07.07.1992]. The capsule has a an ellipsoid form and includes upper and lower parts of concrete reinforced with fiberglass, wherein the upper and lower parts are connected with one another by tenoning with using an epoxy adhesive. The upper and lower parts can be provided with reinforcing fiberglass members in the interior to prevent damage of the capsule. The capsule is not subject to corrosion and remains structurally rigid for long periods of time. A corpse is wrapped in a plastic, gas-tight shroud before placing in the capsule. The interior can contain a preservative such as oil or non-reactive gases which are capable of preserving the corpse for a long time. After the corpse is wrapped and placed into the capsule, a liquid preservative is injected into a bottom of the capsule to insure that air or other gas is not trapped inside. The capsule is provided with a recorded chart showing the location of the burial site and a record of localized information regarding autobiography and genealogy of an individual for further possible advanced scientific studies, etc. This known capsule has such disadvantages as a relatively large weight that complicates transporting the capsule with the corpse and further underwater burying; high material consumption for manufacturing; a

relatively high cost of preservatives; complicated technological process used for filling in the interior with the preservatives; a risk of unsealing of a connection between the upper and lower parts due to affecting by oil-based preservatives as well as a risk of exiting the oil-based preservatives to the environment; an absence of means for decontamination of decomposition products, that creates a risk of contamination of the environment; an absence of possibilities to form a compact structure of the underwater burials on an underwater floor area reserved for this propose; an absence of possibility to take out skeletal remains from the capsule for proposes of a reburial thereof on a land as well as to reuse the capsule for further burying.

As a prototype, it is chosen a marine burial container for sea burials which is made of paperboard [US4041582, published 16.08.1977]. Reinforcements can be made of paperboard such as corrugated paperboard or may be made of masonite, chipboard or wood to add reinforcing to the container. The paperboard container can have its exterior coated with wax or other material and finished like wood grain. Sides and a top of the container have through openings for passing water in the interior and exiting air therefrom when the container is submerging. There are concrete weight members formed in one set on a bottom inside of the container, and the members are provided with flexible straps for fixing a corpse. Before placing the corpse into the container, the corpse may be enclosed in a plastic log, or the like, and the corpse is wrapped by the flexible straps when placing thereof into the container. The top can have straps wrapped around the entire container for insuring that this top stays in place. The container is utilized for shipping bodies in the containers on vessels to sea and then used to bury the bodies in a sea burial. This known container has such disadvantages as a short-life and week structure that excludes re-using the container for further burials; an absence of means for decontamination of decomposition products, that creates a risk of contamination of the marine environment; an absence of possibility to take out skeletal remains from the container for proposes of a reburial thereof on a land.

Disclosure of Invention

A technical problem to be solved by the present invention is providing an underwater coffin for underwater burials having a relatively simple and strong structure and means for decomposition products neutralization to prevent pollution of the environment.

Another technical problem to be solved is providing such a design of an underwater coffin for underwater burials, which will make possible to form a compact structure of the underwater burials on an underwater floor area reserved for this propose with a maximal compact volume, and which will make possible to take out skeletal remains from the underwater coffin after decomposing of soft human body tissues for proposes of a reburial the skeletal remains on a minimal land area as well as a multiple repeated usage of the underwater coffin.

To solve the technical problem, in one aspect, it is provided an underwater coffin for underwater burials in a water body, the underwater coffin comprising: a housing being rigid, elongated and watertight; a cavity located inside the housing for accommodating a human body of a deceased person, wherein dimensions of the cavity correspond to those of the human body of the deceased person; and an aperture provided in one of elements of the housing and allowing the cavity inside the housing to communicate with external surroundings. These are novel features in that the underwater coffin further comprises a filter mounted in the aperture and containing a porous filtering material that is capable of allowing water of the water body to pass into the cavity of the housing and to exit therefrom and is a substrate for bacteria, microorganisms and/or microscopic aquatic organisms, which are capable of feeding on decomposition products of human body tissues and/or on derivatives thereof.

The above-mentioned structure provides neutralization of water, exiting from the cavity of the housing of the underwater coffin, by creating living conditions for bacteria, microorganisms and/or microscopic aquatic organisms of a detritus food chains type in the filter.

The housing can be shaped as an elongated barrel and provided with a housing door located on an open end of the elongated barrel. A preferable orientation of the housing is a horizontal orientation of a longitudinal axis thereof.

The housing can have different shapes, e.g. as an elongated parallelepiped or cylinder.

It is preferable, if the housing door is demountable.

It is preferable, if the aperture is provided in the housing door.

The underwater coffin can be provided with a temporary housing door that is blank to close the housing leaktightly, e.g. during transportation thereof.

The aperture can be enclosed at both sides thereof by perforated screens, and the porous filtering material is closely packed between the perforated screens.

A role of one of the screens can be fulfilled by an outer end plate of the housing door that is faced to the water body and provided with a plurality of through holes therein for this propose.

As another screen, which is faced to the cavity of the housing, can be a mesh.

The housing can be made of reinforced concrete. In this case, it is preferable to provide the housing with erection elements, which are mounted on an outer surface thereof and capable to be gripped by load-handling devices such as straps, load hooks and etc.

The underwater coffin can be provided with a bed that is capable to accommodate the human body of the deceased person thereon and be inserted into the cavity of the housing.

It is preferred, if the bed is equipped with clamping elements for fixing the human body of the deceased person thereon.

The bed can be as a casket casing having a casket lid, wherein the casket casing and/or the casket lid is perforated to allow the water to pass into the casket case and exit therefrom.

Two opposite side walls of the cavity of the housing can be provided with longitudinal guides thereon, at that the bed is provided with slides, which are located on both sides thereof and capable to move along the longitudinal guides.

The housing can be provided with joining elements, which are mounted on an outer surface thereof and capable to join the housing to a housing of another underwater coffin for proposes of creating mass burials.

In another aspect, the present invention provides a filter for filtering water exiting a cavity of a housing of an underwater coffin to a water body, the filter comprises perforated screens with a porous filtering material therebetween, wherein the porous filtering material is a substrate for bacteria, microorganisms and/or microscopic aquatic organisms, which are capable of feeding on the decomposition products of human body tissue and/or on derivatives thereof.

Such the filter can be installed not only in the above-mentioned underwater coffin in accordance with the present invention, but also in another known underwater coffins, e.g. in an aperture or aperture of the underwater coffin design mentioned above in accordance with the patent US4041582.

The porous filtering material can be made of particles of plants, which can be colonized rapidly by bacteria, microorganisms and/or microscopic aquatic organisms dwelled in the water body.

The porous filtering material can be made of wood chips, e.g. sawdust, and/or seaweed.

The porous filtering material can be multilayered, e.g. having layers of different porosities or made of different materials.

It is preferred, if the porous filtering material has a porosity that is increasing in a direction from the cavity of a the housing to outside. i.e. in an outward direction.

Brief Description of Drawings

The present invention will be further explained in more details with references to accompanying drawings as follows:

Fig. 1 – a longitudinal sectional view of an underwater coffin of a modular structure in accordance with an embodiment of the present invention;

Fig. 2 – a cross-sectional view of an underwater burial comprising four coffins;

Fig. 3 – a view of mounting of a demountable sealing door used for towing an underwater coffin to a burial area;

Fig. 4 – a perspective view with a broken section of a temporary housing door; and

Fig. 5 – an exploded perspective view with a broken section of a main housing door having a filter.

Best Modes for Carrying Out of Invention

The present invention will be further explained on an example of an underwater burial of several coffins in accordance the present invention, which have a modular structure.

As it shown in Fig. 1, an underwater coffin 1, designed for underwater mass burials, comprises such main elements as a housing 2 shaped as an elongated barrel in a parallelepiped form and a housing door 7 closing a cavity of the housing 2 at an open end thereof. The underwater coffin 1 is designed for placing on a water body floor horizontally. Alternatively, the housing can have a shape of a cylindrical barrel.

A plurality of the underwater coffins 1 can be joined with one another by means of joining elements mounted on the housing 2. As an example, as it is shown in Fig. 2, four underwater coffins 1 are joined with one another by means of embedded parts 4 that are joined by welding. It is possible to use for joining any appropriate detachable or fixed joints.

In this example, the housing 2 is manufactured of a concrete having a quality class B15 and a waterproofing class W4. The concrete is reinforced by a welded reinforcement of steel rods A-II having a diameter 8 mm with a mesh 100 × 100 mm. A thickness of walls of the housing 2 can be from 80 to 100 mm. Alternatively, the housing 2 can be of any appropriate materials including metallic materials, reinforced plastics and so on which are capable to provide rigidity and durability thereof under affecting a water pressure at a water body floor.

The embedded parts 4 embedded into longitudinal outer surfaces of the housing 2 are made of steel plates having a thickness 10 mm and used for joining the underwater coffins 1 for an underwater mass burial. In addition, there are erection loops 5 embedded into the longitudinal outer surfaces of the housing 2 and serving for slinging the housing 2 when using lifting devices, e.g. during assembling the underwater coffins 1 and/or submerging thereof onto a water body floor of a water body.

Longitudinal guides 12 of channels of a standard size No.5 are mounted on two opposite side walls of the cavity of the housing 2, respectively, and the longitudinal guides are serving for receiving slides of a bed formed as a casket 3. Flexible straps 13 of capron are provided inside the casket 3 for fixing a human body of a deceased person in the casket 3. Both a casing and a lid of the casket 3 are perforated by through holes having a diameter 10 mm for passing a water medium. Both the casing and the lid of the casket 3 are coated from outside by a furnishing fabric having a property of transmitting the water medium.

An assembly set for the underwater coffins 1 includes two demountable housing doors, namely a temporary housing door 6 (see Figs. 3 and 4) and a main housing door 7 (see Figs. 1

and 5). Both housing doors 6, 7 are formed of polypropylene with a thickness at least 20 mm. Alternatively, it is possible to use another appropriate materials for the housing doors, e.g. of metallic material or other polymeric material.

The main housing door 7 and the temporary housing door 6 are installed onto an open end of the housing 2 with using a sealing gasket 8 of polyurethane and fixed on the housing 2 by means of disconnectable locking levers 9.

The temporary housing door 6 is a blank cover serving for closing the cavity of the housing 2 (see Fig. 2) leaktightly during transportation the underwater coffins 1 to a burial area.

The main housing door 7 has an internal space having a function of an aperture that allow the cavity of the housing 2 to communicate with an external environment (see Figs. 1 and 5).

A filter is placed in the internal space of the main housing door 7, and the filter comprises a porous filtering material laid in two layers: a layer 10 of wood chips and a layer 14 of seaweed. From one side, namely from a side of the layer 14, the porous filtering material is enclosed by an outer end plate of the main housing door 7 having a plurality of through holes therein for passing a water medium, and from another side, namely from a side of the layer 10, the porous filtering material is enclosed by a mesh frame 11.

Both the layer 10 and the layer 14, while having a filtering function, also serve as a substrate for colonization and living bacteria, microorganisms and/or microscopic aquatic organisms of a water body.

The layers 10 and 14 are laid compressed to one another. A thickness of each of the layers 10 and 14 can be 200 mm, a diameter of through holes of the outer end plate of the main housing door 7 can be up to 10 mm, and a quantity of the through holes can be from 70 to 100; a mesh size of the mesh frame 11 can be up to 5 mm, which allow for a water medium to pass through freely and to fix the layers 10 and 14 in closed positions for proper filtering in the same time. The mesh frame 11 can be made of a brass of a polymeric material. Herein, it is important that a size of particles of the layers 10 and 14 must be more than a size of meshes of the mesh frame 11 as well as a diameter of the through holes of the outer end plate of the main housing door 7, respectively.

In this example, a size of particles of the wood chips of the layer 10 is chosen less than a size of particles of the seaweed of the layer 14, i.e. a porosity of the layer 10 is than a porosity of the layer 14, that allow to create better conditions for feeding on decomposition products of human body tissues by the microorganisms in proximity to the cavity of the housing 2.

The wood chips of the layer 10 can be in a form of sawdust of different wood species.

As the seaweed of the layer 14, it is preferred to use seaweed submersing in the same water body on which a bed will be placed the underwater coffins 1. At that, it is preferred to use seaweed dried-up thermally.

Alternatively, different non-limited variants are possible for embodiments of the porous filtering material, e.g. using the same material for all layers which has a porosity increasing in a direction from the cavity of a the housing to outside. In the last case, the increasing of the porosity from one layer to another layer can be achieved by increasing a size of particles from one layer to another layer.

The underwater coffin for underwater burials is used as described below.

Before burying, a human body of a deceased person is accommodated in the casing of the casket 3 and fixed in a horizontal position by the flexible straps 13, after that the casket 3 is pushed by sliding along the longitudinal guides into the cavity of the housing 2.

First, the cavity of the housing 2 is closed by the temporary housing door 6, thereby the underwater coffin 1 gains a hermiticity as well as a positive buoyancy. Then the underwater coffin 1 is parbucled on a surface of a water body and towed to a burial area.

Upon arriving to the burial area, the underwater coffin 1 is erected under a surface of the water body, the temporary housing door 6 is replaced by the main housing door 7, and after that the underwater coffin 1 is submerged onto a water body floor.

When the cavity of the housing 2 is filling in with water of the water body through the main housing door 7, the underwater coffin 1 is submerged onto the water body floor slowly with using a lifting device.

In a process of decomposition of human body tissues, it occurs generation of some heat energy and gaseous decomposition products, that creates some increasing a pressure inside the cavity of the housing 2, thereby water polluted by decomposition products is exiting gradually to outside through the mesh frame 11, the layers 10 and 14 and the through holes in the outer end plate of the main housing door 7.

Bacteria, microorganisms and another microscopic aquatic organisms populate within the layers 10 and 14, and these organisms are feeding on the decomposition products and derivatives thereof, thereby the water is exiting from the cavity of the housing 2 being neutralized.

After complete decomposing of the human body tissues, mainly soft tissues, the underwater coffin 1 can be weighed, and skeletal remains can be taken out of the underwater coffin 1, for example for proposes of a reburial the skeletal remains on a land area, where they will occupy a relatively small space, at that he underwater coffin 1 can be reused for another burying of a human body of another deceased person.

It should be understood, that the above examples were used for illustrative proposes only to demonstrate possibilities to carry out the present invention and some advantages thereof, and these examples do not intend for limitation of a scope of protection that is determined by the appended claims, and those skilled in the art are able to carry out another embodiments of this invention within the scope of protection.

Claims

1. An underwater coffin for underwater burials in a water body, the underwater coffin comprising:

a housing being rigid, elongated and watertight;

a cavity located inside the housing for accommodating a human body of a deceased person, wherein dimensions of the cavity correspond to those of the human body of the deceased person; and

an aperture provided in one of elements of the housing and allowing the cavity inside the housing to communicate with external surroundings;

wherein the underwater coffin further comprising a filter mounted in the aperture and containing a porous filtering material that is capable of allowing water of the water body to pass into the cavity of the housing and to exit therefrom and is a substrate for bacteria, microorganisms and/or microscopic aquatic organisms, which are capable of feeding on decomposition products of human body tissues and/or on derivatives thereof.

2. The underwater coffin of claim 1, wherein the housing is shaped as an elongated barrel and provided with a housing door located on an open end of the elongated barrel.

3. The underwater coffin of claim 2, wherein the housing is shaped as an elongated parallelepiped or cylinder.

4. The underwater coffin of claim 2, wherein the housing door is demountable.

5. The underwater coffin of claim 2, wherein the aperture is provided in the housing door.

6. The underwater coffin of claim 5, wherein the housing is provided with a temporary housing door that is blank.

7. The underwater coffin of claim 5, wherein the aperture is enclosed at both sides thereof by perforated screens, and the porous filtering material is closely packed between the perforated screens.

8. The underwater coffin of claim 7, wherein an outer end plate of the housing door has a plurality of through holes therein and fulfill a role of one of the screens, which is faced to the water body.

9. The underwater coffin of claim 8, wherein another screen, which is faced to the cavity of the housing, is a mesh.

10. The underwater coffin of claim 1, wherein the housing is made of reinforced concrete.

11. The underwater coffin of claim 10, wherein the housing is provided with erection elements, which are mounted on an outer surface thereof and capable to be gripped by load-handling devices.

12. The underwater coffin of claim 1, wherein the underwater coffin is provided with a bed that is capable to accommodate the human body of the deceased person thereon and be inserted into the cavity of the housing.

13. The underwater coffin of claim 12, wherein the bed is provided with clamping elements for fixing the human body of the deceased person thereon.

14. The underwater coffin of claim 12, wherein the bed is a casket casing having a casket lid, wherein the casket casing and/or the casket lid is perforated.

15. The underwater coffin of claim 12, wherein two opposite side walls of the cavity of the housing are provided with longitudinal guides thereon, and the bed is provided with slides, which are located on both sides thereof and capable to move along the longitudinal guides.

16. The underwater coffin of claim 1, wherein the housing is provided with joining elements, which are mounted on an outer surface thereof and capable to join the housing to a housing of another underwater coffin.

17. A filter for filtering water exiting a cavity of a housing of an underwater coffin to a water body, the filter comprising perforated screens with a porous filtering material therebetween, wherein the porous filtering material is a substrate for bacteria, microorganisms and/or microscopic aquatic organisms, which are capable of feeding on the decomposition products of human body tissue and/or on derivatives thereof.

18. The filter of claim 17, wherein the porous filtering material is particles of plants.

19. The filter of claim 18, wherein the porous filtering material is of wood chips and/or seaweed.

20. The filter of claim 17, wherein the porous filtering material is multilayered.

21. The filter of claim 17, wherein the porous filtering material has a porosity that is increasing in a direction from the cavity of a the housing to outside.

Abstract

It is provided an underwater coffin (1) for underwater burials in a water body, which comprises: a housing (2) being rigid, elongated and watertight; a cavity inside the housing for accommodating a human body of a deceased person; and an aperture provided in one of elements of the housing and allowing the cavity inside the housing to communicate with external surroundings. These are novel features in that the underwater coffin (1) further comprises a filter mounted in the aperture and containing a porous filtering material (10, 14) that is capable of allowing water of the water body to pass into the cavity of the housing and to exit therefrom and is a substrate for bacteria, microorganisms and/or microscopic aquatic organisms, which are capable of feeding on decomposition products of human body tissues and/or on derivatives thereof. A filter is also claimed for filtering the water exiting the cavity of the housing of the underwater coffin (1), the filter comprising perforated screens (11) with a porous filtering material (10, 14) therebetween which is a substrate for bacteria, microorganisms and/or microscopic aquatic organisms, which are capable of feeding on the decomposition products of human body tissue and/or on derivatives thereof. The invention makes it possible to prevent contamination of a water body with decomposition products.

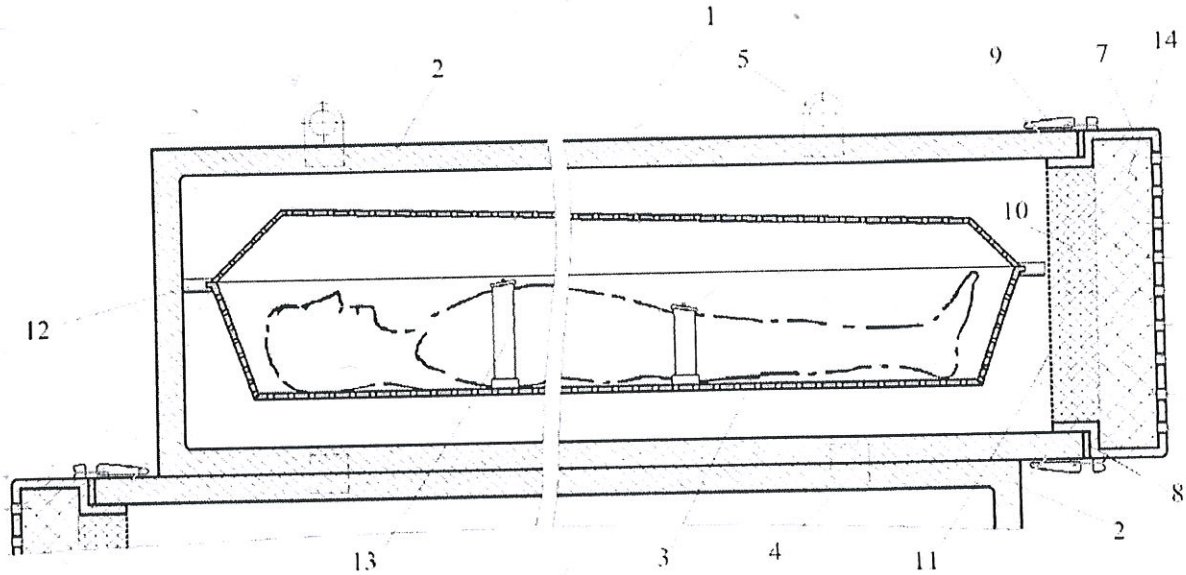

Fig.1

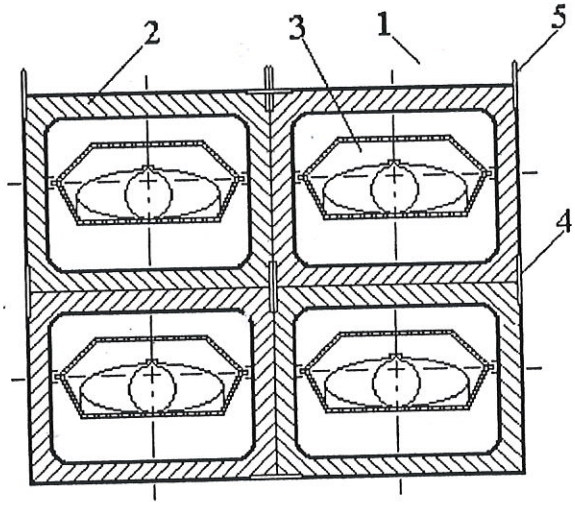

Fig.2

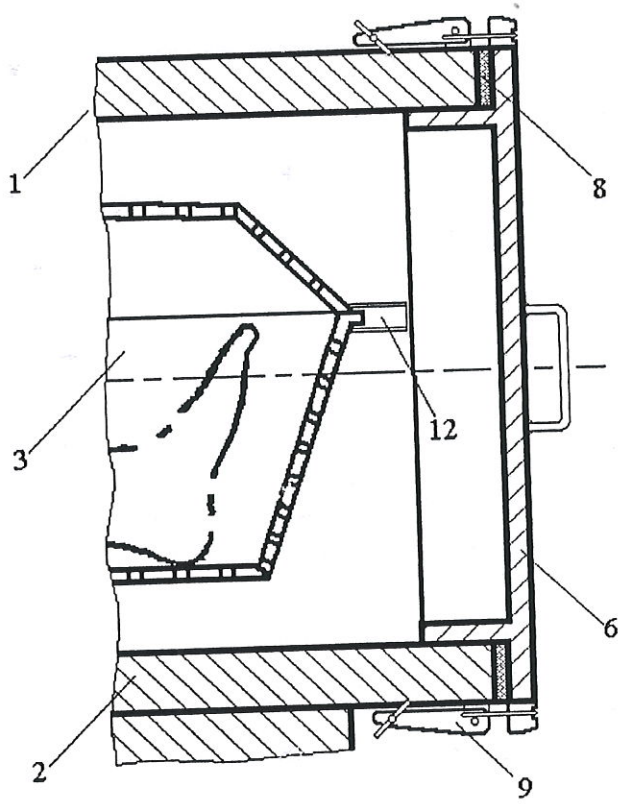

Fig.3

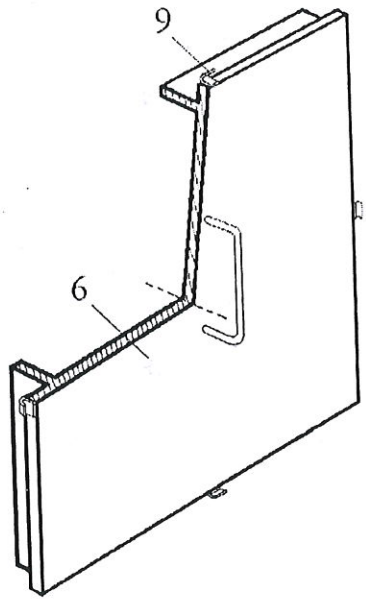

Fig.4

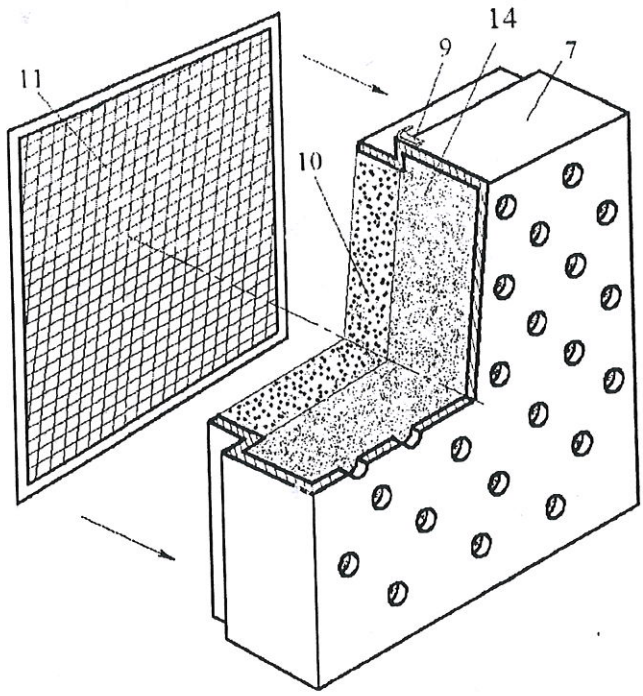

Fig.5