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(54) Ice-free preserver

(57) Device for keeping a part of a surface of an aqueous body such as a pond ice-free, comprising a sleeve-shaped body for shielding the part of the surface in sideward direction, which sleeve-shaped body is provided with a circumferential wall (2) and an open lower end (7) and an upper end, in which the device is provided with one or more heating elements (18a-c) which are arranged for heating of at least a part of the space surrounded by the circumferential wall (2).

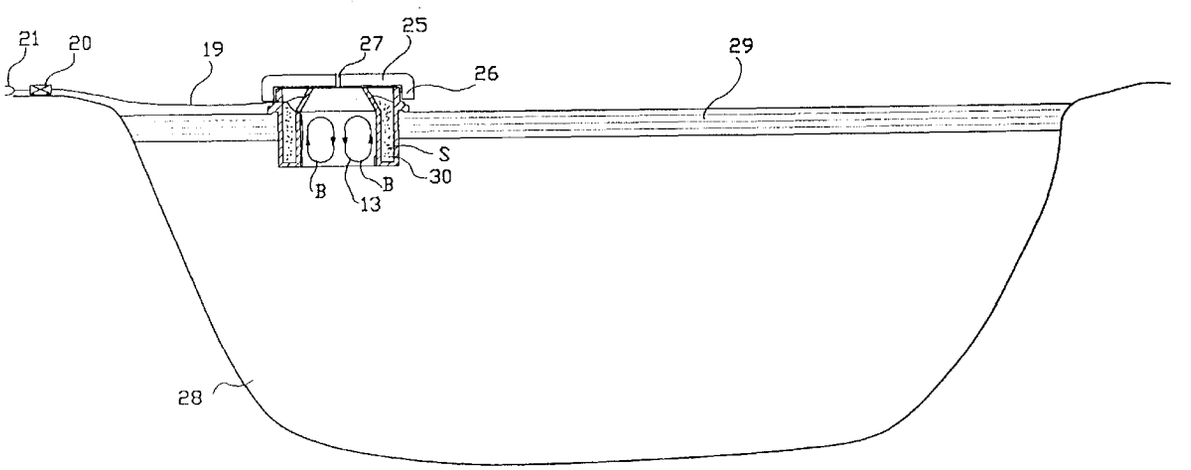

FIG. 3

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Description

[0001] The invention relates to a device for keeping a part of the surface of an aqueous body, such as a pond, ice-free.

[0002] Such ice-free preserver are used for locally keeping open the frozen water surface of for instance a pond, so that fish can keep breathing for air.

[0003] A known ice-free preserver consists of a polystyrene foam annular body, which is provided with a flange at the outer periphery, and also a polystyrene foam lid, which fits over the ring in order to cover the opening in it in upward direction and is supported on the flange. Through the lid an air pipe can be inserted.

[0004] The known ice-free preserver has to remain covered in a lengthy period of frost in order to sufficiently insulate the space within the ring. Nonetheless it may occur that the insulation value turns out to be insufficient.

[0005] The known ice-free preserver is placed prior to a period of frost. As the ice-free preserver is very light as a result of the material used and can very easily be moved by the wind, it has to be kept in its place by an aid. To that end a bag provided with a cord is supplied with the ice-free preserver which bag after filling it with for instance sand can be connected to the ice-free preserver like an anchor.

[0006] Another ice-free preserver consists of a polystyrene foam, two-piece body, provided with an throughgoing bore, which is filled with twigs. A twig has to be extended downwards as anchoring means. From time to time the ice-free preserver has to be rotated, to loosen the ice formed between the twigs.

[0007] There is a need for a ice-free preserver, which provides an ice-free opening under most wintry circumstances which may occur hereabouts.

[0008] Furthermore there is a need for a ice-free preserver which can easily be put in its place.

[0009] There is also a need for a ice-free preserver which is stationary in a reliable manner.

[0010] It is an object of the invention to provide a ice-free preserver which provides for one or more of the aforementioned needs.

[0011] From one aspect the invention provides to that end for a device for keeping a free part of a surface of an aqueous body such as a pond ice-free, comprising a sleeve-shaped body for shielding the part of the surface in sideward direction, which sleeve-shaped body is provided with a circumferential wall and an open lower end and an upper end, in which the device is provided with one or more heating elements which are arranged for heating of at least a part of the space surrounded by the circumferential wall.

[0012] Thus not only is formation of ice counteracted in the area to be kept open, in a passive way by means of insulation, but also in an active way, by means of heating, so that the area mentioned almost certainly will remain ice-free, where a free water surface, accessible from below, is offered to the fish.

[0013] In a further development of the device according to the invention the heating element, heating elements, respectively, is/are arranged in the lower part of the sleeve-shaped body. In this way the water which is within the sleeve-shaped body is heated on a location at a distance below the water surface, so that the heated water may rise and a circulation flow can occur in the space mentioned. The effectiveness of the heating is strongly improved in this way. The water that would otherwise remain standing still in possibly less well heated places, can in this way moreover be mixed with warmer water from other places within the space mentioned.

[0014] A constructive simple design is obtained when the heating element, the heating elements, respectively, is/are arranged on or in the circumferential wall. The circumferential wall then constitutes a direct carrier for the heating elements.

[0015] Preferably a number of heating elements are present, which elements are spaced in horizontal circumferential sense of the sleeve-shaped body. In this way the heating capacity of each element is optimally used. In case of the aforementioned placing at a distance below the water surface several circulation flows will be able to boost each other, which leads to a further increased effectiveness.

[0016] Said circulations flows are further promoted according to the invention when the inner surface of the circumferential wall is substantially cylindrical, preferably circle-cylindrical.

[0017] From another aspect the invention provides a device for keeping a part of the surface of an aqueous body such as a pond ice-free, comprising a sleeve-shaped body for shielding a part of the surface in sideward direction, which sleeve-shaped body is provided with a circumferential wall and an open lower end and an upper end, in which the sleeve-shaped body is provided with ballast spaces which are accessible for its filling with a ballasting means. By filling of the ballast spaces with for instance sand the weight and stability of the sleeve-shaped itself body is increased and in a direct manner. The level of the sleeve-shaped relative to the water surface can simply -and easily corrigible- be adjusted during the insertion of the ballast material in the ballast spaces. The ballast material can moreover increase the heat resistance of the circumferential wall. The ballast material preferably is granular, so that pores are formed.

[0018] Preferably the sleeve-shaped body is provided with parts extending sidewards, preferably in the shape of a circumferential flange. The device can be grabbed and held here during placing and removal.

[0019] From a further aspect of the invention a measure is provided that the sleeve-shaped body is open at the upper end and the circumferential wall with its inner surface tapers upwards. Thus an almost dome-shaped space is created above the water level, which is shielded against dirt and leaves and where the air can remain

substantially stationary and forms an insulating buffer towards the open air, which is possibly heated by the water when aforementioned heating elements are present.

[0020] The invention will be elucidated on the basis of the exemplary embodiment shown in the attached drawings, in which:

Figure 1 shows a perspective view, obliquely from above, on the exemplary embodiment of the ice-free preserver according to the invention;

Figure 2 shows a partially cut-away side view of the ice-free preserver of figure 1; and

Figure 3 shows the ice-free preserver of the figures 1 and 2 placed in a pond with a layer of ice.

[0021] The ice-free preserver 1 shown in figure 1 is substantially tubular, which tube-shape is defined by a hollow, substantially straight-circle-cylindrical wall 2 of for instance polystyrene foam. The wall 2 comprises a circumferential outer wall 4 and a circumferential inner wall 5, 6, a bottom wall 24 connecting these walls below and a number of transverse walls 17 connecting these walls. The walls 4, 5, 6, 17 and 24 define hollow ballast spaces 12 and 30, which are in open connection to each other.

[0022] The inner wall 5 runs vertically to define a straight circle cylindrical space 9 and the inner wall 6 contiguous therewith runs obliquely to the inside to define a truncated conical space 10 which is somewhat shielded towards the top. The inner wall 6 defines a top opening 8 at the upper end. The inner wall 5 defines an opening 7 at the lower end.

[0023] At the outside of the outer wall 4 a circumferential flange 15 is integrally formed, which with its lower surface is situated at the level of the transition between the inner walls 5 and 6. The flange 15 is provided with a pending lower edge 16 and at the top side with ribs 14, which are continued on the surface of the portion of the outer wall 4 situated above it.

[0024] On the inner surface of the inner wall 5, a little above its lower end, three heating elements 18a-c are attached at regular distances from each other in circumferential direction, which elements are series connected by means of electric conductor 19, which is pressed in a slit in the inner surface of the inner wall 5. The contact wire 19 is guided to the outside through the inner wall 6, the ballast space 12 and the outer wall 4 for connection to a power source. The heating elements 18a-c may be known elements per se, such as those which consist of a ceramic carrier plate on which is baked precious metal paste forming the resistance applied to it by means of thick film technique and attachment planes for terminals to be soldered on it. The resistance preferably is one with so-called PTC-effect, as a result of which at a higher temperature the resistance becomes lower, so that it is prevented that the resistances become too hot when they are under power but are not in the water. For a similar reason a material which has high resistance to heat can be chosen for the material for wall 2, such as for instance a polystyrene blend which is on the market under the tradename "Caril".

[0025] The total resistance of the heating elements can remain low, for instance less than 10W.

[0026] The ice-free preserver 1 can furthermore be provided with a lid 25, also for instance of polystyrene foam, which is provided with a pending circumferential edge 26 and a blind hole 27, which if necessary can be pierced for letting through an additional air pipe in case the ice-free preserver has become covered under a thick layer of snow, such as is known per se. The inner diameter of the circumferential wall substantially corresponds to the diagonal distance between the radially surfaces of the ribs 14 turned to the outside.

[0027] The ice-free preserver 1 is placed in a pond 28 prior to an expected period of frost. To that end the ice-free preserver 1 is first provided with a ballast material such as sand S, which can be strewn in the ballast spaces 30 and 12 from above. This can simply be done on the bank. The ballast material can be supplied along, in which case one of the walls, preferably the inner wall 5/6 is provided with a indication for the recommended level of filling. At this recommended level of filling the flange 15 will be at the level of the water surface with its lower plane. The same goes for the transition of the cylinder wall 5 to the conical wall 6.

[0028] The ballast material can also be provided by the user himself/herself. In that case the user can test once or several times how deep the ice-free preserver reaches into the water with the ballast material present then. This could possibly even be done at home in a tank with water, because no pending aids are used.

[0029] After the correct level of filling has been reached, the ice-free preserver 1 is placed at the desired place in the pond, during which the preserver 1 can easily be held on the flange 15. As a result of its mass the ice-free preserver will remain in its place. The flange 15 here increases the stability against tilting, in which the pending lower edge 16 ensures that also when waves are present the flange remains supported there by the water. After the placing of the ice-free preserver 1, the heating elements 18 are located at or below the water surface, in this example at a distance therefrom, near the lower end of the inner wall 5. When it is actually going to freeze the 220V/12V adapter 20 connected to the electric conductor 19 is placed in a socket 21. In this way the heating elements 18a-c get under power and heat development occurs there. The water heated at the surface of the elements 18a-c will rise and near the water surface move inwards and subsequently move downwards again, to finally flow outwards to the inner wall 5, according to circulation flow B. The water at some distance below the heating elements 18a-c, just below the lower opening 7 will remain stationary and as it were

form a cold lock or barrier.

[0030] Above the water surface thus kept clear of the ice layer 29 within the ice-free preserver 1 a shielded air space 10 is formed by the wall 6, which space helps with the insulation of the water surface. This air space 10 and the filling openings 18 can be covered against snow and/or rain by means of the lid 25, which with its edge 26 can be clamped onto the ribs 14. The ribs 14 ensure that ventilation slits remain left. Should as a result of the pressure of ice the wall 2 be pressed in, the lid 25 will move downwards. However the lid will not come loose (and be blown away) because as a result of the thickness of the ribs 14 which increases downwards in a tapering way (see detail 2A) clamping of the edge of the lid 26 onto the ribs 14 is maintained.

[0031] It is noted that the ice-free preserver according to the invention as a result of its great stability can also be used as a support for one or more special provisions. The ice-free preserver can for instance be combined with a lighting fixture and/or a level controller, in which for instance a level meter reaches into the water from the ice-free preserver and the measure signal is emitted via a electric conductor to a controller placed on the bank for a water supply and/or water discharge for the pond.

Claims

1. Device for keeping a free part of a surface of an aqueous body such as a pond ice-free, comprising a sleeve-shaped body for shielding the part of the surface in sideward direction, which sleeve-shaped body is provided with a circumferential wall and an open lower end and an upper end, in which the device is provided with one or more heating elements which are arranged for heating of at least a part of the space surrounded by the circumferential wall.

2. Device according to claim 1, in which the heating element, the heating elements, respectively, is/are arranged in the lower part of the sleeve-shaped body.

3. Device according to claim 1 or 2, in which the heating element, the heating elements, respectively, is/are arranged on or in the circumferential wall.

4. Device according to claim 1, 2 or 3, in which a number of heating elements are present which are spaced in horizontal circumferential sense of the sleeve-shaped body.

5. Device according to any one of the claims 1-4, in which the inner surface of the circumferential wall is substantially cylindrical, preferably circle-cylindrical.

6. Device according to any one of the preceding claims, in which the sleeve-shaped body is provided with ballast spaces which are accessible for its filling with a ballasting means, preferably a granular material.

7. Device according to any one of the preceding claims, in which the sleeve-shaped body is open at the upper end and the circumferential wall with its inner surface tapers upwards.

8. Device according to any one of the preceding claims, in which the sleeve-shaped body is provided with parts extending sidewards, preferably in the shape of a circumferential flange.

9. Device according to any one of the preceding claims, furthermore provided with a lid, for upward sealing the space defined by the sleeve-shaped body and/or its circumferential wall.

10. Device for keeping a part of the surface of an aqueous body such as a pond ice-free, comprising a sleeve-shaped body for shielding a part of the surface in sideward direction, which sleeve-shaped body is provided with a circumferential wall and an open lower end and an upper end, in which the sleeve-shaped body is provided with ballast spaces which are accessible for its filling with a ballasting means, preferably a granular material.

11. Device according to claim 10, in which the ballast spaces are accessible from the top.

12. Device according to claim 10 or 11, in which the body offers support to a means for performing an extra function.

13. Device according to claim 11, provided with a water level controller, at least a water level meter.

14. Device according to claim 12 or 13, provided with a lighting fixture.

15. Device provided with one or more of the characterizing measures described in the description and/or shown in the drawings.

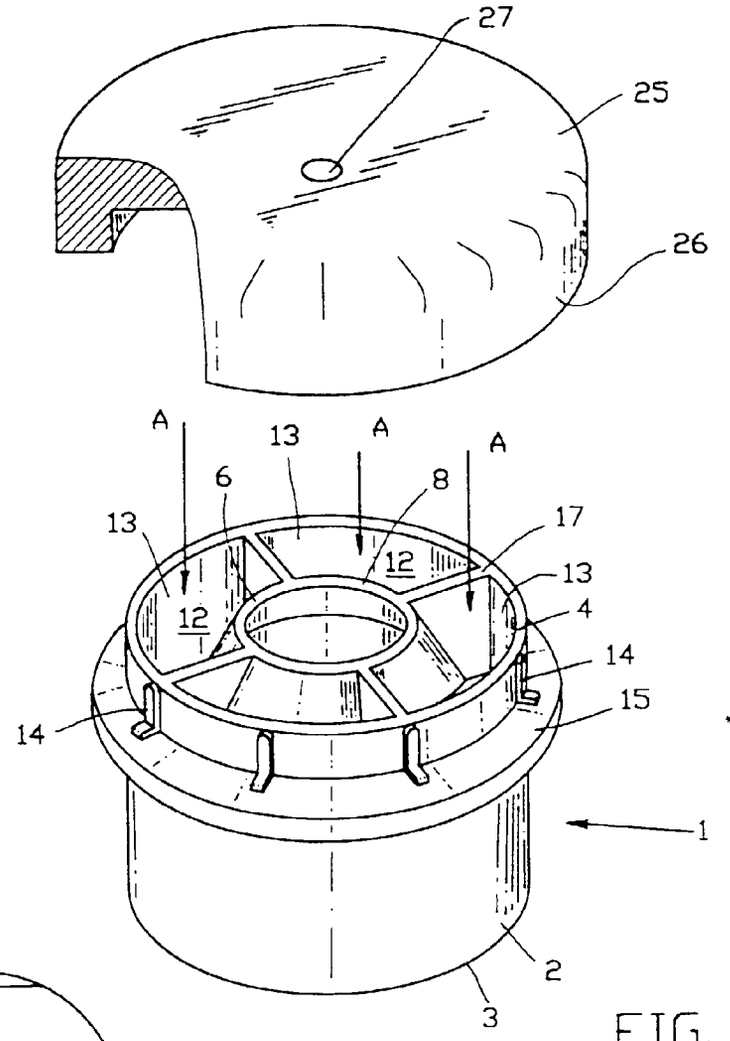
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FIG. 1

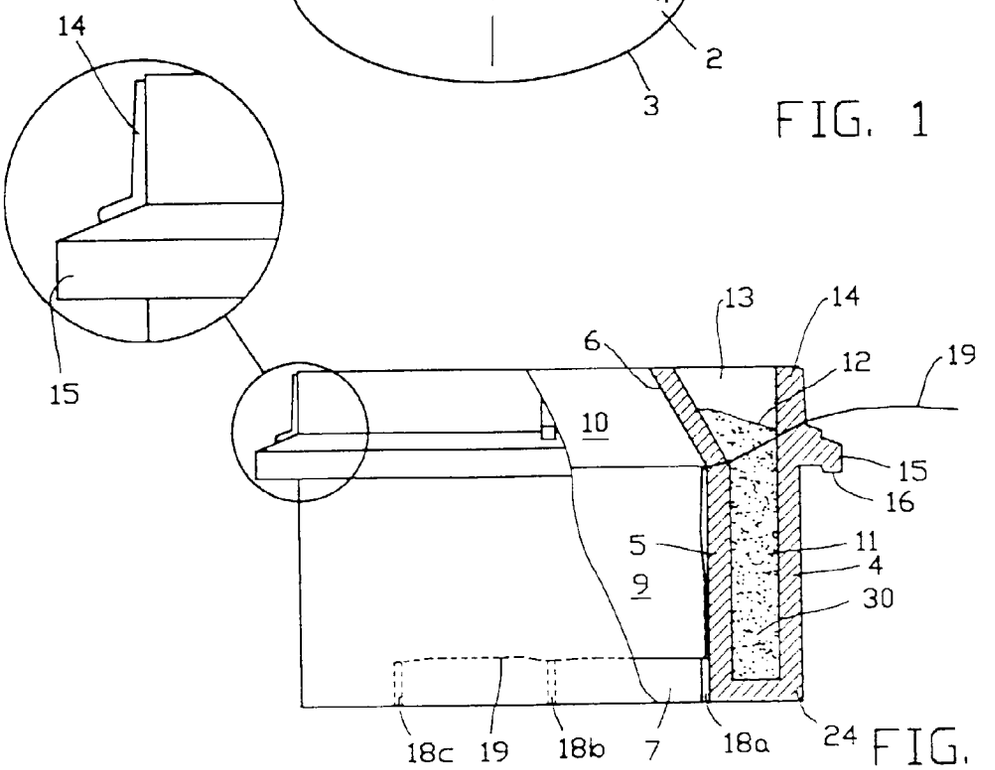
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FIG. 2

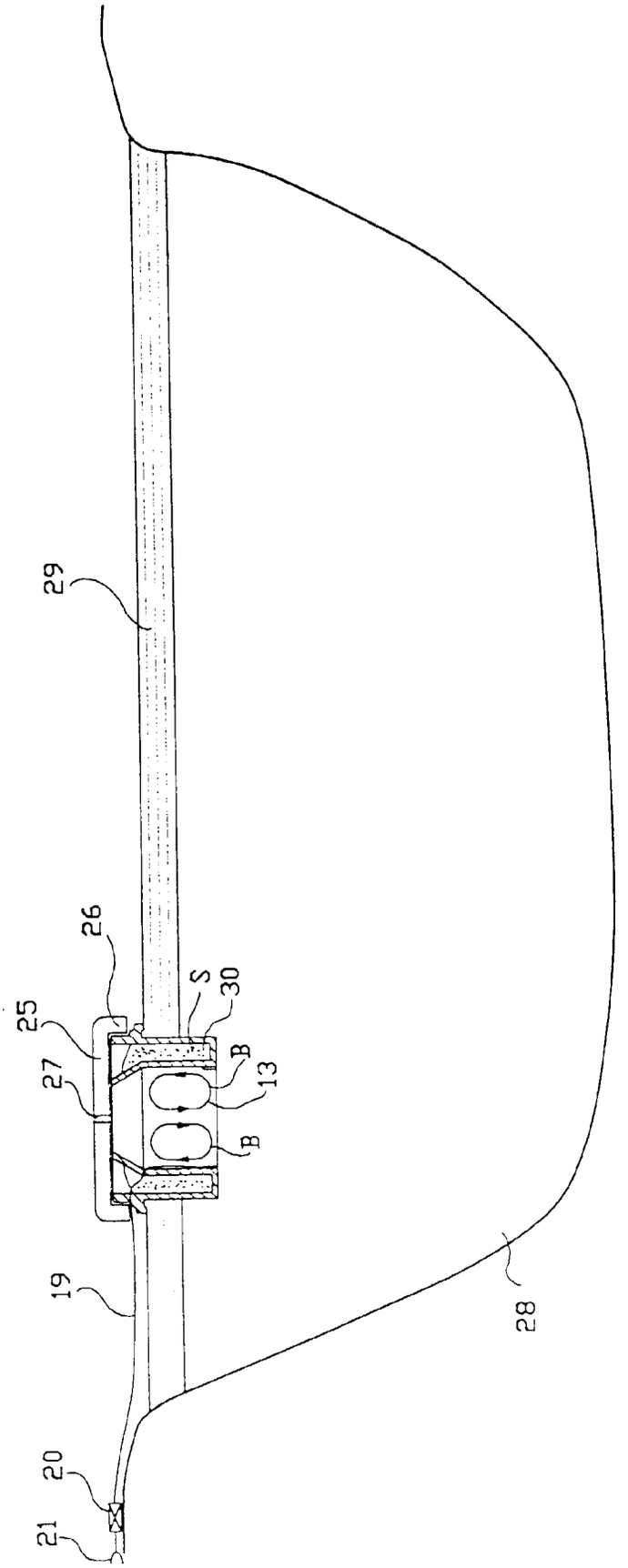

FIG. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 99 20 0623

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28 June 1999	De Coene, P

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