

PATENT SPECIFICATION

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(54) METHOD FOR THE PREVENTION OF FOULING OF SHIPS

(71) I, OYSTEIN RASMUSSEN, a Norwegian Subject of, Hosleveien 119, 1340 Bekkestua, Norway, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a method for the prevention of fouling of ships or other marine vessels.

At the present time, application of paints of the so-called "anti-fouling" type is generally used for the prevention of fouling of ships. This is a paint incorporating toxic substances which diffuse into the sea water adjacent to the side of a ship and kill any living organisms so that they have no opportunity of attaching themselves to the ship's hull. In the main, fouling occurs when the ship is in harbour where there are no substantial currents.

Various other methods have been proposed for distributing the toxic substances over the surface of the ship. The substances have, for example, been distributed in liquid state beneath the water, possibly by means of a carrier. In British Specification No. 1299126 (Application No. 22855/70) it is also proposed to utilise the electrolytic decomposition products of sea water, which are distributed along the side of the ship.

The aim of the present invention relates to a further possibility for prevention of fouling and is characterised in that ozone is distributed over the underwater surface of the ship.

Ozone is known as a strong disinfectant and sterilising agent and has been found useful, amongst other things, in the purifying of drinking water. The deadly effect of ozone both on animal and vegetable plankton and the like has been proved and described in many literature sources, for example by G. Bringmann in "Zeitschrift für Hygiene", Volume 139 (1954) 8, pages 333 to 337. It is however, the effect in fresh water which

is described and not in relation to the form of fouling occurring particularly on ships.

It has now been found that the same effect can also be utilised to prevent growth of algae and plankton and other marine growth, particularly in protection of ships. This has not been envisaged hitherto and presents an unexpected and novel method for the prevention of fouling of ships. It has not been thought possible hitherto to use ozone for this purpose having regard to the large surfaces to be protected, particularly inasmuch as ozone is expensive to produce and it has not been possible to distribute the ozone in a rational manner.

By means of a suitable distribution of the ozone, however, an effective utilisation of the substance is achieved such that it is in fact very suitable for this purpose.

Preferably, the ozone is passed into the sea through perforations in or at the underwater surface of the ship, preferably adjacent the bilge keel

Any of the above mentioned distribution systems having perforations may be used for this purpose; however, as an example of a particularly advantageous embodiment of such a system, reference is made to that used for distribution of the electrolytic decomposition products of sea water in British Specification No. 1299126 (Application No. 22855/70).

The ozone may be passed out and distributed in the form of ozone-enriched compressed air. In this manner good distribution of the ozone is achieved and, at the same time, movement is imparted to the water closest to the side of the ship, by means of the compressed air, so that the possibility of attachment of marine growth to the ship side is reduced.

The ozone may be distributed over the side of the ship during short intervals of time, with longer intermediate periods of cessation. Since the ozone acts extremely quickly it is sufficient to release the ozone over the ship's side in brief periods, for

example 1—5 minutes, with long intervals for example, 1—2 hours or possibly more, between these brief periods. In this manner, the amount of ozone used will be less and, since the ozone is expensive to produce, the method for prevention of fouling is therefore less expensive in operation without detracting from its efficiency.

The ozone may also be distributed periodically and alternately over different sections of the ship's surface. The distribution means for this purpose, may, for example, be as disclosed in British Specification No. 1299126 (Application No. 22855/70) in which air is passed both perpendicularly and horizontally along areas adjacent the ship's side so that a type of pocket effect is achieved and the side of the ship is thereby divided into areas or sections. By means of a suitable valve arrangement in the distribution system, ozone may be supplied to these areas or sections individually and it is then possible, after a brief treatment period, for example, 1—5 minutes, to stop the supply of ozone and to supply ozone to another area. The great advantage of this method is that the ozone apparatus may be of small capacity and in continuous operation, since the ozone is to be supplied to a small area at a time. This is particularly important since the ozone is rapidly decomposed and storage of ozone would thus entail difficulties. The maintenance of a large ozone apparatus capable of providing ozone to the entire side of the ship would be extremely expensive and would consequently increase substantially the cost of the protection method.

When distributing ozone to one section or a few sections at the time, it is expedient to supply compressed air to the other sections simultaneously, so that ozone is conveyed to the side of the ship and to the various sections alternately with compressed air. The areas which at any particular time are not protected by ozone are then being

treated with compressed air and are flushed with air, which to a certain extent is also contributive in repelling marine growth.

It is thus possible by means of this method of distribution to give larger periods of ozone treatment to areas of the ship's side which are particularly subject to marine growth, than to the other areas which are less subject to fouling.

WHAT I CLAIM IS:—

1. A method for preventing fouling of a ship or other marine vessel, in which ozone is distributed over the underwater surface of the ship or other vessel.

2. A method according to claim 1, in which the ozone is passed into the sea through perforations in or at said underwater surface.

3. A method according to claim 2, in which the ozone is passed into the sea adjacent to the bilge keel.

4. A method according to any preceding claim, in which the ozone is passed out and distributed in the form of ozone-enriched compressed air.

5. A method according to any preceding claim, in which the ozone is distributed over the underwater surface of the ship or other vessel during short intervals of time with a longer intermediate period of cessation.

6. A method according to any preceding claim, in which the ozone is distributed periodically and alternately over various sections of said underwater surface.

7. A method according to claim 6, in which the ozone is supplied to the sections alternately with compressed air.

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4. A method according to any preceding claim, in which the ozone is passed out and distributed in the form of ozone-enriched compressed air.

5. A method according to any preceding claim, in which the ozone is distributed over the underwater surface of the ship or other vessel during short intervals of time with a longer intermediate period of cessation.

6. A method according to any preceding claim, in which the ozone is distributed periodically and alternately over various sections of said underwater surface.

7. A method according to claim 6, in which the ozone is supplied to the sections alternately with compressed air.

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