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ANTI-FOULING MULTIPLE COATING

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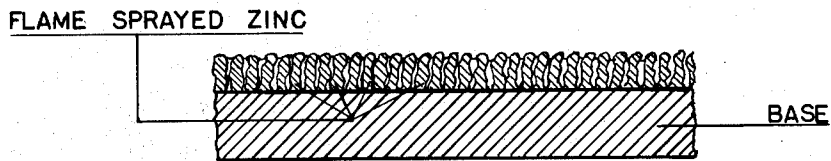


FIG.1.

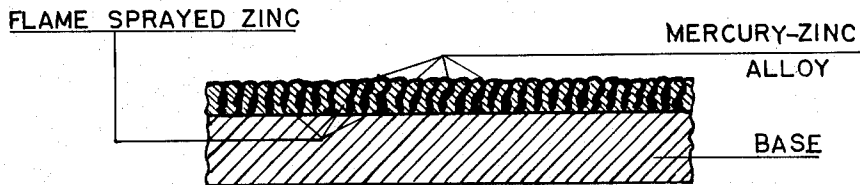


FIG.2.

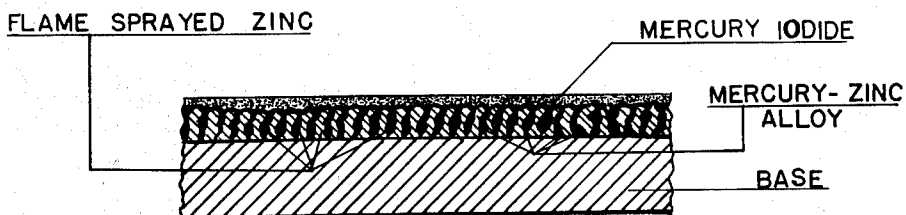


FIG.3.

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ANTI-FOULING MULTIPLE COATING
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1 Claim. (Cl. 29-195)

The present invention relates to an anti-fouling coating for submerged marine objects, equipment and apparatus, such as, boat and ship hulls, piling, dredges, pumping equipment etc., the coating being to protect surfaces against marine growths, such as barnacles, and the process of applying the same.

The primary object of the invention is to provide an improved coating which may be easily and readily applied to the surfaces.

Another object of the invention is to provide such a coating that is applicable to surfaces of a variety of compositions such as wood, steel, plastic, etc.

A further object of the invention is to provide a primary layer of sprayed metal which will alloy with a second metallic coating to form an anti-fouling coating.

While several objects of the invention have been pointed out, other objects, uses and advantages of the invention will become more apparent as the nature of the invention is more fully disclosed.

FIGURE 1 is a view diagrammatically a base with a flame sprayed zinc.

FIGURE 2 is a view showing diagrammatically a base with a flame sprayed zinc and an alloy of mercury-zinc extending into the pores of the zinc and over the outer surface thereof.

FIGURE 3 is a view similar to FIGURE 2 having a mercury iodide extending over the outer surface of the mercury-zinc alloy.

The techniques of spraying hot metals on a surface are well-known. This spraying operation can be used to build up a surface to at least 15 mils in thickness. The density of this sprayed metal is from 85 and 95% of that of solid metal, leaving voids of 5 to 15% of the volume.

The first coating is of a porous heavy non-ferrous metal, flame-sprayed to the surface of the object. Zinc or copper have been found to be very satisfactory for this purpose. The term heavy being used with non-ferrous metals to eliminate aluminum, and refer more particularly to zinc, copper, stainless steel, chromium, etc.

Over the outer porous surface of the flame-sprayed coating, there is applied a second coating of heavy non-ferrous metal of a different type, such as mercury applied by means of a mercury salt and may take the form of mercury chloride. This second non-ferrous coating, or mercury, as the case may be, covers the entire outer surface of the first coating. This second non-ferrous coating reacts with the first coating to form an alloy to coat the outer surface and seal off the pores in the first coating. For example, if zinc is used for the first coating and

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a mercury salt is used as the second coating, the reaction will produce an alloy of zinc and mercury metal. In order to fix and hold this alloy in place on the outer surface of the treated article and retard the dissipation of the alloy, an insoluble mercury iodide salt may be formed on the outer surface of the alloy, such as, by iodine and/or iodide solution.

Tests were run on articles carrying this anti-fouling coating at Bodkins Creek, Anne Arundel County, Maryland, for a 90 day period during the summer of 1955. This test included the taking of groups of steel panels of approximately 2 inches by 4 inches and 1/4 inch thick which had been coated by flame-spraying with zinc. One group was painted with a conventional anti-fouling paint. Another group was painted with still another conventional anti-fouling paint including a mercury compound. In another group, over the zinc coating, there was placed a mercury salt. On still another group, the panels were covered with a mercury salt and over this, there was a coating of an insoluble salt formed from an iodine solution.

In the panel groups containing the conventional anti-fouling paints the number of barnacles ranged from 22 to 35 on each panel. On the panel group carrying the zinc and mercury only, the barnacle count was from 1 to 8. On the panel group carrying the zinc, mercury, and insoluble iodide no barnacles were formed on any of the panels.

This treatment of the surfaces of underwater articles provides a superior anti-fouling covering against various types of marine growth, such as, barnacles, etc. which attach themselves to boat and ship hulls and other objects and equipment.

While the process and the coating of underwater articles etc. has been specifically described it is not intended as a limitation beyond the scope of the appended claim.

I claim:

An article of manufacture adapted to prevent marine growth comprising, in combination, a rigid base adapted for underwater use, having a protective coating applied to the surface of the base, the coating comprising, a flame-sprayed porous zinc metal, an alloy of zinc and mercury metal covering the outer surface and pores of the zinc metal and a coating of an insoluble mercury iodide salt affixed to the outer surface of the alloyed zinc and mercury metal.

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