Dec. 20, 1966 HIROSHI TADO 3,292,373

MARINE PROPULSION APPARATUS

Filed Dec. 2, 1964

FIG. 1

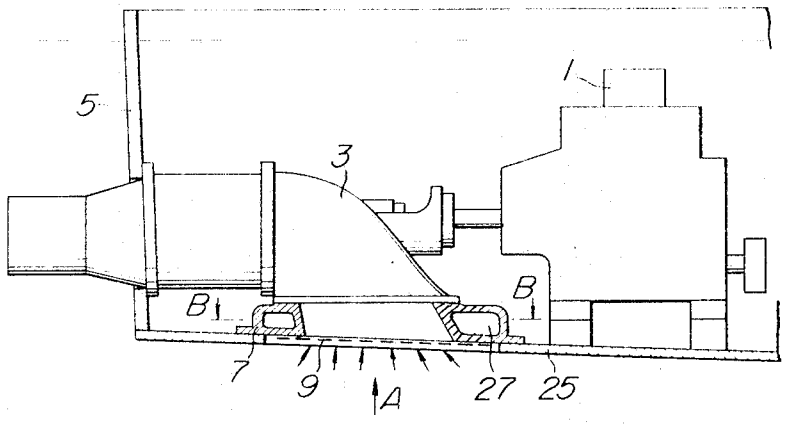


FIG. 2

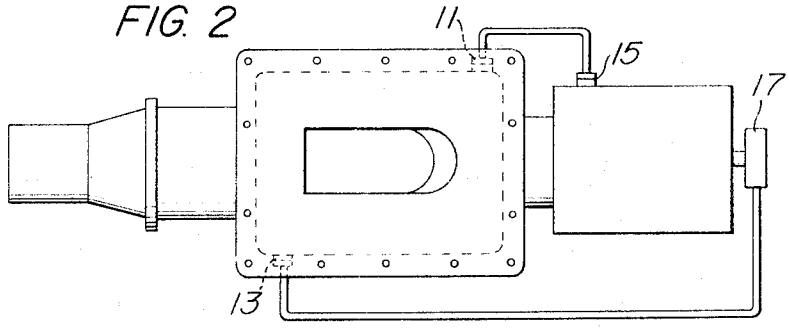
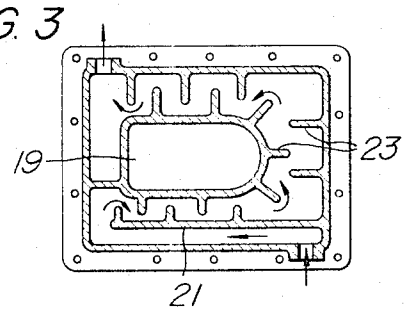


FIG. 3



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United States Patent Office

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MARINE PROPULSION APPARATUS

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3 Claims. (Cl. 60—221)

The present invention relates to marine propulsion apparatus of the type including the combination of an engine and a water jet pump to utilize the reaction produced by jets of water for the propulsion of ships, and more particularly to an improved structure of a mounting block for the water jet pump.

It is widely acknowledged that simplification of cooling and lubricating oil systems for the engine in marine propulsion apparatus of the type described above offers many advantages including reduction in the space occupied by the apparatus and reduction in the weight of the apparatus with attendant reduction in the cost and simplified procedure for operation. It is a common practice for the propulsion apparatus of the type to cool the engine and an associated lubricating oil cooler by water bypassing the discharge side of the water jet pump and to thereby dispense with an independent sea water circulating pump. However, with marine propulsion apparatus of the type which require an independent lubricating oil sump and an independent lubricating oil cooler, such cooling arrangement can not sufficiently attain the purpose of simplification of the structure of the apparatus.

It is therefore the primary object of the present invention to provide a marine propulsion apparatus of the type described which includes therein a lubricating oil sump and a lubricating oil cooler of simplified structure.

In order to attain the above-described object, the present invention proposes a marine propulsion apparatus of the type described which comprises a mounting block fixed on a ship's bottom plate for supporting thereon the water jet pump, said mounting block having a water suction port therethrough, and means for defining in said mounting block a combined lubricating oil sump and lubricating oil cooler for the engine.

The present invention also proposes a marine propulsion apparatus of the type described which comprises a mounting block fixed on a ship's bottom plate for supporting thereon the water jet pump, said mounting block having a water suction port therethrough, a chamber provided in said mounting block and having an inlet and an outlet for lubricating oil so as to define a lubricating oil sump between the outer wall of said mounting block and the peripheral wall of said water suction port, and means provided in said chamber for guiding a suitable flow of lubricating oil therethrough and for cooling the lubricating oil by the utilization of heat exchange with water flow along the ship's bottom and through the water suction port, whereby the lubricating oil sump and the lubricating oil cooler for the engine are unitarily incorporated in said mounting block for the water jet pump.

There are other objects and particularities of the present invention which will become obvious from the following description with reference to the accompanying drawings, in which:

FIG. 1 is a front elevational view in vertical section of an aft portion of a ship in which a marine propulsion apparatus consisting of an engine and a water jet pump coupled thereto is installed;

FIG. 2 is a bottom plan view of the propulsion apparatus of FIG. 1 when looked in the direction of arrow A in FIG. 1; and

FIG. 3 is a sectional view taken on the line B—B in FIG. 1, showing the structure of a combined lubricating oil sump and lubricating oil cooler according to the present invention.

Referring to FIG. 1, there is shown the marine propulsion apparatus which consists of an engine **1** and a water jet pump **3** operatively coupled to the engine **1**. The discharge port of the water jet pump **3** extends rearwardly through a ship's hull **5**. The water jet pump **3** is mounted on a ship's bottom plate **25** with a mounting block **7** interposed therebetween. The mounting block **7** has a water suction port **19** which is aligned with a suction aperture in the ship's bottom plate **25** for water supply to the pump **3**. A perforated screen **9** is fixed to the end edge of the water suction port of the mounting block **7** to prevent dangerous matters from flowing into the pump **3**.

The mounting block **7** is made hollow so as to define therein a lubricating oil sump **27** which has an oil inlet **11** communicating with an oil discharge port **15** of the engine **1** and an oil outlet **13** communicating with a lubricating oil pump **17**, as shown in FIG. 2. Means such as a baffle plate **21** and fins **23** are provided in the lubricating oil sump **27**, as shown in FIG. 3, in order to guide the unidirectional flow of lubricating oil from the inlet **11** to the outlet **13** and to increase the speed of lubricating oil flow through the lubricating oil sump **27** relative to the speed of water flow through the suction port **19** and along the ship's bottom. It will be understood that the baffle plate **21** and the fins **23** act also as cooling means so that the lubricating oil sump **27** can also act as a lubricating oil cooler. Thus, the present invention provides a combined lubricating oil sump and a lubricating oil cooler of simplified structure incorporated in a mounting block for the water jet pump.

What is claimed is:

1. In a marine propulsion apparatus having an engine and a water jet pump to utilize the reaction produced by jets of water for the propulsion of ships, the improvement comprising a mounting block fixed on said ship's bottom plate for supporting thereon the water jet pump, said mounting block having a water suction port therethrough, a chamber provided in said mounting block between the outer wall of said mounting block and the peripheral wall of said water suction port, said chamber having an inlet for receiving lubricating oil from said engine and an outlet for discharging lubricating oil to said engine, said chamber defining a lubricating oil sump for the engine which serves as a lubricating oil cooler for the engine.

2. In a marine propulsion apparatus having an engine and a water jet pump to utilize the reaction produced by jets of water for the propulsion of ships, the improvement comprising a mounting block fixed on said ship's bottom plate for supporting thereon the water jet pump, said mounting block having a water suction port therethrough, a chamber provided in said mounting block between the outer wall of said mounting block and the peripheral wall of said water suction port, said chamber having an inlet for receiving lubricating oil from said engine and an outlet for discharging lubricating oil to said engine,

said chamber defining a lubricating oil sump for the engine, and means provided in said chamber for guiding a suitable flow of lubricating oil therethrough and for cooling the lubricating oil by the utilization of heat exchange with water flow along the ship's bottom and through the water suction port, whereby the lubricating oil sump and the lubricating oil cooler for the engine are unitarily incorporated in said mounting block.

3. Marine propulsion apparatus according to claim 2, in which said means provided in said chamber are a baffle plate and cooling fins.

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