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Yoshino

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[54] **APPARATUS FOR MOUNTING A MARINE ENGINE**

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[51] **Int. Cl.** **B63h 5/00**

[58] **Field of Search** ..... 115/34 R; 264/269; 248/9, 248/15

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[57] **ABSTRACT**

An apparatus for mounting a marine engine which has a transom mounted to a stern and having a circular hole formed at the center thereof, main mounting means having an inner cylinder connected to the engine, an outer cylinder connected to the transom, and a rubber member press-fitted in wedge fashion into the gap formed between the inner and outer cylinders for absorbing the engine vibration and a bush type mounting means having an inner cylinder connected to the flywheel housing of the engine, an outer cylinder connected to the transom, and vulcanized rubber member between the inner and outer cylinders for absorbing the engine vibration, and O-rings provided at the inside of the inner cylinder and at the outside of the outer cylinder for preventing water from entering into the engine.

3 Claims, 3 Drawing Figures

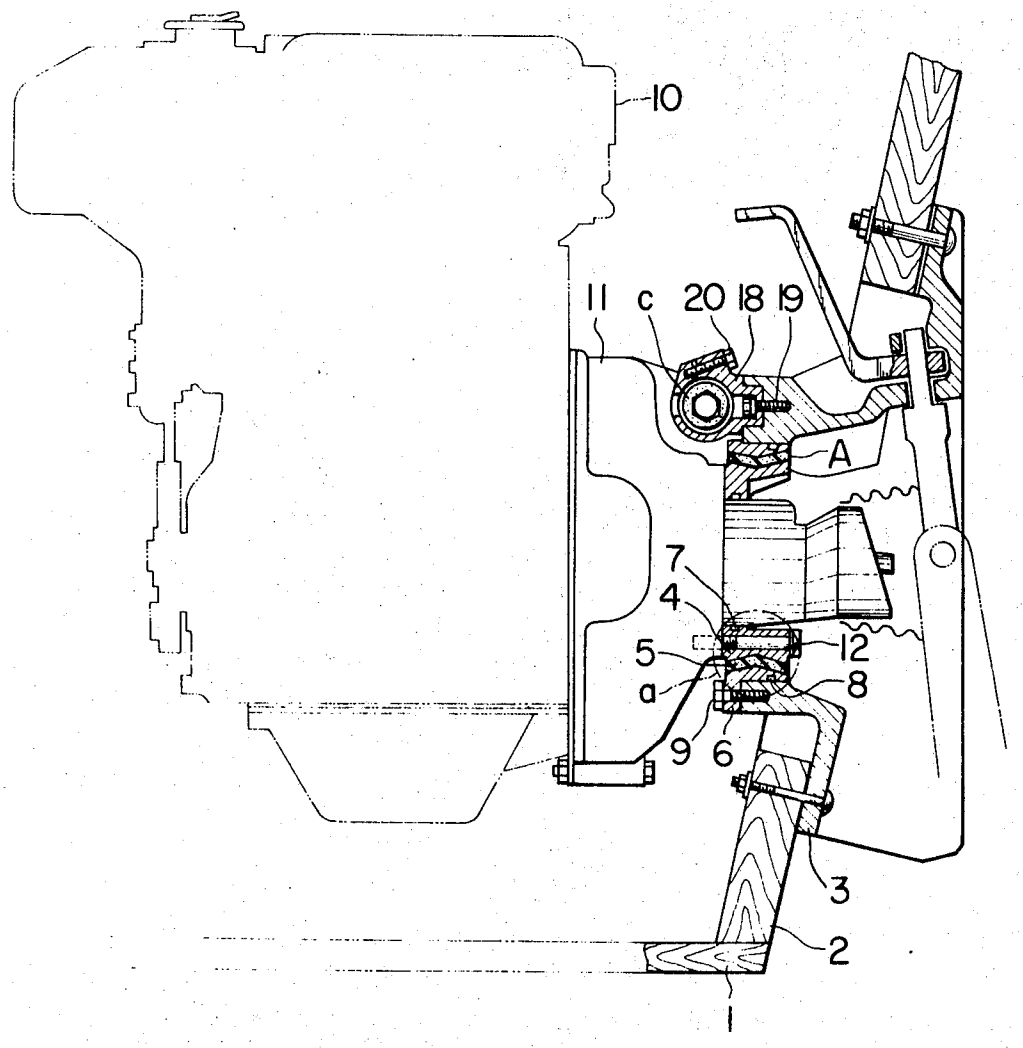


Fig. 1

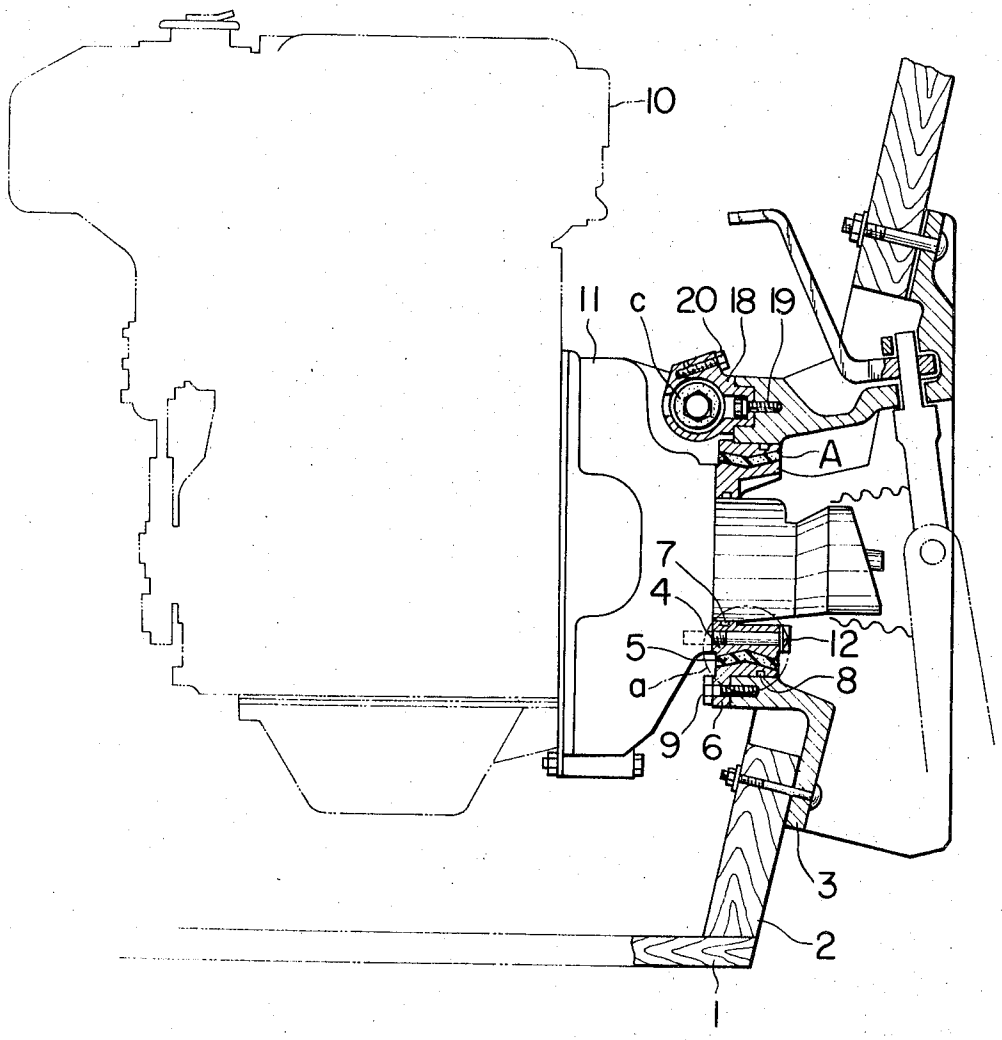


Fig. 2

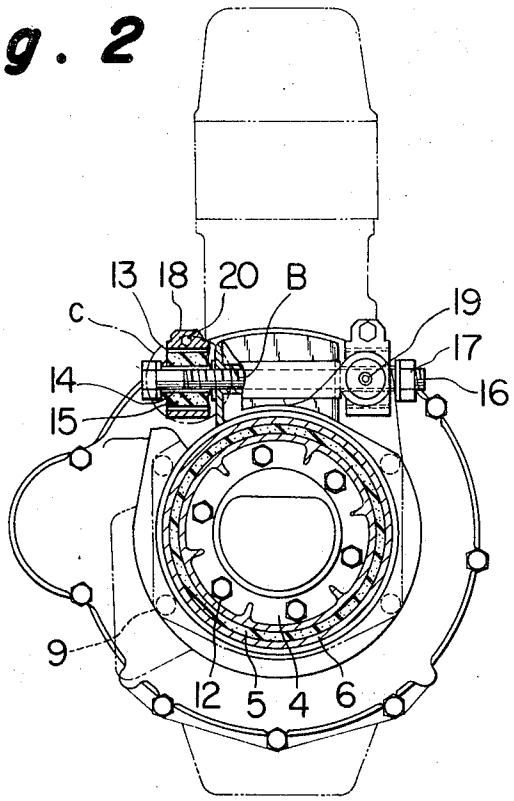
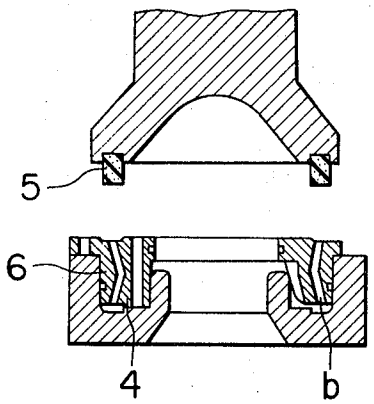


Fig. 3



APPARATUS FOR MOUNTING A MARINE ENGINE

BACKGROUND OF THE INVENTION

This invention relates to a marine engine, particularly to improvements of an apparatus for mounting a marine engine to the stern of a motor boat or compact ship.

Heretofore, the transom bracket surrounding a device for driving a propeller at the stern and the engine were independently mounted in an apparatus for mounting the marine engine, most supporting the engine by four rubber mounting devices. For this reason, several methods of supporting the engine on the hull of the ship were used so that it was difficult to connect the engine to the transom bracket of the ship.

SUMMARY OF THE INVENTION

This invention contemplates to eliminate the aforementioned disadvantages of the conventional mounting device for mounting a marine engine to the stern of the ship and provides an improved apparatus for mounting a marine engine to the stern of a motor boat or compact ship.

It is, therefore, an object of the present invention to provide an apparatus for mounting a marine engine to the stern of a ship which is simple in relation to structure in the connection of the engine to the transom bracket of the ship.

It is another object of the present invention to provide an apparatus for mounting a marine engine to the stern of a ship which effectively prevents engine vibration.

According to the present invention, a specially shaped cylindrical rubber member is mounted to the center of the transom bracket of the ship through the inner and outer cylinders wherein the inner cylinder is connected to the engine and the outer cylinder is connected to transom bracket, and, accordingly, the connection of the engine to the transom bracket becomes very simple, and yet the apparatus for mounting the marine engine to the stern of the ship effectively prevents engine vibration by supporting at three points instead of employing four supports as required in conventional devices.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects, features and advantages of the present invention will become apparent from the following description taken in conjunction with the accompanying drawings, in which:

FIG. **1** is a longitudinal sectional view of one embodiment of the apparatus for mounting a marine engine to the stern of a ship of the present invention;

FIG. **2** is an end view of the apparatus of the present invention; and

FIG. **3** is an explanatory view showing a method of manufacturing the main mounting means used in the apparatus of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference is now made to the drawings, which show one embodiment of the apparatus for mounting a marine engine to the stern of a ship of the present invention.

In the drawings, numeral **1** represents a hull of a ship, and **2** a transom board at the stern of a ship (not shown). Numeral **3** is a transom bracket fixed to the transom board **2** by several bolts. A hole A is formed at the center of the transom bracket **3**, and a main mounting means a is inserted into the hole A of the transom bracket **3**. The main mounting means a comprises an inner and outer cylinders **4** and **6**, and rubber member **5**, and the rubber member **5** is pressfitted in a wedge fashion into the space or groove formed between the inner and outer cylinders **4** and **6** to absorb the engine vibration. Particularly, if this rubber member is inserted between the inner and outer cylinders **4** and **6**, the inner and outer cylinders **4** and **6** are fixed in the axail direction by their wedging effect so that a complete vibration absorbing mounting means is integrally formed. This rubber member **5** effectively absorbs the lateral and elevational engine vibration, particularly the engine vibration due to the lateral rotary variation of the engine vibration. Numerals **7** and **8** represent O-rings provided at the inside of the inner cylinder **4** and at the outside of the outer cylinder **6** for preventing water or liquid from entering into the engine.

This main mounting means a is fixed in advance to the transom bracket **3** by bolts **9.** A flywheel housing **11** is fixed to the engine **10,** and is inserted into the inner cylinder **4** and is fixed thereto by bolts **12** the flywheel is movable with respect to the transom bracket **3** through the rubber member **5** and outer cylinder **6.**

FIG. **3** shows a method of manufacturing the main mounting means a. The inner and outer cylinders **4** and **6** are placed on a trapezoidal jig, and the ring shaped rubber member **5** of is press-fitted into the space b between the inner and outer cylinders **4** and **6** formed into a wedge shape with a predetermined angle at the inside of the outer cylinder **6** and at the outside of the inner cylinder **4** by means of a press-in jig of several tons of load. The main mounting means *a* is thus formed by the above process, and the rubber member **5** cannot be pulled out of the gap or space *b* between the inner and outer cylinders **4** and **6** because of the wedging effect of the angle formed in the space *b*. This rubber member **5** thus has a very good vibration absorbing effect due to its compressed state in comparison with the normal free state of prior art rubber members.

As another embodiment of the apparatus for mounting the marine engine to the stern of the ship of the present invention, a bushing type mounting means c is connected to the flywheel housing **11** and to the transom bracket **3** for preventing the rubber member from deforming due to the weight of the marine engine and also for absorbing the engine vibration, particularly the elevational engine vibration.

The bushing type mounting means c comprises outer and inner cylinders **13** and **14,** and rubber member **15,** and the rubber member **15** is vulcanized into the space formed between the outer and inner cylinders **13** and **14** being integral therewith. A hole B for the mounting bolt is provided in the flywheel housing **11.** Two bushing type mounting means c are fixed to the flywheel housing **11** at each end thereof by mounting bolt **16** and nut **17** at the inner cylinders **14.** Numeral **18** represents a bracket for connecting the outer cylinder **13** of the mounting means c to the transom bracket **3** by a bolt **19.** The bracket **18** is connected to the outer cylinder **13** by bolt **20,** and is fixed to the transom bracket **3** in advance before assembling. Two mounting means

c are movable with respect to the flywheel housing **11** and transom bracket **3** through the rubber member **15.** The bushing type mounting means *c* is inserted into the bracket **18,** and is fixed to the engine finally by the bolts **16** and **17.**

It should be understood from the foregoing description that since the present invention is thus constructed, it may provide simple structure for mounting the marine engine to the stern of the ship and for preventing the engine vibration.

I claim:

1. In an apparatus for mounting a marine engine to the stern of a ship having a flywheel housing on the engine, a transom mounted to the stern of the ship, having a circular hole formed at the center thereof; an inner cylinder connected to the flywheel housing of the engine; an outer cylinder connected to the transom; and a rubber means pressed into the gap formed between the inner and outer cylinders for absorbing the engine vibration; the improvement wherein said inner cylinder includes a recessed wedged angle formed on the outer surface thereof and said outer cylinder includes raised wedged angle formed on the inner surface thereof wherein the wedged angle portions of said inner and outer cylinders are positioned such that said gap has a V-shape in cross-section, and said rubber means has a V-shaped cross-section and completely fills said gap.

2. The apparatus of claim **1** further including O-rings provided on the inside of the inner cylinder and on the outside of the outer cylinder for preventing liquid from entering the engine.

3. The apparatus of claim **1** further including additional mounting means for supporting said engine to prevent the weight of the engine from deforming said rubber means and wherein said additional mounting means absorbs vibration in the vertical direction.

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