UPPER DRIVESHAFT BEARING LUBRICATION FOR MARINE PROPULSION UNIT

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UPPER DRIVESHAFT BEARING LUBRICATION FOR MARINE PROPULSION UNIT

BACKGROUND OF INVENTION

The invention relates generally to marine propulsion devices, such as outboard motors and stern drive units, and more particularly to lower units therefor. The lower unit of a marine propulsion device is normally at least partially in water and is conventionally vertically tiltable and horizontally swingable to afford steering. Such marine propulsion devices or units commonly include a substantially upright drive shaft which is supported by upper and lower bearings mounted in a drive shaft housing. The drive shaft drives a propeller shaft through a gearing arrangement normally mounted in a gear case which is connected to the bottom of the drive shaft housing. More particularly, the invention relates to supplying lubrication to the upper bearing located in spaced relation above the bottom of the drive shaft housing.

SUMMARY OF INVENTION

The invention relates to an arrangement for lubricating an upper drive shaft bearing in a marine propulsion unit. A primary object of the invention is an improved means for transferring lubricating oil to an upper gear case bearing in a marine propulsion unit. A further object is a novel apparatus that acts as a centrifugal impeller to continuously circulate lubricating oil to various operating parts in a marine propulsion unit. Another object is an apparatus that will operate to lubricate an upper drive shaft bearing which is not physically located in oil. Another object is an economical lubricating system that is simple to manufacture. Other objects and advantages will be apparent from the following description and accompanying drawings for the invention.

THE DRAWINGS

The invention is illustrated by the accompanying drawings wherein: FIG. 1 is a partial sectional view of the lower unit of a marine propulsion unit; and FIG. 2 is an enlarged view of a disc-shaped member in accordance with the invention.

DETAILED DESCRIPTION

Referring to the drawings in more detail, it will be seen that FIG. 1 shows a lower unit 10 of a marine propulsion unit. The marine propulsion unit may be either an outboard motor or a stern drive engine which is supported for vertical tilting and horizontal swinging as is well known in the art. The lower unit 10 includes a drive shaft housing 12 connected to, or integral with, a gear case 14.

The drive shaft housing 12 includes a drive shaft 16 operably connected to a suitable source of power, such as the engine or motor. The drive shaft 16 is mounted in an interior cavity 18 of the housing 12 and turns in an upper bearing 20 and a lower bearing 22. A cap 24, which may be part of the lower half of a water pump, retains the upper bearing 20 in position. In addition, it should be noted that the upper bearing 20 is shown as ball bearings while the lower bearing 22 is shown as needle bearings, however, any type of bearings may be used as long as they provide adequate support and allow the necessary rotating movement of the drive shaft 16.

The interior cavity 18 of the drive shaft housing preferably communicates with a bore 26 in the gear case 14. The bore 26 holds a sufficient quantity of lubricating oil 28 which may be supplied through an aperture with a plug, not shown. The aperture may be located in the drive shaft housing 12 for easy access.

As shown in FIG. 1, the drive shaft 16 engages a propeller shaft 30 through a gearing arrangement to drive a propeller.
both bevel gears 36 and 38, or instead, may be incorporated in a separate disc-shaped member. In addition, it should be pointed out that the groove 54 may be formed or cast in the drive shaft housing 12 instead of being formed by the rim 56 in the gear 38.

Various features of the invention are set forth in the following claims.

What is claimed is:

1. A marine propulsion unit comprising a drive shaft housing, a drive shaft rotatably mounted in said housing, an upper bearing in said housing and supporting said drive shaft, a gearcase connected with said drive shaft housing below said bearing and adapted to contain a quantity of lubricating oil, a propeller shaft rotatably mounted in said gearcase and driven by said drive shaft, an oil passageway independent of said drive shaft and extending from said gearcase to said upper bearing, and a disc-shaped member rotatably mounted in said gearcase for movement through the oil contained therein and driven by said drive shaft, said disc-shaped member including a feedline extending radially in said disc-shaped member and terminating, at its radially outer end, in position for periodic communication with said oil passageway in response to rotation of said disc-shaped member and adapted, at its radially inner end, for communication with the oil in said gearcase.

2. A marine propulsion unit as set forth in claim 1 wherein said drive shaft housing has an interior cavity formed around said drive shaft and communicating with said gearcase to allow the lubricating oil to be continuously circulated by spilling over said upper bearing and returning to said gearcase through said interior cavity.

3. A marine propulsion unit as set forth in claim 1 wherein said disc-shaped member has at least one axial transfer opening permitting movement of lubricating oil through said disc-shaped member.

4. A marine propulsion unit as set forth in claim 1 wherein said disc-shaped member includes a periphery having therein means defining a peripheral groove communicating with said feedline and with said oil passageway.

5. A marine propulsion unit as set forth in claim 1 wherein said gearcase includes a bore communicating with said oil passageway, and wherein said periphery of said disc-shaped member includes a pair of axially spaced circumferential edges having a small clearance with said gearcase bore, and wherein said feedline terminates between said edges.

6. A marine propulsion unit as set forth in claim 1 including a pinion gear on the lower end of said drive shaft and wherein said disc-shaped member is a part of a bevel gear driven by said pinion gear.