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PROPELLER FOR OUTBOARD MOTOR

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2 Claims. (Cl. 170—173)

This invention relates to propellers for outboard motors.

According to the present invention there is provided a propeller comprising a hub adapted to be secured to the propeller shaft of an outboard motor, blades for attachment to the hub, and means for releasably securing the blades to the hub, the hub being so adapted that the propeller can be made two, three or four bladed as desired.

For a better understanding of the invention, and to show how the same may be carried into effect reference will now be made to the accompanying drawing, in which:

FIGURE 1 is a partly sectioned rear view of the hub of a propeller for an outboard motor, with two blades attached to the hub, and

FIGURE 2 is a partly sectioned plan view of the hub of FIGURE 1 with the two blades disengaged from the hub.

The propeller essentially consists of a hub 1 and blades 2 which extend radially from the hub. The hub 1 has an inner sleeve 3 and an outer casing 4 which is circular sectioned and narrows towards its after end. The inner sleeve 3 is adapted to be secured to the propeller shaft (not shown) of the outboard motor. A tube 5 of rubber or similar shock absorbent material is fitted over the sleeve 3 and bonded thereto. The sleeve 3 and tube 5 are coaxial. In constructing the hub the assembly of the tube 5 and sleeve 3 is pressed into the outer casing 4 so that the tube 5 is compressed tightly between the sleeve 3 and casing 4. Six radially directed arcuate slots 6 to 11 are formed in the curved surface of the casing 4, the slots all being identically inclined to the longitudinal axis of the hub. The first to fourth slots 6 to 9 are formed at equiangular intervals around the hub axis. Coplanar sections taken perpendicular to the hub axis, of adjacent ones of these slots 6 to 9 therefore subtend an angle of 90° at the hub axis. The fourth, fifth and sixth slots 9, 10 and 11 are also disposed at equiangular intervals around the hub axis. Coplanar sections, taken perpendicular to the hub axis, of adjacent ones of these three slots therefore subtend an angle of 120° at the hub axis. With such an arrangement of slots it will be understood that the first and fifth slots 6 and 10 subtend an angle of 30° at the hub axis as do the third and sixth slots 8 and 11. A tapered hole 12 is associated with each slot 6 to 11. Each hole 12 extends from the front face 4A of the casing 4 and runs parallel to the hub axis and opens into the curved surface of the casing 4 adjacent the rear end of the associated slot 6, 7, 8, 9, 10 or 11. Each hole 12 merges with its associated slot such that recesses 13 are formed by the hole 12 in one of the side walls of the slot.

Each blade 2 has at its inner end a tongue 14 which is adapted for fitting into any one of the six slots 6 to 11 of the hub. A groove 15 is formed in one side of the tongue 14, this groove 15 registering, when the tongue 14 is inserted in a slot, with the recesses 13 in the side wall of the slot.

Depending upon the duty to be performed by the outboard motor with which the propeller is to be associated, the hub is provided with two, three or four blades 2. When two blades 2 are used they are fitted one in the first slot 6 and one in the third slot 8, or (as shown in the drawing) one in the second slot 7 and one in the fourth slot 9. Where three blades 2 are employed they

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are fitted in the fourth, fifth and sixth slots 9, 10 and 11 whilst when four blades are employed they are fitted in the first to fourth slots 6 to 9. Each blade 2 is fitted to the appropriate slot by inserting the tongue 14 on the blade in the slot and a tapered pin 16 is then driven into the hole 12 associated with the slot, from the front end of the hub. The pin 16 lies in the groove 15 in the tongue 14 of the blade and thereby firmly secures the blade 2 to the hub. The hub with blades secured thereto is in appearance very similar to a conventional propeller for an outboard motor. When it is desired to detach a blade 2 from the hub the associated pin 12 can be removed by inserting a punch in the opening near the rear end of the slot and then punching the pin 16 from the hole 12.

If in use of the propeller one of the blades 2 strikes an object, the outer casing 4 slips on the tube 5 which during such slipping is deformed slightly by the relative movement between the sleeve 3 and casing 4.

It will be noted from FIGURE 2 that the tongues 14 do not fill the whole of the lengths of the slots into which they are fitted. By adjusting the position of each tongue along the length of its associated slot before the associated pin 16 is driven home the inclination of the blade can be changed. This permits minor variations of blade pitch to be made without the necessity for changing the blade.

In a modified form of the hub described above the tube 5 is dispensed with and the outer casing is made of rubber. The outer casing fits on the sleeve 3 and is bonded thereto. The casing in this case is of less axial length than the casing 4 of FIGURE 2. In this modified form the slots extend from one end of the casing to the other and the tongues of the blades fitted to the casing project from the forward and aft ends of the casing. End caps in the form of discs coaxial with the outer casing are secured thereto and abut against the forward and aft edges of the tongues and clamp the tongues to the casing. The end caps may be recessed to receive the tongue edges and made so that they can be adjusted slightly about the axis of the hub so that the tongues can be moved forwardly and backwardly in their slots for enabling minor variations of blade pitch to be made. The end caps are, of course, arranged so that they can be locked in the position to which they are adjusted.

In a further modified form of the hub shown in the drawing the casing 4 is hollow and is provided internally with radially directed struts adjacent the slots, spring clips being provided for securing the tongues to the struts.

I claim:

1. An outboard motor propeller comprising a hub adapted to be secured to the propeller shaft of an outboard motor, blades for attachment to the hub, and means for releasably securing the blades to the hub, the hub having six locations, only at each of which a blade can be secured to the hub, the first to fourth locations being disposed at equiangular intervals around the hub axis and the fourth, fifth and sixth locations being at equiangular intervals around the hub axis, the blades being attached to the hub at equiangular intervals around the hub axis.

2. An outboard motor propeller comprising a hub adapted to be secured to the propeller shaft of an outboard motor, blades for attachment to the hub, each blade having a tongue at its hub end, each tongue in section being elongated in the direction of the chord of the associated blade, the hub having six radially directed longitudinally extending slots only in each of which a tongue can be located, the slots extending longitudinally of the hub, the first to fourth slots being disposed at equiangular intervals around the hub axis and the fourth, fifth and sixth slots being at equiangular intervals around

the hub axis, and means releasably securing the tongues
in slots at equiangular intervals around the hub axis.

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