The present invention relates to a propeller guard adapted to be removably attached to the propeller unit of a motorboat outboard motor.

Concentration in swimming and boating areas presents a serious hazard to swimmers. Particularly where water skiing is an active sport, the unguarded propellers of motorboats present a constant threat to life and limb.

For various reasons it is desirable that a propeller guard be easily attached to or removed from the propeller unit with which it is used. A satisfactory propeller guard must also provide maximum protection while at the same time preventing a minimum of drag upon the propulsion of the boat.

One object of the invention, therefore, is to provide a propeller guard which may be readily attached to or removed from the propeller unit of a standard outboard motor.

Another object of the invention is to provide a propeller guard of low cost, high protective value, and which presents a very small drag on the boat propulsion.

A further object of the invention is to provide a propeller guard which can be attached to various sizes and types of propeller units with a minimum of inconvenience.

The above and other objects and advantages of the invention will be more readily apparent from the following description considered in conjunction with the accompanying drawings in which:

Figure 1 is a perspective view of the invention mounted in operative position on the propeller unit of an outboard motor;

Figure 2 is a top plan view of the invention taken on the line 2—2 of Figure 1;

Figure 3 is a side elevation view of the invention taken on the line 3—3 of Figure 2; and

Figure 4 is a rear end elevation view of the invention and accompanying propeller unit.

In the drawings the propeller unit of the standard outboard motor is designated generally as A while the propeller guard of the present invention is designated as B.

Propeller unit A includes a vertically extending upper housing 10 to which a horizontal anti-ventilation fin 11 is attached. Fin 11 includes a portion 11a extending outwardly from the left side of upper housing 10, a portion 11b extending rearwardly from upper housing 10, and a portion 11c extending outwardly on the side of the propeller shaft 15. The other end of cross bar 52 is pivotally supported at one of its ends. A lower portion of lower housing 12 is enlarged at 13 so as to rotateively receive propeller shaft 15. A lower fin 14 extends downwardly from the under surface of enlarged portion 13 of the lower housing 12. Propeller shaft 15 extends horizontally rearwardly from the lower housing and carries a propeller 17 which lies beneath the rearward portion of upper housing 10.

The propeller guard B includes as its main structural element an elongated base member 20. Base member 20 is arcuatedly curved to form at least three-fourths of the circumference of a circle. A first attachment lug 21 having a slot 22 therein is formed integrally with one end of base member 20. A second attachment lug 23 having a slot 24 wherein is formed integrally with the other end of base member 20. Slots 22 and 24 face toward each other, and the distance between attachment lugs 21 and 23 is such as to receive the fin portions 11a, 11c in the slots 22, 24, respectively. When thus attached to the anti-ventilation fin the base member 20 is in approximately concentric relationship to propeller shaft 15 and is positioned somewhat rearwardly of propeller 17 in circumferentially disposed relationship thereto.

A plurality of horizontally disposed ribs 30, 31, 32 are attached to the outer vertical edges of base member 20. Each of these ribs has a mid-portion which extends rearwardly of the base member in an approximately semi-circular configuration, as best seen in Figure 2, as well as end portions which extend forwardly and inwardly from respective sides of the base member. The first horizontal rib 30 is attached to base member 20 at about one-fifth the vertical height of the latter, while ribs 31 and 32 are attached at about two-fifths and three-fifths, respectively, of the vertical height of base member 20. Fastening lugs 41, 42 are provided on respective forward ends of rib 30 for fastening same to respective sides of the lower fin 14. A pair of partial ribs 33, 34 are attached to the upper portion of base member 20. Rib 33 is attached to rib 32, at a point near its horizontal center as viewed in Figure 4, and extends upwardly at an angle of approximately 45° and attaches to the outer surface of base member 20 intermediate rib 32 and attachment lug 21. Rib 34 is attached in similar fashion on the right-hand side of the structure.

Both the base member 20 and the ribs 30—34 are thin, flat members aligned so as to reduce their dynamic resistance or drag while moving through the water. For example, the width of base member 20 measured along the axis of propeller shaft 15, as best seen in Figure 3, is approximately seven times its radial thickness as best seen in Figure 4.

Each of the attachment lugs 21, 23 is somewhat elongated on the forward end so as to provide a length measured parallel to propeller shaft 15 which is greater than the width of base member 20. The slots seen in Figure 3 attachment lug 23 is flush with the rear edge of base member 20, but extends forwardly from the forward edge of base member 20 by approximately one-half the width of the latter. Each of the attachment lugs 23, 24 has threaded openings 45, 46 in respective ends thereof which respectively receive set screws 47, 48. The threaded openings 45, 46 are located in the bottom of respective ends of the slot 22 and 24, hence the set screws 47, 48 bear upon the outer vertical edge of portion 11a or 11c of the anti-ventilation fin.

It will be seen that the slots 22, 24 of the attachment lugs 21, 23 have substantial depth measured transverse to the propeller shaft 15, as well as substantial length measured parallel to the shaft. The pairs of set screws 47, 48 are set inwardly in their respective attachment lugs so as to frictionally engage the vertical outer edge surfaces of the metal anti-ventilation fin. The propeller guard may therefore, from time to time, be attached to different outboard motors having differing dimensions.

Attachment lug 21 carries a pivot bolt 51 which extends parallel to shaft 15, and from which a cross bar 52 is pivotally supported at one of its ends. The other end of cross bar 52 is threaded at 53. An opening 54...
is provided in attachment lug 23, located below the openings 45 and 46. A threaded bolt 55 inserted through opening 54 in attachment lug 23 engages the threaded end opening 53 of cross bar 52. Bolt 54 may, therefore, be tightened so as to draw the two attachment lugs, and hence the two ends of base member 20, together.

It will, therefore, be seen that a six-point suspension is provided. Despite variations in size or irregularities in shape of the anti-ventilation fin the pairs of set screws 47, 48, may be adjusted to provide firm support for the propeller guard. Thereafter the cross bar 52 is raised to a fastening position and bolt 54 is tightened. Cross bar 52 extends transversely in a position intermediate the set screws 47, 48, of each pair. Therefore, the single cross bar clamps all four set screws in tight engagement with fin 11. This is true whether fin edges 11a, 11c, converge in the forward direction, as shown, or diverge.

For reasons of economy in manufacture as well as superior quality it is preferred to cast the propeller guard as an integral unit. That is, it is preferred to cast the base member 20, attachment lugs 21, 23, ribs 30—34, and fastening lugs 41, 42, as an integral structure. Suitable openings are then formed in the attachment lugs and fastening lugs. An alternative method of construction, as illustrated in the drawings, is to cast the left half of the propeller guard as one unit and the right half as another unit. The base member 20 and ribs 30—32 are then each in two parts, which are connected by suitable bolts aligned in a vertical plane passing through the propeller shaft, as shown in the drawings. In any event, however, the various ribs are formed integral with the base member 20 at their respective points of attachment thereto, and the attachment lugs 21, 23 are formed integral with the ends of base member 20.

The invention has been described in considerable detail in order to comply with the patent laws by providing a full public disclosure of at least one of its forms. However, such detailed description is not intended in any way to limit the broad features or principles of the invention, or the scope of patent monopoly to be granted.

1. A propeller guard adapted for attachment to an outboard motorboat propeller unit of the type including a vertical lower housing from which a propeller shaft carrying a propeller extends horizontally rearwardly, an anti-ventilation fin which extends horizontally outwardly on both sides above the lower housing, and a lower fin extending below the lower housing, said propeller guard comprising, in combination: an elongated base member arcuately curved to form at least three-quarters of the circumference of a circle; first and second attachment lugs integrally formed with respective ends of said base member, said attachment lugs having oppositely facing slots therein adapted to receive respective edges of the anti-ventilation fin when said base member is positioned somewhat rearwardly of the propeller in circumdisposed relationship thereto; first, second and third vertically separated, horizontally disposed ribs attached to the outer vertical edges of said base member, each of said ribs having a mid-portion which extends rearwardly of said base member in an approximately semi-circular configuration, and end portions which extend forwardly and inwardly from respective sides of said base member; and means for fastening the forward ends of the lowermost one of said ribs to respective sides of the lower fin.

2. A propeller guard as claimed in claim 1 which further includes a cross bar extending horizontally between said attachment lugs, and means cooperable with said cross bar for drawing said attachment lugs together so as to tightly engage the anti-ventilation fin therebetween.

3. A propeller guard as claimed in claim 2 in which each of said attachment lugs has a separated pair of threaded openings formed therein which extend from the exterior surface horizontally inwardly to the bottom of the associated slot, one opening of the pair being on each side of said cross bar, and which further includes four set screws occupying respective ones of said threaded openings.

4. A propeller guard adapted for attachment to an outboard motorboat propeller unit of the type including a vertical lower housing from which a propeller shaft carrying a propeller extends horizontally rearwardly, an anti-ventilation fin which extends horizontally outwardly on both sides above the lower housing, and a lower fin extending below the lower housing, said propeller guard comprising, in combination: an elongated base member arcuately curved to form at least three-quarters of the circumference of a circle; first and second attachment lugs integrally formed with respective ends of said base member, said attachment lugs having oppositely facing slots therein adapted to receive respective edges of the anti-ventilation fin when said base member is positioned somewhat rearwardly of the propeller in circumdisposed relationship thereto, each of said attachment lugs having a horizontally separated pair of threaded openings therein; each of which extends from the exterior surface horizontally inwardly to the bottom of the associated slot; four set screws occupying respective ones of said threaded openings; a cross bar extending horizontally between said attachment lugs, each end of said cross bar lying between said threaded openings of the associated attachment lug; means cooperable with said cross bar for drawing said attachment lugs together so as to tightly engage the vertical edge surfaces of the anti-ventilation fin between the inner ends of said set screws; first and second vertically separated, horizontally disposed ribs attached to the outer vertical edges of said base member, each of said ribs having a mid-portion which extends rearwardly of said base member in an approximately semi-circular configuration, and end portions which extend forwardly and inwardly from respective sides of said base member; and means for fastening the forward ends of one of said ribs to respective sides of the lower fin.

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