RUDDER ATTACHMENT FOR OUTBOARD ENGINES

ABSTRACT OF THE DISCLOSURE

A rudder attachment for outboard marine drives of either outboard or inboard engines, comprising a cast rudder blade and first clamp head, and a separate, second clamp head. The clamp heads have sockets receiving fore and aft portions of the lower, fin-like housing of the drive. A pair of elongate draft screws extend on opposite sides of the drive housing and are accommodated in receptacle formations of the clamp heads, the screws passing through one clamp head and having nuts by which the clamp heads are pulled toward each other, clamping between them the drive housing and thereby rigidly supporting the rudder blade aft of the housing.

Background

This invention relates to rudder attachments for outboard marine drives of outboard or inboard engines, and more particularly to attachments of this type which can be quickly installed with a minimum of tools and difficulty.

In some prior rudder attachments it was necessary to drill holes through the existing structures to effect the installation. In other attachments of the kind referred to a clamping action was utilized to effect the attachment. The prior devices had drawbacks in that the installation required machining procedures and quite considerable mechanical skill, or else the devices themselves were large and cumbersome, as well as not sufficiently sturdy to withstand successfully all the various conditions of use encountered in boating. In some cases as well, there was the likelihood of damaging the housing or adjoining structures of the drive being worked on.

Summary

The present invention obviates the above drawbacks of prior attachments for outboard drives of outboard or inboard engines, and one object of the invention is to provide a novel and improved rudder attachment which does not require drilling or machining operations but instead enables a tight and secure failure-proof clamping mounting of the rudder blade to be effected with the use of small and compact components not likely to fail or to damage existing engine structures.

This is accomplished by the provision of small clamping blocks or heads which are engageable with fore and aft portions of the lower fin-like housing of the drive, and of elongate clamping screws extending on opposite sides of the fin-like housing and received in receptacle formations of the blocks. The screws pass through one block and have nuts by which the blocks are pulled toward each other and against said fore and aft portions. The rear clamp head or block carries the rudder blade. The blocks can be metal castings, and the fin-like drive housing withstands considerable fore-and-aft forces whereby the clamping means can be drawn up tightly, providing a sturdy, failure-resistant assemblage while involving small parts in a compact arrangement.

Other objects and advantages of the invention are to provide an improved clamp-on rudder attachment in accordance with the foregoing, which can be clamped directly onto the cavitation plate of the drive housing; to provide an improved clamping-type attachment which has great strength, resistance to corrosion, which is especially simple, low in cost of components, and is inexpensive to tool and produce.

Other features and advantages will hereinafter appear.

In the drawings:

FIG. 1 is a side elevational view of the improved clamp-on rudder attachment of the invention, mounted on the lower housing portion of an outboard drive.

FIG. 2 is a top plan view of the rudder attachment of FIG. 1.

FIG. 3 is a rear elevational view of the rudder attachment.

FIG. 4 is a fragmentary sectional view, taken on the line 4-4 of FIG. 2.

FIG. 5 is a top plan view of one of the elongate draft screws of the attachment.

FIG. 6 is a side elevational view of a clamp-on rudder attachment illustrating another form of the invention.

FIG. 7 is a top plan view of the rudder attachment of FIG. 6.

FIG. 8 is a vertical sectional view, taken on the line 8-8 of FIG. 7.

Considering first FIGS. 1 and 2, there is illustrated a lower portion of an outboard drive of either an outboard engine or an inboard engine, comprising a propeller 10 having a bearing in lower housing 12 of fin-like configuration, said housing including a fore portion or edge 14 and an aft portion or edge 16. The lower housing portion 12 also includes a horizontal cavitation plate 18 shown as having a generally oval configuration in top plan, as seen in FIG. 2. The drive housing 12 also includes an exhaust duct 20 of usual type.

In accordance with the present invention there is provided an improved, clamping-type rudder attachment for the drive structure illustrated in FIGS. 1 and 2, which attachment is relatively small and compact, comprising clamping heads engageable with the fore and aft portions 14, 16 of the drive housing, said attachment being further characterized by elongate clamping screws which extend along but do not bear against the opposite broad sides of the housing, and which pull the clamping heads tightly against said fore and aft housing portions. The attachment has the special advantage of providing an extremely sturdy, failure-resistant assemblage while still involving small parts in a compact arrangement that can be economically produced and quickly installed without requiring drills or machining operations.

As shown, the improved rudder attachment comprises essentially a rudder blade 22 and a first clamp head 24 which is rigidly with the rudder blade 22, said clamp head comprising a block preferably constituted as a metal casting integral with the rudder blade 22. The clamp head or block 24 has a pair of spaced-apart receptacle formations 26 adapted to receive a pair of elongate draft screws 28. The rudder attachment further comprises a second clamp head or block 30 which is separate from the rudder blade 22 and first clamp head 24, and which also has a pair of spaced-apart receptacle formations 32 adapted to receive the draft screws 28.

The elongate screws 28 extend along the opposite broad edges of the lower drive housing 12 and are so constituted as to forcibly pull the clamp heads 24, 30 toward each other and against the aft and fore portions 16 and 14 respectively of the housing. For this purpose, the clamp heads 24, 30 are provided with sockets especially arranged to receive the said fore and aft housing portions, and particularly to receive the fore and aft ends or edges of the cavitation plate 18 of the housing.

Considering FIGS. 2 and 4, the socket of the clamp
head 24 comprises a horizontal slot 34 in the lower portion of the head, joining a V-shaped central notch 36 disposed in an intermediate horizontal wall 38. Above the intermediate wall 38 the clamp head 24 has an arcuate or semicircular recess 40. The intermediate wall 38 joins end wall 42 of the clamp head, and these latter adjoin relatively small top walls 44. The clamp head 24 has a pair of spaced rear walls 46 provided with apertures through which the draft screws 28 pass. The said screws also pass through a space defined by the walls 38, 42 and 44, which space and apertures in the walls 46 constitute what I term "receptacle formations" of the clamp head 24, for accommodating the draft screws 28. Nut portions 48 are provided on the screws 28, by which the clamp head 24 may be pulled up tight when securing the attachment in place.

The horizontal slot 34 of the clamp head 24 is arranged to accommodate the rear edge portion 50 of the cavity plate 18, such rear edge portion being herein also considered, as part of the rear or aft portion 16 of the drive housing 12. The V-notch 36 of the clamp head 24 accommodates the trailing edge, designated 52, of that portion of the drive housing 12 which is located immediately above the cavity plate 18. Preferably a relatively snug fit is provided between the trailing edge 50 of the cavity plate 18 and the clamp head 24.

In order to prevent turning of the draft screws 28 when the nuts 48 are being tightened, the said screws may be provided with drifted or struck ears 54, FIGS. 4 and 5, which have a clearance fit in the receptacle formation of the clamp head 24, as may be seen from an inspection of FIG. 4.

The forward clamp head 30 is also preferably a metal casting, and the receptacle formations 32 are preferably threaded to enable the draft screws 28 to be screwed into the formation tightly and to be thereby anchored to the clamp head. Referring to FIG. 2, the clamp head 30 is somewhat in the shape of the letter U, with a central bridge or yoke portion 56 of curved shape, having a horizontal slot 58 in which the front edge portion 60 of the cavity plate 18 is accommodated. The lower portion of the clamp head 30 has notches 62 above and below the horizontal slot 58, to enable a fit to be had to the fore portion 14 of the fin-like drive housing 12 in the vicinity of the cavity plate 18.

For the purpose of taking up slack in the socket 34 and minimizing vertical tilting of the aft clamp head 24 and rudder blade 22, the intermediate wall 38 of the clamp head is provided with screw holes, in which clamping screws 64 are disposed and arranged to engage the upper surface of the cavity plate 18. Also, to minimize the likelihood of such vertical tilting, the draft screws 28 are provided with antitilt means, this being in the form of vertical downwardly offset portions 66 adapted to engage the upper side of the cavity plate 18. Accordingly, when the nuts 48 are pulled up tight, with the clamping screws 64 partially tightened, there is greatly minimized any tilting effect on the rear clamp head 24 and rudder blade 22.

Another embodiment of the invention is illustrated in FIGS. 7 and 8. The drive housing 12a in these figures has a slightly different configuration, with a sloping front edge portion 14a directly above the horizontal cavity plate 18a. There is also a sloping rear edge portion 16a of the drive housing 12a, disposed immediately above the cavity plate 18a.

In the form of the invention illustrated in FIGS. 7 and 8, antitilt arms are provided on the clamp heads. The forward clamp head 30a has a rearwardly extending arm 72 engageable with the portion 14a of the drive housing, and the rear clamp head 24a has a forwardly extending antitilt arm 72 engageable with the rear edge portion 16a of the drive housing. Additionally, the draft screws 28a have different antitilt means, comprising annuli or washer-like members which are pre-fitted on knurled portions 74 of the draft screws and arranged to engage the upper surfaces of the cavity plate 18a.
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3. Apertured members to secure the same against movement.

6. A clamping-type rudder attachment as in claim 1, wherein:
   (a) the draft screws are anchored in the said second clamp head,
   (b) said screws passing through the first clamp head and having nuts to pull the heads toward each other.

7. A clamping-type rudder attachment as in claim 6, wherein:
   (a) tilt-restraining means are provided on the said first clamp head, engageable with the drive housing to prevent vertical tilting of the head and rudder blade.

8. A clamping-type rudder attachment as in claim 7, wherein:
   (a) the tilt-restraining means comprises an arm on and extending forwardly of the first clamp head.

9. A clamping-type rudder attachment as in claim 7, wherein:
   (a) the tilt-restraining means are adjustable and comprise set screws threaded into the first clamp head and engageable with the cavitation plate of the drive housing.

10. A clamping-type rudder attachment as in claim 6, wherein:

11. A clamping-type rudder attachment as in claim 10, wherein:
   (a) the draft screws have laterally extending ears struck from them, comprising said cooperateable means.

12. A clamping-type rudder attachment as in claim 1, wherein:
   (a) the first clamp head and rudder blade comprise a single casting.

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