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OUTBOARD MOTOR PUMP ATTACHMENT

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FIG.2.

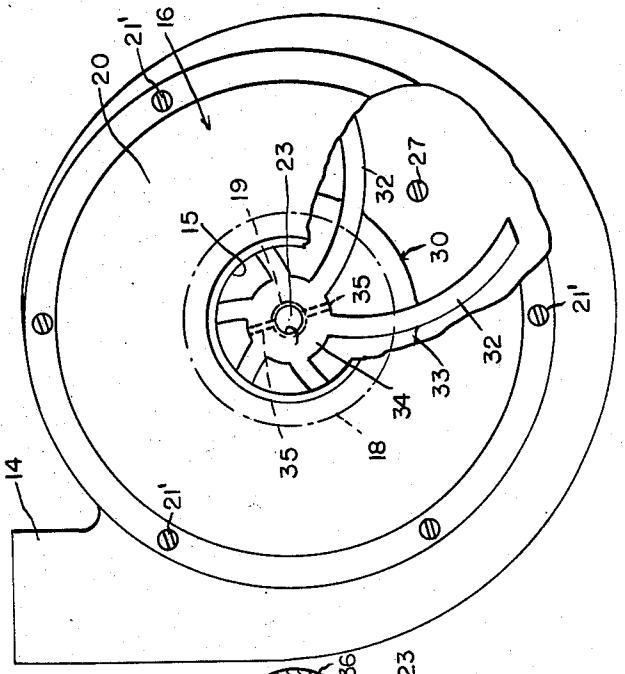
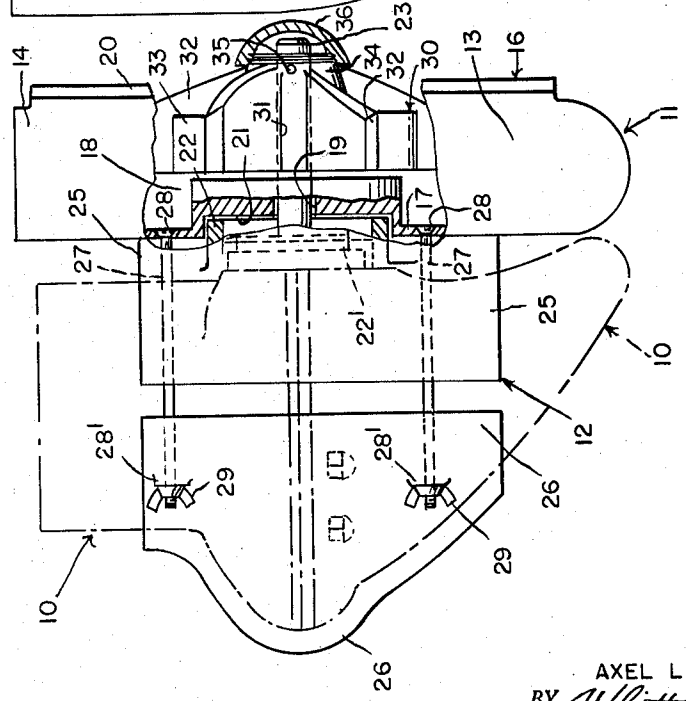


FIG.1.



INVENTOR.

AXEL L. NIELSEN

BY Whittemore, Hulbert & Belknap ATTORNEYS

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OUTBOARD MOTOR PUMP ATTACHMENT

Axel L. Nielsen, Hazel Park, Mich.

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10 Claims. (Cl. 103—87)

The present invention relates to a novel attachment for converting a conventional outboard boat motor to function as a water pump. As such, the conversion unit or attachment of the invention is of great utility to resort dwellers and occupants of localities in general where an adequate supply of water by a fixed pumping installation or well is not available.

There are many such localities indeed, and the inconvenience, as well as possible danger, occasioned by the need for a reliable source of water pressure is of course readily recognized. It is therefore a general object of the invention to satisfy this need by the provision of a simple, inexpensive pump attachment which can be readily and quickly applied by an inexperienced person to the propeller shaft of one or more standard and extremely popular makes of gasoline engine powered outboard motor.

In accordance with the invention, a centrifugal type pump casing or housing, characterized by a tangential discharge and an axial intake to the eye of the pump impeller in the housing, is releasably applied by means of one or more novel clamping fixtures directly to the gear box of the depending shaft housing of the outboard motor, after removal of the motor propeller from its shaft driven in the gear box, as normally secured by a pin to this shaft. The pump impeller is fixedly applied to the propeller shaft and a side plate provided with an axial intake opening is applied to complete the housing structure.

Numerous uses for a unit of the above character to convert an outboard motor for pumping will suggest themselves, such as for irrigation and other operations which are mentioned in my co-pending application, Serial No. 317,017, filed October 27, 1952, now Patent No. 2,792,786, and entitled "Pump and Propulsion Unit." In any application, the attachment has the advantage that the operation of the outboard motor proper which drives the same is entirely unaffected and its existing seals undisturbed and unimpaired as to efficiency.

The operations of setting up the pump are simple in the extreme, involving merely the removal of the propeller from its shaft leading from the lower gear housing of the motor, the clamping of the pump housing to the motor housing (this being greatly facilitated by special clamp fixtures associated with the pump housing), the slipping of the impeller of the attachment or conversion unit onto the exposed end of the motor's propeller shaft and securement of the impeller in fixed relation to the shaft, and the application of an end plate to the pump housing.

An important object of the invention is to provide a pump conversion or adapter attachment or unit of the general character described which may be fabricated practically in its entirety of relatively inexpensive, lightweight castings, requiring little in the way of machining, other than to provide for a reasonably good fit of the pump impeller on the motor shaft and for a reasonably neat and attractive exterior appearance.

Generally considered, the conversion attachment comprises a pump housing of the type including an axial intake opening at an exposed outer side and a tangential discharge passage, all characteristic in a centrifugal pump. A radial, curved vane type impeller is provided to rotate within this housing or casing. An inner or rearward end wall of the pump housing, adjacent the lower, gear box portion of the motor housing is provided with an axial shaft opening to receive the motor propeller shaft; and an annular external recess or counterbore surrounds this opening to telescopingly accommodate an annular formation on an inner or forward clamp fixture of the unit, through which formation the motor propeller shaft extends.

The forward clamping fixture just referred to is appropriately shaped so that it may be positioned with reasonable exactitude in a nested front to rear relation to the gear box portion of the motor housing, and a further shaped, cup-like clamping fixture coacts with this fixture. In accordance with the invention, the further clamping fixture is disposed in opposed axial relation to the first fixture and also has an internal contour in general conformity with the configuration of an adjacent outer surface of the motor housing. The fixtures are drawn together by tie bolts carried by the pump casing, so that the latter is accurately and securley located and clamped against the motor housing in use. It thus resists displacement under vibration, and an extremely compact and rugged pumping unit results.

The foregoing as well as other objects will become more apparent as this description proceeds, especially when considered in connection with the accompany drawings, wherein:

Fig. 1 is a view in side elevation, partially broken away and in axial section, of the attachment of the invention as operatively applied to an outboard motor housing, which is shown in dot-dash line; and

Fig. 2 is a view of the attachment in end elevation, being broken away to illustrate in a general way the nature of the pump impeller therein.

The particular outboard motor selected for illustration, the lower, gear-encasing portion or gear box of the housing of which is shown by dot-dash line in Fig. 1, and generally designated **10**, is the widely distributed Johnson 5½ horse power unit, and the design of the pump conversion attachment or unit **11** applied thereto will also fit an Evinrude 7½ horse power motor. Slight changes in regard to the clamping structure **12** and pump housing **13** of the attachment, as indicated by the particular contours of the motor housing **10**, will adapt the structure of the invention for application to any other known outboard motor construction.

The pump housing **13** is of conventional outline, having a tangential discharge or outlet pipe **14**, to which any suitable sort of hose or conduit may be attached in a conventional way, and an axial intake opening **15** (Fig. 2) in its outer end or side wall **16**.

The opposite or rear wall **17** of centrifugal pump casing **13** is preferably an integral one, and includes a central thickened boss **18** having an axial shaft aperture **19** at its mid point. As to the other end wall **16**, it is preferably constituted by a separate plate **20** in which the axial intake opening **15** is centrally formed. A plurality of circumferentially spaced screws **21'** are employed to secure plate **20** to the housing proper **13**, and when thus mounted, the intake opening **15** is coaxial with the shaft aperture **19**.

The external surface of housing wall **17** is provided with a circular recess or counterbore **21** coaxial with shaft aperture **19**, and this recess telescopingly receives an annular flange formation or shoulder **22** of a first fixture **25** of the clamping structure **12**. The formation **22** coaxially accommodates a flange-like shaft formation **22'** of motor housing **10**.

Clamp fixture **25** is held in fixed relation to the wall **17** of the pump casing **13**, and has a hollow, cupped rear surface contoured for a nested reception of the adjacent forward surface of housing **10**. Fixture **25**, as well as a further, outer or rear clamp fixture **26** which coacts therewith, are preferably furnished as separate parts to be held to the casing or housing **13** by the tie bolt provisions to be described. This permits a standardization of the design of the pump casing **13** for most installations. The attachment is then adapted for application to motor housings **10** of different configuration or size by simply employing clamp fixtures **25, 26** which are specially designed as to their size and outline to accommodate various types of motor housing **10**.

A plurality of elongated tie bolts **27** extend through countersunk apertures **28** in pump housing end wall **17**, there being two such bolts **27** extending on either side of the unit **10**, in vertically spaced relation to one another, in the embodiment of the attachment shown. These bolts will extend past the sides of the inner clamp fixture **25** (or may be passed through suitable apertures in the fixtures, if desired), and extend through appropriately apertured bosses **28'** formed in the outer clamp fixture **26**. Wing nuts **29** may be employed to lock the clamp structure **12** in place on the motor housing **10**, thereby rigidly and ruggedly locking the pump housing **13** to the motor.

As appears from the foregoing, the internal contour of the clamp fixtures **25, 26** is preferably such as to snugly accommodate the external form of the motor housing **10** in the clamped zones, this being particularly desirable in the case of the outer fixture **26**. Tightening of wing nuts **29** draws this member into proper locking relation to the motor housing, and the attachment may be easily and quickly removed by manipulation of the wing nuts.

A pump impeller **30** disposed internally of housing **13** is provided with an axial bore **31** sized to have a close sliding fit on the propeller shaft **23** of the motor **10**. The blades **32** of this impeller are mildly curved throughout their radial extent and are preferably formed integral with a circular base or boss **33** in which the shaft bore **31** is axially formed. Although not illustrated, it is contemplated by the invention that the impeller boss **33** may be appropriately piloted in the housing **13**, as by reference to the adjacent boss **18** on housing end wall **17**. However, this introduces a factor of design in relation to bearing surfaces, and in the interest of simplicity and low production cost, such pilot bearing provisions may be omitted. The boss **33** is directed outwardly to a generally conical end extension **34** which is diametrically drilled to receive the standard shear pin for the motor propeller. The standard propeller locking cap or nut is applied to this boss to cover the outer end of propeller shaft **23**.

The method of assembling the motor and pump units **10, 11** has been generally indicated above. After removal of the motor propeller, the housing **13** (with the inner clamp fixture **25** slid onto tie bolts **27** received by housing apertures **28**, in the event the fixture **25** is a removable one) is slipped over motor shaft **23**, the annular flange **22'** of motor housing **10** being received in the shoulder formation **22** of fixture **25**, as shown in Fig. 1. The outer fixture **26** is then slid onto tie bolts **27**, being brought into snug nesting engagement with the motor housing **10**, and the wing nuts **29** are applied to bolts **27** and taken up tightly.

These operations are performed with the housing end wall plate **20** removed, enabling ready access to the bolts **27** in the operations referred to. The pump impeller **30** is then slipped over the end of shaft **23** to the position shown in Fig. 1, and the shear pin **35** is applied to its boss or hub extension **34** to secure the impeller on the shaft. Finally, end plate **20** is secured on the housing by screws **21'**, completing the assembly of the pump. Nut **36** covers shear pin **35** and holds it in place.

It is preferred that the parts of the attachment be constructed as inexpensively as possible. Thus, the clamp fixtures **25, 26** may be in the form of castings, preferably of light-weight and rust resistant material, such as aluminum. The same is true of the impeller housing **13** and impeller **30**.

The invention affords a service pump of rugged construction and reliable operation for use at resorts and in other locations where adequate source of water pressure is not present. The attachment may be put up in the form of an extremely light-weight and compact kit, the parts of which are installed and removed quickly with ease by inexperienced persons.

The drawings and the foregoing specification constitute a description of the improved outboard motor pump attachment in such full, clear, concise and exact terms as to enable any person skilled in the art to practice the invention, the scope of which is indicated by the appended claims.

What I claim as my invention is:

1. A pump attachment for an outboard motor characterized by a depending gear housing from which a propeller drive shaft extends rearwardly, comprising a pump casing, an impeller housed in said casing and having means to removably mount the same on said drive shaft, said casing having an apertured wall to receive said shaft, and a pair of separable fixtures carried by said pump casing to releasably engage and clamp opposed surfaces of said housing.

2. A pump attachment for an outboard motor characterized by a depending gear housing from which a propeller drive shaft extends rearwardly, comprising a pump casing, an impeller housed in said casing and having means to removably mount the same on said drive shaft, said casing having an apertured wall to receive said shaft, a pair of relatively movable fixtures carried by said pump casing to releasably engage the exterior of said housing and secure said housing and casing to one another, and means engaging said fixtures and drawing the same against said housing to releasably clamp the thus engaged housing between said fixtures.

3. A pump attachment for an outboard motor characterized by a depending gear housing from which a propeller drive shaft extends rearwardly, comprising a pump casing, an impeller housed in said casing and having means to removably mount the same on said drive shaft, said casing having an apertured wall to receive said shaft, and means carried by said pump casing to releasably engage the exterior of said housing and secure said housing and casing to one another, comprising a pair of fixtures to engage said housing exterior, one of which has an internal concave surface contoured in general conformity with said housing exterior and is cradled against the same in a zone remote from said pump casing, and tension means engaging said fixtures and drawing the same against said housing to releasably clamp the thus engaged housing between said fixtures.

4. An attachment in accordance with claim 1 in which said pump casing is in part constituted by a wall in opposed relation to said apertured shaft receiving wall, said last-named wall being removably secured to the remainder of the casing and being provided with a liquid intake opening coaxial with the aperture of said first-named wall.

5. A pump conversion unit for attachment to the gear box of an outboard motor from which a propeller drive shaft extends, comprising a centrifugal pump housing provided with an axially facing wall having an opening to receive said propeller drive shaft of said motor, a forward clamping fixture on said housing wall contoured in general conformity with and externally engaging an opposed surface of said gear box, a rear fixture secured to said housing and engageable with an adjacent surface of said gear box, and means engaging said fixtures and drawing the same against said gear box to releas-

ably clamp said fixtures against said gear box and thereby rigidly mount said pump housing to said motor.

6. A pump conversion unit for attachment to the motor housing of an outboard motor, comprising a centrifugal pump housing provided with an axial wall having an opening to receive the propeller drive shaft of said motor, a forward clamping fixture on said housing wall having a surface in general conformity with an external surface of said motor housing and externally engaging said motor housing surface in the use of said unit, a rearward clamping fixture having a surface in general conformity with and externally engaging an opposed surface of said motor housing, and means to releasably clamp said motor housing between said fixtures and thereby rigidly mount said pump housing to said motor.

7. A pump conversion unit for attachment to the motor housing of an outboard motor, comprising a centrifugal pump housing provided with an axial wall having an opening to receive the propeller drive shaft of said motor, a forward clamping fixture on said housing wall having a surface in general conformity with an external surface of said motor housing and externally engaging said motor housing surface in the use of said unit, a rearward clamping fixture having a surface in general conformity with and externally engaging an opposed surface of said motor housing, and means to releasably clamp said motor housing between said fixtures and thereby rigidly mount said pump housing to said motor, said first-named fixture having an annular, forwardly extending shaft accommodating formation which is in telescoped relation to said axial wall of said pump housing, coaxial with the shaft opening of the latter, when said unit is attached to said motor.

8. A unit in accordance with claim 5 in which said rear fixture is independent of said housing wall.

9. A pump attachment for an outboard motor characterized by a depending housing from which a propeller drive shaft extends rearwardly, comprising a pump casing to house an impeller which is adapted to be removably mounted on said drive shaft, said casing having an apertured wall to receive said shaft, and means carried by said pump casing to releasably engage the exterior of said motor housing and secure said housing and casing to one another, comprising a fixture to engage said housing exterior which has an internal concave surface contoured in general conformity with said housing exterior and is cradled against the same, said releasable securing

means comprising a second fixture disposed adjacent said pump casing and coacting with said first-named fixture in clamping the casing to said motor housing, said second fixture also having cradling engagement with the exterior of said housing, and tension means to releasably clamp the thus engaged motor housing between said fixtures.

10. A pump attachment for an outboard motor characterized by a depending housing from which a propeller drive shaft extends rearwardly, comprising a pump casing to house an impeller which is adapted to be removably mounted on said drive shaft, said casing having an apertured wall to receive said shaft, and means carried by said pump casing to releasably engage the exterior of said motor housing and secure said housing and casing to one another, comprising a fixture to engage said housing exterior which has an internal concave surface contoured in general conformity with said housing exterior and is cradled against the same, said releasable securing means comprising a second fixture disposed adjacent said pump casing and coacting with said first-named fixture in clamping the casing to said motor housing, said second fixture also having cradling engagement with the exterior of said housing, and tension means to releasably clamp the thus engaged motor housing between said fixtures, said tension means comprising a plurality of tie bolts extending through said apertured wall of said pump casing and rearwardly in relation to said fixtures for the reception of securing elements.

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