

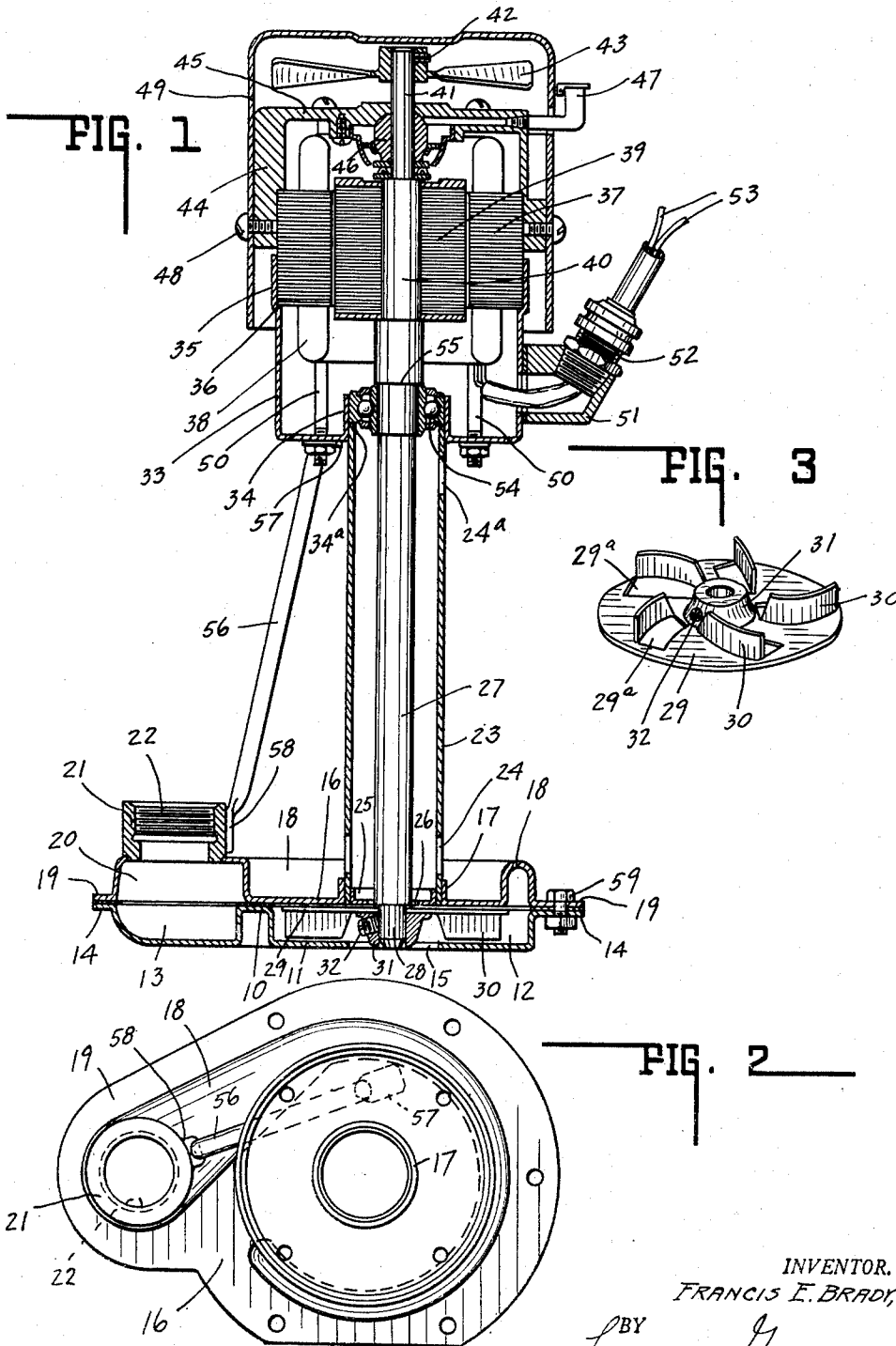
Feb. 20, 1951

F. E. BRADY, JR

2,542,896

PUMP ASSEMBLY

Filed Jan. 30, 1948



INVENTOR.
FRANCIS E. BRADY, JR.

BY
Lockwood, Coldsmith & Co.
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,542,896

PUMP ASSEMBLY

Francis E. Brady, Jr., Muncie, Ind.

Application January 30, 1948, Serial No. 5,486

7 Claims. (Cl. 103-87)

1

This invention relates to an electrically operable hydraulic type pump of the semi-submersible type.

The chief object of the present invention is to construct such a structure of but few parts, the majority of which are of sheet metal character.

Another object of the present invention is to construct the major portions of the unit so that said portions are readily assembled.

The chief feature of the present invention resides in the substantial elimination of all castings.

Other objects and features of the invention will be set forth more fully hereinafter.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

In the drawings

Fig. 1 is a central sectional view of the structure.

Fig. 2 is a top plan view of the intermediate housing assembly.

Fig. 3 is a perspective view of the impeller.

In Fig. 1, 10 indicates a sheet metal (brass or brass plated) half of a pump housing having a central well portion 11 with which communicates a scroll type discharge 12 terminating in outlet chamber 13, said half housing being formed with a peripheral laterally-extending flange 14 and a central intake opening 15.

A complementary plate portion 16 includes central collar 17, scroll-like portion 18, peripheral flange 19, and outlet chamber 20. Rigid with the upper plate is an outlet fixture 21 having internally threaded bore 22 for hose or pipe connection. Fixture 21 is rigid with the plate 16, being soldered or otherwise secured thereto.

Rigid with the collar 17, as by soldering or the like, is a tube or hollow standard 23 apertured at 24. Rigid with the tube and stiffening the lower end is cup 25 having central opening 26 therethrough. Disposed within the tube is shaft 27 reduced as at 28. The tube, collar and cup may be simultaneously secured together by soldering or the like.

A plate 29 has stamped therefrom the vanes or blades 30. A hub 31 is formed with a shouldered portion rigidly secured to said plate and a lock screw 32 secures the resulting impeller assembly to the reduced end 28 of shaft 27. Since the plate portion of the impeller is disposed immediately contiguous to the flat portion of upper plate 16, the apertures 29 resulting from vane formation have no deleterious effect upon pump efficiency.

2

As shown in Fig. 3, the integral stamped-out blades are bent outwardly from the plate 29 comprising an annular disk, within the peripheral edge thereof so as to leave a surrounding reinforcing rim. Each blade is cut from a developed curve in the plate and bent at right angles thereto about a curve so related to the developed curve that the face of the blade will be curved from the inner to the outer end thereof with the exposed cut edge extending in a plane parallel to the plate. Thus, with the stamped-out integral blades bent at right angles to the plate there will be provided a convex leading face and a concave trailing face.

The upper end of tube 23 may be apertured as at 24^a. Cup 33, of sheet metal, includes inwardly extending collar portion 34 of appreciable length so as to nest the upper end of tube 23 and be suitably secured thereto as by soldering or the like. The upper end of the tube 23 thus serves as a stop shoulder 34^a.

The upper end of cup 33 is slightly enlarged as at 35 to form a stop shoulder 36. Press fitted therein is stator laminations 37 of a single phase universal motor having field 38 and rotor 39, the latter being press fitted or otherwise secured to the reduced upper end 40 of shaft 27. The extreme upper end of the shaft is further reduced at 41 and secured thereon at 42 is a cooling fan 43.

A cup-like frame member 44 is press fitted or otherwise secured to the stator and its central portion 45 supports a suitable shaft bearing structure 46 which may be supplied with lubricant as at 47. Secured as at 48 to said frame is the inverted cup closure 49 open at the bottom for permitting circulation of cooling air about the stator laminations 37 by the cooling fan 43. Bolts 50 secure the cup 33 and frame 44-45 together.

Suitably secured to cup 33 is bracket 51 mounting current supply fixture 52 by which supply lines 53 are introduced to the motor. An anti-friction structure 54 is press-fitted upon the shaft and abuts shoulder 55 thereof. The exterior of such anti-friction device is press fitted into collar 34 until it abuts end 34^a of the tube 23. A brace rod 56 is secured at 57 and 58 as by soldering or the like, to cup 33 and fixture 21.

The resulting structure, accordingly, is of other than cast character, thus reducing machining costs to a minimum. The upper plate 16, brace 56, tube 23 and cup 33 when assembled comprise a single unit. After assembly of the upper portion, the same has applied thereto the last mentioned

unit. Then to the exposed end of the same is secured the impeller. Then the bottom plate 10 and top plate 16 are secured together by bolts 59.

While the invention has been illustrated and described in great detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The several modifications described herein as well as others which will readily suggest themselves to persons skilled in this art, all are considered to be within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. A motor driven pump comprising a cup shaped housing, a cap for the same, a tubular member depending from the cup and projecting a slight distance upwardly into the same, a collar interiorly of the housing surrounding the aforesaid projection and projecting above same for bearing support purposes, a stator and rotor disposed in the housing, a shaft carrying the rotor and projecting from the housing to and through the tubular member, an antifriction device carried by the shaft below the rotor and bearing upon the top of the tubular member and nested within the collar, a sheet metal partial pump housing having a scroll type passageway formed in the lower face thereof, a coaxial collar portion extending upwardly therefrom to receive and nest therein the lower end of said tubular member, a second sheet metal partial housing having a complementary and matching passageway formed therein, the partial housings being secured together at flanged peripheries and a bladed impeller in the resulting pump housing and rigid with the lower end of the shaft, the pump housing having a lower coaxial intake opening and an offset upper outlet opening.

2. A pump as defined by claim 1 wherein the lower end of said tubular member is restricted by an apertured cup member, the impeller having a plate portion disposed immediately contiguous to said cup member.

3. A pump as defined by claim 2 wherein the impeller comprises a plate, said plate having blades stamped therefrom, and a shouldered hub, the shouldered portion of which is rigidly secured to said plate.

4. A pump as defined by claim 2 wherein the outlet opening is defined by an internally shouldered and threaded collar rigid with and projecting upwardly from the said first mentioned partial housing.

5. In a semi-submersible motor driven pump including an overhead motor comprising a stator and rotor, the combination therewith of a motor housing comprising a sheet metal cup having a lateral enlargement to provide a shoulder for seating said stator, and an inverted cup-like portion provided with an internal shoulder therein for stator engagement, clamping means for securing said cups in stator clamping engagement, a depending elongated shaft supporting said rotor, an elongated tube supporting said motor housing on its upper end and through which said

shaft extends, a sheet metal pump housing secured to the lower end of said tube, and an impeller rotatable in said housing secured to the lower end of said shaft.

6. In a semi-submersible motor driven pump including an overhead motor comprising a stator and rotor, the combination therewith of a motor housing comprising a sheet metal cup having a lateral enlargement to provide a shoulder for seating said stator, an inverted cup-like portion provided with an internal shoulder therein for stator engagement, clamping means for securing said cups in stator clamping engagement, a depending elongated shaft supporting said rotor, an elongated tube supporting said motor housing on its upper end and through which said shaft extends, a sheet metal pump housing secured to the lower end of said tube and an impeller rotatable in said housing secured to the lower end of said shaft, the upper end of said shaft projecting through the top of the inverted cup portion of said housing, and a cooling fan secured to the upwardly projecting end of said shaft.

7. In a semi-submersible motor driven pump including an overhead motor comprising a stator and rotor, the combination therewith of a motor housing comprising a sheet metal cup having a lateral enlargement to provide a shoulder for seating said stator, an inverted cup-like portion provided with an internal shoulder therein for stator engagement, clamping means for securing said cups in stator clamping engagement, a depending elongated shaft supporting said rotor, an elongated tube supporting said motor housing on its upper end and through which said shaft extends, a sheet metal pump housing secured to the lower end of said tube and an impeller rotatable in said housing secured to the lower end of said shaft, said pump housing having an inlet orifice and an outlet orifice, and an angularly disposed bracing rod having its upper end secured to the bottom of the first mentioned cup portion of said motor housing and its lower end secured to the upper portion of said pump housing for bracing said housings relative to each other and to said tube.

FRANCIS E. BRADY, JR.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
223,642	Finley	Jan. 20, 1880
1,432,951	Bell and Schoenleber	Oct. 24 1922
1,571,735	Queisser	Feb. 2, 1926
1,919,097	Drysdale et al.	July 18, 1933
2,007,856	Haldeman et al.	July 9, 1935
2,163,194	Davis	June 20, 1939
2,208,041	Norin	July 16, 1940
2,295,982	Widman	Sept. 15, 1942

FOREIGN PATENTS

Number	Country	Date
300,283	Great Britain	Mar. 7, 1929