

Dec. 16, 1947.

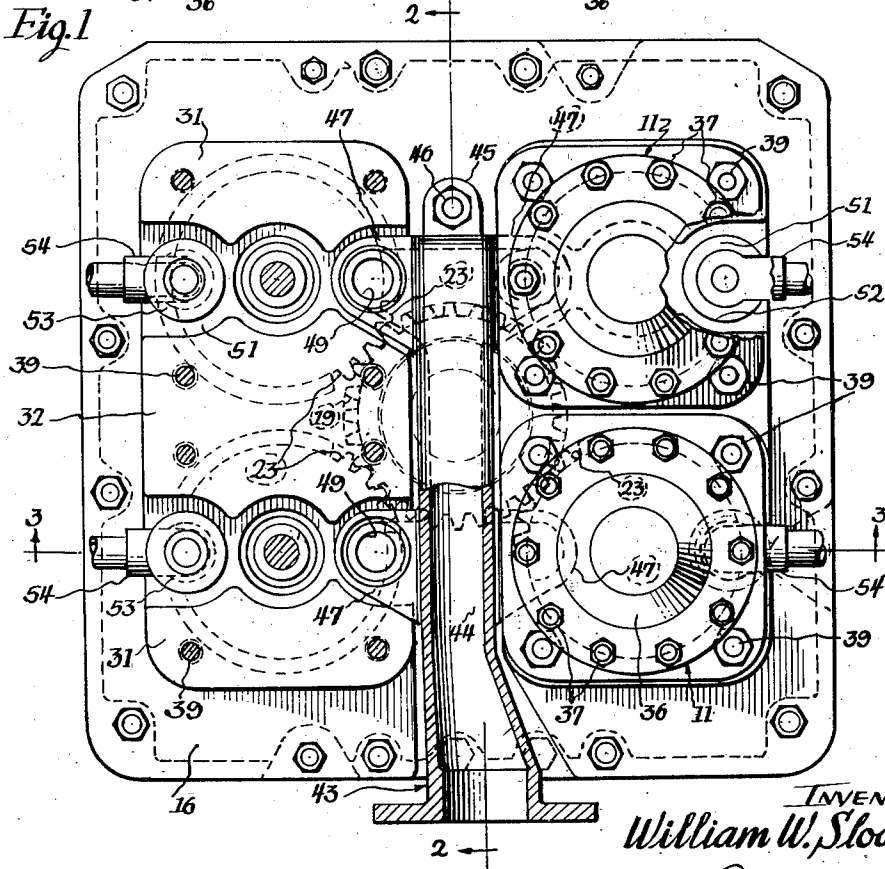
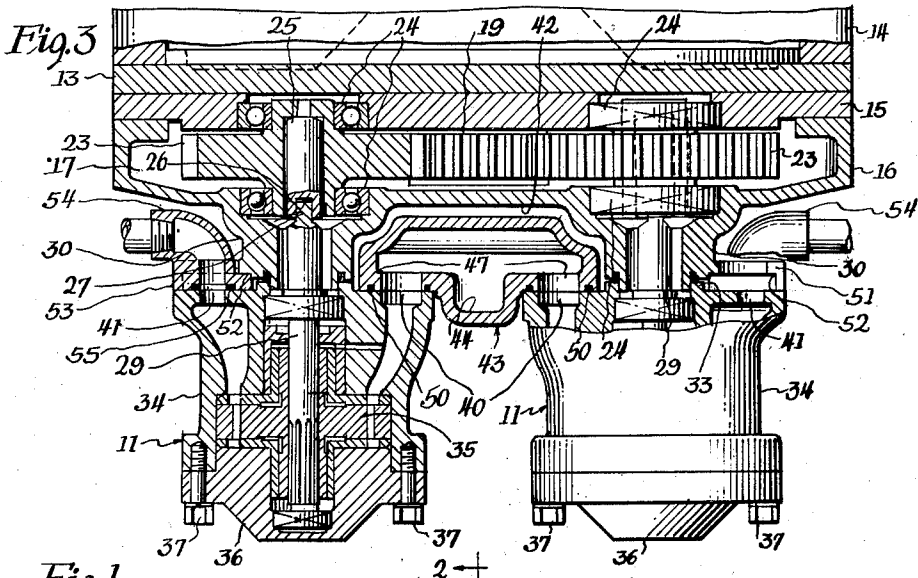
W. W. SLOANE

2,432,825

MOUNTING FOR FLUID PUMPS

Filed Feb. 8, 1946

2 Sheets-Sheet 1



INVENTOR
William W. Sloane
CLARENCE F. POPE
ATTORNEY

Dec. 16, 1947.

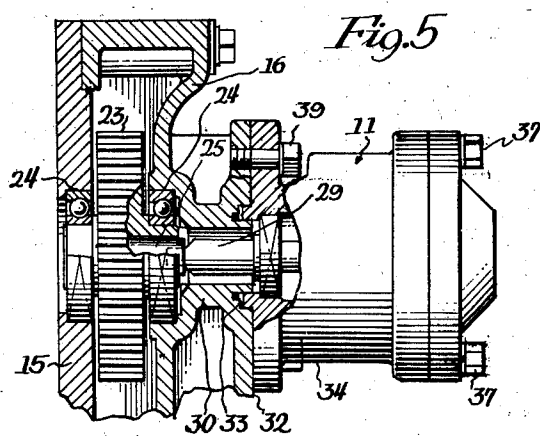
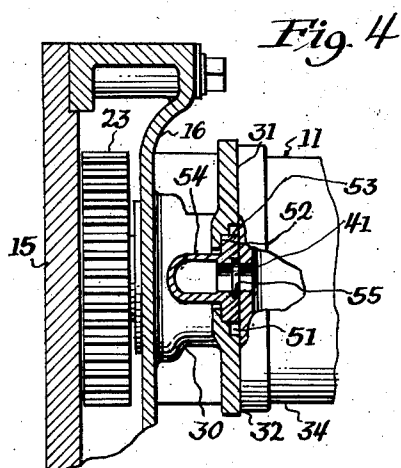
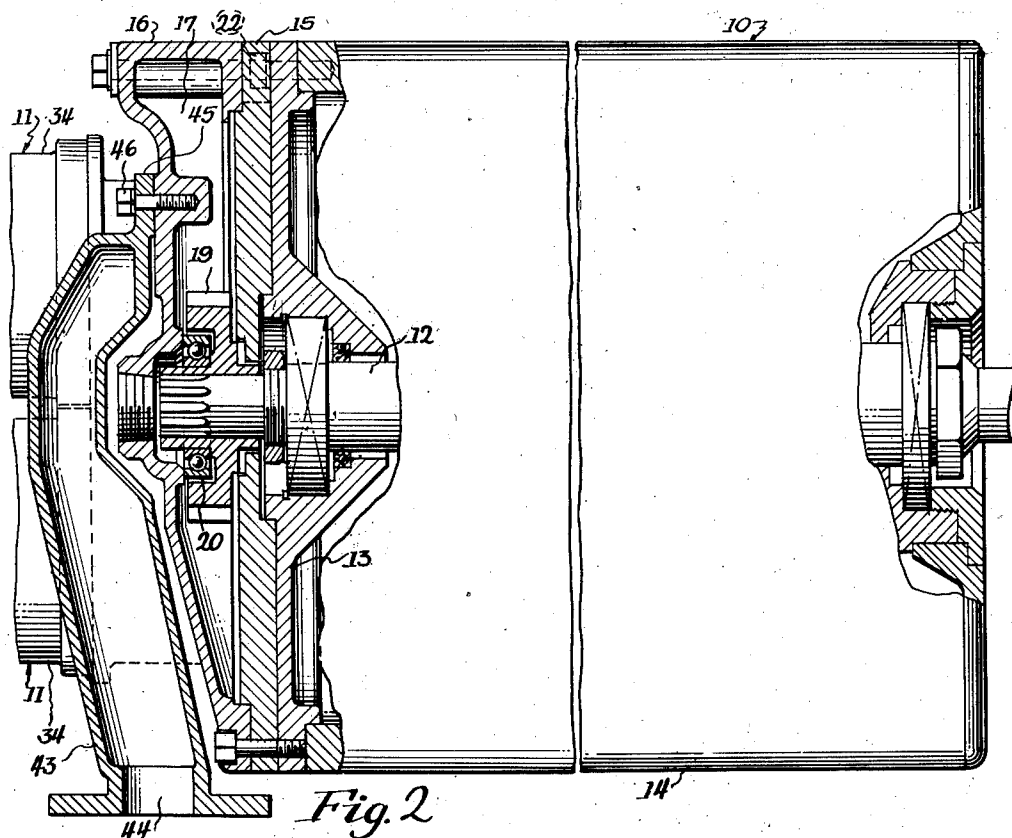
W. W. SLOANE

2,432,825

MOUNTING FOR FLUID PUMPS

Filed Feb. 8, 1946

2 Sheets-Sheet 2



INVENTOR
William W. Sloane
Clarence F. Pale
ATTORNEY

UNITED STATES PATENT OFFICE

2,432,825

MOUNTING FOR FLUID PUMPS

William W. Sloane, Chicago, Ill., assignor to
Goodman Manufacturing Company, Chicago,
Ill., a corporation of Illinois

Application February 8, 1946, Serial No. 646,410

6 Claims. (Cl. 103—1)

1

This invention relates to improvements in mountings for fluid pumps and has among other objects to provide a simplified and improved means for mounting a plurality of fluid pumps on the end of the casing of a drive motor for the pumps and affording a simplified means for supplying fluid to and conducting fluid from said pumps.

A more specific object of my invention is to provide a novel and simplified mounting for a plurality of fluid pumps arranged to mount said pumps on the end of the casing of a drive motor therefor, which is so constructed and arranged that suction and pressure fluid conduits may be set in said mounting and register with the suction and pressure ports of said pumps, so said pumps may readily be connected to said mounting and said suction and pressure connections without the use of individual external piping to said pumps, and enabling the pump mounting to be constructed of one type of metal and the fluid conducting means to be constructed from another material less susceptible to porosity and blow holes and resultant leakages than the mounting for said pumps.

An application Serial No. 591,896, filed by me on May 4, 1945, relates to a mounting for a plurality of fluid pumps on the end of the casing of the drive motor for the pumps. My present application is a continuation in part of application Serial No. 591,896 and differs therefrom in that in my present application the suction and pressure fluid connections for the pumps are separate from the pump mounting and the pump mounting is so constructed and arranged that these fluid connections may be set therein and held in place by the pumps, when secured to the mounting.

These and other objects of my invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawings wherein:

Figure 1 is an end view of a pump mounting constructed in accordance with my invention, with several of the pumps removed and with certain parts of the suction manifold broken away and shown in section;

Figure 2 is a fragmentary sectional view taken substantially along line 2—2 of Figure 1;

Figure 3 is a fragmentary sectional view taken substantially along line 3—3 of Figure 1;

Figure 4 is an enlarged detail fragmentary sectional view showing certain details of the mounting of one of the pressure fittings in the pump mounting; and

Figure 5 is a detail fragmentary sectional view showing certain details of the drive to one of the pumps and the mounting of said pump on the pump mounting.

In the drawings an electric motor 10 of a well known form is shown as affording a source of

2

power for driving a plurality of fluid pumps 11, 11. Said motor has an armature shaft 12 which extends from one end of an end plate 13 of a casing 14 of said motor (see Figure 2). Said armature shaft extends through an inner plate 15 of a gear housing and pump mounting 16 abutting said end plate and suitably secured thereto, and within an inner portion 17 of said housing, and has a motor pinion 19 splined thereon, within said housing. Said housing and pump mounting may be cast from a suitable material such as steel. End thrust of said armature shaft is taken up by a thrust ball bearing 20 mounted on the hub of said motor pinion and engaging an annular stationary part of said inner portion of said housing with its outer race.

The motor pinion 19 meshes with a plurality of spur gears 23, 23. Each of said spur gears forms a drive means for a fluid pump 11 and has a hub projecting from each side thereof (see Figures 3 and 5). Said hubs are journaled on ball bearings 24, 24, the inner bearing being mounted in the inner plate 15 and the outer bearing being mounted within the housing part 16.

The drive connection from each spur gear 23 to the associated pump 11 includes a shaft 25 mounted within the hub of each spur gear (see Figure 3). The outer end of said shaft is slotted and the slotted portion thereof forms a substantially rectangular socket 26 adapted to be engaged with a corresponding projecting end 27 of a pump drive shaft 29 (see Figure 3). The gear housing 16 has a plurality of annular outwardly projecting portions 30, 30, which project outwardly from the bearings 24, 24. Said annular projecting portions are concentric with the axes of rotation of the spur gears 23, 23 and are adapted to have the pump drive shafts 29, 29 extend therethrough. Said annular projecting portions terminate into flat outer plate portions 31, 32 extending outwardly therefrom and having plane finished outer surfaces adapted to be abutted by plane finished inner surfaces of the pumps 11, 11. The outer sides of said bosses are annularly recessed to receive an annular inwardly projecting flange 33 of a pump 11, to register the drive shaft 29 of said pump with the shaft 25.

The pumps 11, 11 are herein shown as being well known forms of sliding vane pumps, and each includes a casing 34 having the shaft 29 journaled therein adjacent its ends, which shaft has a rotor 35 of said pump splined thereon. An outer head 36 closes the outer end of said casing and is secured thereto as by studs and nuts 37, 37. The inner portion of said casing, abutting the housing 16, is of a flanged formation and abuts the outer plane finished surface of the plate portions 31, 32 of said housing 16, and is secured thereto by means of studs and nuts 39, 39 extending through said flanged portion of said casing and threaded

in said housing. Said casing 34 has a suction port 40 leading therein in the direction of the axis of said pump and opening through the flanged inner portion thereof, for supplying fluid to said pump. Said casing also has a pressure port 41 leading therefrom in the direction of the axis of said pump and opening through the flanged inner portion of said housing.

The outer central part of the housing 16 between the pumps 11, 11 and plate portions 31, 32 for each set of said pumps, is recessed, as indicated by reference character 42 in Figure 3, to receive a suction manifold 43 for supplying fluid under pressure to all of the pumps 11, 11. Said suction manifold may be made of a non-porous metal, less susceptible to blow holes and porosity than said housing, and as herein shown, includes a fluid conduit 44 flanged at its outer end and extending between said plate portions and having an ear 45 extending from its end opposite said flanged end, between said plate portions. Said ear abuts an outer face of said recessed portion 42 and is secured thereto as by a stud and nut 46. Said suction manifold is likewise provided with laterally extending apertured fluid outlet portions 47, 47 extending in opposite directions from the central portion thereof and having apertured portions 49, 49 opening to the outer side thereof in the direction of the axes of rotation of the pumps 11, 11. One of said apertured portions is provided for each pump 11 and the outer faces thereof are finished and are adapted to abut the inner finished faces of the pumps 11, 11 and register with the suction ports 40, 40 of said pumps, to supply fluid under pressure thereto. Suitable packing indicated by reference character 50 may be provided to prevent leakage of fluid between the finished inner face of each pump and its associated apertured portion of said manifold.

The housing 16 is also provided with a plurality of pockets 51, 51 between the outer plate portions 31, 32. Each of said pockets opens to the outer side of said housing and has a shouldered portion 52 opening to the outer side of said housing. Each of said shouldered portions is adapted to receive a flanged portion 53 of a pressure fitting 54, which fitting is adapted to register with the pressure port of an associated pump 11, when said pump is mounted on the end of said housing. Said pressure fitting is herein shown as being in the form of an elbow flanged at one end and may be of a different material than said housing, which will be less susceptible to blow holes and porosity than said housing.

The outer side of the flanged portion 53 of the fitting 54 is finished and is adapted to be abutted by the inner finished surface of the flanged portion of an associated pump 11. Said fitting is held in position in the pocket 51 by engagement with said pump, when said pump is secured to the plane finished surface of the housing 16. Suitable packing indicated generally by reference character 55 may be provided between said flanged portion of said fitting and the finished surface of said pump, to prevent the leakage of fluid during operation of said pump.

It may be seen from the foregoing that a simplified pump mounting has been provided which forms a housing for the gearing for driving a plurality of fluid pumps and which has outer plane surfaces adapted to be abutted by corresponding surfaces of said pumps, and adapted to have said pumps secured thereto. It may also be seen that said pump mounting is so arranged that a single suction manifold may be detachably mounted

therein for supplying fluid to all of said pumps, and a simple separate pressure fitting for each pump may be detachably mounted therein and held in position therein by the associated pump, for conducting fluid therefrom. It may further be seen that said pump mounting permits the use of a simplified form of fluid conducting means for supplying fluid to and conducting fluid from the pumps, which may be made from a different material than the housing and mounting for said pumps, to permit the use of a metal which may be porous for the housing, and to permit the use of a non-porous material for the fitting and fluid conduits for the pumps, which mounting is so arranged that the pumps may be mounted thereon or detached therefrom and connected to their respective fluid connections with a minimum amount of time and effort, and which mounting also eliminates all separate external piping connections for each pump.

While I have herein shown and described one form in which my invention may be embodied, it will be understood that the construction thereof and the arrangement of the various parts may be altered without departing from the spirit and scope thereof. Furthermore, I do not wish to be construed as limiting my invention to the specific embodiment illustrated, excepting as it may be limited in the appended claims.

I claim as my invention:

1. In a pump mounting, a plurality of fluid pumps, each of said pumps including a casing having suction and pressure ports therein, and having a pump drive shaft journaled therein, a drive motor for said pumps, a housing secured to the end of said motor, said motor having a shaft extending within said housing, a gear on said motor shaft, a plurality of gears journaled in said housing and meshing with said gear, each of said last mentioned gears forming a means for driving one of said pumps, said housing having openings concentric with the axes of rotation of said gears to permit said pump drive shafts to extend there-through and be driven by said last mentioned gears, a single suction manifold, said housing having a recessed central portion adapted to receive said suction manifold, said suction manifold being separate from said housing and pumps and having a separate suction opening therein for each of said pumps, a separate pressure fitting for each pump for conducting fluid under pressure from an associated pressure port of each pump, and said housing having a separate pocket therein corresponding with each pressure port of each pump, each of said pockets being adapted to receive one of said pressure fittings and said fittings being held therein by an associated pump.

2. In a pump mounting, a plurality of fluid pumps, each of said pumps including a casing having suction and pressure ports therein, and having a pump drive shaft journaled therein, a drive motor for said pumps, a housing secured to the end of said motor, said motor having a shaft extending within said housing, a gear on said shaft, a plurality of gears journaled in said housing and meshing with said gear, each of said last mentioned gears forming a means for driving one of said pumps, said housing having openings concentric with the axes of rotation of said gears to permit said pump drive shafts to extend there-through and be driven by said last mentioned gears, a single suction manifold, said housing having a recessed central portion adapted to receive said suction manifold, said suction manifold being separate from said housing and having a separate

5

suction opening therein for each of said pumps, a separate pressure fitting for each pump adapted to conduct fluid under pressure from an associated pressure port, and said housing having a plurality of pockets therein, one of said pressure fittings being insertible in each of said pockets, and said suction manifold and fittings being secured to said housing and being held in communication with the suction and pressure ports of said pumps by said pumps when secured to said housing.

3. In a pump mounting, a plurality of fluid pumps, each of said pumps including a casing having suction and pressure ports therein, and having a pump drive shaft journaled therein, a drive motor for said pumps, a housing secured to the end of said motor, said motor having a shaft extending within said housing, a gear on said shaft, a plurality of gears journaled in said housing and meshing with said gear, each of said last mentioned gears forming a means for driving one of said fluid pumps, said housing having a plane outer face and having openings concentric with the axes of rotation of said last mentioned gears to permit said pump drive shafts to extend therethrough and be driven from said gears, a suction manifold, said housing having a recessed central portion adapted to have said suction manifold mounted therein, a separate pressure fitting for each pump for conducting fluid under pressure from an associated pressure port, said housing also having a separate pocket formed therein corresponding with each pressure port of each pump and adapted to receive one of said pressure fittings, said casings of said pumps each having a plane face perpendicular to the axes of rotation of said pump drive shafts and said pressure and suction ports of said pumps opening through said faces, and said suction manifold and said pressure fittings having plane engaging surfaces substantially in alignment with the outer face of said housing, and adapted to be engaged by said plane faces of said pump casings, and be held in place by said pumps in registering engagement with said suction and pressure ports of said pumps.

4. In a pump mounting, a plurality of fluid pumps, each of said pumps including a casing having suction and pressure ports therein, and having a pump drive shaft journaled therein, a drive motor for said pumps, a housing secured to the end of said motor, said motor having a shaft extending within said housing, a gear on said shaft, a plurality of gears journaled in said housing and meshing with said gear, each of said last mentioned gears forming a means for driving one of said pumps, said housing having openings concentric with the axes of rotation of said last mentioned gears, to permit said pump drive shafts to extend therethrough and be driven from said last mentioned gears, a suction manifold, said housing having a recessed central portion adapted to receive said suction manifold, a separate pressure fitting for each pump for conducting fluid under pressure from an associated pressure port, said housing also having a separate pocket formed therein corresponding with each pressure port of each pump and adapted to receive one of said pressure fittings, said casings of said pumps having plane engaging surfaces extending in planes perpendicular to the axes of rotation of said pump drive shafts, and said manifold and said fittings having plane engaging surfaces engageable by

6

said plane surfaces of said pump casing, and means for securing said pumps to said housing in engagement with said manifold and fittings and holding said manifold and fittings in fluid conducting relation with respect to said pressure and suction ports of said pumps.

5. In a pump mounting, a plurality of fluid pumps, each of said pumps including a casing having a rotor journaled therein, and said casings each having a plane engaging surface having suction and pressure ports extending there-through in the direction of the axis of rotation of an associated rotor, gearing for driving said pumps, a housing forming a housing and bearing support means for said gearing, a single suction manifold for all of said pumps, said housing having a plane outer engaging surface adapted to be engaged by said plane engaging surfaces of said casings of said pumps and having a recessed central portion adapted to detachably receive said single suction manifold, a separate pressure fitting for each of said pumps for conducting fluid under pressure therefrom, and said housing having a plurality of pockets therein to receive said pressure fittings, and said pressure fittings and said suction manifold being held in place within said pockets and recessed portion of said housing in fluid conducting relation with respect to said pumps by engagement of said pumps with the outer faces of said fittings and said suction manifold.

6. In a pump mounting, a plurality of fluid pumps, each of said pumps including a casing having a rotor journaled therein, and said casings each having a plane engaging surface having suction and pressure ports extending therethrough in the direction of the axis of rotation of an associated rotor, gearing for driving said pumps, a housing forming a housing and bearing support means for said gearing, a single suction manifold for all of said pumps, said housing having a plurality of spaced finished substantially plane outer engaging surfaces adapted to be engaged by said engaging surfaces of said pump casings, the space between said engaging surfaces of said housing being recessed to receive said suction manifold, said suction manifold having a separate suction port opening for each pump and having finished outer surfaces surrounding said port openings, said housing also having a plurality of pockets therein opening into said finished engaging surfaces, pressure outlet fittings adapted to be set in said pockets and register with said pressure outlet openings of said pumps, and means for securing said pumps to said housing with said engaging surfaces of said casings in engagement with said finished surfaces of said housing and said suction manifold and pressure outlet fittings, for holding said suction manifold and fittings in place in said housing in fluid conducting relationship with respect to said pumps.

WILLIAM W. SLOANE.

REFERENCES CITED

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

FOREIGN PATENTS

Number	Country	Date
364,631	Great Britain	Jan. 4, 1932
485,488	Great Britain	May 20, 1938
846,828	France	Sept. 26, 1939