

Aug. 26, 1941.

R. S. WYNE

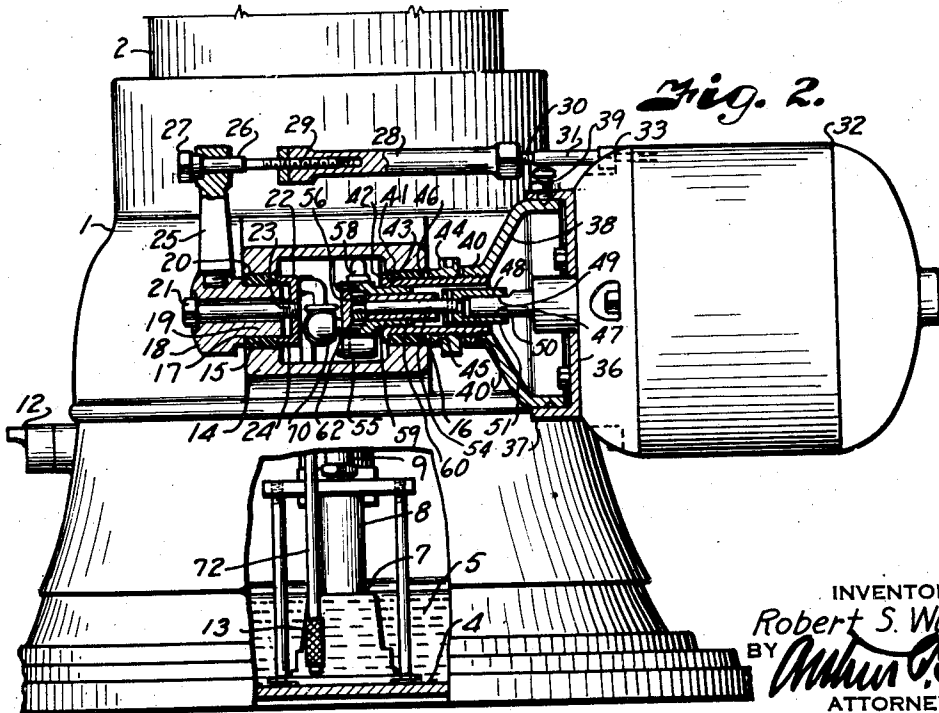
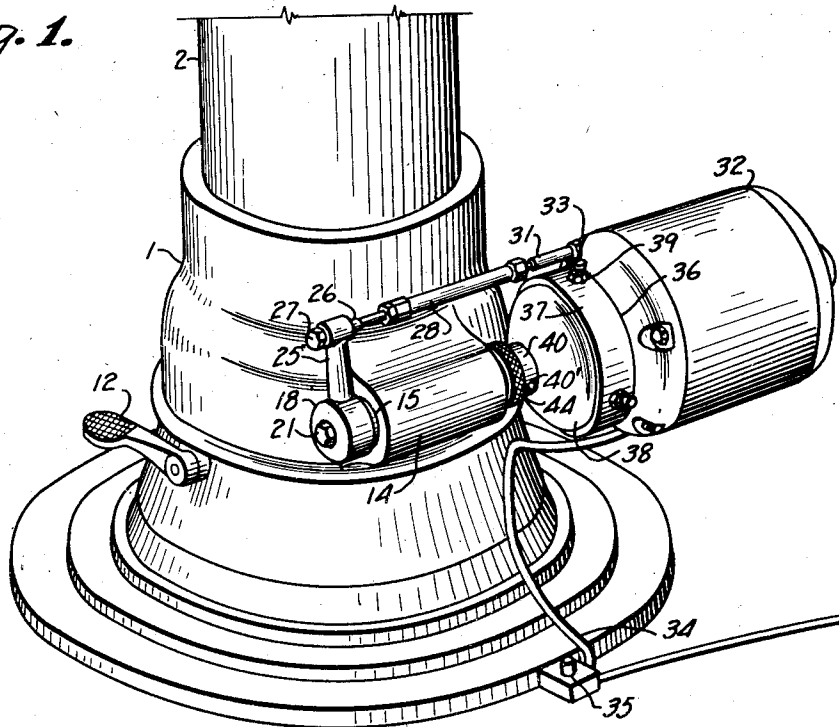
2,253,597

MOTOR DRIVEN PUMP MOUNTING

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2 Sheets-Sheet 1

Fig. 1.



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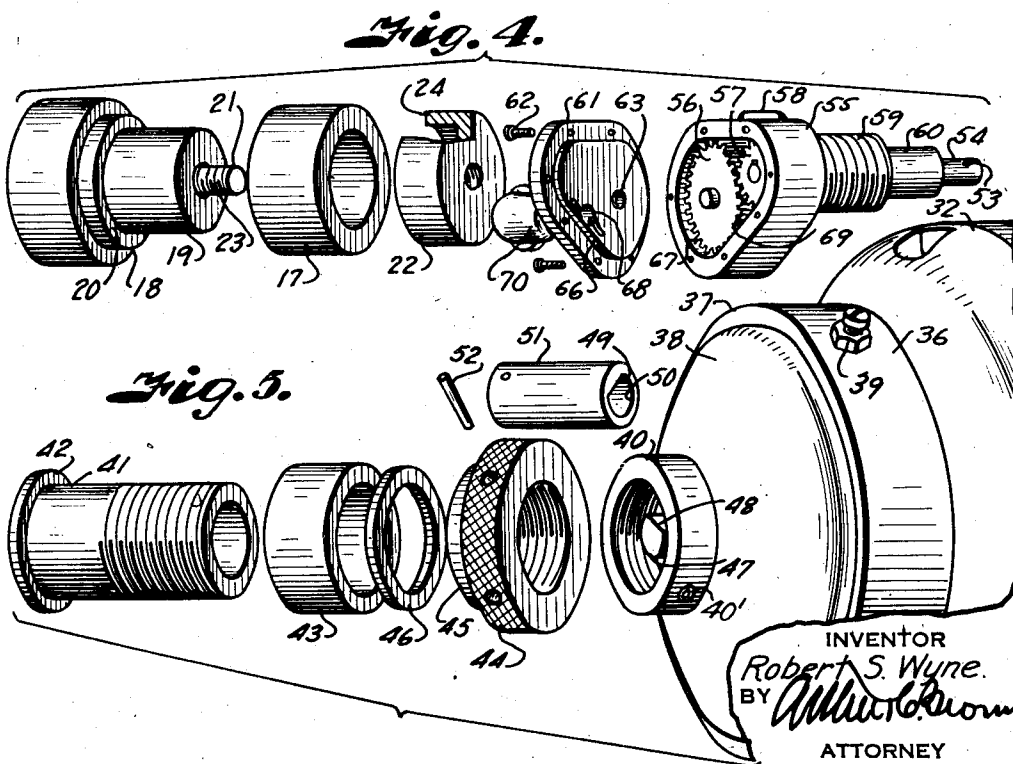
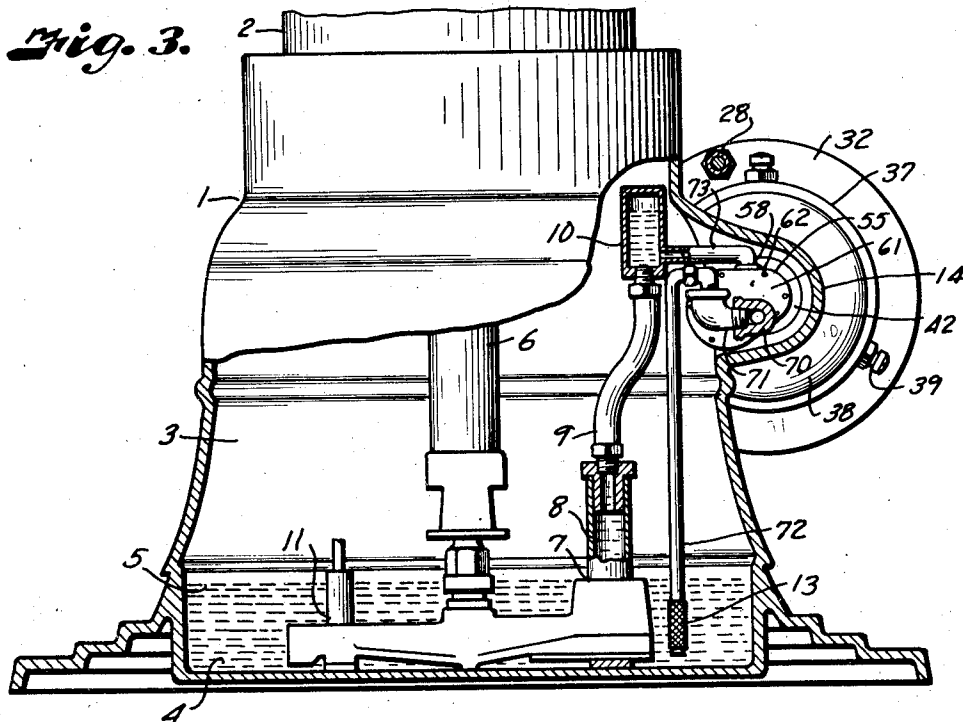


Fig. 5.

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MOTOR DRIVEN PUMP MOUNTING

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5 Claims. (Cl. 103-118)

This invention relates to motor driven pump mountings and more particularly to a pump mounting for a motor driven pump adapted for actuating the elevating systems of dental and like chairs.

The principal object of the present invention is to provide for changing a conventional foot pump type dental chair to a motor actuated chair.

Other important objects of the present invention are to provide for utilizing the ordinary elevating foot pedal mounting of dental and like chairs as a standard or base housing for an improved elevating system actuating mechanism; to provide an improved mounting for a pump and motor therefor; to provide an efficient, durable and easily installed pump and motor for elevating the chair; to provide a motor driven pump assembly requiring a minimum of additional parts to change a foot pump actuated chair to a motor actuated chair; to provide improvements in the connecting and mounting elements for a pump and motor therefor; to provide an improved arrangement of those elements; and to provide a motor driven pump mounting capable of effecting economies to users of motor driven pump elevating systems of this character.

In accomplishing these and other objects of the present invention, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of the pedestal and jack of a dental or like chair equipped with a motor driven pump and mounting therefor constructed and mounted in accordance with the present invention.

Fig. 2 is a front elevational view of the apparatus illustrated in Fig. 1, parts of the mounting and pedestal being cut away to particularly illustrate the construction and arrangement of the elements entering into the organized apparatus.

Fig. 3 is a side elevational view of the apparatus illustrated in Figs. 1 and 2, taken at right angles to the showing of Fig. 2, and particularly illustrating the connections between the pressure medium sump and jack elevating piston.

Fig. 4 is a detail perspective view of a pump and portions of a motor mounting arranged in accordance with the present invention, said pump and portions being shown in disassembled relation.

Fig. 5 is a detail perspective view of the motor mounting sleeve and pump connections, the same being shown in disassembled spaced relation.

Referring more in detail to the drawings:

1 designates a pedestal for a conventional dental or like chair, a jack 2 being reciprocally mounted within the interior 3, Fig. 3, of the pedestal. The pedestal is provided with a sump 4 for receiving pressure medium such as oil 5 adapted for hydraulically actuating the jack 2.

The usual lifting device 6 is suitably connected with the jack 2 and communicates with a substantially conventional hydraulic system 7 which preferably includes the usual piston cylinder 8 communicating through a conduit 9 with an air bell 10. A relief valve 11 is also provided in the hydraulic system 7 which is suitably connected with a pedally actuated release member 12, Fig. 1, mounted on the pedestal in convenient position for actuation by an operator. The usual intake member 13, Fig. 3, is also provided for conveying the pressure medium 5 from the sump to the pump for elevating the jack as now to be described.

As was previously pointed out, one of the principal objects of the present invention is to provide a conventional dental chair, normally provided with a foot pedal actuated pump for elevating the lifting jack, with a motor driven pump, in such a manner that conversion of the pedally actuated elevating mechanism to a motor driven pump elevating mechanism may be easily accomplished with a minimum of cost and inconvenience. Conventional dental and like chairs are usually provided with a housing 14 for enclosing the mechanism which normally interconnects the conventional foot pedal with the jack elevating mechanism. In accordance with the present invention, the usual connections in the housing 14 are removed and the pump and motor mounting, constructed in accordance with the present invention, are substituted therefor.

The housing 14 has openings 15 and 16 therein at opposite ends thereof and in the present instance, a resilient member 17, such as a bushing of rubber or like material, is preferably mounted in the opening 15. A casting 18 having a shank 19 is mounted in the bushing 17, in such a manner that the shoulder 20 on the casting abuts the bushing. A fastening device 21 is suitably extended through the casting, preferably centrally thereof, and a retaining member 22 is suitably fixed to the inner threaded end 23 of the fastening device. The retaining member 22 has an inwardly directed annular flange 24 adapted to be engaged with the inner edge of the bushing 17 in such a manner that as the fastening device 21 is tightened, the bushing 17 is compressed

between the retaining member and the shoulder 20 of the casting to tightly engage the housing and casting for anchoring the casting in the housing.

An upwardly extending arm 25 is suitably connected with the casting 18 and is provided at its upper end with an aperture for receiving a fastening device 26 which extends therethrough and has a head 27 engaged with the arm to prevent complete passage of the fastening device 26 through the arm in one direction. A turnbuckle 28 is threadedly mounted on the threaded end 29 of the fastening device 26, the opposite end of the turnbuckle being threadedly mounted on the threaded end 30 of a fastening device 31, the other end of which fastening device 31 is fixed to a motor housing 32 as indicated at 33.

The motor housing 32 contains a suitable and preferably electric motor which may be energized through conductors 34, Fig. 1, leading to a source of power, and which may be energized or deenergized by a suitable switch 35. The motor housing 32 is preferably provided on its inner end with a supporting plate 36 having an inwardly directed annular flange 37 within which a sleeved member 38 is mounted and fixed thereto by retaining devices 39 mounted on the flange and engageable with the sleeved member 38.

The sleeved member 38 is reduced at its inner end to provide a collar 40 and internal threads are provided on the collar which are engageable with external threads at one end of a sleeve 41, a set screw 40' being provided to lock the collar in position on the sleeve 41. The sleeve 41 has an annular flange 42 at its inner end engageable with the inner edge of a resilient member 43, such as a rubber bushing, which is mounted in the opening 16 of the housing 14 at the end thereof opposite the casting 18.

In order to anchor the bushing 43 and sleeve 41 in the opening 16 of the housing, a lock nut 44 is threadedly mounted on the sleeve 41, which lock nut has an inwardly extending annular flange 45 engageable with a washer 46 interposed between the lock nut and bushing 43 in such a manner that threading of the lock nut on the sleeve 41 in the direction of the casting 18, compresses the bushing 43 whereby it tightly engages both the housing 14 and sleeve 41 to securely anchor the sleeve in the housing.

The motor contained within the motor housing 32 has a driving shaft 47 provided with a squared side 48 to receive the mating squared side 49 of the bore 50 in a connecting member 51, which is sleeveable on the driving shaft 47 of the motor. The connecting member 51 is provided at one end with aligned apertures for receiving a pin 52 adapted to be extended through a passage 53 in the driven shaft 54 of the pump 55.

The pump 55 is preferably of gear type and includes a housing, which the numeral 55 may designate, and interengageable gears 56 and 57 suitably mounted in close relation within the housing 55 in such a manner that actuation of the gear 57 connected with the driven shaft 54 forces pressure medium supplied to the pump housing through the outlet 58 in the housing.

In order to securely mount the gear pump 55 in the housing 14, the pump housing is provided with a lateral extension 59 engaged about the sleeve 50, which forms a bearing for the driven shaft 54 of the pump, and the lateral extension 59 is threaded and engaged with internal

threads at the inner end of the sleeve 41. In this manner, the pump is anchored within the housing 14 so that the gear 57 thereof and the driven shaft 54 are retained in alignment with the driving shaft 47 of the motor.

The gear pump housing is suitably closed on the motor side thereof and the opposite side of the gear pump housing is closed by a cap member 61 retained in engagement with the pump housing proper by fastening devices 62. A bearing recess 63 is preferably provided in the cap member 61 for seating the bearing shaft of the gear 56 of the gear pump and an inwardly extending boss 66 on the cap member snugly engages within the inner face 67 of the gear pump to provide a sealing fit between the gear pump housing and cap member 61. An inlet opening 68 is also provided in the cap member and is preferably positioned therein at a point corresponding to the diverging peripheries of the gears 56 and 57, as indicated at 69 in Fig. 4, in such a manner that as pressure medium is fed to the point 69 of the gear pump housing, such pressure medium is carried outwardly within the teeth of the gears and then inwardly as the peripheries of the gears converge and approach a completion of one revolution for compression of the medium to force it through the outlet 58 of the gear pump housing.

In order to supply the gear pump with pressure medium, the inlet 68 in the cap member communicates with a conduit 70 which, through an L connection 71 and the fittings 72, Fig. 3, communicates with the inlet member 13 leading to the sump 4.

The outlet 58 in turn leads through the connection 73 to the air bell 10 and thence to the hydraulic system to elevate the jack.

The operation of an apparatus constructed as described is as follows:

Assuming the pump and motor mounting, constructed in accordance with the present invention, to be substituted in the housing 14 for the corresponding mechanism of conventional pedally actuated jack elevating mechanisms, and further assuming the jack 2 to be in lowered condition, the motor in the motor housing 32 is energized by actuation of the switch 35. Energization of the motor rotates the motor shaft 47 and pump shaft 54 through the connecting member 51 and the gear 57 in the pump is rotated in a direction opposite that of rotation of the gear 56. Any pressure medium in the pump housing is forced through the outlet 58 and an additional supply of pressure medium is drawn from the sump 4 through the inlet member 13 and its connections through the inlet in the cap member 61 into the gear pump housing in such a manner that the additional supply is also forced out of the outlet 58. From the outlet 58 the pressure medium is transmitted to the connection 73 and the air bell 10 and from the conduit 9 to the piston chamber 8 and thence to the lifting device 6 for smoothly and efficiently raising the jack 2. Release of the switch 35 governs the desired elevation of the jack 2.

When it is desired to lower the chair on the jack 2, the pedal member 12 is actuated for acting on the relief valve 11 to relieve pressure in the lifting mechanism 6 and return the pressure medium to the sump 4 whereby the jack is lowered under the influence of gravity as in conventional practice.

The principal advantages in an apparatus constructed and operated as described, and particu-

larly the motor driven pump mounting thereof, are that special designs of pedestals are not necessary to convert pedally operated elevating mechanisms to motor driven elevating mechanisms and economies are thus effected for users. The elevating mechanism is easily operated and smoothly and efficiently actuated. The motor and pump are positively mounted on the pedestal in aligned relation and in resilient condition to the end that vibrations and normally hard wear do not adversely affect operation of the apparatus. The mounting is easily assembled and quickly installed, and little or no inconvenience is therefore encountered in changing chairs of this character from pedal to motor driven design.

What I claim and desire to secure by Letters Patent is:

1. An apparatus of the character described including a support having a housing thereon, a pump having a driven shaft extending therefrom, a motor having a driving shaft extending therefrom, means on the motor fixing said motor to said housing in alignment with said pump driven shaft, means interconnecting said driving and driven shafts, a casting mounted on said housing, and means mounted on said casting engaged with said motor for aiding in supporting the motor on the housing.

2. An apparatus of the character described including a support having a housing thereon extending exteriorly thereof, a pump including a casing having a driven shaft extending therefrom, a motor including a housing having a driving shaft extending therefrom, means on the motor fixing said motor to said housing in alignment with said pump driven shaft, means interconnecting said driving and driven shafts, a casting mounted in said housing at the end thereof opposite the motor, and a turnbuckle mounted on said casting engaged with said motor housing for aiding in supporting the motor on the housing.

3. An apparatus of the character described including a support having a housing thereon, a pump having a driven shaft extending therefrom, a motor having a driving shaft extending therefrom, means on the motor fixing said motor to

said housing in alignment with said pump driven shaft, means interconnecting said driving and driven shafts, a casting mounted on said housing, means mounted on said casting engaged with said motor for aiding in supporting the motor on the housing, and a resilient bushing interposed between the housing and casting in compressed condition for anchoring the casting to the housing.

4. An apparatus of the character described including a support having a housing thereon, a pump, a motor, means operatively interconnecting said pump and motor, a casting mounted on said housing, means mounted on said casting and engaged with said motor for aiding in supporting the motor on the housing, a resilient bushing interposed between the housing and casting in compressed condition for anchoring the casting to the housing, and means in the casting engaged with the bushing adapted to effect compression of the bushing.

5. An apparatus of the character described including a support having a housing thereon extending exteriorly thereof, a pump including a casing having a driven shaft extending therefrom, a sleeve engaged with the pump casing and housing respectively and extending outwardly relative to the housing, a motor including a housing having a driving shaft extending therefrom, means on the motor engaged with said sleeve for fixing said motor to said housing in alignment with said pump driven shaft, means interconnecting said driving and driven shafts, a resilient member interposed between said sleeve and housing in compressed condition for anchoring the sleeve to the housing, a casting mounted in said housing at the end thereof opposite the sleeve, a turnbuckle mounted on said casting and engaged with said motor housing for aiding in supporting the motor on the housing, a resilient member interposed between the housing and casting in compressed condition for anchoring the casting to the housing, and means engaged with the second named resilient member adapted to effect compression thereof.

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