March 31, 1936. O. H. PIEPER ET AL 2,036,098

FLUID COMPRESSOR

Filed June 28, 1934 2 Sheets-Sheet 1

Fig. 1

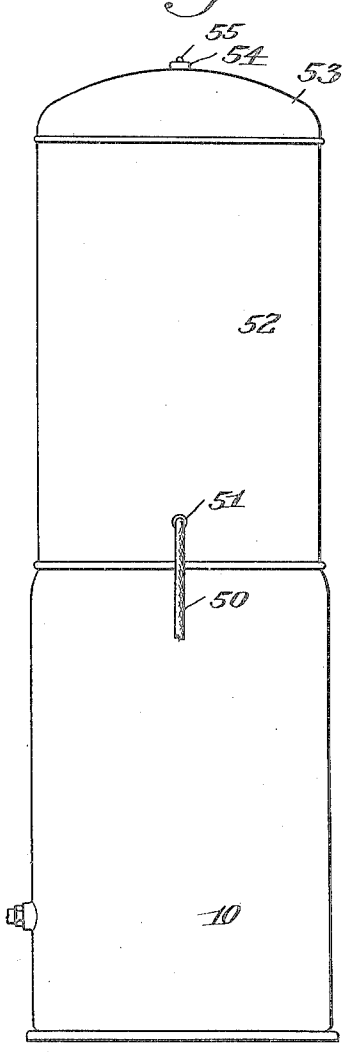
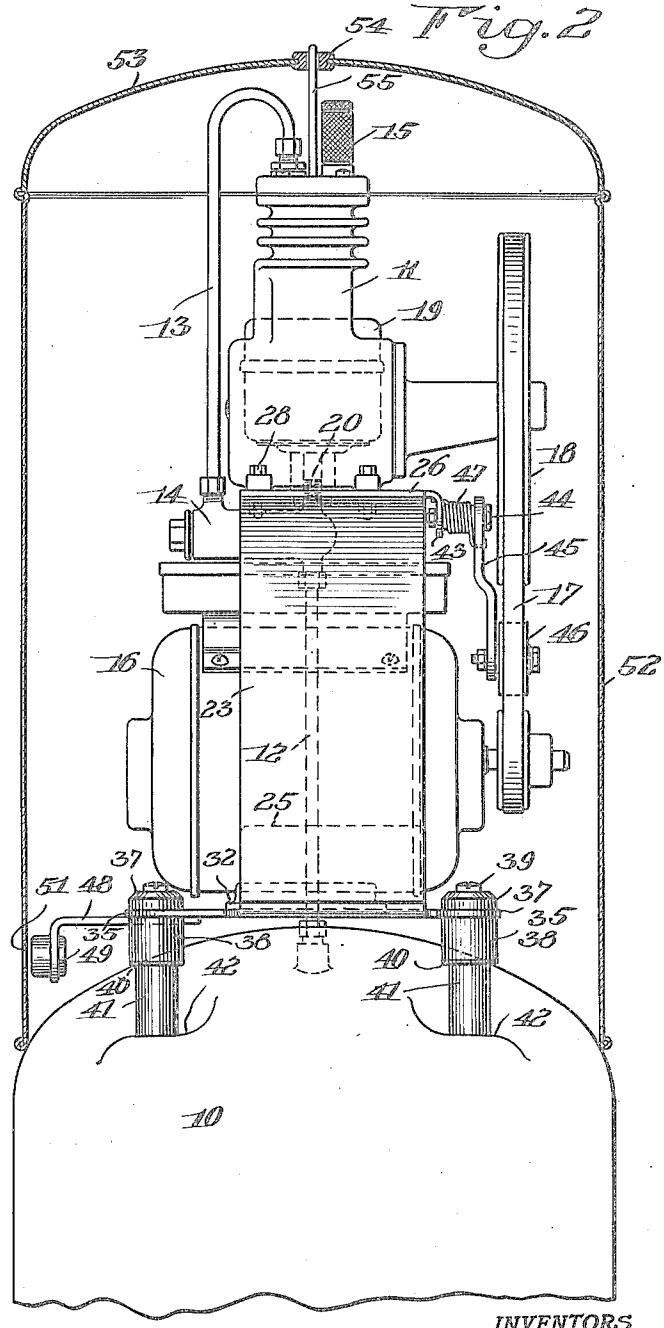


Fig. 2



INVENTORS
Oscar H. Pieper
BY Alphonse F. Pieper
Edward K. Cumpston
their ATTORNEY

March 31, 1936. O. H. PIEPER ET AL 2,036,098

FLUID COMPRESSOR

Filed June 28, 1934 2 Sheets-Sheet 2

Fig. 3

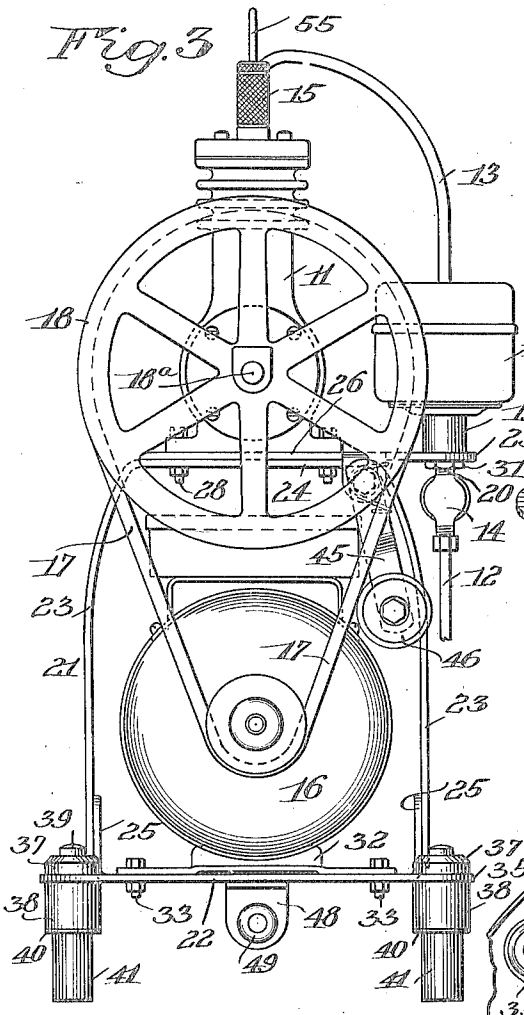


Fig. 6

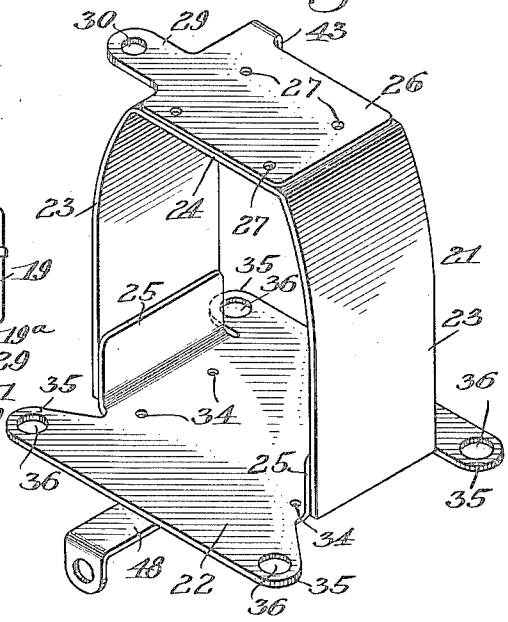


Fig. 4

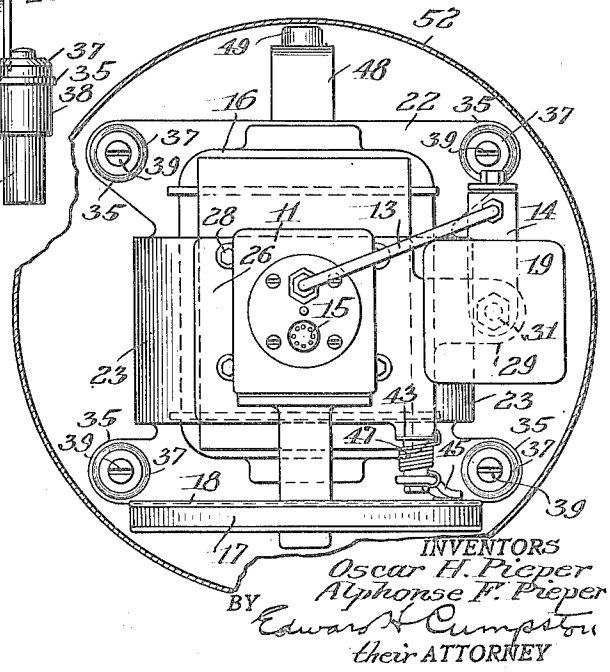
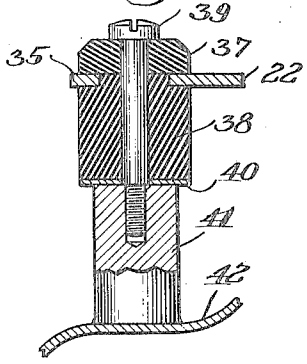


Fig. 5



INVENTORS
Oscar H. Pieper
Alphonse F. Pieper
BY Edward A. Cumpston
their ATTORNEY

Patented Mar. 31, 1936 2,036,098

UNITED STATES PATENT OFFICE

2,036,098

FLUID COMPRESSOR

Oscar H. Pieper and Alphonse F. Pieper,
Rochester, N. Y.

Application June 28, 1934, Serial No. 732,846

11 Claims. (Cl. 230—58)

The present invention relates to fluid compressing means and has for its object to provide a compact and simplified compressor unit which can be economically constructed and operated.

A further object of the invention is to provide a combined fluid holding tank and compressor unit constructed in a manner to insure quiet and efficient operation and one which comprises relatively few parts capable of being readily assembled and conditioned for operation.

A further object of the invention is to provide an improved mounting or bracket for the motor and compressor, comprising a compact and relatively strong supporting unit by which the motor and the compressor are brought close together and one affording a certain degree of flexibility and adapted to prevent any substantial transmission of the vibrations set up by the operation of the motor and compressor to the tank on which the bracket is mounted.

A further object is to provide improved resilient supporting means between the bracket and the tank designed to absorb the shocks and vibrations incident to the movements of the several operating parts of the compressor unit.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a view in elevation of a tank and a casing thereon containing apparatus embodying the invention;

Fig. 2 is a sectional elevation through the casing showing the fluid compressor and supporting and operating parts therefor superimposed upon the tank;

Fig. 3 is a side elevation of the motor and compressor as viewed from the right of Fig. 2 with the casing removed;

Fig. 4 is a top plan view of the compressor unit with the casing shown in section;

Fig. 5 is an enlarged sectional elevation through one of the resilient mountings of the unit interposed between the latter and the fluid receiving tank, and

Fig. 6 is a perspective view of the compressor and motor carrying bracket.

The same reference numerals throughout the several views indicate the same parts.

The present invention relates to a fluid compressor unit designed particularly for use by the dental profession, and constructed in a manner to insure efficient service and extreme quietness in operation through the provision of means by which elimination of the effect of vibration in the various parts of the apparatus is afforded.

Generally, the present structure comprises a fluid holding tank having an electric motor and a fluid compressor superimposed thereon, with resilient means interposed between the tank and the compressor unit, the latter having automatic means for stopping the motor controlled by the pressure within the tank.

Referring to the drawings, 10 designates a tank or reservoir adapted for receiving and containing the compressed air or fluid, the tank being connected with the pump or compressor 11 by means of pipes 12 and 13 and the air filter 14 interposed on said pipes, the pump intake being indicated at 15.

The electric motor for operating the compressor is designated by the reference character 16 and is adapted to drive the belt 17 for operating the pulley 18 fixed on the drive shaft 18a of the compressor.

The electric switch for breaking the motor circuit to stop the motor when a predetermined pressure is built up within the tank, is enclosed within a casing 19 containing pressure responsive means for opening the switch, the casing communicating with the pressure line through an extension 20 of the air filter 14 as described hereinafter.

It will be understood that the compressor, the motor, and the pressure operated switch mechanism may be of any preferred or well known type and that the switch mechanism or its control means can be adjusted to afford different degrees of pressure within the tank from time to time as may be desired.

The motor and compressor are carried by an improved supporting structure such as the unitary mounting bracket designated generally by the reference character 21 and best illustrated in Fig. 6. The bracket comprises a base 22 having an upstanding support thereon comprising the side plates 23 which are preferably curved inwardly at their upper ends and connected by a transverse plate 24 overlying the base. The upstanding support is in the form of an inverted U-shaped member, the ends of which are preferably connected with the base 22 by turning up flange-like portions 25 at two sides of the base and securing said ends thereon in any suitable manner, as for example, by spot welding.

The transverse portion 24 of the U-shaped support is provided with an overlying plate 26, preferably secured thereon by spot welding and hav-

ing holes 27 alined with corresponding holes in the plate 24, not shown, of the U-shaped support. The compressor is superimposed upon the plate 26 and is secured thereon by the bolts 28 extending through lugs on the base of the compressor and through the holes 27 whereby to firmly secure the compressor upon the bracket.

The plate 26 is provided with an apertured extension 29 forming a support for the motor switch casing 19 and the air filter 14, the latter having its outlet portion 20 extending through the opening 30 of the extension and threaded within the depending portion 19a of the switch holding casing 19. A nut 31 serves to clamp the air filter 14 and the switch casing 19 upon the extension 29 of the bracket, as shown in Fig. 3.

The motor is supported within the inverted U-shaped support 21 beneath the compressor and in overlying relation with respect to the base, by a saddle 32 preferably secured to the motor by spot welding. The saddle is seated upon the base and is secured thereon by the bolts 33 extending through the holes 34 of the base, Figs. 3 and 6.

The base is provided with foot-like portions or extensions 35 arranged in pairs at opposite sides of the U-shaped supporting member and each of which has an opening 36 therein, as shown in Fig. 6. The openings are provided to permit the upper and lower portions 37 and 38 of the rubber or rubber-like mountings to contact one with another, as indicated in Fig. 5, as well as to provide clearance for the screws 39 extending through the resilient mountings. Bearing plates 40 on which the mountings are seated are carried by the rigid upstanding lugs 41 on the depressed portions 42 of the head of the tank 10, Figs. 2 and 5, which may be welded or otherwise secured on the tank. With this arrangement there are no metal parts directly connecting the base plate 22 with the lugs 41 of the tank, so that the effective transmission of any vibrations from the base plate to the tank, due to the operation of the compressor unit, is avoided by the yieldable rubber or rubber-like mountings interposed between the tank and the base plate. By tightening the screws 39, the rubber mountings are firmly clamped upon the lugs 41 of the tank. The base plate 22 is spaced from the walls of the tank at all points and from any metal parts connected therewith, thus avoiding the setting up of vibrations in the tank structure and the objectionable noises which would result from the same.

Furthermore, the supporting bracket 21 is constructed in such a manner as to afford a certain degree of resiliency or flexibility whereby it will better absorb the vibrations incident to the operation of the motor and the compressor. This is true for the reason that the bracket is constructed of relatively thin and somewhat flexible sheet material which will yield to a certain extent under pressure of the operating parts carried thereby.

The cushioning effect of the bracket is further enhanced by the particular construction shown, embodying the narrow foot-like extensions 35 of the base which are capable of being flexed under pressure, the same being true of the relatively thin upstanding side plates 23 of the bracket carrying the weight of the compressor and yielding slightly under the load thereof during operation of the unit.

Moreover the construction of the bracket is such as to provide for a compact arrangement of the operating parts of the unit since it permits the motor and the compressor to be positioned relatively close together and also permits the unit to be mounted on and relatively close to the fluid holding tank, thereby reducing the overall length of the apparatus.

The plate 26 of the bracket is provided with an outwardly extending downwardly bent lug 43 adapted to receive a bolt 44 pivotally supporting an arm 45 having an idler 46 thereon for tensioning the belt 17, under the pressure exerted upon the arm by the spring 47, Figs. 2 and 3.

The base 22 is provided with a laterally extending arm 48 secured thereon, preferably by spot welding, the arm being provided with a thimble 49 for receiving and supporting the cord 50 containing the wires or connections for supplying current to the motor, the cord being extended through an opening 51 in the casing or cover 52 for the compressor unit. The casing includes a dome-like portion 53, in the center of which is secured a ring 54 formed of rubber or other suitable material. A guide rod 55 is extended upwardly from the fluid compressor and projects through the ring, as shown in Fig. 2, the opening of the ring surrounding the rod affording a passage for the supply of air for the intake 15 of the compressor. The rod is adapted to facilitate the centering of the cover for the compressor unit on the tank 10, the cover being secured in position by any suitable means, not shown, and serving to deaden any vibrations or noises which may result from the operation of the motor and compressor.

It will be understood that the term "rubber" or "rubber-like material" employed herein is used in a relatively broad sense and is intended to cover natural or synthetic rubber or similar material capable of use as a resilient supporting means for the compressor unit.

We claim:

1. In fluid compressing means, a tank for receiving the compressed fluid, a unitary bracket overlying the tank, a fluid compressor carried by the bracket for supplying the tank, a motor mounted on the bracket independently of the compressor and operatively connected with the compressor, a plurality of mounting members having their upper ends seated on the bracket each comprising a body of relatively soft, resilient material, upstanding supporting parts on the tank forming seats for the lower ends of said mounting members, the latter forming cushioning means for the bracket and the parts carried thereby, and means connecting the mounting members with said upstanding supporting parts.

2. In fluid compressing means, a tank for receiving the compressed fluid, a unitary supporting structure overlying the tank, a fluid compressor carried by the supporting structure for supplying the tank, a plurality of rubber mounting members having portions seated on the supporting structure and forming resilient supporting means therefor, supporting parts on the tank forming seats for said mounting members, and securing devices for said mounting members extending therethrough and connecting said members with said supporting parts, said securing devices being spaced from the supporting structure.

3. In fluid compressing means, a tank for receiving the compressed fluid, a unitary supporting bracket overlying the tank, comprising a base plate provided with extended foot-like portions having openings therein, said base plate having an inverted U-shaped support extending upwardly therefrom, a compressor superimposed upon said U-shaped support for supplying the tank,

a motor supported by the base plate within said inverted U-shaped support and operatively connected with the compressor, a plurality of rubber mounting members interposed between the tank and said extended foot-like portions of the base plate, said mounting members being supported by the tank and extending into engagement with said foot-like portions and in registry with the openings therein, and securing devices for the mounting members extending therethrough in spaced relation to said foot-like portions and connecting said members with the tank.

4. In fluid compressing means, a tank for receiving the compressed fluid, a unitary supporting bracket overlying the tank comprising a base plate provided with extended foot-like portions having openings therein, said bracket adapted to support a compressor and a motor for operating the compressor, a plurality of rubber mounting members interposed between the tank and said extended foot-like portions of the bracket, said mounting members being supported by the tank and extending into engagement with said foot-like portions and in registry with the openings thereof, and securing devices for the mounting members extending therethrough in spaced relation to said foot-like portions and serving to connect said mounting members with the tank.

5. In fluid compressing means, a unitary bracket for supporting a fluid compressor unit in superimposed relation upon a tank for receiving the compressed fluid, said bracket including a base plate having an upstanding support thereon, said base plate having foot-like extensions provided with openings, a plurality of rubber mounting members depending from said foot-like portions in registering relation with respect to the openings, said mounting members being adapted to be received and supported by the tank, and securing devices for the mounting members extending through said openings in spaced relation to said foot-like extensions and through the mounting members and adapted to connect the latter with the tank.

6. In fluid compressing means, a tank for receiving the compressed fluid, a unitary bracket including a base plate overlying the tank and adapted to support a compressor and a motor for driving the compressor, said base plate having a plurality of openings therein, a plurality of rubber mounting members for the bracket each including parts disposed on opposite sides of the base plate in registry with one of the openings thereof and in contact one with another, supporting parts on the tank forming seats for said mounting members, and means extending through said mounting members into said supporting parts and connecting the mounting members with the supporting parts.

7. A supporting structure for a fluid compressor unit including a compressor and a motor for driving the compressor, comprising a unitary bracket having a base plate and supporting means thereon adapted for the reception of the compressor, said base plate being adapted to support the motor beneath the compressor, a plurality of rubber mountings seated on the base plate and forming resilient supporting means for the bracket, said mountings each including portions extending on opposite sides of the base plate, rigid supporting elements forming seats for the mountings, and securing elements for the mountings extending therethrough and through the base plate in spaced relation to the latter, and having their ends anchored upon said supporting elements.

8. In fluid compressing means, the combination of a fluid holding tank, a flexible motor support, a flexible compressor support, a plurality of mountings on the tank on which said supports are superimposed, each of said mountings comprising a body of resilient material for absorbing and dissipating the vibrations of said supports, a motor on said first mentioned support, a compressor on the second mentioned support in spaced relation to the motor, said compressor being connected with the tank for compressing fluid therein, and means operatively connecting the motor with the compressor.

9. In fluid compressing means, the combination of a fluid holding tank, a flexible motor support overlying the tank, mountings interposed between the tank and said support each comprising a body of resilient material for absorbing and dissipating the vibrations of said support, a flexible compressor support connected with said motor support for transmitting the vibrations of the compressor to said motor support and through the latter to said mountings, a motor on the first mentioned support, a compressor on the second mentioned support connected with the tank for compressing fluid therein, and a driving element operatively connecting the compressor with the motor.

10. In fluid compressing means, the combination of a fluid holding tank having spaced upstanding parts, a flexible motor support, a flexible compressor support, said supports being superimposed one upon another, mountings interposed between said upstanding tank parts and one of said supports each comprising a body of resilient material for absorbing and dissipating the vibrations of said supports, a motor on one of said supports, a compressor on the other support having a discharge conduit connected with the tank, and means operatively connecting the motor with the compressor.

11. In fluid compressing means, the combination of a fluid holding tank, a flexible support, a second flexible support of U-shaped construction connected with the first mentioned support, a plurality of mountings interposed between the tank and one of said supports each comprising a body of resilient material for absorbing and dissipating the vibrations of said supports, a motor mounted on one of said supports, a fluid compressor mounted on the other support and having a discharge conduit leading to the tank, and driving means for said compressor operated by said motor.

OSCAR H. PIEPER.
ALPHONSE F. PIEPER.