

June 24, 1947.

J. P. JASON

2,422,968

SUCTION-BLOWER DEVICE

Filed Dec. 11, 1943

2 Sheets-Sheet 1

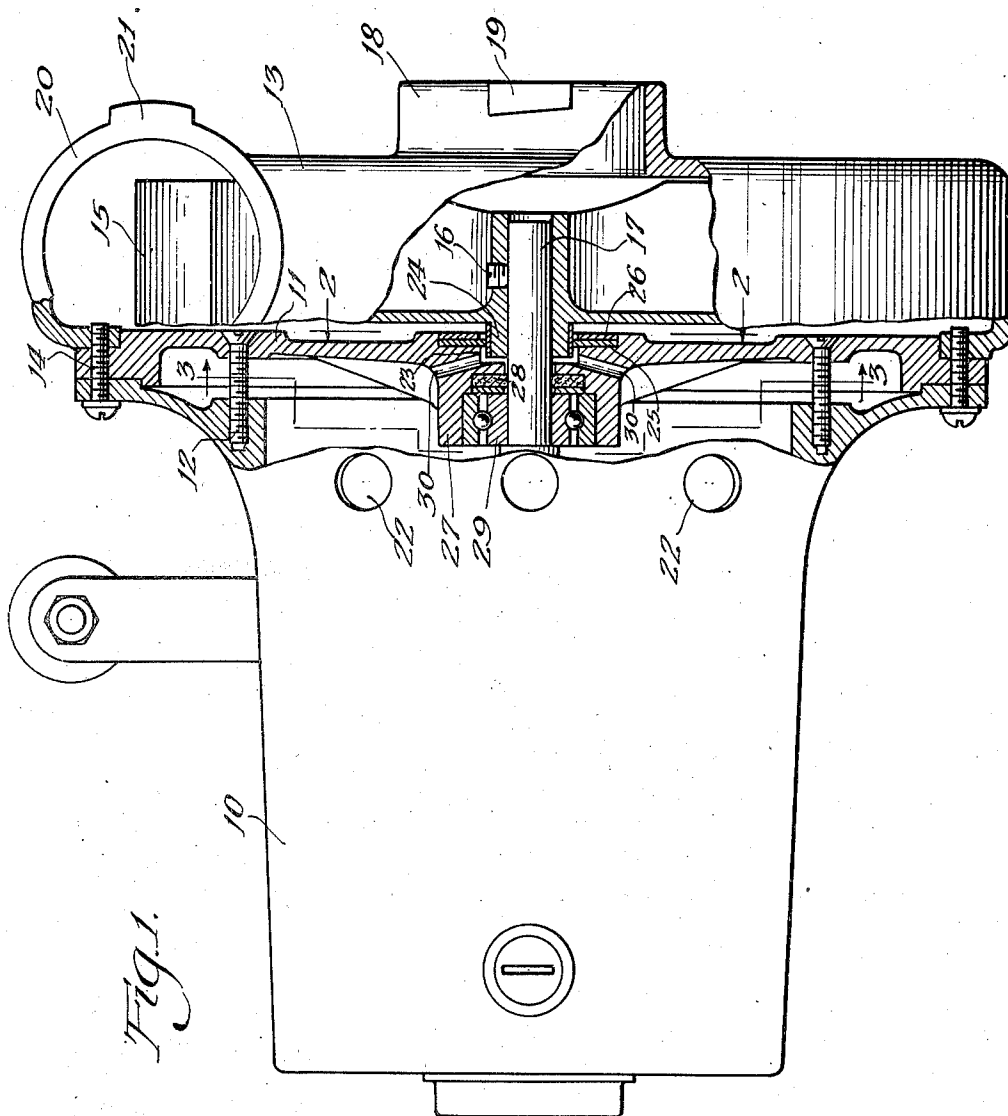


Fig. 1.

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Fig. 2.

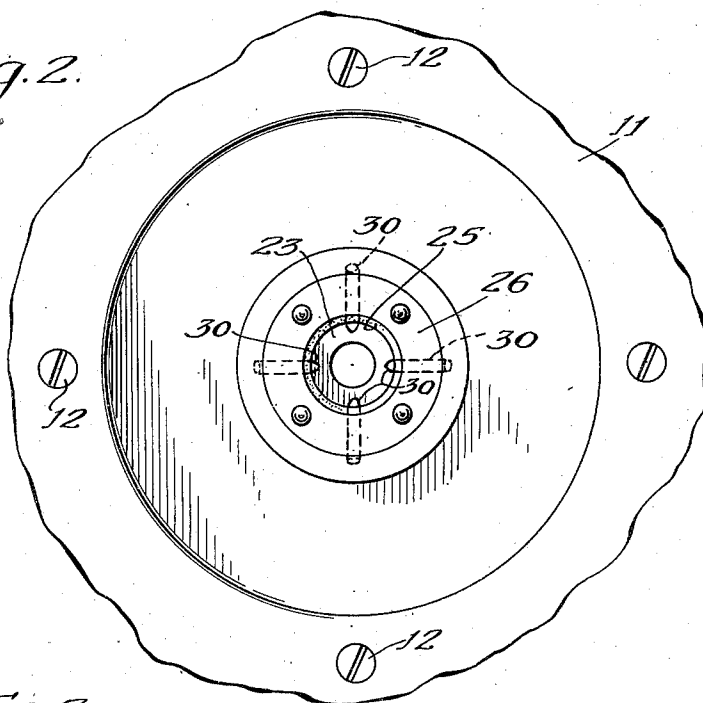
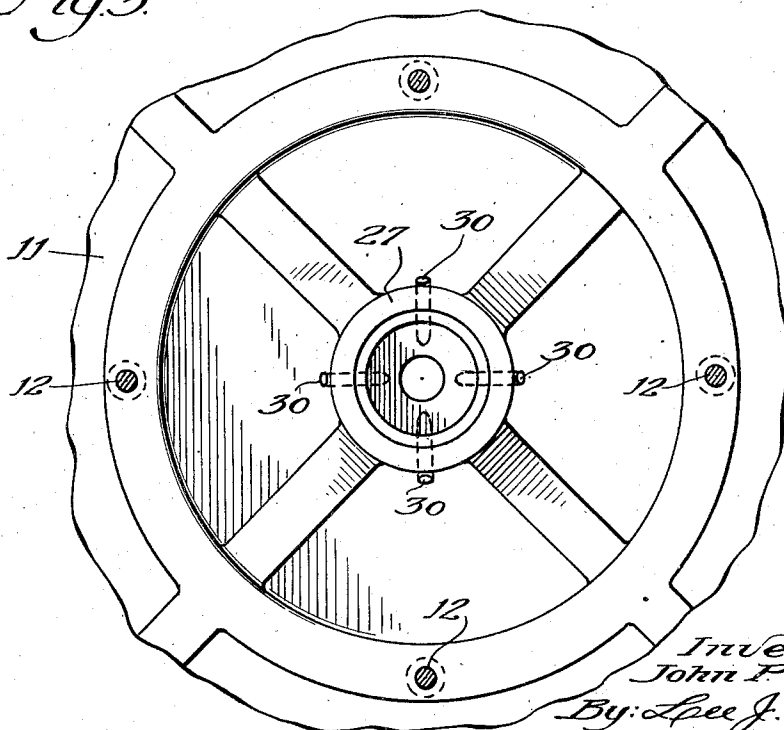


Fig. 3.



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UNITED STATES PATENT OFFICE

2,422,968

SUCTION-BLOWER DEVICE

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Application December 11, 1943, Serial No. 513,890

1 Claim. (Cl. 230—117)

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This invention relates to improvements in a combined blower and suction device, that is, a unit which is adapted and readily convertible for use as a blower, sprayer or vacuum cleaner.

In general such suction-blower units comprise a motor housed in a suitable casing having communication therethrough to the atmosphere, a fan secured to the motor shaft and enclosed in a fan casing, the two casings being secured together, and an intermediate partition or motor casing and closure, the partition being provided with an annular boss or hub seating a motor shaft bearing.

In operation of the device as a suction cleaner, which entails constriction of the air stream entering the fan casing suction inlet, a condition of sub-atmospheric pressure is caused to exist in the fan casing. A tendency to relieve and balance this condition is brought about by air entering the motor casing with the result that atmospheric dust is moved through the motor shaft bearing in a direction from the motor to the fan with attendant gumming of bearing lubricant and undue abrasion of the bearing and shaft. Conversely when the device is operated as a blower, which entails construction of the air stream delivered from the fan casing exhaust outlet, a condition of super-atmospheric pressure is built up in the fan casing with a tendency to likewise relieve this condition through the motor casing. In this instance atmospheric dust will be moved along the motor shaft and the bearing in a direction from the fan to the motor, with like detrimental action.

It is therefore an object of the present invention to provide means in a suction-blower device of the class described for permitting the establishment and maintenance of substantially normal atmospheric pressure along and within the bearing of the motor shaft between the motor and the fan during operation of the device either as a blower or suction cleaner, and to thereby prevent tendency for dust particles to move into the bearing with attendant greater life of the parts and enhanced efficiency and economy.

Other objects relate to details of construction and arrangement of parts which will be apparent from a consideration of the following specification and drawings, wherein:

Fig. 1 is a side elevational view, with parts broken away and partly in section illustrating my invention.

Fig. 2 is a fragmentary elevation of the partition between the fan and motor casings viewed

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in the direction of the line 2—2 of Fig. 1, illustrating my invention.

Fig. 3 is a view similar to that of Fig. 2, but viewed in the direction of the line 3—3 of Fig. 1.

Referring to the drawings, the reference numeral 10 indicates the motor casing of my suction-blower unit, one end thereof being closed by the end closure plate 11 secured thereto by suitable screws as at 12. Mounted against the closure plate 11 is the fan casing 13, the three parts being secured together by suitable screws as at 14, the closure plate 11 thus acting as a partitioning member between the motor and fan casings.

A centrifugal fan 15 is secured as at 16 to the end of the motor shaft 17 which extends through the closure plate 11. The fan casing is provided with an axial suction inlet 18 having a bayonet fixture 19 by means of which a suitable suction hose and mouth may be attached when the device is used as a suction cleaner. The fan casing is further provided with a tangential exhaust port 20 provided with a similar bayonet fixture 21 to which may be attached a suitable dust bag when the device is employed as a suction cleaner, or a suitable hose and nozzle when employed as a blower.

The motor casing is provided with a series of peripheral apertures 22 adjacent the end plate 11 to provide communication with the atmosphere for cooling the motor aided by a fan, not shown, generally provided on the motor shaft adjacent the apertures. The motor casing is likewise provided with screen covered apertures at the opposed outer end, not shown, for the purpose of admitting air to cool the motor parts.

The motor end closure plate 11, in its face adjacent the fan 15, is provided with an annular seat 23 which received the relatively smaller diameter hub 24 of the fan, the face of the plate 11 being counterbored to position a leather gasket or the like washer 25, the latter being held in position by the ring 26. The opposed face of the plate 11 is provided with an annular boss 27, extending in the direction of the motor, seating the washer 28 and the shaft bearing generally indicated as 29.

For the purpose of establishing a condition of normal atmospheric pressure along the shaft 17, where it is journaled by the bearing 29, during operation of the device either as a blower or suction cleaner, and to thereby prevent ingress of atmospheric dust to the bearing either in a direction from the fan to the motor when a condition of super-atmospheric pressure exists in the fan cas-

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ing, or in a direction from the motor to the fan when a condition of sub-atmospheric pressure exists therein, I provide the end plate 11 with one or more, and preferably a plurality of bores or apertures 30 extending through the thickness thereof. These bores 30 extend obliquely as illustrated through the boss 27 to provide a path which extends from the root of the boss 27 at its outer periphery to within the fan hub seat 23. Thus these bores 30 provide a path which communicates with the atmosphere, through the motor casing at one end, and with the fan chamber at the other end immediately in advance of the bearing 29.

In operation of the device as improved in accordance with my invention, when a condition of sub-atmospheric pressure exists in the fan casing 13 tendency for air to move from the motor casing and along the motor shaft 17 through the bearing 29, and thence through the seat 23 and past the washer 25 is substantially eliminated, least resistance to atmospheric pressure being presented by the apertures 30, and thus the conditions of air pressure are permitted to become equalized immediately in advance of the bearing 29 without disturbance therein. Conversely, when a condition of super-atmospheric pressure is built up in fan casing 13, such pressure past the washer 25 and through the seat 23 and thence along the motor shaft 17 will be relieved through the bores 30 instead of through the shaft bearing 29. In this manner a condition of substantially normal atmospheric pressure will be enabled to exist in the bearing 29 and the parts thereof, and between it and the shaft 17, during all conditions of operation of the suction-blower unit, and without undue abrasion of the parts or gumming of lubricant by reason of freedom from disturbance by air and airborne contaminants.

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I claim as my invention:

In a suction blower device of the class described, an electric motor having a casing opened at one end to the atmosphere, a plate-shaped partition secured to the open end of the motor casing and having a central opening formed therein to receive a motor shaft, a fan casing formed with a suction inlet and exhaust outlet and an open end, said fan casing being mounted on said partition and having its open end closed by same, a centrifugal fan disposed within the fan casing and secured to the end of the motor shaft on the opposite side of the partition from the motor, the central opening in said partition being formed with an annular recess defining an air chamber between the motor shaft and the wall defining said central opening, gasket means mounted within said central opening of the partition and disposed at opposite ends of said annular recess defining the air chamber, said partition having an unobstructed air duct passage leading from said annular recess defining the air chamber around the shaft to exhaust within the interior of the motor casing, and an anti-friction bearing mounted in said central opening formed in said partition and adjacent the motor side of said annular recess to provide an auxiliary support for the motor shaft.

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