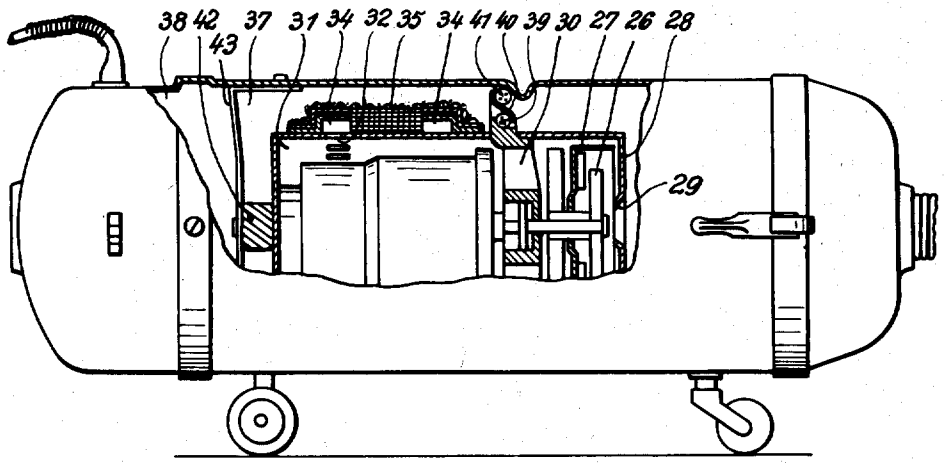
Feb. 11, 1936. O. GRAVE 2,030,366

ELECTRIC VACUUM CLEANER

Filed Oct. 26, 1934 2 Sheets-Sheet 1

FIG.1



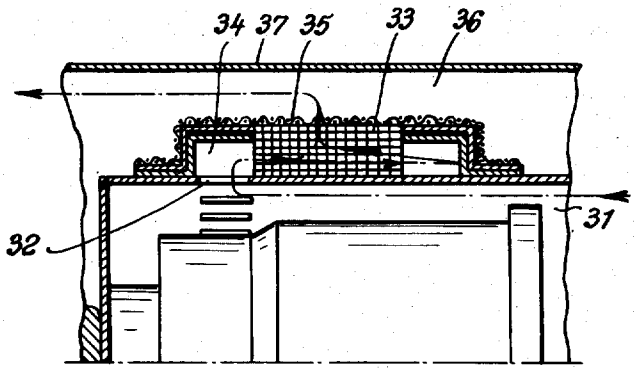


FIG.2

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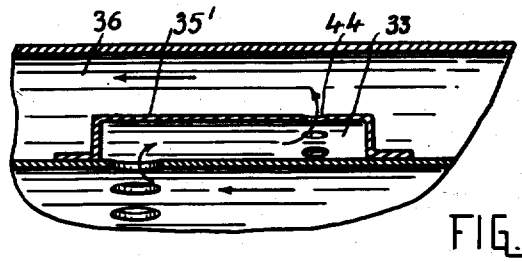

FIG. 3.

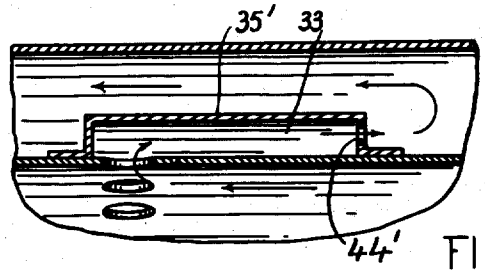

FIG. 4

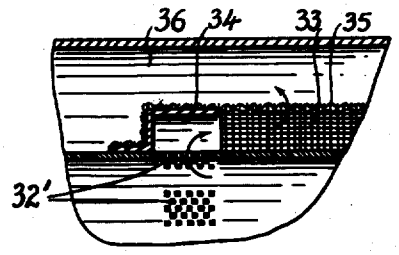

FIG. 5

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UNITED STATES PATENT OFFICE

2,030,366

ELECTRIC VACUUM CLEANER

Otto Grave, Berlin, Germany

Application October 26, 1934, Serial No. 750,140
In Germany November 4, 1933

3 Claims. (Cl. 230—232)

The invention relates to an electrical vacuum cleaner in which both the noises of the motor and of the current of air are almost entirely suppressed.

It has already become known, to mount the motor-fan apparatus, with a view to damping the noise in the vacuum cleaner housing with the interposition of elastic supports, for example rubber rings. Such an arrangement is however not sufficient to lessen the noise to any considerable extent, also it has heretofore been proposed to provide air damping passages for reducing noise.

In accordance with the present invention the motor-fan is supported in and mounted on the vacuum cleaner housing by means of two superimposed rubber rings or gaskets held in position by a ring of S-shaped cross section in order to reduce the noises due to the rotation of the motor, the housing containing the motor being surrounded by an air chamber or jacket into which the air enters through slots provided for the purpose therein, said chamber being provided with a lining of canvas or other suitable material to lessen the noise caused by the current of air.

Sheet metal members may be provided for deflecting the air while to further reduce the noises from the current of air, one of the suction fans may run in a separate chamber or compartment closed by a cover having an inwardly directed inlet orifice.

In the drawings one form of construction of the object of the invention is shown by way of example.

Fig. 1 shows a vertical longitudinal section through the vacuum cleaner.

Fig. 2 shows an enlarged section through the air chamber which indicates the path of the air.

Fig. 3 is a fragmentary section illustrating a modification in the construction of the air chamber.

Fig. 4 is a similar view illustrating a further modification and

Fig. 5 is a section illustrating the employment of sieves in the housing instead of slits.

The motor driven fan 26 runs in an intermediate base pressed from one piece, which intermediate base 27 is closed by a lid 28 towards the air inlet side. The lid 28 possesses a middle part 29 drawn inwards to avoid whirling of the air. The air sucked in by the fan passes through the gaps 30 into the motor chamber 31. The motor chamber is closed on all sides and has only a number of slits 32. Instead of slits there can be provided sieves 32' permeable to air. From the motor chamber the air passes through the openings 32 into an air chamber 33 (cf. Fig. 2) which surrounds the motor housings in the form of a jacket and is provided with plates 34 or the like to deflect the air. The outer wall of the air chamber 33 is indicated by the reference numeral 35. It can for example be covered with linen or other material permeable to air, through which the air reaches the ring space 36 which lies between the wall 35 and the vacuum cleaner wall 37. From this ring space the air passes into the larger outlet chamber 38 and from there into the open.

The plates 34 have the task of deflecting the air. Owing to the linen jacket 35 there is in addition effected a damping of the air, so that the air chamber acts as an air cushion. On issuing from the chamber the air expands as the ring space 36 is larger than the chamber 33. Owing to the deflection of the air, the damping and the expansion on emerging from the smaller space into the larger one a complete elimination of the air noises is effected.

In Fig. 2 is shown the path that the air takes. As the arrows show, the air entering the fan housing passes into the motor housing 31 and from there through the slits 32 into the air chamber 33. Here the air is then projected against the plate 34, deflected and then led through the linen jacket 35 into the ring space 36 inside the casing 37. From there the air, after being deflected again, passes into the outlet chamber.

Instead of the linen covering the air chamber 33 can have a solid wall of metal or the like, which is fitted with a number of slits, openings or the like through which the air passes into the ring space 36. The slits or openings can be of any shape and in any position.

For the purpose of diminishing the motor noises the motor-fan is mounted with the aid of a ring 40 of S-shaped section of elastic material between two elastic rings 39 and 41. Owing to this double rubber bearing all noises made by the motor are damped to such an extent that they cannot be transmitted to the outer walls of the vacuum cleaner. Instead of the S-shaped ring other means can be employed. It is essential that the housing of the motor-fan apparatus should be surrounded by a rubber ring which is supported against a body and that this body itself is supported against the walls of the vacuum cleaner by means of a second rubber ring. At the front the motor housing is held in its position by a buffer 42 of elastic material which is fastened to resilient arms 43. The motor housing can also be

supported against the cap, in which case buffers or other damping means are provided.

I claim:—

1. In an electric vacuum cleaner, a casing, a housing, a motor located within said housing, two rubber rings supporting said motor from the casing, fans driven by the motor producing a vacuum, an S-shaped ring holding said rubber rings in place, said rubber rings minimizing the motor noise, an air jacket surrounding said housing, orifices in the housing for the admission of air propelled by the fans to said jacket and a lining of fabric to said air jacket for lessening the noise of entering air.

2. In an electric vacuum cleaner, a casing, a housing, a motor located within said housing, two rubber rings supporting said motor from the casing, fans driven by the motor producing a vacuum, an S-shaped ring holding said rubber rings in place, said rubber rings minimizing the noise of the motor, an air jacket surrounding said housing, orifices in the housing for the admission of air propelled by the fans to said jacket, sheet metal members located in said jacket deflecting the air, and a lining of fabric to said jacket lessening the noise of the air current.

3. In an electric vacuum cleaner, a casing, a housing, a motor located in said housing, two rubber rings supporting said motor from the casing, fans driven by the motor producing a vacuum, an intermediate chamber enclosing one of said fans, a cover to said chamber provided with an inlet orifice, an S-shaped ring holding said rubber rings in place, said rubber rings minimizing the noise of the motor, an air jacket surrounding said housing, slits in the housing for the admission of air propelled by the fans to said jacket, sheet metal members located in said jacket deflecting the entering air and a lining of fabric to said jacket lessening the noise of the air current.

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