Sept. 20, 1938. H. E. HOOVER 2,130,495

MUFFLER FOR SUCTION CLEANERS

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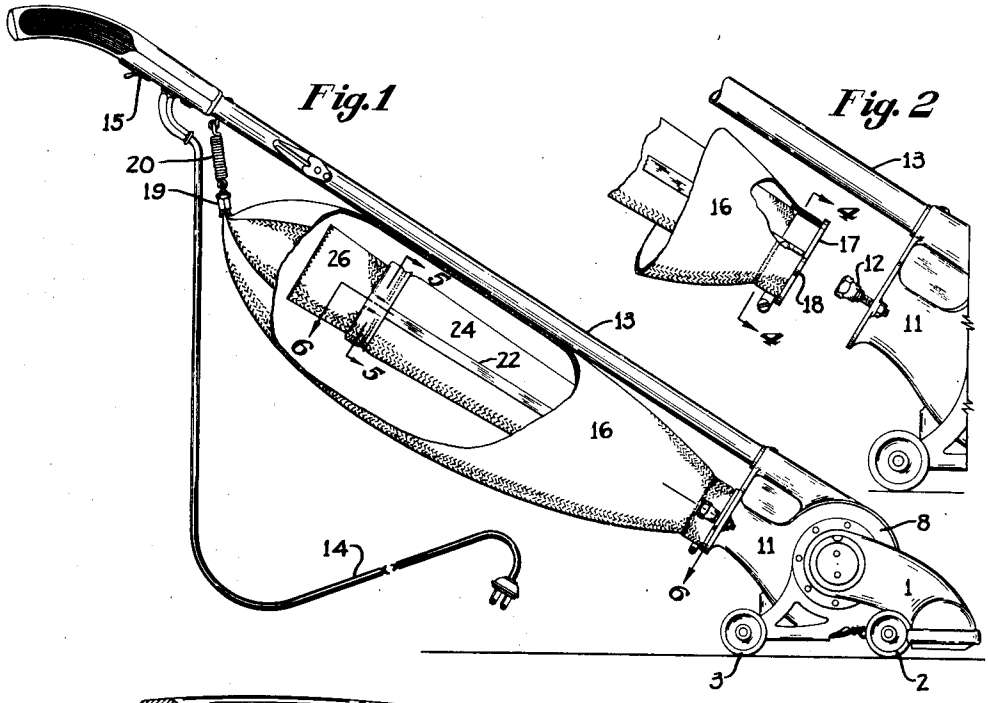


Fig. 1

Fig. 2

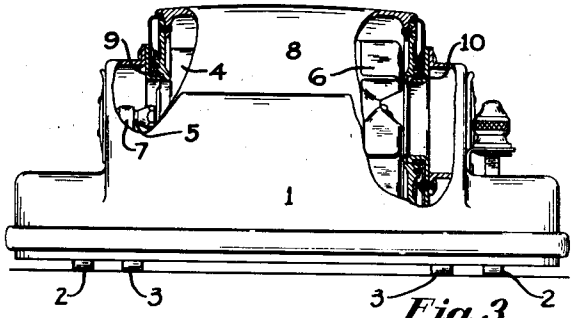


Fig. 3

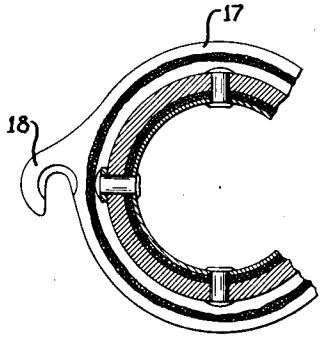


Fig. 4

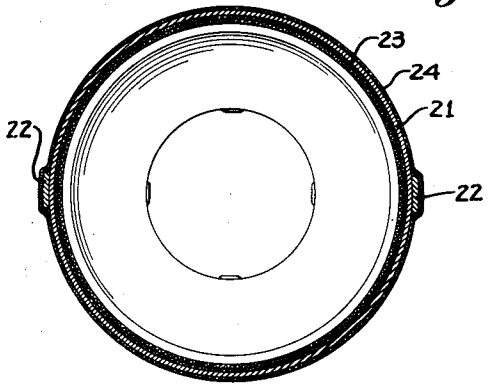


Fig. 5

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MUFFLER FOR SUCTION CLEANERS

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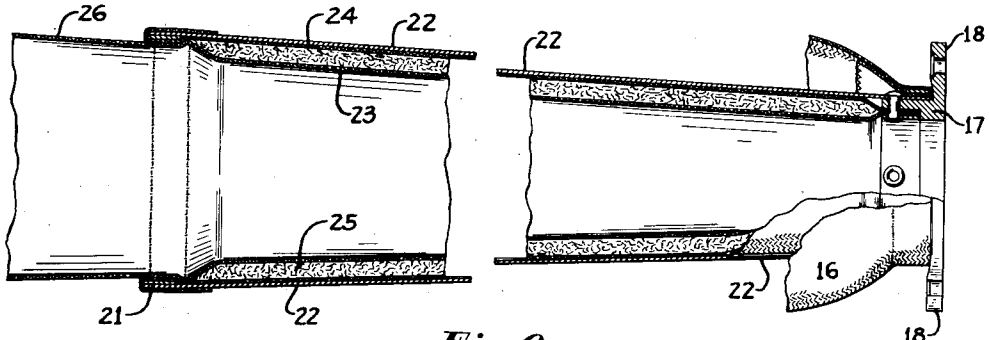


Fig. 6

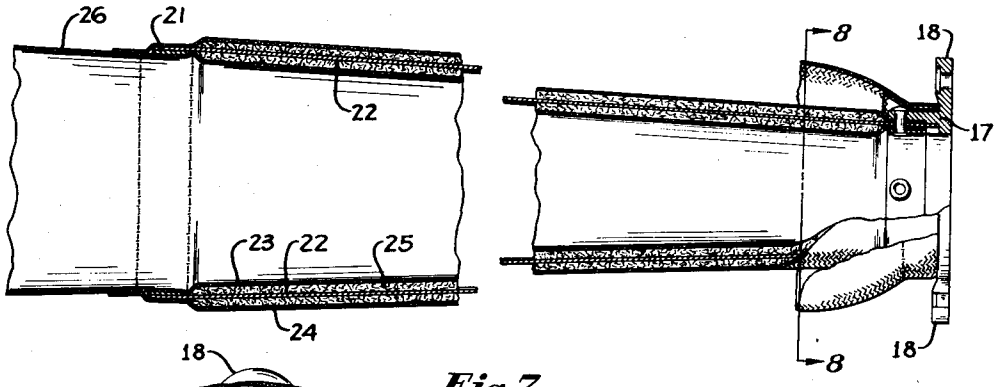


Fig. 7

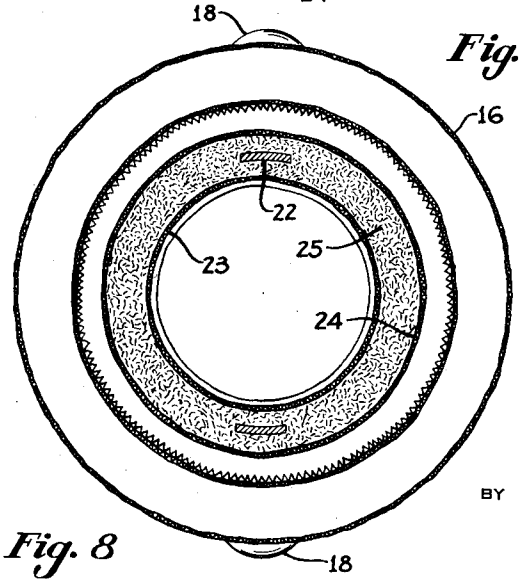


Fig. 8

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Patented Sept. 20, 1938 2,130,495

UNITED STATES PATENT OFFICE

2,130,495

MUFFLER FOR SUCTION CLEANERS

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Application April 29, 1935, Serial No. 18,779

2 Claims. (Cl. 181—42)

The present invention relates to suction cleaners in general and particularly to new and novel means to reduce the operating noise of a suction cleaner. More specifically the invention comprises a new and improved muffler which functions to deaden the sound vibrations of the high velocity air flow thru the cleaner.

The noise of operation of the modern suction cleaner is attributable to a plurality of sources. One of the major of these sources is the flow of air through the cleaner at high velocity. In the suction cleaner constructed in accordance with the present invention a muffler has been provided through which this high velocity stream of air passes. This muffler is so constructed that the vibrations in the air which have been imparted thereto in its passage through the cleaner body are absorbed and reduced in magnitude to result in an over-all decrease in the cleaner noise.

It is an object of the present invention to provide a new and improved suction cleaner. It is another object of the invention to provide a new and improved sound-deadening muffler for a suction cleaner. A still further object is the provision of a new and improved sound-absorbing muffler in a suction cleaner. A still further object is the provision of an improved suction cleaner muffler in which the body of the muffler is of pliant sound-absorbing material which is held in shape by a rigid framework. These and other more specific objects will appear upon reading the following specification and claims and upon considering in connection therewith the drawings attached hereto.

Referring now to the drawings in which preferred embodiments of the present invention are disclosed:

Figure 1 is a side view of a modern suction cleaner with a portion of the dust bag broken away to show the muffler positioned therein;

Figure 2 is a partial side view of the cleaner illustrating the separation of the cleaner bag and muffler from the cleaner proper;

Figure 3 is a front view of the cleaner body with certain parts broken away to show the interior of the machine and specifically the suction-creating means;

Figure 4 is a transverse section through the cleaner bag and muffler upon the line 4—4 of Figure 2;

Figure 5 is a transverse section through the outer end of the cleaner muffler upon the line 5—5 of Figure 1;

Figure 6 is a longitudinal cross-section through the cleaner muffler upon the line 6—6 of Figure 1;

Figure 7 is a section similar to Figure 6 through a second preferred embodiment of the invention;

Figure 8 is a section upon the line 8—8 of Figure 7.

In the drawings a modern suction cleaner is disclosed. The cleaner nozzle 1 is mounted upon a frame which is supported by spaced pairs of front and rear wheels 2, 2 and 3, 3. The driving motor 4 is positioned with its axis parallel to the nozzle 1, and its shaft carries at one end a driving pulley 5 and at its opposite end a suction-creating fan 6. A power-transmitting belt 7 connects pulley 5 to a suitable agitator which is not shown but which is positioned within the nozzle 1 and is adapted to contact a surface covering undergoing cleaning. The suction-creating fan 6 is effective, in the operation of the cleaner, to create a reduced pressure in nozzle 1 through being directly connected thereto. The combination motor casing and fan chamber 8 carries the motor 4 and fan 6 and is itself rotatably mounted about the motor axis through being provided with sealed bearings 9 and 10 at its opposite ends on the rearwardly extending side channels of the nozzle 1. The exhaust outlet 11 of the fan chamber is formed rigidly on the casing 8 and is provided at its flanged end with a clamping means, one of which is shown at 12.

The handle of the cleaner is connected rigidly to the casing 8 and is indicated by the reference character 13 in Figures 1 and 2. The incoming current-carrying leads 14 enter handle 13 near its upper end and are connected through a manually operable switch 15 before passing downwardly through the handle to be connected to the motor 4 in any suitable manner.

The cleaner dust bag 16 is secured at its lower end to a ring 17, which is flanged and formed with outwardly extending ears 18, 18, each of which is clamped to the flanged outer end of the exhaust outlet by a clamping means 12. The open upper end of the dust bag is folded and held in closed and sealed relationship by enclosing U-shaped channel 19 which is itself supported by a spring 20 from the upper end of the handle.

Within the dust bag 16 is a muffler through which all of the cleaning air exhausted from the exhaust outlet 11 must pass in entering the bag. This muffler comprises a rigid frame formed at its lower end by the ring 17 and at its upper end by a ring 21. These two rings are spaced in parallel planes by diametrically opposed rigid

metallic straps 22, 22. Between the spaced rings 17 and 21 and inside the straps 22, 22 extend inner and outer cloth cylinders 23 and 24 the space therebetween being filled by a sound-absorbing material such as felt, indicated by the reference character 25. The body of the muffler as formed by the body of felt and its protective coverings of cloth 23 and 24, is limp and pliant and without sufficient strength to maintain its intended cylindrical form so that it of necessity relies upon the rigid framework formed by the rings 17 and 21 and their inter-connecting straps 22, 22 to provide the necessary rigidity to maintain its form. The inner cloth cylinder 23 is extended beyond the outer frame ring 21, as is clearly seen in Figures 1 and 6, to form a flexible valve 26, which collapses to prevent the reversal of air flow through the muffler when the suction-creating means are turned off. The cloth material used in cylinders 23 and 24 is wear-resisting in the sense that it is long wearing under the scouring action of the suspended matter in the moving air.

Referring now to Figures 7 and 8, in particular, a second preferred embodiment of the improved suction cleaner muffler constructed in accordance with the present invention is disclosed. In accordance with this embodiment, as in the previous, a rigid frame is formed by the ring 17 and the outer ring 21 between which are connected straps 22, 22. The body of the muffler is again formed by the cloth cylinders 23 and 24 the space between which is filled by sound deadening material such as felt, which is distinguished from the first embodiment, shown in Figures 1 to 6 inclusive, the straps 22, 22 are positioned between the cloth cylinders 23 and 24, being embedded in the body of felt 25. In this construction no metallic surfaces are provided which are exposed to the air within the dust bag 16 and which could possibly transmit vibration thereto from the cleaner body.

I claim:

1. A sound-reducing muffler for a suction cleaner and forming a tubular extension of the exhaust outlet of said cleaner, comprising a rigid frame including longitudinally spaced annular frame members and longitudinal frame members extending between said annular members, and a tubular body of sound-absorbing material supported by said frame.

2. A sound-reducing muffler for a suction cleaner and forming an extension of the exhaust outlet thereof, comprising a rigid frame including an annular frame member at each end, circumferentially spaced strips extending lengthwise between said annular frame members, and a tubular sound-absorbing body supported on said frame and composed of a mass of soft fibrous material filling the space between layers of fabric.

HOWARD EARL HOOVER.