

Sept. 6, 1960

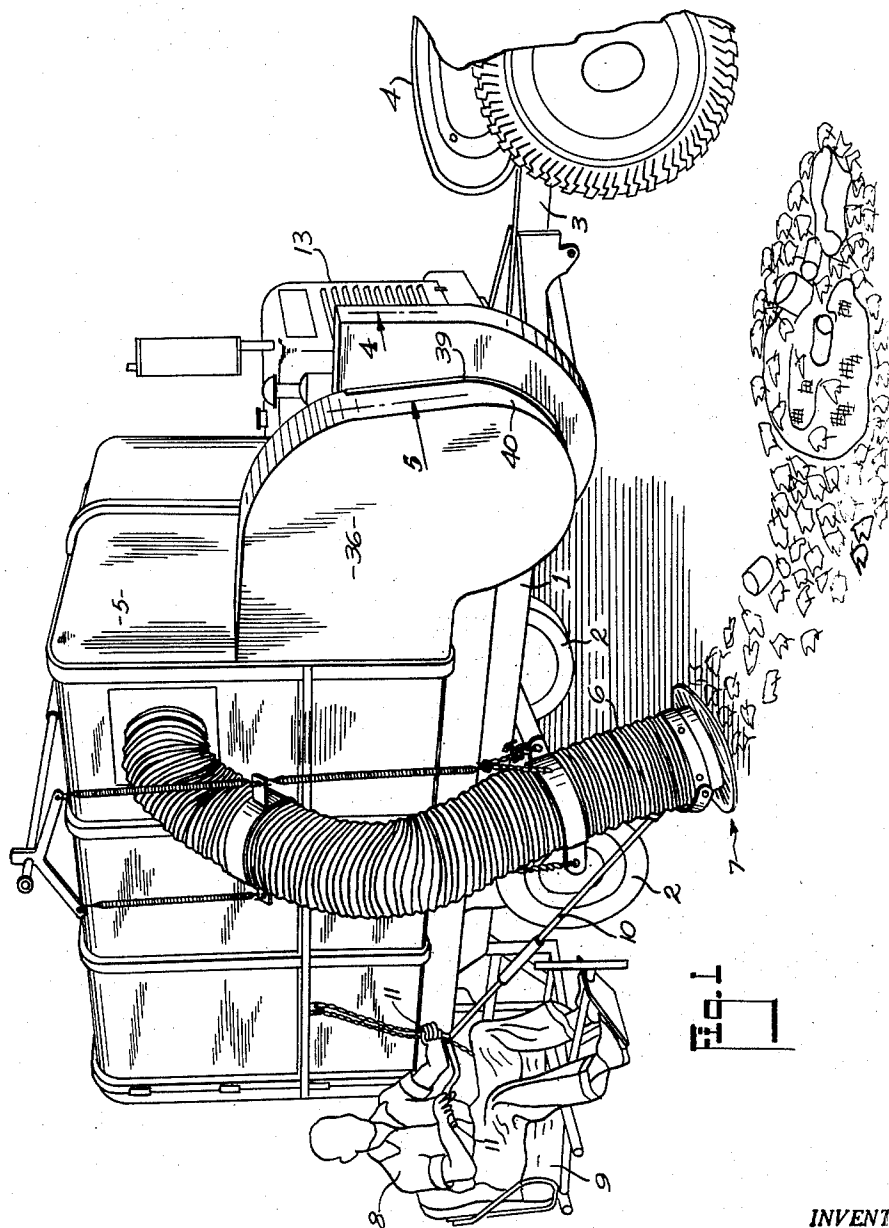
H. I. HANSON

2,951,632

AIR BLOWER

Original Filed Oct. 18, 1952

3 Sheets-Sheet 1



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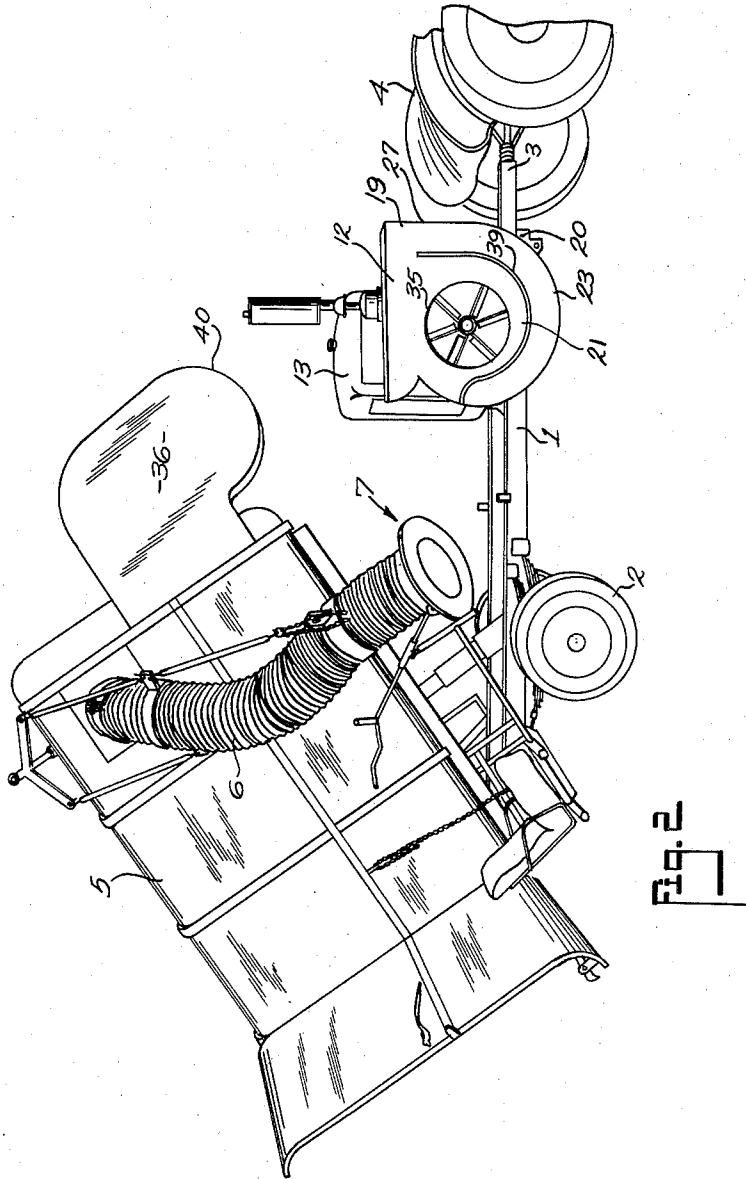


Fig. 2

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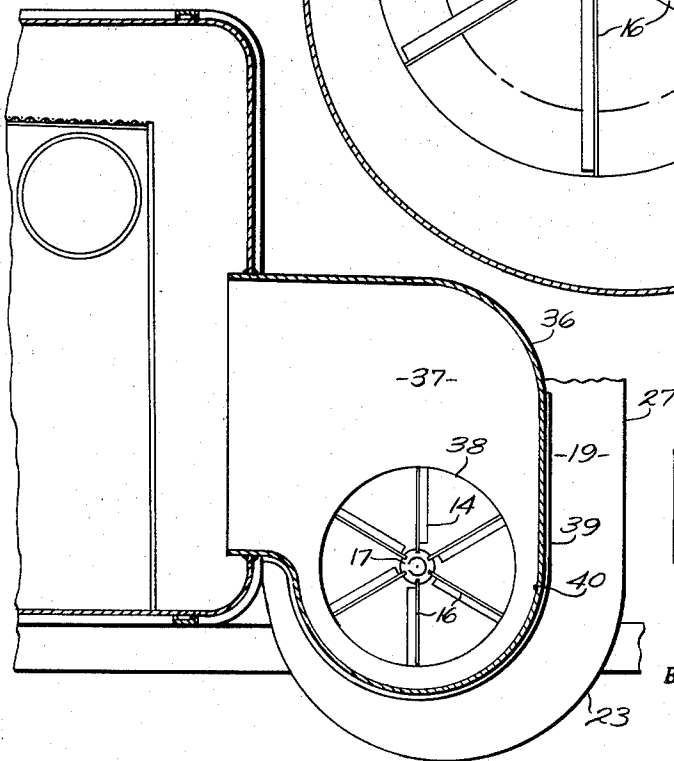
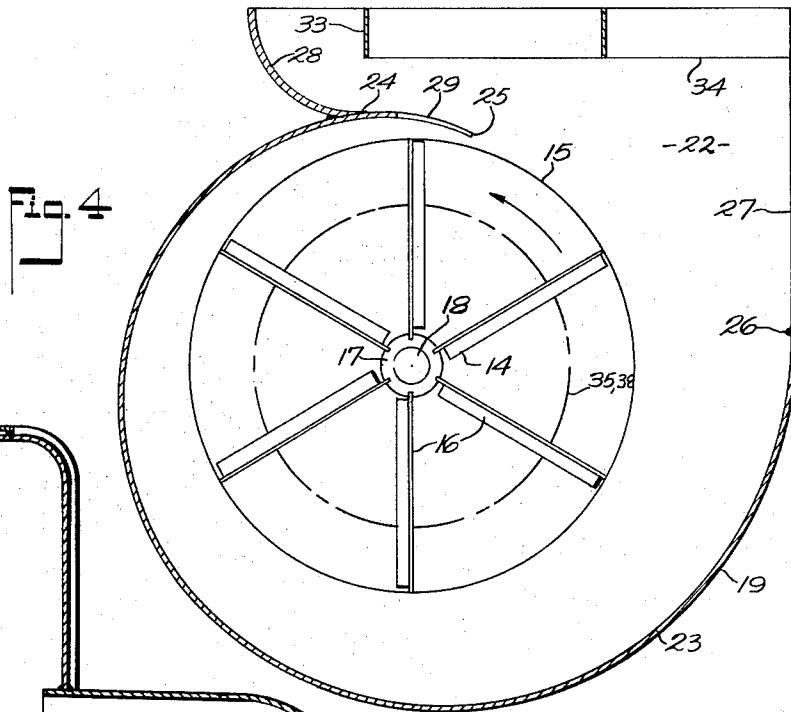
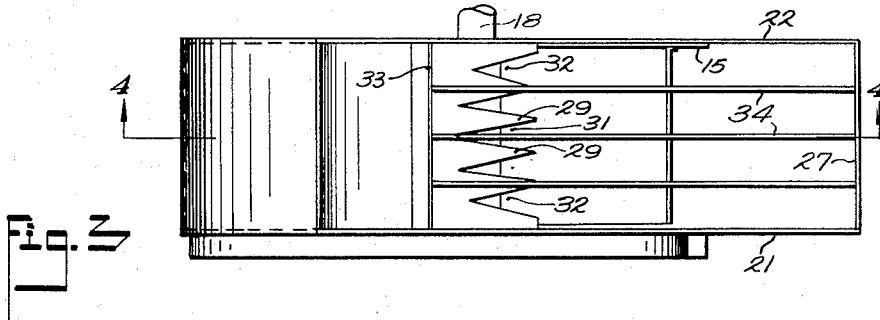


Fig. 5

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2,951,632

AIR BLOWER

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Original application Oct. 18, 1952, Ser. No. 315,509, now Patent No. 2,887,714, dated May 26, 1959. Divided and this application Nov. 21, 1955, Ser. No. 547,969

1 Claim. (Cl. 230—133)

This invention relates to road cleaning machines of the class that pick up refuse from a roadway by suction.

A machine of this class constitutes the subject matter of the co-pending patent application of Hanson, Serial Number 315,509, filed October 18, 1952, now Patent No. 2,887,714.

In said Hanson application is described a power driven blower which pumps air from a refuse collecting chamber and exhausts it to atmosphere, thereby producing partial vacuum in the chamber, and producing suction in a refuse pick-up hose communicating therewith.

The present application is divisional from said Hanson application and relates more particularly to the said blower.

The blower of the present application comprises features described in the Hanson application as follows. The "fan" or blower has a power driven rotor, with radial vanes. It is surrounded by a walled housing having a wall at right angles to the rotor axis and an air inlet opening is provided in this wall at the rotor axis. This construction is provided to coordinate the blower with a large air duct mounted on the collecting chamber; that is, the collecting chamber is normally in a collecting position in which a large duct therefrom communicates with the said blower inlet, to produce partial vacuum in the chamber; and the said communication is automatically discontinued when the chamber is rocked to a refuse dumping position, and again automatically established upon restoring the collecting chamber to normal position.

Air entering the blower inlet is pumped radially over the vanes by centrifugal force and into a circumscribing walled chamber of increasing cross sectional area, and finally exhausted through a generally tangential outlet or exhaust opening to atmosphere, at high velocity.

Since the blower is part of a roadway cleaning machine that may be used in residential districts of a city, it is desirable to direct the outlet opening so that the exhaust air will be blown upwardly. Also it is desirable for the velocity of the exhaust air to be low, so as not to mutilate the leaves of trees under which the machine may be passing; and to this end the exhaust air outlet is increased in cross sectional area to expand the exhausting air and reduce its velocity.

This arrangement however has been found to set up air vibrations at the outlet that produce sound of objectionable pitch and intensity.

In said Hanson application means is described to prevent said noise. It comprises suitable notches or serrations provided in or adjacent to the path of the air leaving the blower.

It is among the objects of the invention hereof to provide:

A blower suitable for the purposes of, and having the desirable features of the blower described in the foregoing;

A blower having an improved construction and mode

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of operation adapting it to produce vacuum in a road cleaner of the vacuum operated class.

Improved means for suppressing noise at the exhaust of a blower.

5 Other objects will become apparent hereinafter to those skilled in the art to which the invention appertains. A preferred embodiment of the invention is fully described in the following description taken in connection with the accompanying drawing in which:

10 Fig. 1 is a perspective view of a road cleaning machine with an embodiment of the invention as a part thereof, and showing the machine in its normal position of use;

Fig. 2 is a view similar to Fig. 1 showing the embodiment of the invention when the machine is in a refuse dumping position;

Fig. 3 is a top plan view of the outlet of a blower of Figs. 1 and 2;

Fig. 4 is a sectional view of the blower taken from the plane 4 of Fig. 1 and may be referred to the plane 4 of Fig. 3;

Fig. 5 is a sectional view from the plane 5 of Fig. 1.

Referring to the drawing there is shown at 1 a vehicle chassis mounted on wheels 2, and being in the form of a trailer, hitched as at 3 to an automotive vehicle 4, for propelling it along a roadway to be cleaned.

The body of the vehicle is in the form of a walled chamber 5 supported on the chassis in a normal refuse collecting position as in Fig. 1, and tiltable or rockable to a refuse dumping position as in Fig. 2.

In Fig. 1, a large diameter hose 6 communicates at one end with the interior of the chamber 5 and at the other or free end has a nozzle 7.

An air pump to be described pumps air out of the chamber 5 producing partial vacuum therein and producing suction in the hose 6; and the hose at its nozzle end picks up refuse by suction and propels it up into the collecting chamber 5.

The nozzle end of the hose may be manipulated to position it with respect to the refuse by an operator 8 riding on a seat 9 carried by the vehicle body and operating a mechanism comprising an intermediately pivoted rod or lever 10, connected at one end to the hose 6 and at the other end having handles 11 convenient to the operator.

Mounted on the chassis 1 is an air blower 12 and at 13 a motor, preferably an internal combustion engine, for driving the blower.

The blower has a rotor 14 comprising a circular disc 15 and radial vanes 16—16 and a hub 17 and the rotor is connected to the engine by a shaft 18 keyed to the hub, and is thereby supported by the shaft.

The rotor is surrounded by a housing 19 supported on the chassis as indicated at 20 Fig. 2.

The blower housing comprises vertical outer and inner parallel axially spaced side walls 21—22; and a curved wall 23 between them, circumscribing the rotor 14. The shaft 18 goes through the wall 22 and supports the rotor.

As viewed in Fig. 4, in which it is assumed that the rotor 14 rotates counterclockwise, the said curved wall 23 may be considered as beginning at a top portion 24 and terminating at 25 approximately vertically above the shaft 18 and close to the circular line of travel of the ends of the vanes 16; and, proceeding around the rotor counterclockwise the curved wall is of progressively greater and greater radius with respect to the shaft as a center, for about three fourths of a revolution to a point 26, whence it proceeds vertically rectilinearly in a wall portion 27. While not essential, the curvature of the curved wall 23 may be that of an involute with respect to the hub 17 as a base circle.

The blower has a walled outlet, comprising the vertical

wall portion 27 and the end walls 21—22, extending upwardly beyond the top portion 24, of the curved wall, and a wall 28 extending upwardly from the curved wall top portion 24.

The walled outlet is thus of expanded cross section, in which the velocity of the outgoing air is reduced without reducing the suction action of the blower and the flow of outlet air is directed upwardly, away from passing or parked vehicles or pedestrians on the roadway.

The outgoing air, at high velocity, flows over the said terminus 25 and it has been found that if the terminus 25 were a continuous metal edge extending from end wall 21 to end wall 22 it would cause the air to vibrate and produce sound or noise of objectionable pitch and intensity. It has been found that this noise can be obviated by means of a transverse series of deep serrations or saw teeth formed with sharp points in a transverse geometric line as shown for the teeth 29 in Fig. 3; whereby the points of the teeth constitute the said terminus 25 and an actual edge is absent.

The cusps between the teeth are preferably of different depths, as shown, the intermediate cusp 31 being of greatest depth and those at the side at 32 of least depth since it has been found that this feature makes the teeth more effective in preventing noise.

A grill work or grating is preferably provided in the outlet opening to guard the blower and at the same time permit free flow of air therethrough. It comprises a transverse sheet metal cross bar 33 set edgewise and welded at opposite ends to the side walls 21 and 22; and spaced longitudinal bars 34 welded at opposite ends to the cross bar 33 and portion 27 of the housing wall.

Air inlet to the blower is provided by a large preferably circular opening 35 in the end wall 21; generally coaxial of the blower.

Duct communication is provided between this inlet opening 35 and the interior of the collecting chamber 5 constructed to permit the chamber to be rocked to dumping position and back again, as follows.

A large sheet metal duct 36 mounted on the collecting chamber 5 in interior communication therewith has a vertical side wall 37 with a large preferably circular opening 38 therein. The wall 37 is so disposed that when the collecting chamber is in collecting position, Fig. 3, this wall is juxtaposed in coplanar relation upon the blower

housing wall 21 with the two openings 35 and 38 axially aligned.

To aid in aligning the openings 35 and 38 and to substantially seal the communication thus effected, the blower wall 21 has an upwardly concave flange 39 thereon and the duct has a forward end wall 40 that seats or nests within this flange when lowered into its collecting position of Fig. 1 or Fig. 5. Thus the duct is automatically put in communication with the blower when in collecting position and automatically interrupts the communication when moved to dumping position, due primarily to the two vertical walls 21 and 37 of the duct and blower housing respectively disposable in substantially coplanar juxtaposition and the two coaxially disposable openings 35 and 38 therein.

The invention is not limited to the exact details illustrated and described, but is comprehensive of all changes and modifications thereof that may be made by those skilled in the art and which come within the scope of the appended claim.

I claim:

A blower comprising a power-driven, centrifugal-impeller-type rotor; a rotor housing around the rotor continuing into a walled outlet passageway comprising; opposite spaced apart side walls; a series of side by side, elongated, pointed teeth formed from sheet metal, projecting from one side wall and being in a common geometric plane transverse of and part way across the passageway, the middle teeth of the series being longer than those at the ends, and the points of the teeth being in a rectilinear geometric line substantially parallel to the rotor axis.

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