J. VOGELZANGS & F. E. MORGAN.

VACUUM CLEANER.

APPLICATION FILED FEB. 2, 1912.

1,048,009.

Patented Dec. 24, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

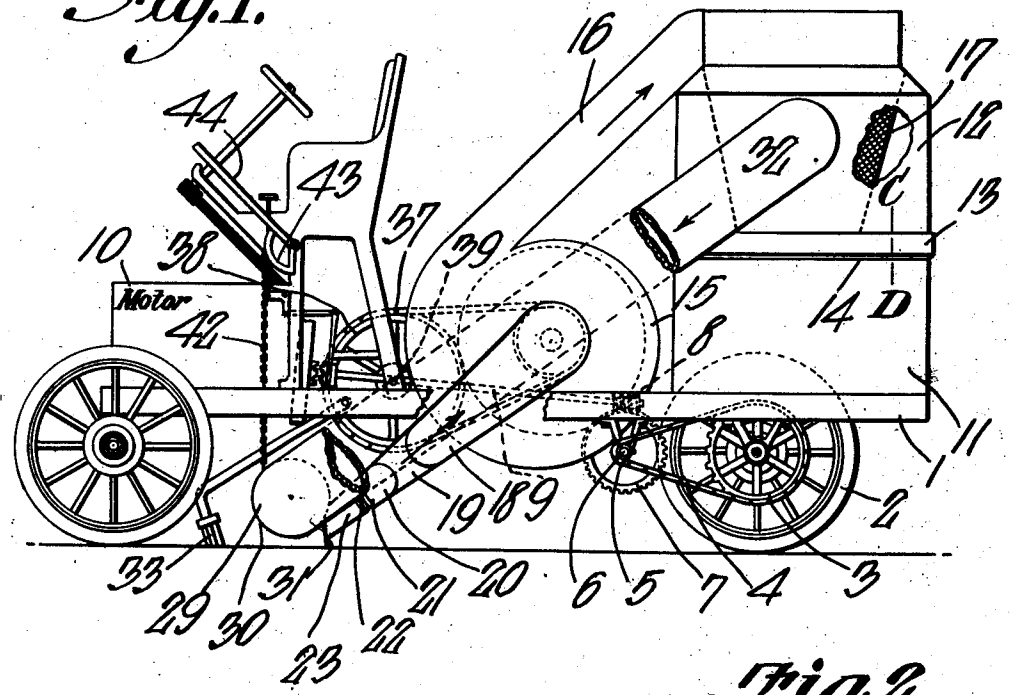
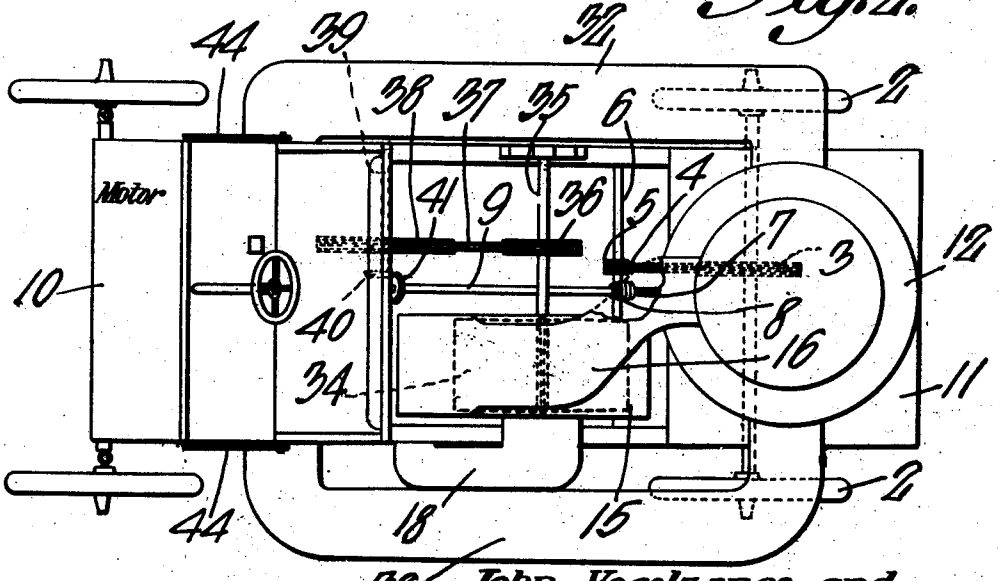


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

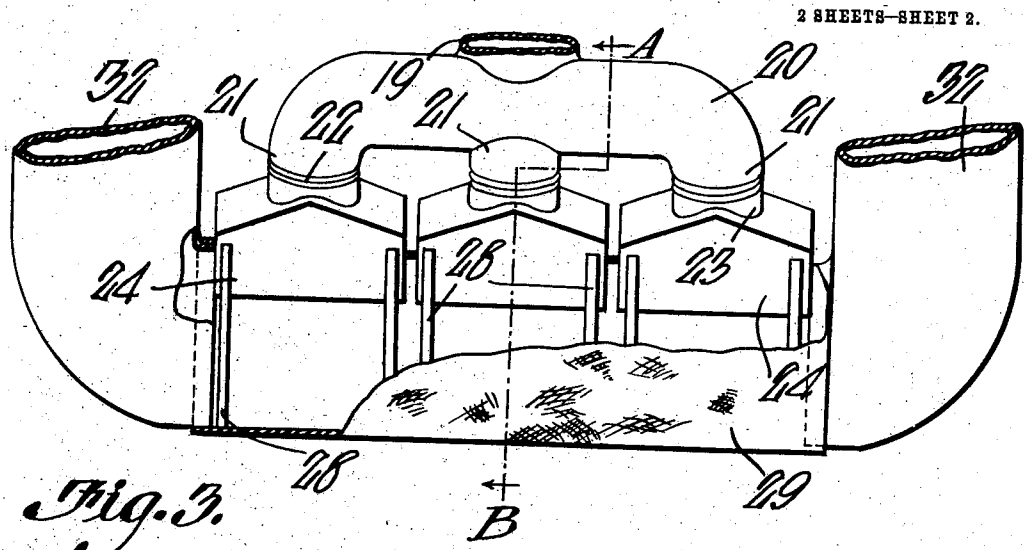

Fig. 3.

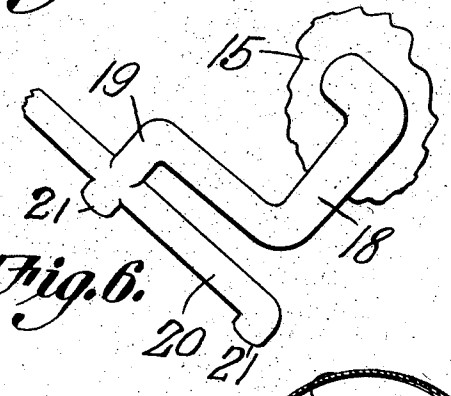

Fig. 6.

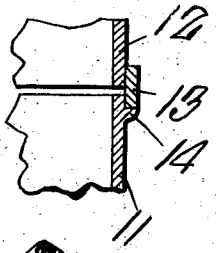

Fig. 5.

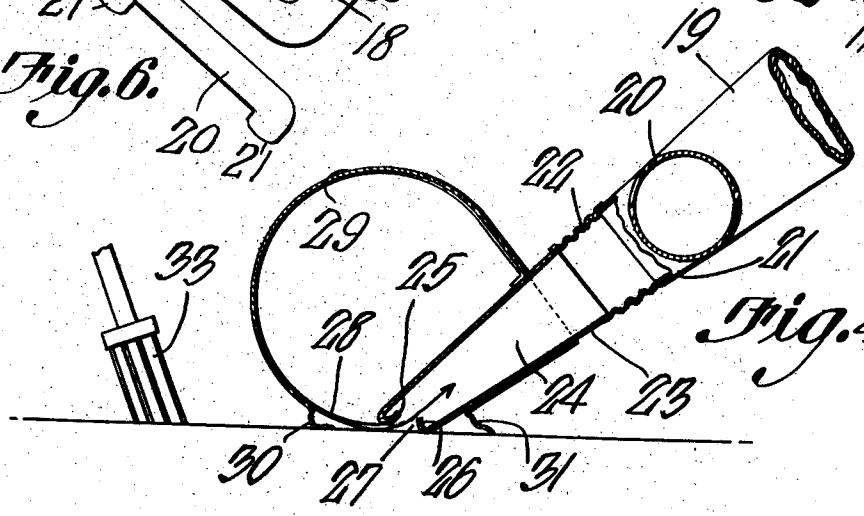

Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN VOGELZANGS AND FRANK E. MORGAN, OF GREEN BAY, WISCONSIN.

VACUUM-CLEANER.

1,048,009. Specification of Letters Patent. Patented Dec. 24, 1912.

Application filed February 2, 1912. Serial No. 674,939.

To all whom it may concern:

Be it known that we, JOHN VOGELZANGS and FRANK E. MORGAN, citizens of the United States, residing at Green Bay, in the county of Brown, State of Wisconsin, have invented a new and useful Vacuum-Cleaner, of which the following is a specification.

This invention relates to vacuum cleaners for use in cleaning streets and the like, the principal object of the invention being to improve that class of machines that utilize a practically continuous circulation of air for the purpose of conveying dust and dirt from the surface being cleaned to a receiver wherein the dirt and dust is separated from the current of air and said current permitted to flow back to a point where it can again be used for conveying dirt to the receiver.

A further object is to mount the suction heads in a novel manner whereby they can be adjusted readily toward or from the surface to be cleaned without breaking the circulation of air through the apparatus.

A further object is to improve upon the suction heads commonly employed.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:—Figure 1 is a side elevation of a machine having the present improvements combined therewith, portions being broken away. Fig. 2 is a plan view of the machine, a portion of one of the air conducting pipes being broken away. Fig. 3 is an enlarged front elevation of the suction head, a portion of the outer casing being removed. Fig. 4 is a section on line A—B Fig. 3 and showing a scraper in advance of the suction head. Fig. 5 is an enlarged section on line C—D Fig. 1. Fig. 6 is a perspective view of a portion of the air conveying means.

Referring to the figures by characters of reference 1 designates the main frame or body of the vehicle the rear or drive wheels 2 of which have a sprocket 3 secured to their revoluble axle and which receives motion through a chain 4 from a sprocket 5 secured to a shaft 6. A worm wheel 7 is also secured to the shaft 6 and receives motion, through a worm 8, from a shaft 9 extending rearwardly from the motor indicated generally at 10. The operation of the driving mechanism can be controlled by the usual or any other preferred means and it is not deemed necessary to describe or illustrate the same in the present case, inasmuch as it constitutes no part of this invention.

A dirt receptacle 11 is removably mounted on the rear portion of the body 1 and is preferably cylindrical, said receptacle being open at the top. A cylindrical separator casing 12 is supported in any suitable manner above the receptacle 11 and a ring 13 is slidably mounted on the casing and is adapted to be lowered so as to close the space betwen the casing and receptacle, any suitable means, such as a bead 14, being provided for supporting the ring in its normal position. It will be apparent that by elevating the ring the receptacle will be released and can be drawn outwardly from under the casing.

A casing 15 is mounted on the body 1 preferably in front of the receptacle 11 and a suction fan, not shown, is designed to rotate within this casing. An outlet pipe or flue 16 extends from the casing 15 and opens into the top of the receiver 12 and an inverted frusto-conical separator 17 is supported within the casing 12 and surrounds the inlet thereof, which is the outlet of the flue 16. An air pipe or flue 18 extending to the intake of the casing 15 projects forwardly and thence laterally under the body 1 and terminates in a downwardly and forwardly inclined tubular arm 19 opening into and supporting a header 20 having tubular branches 21. Each of these branches is connected, by means of a flexible coupling 22, to a tubular neck 23 projecting upwardly from a suction head 24. This head is angular in outline and the front and rear walls thereof converge downwardly and have their inner edge portions turned inwardly up into the head, as indicated at 25 and 26, thus forming an inlet slot 27 therebetween extending throughout the width of the head. These upturned edge portions also permit the suction head to travel over a rough surface without becoming caught thereon and thereby becoming injured.

A desired number of bowed runners 28 is disposed in front of each of the heads 24, the lower ends of these runners being extended under and secured to the inturned portion 25 of the head while the upper ends of the runners are suitably secured to the upper or front face of the head close to the top thereof. The lower portions of the runners serve to hold the inturned portion 25 spaced from the surface being cleaned and the spaces between said surface and the inturned portion 25 and between the lower ends of the runners 28 constitute passages for air as will be hereinafter set forth.

The runners 28 constitute supports for a flexible hood 29 made of air tight material such as rubber or the like and an apron 30 extends downwardly from the hood and is integral therewith, this apron serving to contact with the surface being cleaned and thus prevent the escape of air under the apron. Another apron 31 extends downwardly from the rear or lower face of the head and likewise contacts with the surface being cleaned, thereby preventing the admission of air to the interior of the hood. A single hood can be extended along a series of two or more suction heads, as illustrated in Fig. 3, said hood forming a continuous conduit extending throughout the width of the path traversed by the heads. Each end of the hood communicates with an air flue 32 which extends upwardly to the side of the casing 12, this flue being designed to receive air from the receiver after the separator 17 has separated dust and dirt therefrom.

A scraper in the form of a brush 33 is preferably supported in front of the suction heads so as to loosen the dirt to be removed from the surface being cleaned. This scraper can be of any desired construction and does not constitute any part of the present invention.

The fan contained within the casing 15, and which can be of any preferred form, has been illustrated generally at 34. The shaft 35 on which the fan is mounted preferably receives motion through a sprocket 36 and a chain 37 from another sprocket 38 secured to a shaft 39. This shaft has a bevel gear 40 thereon meshing with a bevel gear 41 on the shaft 9. Thus it will be seen that when the gears 41 and 40 are in mesh, motion will be transmitted to the shaft 39 from shaft 9 and the chain 37 and sprockets 38 and 36 will drive shaft 35 and the fan. A circulation of air will thus be set up, air being forced through the flue 16 into the top of the casing 12 and thence through the casing 12 and into the flue 32 from which it will pass into the end of the hood 29. From the hood the air passes between the lower end portions of the runners 28 and into the openings in the lower ends of the suction heads. From these openings the air passes upwardly through the heads and into the header 20 from which it passes, by way of flue 18, into the fan casing 15. As the air rushes between the runners 28 and between the inturned portion 25 and the surface to be cleaned, any loosened particles of dirt on said surface will be carried by the air into the slot 27 and thence through the casing 15 and flue 16 to the casing 12. The separator 17 will prevent the dirt from flowing with the air to the flue 22 and, instead, said dirt will gravitate to the receptacle 11. The air will, as before set forth, return to the hood 29 and again be used for the purpose of conveying loosened dust and dirt to the casing 12. The pressure of air within the hood will be sufficient to hold the apron 30 pressed firmly upon the surface being cleaned and the suction of air through the hood and into the heads 24 will be sufficient to cause the rear apron 31 to bear downwardly on said surface. Thus it will be seen that the circulation of air through the apparatus will be continuous and will not be broken by any air entering, in appreciable quantities, at any point along the path of the apron.

As the heads 24 are connected to the header 20 by flexible joints 22, it will be seen that the said heads can be raised or lowered with relation to the surface being cleaned. This adjustment of the heads can be effected in various ways. In the drawings a chain 42 has been shown connected to the heads and extended upwardly to a revoluble segment 43 having a lever 44 extending therefrom. By shifting this lever the segment can be rotated so as to pull upwardly on the chain 42 or to lower it as desired, thus causing a corresponding movement of the heads 24.

As hereinbefore pointed out, after the receptacle has been partly or entirely filled, ring 13 can be raised, the receptacle removed and its contents dumped, and said receptacle then replaced. Ring 13 can then be caused to gravitate back to its normal position, thereby sealing the joint between the receptacle and the casing 12.

What is claimed is:—

1. The combination with a series of flexibly supported suction heads, and a flexible conduit connecting the heads, of a casing, means for setting up a current of air from the heads and into the casing, means for directing the air current from the casing and into the conduit, and means for directing the air from the conduit into the heads, said current passing between the heads and the surface being cleaned.

2. A vacuum cleaner including a casing, a suction head having an inlet opening in the bottom thereof, the walls of the opening being inturned, means extending under and

connected to one of the walls of the opening for spacing said wall from the surface to be cleaned, a hood carried by said means and adapted to slidably engage the surface to be cleaned, means for creating a circulation of air from the head to the casing and from the casing to the hood, there being an air passage from the hood and into the head between the hood supporting means.

In testimony that we claim the foregoing as our own, we have hereto affixed our signatures in the presence of two witnesses.

JOHN VOGELZANGS.
FRANK E. MORGAN.

Witnesses:
P. T. BENTON,
FREDA SCHRICKEL.