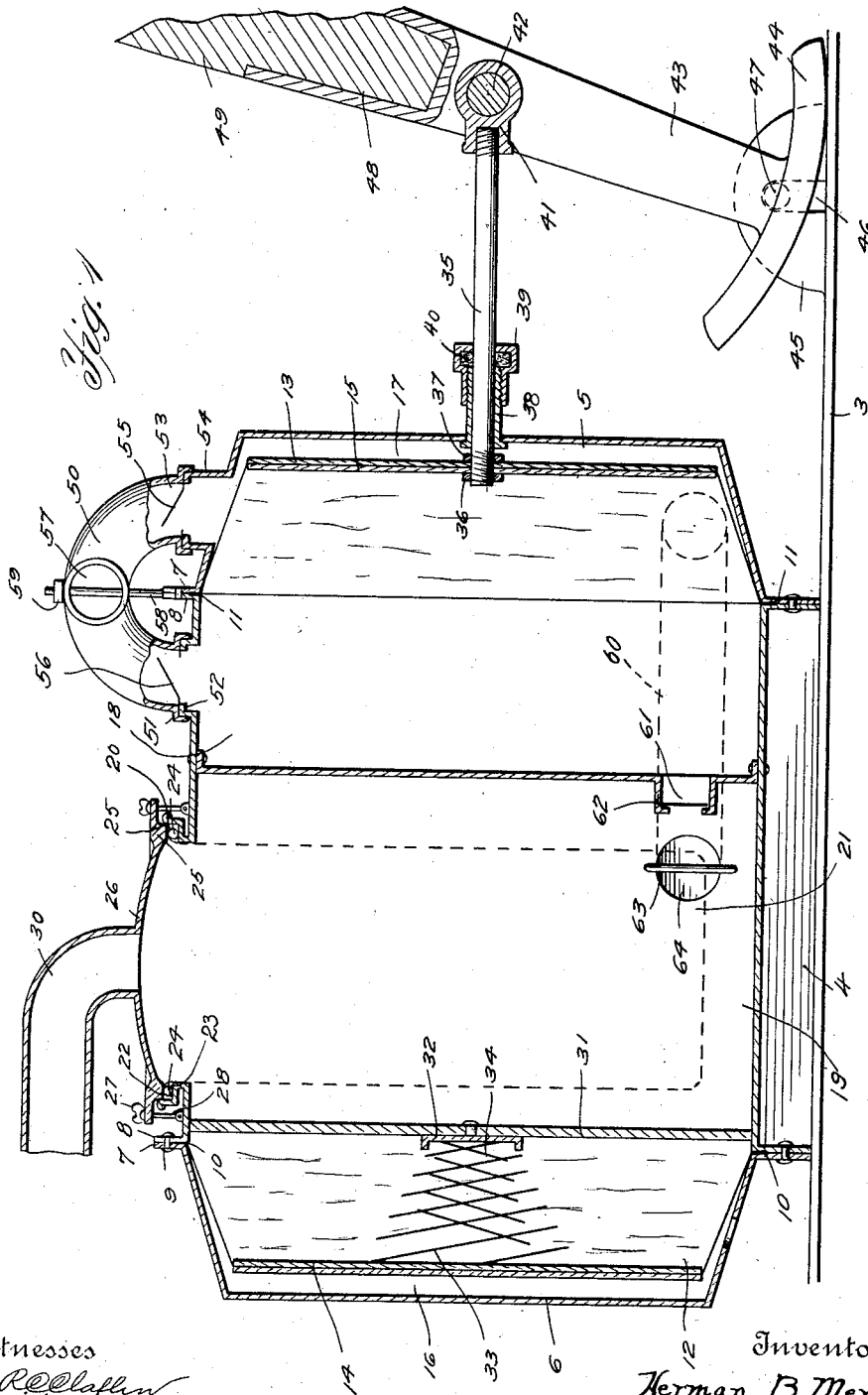


H. B. MERTZ.
VACUUM CLEANING DEVICE.
APPLICATION FILED JULY 18, 1910.

1,062,837.

Patented May 27, 1913.

2 SHEETS-SHEET 1.



Witnesses
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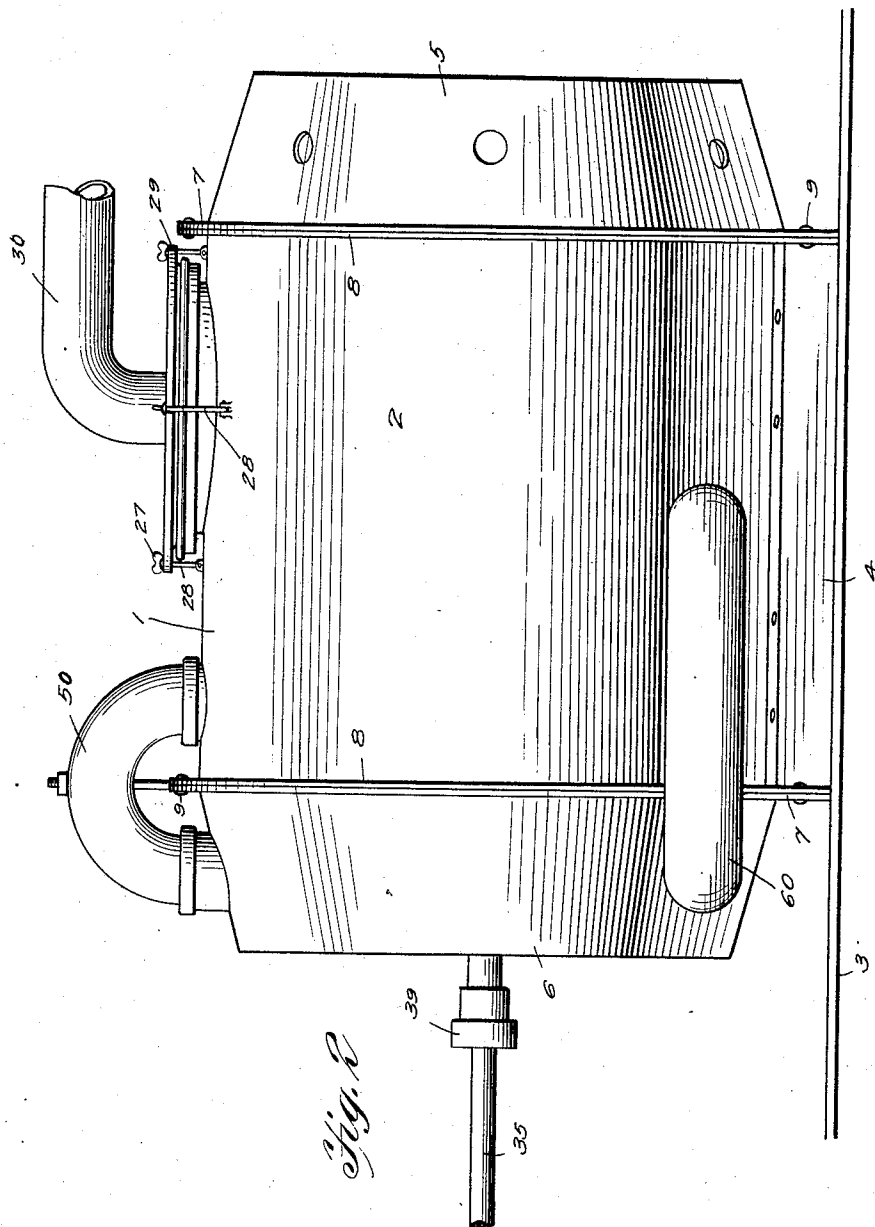


Fig. 2

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UNITED STATES PATENT OFFICE.

HERMAN B. MERTZ, OF BEACH VIEW, PENNSYLVANIA.

VACUUM CLEANING DEVICE.

1,062,837.

Specification of Letters Patent.

Patented May 27, 1913.

Application filed July 18, 1910. Serial No. 572,560.

To all whom it may concern:

Be it known that I, HERMAN B. MERTZ, citizen of the United States, residing at Beach View, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Vacuum Cleaning Devices, of which the following is a specification.

This invention relates to improvements in suction cleaners and it has for its object to provide a light, durable and efficient cleaner.

Another object is to provide a suction cleaner having means to provide a continuous non-interrupted suction.

Another object is to provide a suction cleaner which will be very light to operate.

With the above and other objects which will be described later, in view, I have constructed the apparatus illustrated in the accompanying drawings, in which,

Figure 1 is a longitudinal sectional view of a suction cleaner, and Fig. 2 is a side elevation of a cleaning apparatus.

Like reference characters indicate like parts throughout the several views of the drawings and in the specification, in which—

1 indicates a dust collecting apparatus, consisting of a cylinder 2, mounted on a base 3 by means of supporting members 4. The cylinder is provided with a pair of cone shaped heads 5 and 6 which have flanges 7 thereon and which are secured to the flanges 8 on the cylinder through the medium of the bolts 9; between the flanges are securely held the circumferential edges 10 and 11 of the diaphragms 12 and 13 which have stiffening reinforcing plates 14 and 15. The device is divided into four separated compartments indicated by 16, 17, 18 and 19 respectively.

The compartment 19 is provided with an opening 20 through which a dust collecting bag 21 (indicated by dotted lines) is inserted; this opening is provided with a flared mouth 22 having a seat 23 formed thereon for the mouth of the bag 21 to rest upon, a rubber gasket 24 is also seated on the seat 23, upon which the edges 25 of the top 26 rest and form an air tight joint through the compression caused by the thumb nuts 27 oper-

ating on the bolts 28, which slip into forked projections 29 on the top. The top 26 is provided with an inlet pipe 30 to which a hose may be attached.

A rod 31 crosses the cylinder and is secured to the walls thereof, to the central part of this rod is affixed a plate 32 which acts as a bearing for one end of the spiral springs 33 and 34. The other end of the spring 33 always bears against the diaphragm 12 while the other end of the spring 34 does not normally contact said diaphragm, however it does come into contact therewith when the diaphragm is drawn toward the rod 31, these springs then act in conjunction with one another to force the diaphragm outward.

To the diaphragm 13 is secured a piston rod 35, through the medium of the nuts 36 and 37, this rod works in a bearing 38 which has a packing cap 39 thereon, through the medium of which the packing 40, which may be a lubricating packing, is forced against the rod. The other end of the rod is held by a socket 41 mounted on a pin 42 held by a rocking bar 43, on the lower end of which is a rocker 44, which rocks on the base 3. A bearing 45 is also mounted on the base and has a slot 46 therein in which the pin 47 (shown in dotted lines) secured to the rocker bar, works. This pin operates to allow a free rocking motion to the rocker but at the same time keeps it always in its proper position. The upper end of the rocker bar is provided with a recess 48 into which fits a handle 49. This rocker arrangement keeps the piston rod in a horizontal line and makes the machine work easily and without a hitch.

A curved tube 50 has one end 51 resting on a tubular projection 52 opening into compartment 19 and the other end 53 rests on the tubular projection 54 between this tube and said projections are seated two valves 55 and 56, these valves are held in place by the tube ends. About the center of the tube 50 is an air outlet 57. A bolt 58 is secured to the top of this cylinder and passes directly through the tube 50, which is held in place by the nut 59.

A tube 60 connects the compartments 18 and 19 and valves (not shown) are located in the mouth of the tube. An opening 61 also connects the compartments 18 and 19 and a valve 62 is located therein. A guard 63 protects the valve located at the mouth 64 of the tube 60.

In operation the handle 49 is drawn away from the machine as shown, this action forces the air in compartment 17 out through the opening 57 in the tube 50 via the valve 55 and draws the air from the compartment 19 into the compartment 18 through the valve 62, tending to create a vacuum in compartment 19 which sucks in the diaphragm 12 and contracts the springs 33 and 34 and the vacuum is further relieved by the suction of air through the tube 30. This tube brings in the dirt and dust which is collected into the porous bag 20. As soon as sufficient air enters through the tube 30 to compensate for that drawn from the compartment 19 the tension of the springs 33 and 34 forces the diaphragm 12 back to its normal position thereby tending to again create a vacuum in the compartment 19, which is relieved by air being sucked in through the tube 30. On the reverse stroke of the handle the diaphragm 13 is forced centerward forcing the air in compartment 18 out through the opening 57 in the tube 50 via the valve 56 and at the same time the tendency toward a vacuum in compartment 17 caused by the displacement of the diaphragm is relieved through the suction of air from compartment 19 thereinto, through the pipe 60 via the valve 63 in the mouth 64 thereof. This withdrawal of air from compartment 19 again causes air to be sucked in through the tube 30 and again causes the operation of the diaphragm 12 as above described.

It will be readily seen that the suction of air through the tube 30 is continuous and unbroken at any time during the movement of the handle.

Having described my invention, I claim as new and desire to secure by Letters Patent:—

1. A device of the kind described comprising a cylinder, a partition intermediate the ends of said cylinder, extending transversely thereof and forming two compartments, valve-controlled means for establishing intercommunication between said compartments, a diaphragm secured intermediate the ends of one of said compartments and extending to a point spaced from the end of the cylinder, a valve-controlled pipe emptying at a point alining with said diaphragm and at another point adjacent said partition, into said last-named compartment, said pipe having an air-port intermediate its open ends, a diaphragm secured in said other compartment and terminating

short of the opposite end of said cylinder, an upright member in said last-named compartment, a spring secured to said member and holding said last-named diaphragm distended, means for establishing communication between said compartments, a removable cap at the top of said last-named compartment arranged to clamp a bag depending in the latter, an air tube communicating with said last-named compartment, and emptying into said bag, and means for reciprocating said first-named diaphragm.

2. A device of the kind described comprising a casing having two intercommunicable compartments, diaphragms in said compartments disposed at the ends of said casing but spaced therefrom, flat air compressing members formed upon said diaphragm, one of said members arranged to compress air in its compartment in both a forward and rearward stroke, means for causing said other member to move toward said first-named member when the latter has moved forwardly, or rearwardly, an air-inlet tube expanding air in said other compartment and arranged to restore said last-named member, a removable cap upon said casing clamping a bag depending into said last-named compartment and carrying said tube, and means for discharging the air exhausted by said first-named member.

3. In combination a casing divided into two compartments, valve-controlled means for establishing communication between said compartments, diaphragms disposed at the ends of said casings in said compartments, means for causing one of said diaphragms to exhaust the air in its compartment by a forward and rearward stroke, an air-inlet tube in said other compartment, means for suspending a porous receptacle in said last-named compartment in registration with said tube, said other diaphragm becoming active when said first-named diaphragm has moved, and means for carrying off the air exhausted by said first-named diaphragm.

4. A device of the kind described comprising a casing, said casing being divided into two compartments, an inverted U-shaped pipe opening at the top at each end of one compartment and having a port opening into the atmosphere, a diaphragm in said last-named compartment arranged to force air out of either end of said pipe when it reciprocates, means for reciprocating said diaphragm, a post in said other compartment, a second diaphragm in said last-named compartment, variable-tension springs attached to said post put under compression by said last-named diaphragm when said first diaphragm moves in either direction, an air-delivering tube opening into the second compartment, a pipe connecting said compartments, having an air-

delivering port opening into said first compartment and an air-intake port opening into said second compartment, a valve controlling said last-named port and opening
5 only to admit air, and a tube establishing intercommunication between said two compartments.

In testimony whereof I affix my signature, in presence of two witnesses.

HERMAN B. MERTZ.

Witnesses:

I. LUTHER RAUCK,
A. T. MERTZ.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
