May 3, 1932. S. McCLATCHIE 1,856,133

SUCTION CLEANER

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Fig. 1.

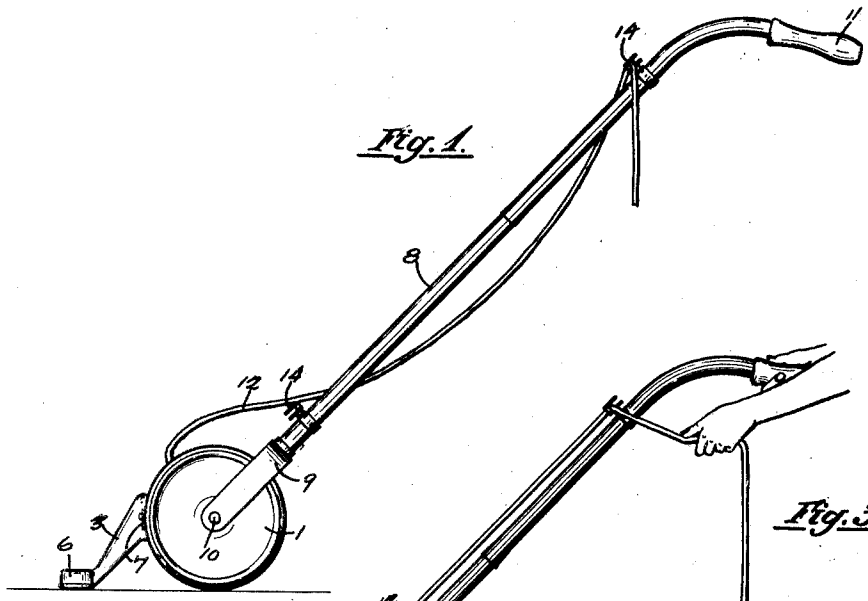


Fig. 3.

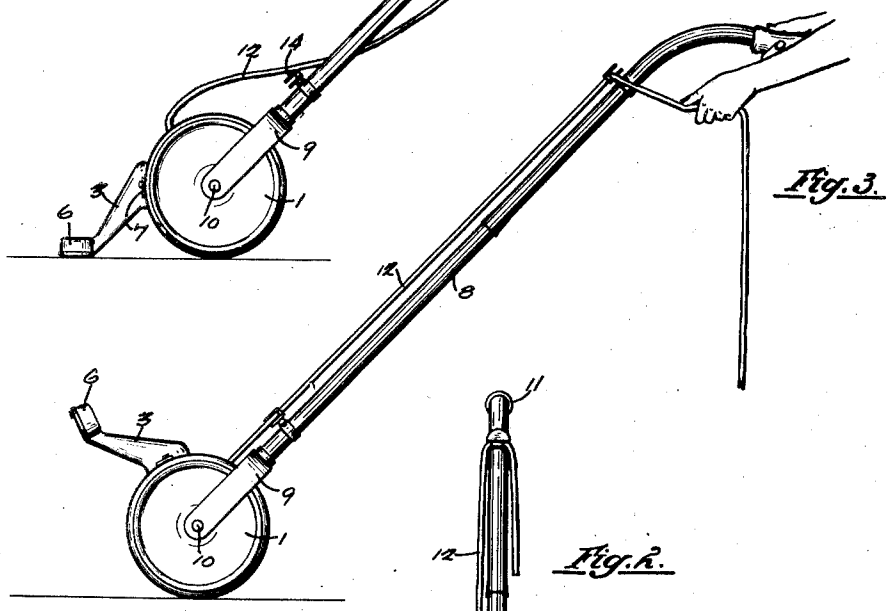
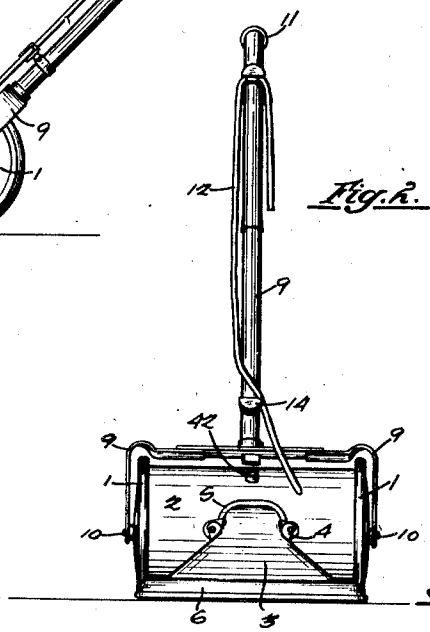


Fig. 2.



Inventor:

Stanley McClatchie

By Smith and Freeman

Attorneys

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Fig. 4.

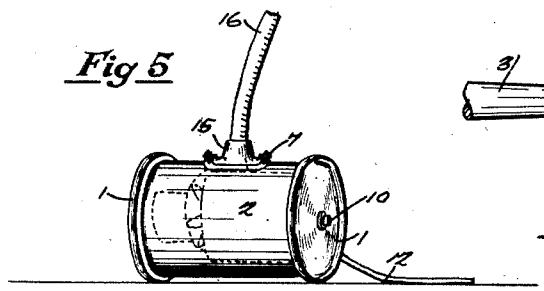


Fig 5

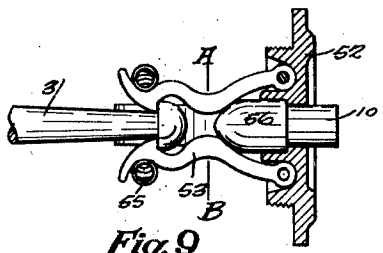


Fig. 9

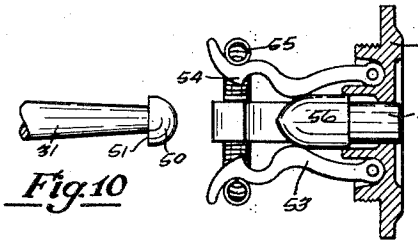


Fig. 10

Inventor:

Stanley McClatchie

By Smith and Freeman

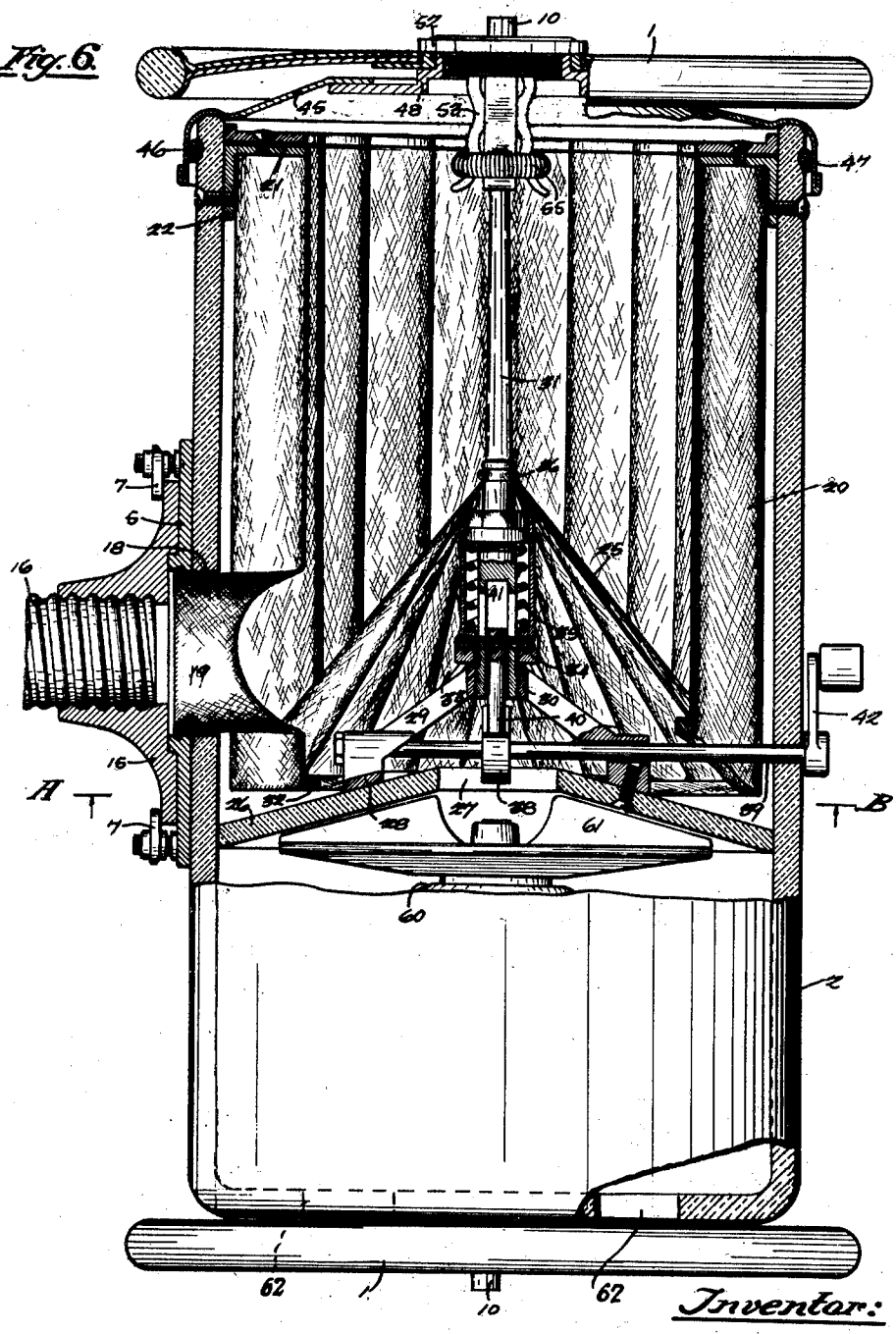
Attorneys

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Fig. 6.



Inventor:

Stanley McClatchie

By Smith and Freeman

Attorneys

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Fig. 7.

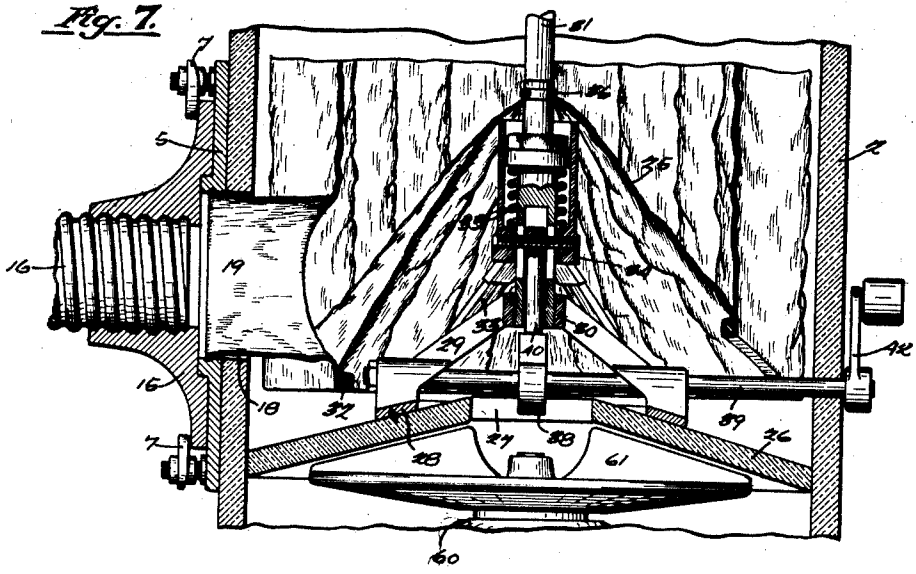
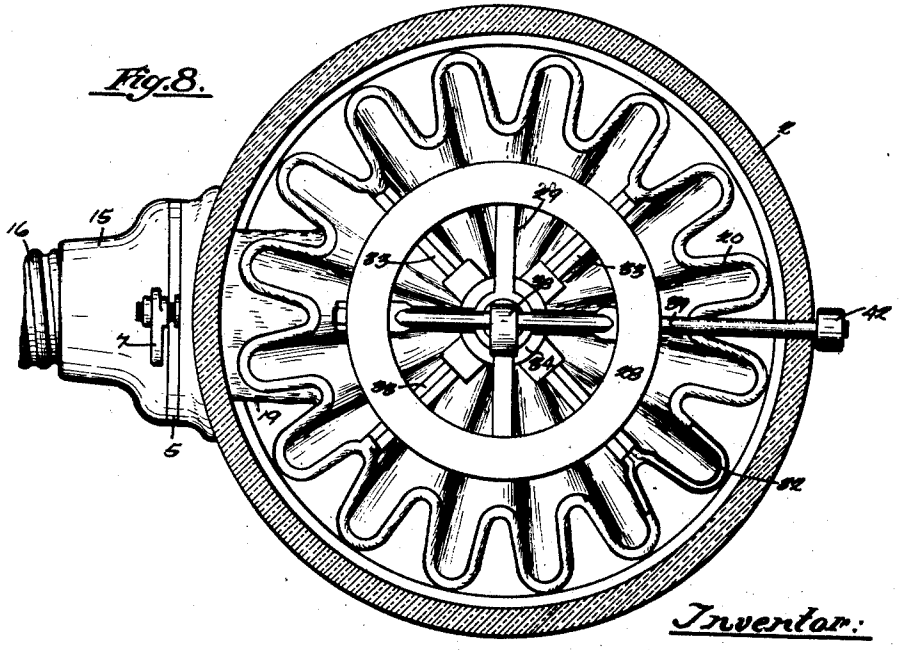


Fig. 8a.



Fig. 8.



Inventor:

Stanley McClatchie

By Smith and Freeman

Attorneys

Patented May 3, 1932

1,856,133

UNITED STATES PATENT OFFICE

STANLEY McCLATCHIE, OF CLEVELAND HEIGHTS, OHIO, ASSIGNOR TO APEX ELECTRICAL MANUFACTURING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO

SUCTION CLEANER

Application filed March 24, 1927, Serial No. 178,074, and in Germany May 7, 1925.

A part of the subject matter hereof is set forth in my German Patent Number 429,778 filed May 7, 1925.

This invention relates to cleaners and has for its object the provision of a new and improved type of casing, supported in a new and improved manner so as to be transported from place to place and manipulated for cleaning purposes more easily and conveniently than other devices; the provision of a cleaner which shall be less noisy than other devices; the provision of a cleaner casing of the portable type having a new and improved construction of dust separator; the provision of an encased dust separator for portable type cleaners which can be emptied and shaken without being removed from the casing; the provision of a cleaner having both rigid and extension nozzles, and operating with both after a new and improved plan; while further objects and advantages of the invention will become apparent as the description proceeds.

In the drawings accompanying and forming a part of this application I have shown one physical construction in which my inventive ideas are embodied although it will be understood that a great many changes in matters of detail can be made and that these drawings are intended merely to illustrate one form of my invention and not to limit me to the features therein delineated. Fig. 1 is a side elevation and Fig. 2 a front elevation of a complete cleaner embodying my improvements, the same being shown in working position; Fig. 3 is a side elevation of the same cleaner with a casing moved to transporting position; Figs. 4 and 5 illustrate the same cleaner as employed with an extension hose; Fig. 6 is a sectional view of the cleaner showing the bag arrangement and other internal parts; Fig. 7 is a partial view similar to Fig. 6 showing the operation of shaking the bag; Fig. 8 is a transverse sectional view corresponding to the line 8—8 of Fig. 6; Fig. 8ª is a detail of the bag shaking cam; and Figs. 9 and 10 are detailed figures of the closure securing means, the former showing the parts in locked condition and the latter in unlocked condition.

An important feature of my invention is the presence of two comparatively large wheels 1—1 mounted coaxially at opposite ends of the casing 2, the latter being preferably cylindrical in shape, and confined within the cylindrical geometrical surface defined by these wheels, so that the device may at all times swing freely from the wheel axis and be moved about with a minimum of exertion or collision. Inside this casing are located the dust separating and suction producing apparatus, while the side of the casing is formed with an inlet opening adapted to receive either a rigid nozzle to act directly upon the floor as the cleaner is moved about, or a hose connected to which an extension nozzle is applied, in which event the casing is drawn freely about following the movements of the hose, and in addition swings freely upon its axis in accordance with the operator's movements. One form of such rigid nozzle is illustrated at 3, being formed at one end with suitable provisions, such as the ears 4, whereby it is detachably connected to a suitable seat member 5 carried by the casing and having at its opposite end a laterally elongated mouthpiece 6 adapted to engage the floor. In order to hold this nozzle in place I have here shown some simple cam-buttons 7; and during the time that the cleaner is used with this rigid nozzle a suitable operating handle 8 is attached thereto in any desired manner, such for example as by means of the resilient yoke 9 whose arms are apertured for rotatable engagement of the trunnions 10 carried by the wheels. This handle may obviously be of any desired length but is preferably so designed that the operator can grasp the grip 11 without stooping, while electric current is conveyed to the driving motor located inside the casing by means of a flexible cord 12 which is preferably attached to the casing so as to be substantially in quadrature with the handle 8 when the floor tool 6 is in floor engaging position. This enables the operator, merely by pulling upon the cord as shown in Fig. 3, to elevate the nozzle so that the cleaner can be drawn or pushed freely over rugs, thresholds or even up or down stairs. The handle is

preferably provided with hooks 14 for the reception of the cord and when the cord is wound on these hooks in a tight manner as shown in Fig. 3 the nozzle is retained in this elevated position so that the cleaner can be drawn about with maximum ease.

Fitted to the seat member 5 interchangeable with the nozzle member 3 is a hose connection 15 adapted to be secured by the same securing elements and having attached a short section 16 of flexible hose to which can be attached any kind of extension tool desired. When this is employed the handle 8 is preferably removed, leaving the casing free to follow the movements of the hose as illustrated in Figs. 4 and 5. The wheels are preferably provided with large rubber tires to constitute buffers as well as to provide a noiseless device.

In its preferred embodiment the casing 2 is made of cylindrical shape with a diameter slightly less than that of the wheels and is preferably made of some material which shall absorb and not transmit the noise of the motor and fan. A preferred material for this purpose is cork, although any kind of wood, wood-pulp, papier-mâché, etc, is advantageous. Preferably the inlet opening 18 from the nozzle or hose is formed midway of the length of this casing and in the same is attached the flexible neck portion 19 of the dust bag 20. This dust bag is preferably made of porous cloth having deeply folded side walls leading from a point slightly at one side of the opening 18 to the opposite end of the casing where they are attached to a supporting member 21 which may have serrations corresponding to the folds and a flange portion 22 fastened to the casing walls. In its preferred form the bottom of the bag consists of a re-entrant conical portion 25, also preferably deeply folded as indicated in Figs. 6 and 7. While I do not limit myself to this specific arrangement, a very satisfactory mode of mounting this bag will now be described.

Traversing the casing adjacent the end of the bag is a transverse partition 26 having at its center an opening 27 leading to the fan. Secured to this partition within the bag compartment thus defined is the ring 28 of a spider whose arms 29 carry a hub 30 to which is screwed the shaft 31. The bottom of the bag is supported and distended by means of a suitable hoop 32 of wire provided with plural radial arms 33 connected to a sheave 34 which is slidably mounted on the portion of the shaft 31 adjacent the spider, a suitable spring 35 being coiled around the shaft and pressing against this sleeve to hold the bag normally stretched lengthwise as shown in Fig. 6. The center of the bag bottom 25 is apertured for the passage of the shaft 31 and leakage at this point is prevented by a suitable tie 36.

As heretofore stated it is desirable to empty the cleaner without removing the bag and for this purpose I provide an agitating device extending outside the cleaner casing whereby the same can be shaken. Such device in the present embodiment includes a cam 38 carried by a transverse shaft 39 suitably journaled in the spider heretofore mentioned and engaging a reciprocable member 40 which is operatively connected in any suitable manner to the sleeve 34. This member in the present instance consists of a longitudinal plunger slidably mounted in a bore 41 formed in the end of the shaft 31, which is here shown as enlarged for the purpose, the sides of the bore being slotted for the reception of a cross pin by means of which the plunger and sleeve are connected. The end of the shaft 39 projects outside of the casing where it is provided with a crank 42.

During use the open ends of the bag and casing are closed by a suitable cover 45 shown in Fig. 6, the same having at its rim a laterally turned portion 46 embracing the casing 2, leakage being prevented by a suitable gasket 47. The center of this cover is provided with a hub 48 on which the wheel 1 is mounted as illustrated in Fig. 6. It is clearly necessary that this cover fit tightly during operation and also be readily removable for emptying the contents of the bag, and one construction for permitting this is illustrated in Fig. 6, this construction employing the end of the shaft 31 which is formed for the purpose with a head having a tapered surface 50 on the outer side and a square shoulder 51 on its rearward side. Secured to the hub 48 is a supporting member 52, here also serving the function of a flange to hold the wheel in place, and having pivoted thereto a plurality of locking arms 53 having hook portions 54 adjacent their ends adapted to ride over the inclined face of the head 50 and to be snapped behind the shoulder 51 by means of the garter spring 55. In order to release these arms from the head a wedging member 56 is slidably mounted in the member 52 having a slanting faced head adapted to be forced between these arms by longitudinal pressure. The shank of this member is here shown as constituting the trunnion 10 on which the arm 9 is journaled, so that pressing this trunnion both facilitates the releasing of the handle yoke even if the same have little or no resiliency, and also disconnects the wheel and cover after which the casing can be ended and the litter shaken out without obstruction.

The suction producing appliances are mounted inside the casing upon the opposite side of the partition 26 from the dust bag and comprise a motor 60 mounted preferably with its shaft coaxial with the casing and here shown as having a centrifugal fan 61

close to the partition 26. The air is drawn through the opening 27 to the center of the fan and escapes around the edge thereof being ultimately discharged through apertures, 62, formed in the end of the casing inside the plane of the adjacent wheel. This escaping air serves to cool the motor, and the chamber in which it is discharged being of considerable size, and the outlets therefrom being located behind the wheel, the amount of noise produced by the fan is a minimum.

It will be understood that a great many changes in detail can be made within the scope of my inventive idea and I do not limit myself to the materials of construction herein suggested or to the particular shapes, and arrangements of nozzle or to the illustrated manner of attaching the handle or wheels to the casing, nor to the details of bag construction and support, nor in any other wise except as specifically recited in my claim.

Having thus described my invention, what I claim is:

In a cleaner, a casing, carrying wheels for said casing, handle means operatively connected to said casing, a collecting nozzle carried by and projecting from said casing and having an inlet mouth operatively presented to the surface on which said wheels rest, suction producing and dust separating apparatus inside said casing and operatively associated with said collecting nozzle, said dust separating apparatus comprising a strainer of porous material, and means carried by said casing for removing the dust and litter from said strainer without removing said strainer from said casing, said casing having a removable closure to permit the discharge of such dust and litter.

In testimony whereof, I have signed my name to this specification this 16th day of March, 1927.

STANLEY McCLATCHIE.