

July 14, 1936.

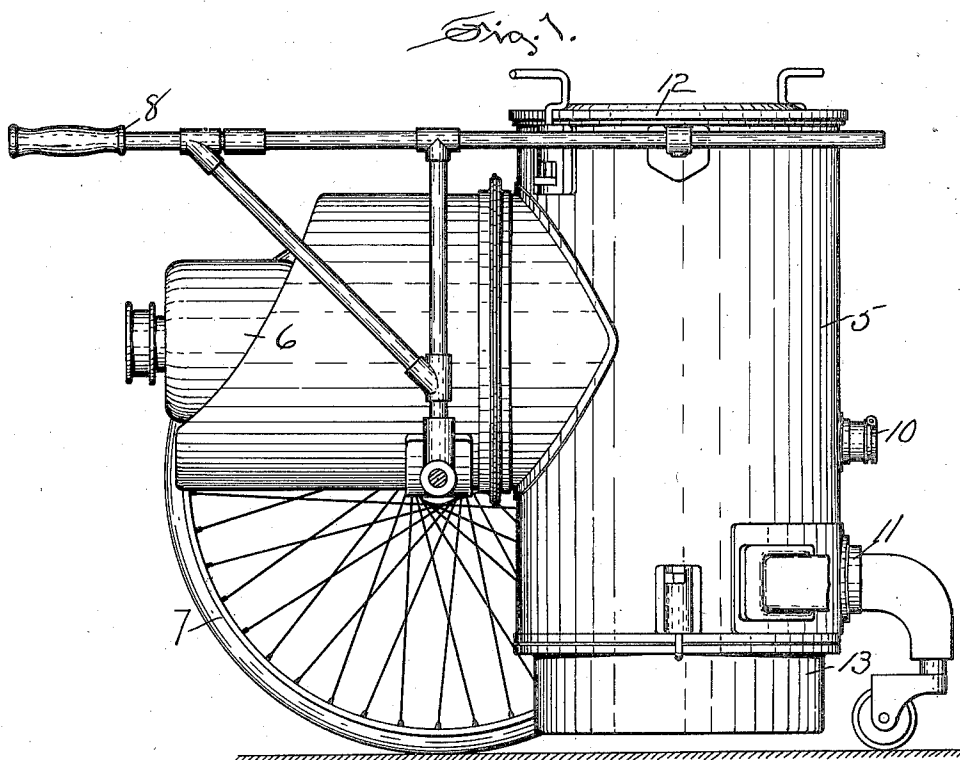
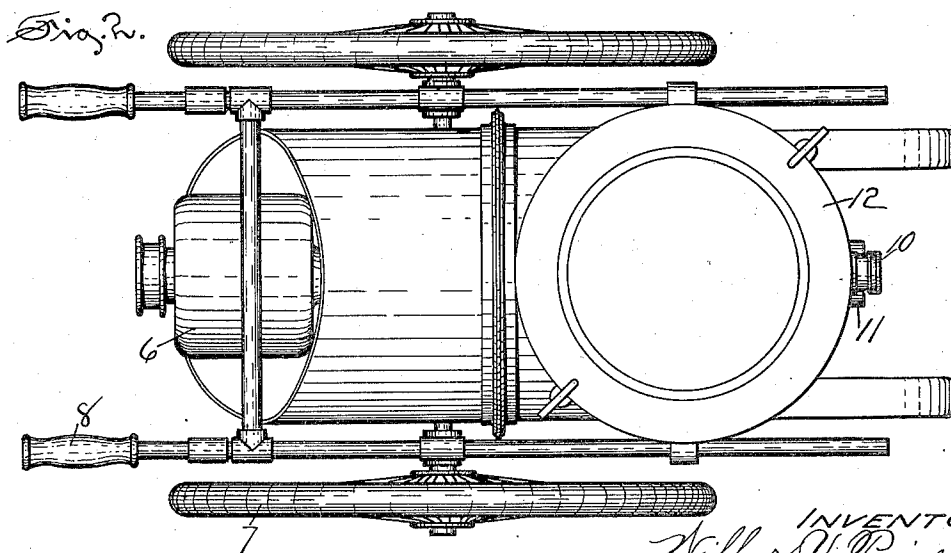
W. V. PAINE

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DUST AND DIRT SEPARATOR

Filed Aug. 23, 1935

2 Sheets-Sheet 1



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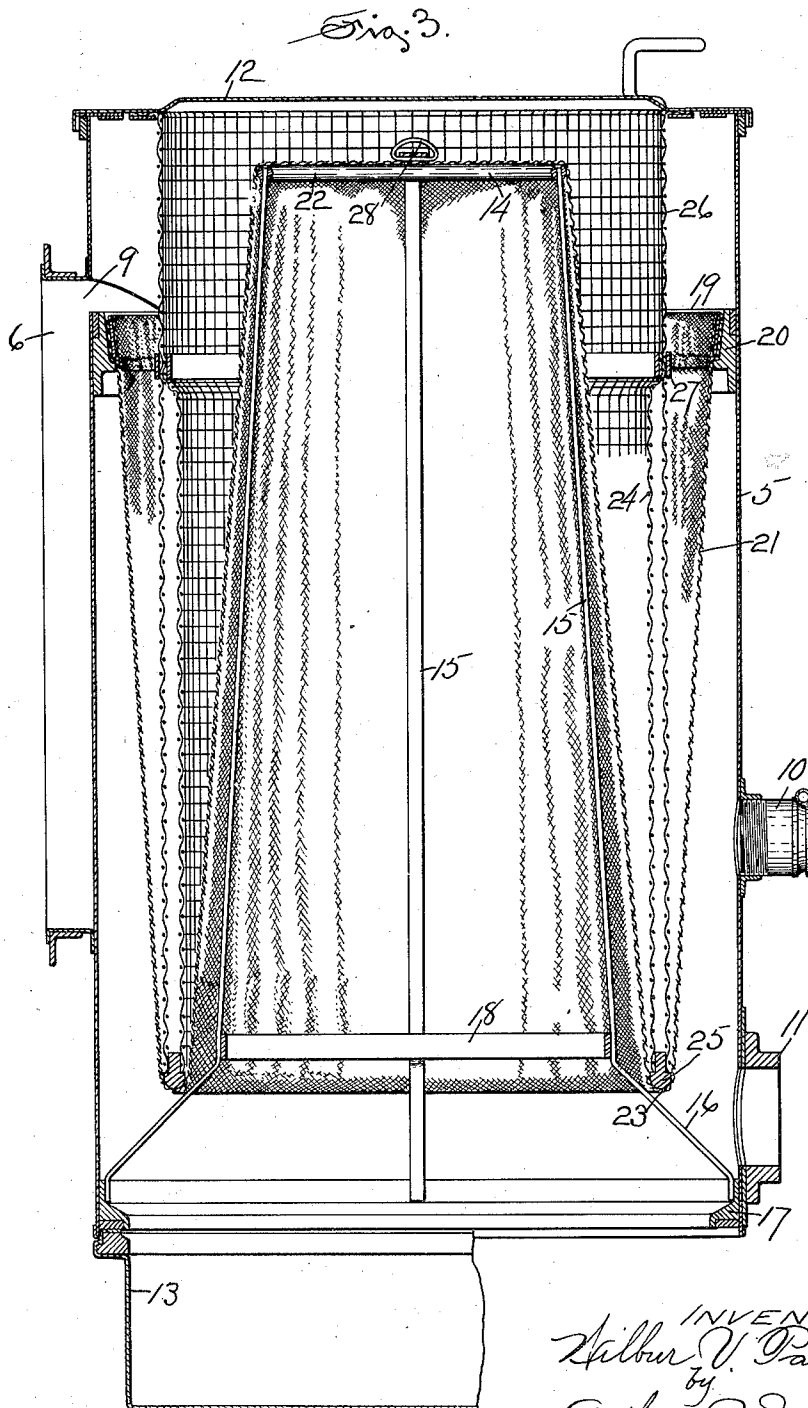
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DUST AND DIRT SEPARATOR

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Application August 23, 1935, Serial No. 37,468

8 Claims. (Cl. 183—58)

My invention relates to the class of apparatus which is employed for the purpose of filtering air by the separation of dust and dirt therefrom, and an object of my invention, among others, is the production of an apparatus of this sort that shall be simple in construction, particularly efficient in operation and especially one by the use of which the filtering member, as a bag, may be readily cleaned without untoward distribution of the dust to the annoyance of the person effecting the cleaning and to others.

One form of an apparatus embodying my invention and in the construction and use of which the objects herein set out, as well as others, may be attained is illustrated in the accompanying drawings in which

Figure 1 is a side view of a portion of an apparatus embodying my invention.

Figure 2 is a top view of the same.

Figure 3 is a detail view on enlarged scale in vertical central section through the separator.

In the accompanying drawings the numeral 5 denotes the shell of the separator, 6 the shell of a motor and vacuum producing member, as a fan, all of which may be supported as by means of wheels 7 and which may be moved as by handles 8. As my invention relates solely to the dust separator only enough of the associated apparatus to enable an understanding of the use of such separator is shown herein.

An opening 9 communicates between the chambers in the shell 6 of the motor and the shell 5 of the separator, and the latter, as shown herein, is provided with two inlets 10—11, either of which may be used, this being merely a matter of convenience.

A cover 12 is removably affixed in any suitable manner to the top of the shell 5, and a dust and dirt receptacle 13 is also removably secured to the bottom of the shell 5 to receive the dust and dirt separated from the air. Any suitable means for removably securing the cover and the dirt and dust receptacle in place may be employed, this not being material to my invention.

An inner bag support 14 in the form of a ring is mounted near the top of the chamber in the shell 5, as shown in Fig. 3 of the drawings. This ring is held in place as by means of supporting strips 15 of any suitable number, four being shown herein, extending downwardly in spaced relation to the sides of the shell 5 and slightly diverging one from another to a point near the bottom where they diverge more abruptly as at 16, the lower ends being attached to a base ring 17 secured near the bottom edge of the shell 5. A sep-

arator ring 18 may be employed near the bottom of the strips 15 to hold them rigidly in position.

The structure described in the preceding paragraph comprises a supporting frame conforming in shape substantially to a section of the bag of similar shape and dimension, the bottom end of the bag of similar shape resting upon the frame which aids in maintaining the shape of the bag.

An outer bag support 19 in the form of a ring is seated upon a shoulder in a stiffener ring 20 for the shell 5 and secured to the inner wall of said case near the upper part thereof, as shown in Fig. 3 of the drawings.

A bag 21 of any suitable material to filter dust and dirt from air and of tubular form and preferably of conical shape has its larger end secured to the bag support 19 which may be removably mounted in the ring 20. This larger end of the bag is open, but the opposite bottom end 22 is closed and is supported upon the ring 14. When in working position the bag extends downwardly from the ring 20 to a fold 23 and from such fold upwardly to the ring 14 which is located within the bottom or closed end of the bag.

The ring 20 with the support 19 and the bag attached thereto divide the compartment in the shell into a lower separating chamber located below said ring and an outlet chamber located above said ring, the outlet 9 leading out of the outlet chamber by a comparatively narrow opening, and as shown in Fig. 3 of the drawings.

A separating support 24, which is preferably of wire netting in two separated annular pieces as to its lower portion, extends downwardly within the folds of the bag, these two members being secured at their lower ends to a separating ring 25 located within the fold of the bag at its lower end. One portion of the outer member of the wire netting support extends upwardly as at 26 and is secured to the under side of the cover 12, the two members of the lower end of said support being secured together at the upper edge of the inner member as by means of a ring 27.

In operation the dust laden air is drawn into the chamber in the shell 5 by means of suction created in the shell 6 as by a fan, the dust and dirt being carried on currents of air entering through the inlets 10—11 as from pneumatic tools commonly used in connection with apparatus of this sort and in a manner that will be readily understood. This dust laden air passes through the meshes of the bag 21 as to both folds thereof, the finer particles of dust remaining on the bag and the coarser particles dropping into the dust receptacle 13.

The filtered air from the inner portion of the bag passes through the wire netting and the entire volume of filtered air passes outwardly through the opening 9. In this operation the finer particles of dust accumulate upon the bag as to both folds and it is therefore necessary to remove this finer dust from the bag when it becomes too heavily laden. For this purpose the cover 12 is removed and with it the separating support 24, leaving the bag loosely suspended within the chamber in the shell 5. By the use of a loop 28 secured to the bottom of the bag near the cover 12 the bag may be vigorously shaken to dislodge the dust therefrom, and such dust being all on the inside of the bag will fall into the receptacle 13 at the bottom of the shell.

When the bottom closed end of the bag is lifted the bag becomes quite loose on the supporting frame and in the shaking operation this loose portion being whisked against the frame the latter will aid in discharging the dust from within the bag.

This provides a very sanitary arrangement and avoids the disagreeable results following the removal of the bag from the shell and the dislodging of the dust therefrom, the operation not only being simplified but the inconvenience present in prior structures being also lessened.

In accordance with the provisions of the patent statutes I have described the principles of operation of my invention, together with the device which I now consider to represent the best embodiment thereof; but I desire to have it understood that the device shown is only illustrative and that the invention may be carried out by other means and applied to uses other than those above set out.

I claim:

1. A dust separator including a shell having a dust separating chamber therein, a separator bag of conical shape suspended within the shell with its closed bottom end upward, means for securing the opposite open end of the bag within the shell, a frame conforming in shape to the shape of the bag and extending into the bag to support its closed end, and means attached to the closed end of the bag for shaking it within the chamber in the shell to dislodge dust therefrom.

2. A dust separator including a shell having a dust separating chamber therein, a separator bag of conical shape having a large open end and an opposite smaller closed bottom end, said bag being vertically disposed with its bottom end upward and being folded to locate said closed bottom end near the top of the chamber and projecting through said open end, a frame extending vertically into the bag and against the bottom closed end to support said end from downward movement, means for securing the opposite open end of the bag, and means attached to the closed bottom end for shaking the bag within the shell to dislodge dust therefrom.

3. A dust separator including a shell having a dust separating chamber therein, a separator bag of conical shape having an open end and an opposite closed end, said bag being folded to locate the closed bottom end projected through and above the open end near the top of the chamber, a frame conforming in shape to the shape of the bag and extending into the bag to support its closed end, means extending between the folds to prevent said folds from collapsing under a partial vacuum, means for securing the opposite open end of the bag, and means at-

tached to the closed bottom end for shaking the bag within the shell to dislodge dust therefrom.

4. A dust separator including a shell having a dust separating chamber therein, a cover for said shell, a separator bag of conical shape having a large open end and an opposite smaller closed end, said bag being folded to locate the closed bottom end near the top of the chamber in the shell, a frame extending into the bag to support its closed end, a support of wire netting comprising two sheets of barrel form extending downwardly between the folds of the bag to prevent them from collapsing under a partial vacuum, one of said sheets extending upwardly beyond the other sheet and having its edges secured to the under side of the cover, and means attached to the closed bottom end of the bag to shake it to dislodge dust therefrom.

5. A dust separator including a shell having a dust separating chamber therein and having a bag supporting member provided with a seat for the support for a bag, a cover for said shell, a separator bag of conical shape having an open end and an opposite closed end, a ring secured to the open end of the bag to removably rest upon said seat, said bag being folded to locate the closed bottom end projected through and above the open end to a point near the top of the chamber in the shell, a frame extending into the bag to support its closed end, and a support of wire mesh extending downwardly between the folds of the bag to prevent them from collapsing under a partial vacuum within the shell, said support comprising two sheets, the upper edge of the inner sheet being secured to a band and the inner sheet projecting past said band and secured to said cover.

6. A dust separator including a shell having a dust separating chamber therein, supporting strips extending upwardly in converging directions within the shell, an inner bag supporting ring secured to the upper ends of said strips, a member secured to the wall of the shell below the top edge thereof and having a shoulder to afford a bag support, an outer bag supporting ring removably seated upon said shoulder, a cover for the shell, a separator bag of conical shape having its larger open end secured to the outer ring, said bag being folded and extending upwardly through and above said open end and having the inner surface of its smaller bottom closed end resting on said inner ring in proximity to said cover, and a separating member composed of wire screen extending downwardly between the folds of the bag to prevent them from collapsing under a partial vacuum within the shell.

7. A dust separator including a shell having a dust separating chamber at the lower portion thereof and an outlet chamber at the upper portion thereof, a cover for the outlet chamber, a stiffening ring secured to the inner surface of the shell at a distance from the upper edge thereof and having a bag ring supporting shoulder, an outer bag supporting ring seated upon said shoulder, said rings being located between said chambers dividing them one from the other, bag supporting strips extending in convergent directions upwardly within the shell to a point above said rings, an inner bag supporting ring attached to the upper end of said strips, a bag of conical shape having its open, larger end secured to said outer supporting ring, said bag extending downwardly within the chamber and then upwardly with its smaller closed bottom end projected through and located above the larger open end

and supported by said inner supporting ring, and a separator support secured to said cover and projecting downwardly between the folds of the bag to prevent said folds from collapsing under a partial vacuum within the bag.

5 8. A dust separator including a shell having a dust separating chamber in the lower portion thereof and an outlet chamber in the upper portion thereof, a cover for said outlet chamber, a
10 stiffening ring secured to the inner surface of the shell at a distance below the upper edge thereof and having a bag supporting shoulder, an outer bag supporting ring removably seated upon said
15 shoulder, said rings being located between the dust separating and outlet chambers, bag supporting strips extending in convergent directions upwardly within the shell to a point within the

outlet chamber located above said rings, an inner bag supporting ring attached to the upper end of said strips within the outer chamber, a bag of conical shape having its larger open end secured to said outer supporting ring, said bag extending
5 downwardly within the chamber and then upwardly with its smaller closed bottom end projected through said rings and supported by said inner supporting ring, a separator support secured to said cover and projecting downwardly
10 between the folds of the bag to prevent said folds from collapsing under a partial vacuum within the bag, and an outlet opening formed through the wall of the shell above said rings and extending
15 for some distance around the shell.

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