I. S. SHERMAN.

VACUUM SEPARATING APPARATUS.

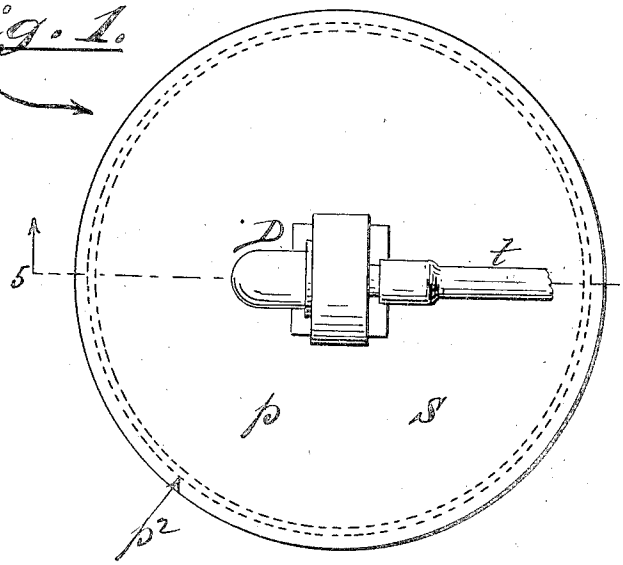
APPLICATION FILED JUNE 20, 1919.

1,322,361.

Patented Nov. 18, 1919.

2 SHEETS—SHEET 1.

Fig. 1.



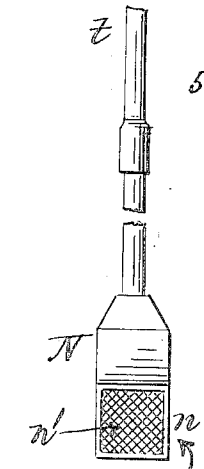


Fig. 3.

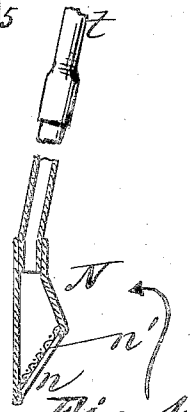


Fig. 4.

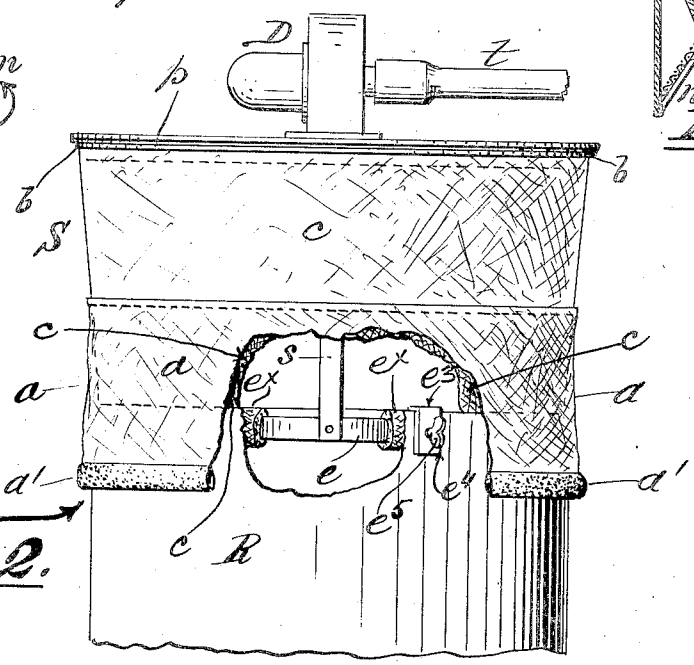


Fig. 2.

Inventor

Israel S. Sherman,

By his Attorney Leo. McNeill

I. S. SHERMAN.

VACUUM SEPARATING APPARATUS.

APPLICATION FILED JUNE 20, 1919.

1,322,361.

Patented Nov. 18, 1919.

2 SHEETS—SHEET 2.

Fig. 5.

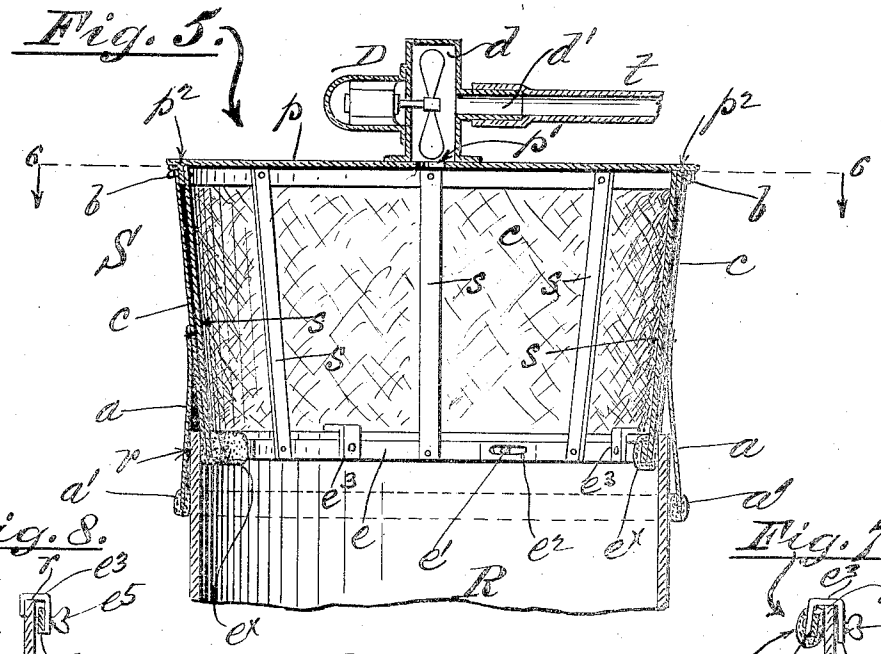


Fig. 8.

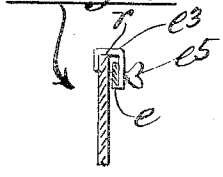


Fig. 7.

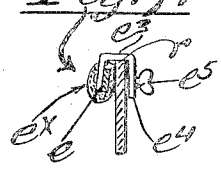
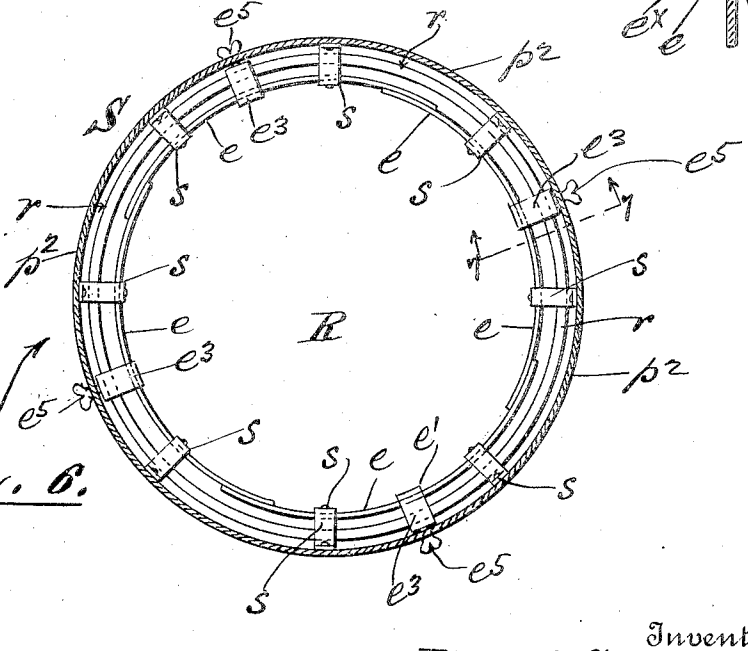


Fig. 6.



Inventor

Israel S. Sherman,

By his Attorney

Geo. W. Wiatt

UNITED STATES PATENT OFFICE.

ISRAEL S. SHERMAN, OF BROOKLYN, NEW YORK.

VACUUM SEPARATING APPARATUS.

1,322,361. Specification of Letters Patent. Patented Nov. 18, 1919.

Application filed June 20, 1919. Serial No. 305,533.

To all whom it may concern:

Be it known that I, ISRAEL S. SHERMAN, a citizen of the United States, and a resident of the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Vacuum Separating Apparatus, of which the following is a specification.

My improvements relate to vacuum apparatus for the pneumatic separation and collection of dust and light particles of matter from heavier material or surfaces; and the invention consists in the construction and arrangement of parts herein described and claimed specifically, whereby the device may be utilized for the sifting of ashes, etc., as well as for sweeping, dusting and similar purposes,—a distinctive feature being its adaptability for use in conjunction with an ash can, barrel or receiver of any kind into which the ash or dust is deposited, in contra distinction to the old method of collecting such pulverous material in the filter bag or screening member.

In the accompanying drawings,

Figure 1, is a top view of my screening apparatus, broken away in part;

Fig. 2, is a side elevation of the screen as applied to a refuse receptacle, parts being broken away;

Fig. 3, is a front elevation of the sifting nozzle and Fig. 4, a sectional detail thereof;

Fig. 5, is a sectional elevation taken upon plane of line 5—5, Fig. 1;

Fig. 6, is a horizontal section taken upon plane of line 6—6, Fig. 5;

Fig. 7, is a sectional detail taken upon plane of line 7—7, Fig. 6, showing one of the clamps of the expansible ring of the screener;

Fig. 8, is a similar view, showing a modification.

What may be designated as the screening member S, considered as a whole, consists essentially of a skeleton frame-work comprising a cap plate p, a plurality of equidistant suspenders s, s, attached to said cap plate p, and an expansible ring e, secured to the lower portions of said suspenders s, s. These parts form the support for the exhaust or suction device D, the screening cloth c, and the apron a. The exhaust or suction device D, is preferably of the fan type driven by an electric motor in a manner well known in the art, the vacuum chamber d, communicating with the flexible suction tube t, through the axial port d', and with the interior of the separator S, through a discharge port p', in the cap plate p, as shown in Fig. 5. The upper ends of the suspenders s, s, are riveted or otherwise secured to a flange p^2, on the under side of the cap plate p, while their lower ends are in like manner riveted or otherwise secured to the sectors, e, e, which form the expansible ring,—two of said suspenders being secured to each sector e, as will be understood by reference more particularly to Fig. 6, by which it will be seen that the sectors e, e, overlap at adjacent ends, a pin e', on one part engaging the sides of a slot e^2, in the other as indicated in Fig. 5. The screen cloth c, is attached to the cap flange p^2, by a binder b, of any suitable character, and is of sufficient length to extend down to the expansible ring e, to which it may be attached in any desired manner. The upper edge of the apron a, is stitched or otherwise secured to the screening cloth c, and its lower edge is formed with a felt or similar packing a', of sufficient weight to insure close contact with the exterior of the receptacle.

Said receptacle R, may be of any desired or suitable character, as an ash can, barrel or similar container for the pulverous matter collected. It is preferably although not necessarily circular in cross section, and for convenience of illustration I have shown it as of cylindrical form. It is portable in character, so that when the screening member S, is removed therefrom it can be independently handled for the disposal of its contents.

The screening member S, is supported upon and over the mouth of the receptacle R, by means of bracket arms e^3, attached to the expansible ring e,—said bracket arms e^3, resting directly upon the edge r, of the receptacle R, and being formed with pendent members e^4, provided with binding screws e^5, by which the screening member S, may be temporarily but positively secured to the receptacle R, as will be understood by reference more particularly to Fig. 7. That is to say, the sections of the expansible ring e, are, by means of the screws e^5, clamped against the inner surface of the mouth of the receptacle, the overlapping of the sections e, e, of the ring, allowing it to conform to the size and configuration of said mouth or opening. In order to attain a relatively tight joint between the mouth of the recep-

tacle and the expansible bearing ring, the latter is provided with a padding e^x, of felt or other suitable material, so as to insure a close fit. This padding e^x, is omitted from Fig. 6, in order to more clearly show the construction and arrangement of the other parts; and is also omitted in part from Figs. 2 and 5, for a like reason, but its function is clearly indicated in Figs. 5 and 7. However, in order to intercept any impalpable powder that might be forced through the joint by the pressure within the screener S, the latter is provided with the external apron *a*, which extends below the edge *r*, of the receptacle R, and mitigates the effects of such leakage, if any.

The woven textile fabric constituting the screen *c*, is of a character especially prepared for the purpose and adapted to intercept the passage of solid particles, no matter how small, while allowing the escape of air in excess of atmospheric pressure.

The flexible suction tube *t*, terminates in a nozzle N, of peculiar construction in that it is formed with a relatively large inlet *n*, provided with a reticulated screen *n'*, adapted to exclude coarse material while admitting the entrance of pulverous material which is drawn in with the air as a vehicle owing to the partial vacuum created in the chamber *d*, by the exhaust mechanism. By the provision and use of a nozzle N, of this character, my apparatus is adapted for use as a means of separating ash from cinders, etc., as well as for the various other purposes to which vacuum cleaners have heretofore been applied.

The expansible ring *e*, is an important factor in adapting the screening member S, to fit and compensate for variations in size of the receptacles to which it may be applied. Ordinarily and preferably the ring *e*, is made to fit the interior surface of the mouth of the receptacle R, as shown in the drawings, but in certain cases it may be desirable to fit it around the mouth externally, in which case a form of clamp shown in Fig. 8, may be substituted for that shown in Fig. 7.

It is to be noted that the pulverous material is precipitated from the suction chamber *d*, through the discharge port *p'*, vertically and axially as related to the screening member S, and the receptacle R, below it, thus aiding gravity in the separation of the solid matter from the air vehicle by which it has been carried over into the screening member, while the air vehicle itself readily escapes laterally through the screen cloth *c*, well above the receptacle R, for the residuum. Hence the clogging of the screen cloth *c*, is obviated, back pressure avoided, and a minimum of power only is required to effect the successful working of the apparatus.

My apparatus is simple and inexpensive, and particularly adapted to the varying requirements of household use, although I do not confine myself thereto, since it is obvious that the essential features of my invention may be employed wherever the collection of pulverous material is a desideratum, either on a large or a small scale.

What I claim as my invention and desire to secure by Letters Patent is,

1. Vacuum separating apparatus of the character designated comprising a screening member consisting essentially of skeleton framework and an inclosing screen material mounted thereon, means for detachably fitting said members over the open end of a residuum receptacle, means for insuring a dust-tight joint upon the inside and outside of said receptacle, and suction means mounted on the top of the said member for conveying pulverous material with air as a vehicle into the said screening member and then precipitating the pulverous material from such air.

2. Vacuum separating apparatus of the character designated, comprising a screening member consisting essentially of skeleton framework and an inclosing screen material mounted thereon, means for detachably fitting said members over the open end of a residuum receptacle, means for insuring a dust-tight joint upon the inside and outside of said receptacle, and suction means mounted on the top of the said member for conveying pulverous material with air as a vehicle into the said screening member and then precipitating the pulverous material from such air, the top of the screening member having a restricted discharge port into the interior of said member, and the suction means being disposed entirely outside said member.

3. Vacuum separating apparatus of the character designated, comprising a screening member consisting essentially of skeleton frame work and an inclosing screen cloth mounted thereon, a residuum receptacle, said skeleton frame work being formed with an expansible bottom ring, and padded to insure a dust tight joint with the receptacle, and with means for detachably supporting it on said residuum receptacle, and suction means for conveying and precipitating pulverous material from air as a vehicle into said screening member and receptacle, for the purpose described.

4. Vacuum separating apparatus of the character designated, comprising a screening member consisting essentially of skeleton frame work and an inclosing screen cloth mounted thereon, said skeleton frame work being formed with a padded expansible bottom ring, and with means for detachably supporting it on a residuum receptacle, and suction means for conveying and precipitat-

ing pulverous material from air as a vehicle into said screening member and receptacle, for the purpose described.

5. Vacuum separating apparatus of the character designated, comprising a screening member consisting essentially of skeleton frame work and an inclosing screen cloth mounted thereon, a residuum receptacle, said skeleton frame work being formed with an expansible bottom ring having overlapping sections, means for detachably supporting said screening member on a residuum receptacle, and suction means for conveying and precipitating pulverous material from air as a vehicle into said screening member and receptacle, for the purpose described.

6. Vacuum separating apparatus of the character designated, comprising a screening member consisting essentially of skeleton frame work and an inclosing screen cloth mounted thereon, means for detachably supporting said screening member and residuum receptacle, an annular apron attached to said screening member and extending around and below the mouth of said receptacle, and suction means for conveying and precipitating pulverous material from air as a vehicle into said screening member and receptacle, for the purpose described.

7. Vacuum separating apparatus of the character designated, comprising a screening member consisting essentially of skeleton frame work and an inclosing screen cloth mounted thereon, said skeleton frame work being formed with means for detachably supporting it on a residuum receptacle, and also with a cap plate, and suction means mounted on said cap plate and arranged to convey and precipitate pulverous material from air as a vehicle into said screening member and said receptacle, for the purpose described.

8. Vacuum separating apparatus of the character designated, comprising a screening member consisting essentially of skeleton frame work and an inclosing screen cloth mounted thereon, said skeleton frame being formed with a cap plate, with an expansible bottom ring, and with means for detachably supporting it on a residuum receptacle, and suction means mounted on said cap plate, and arranged to convey and precipitate pulverous material from air as a vehicle into said screening member and said receptacle, for the purpose described.

9. Vacuum separating apparatus of the character designated, comprising a screening member consisting essentially of skeleton frame work and an inclosing screen cloth mounted thereon, said skeleton frame work being formed with a bottom ring, and with means for detachably supporting it on a residuum receptacle, and suction means for conveying and precipitating pulverous material from air as a vehicle into said screening member and receptacle, for the purpose described.

ISRAEL S. SHERMAN.

Witnesses:
GEO. WM. MIATT,
DOROTHY MIATT.