J. ROBERTSON.

DUST SEPARATOR.

APPLICATION FILED MAR. 20, 1911.

1,136,836. Patented Apr. 20, 1915.

Fig. 4

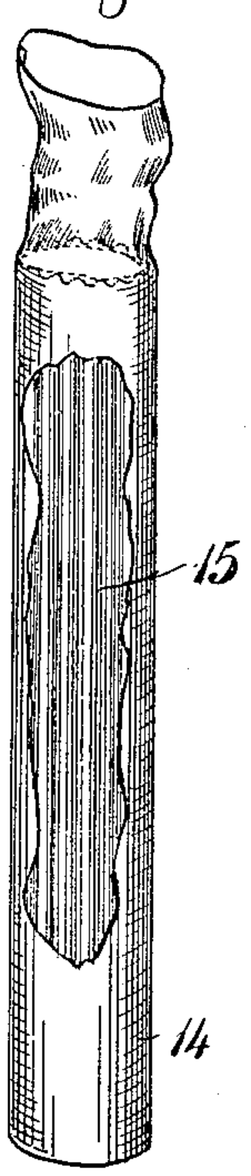


Fig. 1

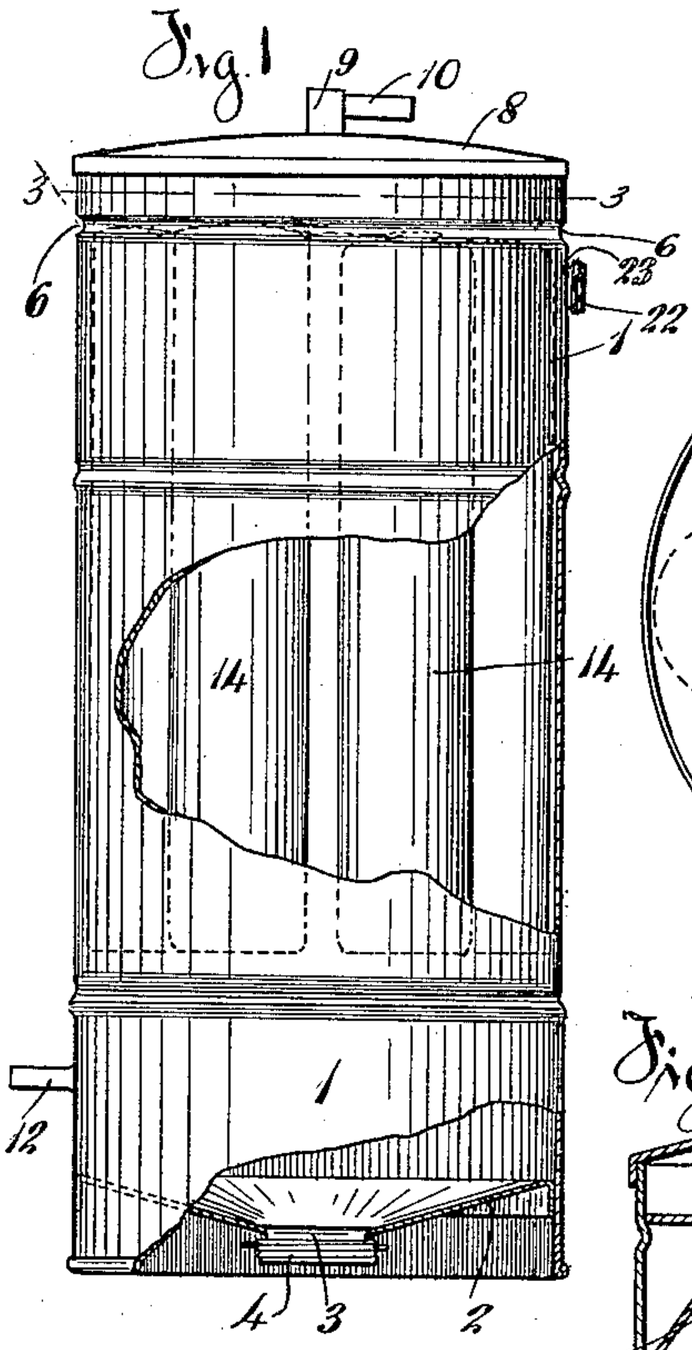


Fig. 3

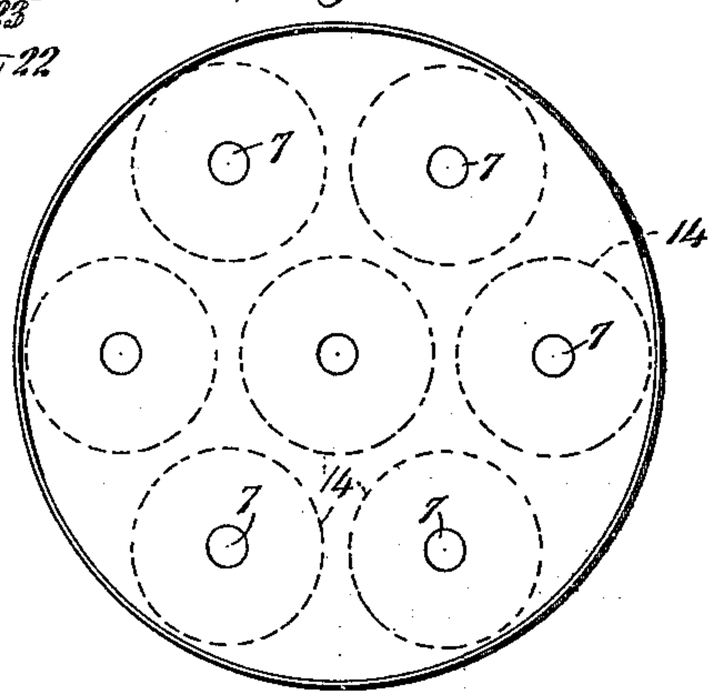


Fig. 2

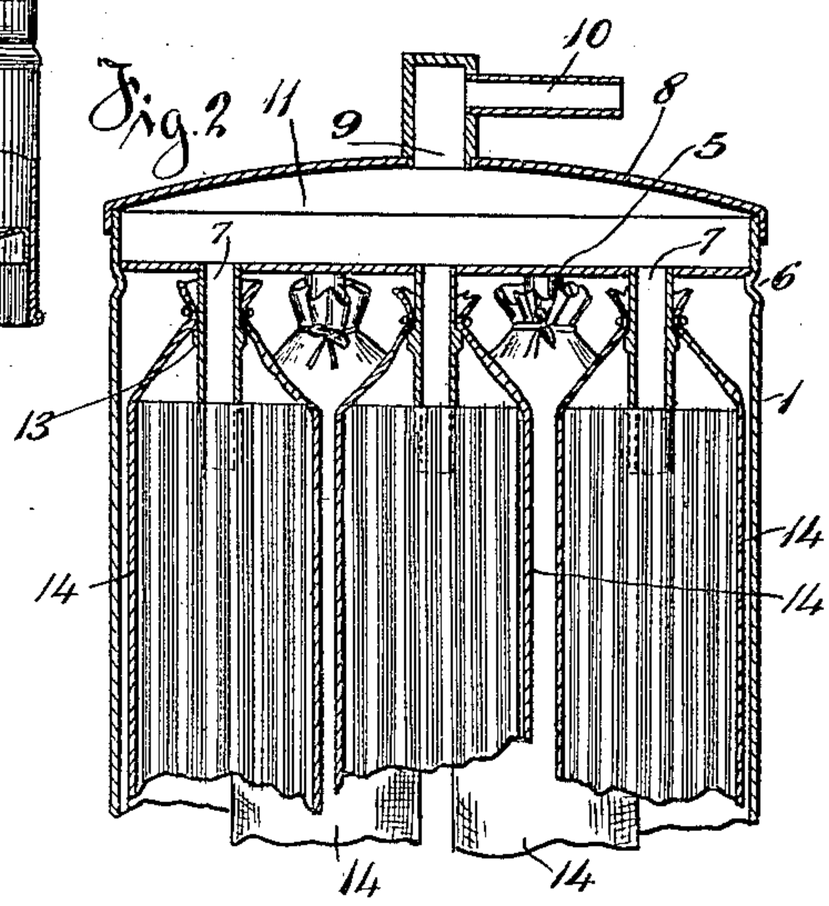


Fig. 5

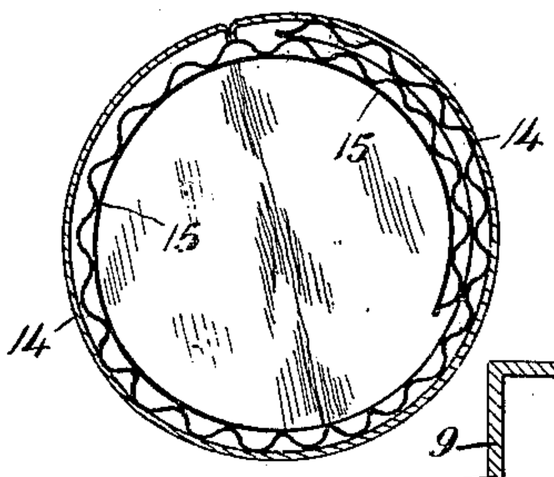
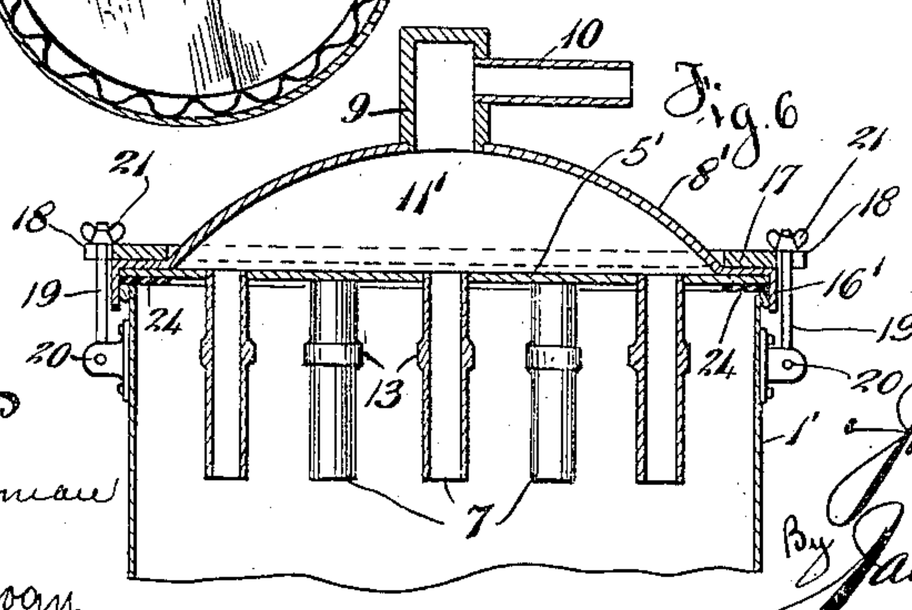


Fig. 6



Witnesses

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DUST-SEPARATOR.

1,136,836. Specification of Letters Patent. Patented Apr. 20, 1915.

Application filed March 20, 1911. Serial No. 615,766.

To all whom it may concern:

Be it known that I, JOHN ROBERTSON, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Dust-Separators, of which the following is a specification.

My invention relates to dust separators for vacuum cleaning machines. In a machine of this character the essential requisites are that it have a strong suction and an efficient separator.

The object of my invention is to construct a separator which will separate air and dust more thoroughly than those now in use.

The object of my invention is to provide a dust separator with a filtering bag having a removable roll or piece of corrugated material within said bag, having its corrugations extending substantially longitudinally therewithin to form a series of air passages lengthwise of and within said bag.

My invention consists in the device as claimed.

In the accompanying drawing which serves to illustrate my invention: Figure 1 is an elevation of a separator made in accordance with my invention, parts being broken away for the sake of clearness. Fig. 2 is a vertical section taken through the central portion of a separator made in accordance with my invention. Fig. 3 is a cross section taken on the line 3—3 of Fig. 1. Fig. 4 is a detail view of one of the separating or filtering bags employed in my invention, part being broken away for the sake of clearness. Fig. 5 is a cross section taken through the separating or filtering bags shown in Fig. 4. Fig. 6 is a vertical section taken through the center of a separator showing a modified form of how the top of the separator may be constructed.

In the embodiment of my invention as illustrated and which shows a preferred construction, 1 represents a metallic receptacle preferably made cylindrical in shape. The receptacle is provided with a bottom 2, which is suitably fastened therein and is preferably reduced at its central portion to form a mouth 3, which is closed by means of the cap 4, which may be screw threaded thereon. The receptacle 1 is preferably provided with a plate 5 at the top thereof which rests upon a bead 6 formed in the sides of the cylindrical receptacle 1 and soldered thereto. The plate 5 is provided with a plurality of nipples 7 fitting in suitable holes in said plate, said nipples extending downwardly into the receptacle 1. A cover plate 8 is then placed on the top of the receptacle 1, thereby closing the same, and is provided with an opening 9 in which is fastened an exhaust nozzle 10. Thus I form what may be called an exhaust chamber 11 at the top of the receptacle 1. The receptacle 1 is provided with an intake port 12 near the bottom thereof.

The extending nipples 7 which are fastened to the plate 5 at the top of the receptacle 1 are each provided with a shoulder 13, and sifting or filtering bags 14 are tied above said shoulders upon the nipples 7. As many of these bags may be provided as there are nipples in the plate 5, there being seven shown. The sifting or filtering bags 14 are best shown in Fig. 4, which illustrates one of the bags untied at the top and provided with a roll of corrugated paper 15 or other suitable support on the inside of said bag to prevent said bag from collapsing, and at the same time to allow the air to pass through said bag and enter the inside thereof on its way to the exhaust port or nozzle 10. One layer of corrugated paper is sufficient. Thus it is readily seen that the air being pumped from the exhaust port 10 will be compelled to create a partial vacuum inside the bags 14 and receptacle 1, and thereby draw air through the intake port 12. As soon as the dust laden air which is drawn through the intake port 12 comes into contact with the outer surfaces of the bags 14 the separation or straining of the dust from the air takes place, by reason of the fact that the air gently filters through the fabric comprising the bags while the dust clings to the outer surface of said bag or drops therefrom to the bottom of the receptacle 1, through which it may be discharged by removing the cap 4.

If desired, the top of the receptacle may be formed as shown in Fig. 6, in which the plate 5′ is adapted to rest upon the top of the receptacle 1′, and is provided with a gasket 24 to make it air-tight. The top lid or cover 8′ is provided with nozzle 10 and is shaped to form an exhaust chamber 11′, having flanges 16′ adapted to fit down over the sides or edges of the plate 5, and over the edges of the receptacle 1. A clamp ring 17

is adapted to rest on top of the outer edge of the cover plate 8′ and is provided with suitable slotted lugs 18, each of which allows a bolt 19 to enter. Said bolts 19 are fastened and pivoted to the receptacle 1 at 20, and are each provided with a thumb screw 21, which is adapted to be tightened and thereby clamp the top 8′ on the receptacle 1.

By placing a plurality of sifting or filtering bags 14 in the receptacle 1, and thereby increasing the filtering surfaces of the separator, I proportionately decrease the velocity of the air through the filtering material and consequently reduce the force of the impact of air and dust against the surface of the filters, and thereby allow the air to pass through the separators very gently, thus eliminating the liability of any of the dust passing through with the air as it naturally would if it contacted with the surfaces of the bags with great force. Of course the nozzle 12 and the nozzle 10 being the same size, the air enters the receptacle with the same velocity with which it is exhausted. By this construction the force of the air against the surface of the filters is from two thousand to three thousand times less than the suction force on the surface that is being cleaned. The force with which the air passes through these filters is practically *nil*. While the air is passing through the hose and the inlets and the outlets with great velocity and force, the air inside the receptacle and filters is practically at rest.

One great advantage of my device is that by increasing the sifting and filtering surfaces of the separator, I am enabled to greatly reduce the size of the mesh in the goods out of which the bags are made, thereby insuring a more thorough filtration of the air, and producing a more efficient separator. Another great advantage of my machine is that it may be emptied easily and without handling any dust whatever, such as is the case with separators which collect the dust in a bag which must be taken out of the receptacle and emptied. No handling of the bag is necessary with my device. When it is desired to empty the separator, it should first be shaken sufficiently to loosen the dust which clings to the sides of the bags and allow it to drop to the bottom, then unscrew the cap 4 and allow the dust to fall from the bottom of said receptacle.

The separator bags are adapted to be easily cleaned by simply removing the cap 4 and attaching a blower to the nozzle 10. The air will be forced from the pump through the several filters 14 from the inside, thus blowing the dust off from the outer surface and cleaning the bags without the necessity of removing them from the receptacle or of handling them, the operation of cleaning after the cap 4 has been removed and the air pump attached being automatic. This enables the operator to quickly, conveniently and readily clean the bags or filters without handling them, and without coming into contact with the dust as it is being removed therefrom. A more rapid removal of the dust from the surface of the filters may be effected by removing the screw cap 22 which closes the opening 23 near the top of the receptacle 1, and inserting therein a nozzle connected with the blower of the pump. The dust will thus be quickly blown off from the surface of the filters and out through the opening in the bottom of the receptacle.

Many modifications of my invention may be made without departing from its spirit and scope, especially in the shape and sizes of the parts shown.

What I claim as new and desire to secure by Letters Patent is:

1. In a dust separator, a filtering bag, a removable roll of corrugated material within said bag adapted to prevent its collapsing, and having its corrugations extending longitudinally therewithin to form a series of air passages lengthwise of and within said bag, substantially as set forth and for the purposes specified.

2. In a dust separator, a filtering bag and a removable piece of corrugated material within said bag having its corrugations extending longitudinally therewithin to form a series of air passages lengthwise of and within said bag.

JOHN ROBERTSON.

Witnesses:
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WINONA DOAN.

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