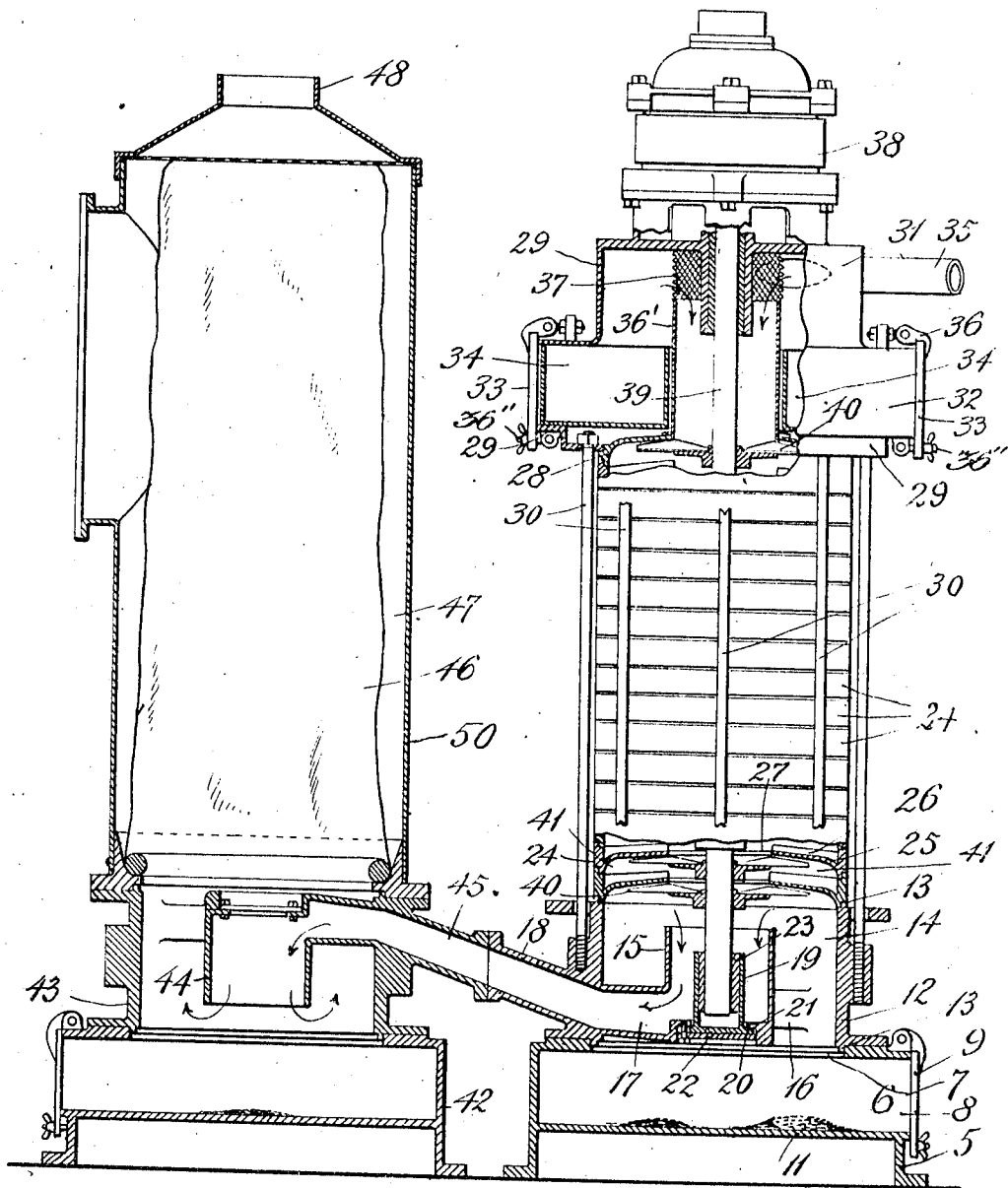


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CLEANING APPARATUS.
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1,022,114.

Patented Apr. 2, 1912.



WITNESSES:

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CLEANING APPARATUS.

1,022,114.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, IRA H. SPENCER, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented a new and Improved Cleaning Apparatus, of which the following is a specification.

My invention relates more especially to the class of devices by the action of which a current of air or other fluid is produced, and the object of the invention is to provide a device of this class having numerous novel features of advantage and utility.

One form of device in the use of which the objects sought may be attained is illustrated in the accompanying drawings, in which the figure is a view in central longitudinal section through an apparatus embodying my invention.

My improved apparatus is especially applicable in the operation of cleaning by a movement of a current of air or other fluid, and for this reason I have chosen such an apparatus for illustration and description as one in which a full and clear disclosure of the invention can be made, although it will be understood that the invention is not limited to its embodiment in a device of this character but may find application in many different forms of apparatus. In order that apparatus of this character may meet with what may be termed "domestic" uses and requirements, that is, may be employed in residences or other comparatively small buildings, as well as in factories, public buildings and the like, I have found it essential that an apparatus must be not only durably constructed, but must be capable of economic construction and must also be economical and simple in its operation, requiring little care in order that it may be operated by those comparatively unskilled in mechanics.

In the apparatus described herein such a result is attained and in the accompanying drawings the numeral 5 denotes a base constructed of any suitable material, preferably metal cast to shape. This base may be of any suitable form to meet special requirements and embodies a settling chamber 6 having an opening 7 extending therefrom. The bottom 11 of the settling chamber 6 is preferably raised above the lower line of the base and a hole 8 having a cover 9 pro-

vides means for removal of material from the settling chamber.

In some forms of apparatus it is desirable that a second casing shall be employed in connection with that above described and this second casing may be utilized for various purposes. In order therefore to simplify the construction and provide a device in which there are few parts of different construction I have so formed the parts that they may be interchanged.

A drum 12 is located upon the base 5 and is so constructed that it may be reversed top for bottom. Ribs 13 are located at each end of the drum, these ribs being of annular form and of a size to fit within the opening 7, or engage the bottom of a series of rings to be hereinafter described.

A dust chamber 14 is contained within the drum 12, this chamber being open at each end of the drum. A cup 15 is located within the chamber 14, being sustained partially by supports 16 and partially by an outlet duct 17. The outlet duct extends from the opening in the cup through the wall of the drum and to a distance beyond the drum, as indicated at 18. This duct opens out through the wall of the drum near one end and is inclined toward the opposite end in order to bring its outlet in the central line of the drum so that the drum may be reversed as hereinafter described.

A bearing is supported within the cup 15, this bearing including a socket-piece 19 having a flange 20 located underneath a lip 21 at the bottom of the cup 15. A plate 22 secured in any desired manner as by means of bolts, holds the socket-piece 19 in place, the construction being such, however, that this socket-piece may freely move laterally. The bearing member also includes a filling 23 located within the socket-piece 19.

A sectional casing is supported by the drum 12, this casing including a series of rings 24 superimposed one upon the other, these rings being duplicates each of the other. Each ring has a recess on one end and a rib on the opposite end, both being of annular form so that the rib of a ring is located in the recess of an adjoining ring when the parts are assembled to form the casing. Each ring has a flange 25 formed integrally therewith and projecting inward toward the center and upon each of these

flanges are formed a series of vanes or deflectors 26. The construction of the flanges provides openings 27 therethrough, these openings being of suitable size for special work required of the apparatus.

The required number of rings 24 being disposed one upon the other to form a casing of required length or height, an end ring 28 is placed at the end forming a cap or cover for the casing. This cover has a shoulder for positioning a receiver casing 29, which is held in place by means of tie-rods 30 engaging the receiver casing and the drum 12, thus securing the several members of the structure tightly together.

The receiver casing includes an inlet chamber 31 and a receiver chamber 32, the latter being closed as by means of doors 33. The inlet chamber 31 is of smaller diameter than the receiving chamber 32 in order that the edges of the receivers 34 shall be located well underneath the inlet chamber, so that dirt and other refuse separated from the air within the inlet chamber 31 may be deposited directly in the receivers 34, thus preventing any of such matter from falling between the receivers and the wall of the casing. An inlet pipe 35 leads into the inlet chamber 31, being arranged tangentially thereto. This inlet pipe is adapted to receive a hose or other tubular connection with a cleaning tool or like device by means of which dirt or other refuse is collected and, commingled with the air, conducted to the inlet chamber 31. Pivot bolts 36 with thumb screws 36'' are employed for holding the doors 33 in place, the doors in the preferable construction, and as herein shown, being formed larger than the casing thus providing means in the projecting edge to receive the fastening bolts.

A neck 36' projects upward from the cover 28 to within a short distance of the top of the casing 29 and a screen guard 37 extends downward from said top to the edge of said neck, to prevent the passage of comparatively large and light materials, as rags, waste or the like, liable to become entangled in the mechanism.

A motor 38 is mounted on the casing 29, the shaft 39 of said motor extending through the casing 29 and the shell composed of the rings 24, the end of the shaft opposite the motor being located in the bearing in the cup 15, which bearing may be termed a "floating bearing". Impellers 40 constituting blades secured to the shaft 39 are arranged in series within the compartments 41 formed between the flanges 25.

It will be seen that the device above described when set in operation will cause a current of air laden with various kinds of impurities to be created, flowing in at the inlet pipe 35 into the chamber 31, where by centrifugal action, the heavier particles are

deposited in the receptacles 34. The balance passes over the edge of the neck 36', through the screen guard 37, through the shell containing the impellers to the duct chamber 14, where further separation takes place, the heavier particles falling into the settling chamber 6. The air now comparatively free passes out through the duct 18, where it may be delivered freely to the atmosphere or into a chimney or like place, or into another shell, as shown herein.

The shell or shells other than those above described and used in connection therewith may be employed for various purposes. They may serve as a shell for a dust collector or for a duplicate of the pressure-creating device herein above described. As showing one use to which this second shell may be put I have illustrated it in connection with a dust collector.

A base 42 supports a deflector casing 43 which, it will be noted, is a duplicate of the drum 12, being inverted, however, from the position used in the other part of the apparatus. The base is also a duplicate of that used in the other part of the apparatus.

An inverted cup 44, connected with the inlet 45, forms a deflector to direct the air current downward, which then flows upward through the drum 43 into a separator casing 50. A screen 46 is suspended within this casing, the air current passing within the screen 46 and then outward through its meshes into the chamber 47 from which it passes through the outlet 48 to any desired point.

I claim—

1. In combination a drum, a cup supported within the drum projecting from one end thereof, and a duct leading from said cup and having an opening at one side of the drum midway between the ends of the drum.

2. In combination a base, a shell composed of rings duplicates each of the other placed end to end and with compartments formed in said shell, a cap fitting the end of the shell, a casing fitting upon said cap, tie-bolts engaging the base and shell to secure all of the parts together, a neck extending from the cap and within the casing, a motor supported by the casing, a shaft depending from the motor within the shell, and impellers secured to said shaft and located within said compartments.

3. In combination a shell, means for supporting the shell, a shaft depending within the shell, a cup supported within the structure having an opening through its end, a bearing projecting through said opening and having an opening at one end, a plate to hold said bearing in place, said cap having a duct extending outward through the wall of the chamber in which the cup is located and impellers secured to said shaft.

4. In combination a shell, means for supporting the shell, a motor supported by the shell, a motor shaft depending within the shell, a cup supported within the structure
5 and having an opening through its end, a bearing projecting through said opening, a plate to hold said bearing in place, said cup having a duct extending outward through the wall of the chamber in which the cup is
10 located, and impellers secured to said shaft.

5. In combination a shell, means for supporting the shell, a motor supported by the shell, a shaft depending from the motor within the shell, a cup supported within the structure and having a recess in its bottom and an opening from said recess to the interior of the shell, a bearing having a flange located within the recess and projecting through said opening, a plate located within
15 the recess to hold the bearing in position, said cup having an opening through the wall of the chamber containing it, and impellers secured to said shaft.

6. In combination a base and a drum provided with interlocking means, each end of the drum being constructed to fit the base, a shell mounted upon the drum, said shell and drum having interlocking parts, a motor supported by the shell, a shaft depending
20 from the motor within the shell, and impellers secured to said shaft.

7. In combination a base having an opening, a drum having each end adapted to fit the base and with ribs on each end to fit said
25 opening, a shell arranged to fit either end of said drum, a motor supported by the shell, a shaft depending from the motor within the shell, and impellers secured to said shaft.

8. In combination a shell and a drum, interlocking parts between the shell and drum, said drum having each edge constructed to fit the shell, a motor mounted upon the shell, a shaft depending from the motor within the shell, and impellers secured to
30 said shaft.

9. In combination a shell and a drum having interlocking engagement, each end of the drum being adapted to fit the shell, a cup supported within the drum and with an
35 outlet through the side thereof, a motor supported by the shell, a shaft depending from the motor within the shell, a floating bearing

for said shaft located within said cup, and impellers secured to said shaft.

10. In combination a structural base containing a chamber, a cup located within said chamber, and a duct extending from said cup through the side wall of the base. 55

11. In combination a structural base containing a chamber, a cup located within said chamber, a duct extending from said cup through the side wall of the base, and a projection containing said duct terminating in a plane midway between the ends of the base. 60

12. In combination a structural base containing a chamber, a cup located within said chamber with its bottom near one end, said cup opening toward the opposite end, and a duct extending from said cup through the side wall of the base. 65

13. In combination a structural base containing a chamber, a cup located within said chamber with its bottom at one end, said cup opening upward, and a duct extending from the bottom of said cup through the side wall of the base. 70

14. In combination a structural base containing a chamber, a cup located within said chamber, a duct extending from the bottom of said cup to the side wall of the base, and a projection extending in continuation of said duct and terminating in a plane midway between the ends of the base. 75

15. In combination two structural bases duplicates each of the other, coöperatively mounted but reversed in position one from the other, each having ducts communicating one with the other, a shell mounted on one of the bases, and means within said shell for creating flow of a current of air. 80

16. In combination a shell, means for supporting the shell, a shaft depending within the shell, impellers secured to said shaft to force air through the shell, means for driving the shaft, a cup supported at the lower end of the shell and having an outlet there-through from the shell, and a bearing for said shaft located in said cup. 85

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Witnesses:

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