

W. W. FARNSWORTH.
CLEANING APPARATUS.
APPLICATION FILED JULY 5, 1919.

1,383,456.

Patented July 5, 1921.

2 SHEETS—SHEET 1.

Fig. 1

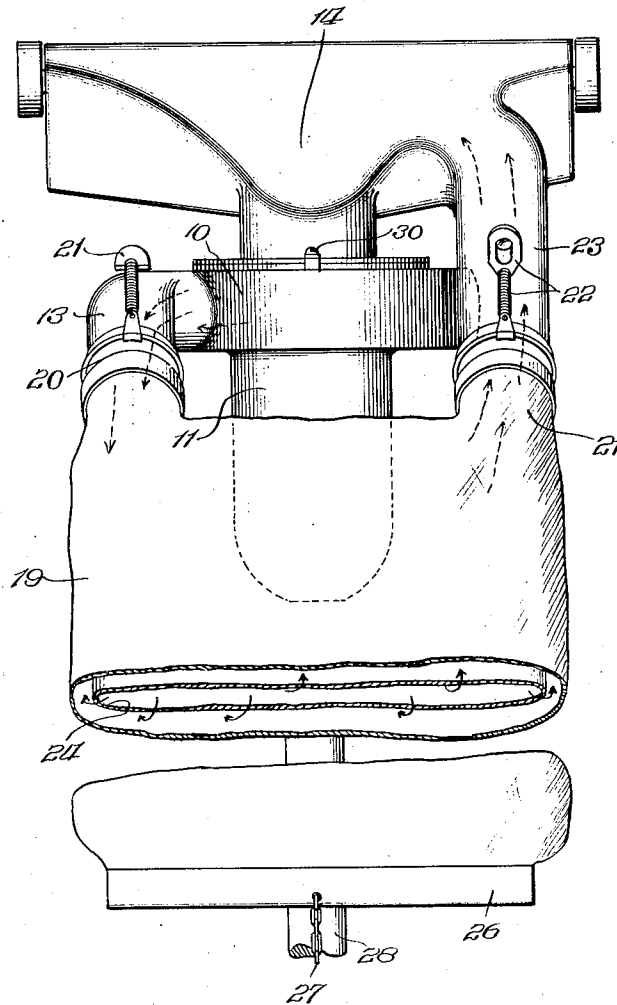
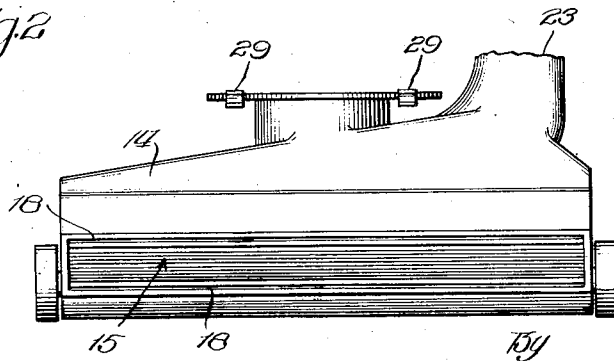


Fig. 2



Inventor:
Wm. W. Farnsworth

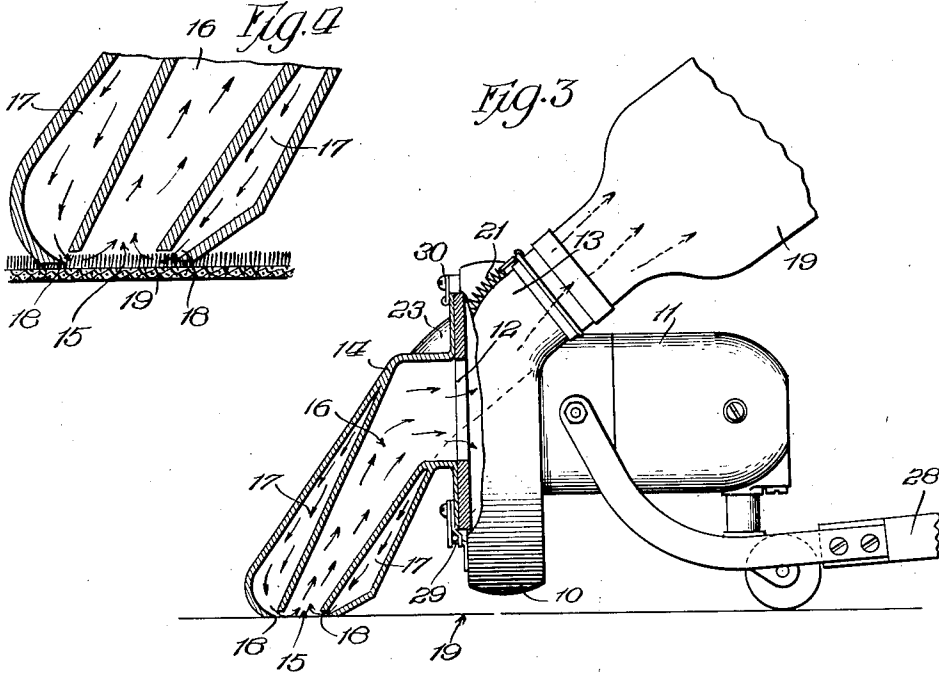
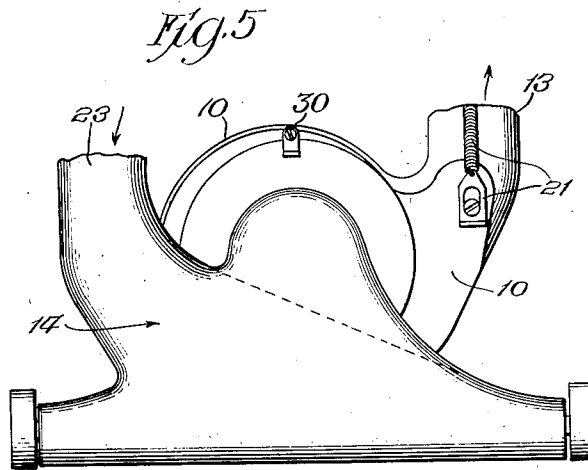
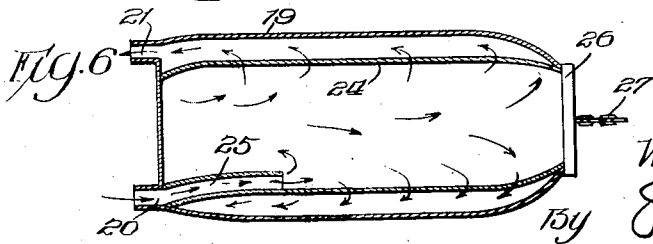
John G. Johnson
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

WILLIAM W. FARNSWORTH, OF LITTLETON, COLORADO.

CLEANING APPARATUS.

1,383,456.

Specification of Letters Patent.

Patented July 5, 1921.

Application filed July 5, 1919. Serial No. 308,697.

To all whom it may concern:

Be it known that I, WILLIAM W. FARNSWORTH, a citizen of the United States, residing at Littleton, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Cleaning Apparatus, of which the following is a specification.

This invention relates to improvements in cleaning apparatus, particularly adapted, though not necessarily limited in its use, for cleaning carpets, rugs, etc., and one of the objects of the invention is to provide an improved apparatus of this character having means whereby a blast of air may be directed against the surface to be cleaned to act as an agitator to agitate and loosen the dirt or foreign matter, after which the blast will cooperate with the suction to carry the dirt and foreign matter away from said surface.

A further object is to provide an improved apparatus of this character in which the dirt laden air will be retained in an air-tight bag, sack, or receptacle, then purified and used over again, whereby any of the dirt or dust will be prevented from escaping into the room after it has been taken up and delivered into the apparatus.

A further object is to provide an improved apparatus of this character embodying a suction nozzle having an elongated narrow entrance opening adapted to stand in close proximity to and be moved across the surface, with blast discharge outlet openings disposed in close proximity to the surface to direct the blast thereagainst and thereacross, the blast and suction being created by a single air moving device thereby causing a continuous circulation of the air.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention, and in which;

Figure 1 is a top plan view of an improved apparatus of this character constructed in accordance with the principles of this invention and with parts broken away.

Fig. 2 is a bottom plan view of the suction nozzle.

Fig. 3 is a side elevation partly in vertical section.

Fig. 4 is an enlarged detail vertical sectional view of a portion of the nozzle.

Fig. 5 is a front elevation of Fig. 3 with parts omitted and parts broken away.

Fig. 6 is a longitudinal sectional view of the air-tight bag or sack.

In the drawings the numeral 10 designates generally a fan casing having a fan which is driven by means of a suitable motor 11 as is usual in devices of this character. The fan casing is provided with an inlet opening 12 and a discharge outlet 13.

The nozzle designated generally by the reference numeral 14 may be of any desired configuration and is provided with a narrow inlet opening 15 adapted to stand in close proximity to and to be moved across the surface to be cleaned. This inlet opening 15 forms one extremity of a suction passage 16 which has communication with the inlet opening 12 of the fan casing 10 so that when suction is created by the fan in the casing 10, the suction will be manifested in the passage 16. The nozzle 14 is provided with one or more chambers 17 so constructed that portions of the chamber are located on opposite sides of the passage 16. These chambers or passages 17 are each provided with a narrow discharge outlet opening 18 arranged in close proximity to the inlet opening 15 of the suction passage 16. The discharge outlets 18 may be of any desired size and are arranged parallel with each other and extend lengthwise of the opening 15 to define the lateral edges of the suction inlet opening 15. The outlet openings 18 are disposed to direct blasts of air against the surface 19 at an angle to the surface so as to operate as a pneumatic agitator for agitating and loosening the dirt and foreign matter from the surface 19, and after the dirt and foreign matter has been dislodged or loosened, the blasts cooperate with the suction to carry the dirt and foreign matter away from the surface into the suction passage 16. From the suction passage 16 the dust-laden air will be delivered into the casing 10 through the opening 12 to be discharged therefrom through the outlet opening 13 into an air-tight bag or sack 19 which has an inlet 20 that is detachably

secured to the discharge outlet 13 by means of a suitable detachable fastening device 21, usual in devices of this character.

The bag or sack 19 is constructed of any suitable flexible material which is impervious to air and is provided with a discharge outlet 21. This discharge outlet is connected by means of a suitable detachable fastening device 22 to an inlet opening or conduit 23 which discharges into the nozzle 14 outside of the suction passage 16, or into the chambers or passages 17 so that the air discharged into the chambers or passages 17 will be delivered in the form of a blast through the outlet openings 18. It will thus be seen that inasmuch as the bag or sack 19 is air-tight and impervious to the passage of air through its walls, and inasmuch as the fan is discharging a current of air into the sack during operation, the air will find its way out of the bag through the discharge outlet 21 and into the inlet passage 23 of the nozzle, thereby causing the fan or air moving means to not only create a suction through the passage 16 but will also create a blast through the outlet openings 18. As the opening of the nozzle which passes over the surface to be cleaned is closed by such surface, it will be manifest that the single air moving means within the casing 10 will cause a continuous circulation of the air so that the air will be used over and over again.

Arranged within the sack or bag 19 is a filter or separator for purifying the dust-laden air. This filter may be of any suitable construction but is preferably in the form of a porous bag or sack 24 which has an inlet opening or passage 25 that connects and has communication with the inlet opening 20 of the outer casing 19. This inner porous bag or casing is closed to the outlet opening 21 of the outer casing or bag and both the inner and outer casing or bag are provided with the usual clean-out openings arranged at one end of the bag and which clean-out openings are closed by means of the usual detachable clip 26 to which is connected a chain or flexible member 27 and by means of which chain 27 the upper end of the bag is detachably secured to the handle 28 of the device in a manner common in devices of this character.

It will, therefore, be manifest that with this improved construction all of the dust-laden air will be retained within the bag 19 and cannot escape into the room through the walls thereof. The single air moving device not only creates a suction but also a blast, both of which operate upon the surface to be cleaned and will cause a continuous circulation of the air. Furthermore it will be noted that the blast of air currents will be maintained against rarefaction during the entire time that they are directed against and across the surface to be cleaned,

with the result that the air currents will be more effective than they would be if they were allowed to expand or rarefy immediately upon coming into contact with the surface. By directing the air blast toward the suction inlet, all tendency of the air blast to agitate and blow away dust or dirt on the outside of the nozzle in close proximity thereto will be avoided, and if there should be any tendency to distribute any dust or dirt on the outside of the nozzle, the air currents, with this improved construction, will have a tendency to draw it into the nozzle.

The nozzle is detachably secured in position to the fan casing in any suitable manner usual in devices of this character such as by means of a detachable fastening or connection 29 and a clip 30 so as to permit the nozzle to be readily removed and as readily applied when desired.

Obviously many changes may be made in the details of construction and of the arrangement of the passages in the nozzle without departure from the spirit of this invention.

What is claimed as new is:—

1. A cleaning apparatus embodying a nozzle adapted to be moved over the surface to be cleaned, and having a comparatively narrow slot adapted to be closed by said surface, there being narrow discharge outlet slots arranged along both of the lateral edges of the first recited slot for directing blasts of air against the said surface and in directions toward the first recited slot, the height of each of the outlet passages decreasing in directions from one end to the other end of the nozzle, an air moving element having a suction side and a blast side, the first recited slot having communication with the suction side of the said element, means forming communication between the blast side of the said element and the said discharge outlet slots, and means whereby the air moved by the said element will have a continuous and uninterrupted circulation across the said surface from the outlet to the inlet slot, the said air currents being maintained against rarefaction during their passage across the said surface.

2. In a cleaning apparatus, the combination of a suction nozzle adapted to be moved over the surface to be cleaned and having a narrow inlet slot, an air moving device adapted to create a suction through the inlet slot, there being narrow discharge outlet slots extending along opposite sides of the inlet slot and directed toward the surface to be cleaned, said outlet slots being connected with the blast side of the air moving device, the outlet passages decreasing in height from one end to the other end of the nozzle, and impurities collecting means through which the air passes before it

reaches the outlet slots, the air currents being maintained against rarefaction during their passage across the said surface.

3. In a cleaning apparatus, the combination of a suction nozzle to be moved over the surface to be cleaned and having a narrow inlet slot, an air moving device for creating a suction in the nozzle, means whereby the blast from said air moving device will be maintained against rarefaction during the passage across the said surface

and will operate as a pneumatic agitator against the said surface adjacent the inlet slot and on opposite sides of the slot and in directions toward each other, and impurities collecting means for purifying the air before it is delivered against the said surface.

In testimony whereof I have signed my name to this specification on this 3rd day of 20 July, A. D. 1919.

W. W. FARNSWORTH.