

July 22, 1930.

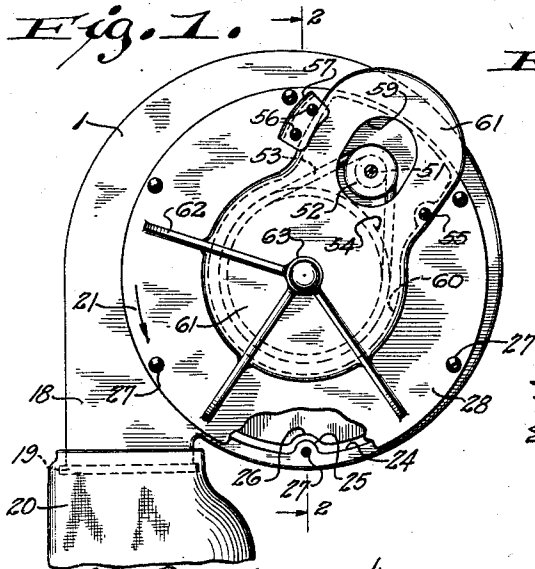
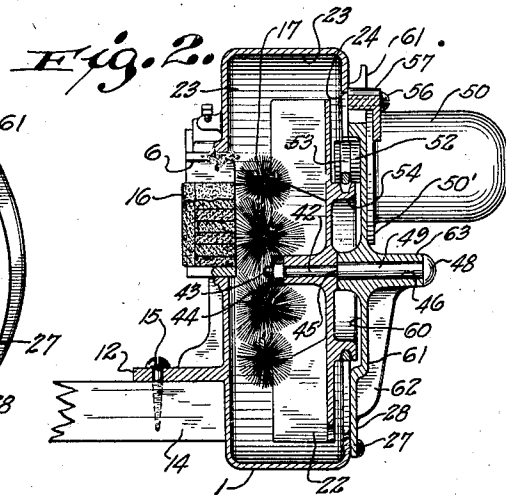
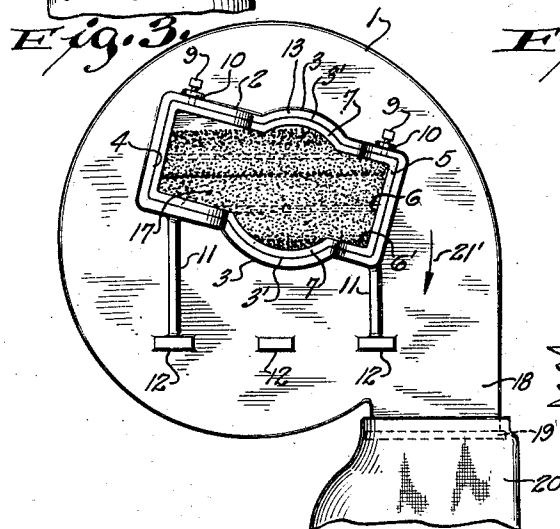
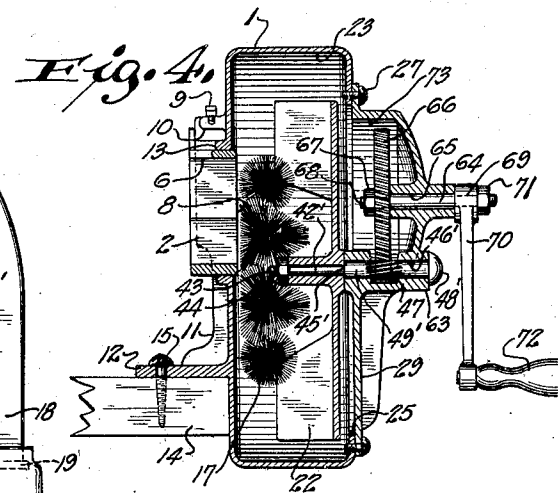
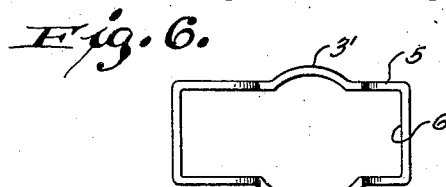
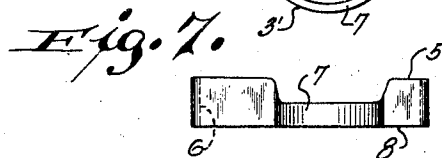
E. R. LOCHMAN

1,770,935

ERASER CLEANING MACHINE

Filed Aug. 6, 1927

2 Sheets-Sheet 1



INVENTOR.

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2 Sheets-Sheet 2

Fig. 8.

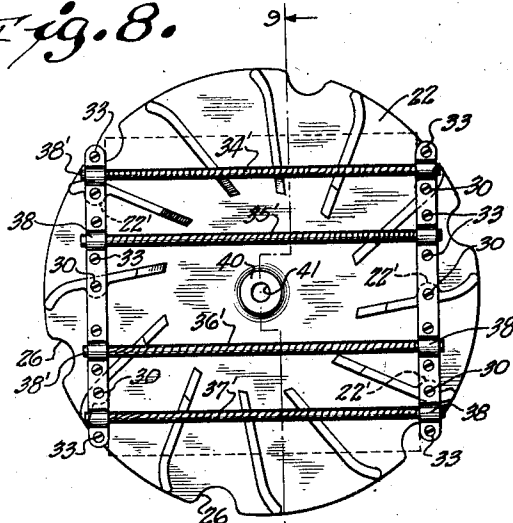


Fig. 9.

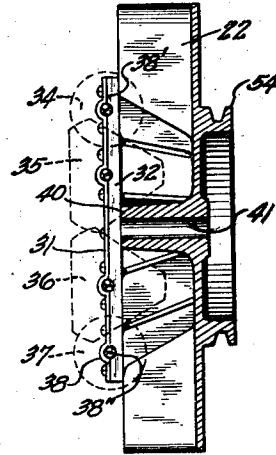


Fig. 10.

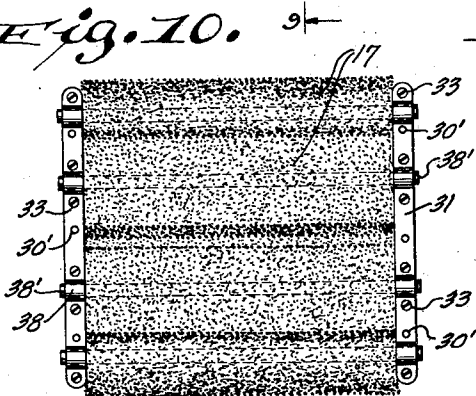


Fig. 11.

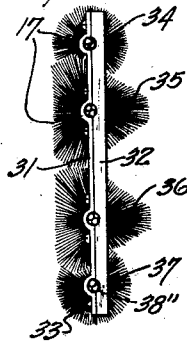


Fig. 5.

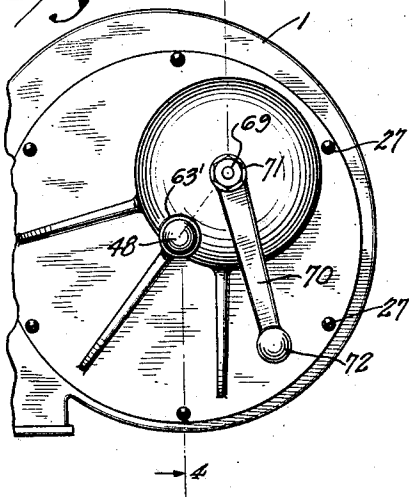
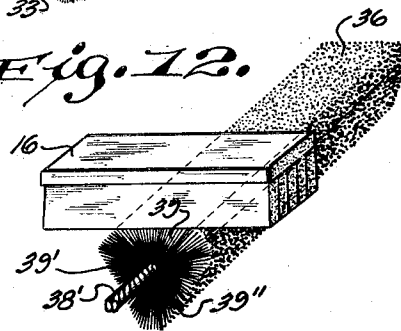


Fig. 12.



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Emil R. Lochman

UNITED STATES PATENT OFFICE

EMIL R. LOCHMAN, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO WALTER J. McMILLAN,
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ERASER-CLEANING MACHINE

Application filed August 6, 1927. Serial No. 211,173.

My invention relates to improvements in eraser cleaning machines.

The object of my invention is to provide a substantial machine of novel construction for cleaning blackboard erasers of chalk dust.

The principal objects of my invention are to provide a machine of simple and durable construction, which may safely be operated by an inexperienced person, which may easily be driven by hand or electric motor, and having a large and very efficient brush and fan directly connected to each other, and original means by which the entire surface of the eraser is at once brought in contact with the brush and quickly and efficiently cleaned thereby, and whereby all of the dust is quickly sucked away from the eraser and deposited into a bag or other receptacle.

Another important object is to provide a large composite brush, which is very efficient in action, cheap to manufacture, and in which individual sections can be turned and reset, thereby providing other unused portions, so that said composite brush practically provides three brushes in one, and further provides means to readily replace the worn out sections or individual brushes with new ones.

These and other objects may be attained by means of the construction illustrated in the accompanying drawings, in which,

Figure 1 is a side elevation showing the rear of the machine with means for motor drive, Fig. 2 is a vertical sectional view taken on line 2—2 of Fig. 1, Fig. 3 is a side elevation showing the front of the machine, Fig. 4 is a vertical sectional view taken on line 4—4 of Fig. 5, Fig. 5 is a side elevation of the rear of the machine with means for hand operation, Fig. 6 is a front elevation of the supporting frame for the erasers, Fig. 7 is a side elevation of Fig. 6, Fig. 8 is a front elevation of the fan and the skeleton of the brush while its outline is shown in dotted lines, Fig. 9 is a vertical sectional view of Fig. 8 on line 9—9, Fig. 10 is a front elevation of the brush, Fig. 11 is a side elevation of Fig. 10, Fig. 12 is a perspective view of a sectional member of the brush showing one of its sides in contact with an eraser.

Referring to the drawings, the numeral 1

designates the casing which by its extending lugs 12 is fastened to a suitable support 14 by screws 15, and which in turn supports all other parts of the machine. Said casing has an opening 4 and a raised flange 2 surrounding said opening; the ribs 11 connect said flange with the lugs 12 to insure a rigid support for the casing; the supporting frame 5 fits loosely into the opening 4 and is held firmly in its adjusted position by setscrews 9 which are tapped in the reenforced sections 10 of flange 2. The opening 4 has semicircular extensions 3 fitting like extensions 3' of the supporting frame, these furnishing room for thumb and fingers respectively while holding the eraser 16 in the opening 6 of the supporting frame, and said parts have cut down sections 7 and 13 for bringing said thumb and fingers as close as possible to the brush 17, so that a thin worn down eraser can still be cleaned properly on the machine. It is readily seen that the supporting frame can be set inward as the brush 17 wears down.

The casing terminates into the mouthpiece 18 which has a surrounding lip 19 holding the bag 20 which is suitably fastened to said mouthpiece, through which the machine discharges air and chalk dust into said bag, of which only the upper section is shown in the drawings. The casing has a large circular opening 24 provided with inwardly extending lugs 25 and the cover 28 is fastened by screws 27 to said lugs 25.

The covers 28 and 29 are interchangeably fitted to the casing and all of the revolving operating parts are suitably mounted on said covers, with the distinction that cover 28 is fitted for motor operation, while cover 29 is fitted for hand operation. These operating parts are few in number, and are simple and efficient in operation, and it is readily seen that this arrangement of interchangeable covers is a very valuable feature for providing the same machine for schools equipped with electric current, as well as those without such equipment.

The principal operating members are the brush 17 and the fan 22 fastened together by screws 30 passed through the holes 30' in brush bars 32 and being screwed into the lugs 100

22' cast onto the rear part of the fan blades. The shaft 49 is passed through the bearing 46 of cover 28 and has a reduced part 42 fitting into the bore 41 of the fan and the latter is firmly mounted thereon by nut 44 being screwed on the threaded end 43 of said reduced part, thus forcing the hub 40 of the fan tightly against the shoulder 45, and the head 48 preventing end motion, it will be seen that mounted in this manner the brush and fan turn freely on said shaft in bearing 46, and these parts are alike and work alike in both motor and hand operated machines, but the respective parts for the hand operated machine are marked 49', 42', 45', 48' and 46'. The hand operated shaft 49' is partly cut and forms the pinion 47 meshing with gear 66 which is held firmly by nut 67 on the reduced section 68 of shaft 64, while the crank handle 70 is firmly mounted on the reduced section 69 by nut 71, thus providing proper hand operating means for the said fan and brush; the shaft 64 turning freely in bearing 65 while the gear 66 has free play in pocket 73 forming part of cover 29. The cover 28 fixed for motor operation is provided with a raised portion 61, and the motor 50 is held on the outer part of said section in an adjustable manner by screw 55 passed through the rim 50' of the motor while a clamp 57 holds the motor on the opposite side of the rim by screws 56. This allows the motor sufficient adjustment to compensate for the stretching of belt 53, connecting the motor pulley 52 with the pulley rim 54 cast onto the fan 22; while the oval cutout 59 allows for such adjustment. The pocket 60 allows free play for these pulleys and belt in the cover 28.

The broken cover section in Fig. 1 illustrates the manner in which brush and fan are inserted into the chamber 23 of the casing after all the operating parts are assembled on the cover. The casing is provided with lugs 25, preferably six in number, and the fan is provided with a like number of cut out sections 26 which allow the fan to pass the lugs, then the cover is fastened to the casing by screws 27 as described.

The composite brush 17 is made up of suitable numbers of individual brushes 34, 35, 36, and 37 of the type where the bristles are held in a twisted wire core; the brushes 34 and 37 are of a cylindrical shape, while the brushes 35 and 36 have three flat surfaces. All of the brushes have core extensions 38' on either end, and are held thereby in the brush bars 32 by caps 31 in the fixed slots 38'' and corresponding cap parts 38 by screws 33, thus forming a large square brush with a good operating surface for the purpose intended, and being open and porous, the air and chalk dust passes freely through it, and is sucked in and delivered into the bag by the fan 22. (See Figs. 8 and 9 for the best illustration of this arrangement.) Fig. 9 shows the vari-

ous fan blades in cross section, while in Figs. 2 and 4 only two of the blades are shown while the rest are broken out, to present a clear view for the principal features. Figs. 8 and 9 show the brush and brush parts in dotted outline, to present a clear view of the skeleton of the brush and the way of mounting the same on the fan.

The important feature of resetting the brushes is best illustrated in Fig. 12, when the brush surface 39 is worn down, then the brush is reset to bring the surface 39' in contact with the eraser 16, and when this side is worn down, the third side 39'' is set upward; this of course is done with all four sections 34, 35, 36 and 37 alike, so that the composite brush 17 practically contains three brushes in one. The individual brushes are cheap to manufacture and can easily be replaced by inexperienced operators, and thereby assure efficient and continuous use of the machine.

Another very important feature of the machine is that the entire surface of the eraser is at once presented to the revolving brush and cleaned at once, thus saving a great deal of time required by other machines in passing the eraser back and forth over a small opening a great many times before the eraser is cleaned.

In the operation of my invention, the fan and brush are set in operation by either motor or hand power, then the operator inserts the eraser into the rectangular opening 6 of the supporting frame 5, thus bringing the entire surface of the eraser 16 at once in contact with the revolving brush 17, while the fan is sucking air through the remaining part of the opening 6, and turning in the direction of arrows 21 21' quickly deposits air and chalk dust into the bag 20. For easy and efficient operation and easily holding and handling of the erasers the rectangular opening 4 in the casing, as well as the inserted supporting frame 5 are placed in an inclined position, see Fig. 3, and while the eraser is held lightly in the fingers of the operator, the action of the revolving brush brings it into the corner 6' of the supporting frame 5, which latter is adjusted and set inward as the surface of the brush 17 wears down.

While I show the same machine for both motor and hand operation, the principal features of both constructions are alike, and while there is a greater demand for motor driven machines, it is of decided advantage to supply the same machine with motor drive to schools with electric current, and with hand operation for schools without electric equipment. It is furthermore of considerable importance that all of the revolving operating members are mounted on the cover. This allows quick and ready assembling in manufacture, as well as ready access to these parts for readjusting the brushes. It will further be

noticed that the twist wire core brushes are cheap to manufacture, original in their application and very efficient for the purpose as shown and described.

It is further important for the safety of children as well as other operators, that the pulleys and belt in the motor driven machine, as well as the driving gear and pinion of the hand operated machine, are incased in the same manner in the respective covers.

What I claim as my invention is:

1. A vacuum cleaner for blackboard erasers comprising a casing having inlet and outlet openings, a suction fan and cleaning means within the casing, and a rectangular supporting frame for said inlet for receiving and supporting the entire eraser in contact with the cleaning means.

2. A vacuum cleaner for blackboard erasers comprising a casing having opposite flat walls and inlet and outlet openings, a revolving fan and cleaning means within the casing, and a rectangular supporting frame for said inlet, said inlet opening being on one flat wall of the casing, said cleaning means being mounted on said fan and facing said inlet opening.

3. A vacuum cleaner for erasers comprising a casing having opposite flat walls and an inlet and an outlet, said inlet being on one flat side of said casing, a rotatable fan and brush unit for said casing of larger dimensions than said inlet, said inlet being of rectangular shape to receive the entire eraser for contact with the brush, said fan and brush operating within the casing.

4. A vacuum cleaner for erasers comprising a casing having an inlet and an outlet, a revolving fan and brush unit for said casing of larger dimensions than said inlet, a shaft for driving said fan and brush unit and forming the center thereof, said inlet being of rectangular shape and being on a flat side of said casing for receiving an entire eraser for suitable contact with the brush, said inlet being located to one side of the center of said fan and substantially away from it.

5. In an eraser cleaning machine, a fan comprising a disk, radiating fan blades on one side of said disk mounted on the outer portion thereof and leaving an open central suction area, and a flat pervious cleaning element mounted on the outer edges of said blades and covering said blades and said suction area.

6. An eraser cleaning machine comprising a casing having an inlet opening and an outlet opening, a rotatable disk-like fan and a pervious cleaning element entirely within said casing and mounted on a flat side of said fan and a supporting and driving member for said cleaning element and fan extending through said casing, and a motor connected to said driving member exteriorly of said casing, said inlet opening being of a sufficient

size to permit the entrance of an entire eraser into the casing, said fan and cleaning element operating within said casing, said cleaning element facing said inlet.

7. An eraser cleaning machine comprising a casing having a flat wall and an inlet opening and an outlet opening, said inlet opening being on a flat side of the casing, a disk like fan revolubly mounted within said casing, a pervious cleaning element secured to the flat side of the fan and facing the inlet and forming a revoluble flat cleaning and supporting surface, and means for operating said fan and cleaning element, said fan and cleaning element operating within said casing and below the inner surface of said flat side having said inlet.

8. A vacuum cleaner for erasers comprising a casing, a disk-like revolving fan for said casing, said casing having an air inlet and outlet, said air inlet being of rectangular form and adapted to receive an entire eraser, and a flat pervious cleaning element mounted on said fan to rotate therewith, said fan and cleaning element operating within said casing in operative relation to said rectangular inlet.

In testimony whereof I have signed my name to this specification.

EMIL R. LOCHMAN.

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