Aug. 3, 1926.

1,594,685

F. J. OSIUS

CARPET SWEEPER

Filed May 8, 1922

2 Sheets-Sheet 1

Fig. 2.

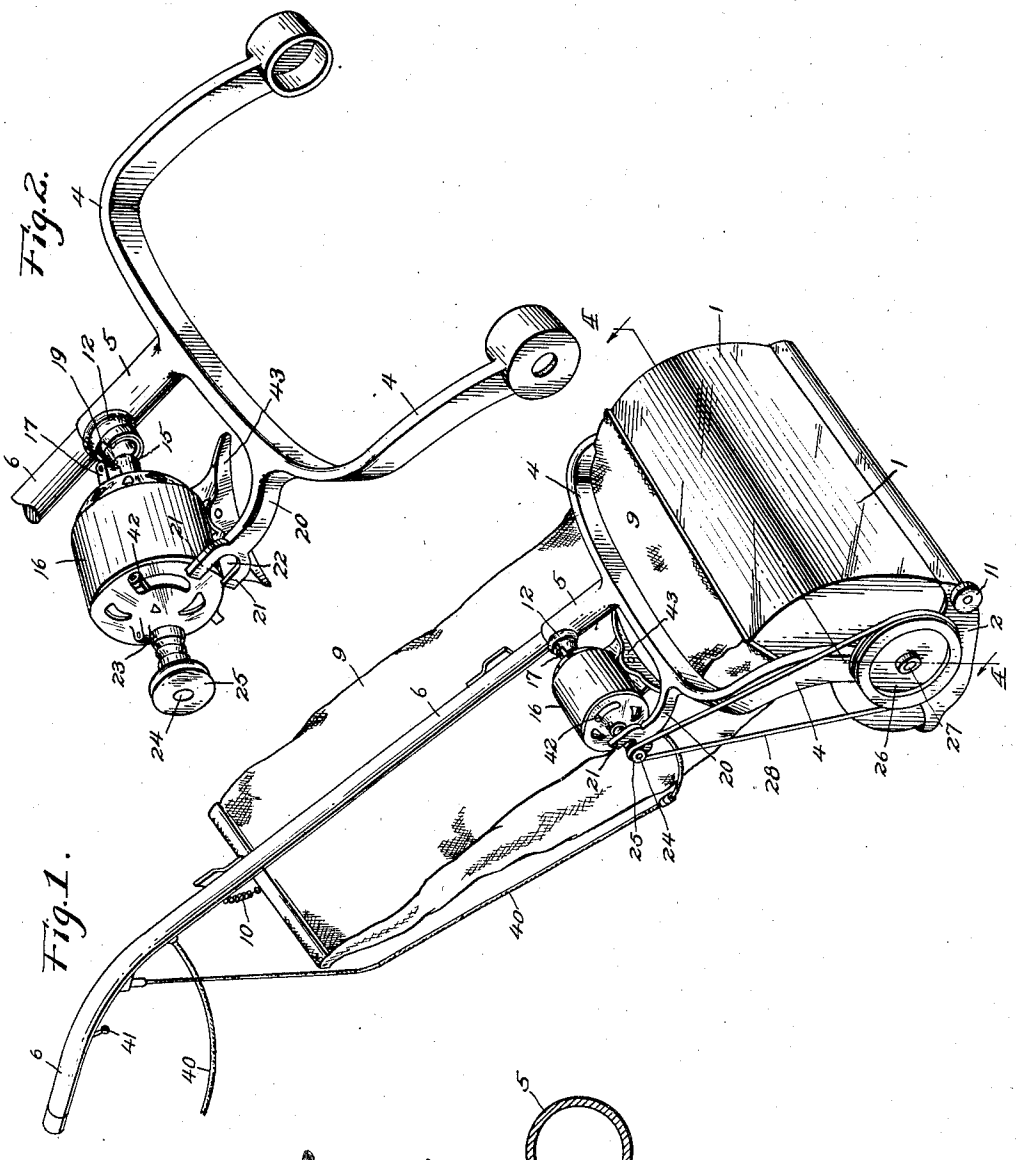


Fig. 1.

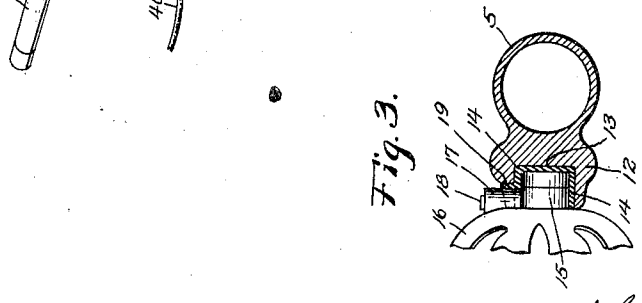


Fig. 3.

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Fig. 4.

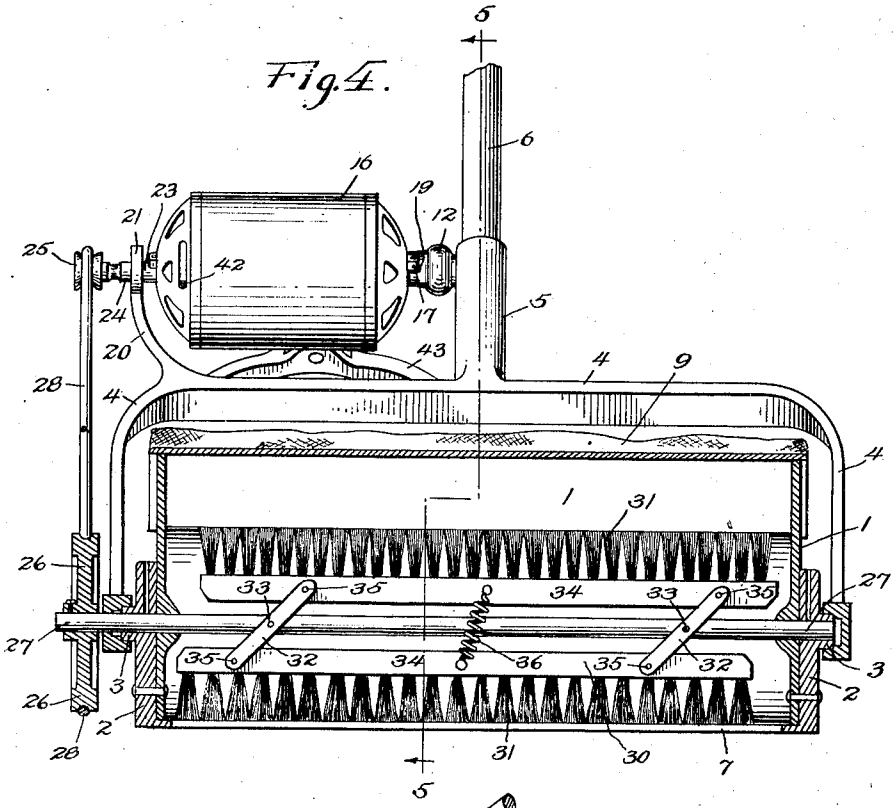
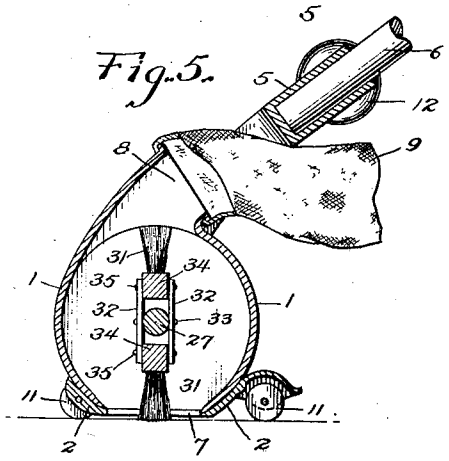


Fig. 5.



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UNITED STATES PATENT OFFICE.

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CARPET SWEEPER.

Application filed May 8, 1922. Serial No. 559,193.

This invention relates to carpet sweepers and has for its principal object to provide a power-driven sweeper in which the power is supplied by a motor which may be readily and quickly attached to or removed from the sweeper, whereby the same motor may be employed for performing work of different characters about the house.

A further object of the invention is to provide a sweeper of the character described in which the power may be supplied by a motor which is relatively so small as to be ordinarily incapable of performing the work required of it in this connection.

A still further object of the invention is to provide a brush construction whereby this said small motor may be efficiently employed for driving the sweeper mechanism without sacrificing any of the efficiency of the motor.

A still further object of the invention is to provide a special construction whereby the motor may be readily attached to and detached from the sweeper in order that it may be employed for other purposes.

With these and other objects in view which will appear as the description proceeds, the invention consists in the novel details of construction and combinations of parts more fully hereinafter disclosed and particularly pointed out in the claims.

The use of electrical household appliances has developed very rapidly within the past few years until it has reached the point where substantially all of the work which was formerly manually performed is now accomplished by means of electrically operated mechanisms. There are upon the market today several forms of small electric motors which are especially adapted for driving sewing machines. Such machines require comparatively little power and the motors are consequently relatively small and compact, while at the same time, being sufficiently powerful to accomplish the result for which they are designed and built.

The present invention contemplates the employment of a motor such as this for the purpose of driving the brush mechanism of a carpet sweeper. The frictional engagement of the ordinary sweeper brush with the carpet or other surface which is being cleaned, is ordinarily so great as to make it impossible to employ a small motor of the character above described in this connection, inasmuch as the said motor is not sufficiently powerful to overcome the friction developed between the brush and the carpet.

However, by employing the new brush construction, constituting a part of this invention, it is possible to successfully and efficiently operate a carpet sweeper with a motor such as the sewing machine motor above mentioned, thereby permitting the use of a single motor for the two appliances.

Referring to the accompanying drawings in which like numerals designate like parts in all the views;

Figure 1 is a perspective view of a carpet sweeper constructed in accordance with the present invention.

Fig. 2 is a perspective view of a portion of the bail and handle of the sweeper illustrating the method of readily attaching and detaching the motor therefrom.

Fig. 3 is a fragmentary sectional view, partly in elevation through one of the lugs or bosses provided upon the bail, shown in Figs. 1 and 2, for receiving and supporting the motor.

Fig. 4 is a vertical sectional view, partly in elevation, taken approximately on the plane indicated by the line 4—4 of Fig. 1, looking in the direction of the arrows; and

Fig. 5 is a transverse vertical sectional view, taken approximately on the plane indicated by the line 5—5 of Fig. 4.

In the said drawings, the numeral 1 indicates a casing or housing of sheet metal or other suitable construction, which may be provided with the reinforcing end members 2, secured to the ends thereof, which members are provided with the bosses 3 upon which is pivotally mounted the bail 4, having the socket 5 rigid therewith and adapted to receive the handle 6. The said casing or housing 1 is provided with an inlet opening 7, extending substantially the full width of the machine, as will be clear from Figs. 4 and 5, and also with an outlet opening 8, disposed at approximately 180 degrees from the said inlet opening 7.

One end of the usual fabric or other bag 9 is connected to the said outlet opening 8 for the purpose of receiving the dirt and

other material which is removed from the carpet or other surface being swept, the other end of which bag is closed and may be resiliently supported from the upper portion of the handle 6 by means of the coil spring 10, see Fig. 1. The casing 1 is preferably mounted on suitable wheels or rollers 11, journalled upon the end members 2.

The handle socket 5 of the bail 4 is provided with a recessed boss or lug 12 extending at substantially right angles to the axis of the said socket member 5, the recess 13 of which is preferably circular in form and is lined with a rubber or other suitable resilient lining 14, see Fig. 3.

The said recess 13 and rubber cup member 14 are adapted to receive the cylindrical bearing 15 of the motor 16. The said bearing 15 is provided with an angularly extending lug 17 which is drilled to provide an oil well for the motor shaft, which well is normally closed by means of a plug or cap 18. The said oil well lug 17 fits into a recess or indentation 19, provided in the edge of the lug or boss 12, as will be clear from Figs. 2 and 3, thereby preventing the rotation of the field frame of the motor 16, when the parts are in the positions illustrated.

The bail 4 is also provided with a rigid upwardly extending arm 20, the upper end of which is bifurcated to provide the fingers 21 partially enclosing the slot or recess 22, which is adapted to receive the bearing extension 23 with which the opposite end of the motor 16 is provided.

The shaft 24 of the said motor is provided with a pulley 25, and the parts are so designed and constructed that the said pulley 25 will be in substantial alinement with a pulley 26, mounted upon the brush shaft 27 of the sweeper. The pulley 26 may be driven from the said pulley 25 by means of the belt 28, which is preferably formed of rubber or other suitable flexible material.

The shaft 27 extends through and is journalled in the end members 2 of the casing or housing 1, as will be clear from Fig. 4, and carries the sweeper brush 30, the peculiar construction of which, as was above stated, permits the use of the relatively small motor.

This brush construction comprises a pair of oppositely disposed brush members 31, which are pivotally secured to the shaft 27 by means of the plurality of pairs of arms 32. These said arms 32 are pivoted to the said shaft 27 as at 33 and are likewise pivoted to the brush heads 34 as at 35.

The coil spring 36 is secured to the brush heads 34 intermediate the said levers 32, as will be clear from Fig. 4, and tends normally to draw the said brush members towards the said shaft. The strength of the said spring is so chosen, however, that the centrifugal action, due to the rotation of the brush members by the motor 16, will overcome the said spring and will cause the brush members to move outwardly from their position, as illustrated in Fig. 4, thereby causing the tips of the brushes 31 to engage with the carpet or other surface which is being cleaned, as will be readily apparent.

When this outward movement takes place the arms 32 will swing about their pivots 33, thereby permitting the said brushes to move outwardly, at the same time connecting them to the shaft 27, whereby rotation may be imparted to them.

This outward or radial movement of the brushes 31, as was above stated, will bring their ends into contact with the carpet or other surface which is being cleaned, and inasmuch as they are being rotated in a clockwise direction, as seen in Fig. 5, the dust, lint, and dirt, which are present upon the carpet will be forced upwardly within the casing 1, and out through the outlet passage or opening 8 and into the receiving bag 9 in the usual manner.

As the brushes engage the surface of the carpet under the action of the centrifugal force, due to their rotation, their frictional engagement therewith will be so great as to partially overcome the force of the motor 16 with the result that the speed of the said motor will be lowered. As soon as this occurs, the centrifugal force, acting to throw the brushes 31 outwardly, will be reduced and the spring 36 will draw them inwardly toward the shaft 27.

This inward movement will, of course, reduce the frictional engagement of the brushes with the carpet or other surface, whereupon the motor 16 will again speed up and the centrifugal force will again throw the brush members outwardly. This movement of the brush members acts as an automatic control or governor whereby when the motor 16 speeds up sufficiently to cause the centrifugal force to throw the brush members 31 outwardly to such an extent as to cause their frictional engagement with the carpet to become too great, the motor speed will be automatically reduced, whereupon the brush members will be drawn inwardly again by means of the spring 36 thereby reducing their frictional engagement with the carpet, and permitting the motor to again speed up.

It will be obvious that after the motor has been started and has run a short time that the brush members 31 will so adjust themselves that their frictional engagement with the surface being cleaned will be substantially equal to the capacity of the motor, so that both the brush members and the motor will run at substantially constant speed so long as the surface over which the machine is being moved remains comparatively even. Of course if the nap of the carpet is worn in places or is otherwise uneven so that the

frictional engagement of the brush members therewith is varied either above or below this point of substantial equilibrium the said members will either move inwardly or outwardly to compensate therefor in the manner above described.

It is also obvious that since the brush members are in their innermost positions when the motor is started and therefore are entirely out of contact with the carpet or other surface that the said motor will start under practically no load, thus permitting it to attain its normal speed in a relatively short time, without danger of overloading the same. Of course as the motor speeds up the brush members will be moved outwardly, as above explained, until they contact with the surface of the carpet, whereupon their frictional engagement therewith will serve to automatically position them in the substantial state of equilbrium above mentioned.

These features, as above pointed out, are very important, inasmuch as they permit of the use of the relatively small sewing machine motors, which are not powerful enough to normally operate a device of this character.

The motor 16 may be supplied with current by means of the usual cord 40, which current is controlled by means of a switch 41 mounted within the handle 6 at a convenient point. The said motor, as is usual in this type, is provided with brush control handles 42, whereby the position of the motor brushes may be shifted to control the speed thereof to a certain extent and to also reverse the direction of rotation of the motor armature.

The said motor is also provided with a base 43, whereby it may be mounted upon a sewing machine or other appliance when not in use upon the sweeper. In order to remove the motor from the sweeper it is only necessary to disconnect the belt 28, whereupon the left hand end of the motor, as seen in Figs. 1 and 2, may be moved upwardly, thereby withdrawing the bearing extension 23 from the slot 22 and permitting the extension 15 to be withdrawn from the socket 13 of the lug or boss 12.

It is obvious that those skilled in the art may vary the details of construction, as well as the arrangement of parts without departing from the spirit of the invention, therefore it is not wished to be limited to the above disclosure, except as may be required by the claims.

What is claimed is:

1. The combination with a carpet sweeper provided with a casing of a rotatable centrifugally expansible brush normally out of contact with the surface to be cleaned, and a small motor for rotating said brush and causing it to engage the surface to be cleaned, the engagement of said brush with the surface being cleaned controlling the speed of said motor.

2. In a carpet sweeper provided with a casing, a brush normally out of contact with the surface to be cleaned and expansible to engage the surface being cleaned, and a small motor removably mounted on said casing for rotating said brush to maintain the working engagement with the surface being cleaned within the capacity of the motor.

3. A carpet sweeper comprising a casing having an inlet opening, a small electric motor carried thereby, and an expansible brush within the casing extending into the inlet opening, said brush being normally out of contact with the surface to be cleaned and being rotated by the motor and moved into operative engagement with the surface to be cleaned by expansion when the brush is rotated at a predetermined speed, and lessening contact with said surface when the speed of rotation is less than the predetermined speed, to maintain the work performed within the capacity of the motor.

4. A carpet sweeper comprising a casing, having an inlet opening, a small electric motor carried thereby, and an expansible brush within the casing and normally out of contact with the surface to be cleaned and rotated by the motor and extending into the inlet opening to engage the surface to be cleaned, there being a centrifugal action of the brush for causing the brush to engage the surface being cleaned, and a contractile means for causing said brush to lessen its engagement with the surface being cleaned when the work performed by said engagement is greater than the efficient operation of the motor.

5. A carpet sweeper comprising a casing, a low-power motor carried by said casing, an expansible brush in said casing normally out of contact with the surface being cleaned and driven by said motor and adapted to be expanded by centrifugal force to contact with a surface to be cleaned; and means tending to move said brush out of contact with said surface, whereby its frictional engagement therewith may be lessened when the speed of said motor decreases.

6. A carpet sweeper compirsing a casing, a low-power motor carried by said casing, a centrifugally controlled radially expansible brush within the casing and normally out of contact with the surface to be cleaned and driven by said motor, and adapted when expanded to contact with a surface to be cleaned, whereby the speed of said motor may be reduced, and means yieldably opposing the expansion of said brush and contracting the same when said motor speed is reduced to lessen its frictional engagement with said surface, whereby said motor speed may be permitted to again increase.

7. A carpet sweeper, comprising a casing, having an opening, a brush within the casing having a shaft extending through the opening and having a pulley on one end, a bail connected to the casing at the axis of said shaft and having a recessed portion and an arm provided with a slot, a motor removably extending into the recess and the slot and having a pulley on its shaft, and a belt engaging the two pulleys for transmitting motion from the motor to the brush.

In testimony whereof, I affix my signature.

FREDERICK J. OSIUS.