June 6, 1933. P. H. WALSH 1,913,016

CARD CLEANING APPARATUS

Filed June 23, 1931 3 Sheets-Sheet 1

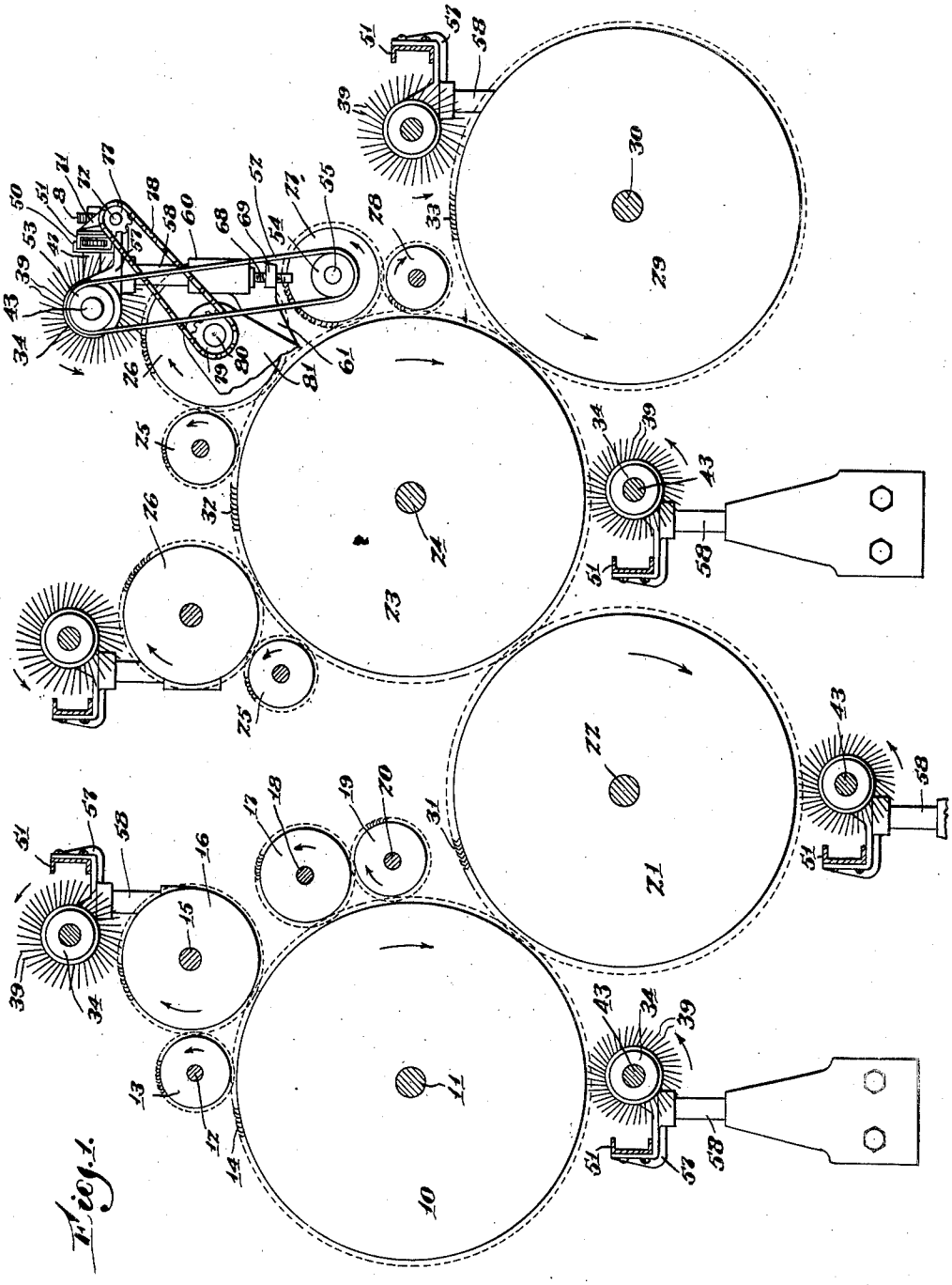


Fig. 1.

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CARD CLEANING APPARATUS

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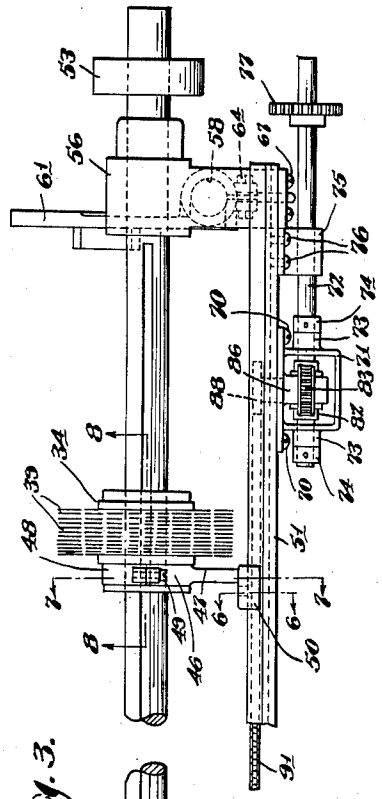


Fig. 3.

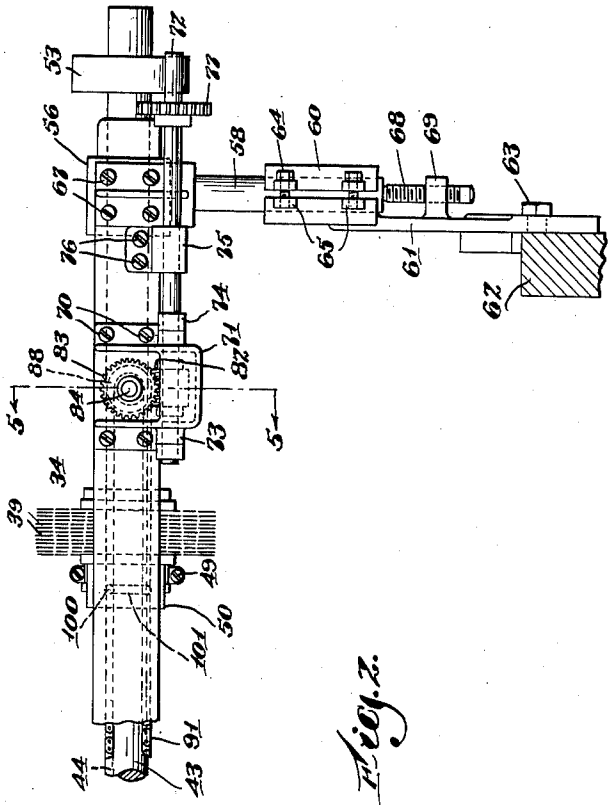
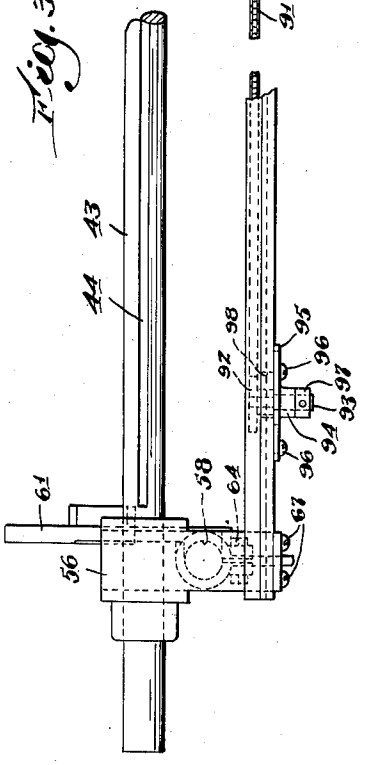
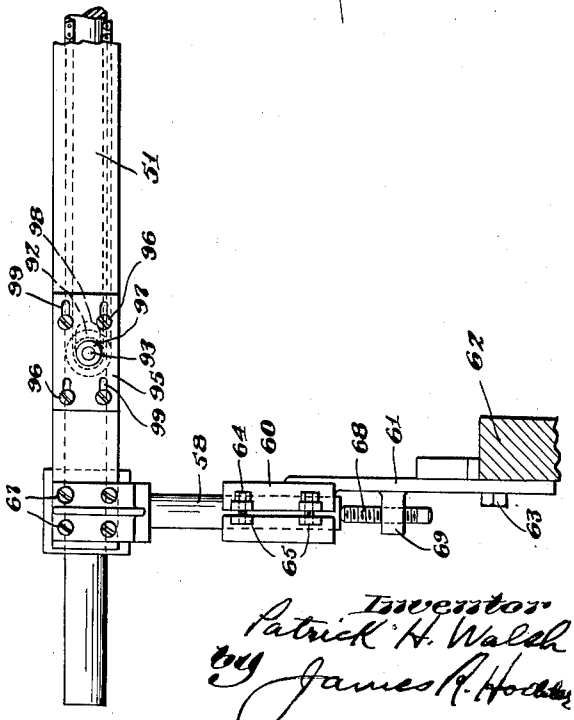


Fig. 2.





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CARD CLEANING APPARATUS

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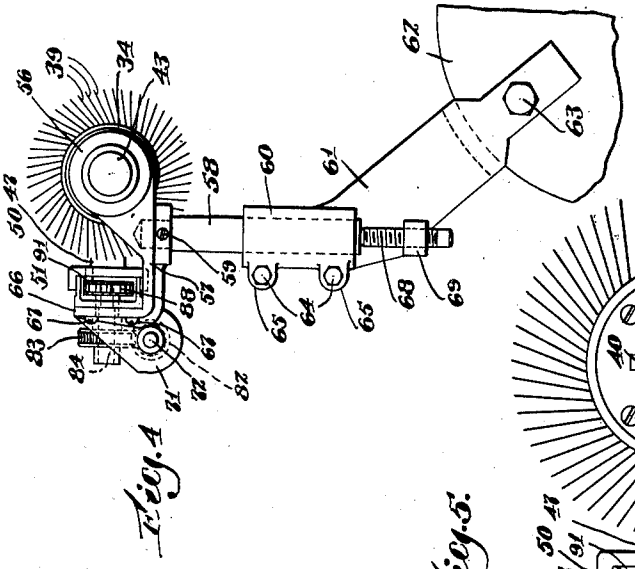


Fig. 4.

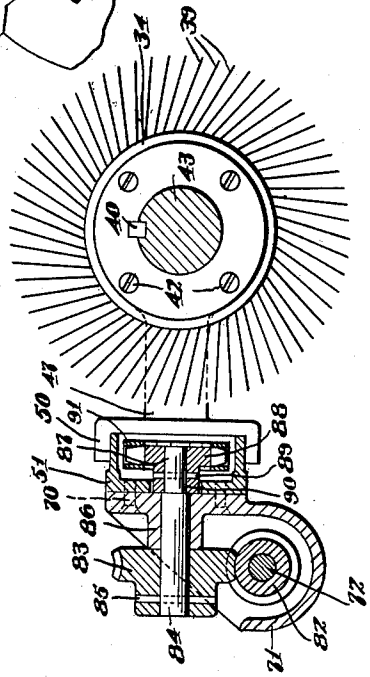


Fig. 5.

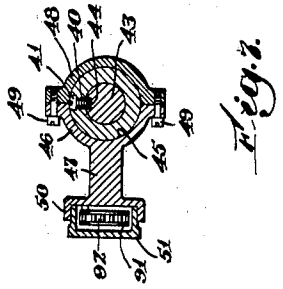


Fig. 7.

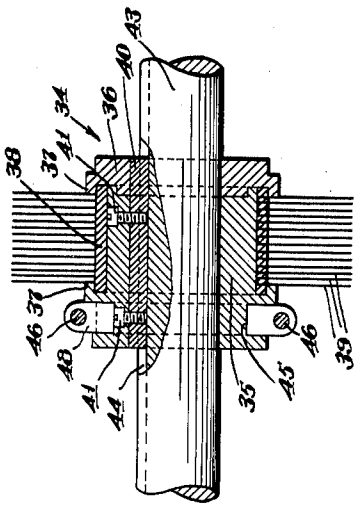


Fig. 8.

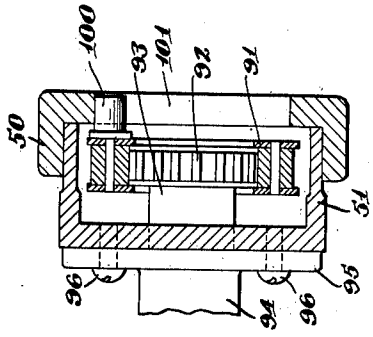


Fig. 6.

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UNITED STATES PATENT OFFICE

PATRICK H. WALSH, OF NEWTONVILLE, MASSACHUSETTS, ASSIGNOR TO CARO CLOTH CORPORATION, OF CAROLINA, RHODE ISLAND, A CORPORATION OF DELAWARE

CARD CLEANING APPARATUS

Application filed June 23, 1931. Serial No. 546,200.

My present invention relates to cleaning devices, and more particularly to a novel and improved device for cleaning the rolls and cylinders of a carding machine.

Carding machines, as is well known, comprise a plurality of contiguous cylinders, drums, or rolls, covered with clothing, said clothing comprising usually a plurality of bent wire teeth which are set closely in rows in a piece of leather or other suitable material and fastened to the rolls or cylinders.

The purpose of these machines is to clean and disentangle material such as wool, cotton, flax, and the like, collecting together all the fibres, of whatever length, and straightening the same for subsequent use.

During the carding operation, the various rolls and cylinders, such as the main cylinders, doffer rolls, stripper rolls, worker rolls, and fancy rolls, collect dust, dirt, lint, and other foreign matter, which prevent the card clothing from performing its functions on the various rolls with full efficiency.

An important object of the present invention, therefore, resides in the provision of means to clean the card clothing on various rolls.

Another object of the invention resides in the provision of means which will accomplish this cleaning operation during the continuous operation of the carding machine, without interrupting the work of said machine.

Another object of the invention resides in providing a cylindrical brush having bristles, preferably of wire, set tangentially therein, and in providing means to rotate and simultaneously reciprocate said brush during the operation of the carding machine.

Another object of the invention resides in the particular means for effecting the reciprocation of the brush during its rotative cleaning movement.

Other objects and features of the invention reside in the particular construction and arrangement of the parts of my novel device, and all of the above, together with other objects and features of the invention, details of construction, combination of parts, and advantages, will be hereinafter more fully pointed out, described and claimed.

Referring to the drawings, illustrating a preferred embodiment of the present invention,

Fig. 1 illustrates diagrammatically a carding machine with my novel cleaning roll positioned in operative relation with several of the individual rolls of the machine;

Fig. 2 is a side elevation of the cleaning roll operating mechanism;

Fig. 3 is a top plan view of the structure of Fig. 2;

Fig. 4 is an end elevation of the cleaning roll operating structure with the driving pulley and gear removed;

Fig. 5 is a cross sectional view on the line 5—5 of Fig. 2;

Fig. 6 is a cross sectional view on the line 6—6 of Fig. 3;

Fig. 7 is a cross sectional view on the line 7—7 of Fig. 3; and

Fig. 8 is a fragmentary cross sectional view on the line 8—8 of Fig. 3.

Referring now to the drawings, for a particular description of the invention, its construction and operation, there is shown diagrammatically a carding machine, the framework and driving belts of which have been omitted for the sake of clearness, and in this drawing 10 designates a main cylinder rotating in the direction of its arrow and at any desired speed, this main cylinder being mounted for rotation on a shaft 11. Mounted parallel to the shaft 11 is a shaft 12 on which is mounted a stripper roll 13, the cylinder 10 and stripper roll 13 each being covered with conventional card cloth designated generally at 14, the cards or wires being in engagement, as clearly illustrated in Fig. 1.

Also parallel with the shaft 11 and with the shaft 12 is a shaft 15 on which is mounted a worker roll 16 covered with card cloth which is in contact with the cloth on the cylinder 10 and roll 13. Spaced from the worker roll 16 is a fancy roll 17 mounted on a shaft 18 and covered also with card clothing, which clothing is in engagement with the card cloth on the cylinder 10 and

with similar cloth on a stripper roll 19 mounted on the shaft 20. An intermediate doffer roll 21 is mounted on a shaft 22 and the card clothing of this intermediate doffer roll is in engagement with the clothing on the cylinder 10 as well as on another adjacent main cylinder 23 mounted on the shaft 24. Two sets of stripper rolls 25 and worker rolls 26 are provided in engagement with the cylinder 23, as well as a fancy roll 27 and cooperating stripper roll 28. A finisher doffer roll 29, covered with card cloth in engagement with the cloth covering the cylinder 23 is also provided, mounted on the shaft 30.

Each of the cylinders and rolls illustrated in Fig. 1, and above briefly described, rotates in the direction of its respective arrow shown thereon, and at speeds which have been predetermined to accomplish the results desired.

The operation of the carding machine illustrated is simple, and will be readily understood, being briefly described as follows.

As material, such as a web of fleece, is fed to the main cylinder 10, at the left of Fig. 1, it is caught by the clothing on said roll and fed therearound. As such material passes under the stripper roll 13, it will be raised to the outer edge of the cloth on the cylinder 10. In such position it will encounter the cloth on the worker roll 16, which will pick said material from the cylinder 10 and feed it in the direction of the arrow on the worker roll 16. The stripper roll, however, is rotating at a much faster rate of speed than the worker roll 16, and the card cloth on the stripper roll 13 will therefore take the material from the worker roll 16 and return it to the cylinder 10, this operation being continuous.

As the fibres of the material being operated upon become straightened out, or partially straightened out, they will be carried by the card cloth 14 on the cylinder 10 until reaching the fancy roll 17, which will have a still further straightening effect upon the fibres of the material, and after passing the fancy roll 17, the material will be picked up by the card cloth on the stripper roll 19, from which it will be taken by the card cloth on the fancy roll 17 and returned to the cylinder 10. From the cylinder 10 the card cloth 31 on the intermediate doffer roll 21 will take the material and transfer it to the card cloth 32 on the cylinder 23. The material will pass through the same operations with the stripper rolls 25 and worker rolls 26 as above briefly described with relation to the stripper roll 13 and worker roll 16, and will also be treated by the fancy roll 27 and stripper roll 28 in the same manner as described with relation to the fancy roll 17 and stripper roll 19.

After passing the final stripper roll 28, the material will be removed from the cloth 32 by the cloth 33 of the finisher doffer roll 29, whence it will be removed in any desired manner for subsequent operation.

It will be appreciated, that during the carding operation, the card clothing on the various cylinders and rolls will accumulate dust, dirt, lint, and the like, which will interfere with the proper functioning of the said card clothing, unless such foreign matter is removed. I therefore provide my novel cleaning apparatus, and associate the same with as many of the cylinders or rolls as desired, said cleaning device operating upon a cylinder or roll at a line along which no material is fed during the carding operation, so that any material removed by my novel cleaner will be simply in the nature of waste or foreign matter.

In Fig. 1 I have illustrated a cleaner associated with the cylinder 10, another with the cylinder 23, another with each of the doffer rolls 21 and 29, and one associated with each of the worker rolls 16 and 26.

It will be appreciated, however, that I may dispense with or add as many of these cleaning devices in a given carding machine as may be deemed desirable or necessary.

Each of the cleaning devices is identical, with the possible exception of its supporting bracket, and therefore a description of one cleaning unit will suffice for all.

My novel cleaner comprises a wheel 34 comprising a hub 35 and cap 36 provided with inturned flanges 37 to secure in place the leather 38 or other material in which the cleaning bristles or wires 39 are imbedded.

A key 40 is fixed in the hub 35 by screws 41, the cap 36 being fixed to said hub by the screws 42 as clearly illustrated in Fig. 5.

The wheel 34 is mounted upon a shaft 43, the key 40 riding in the keyway or slot 44 formed in said shaft. The hub 35 is provided with an annular groove 45, in which is seated the yoked end 46 of a brush wheel arm 47, the yoke 46 being held in said groove by a cap 48 fixed to said yoke by bolts 49. The outer end of the brush wheel arm 47 is yoked, as illustrated at 50, and rides on the flanges at the open side of a channel member 51.

Rotation is imparted to the shaft 43 by means of a belt 52 engaging the pulley 53 on said shaft. Said belt is driven by a pulley 54 fixed on the shaft 55 to which the fancy roll 27 is also fixed. Thus, the brush wheel 34 will rotate within the yoke 46 and cap 48, since the arm 47 is restrained from rotation by its yoked end 50 on the channel guide 51.

The shaft 43 is mounted in bearings 56 carried by brackets 57, said brackets 57 being fixed to the upper reduced ends of posts 58 by set screws 59. The posts 58 are

clamped in split sleeves 60 fixed to or an integral part of brackets 61 which in turn are fixed to the frame 62 of the machine by bolts 63, or the like. Bolts 64 are utilized to clamp the open sides of the sleeves, these bolts being positioned in bosses 65 on said sleeves. The brackets 57 have upturned ends 66, to which the channel guides 51 are fixed by screws 67. An adjusting screw 68 threaded through a boss 69 on the bracket 61 serves to adjust the height of the posts 58 as desired.

Fixed to the channel frame 51 by screws 70 is a casing 71 through which extends a shaft 72 having bearings in the journals 73 of said casing and longitudinal movement of said shaft being restrained by collars 74. The shaft 72 also has a bearing in a journal 75 fixed to the channel member 51 by screws 76. Adjacent to the free end of the shaft 72 is fixed a sprocket 77, a drive chain 78 running over said sprocket and also over a sprocket 79 mounted on the shaft 80, said shaft 80 carrying one worker roll 26 and being supported in a bracket 81. Within the casing 71, and fixed for rotation with the shaft 72 is a worm 82 in mesh with which is a worm gear 83 fixed to a shaft 84 by a pin 85, the shaft 84 having a bearing in the journal 86 projecting laterally from the casing 71 and having a reduced end 87 to which a sprocket 88 is fixed by means of the pin 89 projecting through the hub 90 of said sprocket and the reduced end 87 of the shaft 84. Running over the sprocket 88, which is housed within the channel 51, is a chain 91, said chain also passing over a sprocket 92 mounted on a shaft 93 which has a bearing in the journal 94 projecting from the plate 95, said plate being fixed to the channel 51 by screws 96 and a collar 97 preventing longitudinal displacement of the shaft 93.

The channel 51 is provided with an elongated slot 98 through which the shaft 93 passes, and the plate 95 is provided with a plurality of elongated slots 99 through which the stems of the screws 96 project, thus permitting movement of the sprocket to loosen or tighten the chain 91 as desired. The chain 91 is provided with a pin 100 which rides in a vertical slot 101 in the brush wheel arm 47, as clearly illustrated in Fig. 6.

Thus, as the worm gear 83 is rotated, rotating the sprocket 88, the chain 91 is set in motion, and will carry with it the wheel arm 47. When the wheel arm 47 reaches the limit of movement of the chain 91 to the left, as illustrated in Fig. 3, the pin 100 will ride down in the slot 101 and upon commencing its return movement will draw the arm 47 therewith. Simultaneously with this longitudinal movement of the brush, rotation is being imparted to the shaft 43 and hence to the brush 34, imparting to said brush a combined rotary and reciprocating movement.

It will be apparent, from a glance at Fig. 5 that the wires or bristles 39 are set in the leather backing 38 tangentially with respect to the radius of the brush wheel 34, and will thus impart to the card roll or cylinder with which it is associated a brushing action, the bristles 39 being so arranged with respect to the wires of the card cloth as to reach substantially through said wires to effect a thorough cleaning and brushing thereof.

Since my novel device is operated during the actual operation of the carding machine, the cleaning of the various rolls and cylinders is effected without any interruption of operation of said machine, an advantage which will be instantly apparent to those skilled in the art.

The simplicity, ruggedness, efficiency, and other advantages of my novel cleaning device will also be evident to those skilled in this particular art.

While I have necessarily described my present invention somewhat in detail, it will be appreciated that I may vary the size, shape, and arrangement of parts, within reasonably wide limits, without departing from the spirit of the invention.

My invention is further described and defined in the form of claims as follows:

1. A device of the kind described, comprising a shaft having an elongated groove therein, a brush wheel, a key carried by said wheel and riding in said groove, means to effect rotation of said shaft and said wheel, an arm carried by said wheel, a channelled guide parallel with said shaft, one end of said arm riding on said guide, sprockets housed in said guide, an endless chain carried by said sprockets, and cooperating means on said chain and said arm to effect reciprocation of said arm and hence of said wheel relative to its shaft.

2. A device of the kind described, comprising a shaft having an elongated groove therein, a brush wheel, a key carried by said wheel and riding in said groove, means to effect rotation of said shaft and said wheel, an arm carried by said wheel, a channelled guide parallel with said shaft, one end of said arm riding on said guide, sprockets housed in said guide, an endless chain carried by said sprockets, a pin carried by said chain, said arm having an elongated slot in which said pin is seated, said pin effecting reciprocation of said arm and hence of said wheel relative to its shaft.

3. A device of the kind described, comprising a shaft having an elongated groove therein, a brush wheel, a key carried by said wheel and riding in said groove, means to effect rotation of said shaft and said wheel, an arm carried by said wheel, a channelled guide parallel with said shaft, one end of

said arm riding on said guide, sprockets housed in said guide, an endless chain carried by said sprockets, a pin carried by said chain, said arm having an elongated slot in which said pin is seated, said pin effecting reciprocation of said arm and hence of said wheel relative to its shaft, and means to adjust one of said sprockets along said channelled guide.

4. A device of the kind described, comprising a shaft having an elongated groove therein, a brush wheel, a key carried by said wheel and riding in said groove, means to effect rotation of said shaft and said wheel, an arm carried by said wheel, a channelled guide parallel with said shaft, one end of said arm riding on said guide, sprockets housed in said guide, an endless chain carried by said sprockets, a pin carried by said chain, said arm having an elongated slot in which said pin is seated, said pin effecting reciprocation of said arm and hence of said wheel relative to its shaft, a shaft on which one of said sprockets is mounted, a bearing plate supporting said sprocket shaft, said plate and said guide having cooperating means to permit adjustment of said plate and hence of said sprocket along said guide.

5. A device of the kind described, comprising a shaft having an elongated groove therein, a brush wheel, a key carried by said wheel and riding in said groove, means to effect rotation of said shaft and said wheel, an arm carried by said wheel, a channelled guide parallel with said shaft, one end of said arm riding on said guide, sprockets housed in said guide, an endless chain carried by said sprockets, cooperating means on said chain and said arm to effect reciprocation of said arm and hence of said wheel relative to its shaft, and means to impart movement to said chain independent of the rotation of said shaft.

6. A device of the kind described, comprising a shaft having an elongated groove therein, a brush wheel, a key carried by said wheel and riding in said groove, means to effect rotation of said shaft and said wheel, an arm carried by said wheel, a channelled guide parallel with said shaft, one end of said arm riding on said guide, sprockets housed in said guide, an endless chain carried by said sprockets, cooperating means on said chain and said arm to effect reciprocation of said arm and hence of said wheel relative to its shaft, means to impart movement to said chain independent of the rotation of said shaft, and means to adjust the height of said shaft and said channelled guide simultaneously.

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

PATRICK H. WALSH.