Nov. 23, 1943. S. STEINMETZ ET AL. 2,334,796

CLEANING IMPLEMENT

Filed Feb. 6, 1941

Fig. 1.

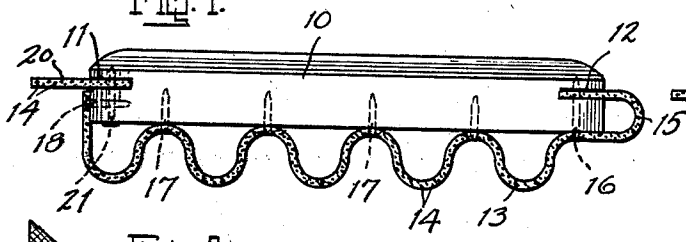


Fig. 3

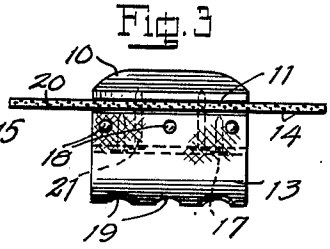


Fig. 2.

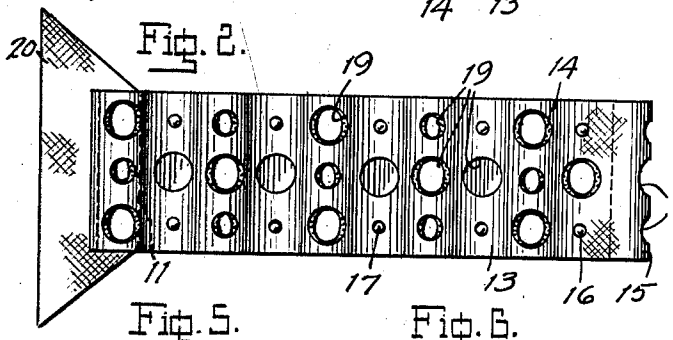


Fig. 4.

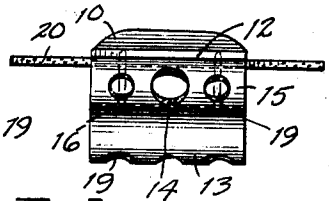


Fig. 5.

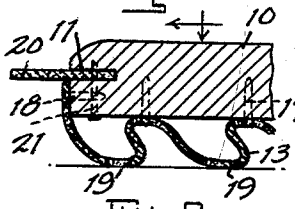


Fig. 6.

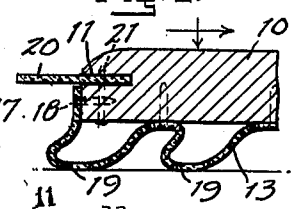


Fig. 7.

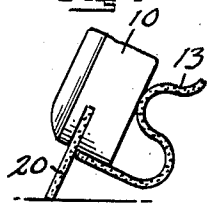


Fig. 8.

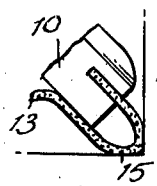


Fig. 9.

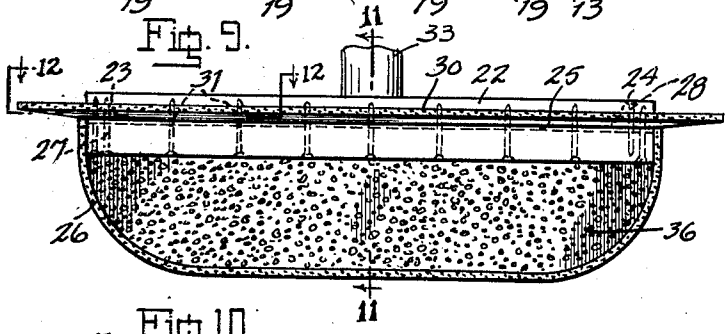


Fig. 11.

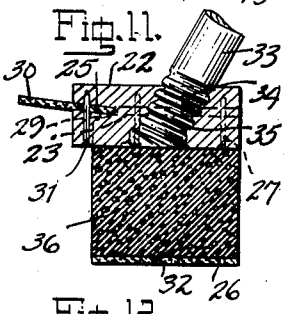


Fig. 10.

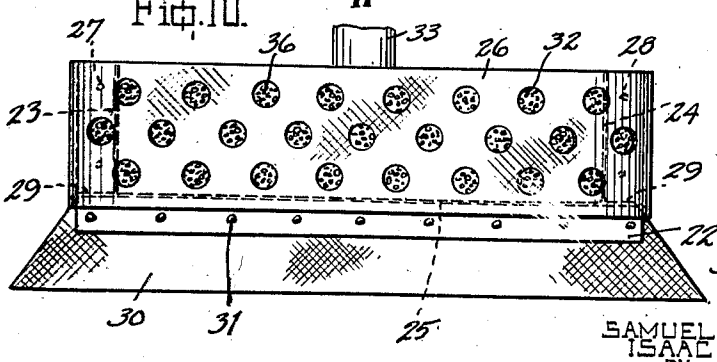
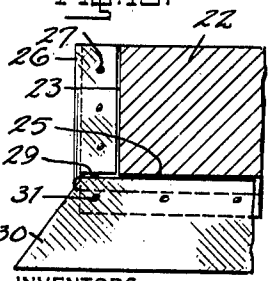


Fig. 12.



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CLEANING IMPLEMENT

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Bridgeport, Conn.

Application February 6, 1941, Serial No. 377,599

2 Claims. (Cl. 15—121)

The present invention relates to an improvement in cleaning implements, and particularly such implements in the nature of cleaning brushes for use in the scrubbing of floors and walls, for cleaning windows, and other similar surfaces, and for other such uses where water is used in connection with the cleaning operation.

It is the object of the invention to provide a cleaning implement in which the cleaning surface is yieldably supported under resilient pressure so that such surface will readily conform to the surface being cleaned, and will function to press and rub the water usually containing soap or cleaning compound, into engagement with such surface being cleaned without requiring any great effort on the part of the person manipulating the implement; and further to provide a cleaning surface which will effectually engage all portions of the surface being cleaned, and will not mar or scratch such surface. To this end it is particularly proposed to provide a cleaning implement in which the cleaning surface is in the form of a heavy woven fabric, impregnated and coated with rubber, and having perforations therein which have the double function of presenting numerous relatively sharp edges disposed in all directions for engaging the surface being cleaned, and also of providing inlet and outlet passages for the water, so that such water will flow to the surface being cleaned through these perforations, and will also be picked up and distributed to other points as the cleaning implement is moved such action being in the nature of a pumping of the water brought about through the application and lifting of pressure upon the implement.

The rubberized fabric material is similar to that employed in tire making, and may, in fact, be reclaimed from used tires. In preparing this material for use in the invention, strips are cut bias to the weave of the fabric so that the woven threads will not ravel, and the longitudinal edges, as well as the edges of the perforations therein, will present a series of thread or strand ends, which in cooperation with the cut rubber edges will produce an effective non-abrasive dirt-removing rubbing surface for contact with the surface being cleaned.

It is further proposed to provide the perforations in the rubbing surface in such relation that as the surface is flexed through downward pressure upon the implement and forward or backward propelling pressure, the relatively sharp edges of the cut perforations will engage the surface being cleaned with a scraping squeegee action, and at the same time the thread or strand ends will be brought into contact with the surface being cleaned, thus subjecting it to the intensive cleaning action of a relatively large number of minute brushes, and due to the fact that the strands are water-absorbent they will absorb sufficient water so as to provide a constantly wetted surface. This action is especially desirable in the cleaning of such surfaces as windows.

A further object is to provide a cleaning implement including a squeegee element, also formed of the rubberized woven fabric, and disposed in such relation to the scrubbing or cleaning surface that it may be readily turned into operative position following the brushing or scrubbing action.

It is also proposed to provide as part of the cleaning implement a corner engaging element disposed in such relation to the brushing or scrubbing surface that, as the cleaning implement is brought into close proximity to a wall, the corner cleaning element may be brought into operative engagement with the corner between the floor and the wall simply by tilting the implement so that the cleaning of such corners may be carried on in conjunction with the cleaning of the floor surface.

It is further proposed to provide a cleaning implement including a pressure applying water supplying means in the form of a water-storing and expelling element, which at the beginning of the cleaning operation may be filled with water and during the cleaning operation will constantly supply desired quantities of water through greater or less pressure applied to the implement. This element is preferably in the form of a sponge rubber block which in addition to its properties of providing a resilient support and a water reservoir is relatively soft and will not mar or scratch the surface being cleaned.

With the above and other objects in view, embodiments of the invention are shown in the accompanying drawing, and these embodiments will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the drawing:

Fig. 1 is a side elevation of a cleaning implement of scrubbing or brushing type according to one exemplary embodiment of the invention.

Fig. 2 is a bottom plan view.

Fig. 3 is an end elevation from the squeegee end of the implement.

Fig. 4 is an end elevation from the corner cleaning element end of the implemnt.

Fig. 5 is a longitudinal sectional view of one end of the implement, and showing the deflection of the scrubbing surface when the implement is pressed downwardly in engagement with the surface to be cleaned and moved in the direction of the arrow to the left.

Fig. 6 is a similar view showing the deflection of the cleaning surface when the implement is moved in the opposite direction in the direction of the arrow to the right.

Fig. 7 is a fragmentary side elevation of the squeegee end of the implement and showing the same in operative engagement with the surface being cleaned.

Fig. 8 is a fragmentary side elevation of the corner cleaning element end of the implement and showing the same in operative engagement with a corner being cleaned.

Fig. 9 is a front elevation of a cleaning implement, according to a modified form of the invention and particularly adapted as an implement for cleaning a window or similar surface.

Fig. 10 is a bottom plan view thereof.

Fig. 11 is a vertical sectional view, taken along the line 11—11 of Fig. 9.

Fig. 12 is a horizontally fragmentary sectional view taken along the line 12—12 of Fig. 9.

Similar reference characters indicate corresponding parts throughout the several figures of the drawing.

Referring to the drawing, and more particularly to Figures 1 to 8 thereof, the invention, according to the exemplary illustrated embodiment shown therein, comprises a rectangular handle 10, preferably in the form of a wood block, although it be understood that any other suitable material may be used instead. In the respective ends of this block there are provided horizontal slots 11 and 12 extending inwardly for a short distance from the end surfaces, and in the slot 12 there is engaged one end of a strip of flexible cleaning surface forming material 13, this strip preferably being rubberized woven fabric, cut on the bias, so that the warp and weft strands of the relatively coarse material of the rubberized base, such as duck or canvas, are diagonally disposed and there is no tendency to unravel, and the ends 14 of these warp and weft strands are exposed along the cut edges, where they have the effect of providing numerous closely arranged minute rubber-set brushes.

The strip 13 is extended from the end engaged in the slot 12 in the form of a corner-cleaning loop portion 15 projected horizontally from one end of the handle 10, and is carried beneath the under-surface of the end of the handle where this loop portion is secured by nails 16 driven upwardly through the portion of the strip beneath the handle and through the portion of the strip engaged in the slot 12.

The strip is corrugated from the nails 16 along the underside of the handle 10 and secured at the concave bases of the corrugations by nails 17, the convex corrugations projecting downwardly from the under-surface of the handle in the form of a series of longitudinal spaced yieldable cleaning or brushing surfaces. The last convex corrugation at the end of the strip is secured by engaging the end of the strip with the vertical end surface of the handle 10 beneath the slot 11 and fastening it by nails 18. The strip is provided with perforations 19, and these may be of varying size and are arranged so that a plurality of them are arranged transversely in centralized relation along each of the convex corrugations, and also along the center line of the horizontally projecting corner-cleaning loop portion 15. These holes are also preferably provided centrally of the concave corrugations between the nails 17 for the purpose of providing inlet and exit entrances for water to flow to the inner surface of the corrugations and downwardly to the perforations provided in the convex corrugations.

As is clear from Figures 3 and 4 the perforations 19 are out of engagement with the floor surface at their side edges when there is no downward pressure applied to the brush, so that water flowing through the open sides will flow through the perforations beneath the brushing or scrubbing surfaces. As downward pressure is applied to the brush, the edges of these perforations are pressed into engagement with the floor surface, and thereupon as the brush is moved longitudinally as shown in Figs. 5 and 6, one edge of the perforations is forceably drawn along the floor surface with a squeegee action while the other edge will be slightly raised from the floor surface to allow water to flow through the perforations. As the vertical pressure upon the brush is varied, the deflection of the yieldable corrugations will vary, and this will cause the edges of the perforations to engage the floor surface with a grinding or squeezing action, which in cooperation with cleaning water tends to effectually loosen the dirt. During this operation the sharp cut edges of the rubber engage the floor with a scraping action, while the numerous brush ends 14 of the warp and weft strands are brought into contact with the floor surface. Inasmuch as these strands will retain water, the implement may be effectually employed in cleaning such surfaces as glass, the water retained in the strand being sufficient to clean the surface while the sharply cut rubber edges follow the action of the brushes and squeegee the water therefrom.

Within the slot 11 there is engaged a flexible squeegee element 20, made from the same material as the corrugated cleaning element 13, and secured therein by nails 21 driven upwardly from the under-side of the handle 10 through the inserted portion within the slot 11. This squeegee member has a straight operating edge and end edges converging from the relatively long operating edge to the sides of the handle 10.

While the cleaning implement is shown for operation by being gripped in the hand it will be understood that if desired a pole handle may be screwed therein. The implement would preferably have provision for selectively securing such pole handle so that it would extend in opposite direction away from the squeegee edge of the corner cleaning end.

In operation the squeegee element 20 may be conveniently operated in conjunction with the cleaning operation being carried on by the corrugated cleaning element 13 by tilting the handle, as shown in Fig. 7, following the cleaning operation to squeegee the dirt containing water from the cleaned surface. The corner cleaning portion 15 is also adapted to be operated in conjunction with the cleaning element 13 by tilting the handle as shown in Fig. 8, following the cleaning operation with the cleaning element 13, to engage the loop portion 15 in a corner between the floor and wall. In this connection the perforations 19 in the portion 15 provide cleaning edges for operating in the angle of the corner and also render the curved end of the portion 15 relatively flexi-

ble, so that the connecting portions between the perforations may be easily forced into the sharp angle of the corner.

In Figs. 9 to 12 we have illustrated a modified form of the invention which is particularly adapted for window cleaning, although it may conveniently be used for general cleaning purposes. A rectangular block member 22 is provided at its respective ends with horizontal slots 23 and 24, corresponding substantially in placement to the slots 11 and 12 of the first embodiment, and along the forward surface of the block there is provided a slightly upwardly inclined slot 25 extending between the slots 23 and 24. Within the slot 23 there is engaged one end of a flexible cleaning strip 26, secured by nails 27 driven upwardly from the under-side of the block 22 through the portion of the strip inserted in the slot 23, the strip being carried beneath the block 22 in substantially spaced relation thereto and its other end being engaged in the slot 24 and secured by nails 28 driven downwardly from the upper side of the block 22 through the portion of the strip engaged in the slot 24. The ends of the strip engaged in the slots 23 and 24 are cut away at their forward extremities as at 29, so that these extremities will be substantially flush with the base of the slot 25, and will, therefore, not interfere with the engagement in the slot 25 of the longitudinally extending squeegee element 30, which is secured therein by a series of nails 31, driven upwardly from the under-side of the block 22 through the portion of the squeegee element engaged in the slot 25.

The cleaning element 26 and the squeegee element 30 are both constructed of the same bias cut flexible rubberized woven fabric material as the corresponding elements of the first embodiment, and the cleaning element 26 is provided with a series of perforations 32, preferably arranged in staggered rows. An inclined pole handle 33 is engaged at its screw threaded end 34 in a threaded hole 35 in the block member 22 and extends in opposite direction to the squeegee element. It will be understood that if desired the squeegee element may be provided at one end of the block member in similar arrangement to that shown in the first embodiment, in which case the pole handle would extend in opposite direction thereto and longitudinally of the block member.

Whereas the series of convex cleaning portions of the member 13 of the first embodiment of the invention are resiliently supported by the concave corrugations secured by the nails 17, which arrangement imparts sufficient inherent stiffness to the cleaning portions to maintain them in projected relation while allowing them to flex under pressure, the cleaning element 26 is resilient supported in projected relation with respect to the block member 22 by an inserted resilient block 36. This block is preferably formed of sponge rubber, which has the property of providing resilient support and at the same time acting as a reservoir for water which will be expelled through the perforations 32 and at the sides of the cleaning element upon the application of pressure thereto. It will be understood of course that any other material having these properties may be employed. This sponge rubber block member is simply retained in place by its own expansion pressure so that it may be readily disengaged for the purpose of cleaning and filling it with water.

We have illustrated and described preferred and satisfactory embodiments of the invention, but it will be understood that changes may be made therein, within the spirit and scope thereof, as defined in the appended claims.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

1. In a cleaning implement, a supporting block member, and a cleaning element disposed at its under-side comprising a flexible resilient strip of material of substantial thickness having spaced end portions thereof secured to said block and an intermediate portion projecting downwardly therefrom in the form of a yieldable resilient loop, open at its longitudinal sides, said loop portion having perforations in its projected surface, the walls of which are at an angle to the projected surface, said perforations being in communication at the inner side of said strip with said open longitudinal sides to allow flow of water between said perforations and said open sides, the longitudinal edges of said strip and the edges of said perforations adapted to move in engagement with the surface being cleaned as the strip is compressed and flexed through reciprocatory movement of the block member under pressure.

2. In a cleaning implement, a supporting block member, and a cleaning element disposed at its under-side comprising a strip of flexible resilient material of substantial thickness having spaced end portions thereof secured to said block and an intermediate portion projecting downwardly therefrom in the form of a yieldable resilient loop, open at its longitudinal sides, said loop portion having perforations in its projected surface, said perforations being in communication at the inner side of said strip with said open longitudinal sides to allow flow of water between said perforations and said open sides, the walls of which are at an angle to the projected surface, and a flexible resilient water absorbing and expelling insert member engaged between said block member and said projected loop portion of said strip, and removably therefrom through said open longitudinal sides, the longitudinal edges of said strip and the edges of said perforations adapted to move in engagement with the surface being cleaned as the strip is compressed and flexed through reciprocatory movement of the block member under pressure.

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