

March 17, 1942.

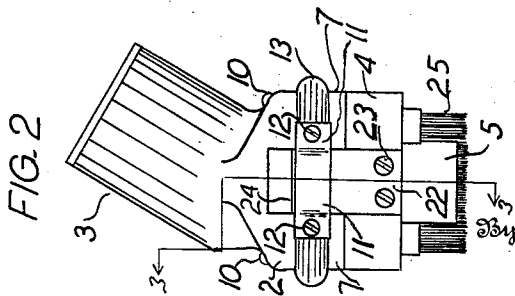
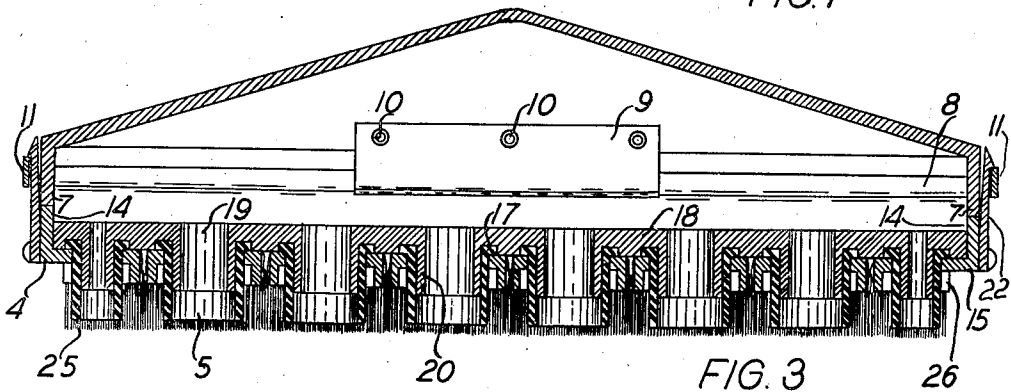
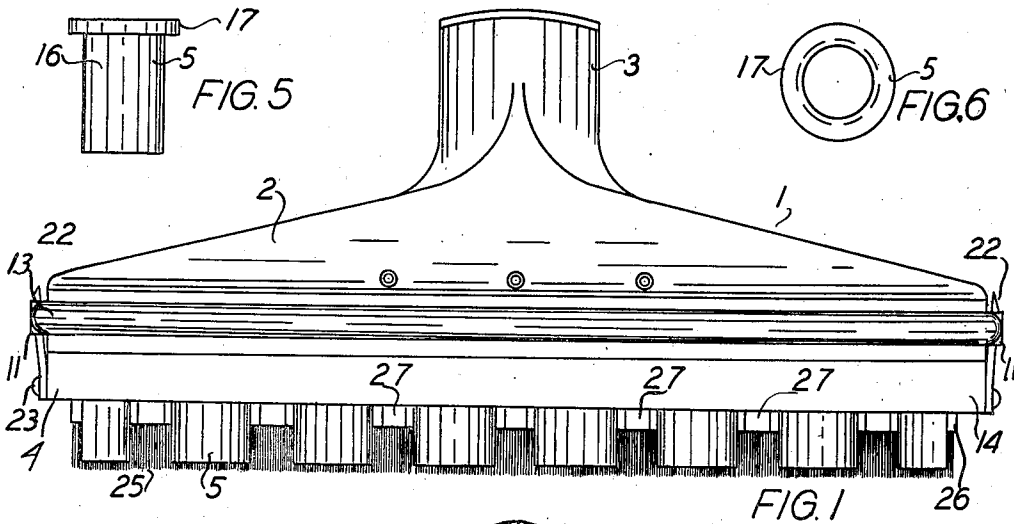
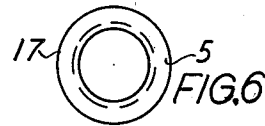
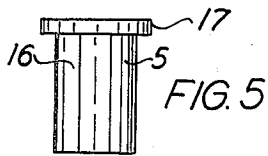
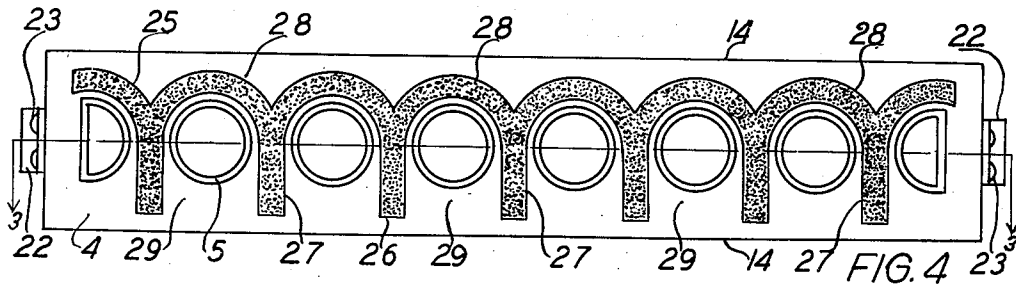
D. M. DOW

2,276,944

VACUUM CLEANER FLOOR MOP

Filed May 26, 1939

3 Sheets-Sheet 1



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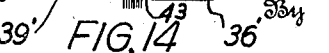
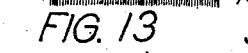
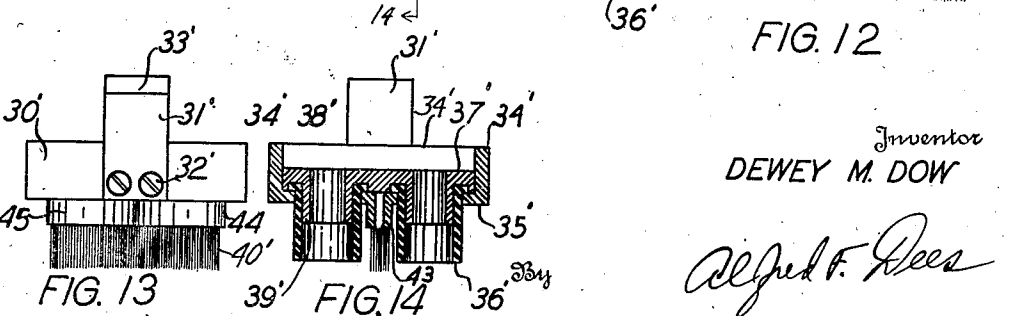
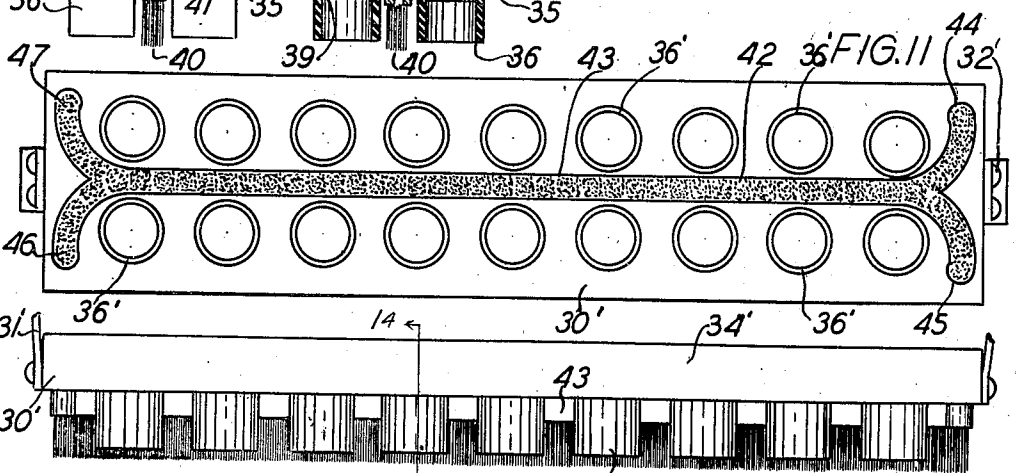
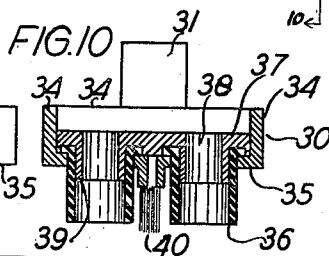
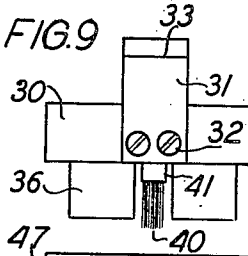
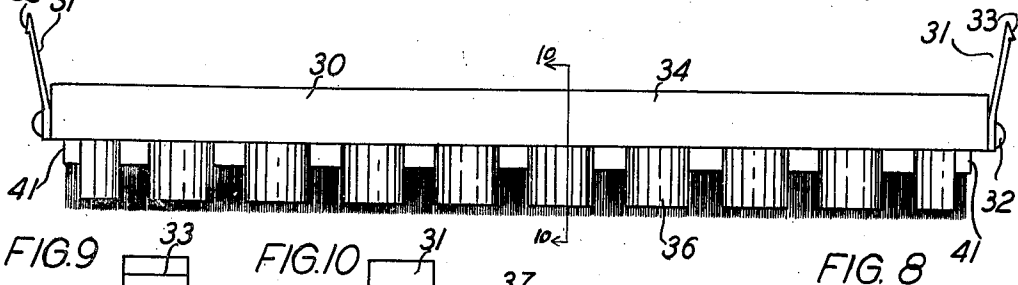
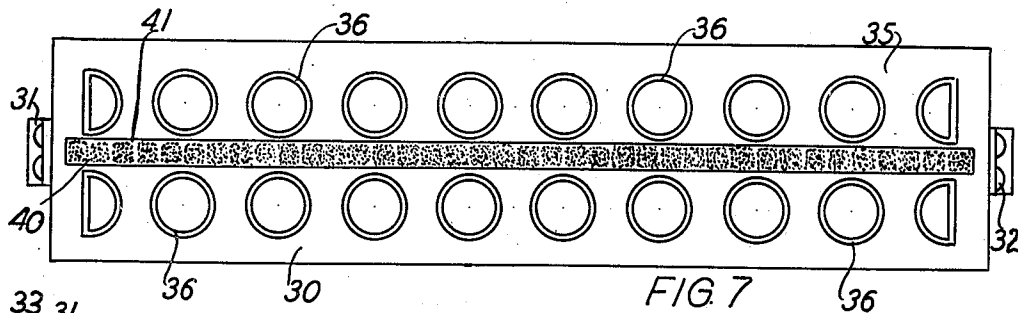
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VACUUM CLEANER FLOOR MOP

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3 Sheets-Sheet 2



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VACUUM CLEANER FLOOR MOP

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3 Sheets-Sheet 3

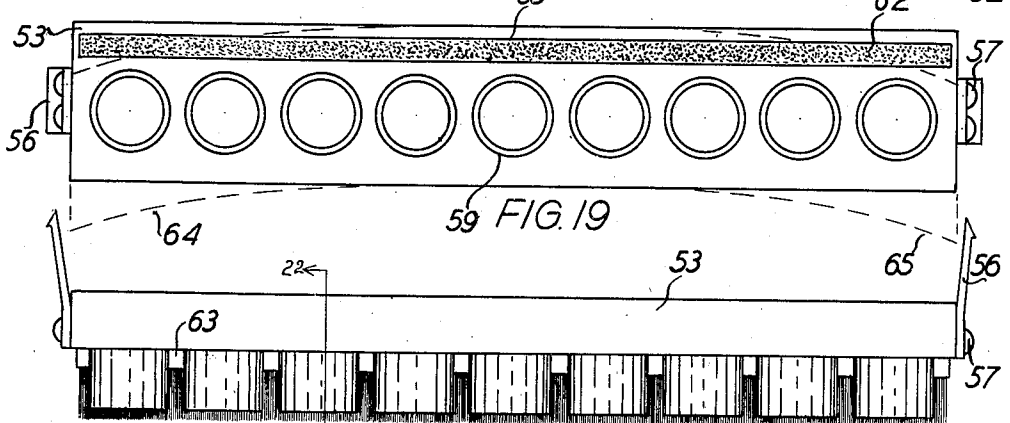
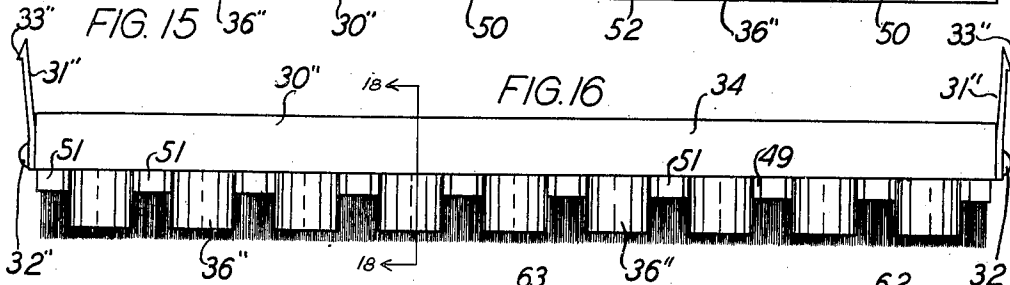
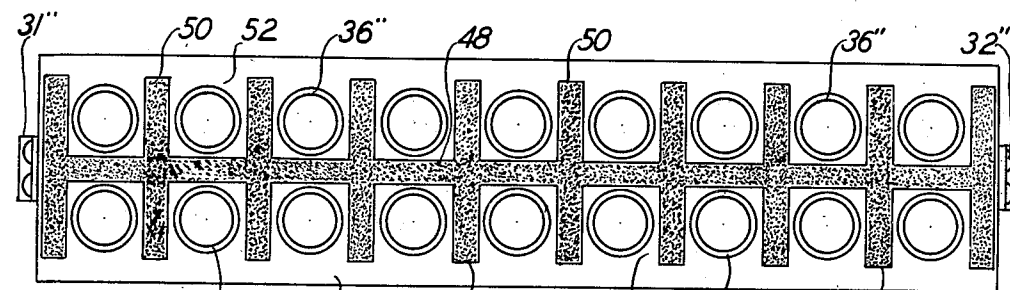


FIG. 20

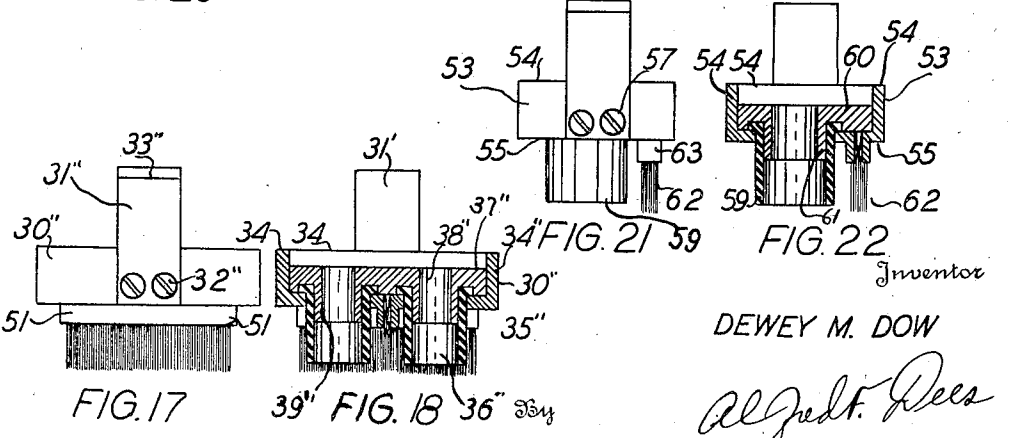


FIG. 17

FIG. 18

FIG. 21

FIG. 22

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UNITED STATES PATENT OFFICE

2,276,944

VACUUM CLEANER FLOOR MOP

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Application May 26, 1939, Serial No. 275,831

4 Claims. (Cl. 15—158)

This invention relates to vacuum cleaners and more specifically concerns a bare floor cleaning device, more properly designated a mop, which is adapted to be used in connection with a portable vacuum cleaner.

The object of this invention is to produce a floor mop for use in connection with a portable vacuum cleaner that will definitely and completely clean a smooth hard surfaced floor or floor covering and which will prevent dust from being brushed away from the suction inlets by the brush bristles.

Another object of this invention is to provide a brush in which at least one side of a plurality of suction inlets in a floor mop has a continuous row or series of brush bristles disposed adjacent thereto.

Another object of this invention is to produce a floor mop of the push or pull type which will not only urge large and heavy particles of dirt toward a common spot or a plurality of such spots, but will remove the finer dust and dirt from the heavy particles to ease the task of removing and disposing of the large particles of dirt.

A still further object of this invention is to so arrange the brush bristles with respect to the suction inlets in the floor mop that the normal accumulation of dust and dirt ahead of the brush, as it moves over the surface being cleaned, will be to force the accumulation underneath and closer to the mouths of the suction inlets.

Another object of this invention is to reduce the cost of manufacture of a floor mop, to increase the efficiency and increase the range of usefulness thereof.

Other and further objects will appear to those skilled in the art to which this invention appertains and any and all modifications, alterations and variations of structure of that described and disclosed coming within the spirit and scope of the invention are deemed included herein. The invention is limited only by the claims appended to the specification and the drawings set forth a preferred embodiment of the invention along with desirable modifications thereof in which:

Fig. 1 is a front elevational view of the floor mop; shows the nozzle and brush back in assembled relation.

Fig. 2 is a side elevational view of the floor mop.

Fig. 3 is a vertical sectional view of the floor mop taken substantially along the line 3—3 of Figs. 2 and 4.

Fig. 4 is a bottom plan view of the brush back

showing the disposition of brush bristles and suction inlets.

Fig. 5 is a vertical elevational view of one of the suction inlets.

Fig. 6 is a top plan view of one of the suction inlets.

Fig. 7 is a bottom plan view of a modification of the brush back of Figs. 1-4.

Fig. 8 is a front elevational view of the brush back of Fig. 7.

Fig. 9 is an end elevational view of the brush back of Fig. 7.

Fig. 10 is a sectional view of the brush back taken along the line 10—10 of Fig. 8.

Fig. 11 is a bottom plan view of a further modification of the brush back of Figs. 1-4.

Fig. 12 is a front elevational view of the brush back of Fig. 11.

Fig. 13 is an end elevational view of the brush back of Fig. 11.

Fig. 14 is a vertical sectional view taken along the line 14—14 of Fig. 12.

Fig. 15 is a bottom plan view of a still further modification of the brush back of Figs. 1-4.

Fig. 16 is a front elevational view of the modification of Fig. 15.

Fig. 17 is an end elevational view of the modification of Fig. 15.

Fig. 18 is a vertical sectional view thereof taken substantially along the line 18—18 of Fig. 16.

Fig. 19 is a bottom plan view of still another modification of brush back of Figs. 1-4.

Fig. 20 is a front elevational view of the modification of Fig. 19.

Fig. 21 is an end elevational view thereof.

Fig. 22 is a vertical sectional view thereof taken substantially along the line 22—22 of Fig. 20.

The floor mop generally indicated at 1 of the instant invention is a two part separable organization comprising a nozzle 2 having an outlet or exhaust 3 to which a hose or wand, or a combination thereof may be attached and thence connected to a source of suction preferably derived from a portable vacuum cleaner although any other source of suction is adaptable thereto. Removably secured to the lower portion of the nozzle is brush back 4, in which are also mounted the suction inlet tubes or conduits 5, to be more particularly described hereinafter.

The nozzle portion 2, of the floor mop has a plurality of downwardly extending walls 7, 7 etc. that form the mouth of the nozzle. Attention is invited to the fact that the nozzle mouth has a length considerably greater than its width. Secured to the longitudinal walls of nozzle is a pair

of agitators 8, one only of which is shown, that are held in position on the walls by a spring clip 9, which is riveted, or otherwise secured to the walls of the nozzle by means 10, 10. The agitators are similar in construction to those described and shown in U. S. Patent 1,980,438.

Mounted exteriorly on the end walls of the nozzle is a pair of U shaped brackets 11, 11 secured thereto by screws 12, or other appropriate holding means. The function of these brackets is to assist in holding brush back 4 over the mouth of the nozzle. Mounted exteriorly of the nozzle is a bumper 13, preferably of mar-proof rubber, that is intended to absorb shocks and blows as the mop comes into contact with articles of furniture or the interior trim of the home to thereby prevent damage to it or the nozzle.

Brush back portion 4, of the nozzle comprises essentially a box-like structure having a plurality of wall portions 14, 14 etc., and a bottom wall portion 15. The brush back has a dimension and shape such that walls 7, 7 etc., and walls 14, 14 etc. will coincide and, as nearly as possible, form a leak proof contact.

Arranged in appropriate apertures in the bottom wall 15 of the brush back are a plurality of suction inlets 5, preferably cylindrical in form, although the two end ones in the instant case are semi-circular, although by a simple alteration or respacing of the apertures, completely cylindrical suction inlets could be employed. The suction inlet 5 comprises essentially a body portion 16, equipped with a flange portion 17, which is adapted to rest upon the top surface of wall 15. The suction inlets are preferably made from a mar-proof rubber and are held in position in the brush back 4 by means of a plate 18.

Plate 18 fits snugly within the opening provided by walls 14, 14 etc., and on its lower side is embossed so as to receive flanges 17, of inlets 5. Plate 18 is apertured as at 19, which apertures coincide exactly with inlets 5. Plate 18 is further provided with projection 20 that snugly fits within the inlets 5, which in combination with the embossings to receive the flanges 17, serves to hold the inlets in position, prevents their buckling and accidental removal from the brush back. Plate 18 is urged downwardly by reason of the agitator 8, which bears directly upon it and is held there by means to be hereinafter described. The projection 20 is concentric with the aperture 19, as will be observed.

Means have been provided in the brush back 4 to facilitate easy removal thereof, whereby the nozzle 2 may be used as a straight suction tool, or to replace with a different type of brush. To this end spring retaining means 22 are secured to ends of the brush back screws or rivets 23. The springs 22 are provided with a shouldered portion 24 which fits over the top U bracket 22. By this means brush back 4 is kept firmly engaged with the mouth of nozzle 2, and agitators 8 act to prevent any relative movement laterally of the brush back 4, and nozzle 2. When the brush back 4 is in engagement with the nozzle 2, the agitators not only serve to prevent lateral motion of the brush back but the shouldered portion of the spring urges the agitators against plate 18 to hold the suction inlets in place.

The brush back supports brush bristle tufts 25 held in position in the brush back in a manner similar to that shown and described in U. S. Patent 2,130,635, or in the manner shown and described in application S. N. 275,830 concur-

rently filed herewith. The brush bristle tufts are supported in a projection 26, in order that the bristles may be maintained shorter and more rigid. As will be noted from an examination of Fig. 4, the brush bristles are set in a plurality of rows 27, 27 etc., which are joined by portions 28, 28 etc., to form a plurality of pockets 29, 29 etc. The portions 28 form a continuous row of bristles across the face of the brush back and, while shown as made up of a plurality of arcuate portions, any other form such as a straight line could be formed with equal facility.

The mop of the invention just described is a single stroke brush. In other words, it performs its function from one side only. Dirt and dust must enter pockets 29, 29, etc., and is then constantly urged upward and into the suction inlets 5. A much more thorough cleaning action is provided by reason of the inlets 5 being arranged in the pockets 29. Each suction inlet is completely segregated from the other and its cleaning action is confined to the small area provided by the pocket. It is a virtual impossibility for dust and dirt entering the pockets to pass the bristles or to cling to them because of the concentrated suction action in the individual pockets.

Figures 7-10 disclose a modification of the brush back 4, of Figs. 1-6. The brush back 30 is adapted to fit a nozzle similar to nozzle 2, described above and in order to retain the brush in position against such a nozzle, springs 31 are secured to the ends of brush back by screws 32, or other appropriate securing means. Each of these springs has a shouldered portion 33, which functions similarly to the shouldered portion 24, described in connection with spring 22, of Figs. 1-4.

Brush back 30 is provided with a plurality of wall portions 34, 34 etc., which are adapted to engage with the lips defining the mouth of a cooperating suction nozzle. Arranged in the bottom wall 35 of the brush are a plurality of suction inlets 36, 36 etc., in appropriate apertures and disposed in two rows across the face of the brush back as shown. These suction inlets are substantially cylindrical in shape and similarly formed to inlets 5, previously described. A plate 37 is provided and is adapted to fit snugly in the pocket, or opening, formed by walls 34, 34 etc. Plate 37 is apertured as at 38, which apertures correspond identically with the apertures in inlets 36. Plate 37 is further provided with a projection 39, concentric with the aperture 38 and with suction inlet 36, and extends into the suction inlet a substantial distance as shown. The plate 37 is further embossed in its lower side to receive the flanged portion of the suction inlet. It is obvious therefore that the projection 39, and embossing of the plate 37 adapted to receive the inlet flange and act to prevent the suction inlet 36 from buckling, to hold it in position and to prevent an accidental disengagement of the inlet from the brush back.

Disposed upon the lower or bottom face of the brush back 30 is a row of brush bristle tufts 40. These tufts are held and mounted in the brush back as described above and in U. S. Patent 2,130,635. The tufts are set in a projection 41 in order that bristle length may be shortened and further that the bristle tufts may be relatively stiff.

The modification just described discloses the single row of bristles. It is two-way in its function in that on either a forward or return stroke it is

capable of effecting a cleaning action. The single row of bristles causes dust and dirt coming in contact therewith to be pushed along and constantly urged under the appropriate row of suction inlets. By reason of their ends being disposed closely to the floor, there will be a greater tendency to urge the dust and dirt particles up into the suction nozzles. There will also be no tendency of linty dirt to get stuck in the bristles by reason of the fact that it is not necessary for it to pass through a row of bristles to get to the suction passage. The brush merely assists the linty material and dirt in getting to the suction inlet and does not impede its passage.

A further modification of the brush back 4 of Figs. 1-4 is set forth in Figs. 11-14. The arrangement of suction inlets and the method of mounting them in the brush back is identical with that of Figs. 7-10. The corresponding parts in Figs. 11-14 and 7-10 have been similarly numbered and the description of the parts bearing the primed numbers in Figs. 11-14 is identical with the unprimed numbers of Figs. 7-10.

The brush arrangement of Figs. 11-14 is modified from that of Figs. 7-10. This comprises a single row of bristle tufts that are set in a projection 43, in the manner described above and for the same reasons. The single row extends nearly to the ends of the brush back at which point the row 42 flares out as at 44, 45, 46 and 47. Each of the flared ends extends slightly beyond the row of suction inlets. This arrangement in effect arranges each individual row of inlets in a large pocket defined by the single row and the flared ends, i. e., row 43, and flared ends thereof 44 and 47 constitute one pocket and row 43 and flared ends 45 and 46 constitutes the other pocket. The brush bristles function in exactly the manner described above in connection with Figs. 7-10 with the exception that the end suction inlets are permitted to function with the same efficiency as the others.

Figs. 15-18 set forth another modification of the brush back of Figs. 1-4 and is an extension of the disclosure of Figs. 7-11. The brush back, suction inlets, etc. in Figs. 15-18 that have double primed numbers applied thereto are identical with similar parts of Figs. 7-11, and no additional description thereof is thought necessary.

The brush arrangement in Figs. 15-18 constitutes a single row of bristles extending across the face of the brush and set in a projection 49 in the manner and form substantially as described above in connection with the disclosures previously described. There are also provided a plurality of transversely arranged projections and rows of bristles 50, 50 etc. extending from row 48 and bristle 48 and projection 48 which are set in projections 51, 51 etc. These transverse short rows in connection with the long row form a plurality of pockets 52, 52 etc., in each of which a suction inlet 36'' is arranged. Each of the suction inlets and its surrounding bristles function identically as in Figs. 1-4. In this instance, however, the floor mop cleans in both directions of movement thereby reducing the amount of time necessary to clean a given area.

The modification disclosed in Figs. 19-22 shows a brush back 53 for a floor mop which comprises a plurality of wall portions 54, 54 etc., and a bottom wall portion 55. Secured to the ends of the brush back 53 are retaining or holding members 56, which have the same function as element 22 above described. It is secured to the brush back by screws 57.

Arranged in the bottom wall of the brush back 53 is a plurality of suction inlets 59 disposed in suitable apertures provided therefor. The suction inlets are cylindrical in shape and are formed similar to inlet 5 above described.

Means are provided for holding the suction inlet in position which comprises a plate which is apertured similarly to bottom plate 55. Plate 60 is also equipped with a projection 61 concentric with inlet 59, and which extends a substantial distance in the inlet. The plate is also embossed to receive the flanged portion as shown. The function of the embossing and flanging of plate have been described of Figs. 19-22.

A single row of brush bristles 62 extends longitudinally across the face of the brush and is set in a projection 63 in a manner and for a purpose previously described. The functioning of the row of bristles and its relationship relative to the suction inlets previously described in connection with Figs. 7-11 applies with the exception that the disclosure of Figs. 19-22 is a single stroke brush.

It may also be desirable at times to make the brush back 53 curved in form as indicated by dotted lines 64 and 65, and the bristle row as well as the row of suction inlets would be curved to conform.

The above is considered to so fully reveal the gist of the invention that anyone by studying the same can successfully reproduce same.

That which is considered new, novel and useful and which is sought to be protected by Letters Patent of the U. S. is as follows:

1. A cleaning tool for attachment to a vacuum cleaner nozzle, comprising a back, two parallel rows of suction inlets in said back, projecting beyond the surface thereof, and a continuous row of brush bristles extending between said rows of inlets from end to end thereof and in proximity thereto, and projecting beyond the plane of the mouths of said inlets, whereby to sweep dust and dirt toward one row of inlets when the tool is moved in one direction, and toward the other row of inlets when the tool is moved in the reverse direction.

2. A cleaning tool as defined in claim 1, wherein said bristles are extended to form pockets partially enclosing said inlets.

3. A cleaning tool as defined in claim 1, including transverse rows of bristles forming, together with said continuous row, a plurality of pockets each embracing a single inlet.

4. A cleaning tool as defined in claim 1, wherein said row of bristles is branched at its ends to form pockets, each enclosing a row of the inlets.

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