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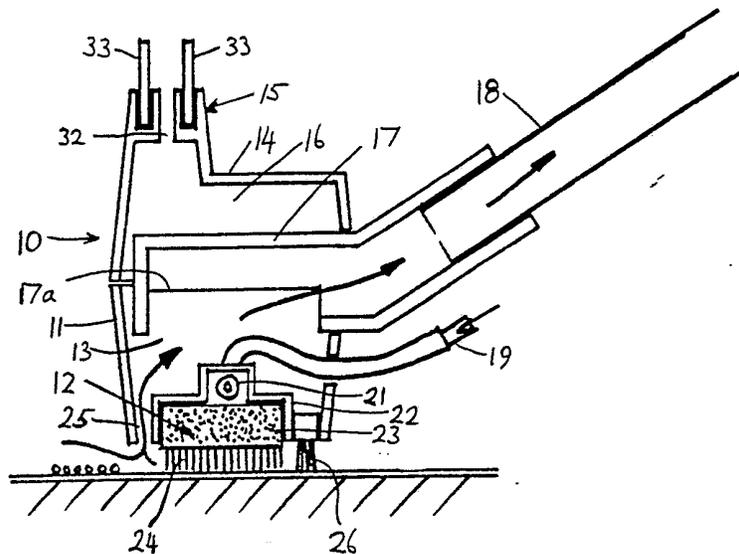
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(54) **Cleaning head**

(57) A cleaning head for use with apparatus for cleaning floors and walls comprises a liquid applicator 12 comprising a compressible porous body 23 having a pile fabric 24 thereon and conduits 19, 21 for supplying liquid to the porous body for subsequent discharge through the pile fabric. The liquid applicator may be housed in suction chamber 13 of housing 11 connectable to a source of suction via tubes 17, 18. The cleaning head may also be provided with another suction chamber 16 having a suction opening 32 bordered by flexible blades 33, and connectable to the source of suction by swivelling the head about tube 17. A brush 26 may be located adjacent an edge of the liquid applicator.



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Title: "Cleaning Head"

Description of the Invention

This invention relates to a cleaning head for use with apparatus for cleaning floors, walls or the like surfaces, more especially hard surfaces, by the application of a suitable cleaning liquid. More specifically, the invention is concerned with a cleaning head which is adapted for the distribution of such a cleaning liquid on to a hard surface and preferably also adapted for use in picking-up or collecting the soiled liquid by means of suction.

The requirements of such cleaning heads for use on hard surfaces differ significantly from cleaning heads for carrying out a similar operation on a soft surface, such as afforded by carpet or upholstery, in the same way that different suction heads are needed for dry suction cleaning operations on different surfaces, such as hard or soft respectively.

The present invention provides an improved cleaning head for use in wet process cleaning operations on hard surfaces, which cleaning head has one or more of the following features:-

an applicator for applying a cleaning liquid to a hard surface, said applicator comprising an operative surface of densely packed thin flexible filaments, for example afforded by a pile fabric, and a distributor body comprising a porous medium such as a body of foamed plastics material, and a liquid supply conduit arranged to deliver the cleaning liquid to said body;

such applicator is disposed in a housing which defines a suction chamber for connection to a source of suction, the housing affording an air inlet adjacent to at least one edge of said applicator so as to be adapted to pick-up dry material from the surface being cleaned whilst the applicator is in use;

a brush of relatively harder material than the applicator operative surface arranged at at least one edge of said applicator, preferably at least at the edge opposite that at which said air inlet is arranged;

a liquid pick-up housing comprising a suction chamber affording an air inlet in the form of a slot provided with flexible blades along its

opposed side edges, such blades preferably being formed with parallel grooves on the faces which are presented outwardly of the slot.

These and other features in accordance with the invention will now be described by way of example with reference to one embodiment of cleaning head in accordance with the invention and as shown in the accompanying drawings wherein:-

FIGURE 1 shows a diagrammatic section through such cleaning head as in use for the application of a cleaning liquid; and

FIGURE 2 is a similar view of the cleaning head in use for collecting soiled liquid.

As shown in the accompanying drawings, a preferred embodiment of cleaning head in accordance with the invention comprises a rectangular body 10 which defines a first housing 11 with an applicator assembly 12 at the mouth thereof, the interior of the housing comprising a suction chamber 13, and a second housing 14 provided with a pick-up assembly 15, and defining internally a further suction chamber 16, the two suction chambers being separated by an internal wall (not shown) within the body. The head is mounted in a swivelable manner on a suction tube 17 which has a downwardly directed opening 17a which communicates with the suction chamber which is, for the time being, in contact with the surface to be cleaned. The suction tube is connected to a flexible hose 18 which is in turn connected to a source of suction in a conventional manner. A flexible pipe 19 serves as a liquid tube and is equipped with a manually operable valve (not shown) whereby cleaning liquid can be delivered under the users control from an appropriate reservoir.

The pipe 19 is connected to a transverse distributor tube 21 which terminates in transversely spaced outlets within a holder 22 which carries a porous body 23 of foamed plastics material having a facing layer 24 comprising a pile fabric, a preferred material for the pile being mohair.

A gap 25 between the holder 22 and the forward edge of the housing 11 defines an air inlet, and at the opposite side of the housing 11 a bristle brush 26 is provided. A similar brush may also be provided adjacent to the air inlet gap 25 if required and likewise similar brushes can be provided at the end edges of the applicator assembly also. The bristles of these brushes are made of a harder, stiffer material than the soft pile, but the arrangement is such that the pile fabric is normally disposed at a lower level than the bristles of brush 26, i.e. the pile fabric 24 protrudes below the brush 26.

In use, the applicator assembly 12 is applied to the hard surface to be cleaned and the manual control valve is operated so as to allow cleaning liquid to be supplied to the distributor body 23. The liquid percolates through the porous body 23 and is supplied substantially uniformly to the pile fabric 24.

The air inlet gap 25 enables a current of air to be established immediately adjacent to the applicator assembly 12 so as to pick up any loose dust or fibres on the surface, in the manner of a conventional dry suction cleaner head.

The brush 26 serves two purposes. Firstly, it limits the inward movement of the pile fabric 24 in response to pressure applied to the cleaning head by the user, and secondly it provides a scrubbing action on the wetted surface.

The fine soft filaments or fibres of the pile fabric 24 are effective to penetrate into small crevices in the hard surface being cleaned and provide a more efficient and gentler cleaning action than conventional scrubbing machines which use relatively coarse and hard bristles which less effectively penetrate small crevices and can more easily damage the surface being cleaned. The bristles of the brush 26, however, enable the user to carry out a gentle scrubbing operation when required, whereas the air inlet gap 25 ensures that loose dirt is removed rather than remaining on the surface and therefore contaminating the cleaning liquid as it is applied to the surface.

When an area of the surface being cleaned has been wetted and adequately cleaned by the application of the liquid using the applicator assembly 12, the body 10 is swivelled about the suction tube 17 so as to expose the suction chamber 16 of the second housing 14 to the inlet opening 17a. Air is then drawn in through the pick-up assembly 15 which comprises a slot 32 extending across substantially the entire transverse width of the body 10. Flexible blades 33 are provided along the opposed side edges of the slot 32. Such blades provide a wiping action which assists in collecting the soiled liquid from the surface being cleaned. Preferably, the outermost faces of the blades 33 are formed with parallel grooves which extend transverse to the length of the blades, i.e. perpendicularly to the surface being cleaned. Such grooves provide channels which are open at the free edges of the blades. When the cleaning head is being pushed forwardly, as shown in Figure 2, such channels are at the underside of the leading blade and therefore allow water on the surface to be drawn into the space between the blades so as to be

drawn into the suction chamber 16, whereas the corresponding grooves on the trailing blade are on the upper face thereof, with the result that the lower, or inner face scrapes over the surface so as to prevent water escaping before it can be picked up. When the head is moved in the opposite direction, a similar effect is obtained by virtue of the blades flexing in the opposite direction.

Typically, the cleaning head may have a transverse width of between about 20 and 30 cm, and in practice it has been found that the cleaning liquid is distributed substantially uniformly across the entire area of the applicator from the two outlet openings of the distributor tube 21 which are spaced equally on opposite sides of the centre line, the porous body 23 serving to ensure that the liquid spreads evenly from the two localised points of delivery to cover the entire area of the pile fabric 24. However, if desired, the distributor tube 21 could be formed with intermediate outlet nozzles if required.

Whilst it is advantageous to provide the air intake gap 25 adjacent to the applicator assembly 12, the gap 25 could contain a further bristle brush 26 in any case where pick-up of dry material is not required. In that case, it will be appreciated that the interior of the housing would not be required to constitute a suction chamber and need not be in communication with the interior of the suction tube 17, which would be modified accordingly. For example, the housings 11 and 14 could be afforded by separate cleaning heads, one of which affords the housing 11 associated with the applicator assembly 12 and the other of which affords the housing 14 associated with the pick-up assembly 15, such heads alternatively being connected to the flexible hose 18, although when the first housing 11 with the applicator assembly 12 is in use the suction motor should be de-energised, or alternatively the housing should afford an air inlet for example at a position above the applicator assembly so that air flow is maintained in the flexible hose 18 to prevent overheating of the suction motor.

CLAIMS:-

1. A cleaning head for use with apparatus for cleaning floors, walls or the like surfaces, more especially hard surfaces, by the application and optionally pick-up of a cleaning liquid, said cleaning head being characterised by an applicator assembly comprising a compressible porous body having an operative facing layer formed by a pile fabric, and a liquid supply conduit arranged to deliver such liquid to said body, the liquid flowing through said body to said facing layer.
2. A cleaning head according to Claim 1 wherein the applicator assembly is disposed in a housing which defines a suction chamber connectable to a source of suction, the housing affording an air inlet adjacent to at least one edge of said applicator assembly to enable dry material to be picked up from the surface being cleaned by suction simultaneously with the application of said liquid by means of the applicator assembly.
3. A cleaning head according to Claim 1 or Claim 2 wherein a brush of relatively harder material than the facing layer of the applicator assembly is arranged at at least one edge of said applicator assembly.
4. A cleaning head according to Claim 3 wherein the facing layer of said applicator assembly is normally disposed so as to project outwardly from the housing beyond the brush the latter serving to limit inward displacement of the facing layer when in use.
5. A cleaning head according to Claim 2 and Claim 3 or Claim 4, wherein said brush is disposed at the edge of the applicator assembly opposite to that at which the air inlet is provided.
6. A cleaning head according to any one of the preceding claims comprising a further housing defining a suction chamber and affording an air inlet in the form of a slot provided with flexible blades along its opposed side edges for the pick-up of liquid from the surface being cleaned.
7. A cleaning head according to Claim 6 wherein said blades are formed with parallel grooves on the faces thereof which are presented outwardly of

the slot so as to enable water to be drawn under the end edge of the respective blade when said outwardly presented faces adopt a convex configuration due to movement of the cleaning head over the surface being cleaned.

8. A cleaning head according to Claim 6 or Claim 7 wherein the two housings are mounted in back-to-back relationship within a body which is swivellably mounted on a suction tube whereby either the housing containing the applicator assembly or the housing with the liquid pick-up slot can be presented to the surface to be cleaned at the option of the user.

9. A cleaning head according to Claim 8 wherein the suction tube is formed with a laterally directed opening which is arranged to communicate alternatively with the suction chamber within housing or the suction chamber within housing dependent on the position of the body relative to the tube.

10. A cleaning head according to any one of the preceding claims wherein the liquid supply conduit comprises a transverse tube having outlets at the ends thereof adjacent to the porous body of the applicator assembly.