

Dec. 25, 1962

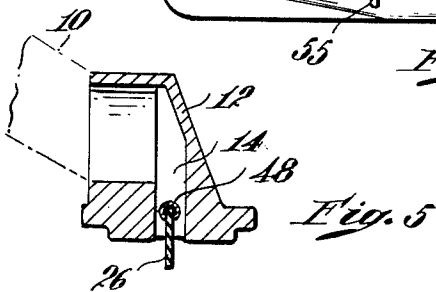
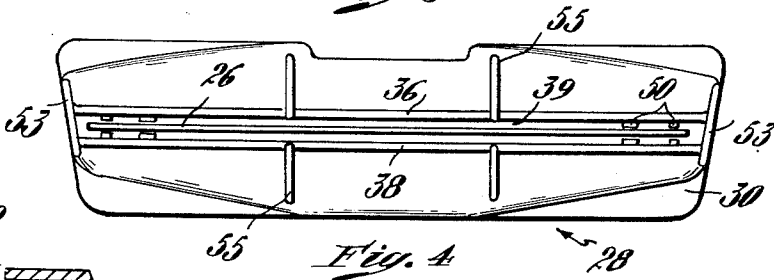
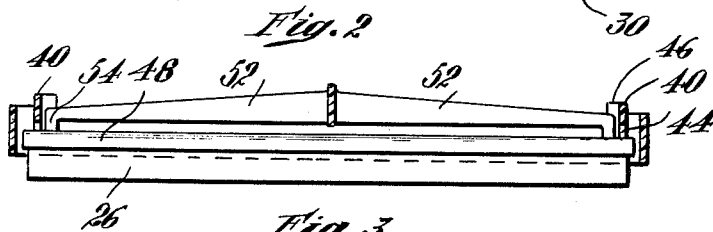
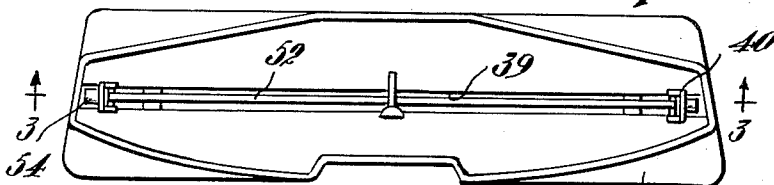
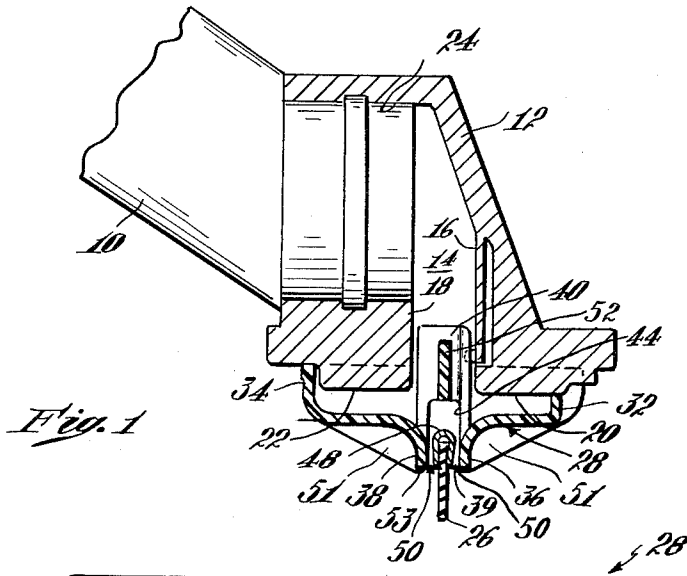
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3,069,716

VACUUM CLEANER NOZZLE AND ATTACHMENT

Filed Feb. 11, 1960

2 Sheets-Sheet 1



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VACUUM CLEANER NOZZLE AND ATTACHMENT

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2 Sheets-Sheet 2

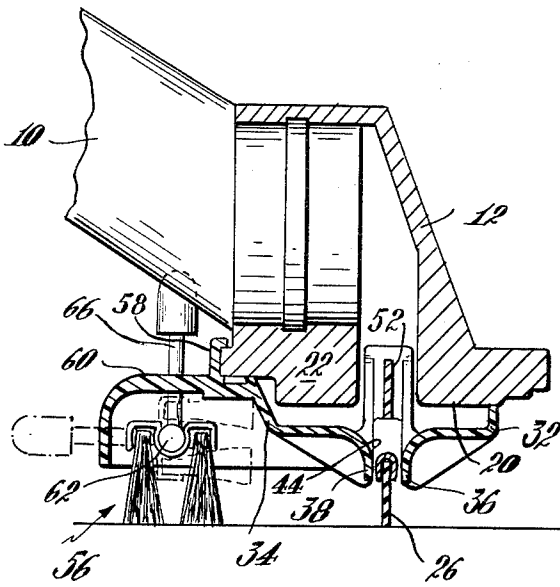
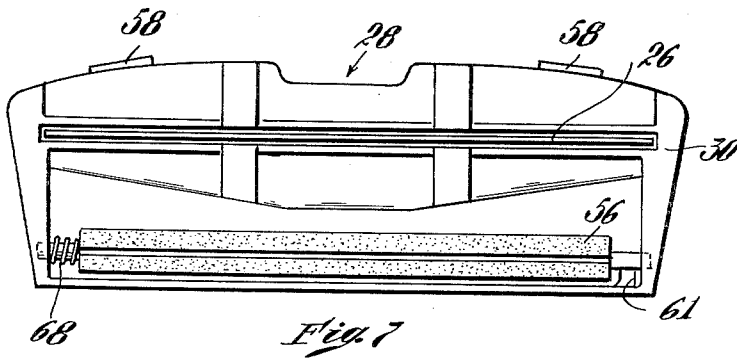
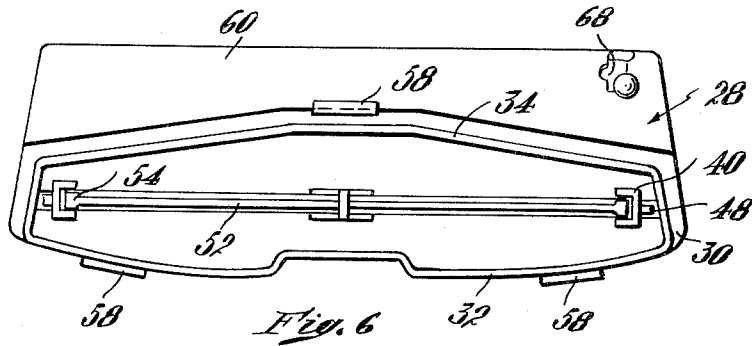


Fig. 8

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**VACUUM CLEANER NOZZLE AND ATTACHMENT**  
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2 Claims. (Cl. 15—371)

This invention relates to vacuum cleaners and has for its principal objects to provide apparatus for picking up solids, on the one hand, and fluids, on the other hand, and, in particular, for picking up liquids without leaving tracks or traces of moisture along the path of movement; to provide an attachment for use with a suction head of conventional construction whereby it may be employed to pick up liquids without lessening its utility for picking up solids; and to provide an attachment for the foregoing purposes which is easy to apply and remove and does not require modification of the head for attachment thereto.

As herein illustrated, the apparatus comprises a suction head containing a narrow uptake passage having a long, narrow intake opening at its lower end and a lateral opening at its upper end for communication with the intake tube of the cleaner. A thin, flat blade is disposed longitudinally of the intake opening midway between its front and back walls, with a portion secured within the opening and another portion extending from the opening for contact with the floor. The lower portion of the blade is adapted to move relative to the front and back walls of the opening in a direction opposite to the direction of movement across the floor and, by such movement, partially to restrict the opening at the side toward which it moves. Movement of the lower portion of the blade may be a flexing of the blade itself, or the blade may be mounted for pivotal movement about its upper edge, so as to swing forwardly and rearwardly with reference to the front and back walls. Preferably the blade is mounted for vertical movement within the opening against means yieldably resisting such movement. While the blade may be permanently mounted in the head preferably it is detachable, being mounted on a shoe adapted to be placed over the lower face of the suction head and to be snapped into engagement therewith, so that a conventional suction head may be converted from solid pick-up to liquid pick-up by the simple expedient of applying the attachment thereto. Optionally, the attachment may have a forward extension for supporting a brush parallel to the blade. The brush is mounted for rotation about a horizontal axis so that it may be disposed in a position for contact with the floor in conjunction with the blade, or rotated to an inoperative position so that the blade may be used by itself.

The invention will now be described in greater detail with reference to the accompanying drawings wherein:

FIG. 1 is an elevation of the lower part of the intake tube of a vacuum cleaner, showing the suction head in vertical section, with the liquid pick-up attachment applied to it;

FIG. 2 is a top view of the attachment removed from the head;

FIG. 3 is a longitudinal vertical section taken on the line 3—3 of FIG. 2;

FIG. 4 is a bottom view of the attachment;

FIG. 5 is a vertical section through a suction head with means built into it for the purpose of picking up liquid;

FIG. 6 is a top view of a modification of the attachment;

FIG. 7 is a bottom view of the modification; and

FIG. 8 is an elevation of a lower part of an intake tube of a vacuum cleaner, showing the suction head in section with the modified attachment applied thereto.

Referring to the drawings, there is shown (FIG. 1) the lower end of the intake tube 10 of a conventional vacuum cleaner having a suction head 12 mounted on it. The head 12 extends transversely of the intake tube and has a long, narrow uptake passage 14, defined by front and rear walls 16 and 18, the lower end of which is open and is adapted to be supported adjacent to the floor by runners 20 and 22, forwardly and rearwardly thereof. At its upper end the passage 14 has a lateral opening 24 into which the lower end of the intake tube 10 is removably secured.

The aforesaid suction head is suitable for picking up solid matter and to some extent will pick-up liquid, however, not without leaving traces of liquid on the floor. To pick-up the liquid efficiently, without leaving a trace, so that the floor is substantially dry, a blade 26 is used in conjunction with the suction head. The blade 26 may, as will appear hereinafter, be built into the head, however, in the preferred form of the invention it is part of an attachment 28, which may be applied to the bottom side of the suction head to convert it from picking up dust to picking up liquid. The attachment 28 is an elongate, substantially rectangular shoe 30 (FIGS. 2 and 4), having upstanding walls 32 and 34 which engage respectively, the lower side of the runner 20 and the rear edge of the runner 22 and intermediate downwardly extending, spaced walls 36, 38 which define a narrow opening 39 situated subjacent the uptake passage 14 in the head. At the ends of the passage 39 there are vertically disposed bearing elements 40, the transverse width of which corresponds substantially to the front to back width of the uptake passage 14 and these bearing elements in conjunction with the rear wall 34 are somewhat elastic and when forced into the open lower end of the passage 14, over the shoulder of the runner 22, yieldably hold the shoe in place. The bearing elements 40 contain vertically disposed slots 44 and 46. The blade 26 has a rigid back 48, the opposite ends of which are disposed in the slots 44, the latter being made wide enough (FIG. 1), so that the blade can rock forwardly and rearwardly about its back within the slots 44. Nub-like projections 50 (FIG. 4), of which there are two pairs near each end of the blade, extending toward each other from the front and back walls 36 and 38 and, by engagement with the lower edges of the back 48, hold the blade suspended within the opening 39. The elasticity of the walls 36 and 38 is such that, although the space between the nubs 50 is less than the thickness of the blade back 48, the blade may be thrust upwardly between them to mount it in place and can be as easily removed. The slots 44 are vertically deeper than the depth of the back 48 and hence the blade is movable vertically within the slots 44. Spring arms 52 (FIG. 3) are fastened to the shoe and have at their ends downwardly extending fingers 54 which lie within the slots 46 and bear against the top side of the back 48, yieldably holding the blade in its lowermost position against the projections 50.

The front and back walls are reinforced at their ends by webs 51, the lower portions of which project slightly below the lower edges of the walls, providing narrow supports 53 at the ends. Additional supports 55 are provided intermediate the ends and these in conjunction with the supports 53 serve to hold the mouth of the attachment off the floor when the blade is removed.

The blade preferably is a flexible material such as rubber or plastic, however, it may be substantially rigid so that deflection forwardly and rearwardly with movement of the apparatus takes place solely because of the pivotal mounting of the back of the blade. Whether the blade flexes or pivots it always moves in a direction opposite to the direction of movement of the head, so that it acts as a squeegee picking up and pushing the

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liquid ahead of it, in a position to be sucked up into the mouth of the uptake passage above it. By locating the blade midway between the front and back walls of the opening, it is equally effective in either direction. It is also to be observed that the liquid is picked up at the leading side of the blade and that the suction is most effective at this side since the opposite side is partially closed by the deflection of the blade.

As indicated above, instead of mounting the blade as an attachment the suction head itself may have built into it a blade, as shown in FIG. 5, by providing suitable bearings at the opposite ends of its uptake passage 14, such as the bearings 40 described above, and mounting the back of the blade 43 within the bearings for pivotal movement forwardly and rearwardly and, if desired, for vertical movement therein.

A modification of the attachment is shown in FIGS. 6 to 8 inclusive, in which in addition to the blade 26 there is a brush 56. As described above, the blade 26 is supported by a shoe 28 having upwardly extending walls 32, 34 which span the bottom side of the suction head 12, in this instance seating against the front runner and against the head, rearwardly of the rear runner 22. Resilient latch members 58, of which there are three, one at the rear and two at the front integral with the walls, hold the attachment in place by engagement with the front and rear edges of the suction head, as shown in FIG. 8. The shoe has downwardly projecting, spaced front and rear walls 36 and 38, between which the blade 26 is supported in exactly the same fashion as described above.

At the rear side of the shoe there extends a brush housing 60 having at its ends bearings 61 for supporting a horizontal shaft 62, to which the brush 56 is fastened. A lever 66 is fastened to the shaft 62 near one end and projects from the housing through a slot 68 (FIG. 6), portions of which are situated in the top and side walls of the housing so that the lever may be rocked from the position shown in FIG. 8 in full lines to the dotted line position and, by such rocking, to rotate the brush from full line position in contact with the floor to the dotted line position elevated from the floor close to the underside of the housing. A spring 68 on the shaft biases it in a direction to hold the lever 66 engaged with lateral notches at either end of the slot 68 to hold the brush locked in either position.

When the brush is in contact with the floor the apparatus may be used for scrubbing purposes in conjunction with the blade. For complete pick-up of liquid from the floor, however, after thorough scrubbing has been effected, the brush is elevated to its inoperative position so that the blade may be used by itself to insure pick-up of the liquid without trace of moisture such as would be left by the brush tracking over the floor if not moved to its inoperative position.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. In combination with the suction head of a vacuum cleaner which has a substantially flat sole plate containing a narrow elongate opening adapted to be connected to a vacuum cleaner hose; a shoe having a bottom wall and upwardly projecting side and end walls, said bottom wall containing a narrow elongate slot defined by spaced, downwardly projecting lips, means holding the shoe with the side and end walls engaged with the sole plate of the nozzle so that the bottom wall is spaced

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therefrom and provides, in combination therewith, a chamber subjacent the sole plate and so that the elongate slot in the shoe is vertically subjacent the elongate opening in the sole plate, a thin narrow blade having a stiff back and a flexible edge, means on the shoe supporting the blade within the slot between the downwardly projecting lips for vertical movement therein, means yieldably holding the blade with its flexible edge projecting from the lips, said blade being movable upwardly into the chamber, by engagement of its flexible edge with the floor, to clear the back of the blade of the slot, and downwardly projecting ribs at the ends of the shoe for supporting the lower edges of the downwardly projecting lips above the floor when the blade is removed.

2. In combination with the suction head of a vacuum cleaner which has a substantially flat sole plate containing a narrow elongate opening adapted to be connected with a vacuum cleaner hose; a shoe having a bottom wall and upwardly projecting side and end walls, said bottom wall containing a narrow elongate slot defined by spaced, downwardly projecting lips, yieldable latch members on the shoe engaged with the sole plate operating to hold the shoe with the side and end walls engaged with the sole plate so that the bottom wall is spaced therefrom and provides, in combination therewith, a chamber subjacent the sole plate, and so that the elongate slot in the shoe is vertically subjacent the elongate opening in the sole plate, bearing elements integral with the shoe projecting upwardly from the ends of the slot therein into the opening in the sole plate, said bearing elements containing vertically disposed slots, a thin flexible blade having a stiff back and flexible lower edge, trunnions at the ends of the back engaged within the slots in the bearing elements and supporting the blade in the slot between said spaced parallel, downwardly projecting lips, said trunnions being movable vertically within the bearing slots, and said slots in the bearing elements being long enough to permit the blade to rise upwardly into the chamber above the slot in the bottom wall of the shoe so that the back of the blade clears the slot in the bottom wall, said back having a greater transverse thickness than the flexible edge, nubs projecting from the lips into the opening beneath the lower edge of the back, and a spring having arms bearing against the back of the blade, but unattached thereto, pressing the blade downwardly so that the lower edge of the back is held against the nubs, the downwardly projecting lips being elastically displaceable, and the lower ends of the bearing slots being open so that the blade may be removed by spreading the lips apart sufficiently to clear the nubs of the back.

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