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VACUUM CLEANER PICKUP HEAD

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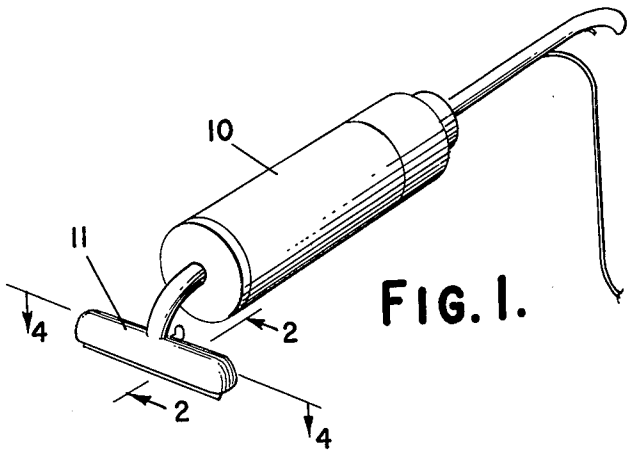


FIG. 1.

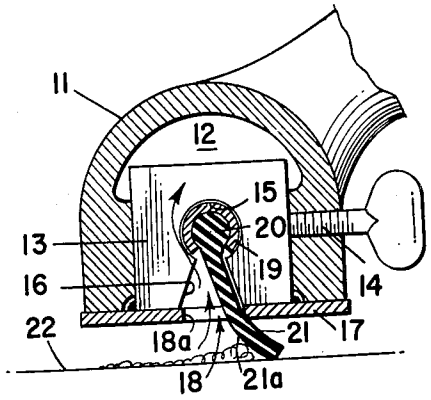


FIG. 2

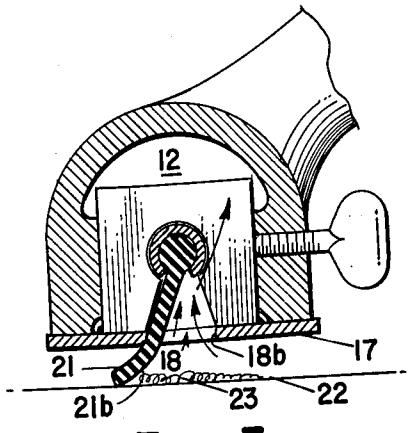


FIG. 3.

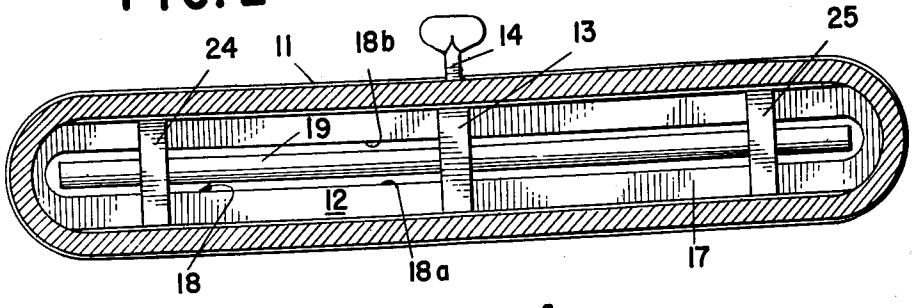


FIG. 4.

INVENTOR.

JOHN J. KELNHOFER

BY *Elliott & Pastoriza*

ATTORNEYS

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VACUUM CLEANER PICKUP HEAD

John J. Kelnhofer, Ontario, Calif., assignor to Fabmagic, Inc., a corporation of California

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This invention generally relates to vacuum cleaners and more particularly to an improved vacuum cleaner pickup head, preferably for use in removing liquids from a floor or equivalent surface.

The efficiency of a vacuum cleaner is determined in large part by the degree of suction that can be realized per unit area of opening in the vacuum cleaner head. To pick up water or other liquids from a floor requires a relatively high degree of suction per unit area.

To facilitate entrance of water or other liquid to be picked up, conventional vacuum cleaner heads usually employ an elongated transverse strip which will tend to pile up the water in front of the head receiving opening as the head is moved over the floor surface. When the head is moved in a forward direction, the water will tend to pile up against the front surface of the strip and be received in the head opening between this front surface and the front edge of the opening. The suction existing between the rear edge of the opening and the rear surface of the strip does not to any appreciable extent function to pick up water since the water has been wiped ahead by the strip.

On reverse movement of the head in a rearward direction, any liquid will tend to pile up against the rear surface of the strip and be sucked into the head opening between this rear surface and the rear edge of the opening itself. The portion of the opening ahead of the strip will then not appreciably serve to pick up any liquid.

With the foregoing considerations in mind, it is evident that up to fifty percent of the available suction area is wasted during a cleaning operation.

Accordingly, it is a primary object of this invention to provide an improved head in which all of the available opening area of the head is used for the purpose of picking up water or other liquid.

More particularly, it is an object to provide an improved vacuum cleaner pickup head in which the suction opening area is used in its entirety to pick up water when the head is moved in either a forward or rearward direction to the end that greatly increased efficiency in the use of the vacuum cleaner results.

Briefly, these and other objects and advantages of this invention are attained by providing as a substitute for the conventional type of wiping strip a special flexible type of strip element which is mounted within the interior of the head in such a manner as to swivel in a fore and aft direction. With this arrangement, forward movement of the vacuum cleaner head will result in the strip swiveling in a manner such that its rear surface engages the rear edge of the suction opening so that the entire exposed area of the opening is forward of the strip to effect maximum water pickup. When the head is reversed in motion, the strip is caused to swivel in an opposite direction so that its front surface engages the front edge of the head opening so that the effective suction area of the opening is entirely to the rear of the strip for maximum efficiency in picking up water.

A better understanding of the invention will be had by now referring to a preferred embodiment thereof as illustrated in the accompanying drawings, in which:

FIGURE 1 is a perspective view of a commercial type vacuum cleaner incorporating a pickup head in accordance with the present invention;

FIGURE 2 is an enlarged cross section taken in the direction of the arrows 2—2 of FIGURE 1 showing the relative positions of various components when the head is moved in a forward direction;

FIGURE 3 is a view similar to FIGURE 2 but showing the relative positions of various components when the head is moved in an opposite or rearward direction; and,

FIGURE 4 is a plan cross section of the head taken in the direction of the arrows 4—4 of FIGURE 1.

Referring first to FIGURE 1, there is shown a vacuum cleaner including a vacuum tank **10** and pickup head **11**. In the detailed views of FIGURES 2, 3, and 4, it will be noted that the head **11** includes a hollow interior **12**. Within the interior **12** there is supported a block member **13** as by a set screw **14**. The block member itself includes a transverse bore **15** having a lower circumferential portion thereof radially cut away to define an inverted V-shaped channel **16**, opening in a downward direction.

The entire bottom surface of the head **11** is closed off by a plate **17** having an elongated transverse slot designated generally by the numeral **18**. The plate **17** may be rigidly secured to the under side of the block **13** so that when the block **13** is removed as by loosening the set screw **14**, the bottom plate **17** is also removed from the bottom portion of the head **11**.

As shown in both FIGURES 2 and 3, there is provided a support and wiper mounted in the block **13** for swiveling movement. In the embodiment chosen for illustrative purposes, the support takes the form of an elongated rod **19** having a diameter slightly smaller than the bore **15** in the block **13** so that it is free to rotate therein. The rod **19** in turn supports a flexible wiper strip provided with an upper cylindrical bead **20** received within the hollow interior of the rod **19**. The remaining portion of the wiper strip extends downwardly as at **21** to pass out of the inverted V-shaped channel **16** and lower slot **18**. The extreme end **21** of the wiper strip is arranged to engage a surface such as indicated at **22** for the purpose of piling up liquid or dirt **23**.

With reference to FIGURE 4, it will be noted that the preferred embodiment includes additional block members **24** and **25** spaced equally on either side of the block member **13** so that adequate axial support for the rod **19** is provided throughout the transverse length of the interior **12** of the pickup head. The bottom plate **17**, as stated, is preferably secured to the blocks so that the blocks **13**, **24**, and **25** are held in rigid relationship with respect to each other and with their respective bores aligned for receiving the rod **19**.

From the foregoing description, the operation of the improved pickup head will be evident. With reference once again to FIGURE 2, if it is assumed that the head **11** is moved in a forward direction which, in the view of FIGURE 2, would be to the left, the strip **21** will be flexed to the right and will also be capable of movement to the right as a consequence of the rotative mounting of the rod **19** in the bores of the blocks. The movement is such that the strip portion **21** will engage the rear edge of the slot **18** so that a suction opening is defined between the front surface **21***a* of the strip **21** and the front edge **18***a* of the slot opening **18**. Since this is the only opening to the interior **12** of the head **11**, there will be provided maximum suction per unit area. Further, the water or other liquid **23** which will pile up against the front surface **21***a* of the strip **21** will be in proper position for immediate withdrawal into the interior **12** of the head **11**, all as indicated by the arrows.

If now the vacuum head **11** is moved rearwardly or to the right as viewed in FIGURE 3, the engagement of the extreme end of the strip **21** with the floor surface **22** will swing the strip member **21** forwardly until its front surface **21***a* engages the front edge **18***a* of the opening **18**. The suction opening will then be defined between the rear

surface **21***b* of the strip **21** and the rear edge **18***b* of the slot **18**. Again, the water or other debris to be picked up will be accumulated against the rear edge **21***b* as indicated at **23** in FIGURE 3 and is thus in a position to be received within the opening as again indicated by the arrows.

In the event other debris is to be picked up, the provision of the set screw **14** permits easy removal of the blocks together with the bottom plate **17** and wiping strip **21** so that another unit which may include brushes, for example, may be inserted within the hollow interior of the head **11**.

From the foregoing description, it will be evident that the present invention has provided a unique pickup head structure in which maximum use at all times of the available suction opening is employing for the purposes of picking up liquid or other debris.

While only one particular embodiment has been set forth and described, it will be evident to those skilled in the art that various changes may be made that fall clearly within the spirit and scope of the invention. The improved vacuum cleaner pickup head is therefore not to be thought of as limited to the one particular embodiment set forth merely for illustrative purposes.

What is claimed is:

1. A vacuum cleaner pickup head comprising: a transverse casing having a hollow interior terminating in a downwardly facing transverse opening; a transverse wiper; means mounting said wiper in said interior for swinging movement in a fore and aft direction, said means including at least one block member stationarily secured in said interior, said block member having a transverse bore, the lower circumferential inner surface of which is radially

cut to define an inverted V-shaped channel facing downwardly and communicating with said bore; a swiveling rod rotatably held in said bore and secured to one edge of said wiper, the remaining portion of said wiper extending downwardly through said channel to pass through said transverse opening engage a surface to be cleaned, whereby forward movement of said head over said surface swings said wiper against the rear edge of said opening to expose a suction receiving area between the front surface of said wiper and the front edge of said opening and rearward movement of said head over said surface swings said wiper against the front edge of said opening to expose a suction receiving area between the rear surface of said wiper and the rear edge of said opening.

2. A vacuum cleaner pickup head according to claim 1, including a bottom plate having an elongated transverse slot defining said opening, said plate being secured to said block member with said slot registering with said channel in said block member.

3. A vacuum cleaner pickup head according to claim 2, including set screw means passing into said casing for securing said block member in said interior.

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