Aug. 23, 1966 C. E. MEYERHOEFER 3,267,511

VACUUM MOPPING APPARATUS

Filed June 1, 1964 2 Sheets-Sheet 1

FIG. 1

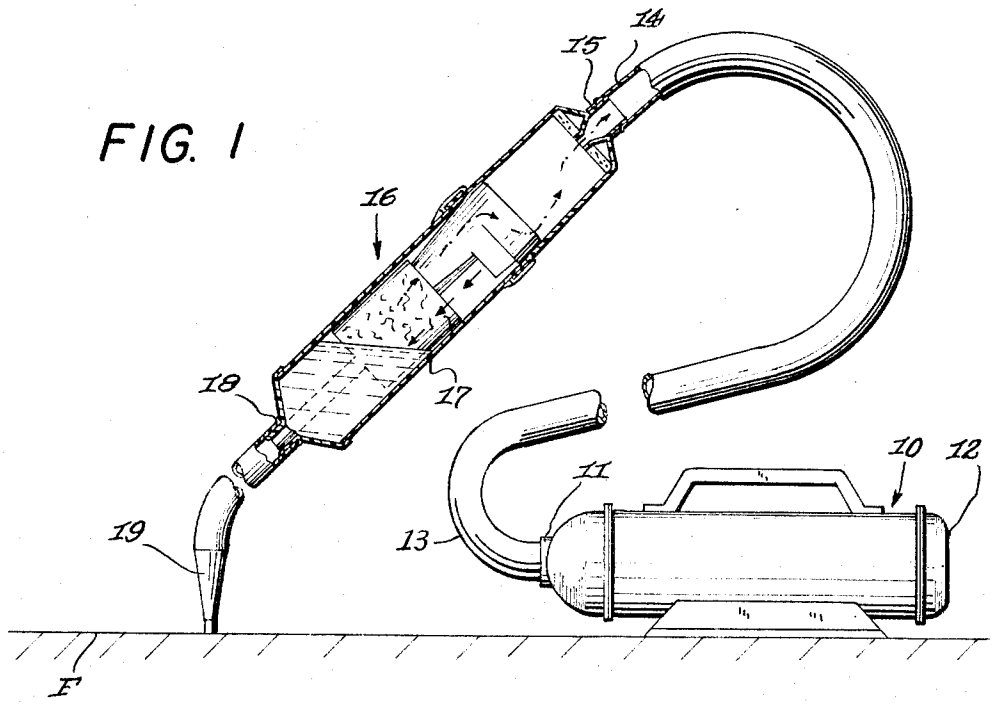
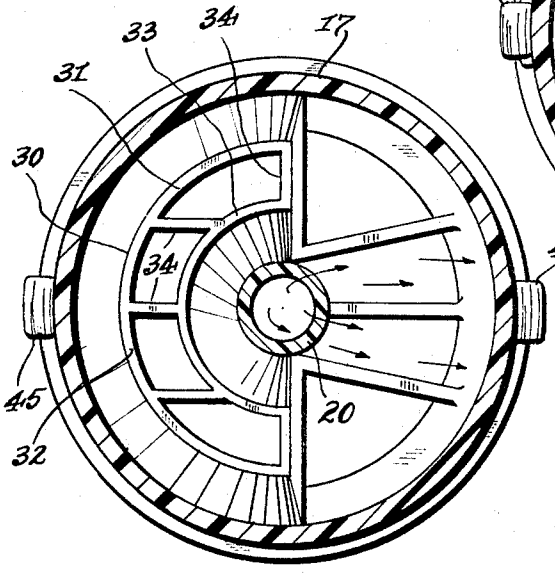


FIG. 3



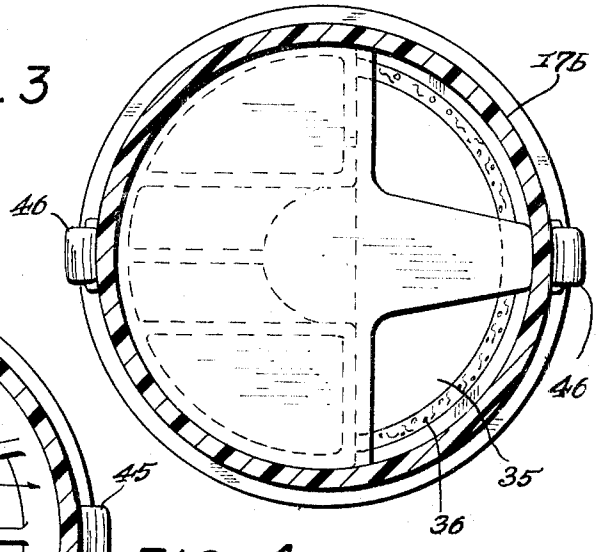


FIG. 4

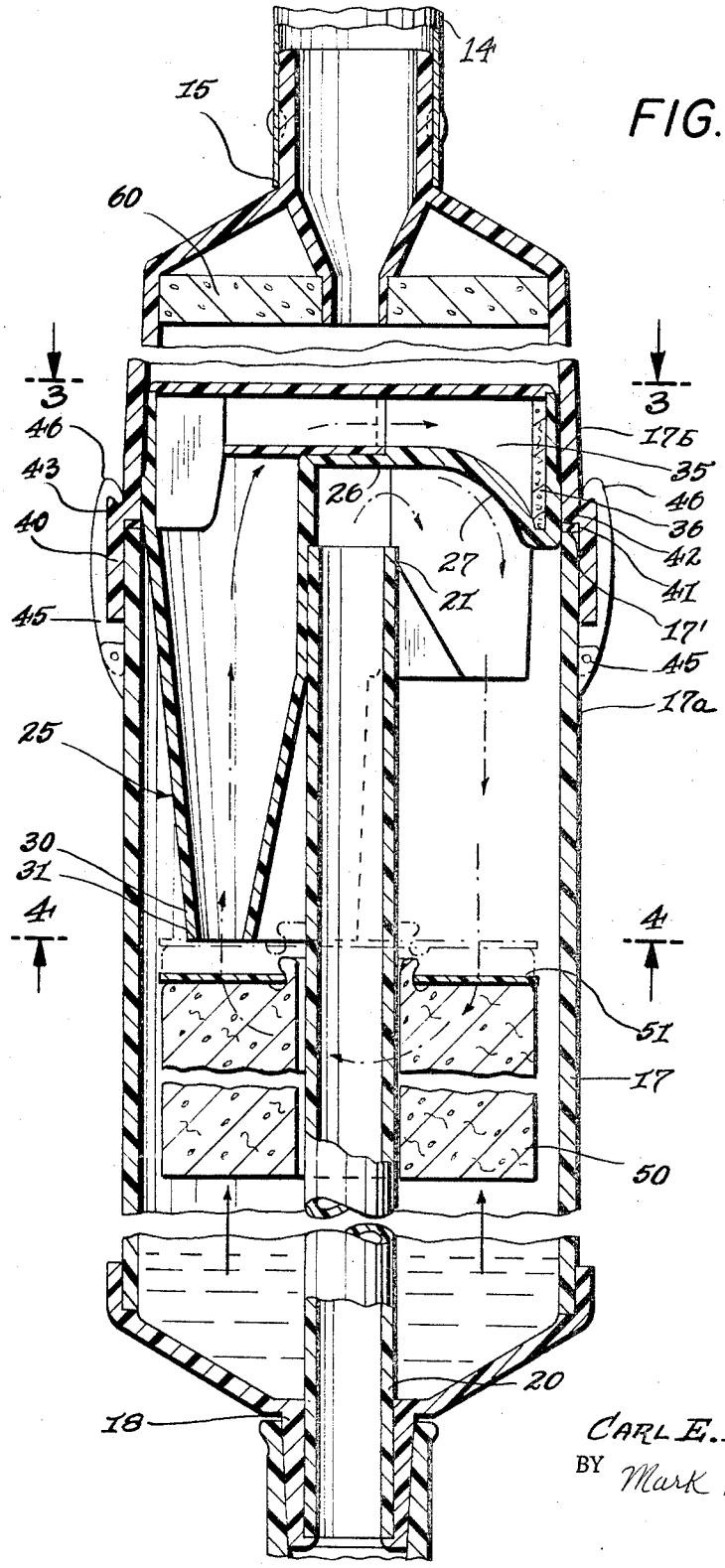
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FIG. 2



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3,267,511

VACUUM MOPPING APPARATUS

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5 Claims. (Cl. 15—353)

This invention relates to a vacuum mop device and particularly to a vacuum mop device for use in cleaning liquid mopping residues from freshly mopped floors or the like, to the end that the dirt containing residues do not dry on the floor.

More particularly, this invention relates to a wand type vacuum mopping device which may be used in conjunction with a conventional vacuum cleaner, such as may be found in the home. This invention relates further to a wand type pick-up attachment for use with conventional vacuum cleaners, which will pick up liquid residues from mopped floors or the like, and which is provided with a novel internal attachment which permits the pick-up of moisture but reduces to a minimum the possibility that moisture will flow through the suction hose connecting the upper end of the wand with the vacuum source. This invention relates further to a wand type water pick-up attachment, which is light-weight, easily emptied, and which assures that no water will be admitted to the interior of the vacuum cleaner motor.

It is known to employ a vacuum source as the means for drawing water from a freshly mopped floor. While devices of this type are efficient, they have heretofore necessarily entailed the use of relatively large liquid containing canisters for the storage of the dirty water. Thus the typical known vacuum pick-up attachment has been necessarily used in connection with large commercial type pick-up constructions, capable of moving a larger volume of air than is the case with the usual household vacuum attachment. Attempts to provide a vacuum water pick-up useful with the typical household vacuum cleaner, have been universally unsuccessful. Where such attachments have taken the form of a wand type pick-up unit, no construction heretofore devised has successfully prevented increments of moisture from passing through the pick-up apparatus along with the air stream, and being carried to the vacuum cleaner motor. It will be readily recognized that if even relatively minor amounts of moisture are carried to the motor, an electrical failure and possibly also a shock hazard will result. At best the presence of such moisture in the motor and housing of the vacuum device, will cause corrosion of the internal parts of the device.

Attempts have been made to provide an attachment for use with home vacuum cleaner units resembling in principle the commercial type unit above described. Such units include a relatively wide liquid receiving canister interposed between the pick-up nozzle and the vacuum source. Such devices avoid in a large measure the problem of carrying moisture into the interior of the vacuum source, by laterally displacing within the container the input through which the moisture is discharged into the container, and the exhaust through which the air stream is discharged into the vacuum cleaner housing. Apparatus of this type has not met with favorable reception, since the provision of a wide canister as a moisture receptacle necessitates that two units, namely the vacuum cleaner and the receptacle rest on the floor, and it is thus necessary for the operator, in addition to using the pick-up device, to drag two separate attachments which rest on the floor.

Accordingly, it is an object of this invention to provide a wand type liquid pick-up attachment for use with a conventional vacuum cleaner device, wherein there is

minimal likelihood of liquid particles passing completely through the pick-up attachment, and into the vacuum source structure. A further object of the invention is the provision of a moisture pick-up attachment of the wand type, wherein the liquid receptacle is of a relatively small diameter permitting the same to be used as a handle for moving the pick-up nozzle across the floor surfaces, said receptacle having a novel interior baffling attachment. Still a further object of the invention is to provide a pick-up device of the type described which is light-weight and inexpensive to manufacture in addition to being highly efficient in preventing water from traversing the attachment. Still other objects of the invention will become apparent.

In order fully to explain the invention reference is made to the accompanying drawings illustrating an embodiment thereof, wherein:

FIGURE 1 is a side elevational view of a vacuum cleaner device with the attachment of the present invention secured thereto, portions of the attachment being shown in section.

FIGURE 2 is a magnified longitudinal section through the pick-up attachment shown in FIGURE 1.

FIGURE 3 is a cross section taken on the line 3—3 of FIGURE 2.

FIGURE 4 is a cross section taken on line 4—4 of FIGURE 2.

In accordance with the invention, there is shown in FIGURE 1 a vacuum cleaner **10** of the usual type including a suction end **11**, and an exhaust end **12**. While the illustrated vacuum cleaner is of the so called tank type, it will be recognized that the pick-up attachment of the present invention may be used with the canister type vacuum cleaners and indeed substantially any vacuum developing device.

To the suction end **11** of the vacuum cleaner **10** there is attached suction hose **13**, the other end **14** of the hose **13** being frictionally fit to the upper end **15** of the pick-up attachment **16**. The pick-up attachment includes an extended cylindrical body **17** to the lower edge **18**, of which there is attached a pick-up nozzle **19**. Optionally but preferably, the nozzle **19** at its lowermost, floor contacting surface, is provided with some form of deformable wiper blade or squeegee to facilitate liquid pick-up.

Referring now to FIGURE 2, there is defined within the container adjoining the bottom **18** thereof, an upwardly extending tube or conduit **20** located generally coaxially of the container **17**, and terminating at an upper end **21**, which is directed toward but spaced from the upper end **15** forming the outlet from the container.

Interposed between the upper end **21** of the tube **20** and the outlet **15** of the container **17**, is a baffle device referred to generally as **25**. The baffle device **25** essentially divides the container **17** into upper and lower chambers by defining between the chambers a circuitous path. The baffle **25** is so designed that a maximum of moisture passing through the tube **20** is condensed and collected by the baffle in such manner as to cause the same to flow or be distributed downwardly, and collected adjacent the lower end **18** of the container. An important feature of the invention lies in the ability of the novel baffle structure to prevent or reduce the tendency of moisture flowing upwardly through the tube **20** to become atomized, and as will be hereinafter understood, the flow stream or pattern created by the baffle tends toward the collection or formation of larger particles or droplets of moisture, which are less likely to pass through to the upper chamber above the baffle. The baffle **25** includes a laterally or transversely extending blocking portion **26**, located directly above and in spaced relation to the upper end **21** of tube **20**. A guide surface **27** forms a continuation of the blocking portion **26**, the guide surface being directed down-

wardly toward the end 18 of the container. The surface 27 is directed toward the wall portion of the container 17 at an angle which becomes progressively more acute as it approaches the wall portion. As a result of the angular conformation of the guide surface 27, a mixture of moisture and air, which is projected through the tube 20, is impinged against the side walls of the container 17 adjacent the lower terminal edge of the guide 27 at an acute angle. It has been discovered that by impinging the moisture and air against the side wall at a shallow angle as aforesaid, a very high percentage of the moisture is condensed and formed into streams which follow the inner side walls and flow to the lower end of the container.

The baffle includes an intake portion 30, the lower terminal edge 31 of which is disposed at a lower level within the container than the guide surface 27. As best seen in FIGURE 4, the intake portion is defined by a pair of concentric arcuate ribs 32, 33 which are joined by connecting ribs 34, 34. The lowermost end portion 31 of the intake member 30, is substantially planar for purposes which will appear hereafter.

The intake portion 30 connects with the upper chamber through laterally directed passage 35. At the end of passage 35 and surrounding substantially the entire peripheral portion of said passage, there is disposed an arcuate piece of sponge material 36. The sponge material, which preferably comprises cellulose or other absorbent spongy structure, is glued or otherwise affixed to the side walls in the upper chamber opposite the exit of the passage 35.

From the foregoing, it will be seen that any particles of moisture, which may by chance pass through the baffle and laterally directed passage 35, will be impinged against the absorbent sponge 36 and will be thus prevented from progressing further toward the upper end 15 of the container 17.

The container 17 is of a two part structure, the lower end 17*a* terminating at an uppermost rim portion 17'. The upper segment of the container 17*b* includes an annular sleeve 40 which fits over the walls adjacent the rim 17' of the lower section 17*a*. A gasket 41 is affixed about downwardly directed shoulder 42 in the upper portion 17*b*. An outer annular shoulder 43 is defined about the outer walls of the upper section 17*b* adjacent the lower ends thereof. Conventional latch mechanisms 45 secured to lower section 17*a* include jaw portions 46, 46 engageable over the annular shoulder 43. It will be understood that the latch mechanisms merely squeeze the upper and lower sections together against the interposed gasket 41 to form a liquid tight seal between the two sections. When released, the latches 45 permit the two sections to be separated for emptying collected liquids from the lower section.

Within the lower section and slidably guided on tube 20, there is disposed an annular float member 50 which is preferably made of a light-weight but rigid foamed material having a non-interconnecting cell structure. A preferred example of such a material is molded foamed styrene plastic. This material has the advantage of lightweight making it extremely buoyant, and at the same time has a relatively low water absorption factor. To the upper end of the float 50 there is glued or otherwise secured, an annular neoprene washer 51. The diameter of the float and washer is such as to provide an access space between the outer edges thereof, and the inner walls of the container to permit the passage of fluids which run down along the walls.

The operation of the device will be evident from the foregoing description. With the source of vacuum connected, the nozzle 19 is moved across the wet floor F. Suction will cause a mixture of moisture and air to flow upwardly through the length of tube 20 against the blocking portion 26, and across the guide surface 27. The mixture of air and moisture is impinged at a shallow angle against the inner wall of container 17 with a majority of the moisture being thus collected and flowing in a stream down past the float 50, and into the lower end of the container. The air substantially freed of moisture, flows upwardly through the intake portion 30, lateral passage 35 and against the sponge 36. In view of the lateral direction of the passage 35 and the positioning of sponge 36, any moisture which may be entrained in the air at this point, is impacted against the sponge 36 with the result that the moisture is absorbed by the sponge. The air continues to flow beyond the passage 35 into the exhaust end 15 of the container, and then to the vacuum cleaner. Optionally, and as a final precaution against moisture, an annular collar of absorbent sponge 60 may be disposed at the upper end of the container surrounding the exit aperture.

As the liquid level in the lower end of the receptacle rises, the float 50 will move progressively closer to the lower terminal edge 31 of the intake 30 of baffle 25.

It is a feature of the invention that by reason of the free sliding movement of float 50 on tube 20, a very rapid sealing action between the gasket 51 and the lower end 31 is achieved. In practice, when the gasket 51 approaches to within about an inch to two inches of the lower end 31 of the intake portion, the suction is sufficient to cause the entire float assembly to be lifted rapidly and snap into sealing relation of the lower end 31. The importance of such rapid sealing action lies in the fact that in normal operation, the upper surface of the gasket 51 will become covered with liquid. If a rapid snap sealing action were not effected, and were the wet upper edge of the gasket 51 to come in close proximity to the intake end 31, it will be evident that parts of the liquid would be sucked off the gasket and would be transmitted to the vacuum forming apparatus. By the snap or sudden action of sealing the gasket 51 against the intake portion 31, the wet upper surface of the float is prevented from coming into close proximity to the intake end for any appreciable time. It will be understood that once the gasket is seated against the intake portion, the vacuum will thereby be shut off and the operator must then turn off the vacuum motor and empty the container by opening the latching members 45 to disconnect the two container halves.

From the foregoing it will be understood that the present invention provides a simple inexpensive and effective attachment for a vacuum cleaner, to permit water to be picked up from a freshly mopped floor or the like. Having thus described the invention and illustrated its use, what I claim as new is:

1. In a vacuum mopping device a wand type pick-up attachment comprising a tubular container of a length several times its diameter, an intake orifice at the bottom of said container for connection to a fluid pick-up head, an exhaust aperture at the top of said container for connection to a vacuum source, a conduit within said container extending from said intake orifice part way toward said top end, said conduit being disposed generally coaxially of said container, a float member of expanded plastic foam disposed about said conduit and slideable with respect thereto, a sealing gasket fixed to the upper end of said float, a baffle member in said container interposed between the upper end of said conduit and said upper end of said container and dividing said container into upper and lower chambers, said baffle member providing a circuitous flow path between said lower and upper chambers, said baffle having an intake portion in said lower chamber the lower terminal end of said intake portion being closer to said bottom of said container than the upper end of said conduit, said lower terminal end being a restricted nozzle defined by a substantially planar surface aligned substantially in parallelism with said gasket of said float, said gasket of said float being shiftable upwardly to sealing position of said lower end of said intake portion.

2. In a vacuum mopping device a wand type pick-up attachment comprising a tubular container of a length several times its diameter, an intake orifice at the bottom of said container for connection to a fluid pick-up head, an exhaust aperture at the top of said container for connection to a vacuum source, a conduit within said container extending from said intake orifice part way toward

said top end of said container, a baffle interposed between the upper end of said conduit and said top of said container to divide said container into upper and lower chambers, said baffle including an uninterrupted blocking portion, a guide portion forming a continuation of said blocking portion, said guide portion curving gradually downward toward said bottom end of said container, the lower portions of said guide portion defining an acute angle with respect to and merging with the inner surfaces of said container, said guide portion and blocking portion together defining a segment overlying the entirety of the upper end of said conduit whereby fluids following said guide will be impinged against said surfaces at an acute angle, and intake tube means leading from said upper chamber into said lower chamber and providing the sole passageway between said chambers, the lower end of said intake tube means being disposed below the upper end of said conduit.

3. In a vacuum mopping device a wand type pick-up attachment comprising a tubular container of a length several times its width, an intake orifice at the bottom end of said container for connection to a pick-up head, an exhaust aperture at the top of said container for connection with a vacuum source, a conduit substantially coaxially located within said container and extending from said intake orifice part way toward said top end, a baffle member dividing said container into upper and lower chambers said member including a transverse blocking portion at a level above and overlying the entire upper end of said conduit, and an unbroken guide surface forming a continuation of said blocking portion directed downwardly toward the bottom of said container and merging with side portions of the walls of said container said guide surface being gradually inclined with respect to said side portions and being of a size to cause substantially all of the fluids passing through said conduit to be impinged at an acute angle against said side portions, a passage between said upper and lower chambers defined in said baffle member at a point diametrically opposed to and spaced from said guide surface, the lowermost portion of said passage being disposed at a level below the upper end of said conduit.

4. In a vacuum mopping device a wand type pick-up attachment comprising a tubular container of a length several times its width, an intake orifice at the bottom end of said container for connection to a moisture pick-up nozzle, an outlet adjacent the top of said container for connection to a vacuum source, a conduit extending upwardly within said container, a baffle member in said container interposed between the upper end of said conduit and said outlet and dividing said container into upper and lower chambers, said baffle providing a circuitous pathway between said chambers, an intake portion in said baffle forming the lower entrance to said pathway in the form of a downwardly directed, constricted nozzle, said intake portion forming a first component of a valve member, a float slideably guided on said conduit and having a second valve component fixed thereto said valve component being disposed in the path of movement of said first valve component as said float moves upwardly along said conduit, said float being formed of light weight material whereby said valve components will snap rapidly into seated engagement when said valve components are disposed at least about an inch apart when said outlet is connected to a vacuum source.

5. A device in accordance with claim 4 wherein an absorbent sponge barrier member is located within said upper chamber in the path of materials traversing said circuitous pathway.

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