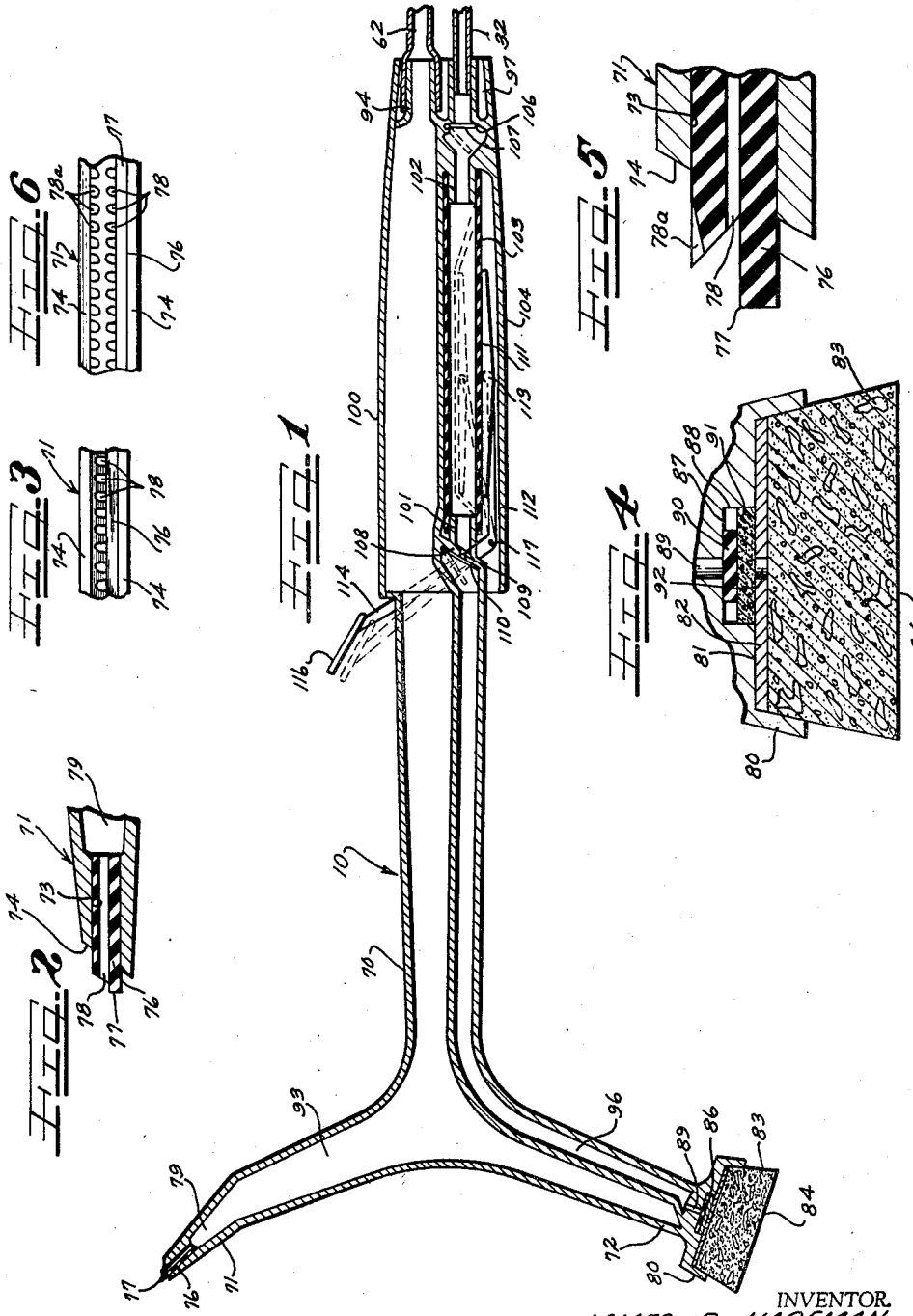
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CLEANING TOOL

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CLEANING TOOL

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This invention relates generally to cleaning apparatus and more particularly relates to a cleaning tool incorporating a duel head and nozzle adapted to be interchangeably connected to either a conventional vacuum cleaner or to its own motor fan unit and further characterized by an integral pump actuatable by the operator to selectively provide a supply of cleaning fluid to the cleaning head.

It is an object of the present invention to provide cleaning apparatus including a liquid flow passage having an elastic wall portion with check valves on both the upstream and downstream end of the elastic wall portion so that upon flexing the wall portion a pumping action will be developed.

Many other features, advantages and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description which follows and the accompanying sheets of drawings in which a preferred structural embodiment of a cleaning apparatus incorporating the principles of the present invention is shown by way of illustrative example.

On the drawings:

FIGURE 1 is a cross-sectional view of the cleaning tool provided in accordance with the principles of the present invention.

FIGURE 2 is an enlarged fragmentary cross-sectional view illustrating additional details of the squeegee head.

FIGURE 3 is a fragmentary elevational view illustrating further details of the squeegee head.

FIGURE 4 is a fragmentary cross-sectional view of the washer head.

FIGURE 5 is an enlarged fragmentary cross-sectional view illustrating additional details of the squeegee head.

FIGURE 6 is a fragmentary elevational view illustrating further details of the squeegee head.

As shown on the drawings:

Referring now to FIGURES 1–6, the dual head cleaning tool is shown generally at **10** and comprises a generally Y-shaped member including a main body portion **70** having oppositely extending legs including one leg forming a squeegee head **71** and a second leg **72** forming a cleaning or washing head.

The squeegee head **71** has a transversely elongated portion formed with a transverse slot **73** opening out of a beveled end face **74**.

A resilient squeegee element **76** is received within the transverse slot **73** and has an action edge **77** which projects outwardly beyond the beveled end face **74** for engagement with the surface being cleaned.

Also received within the transverse slot **73** is a port member constituting a resilient flat insert having one face thereof fluted to form a row of recesses **78**. The fluted recesses **78** together with the squeegee element **77** form passageways extending inwardly from the action edge **77** to the hollow interior **79** of the squeegee head **71**. The port member may constitute a resilient flat insert having one face thereof fluted to form a row of recesses **78** and the other face thereof notched to form a row of inclined recess **78***a* (FIGURE 5). Therefore, when the port member contacts the surface to be cleaned, air and water are allowed to pass through the inclined recesses **78***a* and into recesses **78** to passage **79**.

The cleaning or washing head **72** is characterized by

side walls **80** forming a recess and having a bottom wall **81**. Received within the recess and engaged against the bottom wall **81** is a rigid backing plate **82** against which is bottomed a cellular mass such as a sponge **83**. The sponge **83** extends outwardly of the flanges **80**, thereby to provide an action surface **84** for engaging a surface to be cleaned with a scrubbing action.

Within the wall **81** and behind the rigid backing plate **82** there is formed a valve compartment **86** having a bottom wall **87** and side walls **88**. The bottom wall has formed therein an opening **89** which is normally closed by a rubber or resilient disk valve **90**. To retain the disk valve **90** in yieldable closing relation with the opening **89**, a continuous biasing means **91** is situated between the rigid backing plate **82** and the valve disk **90**. The continuous biasing means **91** could take the form of a spring, however, it may conveniently take the form of a resilient spongy material as illustrated in FIGURE 4.

The rigid backing plate **82** is formed with suitable passage means **92** communicating the valve compartment **86** with the cellular mass **83**. Accordingly, when cleaning liquid is supplied through the opening **89** to the valve compartment **86**, the cleaning liquid will saturate the sponge **83** and will be supplied to the action surface **84** in proper amount to effect a desirable cleansing action.

As shown in FIGURE 1, the dual head **10** has a passage **93** which communicates with the hollow interior of the squeegee head **71** and the passage **93** leads rearwardly through the wand **11**, there being a nipple **94** provided for connection to the conduit **62** so that vacuum bias may be applied to the passages **78** for effecting a vacuum pick-up at the action edge of the squeegee.

The dual head **10** is also formed with a passage **96** which communicates with the opening **89** and which leads rearwardly through the wand **11**, there being formed a nipple **97** connected to the conduit **32** and by means of which cleaning liquid may be supplied to the sponge **83**.

The wand **11** of the present invention is particularly characterized by a pump. In this connection, note that the wand **11** has a rigid housing **100** which forms a portion of the passages **93** and **96**.

With specific regard to the passage **96**, there is provided a pair of end fittings or nipples **101** and **102** which are spaced apart from one another longitudinally and which serve to connect opposite ends of an elastic tube shown at **103**.

The housing **100** provides a rigid backing member **104** adajacent one side of the elastic tube **103**.

The nipple **102** is formed with a valve seat **106** closed by a check valve **107** which may conveniently take the form of a flap valve which moves between the full line position and a dotted line position as shown in FIGURE 6.

Likewise, the nipple **101** is provided with a wall **108** in which is formed a valve opening **109** regulated by a check valve **110**. The valve **110** can also conveniently comprise a flap valve which moves between the full and dotted line positions shown in FIGURE 6.

A movable piston member **111** is engaged against the elastic tube **103** at the side opposite the rigid backing member **104** and means are provided to urge the movable piston member **111** inwardly, thereby to flex the elastic tube **103** and temporarily alter the volume of that portion of the passage **96** between the check valves **107** and **110**, thereby to develop a pumping action.

To effect that end, there is provided a lever member having a first arm **112** pivotally connected as at **113** to the movable piston member **111**. The lever member has a second arm **114** on the end of which is formed a manual actuating handle **116**.

A fulcrum effects a pivotal connection as at **117** between the lever arm and the rigid housing **100**. Thus, upon rocking the lever arm through engagement of the

actuating handle 116, the movable piston 111 is moved inwardly or outwardly to flex the elastic tube 103, thereby pumping cleaning fluid from the compartment 20 through the conduit 32 and the passage 96 to the washing head 72.

In use, the dual head 10 together with the wand 11 and the casing unit 12 are interconnected by the conduit means 32 and 62. The user can operate the actuating handle 116 of the pump contained within the housing 100 of the wand 11, whereupon cleaning liquid from a source will be directed to the passage 96 to the sponge 83, whereupon the action surface 84 engages the surface to be cleaned in the presence of the cleaning agent.

The operator then turns the dual head 10 through 180° and engages the action edge 77 of the squeegee element 76 against the surface, whereupon liquid and soil is removed and drawn by vacuum bias through the passages 78 into the hollow core 79 for transmission via the passage 93 and the conduit 62 to the tube 60.

Although minor modifications might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon all such modifications as reasonably and properly come within the scope of my contribution to the art.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A cleaning tool comprising,

an elongated main body portion having a pumping chamber formed therein including check valves and an elastic wall portion,

means to flex said elastic wall portion to develop a pumping action,

said main body portion having a passage for receiving the fluid discharged by said pumping action and forming a reservoir for fluid in said tool,

said body portion having a washer head at the end of said passage,

said washer head having a recess formed therein,

a plate member having a centrally disposed passage formed therein and extending across the bottom of said recess,

means forming a valve compartment between said body portion passage and said centrally disposed passage in said plate member,

a resilient disc valve positioned in said compartment and extending across said body portion passage,

a continuous biasing means between said disc valve and one side of said plate member tending to normally close said disc valve against said body portion passage,

and a sponge in said recess bottomed against the other side of said plate member,

said continuous biasing means being compressible against one side of said plate member and said sponge being compressible against the other side of said plate member,

whereby said disc valve will meter flow of fluid delivered to said passage by said pumping action to said sponge.

2. A cleaning tool as defined in claim 1, wherein said continuous biasing means comprises a resilient spongy material.

3. A cleaning tool as defined in claim 1, and further characterized by a rigid housing circumjacent said elastic wall portion including a backing portion opposite said elastic wall portion, a nipple connected at each end of said pumping chamber, said means to flex said wall portion to develop a pumping action comprising a movable piston member engaging against said elastic wall portion opposite said backing portion along a substantial portion of its length, said check valves being located in each of said nipples to insure one way flow through said pumping chamber, and a lever arm having one end connected to said piston member and having an actuating handle at its opposite end, and a fulcrum pivotally connecting an intermediate portion of said lever arm to said rigid housing, whereby pivotally rocking said lever arm will compress said elastic wall portion to temporarily change the volume of said pumping chamber between said check valves to develop the pumping action.

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