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Anthony et al.

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[54] PORTABLE VACUUM CARPET AND UPHOLSTERY CLEANING APPARATUS

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[52] **U.S. Cl.** **15/321**, 15/345

[51] **Int. Cl.** **A47l 7/00**

[58] **Field of Search** 15/302, 320, 321, 322, 345, 15/346

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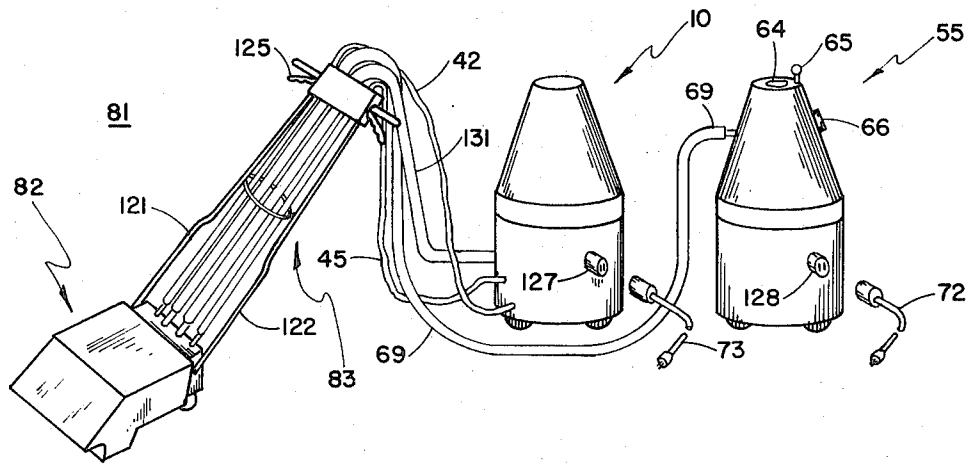
[57] **ABSTRACT**

Apparatus for cleaning carpets, upholstery and the like comprising a separate reservoir system for supplying under pressure to a remote cleaning head a heated cleaning solution and a separate vacuum pick-up system for picking up via the cleaning head and storing cleaning solution applied to a carpet or the like. The reservoir system includes means to continuously heat the cleaning solution in the reservoir and a fluid pump and an air pump driven by an electric motor. The vacuum system includes a vacuum pump which is driven by a second electric motor on an electrical circuit separate and distinct from that of the motor in the reservoir system. Both motors are of a size and design that they may be separately started up and operated at full load on separate residential electrical circuits without blowing the fuses for these circuits. The vacuum system may also include means for directing the heated air exhausted from the vacuum pump onto the material being cleaned to facilitate drying.

6 Claims, 5 Drawing Figures



Patented May 23, 1972 3,663,984

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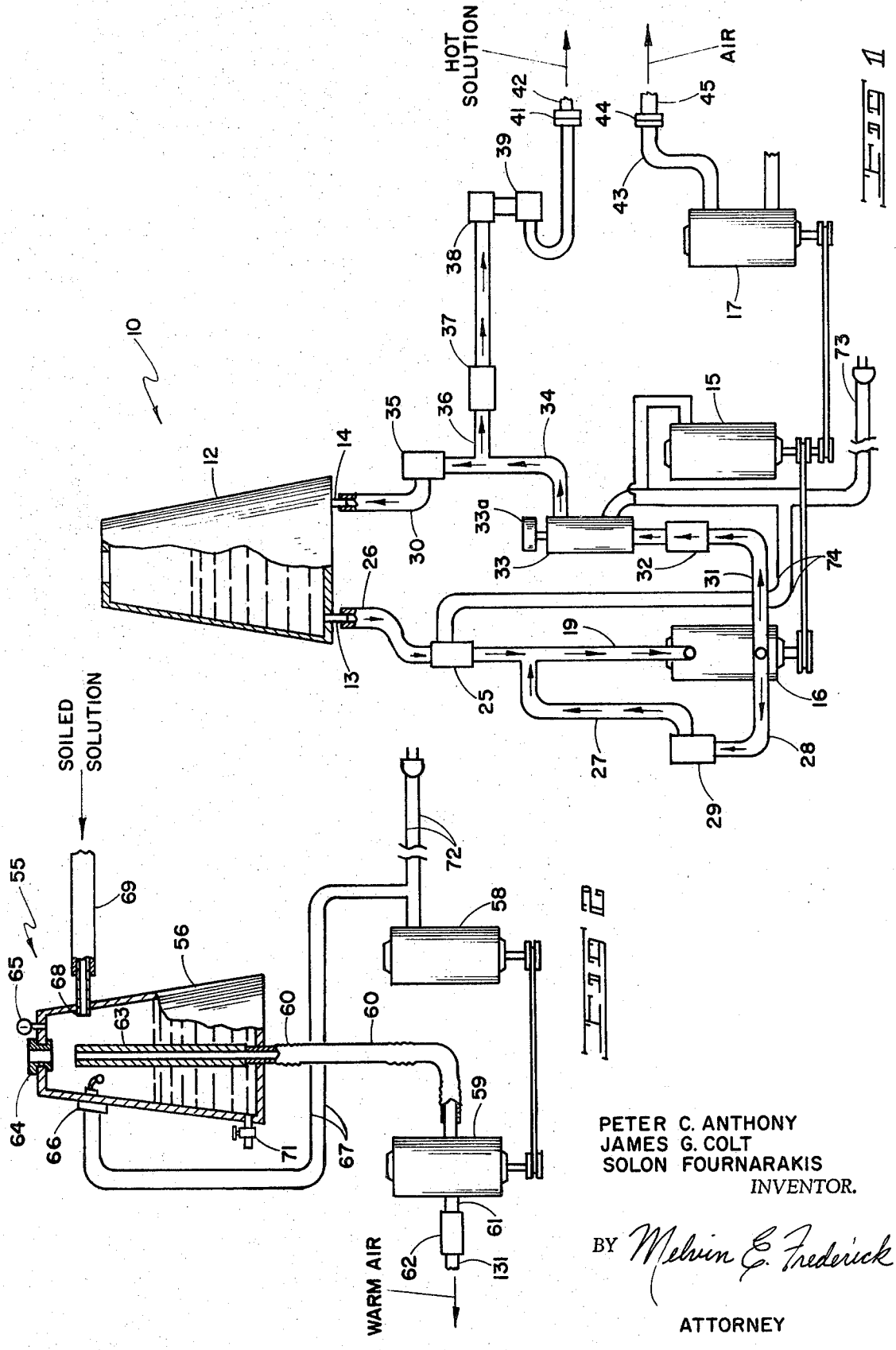

FIG. 1

FIG. 2

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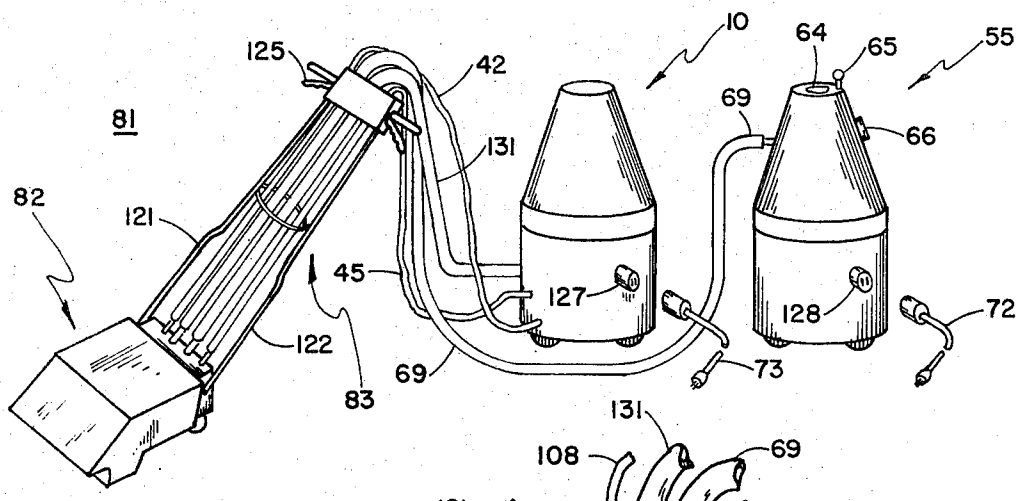

FIG 5

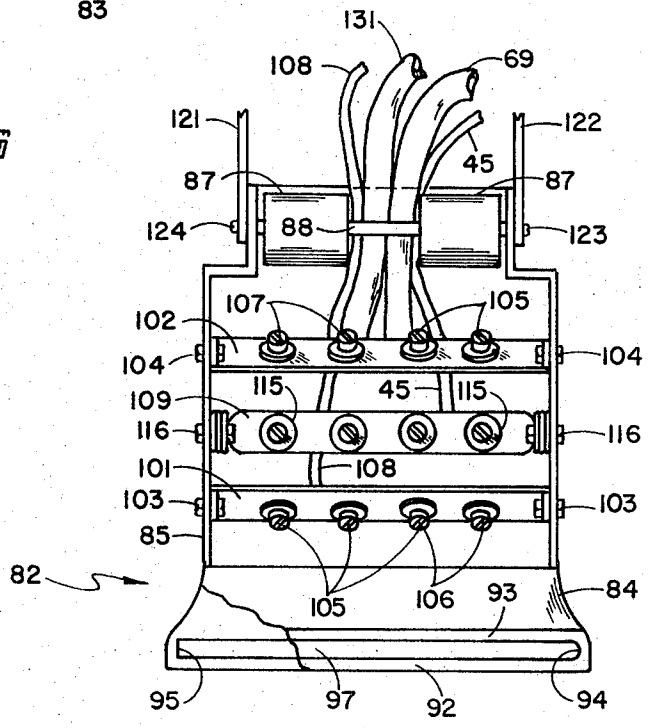

FIG 3

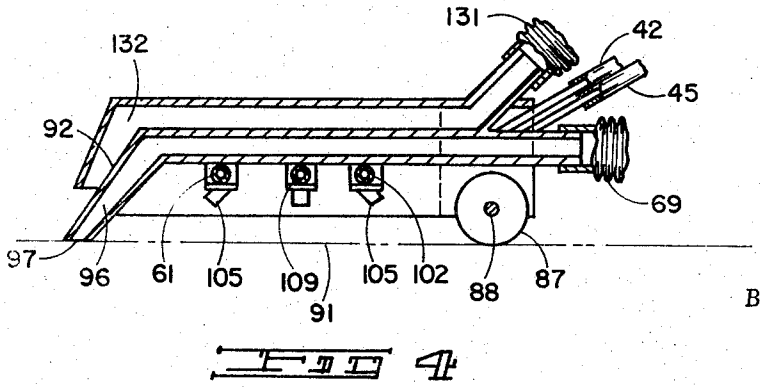

FIG 4

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PORTABLE VACUUM CARPET AND UPHOLSTERY CLEANING APPARATUS

The present invention relates to carpet and upholstery cleaning apparatus, and more particularly to such apparatus for supplying a heated cleaning solution to a cleaning head for application to a carpet or the like and providing vacuum pick-up means to withdraw from the carpet the cleaning fluid and entrained dirt.

In the cleaning of carpet and upholstery, it has been found effective to discharge a jet of pressurized cleaning solution into the pile, nap, or weave of the fabric to be cleaned, and to thereafter apply suction to the fabric to withdraw the used cleaning solution from the fabric together with the dirt loosened and intrained in the cleaning solution.

Cleaning apparatus of the type referred to above may comprise, for example, a liquid tank and vacuum tank mounted on a base structure housing a drive motor and its associated components. The motor drives a suction blower, the intake side of which is coupled to the interior of the vacuum tank while the discharge side of the vacuum blower discharges to the atmosphere either directly or through a muffler. A liquid pump also driven by the aforementioned motor is connected to draw liquid from the liquid tank and feed the liquid under pressure to heating means which is then discharged through a hose and control valve to a spray or cleaning head attached to discharge the heated liquid onto the material being cleaned.

Other cleaning devices particularly devoted to commercial cleaning fields have been provided which include fluid distribution means and a vacuum means for picking up fluid and loosened material from surfaces after the surface has been scrubbed by brushes or the like. Still other devices have been provided which include means for high pressure fluid distribution and vacuum pick-up means for receiving the fluid delivered to the surface to be cleaned. The picked-up fluid may or may not be returned for recirculation. These devices operate on the principle that the high pressure fluid delivery serves as the cleaning and scrubbing element thereby eliminating the use of brushes or other scrubbing devices.

It is therefor an object of the invention to provide improved and simplified two-tank cleaning apparatus.

Another object of the invention is to provide improved and simplified two-tank cleaning apparatus designed to deliver a heated cleaning solution under pressure to a surface to be cleaned and to recover the solution through the use of a vacuum system.

A further object of the invention is the provision of improved and simplified two-tank cleaning apparatus comprising a portable reservoir tank system separate from a portable vacuum pick-up system.

A still further object of the invention is the provision of cleaning apparatus comprising a reservoir system driven by an electric motor and a separate vacuum pick-up system driven by a second electric motor wherein the electric motors are connected to and operate from separately fused conventional electric circuits.

A still further object of the invention is the provision of improved and simplified two-tank cleaning apparatus comprising a portable reservoir tank system separate from a portable vacuum pick-up system wherein cleaning solution in the reservoir system may be continuously circulated through heater means when not directed to a material or surface being cleaned.

Another object of the invention is to provide an improved and simplified mechanism for supplying a cleaning solution under pressure to one hose line for connection to one chamber of a two-chamber carpet and upholstery cleaning nozzle, suction means for connection to a vacuum hose line to be connected to the other chamber of the cleaning nozzle, and means to discharge jets of high pressure air adjacent the point at which the cleaning solution is discharged from the cleaning nozzle to facilitate loosening of dirt and the like from surface of the material being cleaned and produce suspension of the dirt in the cleaning solution discharged from the cleaning nozzle.

The novel features that are considered characteristic of the invention are set forth in the appended claims; the invention itself, however, both as to its organization and method of operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment, when read in conjunction with the accompanying drawings, in which:

FIG. 1 is a diagrammatic view of the reservoir system;

FIG. 2 is a diagrammatic view of the vacuum pick-up system;

FIG. 3 is a bottom view of the floor tool assembly;

FIG. 4 is a side view partly in section of the floor tool assembly including hot air discharge apparatus; and

FIG. 5 is a perspective view of the cleaning head together with the reservoir and vacuum pick-up systems.

Directing attention now to the drawings, in FIG. 1 is shown the reservoir system designated generally by the numeral **10**. The reservoir system is supported by an acoustically insulated base housing **11** (see FIG. 5), the reservoir or solution tank **12** being removably attached as by hooks or the like (not shown) to the upper surface of the housing **11** and the balance of the reservoir system more fully described hereinafter being contained in conventional manner within the base housing **11**.

At the base of the reservoir tank are provided two connections **13** and **14** preferably of the conventional "quick disconnect" type so that the reservoir tank can be simply, quickly, and without loss of fluid, removed from the base housing while still containing a liquid or cleaning solution. Disposed within and supported by the base housing is an electric drive motor **15** of such power rating and speed more fully described hereinafter coupled, for example, in conventional driving relationship via pulleys to a solution or liquid pump **16** and an air pump **17**. While the electric drive motor must meet certain power requirements set forth below, the specific type of liquid pump or air pump employed is not material to the invention, and since several well-known types are suitable for the purpose, the details thereof are not illustrated or described herein. As and for the purposes more fully set forth hereinafter, the drive motor **15** must be of a type and capacity that with the current drawn by the heater means, is incapable of drawing sufficient current under substantially full load during start up and operation to blow a fuse in conventional residential and industrial circuits, all of which must be fused at 15 amperes in accordance with the National Electrical Code.

The inlet or low-pressure side of the liquid pump **16** is connected by a conventional pipe or liquid supply line **19**, a pressure sensitive switch **25**, and a flexible hose **26** to the quick disconnect connection **13**.

The inlet and outlet sides of the liquid pump are coupled through conventional by-pass means including pipes **27** and **28** and a pressure regulator **29** for maintaining a predetermined pressure at the outlet of the liquid pump. The liquid pump may be of a conventional type as noted above and typically should be capable of providing an outlet pressure of about 100 psi at flow rates of about 2 gallons per minute. The pressure regulator **29** which also is of the conventional type preferably is adjustable to permit adjustment of the output pressure of the solution pump. The outlet of the liquid pump **16** communicates through pipe **31** and a one-way check valve **32** with the lower end of a conventional electric type heater means **33** for increasing or raising the temperature of the cleaning fluid to a suitable temperature to provide at its outlet fluid at a temperature of, for example, about 160° F. A suitable heater may be, for example, a "Chromalox," Model No. B, manufactured by the Edwin L. Wiegand Company which includes adjustable thermostat means **33*a*** to limit the maximum temperature of the liquid heated by the heater.

The outlet side of the heater **33** communicates through one port of a T-connection via pipe **34**, flexible hose **30**, a pressure regulator **35**, and connection **14** with the interior of the reservoir tank **12**. Through the other port of the T-connection, the outlet of the heater also communicates via pipe **36**, filter **37**, adjustable flow pressure valve **38**, pressure gauge **39** and a

quick disconnect connection 41 with an insulated and flexible high temperature fluid hose 42, the remote end of which hose communicates with the cleaning head more fully described hereinafter. As will now be apparent, heated fluid may flow from the heater 33 in one of two directions, the first of which is through pressure regulator 35 and back into the reservoir tank and the second of which is via pipe 36 and flexible hose 42 to the cleaning head. Pressure regulator 35 is adjusted to open and permit heated fluid to pass there through when the pressure in line 34 is slightly less than the pressure at which regulator 29 in the liquid pump by-pass circuit is set.

It is an important feature of the invention that when the control valve in the cleaning head is in its normally closed position, thereby preventing the discharge of cleaning fluid (or flexible hose 42 is disconnected thereby closing line 36 at connection 41), cleaning fluid in the reservoir tank will be continuously supplied to the heater 33, heated, and then circulated back into the reservoir tank 12. The adjustable flow pressure valve 38, pressure gauge 39, and one-half of connection 41 are mounted in the base housing 11. The quick disconnect connection 41 is, of course, poled such that the high temperature fluid line 36 is closed when the flexible hose 42 to the cleaning head is disconnected.

When the high temperature fluid line 36 is coupled to the cleaning head via hose 42 and the control valve at the cleaning head is opened, the heated fluid which previously was flowing back into the reservoir tank via pressure regulator 35 now flows through the high temperature flexible hose 42 and is discharged at the cleaning head because the pressure on the heater outlet side of pressure regulator 35 drops below the critical pressure at which it is set and, accordingly, pressure regulator 35 closes. Upon closure of regulator 35, the heated fluid is directed to the cleaning head. When the control valve on the cleaning head is closed or hose 42 is disconnected, the pressure on the heater side of pressure regulator 35 increases to substantially that of regulator 29, thereby causing pressure regulator 35 to exceed its critical pressure and, hence, open and permit heated cleaning fluid to again be circulated back to the reservoir tank. As will now be obvious in accordance with the invention, there is a continuous flow of fluid from the reservoir tank to the heater and thence back to the reservoir tank except when fluid is permitted to be discharged at the cleaning head. This permits the solution in the tank to be continuously increased toward and/or maintained at the maximum desired operating temperature thereby allowing maximum cleaning capability to be effected by the cleaning solution.

Air pump 17 is driven via a pulley by the electric motor 15. The air pump which may be a conventional air compressor pump preferrably provides about 10 pounds per square inch pressure at its outlet at a flow rate of about 3 cubic feet a minute. The outlet or high pressure side of the air pump communicates through pipe 43 and quick disconnect type connection 44 with a flexible air hose 45, the remote end of which is coupled to the cleaning head as and for the purposes more fully described hereinafter.

Directing attention now to FIG. 2 there is shown the vacuum tank pick-up system generally designated by the number 55 comprising a vacuum tank 56 removably supported as by hooks (not shown) on a second base housing 57 separate from housing 11, a second drive motor 58, and a suction blower 59. The drive motor 58 is drivingly connected as by a pulley-belt system to the suction blower 59. The suction blower may be of the positive displacement type. The specific type of suction blower employed is not material to the invention, and since several well-known types are suitable for the purpose, the details thereof are not illustrated or described herein. The outlet or high pressure side of the suction blower 59 communicates through a pipe 61 with one end of a silencer 62 which may be a small conventional muffler of the type used to muffle the exhaust noise of internal combustion engines and the like. The silencer 62 is preferably supported within the base housing as by support brackets or the like.

A suction type flexible hose 60 is connected to the inlet or low pressure side of the suction blower 59 and extends upwardly through a hole in the base housing 57. The upper end of the flexible hose 60 is removably fitted onto the lower end of a suction tube 63 incorporated axially in the vacuum tank 56. The flexible hose 60 preferrably is of the annularly corrugated, axially resiliently extensible type to permit it to be easily connected and disconnected from the axial tube 63 of the vacuum tank 56.

The base housings 11 and 57 may be of sheet metal, cylindrical, mounted on casters, and of a size to receive the components as described hereinbefore.

The vacuum tank is of the same size and generally of the same structure as the reservoir tank. Each may comprise a conventional domed bottom, sealed into the lower end of a conical wall having a radially inwardly extending shoulder. While the upper end of the reservoir tank is open, that of the vacuum tank is closed, and has a suction relief valve 64 mounted thereon. The suction relief valve 64 is so adjusted that when the pressure within the vacuum tank drops below a pre-set minimum of the relief valve, the latter will open to permit atmospheric air to bleed in and thus limit the vacuum in the tank to the desired level. A conventional vacuum gauge 65 is mounted on the vacuum tank to indicate the degree of vacuum therein. Also mounted on the vacuum tank is a soiled water level control switch 66. Switch 66 is connected in series via conductor 67 with the drive motor 58 to shut the motor off when the liquid level in the vacuum tank approaches the top thereof. Also provided adjacent the top of the vacuum tank is a suction inlet 68 for communicating the vacuum hose 69 with the interior of the vacuum tank. The remote end of the vacuum hose 69 is coupled to the cleaning head as and for the purposes more fully described hereinafter. A drain valve 71 is also provided at a low point in the vacuum tank for draining soiled cleaning solution therefrom. An extension cord 72 is provided for connection to a suitable source of electric power for operating the motor 58. Similarly, an extension cord 73 is provided for connecting drive motor 15 of the reservoir system to a suitable but separately fused source of electric current. Pressure switch 25 is connected in series with electric motor 15 via conductors 74. Pressure switch 25 in the reservoir system is effective to shut off motor 15 when the pressure, and, hence, the fluid level in reservoir tank 12 reaches a suitable predetermined low value.

Referring now to FIGS. 3, 4, and 5, a cleaning head in accordance with the invention indicated generally by the numeral 81 includes a floor tool head assembly 82 and a handle assembly 83. Referring particularly now to FIGS. 3 and 4, the floor tool head assembly includes a pick-up nozzle unit 84 to the opposite ends of which are secured outwardly extending members or brackets 85 and 86. A split roller 87 is rotatable on a shaft 88 which may include adjustable securing means (not shown) at the outer ends of brackets 85 and 86. The adjustment means are preferably constructed and arranged in conventional manner so that when the split roller 87 is in contact with the surface of the carpet or the like being cleaned, the nozzle unit 84 assumes the position indicated in FIG. 4, i.e., the open end of the nozzle unit is parallel and in contact with the surface 91 being cleaned.

The nozzle unit 84 is generally hollow having converging front and rear walls 92 and 93 and side walls 94 and 95 defining a suction chamber 96 having an elongated narrow suction opening 97. In the working position shown in FIG. 4, the nozzle opening 97 of the nozzle unit is maintained in contact with an upper surface 91 of, for example, a carpet being cleaned. Cleaning fluid dispensing means including first and second tubes or manifolds 101 and 102 spaced one from another are adjustably secured by means 103 and 104 at about the inner and outer ends of the brackets 85 and 86. The tubes 101 and 102 each have a plurality of adjustable jet outlet nozzles 105, each having openings 106. The jet outlet nozzles of each tube are preferably uniformly spaced from one another on a common axis. The slots 107 of the nozzles are however, canted

slightly such that the edges of the fan-shaped spray from the nozzles overlap but do not interfere one with another. This is effective in preventing what is commonly referred to as streak lines in a carpet.

Each of the jet outlet nozzles **105** may be of conventional configuration whereby various arrangements of spray distribution may be provided. The tubes **101** and **102** are each rotatably adjusted about their longitudinal axis to permit adjustment of the direction in which fluid is discharged from each tube onto the surface being cleaned. The nozzles of tube **101** closest the pick-up nozzle unit **84** is preferably oriented to direct the spray discharge to impinge the surface being cleaned in the direction of the pick-up nozzle unit at an acute angle, suitably 20° to 40°. The second tube **102** is similarly oriented but at an acute angle away from the pick-up nozzle of, suitably 20° to 40°. The provision of a spray discharge directed both in a forwardly and rearwardly direction in accordance with the invention results in both of the sides of the fibers comprising the nap of the carpet, for example, receiving the spray discharge. As a result a more effective cleaning operation is provided. Further, the spray discharge from each tube tends to further loosen, dislodge and especially lift to the top of the nap the imbedded dirt loosened and dislodged by the other tube. Still further, the two solution manifolds provide in a single pass multiple agitation of the carpet fiber without necessitating a second pass and superfluous undesirable wetting of the carpet fiber.

The tubes **101** and **102** each have an inlet port to accept a hose **108** connecting the said tubes to the high temperature cleaning fluid hose **42**.

Disposed between the tubes **101** and **102** of the cleaning fluid dispensing means is a third tube **109** having a plurality of jet outlet nozzles **115** arranged and adapted substantially as described in connection with the fluid cleaning dispensing means tubes **101** and **102**. Tube **109** is adjustably secured by suspension means **116** at the middle portions of brackets **85** and **86**. Suspension means **116** are preferably arranged and adapted to permit, within limits, substantially free rotational movement of tube **109** substantially about its longitudinal axis whereby its jet outlet nozzles may substantially freely move or oscillate forwardly and rearwardly of a plane normal to the surface being cleaned.

Tube **109** has an inlet port to accept hose **45** connecting the said inlet port to the air pump **17**. The provision of tube **109** intermediate tubes **101** and **102** is particularly advantageous in facilitating cleaning of a carpet or the like. In addition to the action provided by jet outlet nozzles of tubes **101** and **102**, the jets of air from jet outlet nozzles **115** of tube or air manifold **109** creates both turbulance and vibration of the nap which further loosens, dislodges, and lifts to the top of the nap imbedded dirt and soil. The air to tube or air manifold **109** is preferably supplied from pump **17** at a pressure sufficient to produce substantial agitation. The exact pressure and velocity will, of course, depend on the size of tube **109** and the size and number of the jet outlet nozzles **115**.

FIG. **5** is a perspective view showing the floor tool head assembly **82** and a handle assembly **83**, the floor tool assembly and handle assembly being shown in working position operatively connected to the reservoir tank system **10** and the vacuum tank pick-up system **55**. The handle assembly **83** has spaced side members **121** and **122** rotatably mounted as seen at **123** and **124** (see FIG. **3**), at the outermost ends of the brackets **85** and **86**. Known means can be provided selectively to lock the handle at one of several alternate positions. The vacuum hose **69** is shown extending from the handle assembly **83** to the vacuum pick-up system **55**. The fluid supply hose **42** extends from the reservoir tank system **10**, a normally closed fluid control valve **125** being provided to control the flow of fluid. Further shown is the air pressure hose **45** extending from the reservoir tank system **10** to tube **109**. The control valve **125** is placed in a position so as to be in convenient reach of a hand of an operator.

The operation of the illustrative form of the invention is as follows:

With the reservoir tank and vacuum tank pick-up systems assembled and the cleaning head operatively connected, the extension cords **72** and **73** are connected to suitable but separate sources of electric current each separately fused for 15 amperes. A supply of cleaning solution such as, for example, water with suitable cleaning and/or solvent material in solution therein, is poured into the open top of the reservoir tank **12**, the amount and type of solution used being determined by the nature of the cleaning job to be performed. With the drain valve **71** of the vacuum tank **56** closed, and the suction relief valve **64** and the pressure regulator valves **29** and **35** set to the desired settings, the necessary switches **127** and **128** are closed to energize the separate drive motors **15** and **58** and the heating element of the heating means **33**. With the reservoir system drive motor **15** and the heater **33** operating, the liquid in the reservoir tank is continuously being heated and the suction blower **59** immediately reduces the pressure within the vacuum pick-up tank **56** which causes a partial vacuum in the suction hose **69**. Control valve **125** being open, the size of the suction nozzle **97** is such as to limit the flow of atmospheric air there through below the capacity of the suction blower **59**, so that were it not for the vacuum relief valve **64**, the vacuum in the hose **69** would be greater than desirable. Accordingly, a suitable setting of the vacuum relief valve **64** is such as to maintain the vacuum in the tank **56** at a suitable level below ambient atmospheric pressure. With the system thus operating and after a few moments have been allowed to permit the heating of the liquid in the heater **33**, the control valve **125** at the cleaning head may be opened to permit the discharge of cleaning fluid via nozzles **105** on to the surface to be cleaned.

The suction nozzle **97** is drawn in successive strokes across the material to be cleaned in the direction of the tubular nozzle handles **121** and **122**, while at the same time operating the control valve **125** as required to direct two fan-shaped streams of heated cleaning fluid from the jet outlet nozzles in the cleaning fluid dispensing means on the material being cleaned. Simultaneously with the discharge of cleaning fluid, high-pressure fan-shaped jets of air from the jet outlet nozzles **115** of the air dispensing means is also discharged on to the material being cleaned in a region between the jets of cleaning fluid. The dirt from the material being cleaned, loosened and dislodged both by the action of the jets of cleaning fluid and the jets of air together with the cleaning solution used, and atmospheric air drawn through such material, are all sucked into the cleaning fluid pick-up chamber **96** of the nozzle and passes thence through the vacuum hose **69** and discharged in the vacuum tank **56** through the suction inlet tube **68**.

The soiled cleaning fluid is discharged through the vacuum inlet tube **68** into the vacuum tank **56** in conventional manner to prevent the flow of said cleaning fluid thereof through the suction blower. At desired intervals, the collected cleaning fluid may be withdrawn from the vacuum tank **56** by opening the drain valve **71**.

In accordance with a further feature of the invention, the air exhausted from the silencer **62** may be utilized to facilitate drying of the material being cleaned. Typically, air is exhausted from the noise silencer or muffler **62** at a high flow rate and elevated temperature. This heated temperature air is utilized in accordance with the invention to facilitate drying of a carpet or the like by directing it via a hose **131** coupling the outlet end of the muffler **62** to an air discharge chamber **132** carried by the floor tool head assembly in such a manner that the air is discharged in close proximity to the surface of the material being cleaned.

The invention provides a simple and highly effective apparatus for supplying high pressure, high temperature cleaning fluid and vacuum to a single cleaning head for use in cleaning carpets, upholstery, and other materials. Apparatus in accordance with the invention is compact, simple and relatively inexpensive to manufacture and very effective and inexpensive to operate. It requires two separately fused sources of electric current for its operation; it permits continuous heating of the cleaning solution; it utilizes jets of air to increase the

cleaning action of the cleaning solution; it reduces the necessity of the handling of cleaning solution; and reduces the noise level inherent with the use of the system in addition to permitting use of conventionally fused electric housing circuits without blowing the fuses by the provision of a portable reservoir tank system separate from a portable vacuum pick-up system. It further utilizes the hot air exhaust to facilitate drying.

While a preferred embodiment of the invention has been illustrated and described, it will be understood, however, that various changes and modifications may be made in the details thereof without departing from the scope of the invention as set forth in the appended claims.

Having thus described the invention, what is claimed as new and desired to protect as Letters Patent is:

1. In a two-tank cleaning apparatus for cleaning carpets and the like in situ comprising a cleaning solution reservoir tank system, a vacuum tank pick-up system, and a remote cleaning head; said reservoir tank system comprising a reservoir tank, electric heater means having an inlet and an outlet, a liquid pump having an inlet for receiving liquid from said reservoir tank and an outlet for supplying it under pressure to the inlet of said heater means, a first electric drive motor for actuating said liquid pump, and first flexible hose means for receiving heated liquid from the outlet of said heater means and supplying it under pressure to said cleaning head; said vacuum tank pick-up system including a vacuum tank, second flexible hose means coupling the interior of said vacuum tank to the interior of a cleaning fluid pick-up chamber in said cleaning head, said chamber having an open end adapted to be maintained in contact with a surface to be cleaned, an air suction-blower having an outlet and an inlet, said inlet being coupled to said vacuum tank for evacuating air from said vacuum tank, and a second electric drive motor for actuating said suction-blower, the improvement comprising:

a. an air pump driven by said first motor, said air pump having an air inlet and outlet;

b. air hose means adapted to be coupled to said air pump outlet and said cleaning head for directing air under pressure from said air pump to said cleaning head;

c. cleaning fluid dispensing means carried by said cleaning head including a plurality of outlet nozzles adapted to receive heated cleaning fluid from said second hose means and discharge said heated fluid to impinge on said surface to be cleaned; and

d. air manifold means including a plurality of outlet nozzles carried by said cleaning head adapted to receive air from said air hose means and discharge said air to impinge on said surface to be cleaned at a region adjacent that of said cleaning fluid and cause turbulence of said cleaning fluid discharged on said surface and consequent mixing of said fluid with foreign matter on said surface.

2. In a two-tank cleaning apparatus for cleaning carpets and the like is in situ comprising a cleaning solution reservoir tank system, a vacuum tank pick-up system, and a remote cleaning head; said reservoir tank system comprising a reservoir tank, electric heater means having an inlet and an outlet, a liquid pump having an inlet for receiving liquid from said reservoir tank and an outlet for supplying it under pressure to the inlet of said heater means, a first electric drive motor for actuating said liquid pump, and first flexible hose means for receiving heated liquid from the outlet of said heater means and supplying it under pressure to cleaning fluid dispensing means including a manifold in said cleaning head; said vacuum tank pick-up system including a vacuum tank, second flexible hose means coupling the interior of said vacuum tank to the interior of a fluid pick-up chamber in said cleaning head, said chamber having an open end adapted to be maintained in contact with a surface to be cleaned, an air suction-blower having an outlet and an inlet, said inlet being coupled to said vacuum tank for evacuating air from said vacuum tank, and a second electric drive motor for actuating said suction-blower, the improvement comprising:

a. first by-pass means including first pressure regulator means coupled to the inlet and outlet of said liquid pump for maintaining a predetermined pressure at the outlet of said pump;

b. a first liquid supply line coupling said reservoir tank to said pump inlet for supplying liquid to said pump;

c. a second liquid supply line coupling the outlet of said pump to the inlet of said heater means for supplying liquid to said heater means;

d. a third liquid supply line coupling the outlet of said heater means to said reservoir tank;

e. a fourth liquid supply line having one end coupled to the outlet of said heater means for supplying heated fluid to said dispensing manifold; and

f. second pressure regulator means for permitting liquid to flow from said heater and back to said reservoir tank through said third liquid supply line when flow through said fourth line is prevented.

3. The combination as defined in claim 2 and additionally including;

a. a first base housing, said cleaning tank reservoir system being disposed on said first base housing; and

b. a second base housing separate from said first housing, said vacuum tank pick-up system being disposed on said second base housing.

4. The combination as defined in claim 3 wherein said first and second drive motors are incapable of drawing sufficient current under substantially full load during start up and operation to blow a fuse in a conventional 15 ampere house circuit;

a. first extension cord means for coupling said first motor to a source of electrical power; and

b. second extension cord means separate from said first means for coupling said second motor to a source of electrical power.

5. In a two tank cleaning apparatus for cleaning carpets and the like in situ comprising a cleaning solution reservoir tank system, a vacuum tank pick-up system, and a remote cleaning head; said reservoir tank system comprising a reservoir tank, electric heater means having an inlet and an outlet, a liquid pump having an inlet for receiving liquid from said reservoir tank and an outlet for supplying it under pressure to the inlet of said heater means, a first electric drive motor for actuating said liquid pump, and first flexible hose means for receiving heated liquid from the outlet of said heater means and supplying it under pressure to cleaning fluid dispensing means including a manifold in said cleaning head; said vacuum tank pick-up system including a vacuum tank, second flexible hose means coupling the interior of said vacuum tank to the interior of fluid pick-up chamber in said cleaning head, said chamber having an open end adapted to be maintained in contact with a surface to be cleaned, an air suction-blower having an outlet and an inlet, said inlet being coupled to said vacuum tank for evacuating air from said vacuum tank, and a second electric drive motor for actuating said suction-blower, the improvement comprising:

a. first by-pass means including first pressure regulator means coupled to the inlet and outlet of said liquid pump for maintaining a predetermined pressure at the outlet of said pump;

b. a first liquid supply line coupling said reservoir tank to said pump inlet for supplying liquid to said pump;

c. a second liquid supply line coupling the outlet of said pump to the inlet of said heater means for supplying liquid to said heater means;

d. a third liquid supply line coupling the outlet of said heater means to said reservoir tank;

e. a second pressure regulator means disposed in said third liquid supply line for permitting liquid to flow from said heater and back to said reservoir tank when the pressure at said heater outlet is not substantially less than the pressure at said pump outlet;

f. a fourth liquid supply line having one end coupled to the outlet of said heater means; and

g. valve means for selectably opening and closing the other end of said fourth supply line.

6. The combination as defined in claim 5 and additionally including:

a. an air pump driven by said first motor, said air pump having an air inlet and outlet;

b. air hose means adapted to be coupled to said air pump outlet and said cleaning head for directing air under pressure from said air pump to said cleaning head;

c. cleaning fluid dispensing means carried by said cleaning head including a plurality of outlet nozzles adapted to receive heated cleaning fluid from said second hose means and discharging said heated fluid to impinge on said surface to be cleaned; and

d. air manifold means including a plurality of outlet nozzles carried by said cleaning head adapted to receive air from said air hose means and discharge said air to impinge on said surface to be cleaned at a region adjacent that of said cleaning fluid and cause turbulence of said cleaning fluid discharged on said surface and consequent mixing of said fluid with foreign matter on said surface.

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