



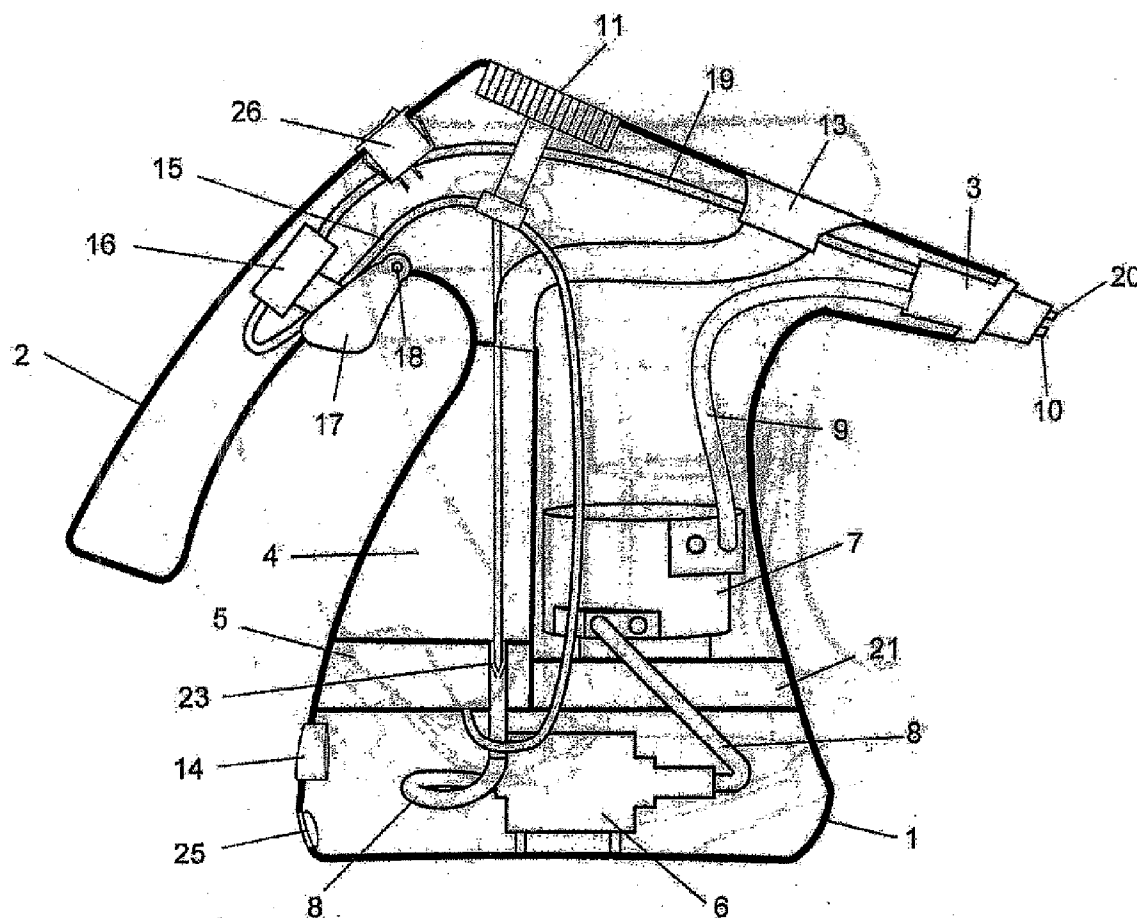
US 20080022480A1

(19) **United States**(12) **Patent Application Publication**
Lee(10) **Pub. No.: US 2008/0022480 A1**(43) **Pub. Date: Jan. 31, 2008**(54) **HANDHELD STEAM CLEANER****Publication Classification**(75) **Inventor: Kwok Kay Lee, Kwun Tong (HK)**(51) **Int. Cl.**
F22B 1/28 (2006.01)(52) **U.S. Cl.** 15/320(57) **ABSTRACT**

Correspondence Address:

LEYDIG VOIT & MAYER, LTD
700 THIRTEENTH ST. NW, SUITE 300
WASHINGTON, DC 20005-3960(73) **Assignee: Main Power Electrical Factory**
Ltd., Kwun Tong (HK)(21) **Appl. No.: 11/494,730**(22) **Filed: Jul. 28, 2006**

A handheld steam cleaner has a housing with an integral pistol-grip handle and a nozzle. Located within the housing are a soap tank, a water reservoir, a water pump and a steam generator. A soap pump is located in the handle. A first passage leads from the water reservoir, through the water pump and the steam generator, to a steam discharge opening in the nozzle. A second passage leads from the soap tank, through the soap pump, to a soap discharge opening in the nozzle. The housing also has a body. The handle is connected with the nozzle and the body extends downwardly from the handle and the nozzle.



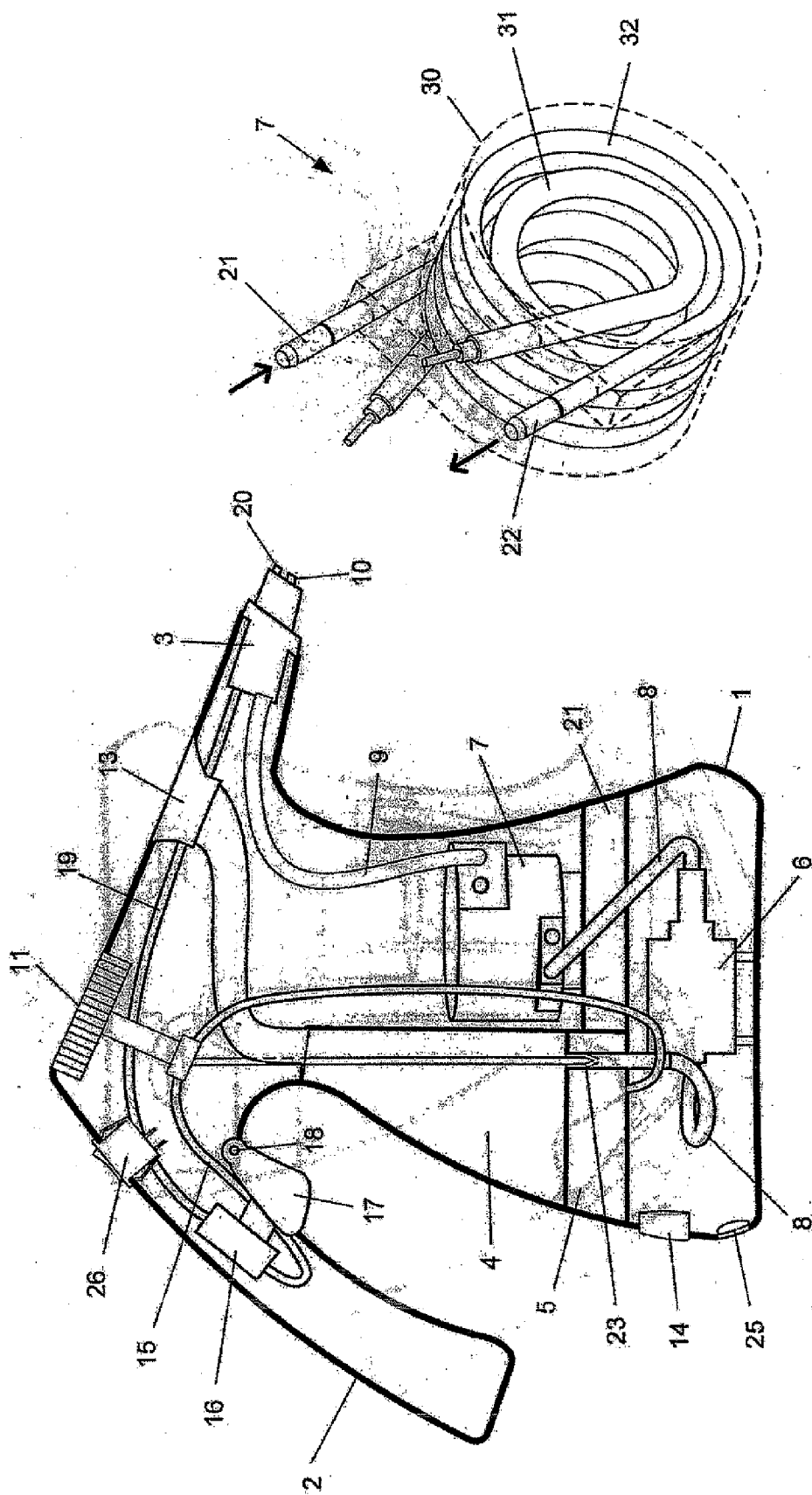


FIGURE 2

FIGURE 1

HANDHELD STEAM CLEANER

BACKGROUND TO THE INVENTION

[0001] 1. Field of the Invention

[0002] The current invention relates to steam cleaners, and more particularly to a handheld steam cleaner for domestic use.

[0003] 2. Background Information

[0004] Water is a common cleaning agent. Hot water and steam are more effective cleaning agents because they help to dissolve stubborn dirt as well as grease and other chemicals. Steam cleaners are well-known within industry and are becoming increasingly popular for domestic use. Domestic type steam cleaners are particularly use for household cleaning tasks, however although they are smaller in size than commercial steam cleaners they are still relatively large and complicated to set up and move from place to place and thus a person might be discouraged from using one when only a smaller cleaning job was required.

[0005] Additionally, steam cleaners of often more effective when used with a cleaning agent such as detergent and steam cleaners are known to incorporate detergent dispensing means. This adds to the size and complexity of the steam cleaner.

SUMMARY OF THE INVENTION

[0006] Accordingly, is an object of the present invention to provide a handheld steam cleaner, and in particular a steam cleaner suitable for domestic use, which is small and easy to set-up and use for small cleaning tasks, or that at least provides the public with a useful alternative.

[0007] In view of the forgoing, there is disclosed herein a steam cleaner comprising A steam cleaner comprising:

[0008] a housing having an integral pistol-grip handle and a nozzle,

[0009] a water reservoir located with the housing,

[0010] a pump located in the housing and communicating with the water reservoir for pumping water from the reservoir,

[0011] a steam generator connected with the pump for converting water to steam and communicating with the nozzle for discharging steam from the steam cleaner.

[0012] Preferably, the steam cleaner further comprises a detergent tank located with the housing, a manually operable pump located within the housing and detergent delivery lines for delivering detergent in the tank through the manually operable pump and to a detergent discharge opening in the nozzle.

[0013] Preferably, the manually operable pump has a level pivotally mounted with the handle as a mechanical trigger movable by a finger for operating the pump.

[0014] Preferably, the detergent tank is removably positioned with the housing and coupled with a releasable catch for removing the detergent tank to be filled.

[0015] There is further disclosed herein a handheld steam cleaner comprising:

[0016] a housing with a handle portion, a nozzle portion and a body portion and in which the handle portion is connected with the nozzle portion and the body portion extends downwardly from the handle and nozzle portions,

[0017] a soap tank, a water reservoir, a water pump and a steam generator located with the body portion,

[0018] a first passage leading from the water reservoir through the water pump and the steam generator and to a steam discharge opening in the nozzle portion,

[0019] a soap pump located in the handle position, and

[0020] a second passage leading from the soap tank through the soap pump and to a soap discharge opening in the nozzle portion.

[0021] Preferably, the handle portion is a pistol-grip handle.

[0022] Preferably, the handle extends downwardly substantially parallel to the body portion.

[0023] Preferably, the soap pump includes a trigger lever on the handle portion.

[0024] Preferably, the soap discharge opening is above the steam discharge opening.

[0025] Preferably, the steam generator comprises a generally cylindrical body of heat conductive material encasing a heating element and a passage passing through the body in which water is heated to steam.

[0026] Preferably, the body of heat conductive material is formed about the heating element.

[0027] Preferably, the heating element and passage have spiral shapes within the body of heat conductive material.

[0028] Preferably, the spiral shapes of the heating element and the passage are concentric.

[0029] Further aspects of the invention will become apparent from the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0030] An exemplary form of the present invention will now be described by way of example only and with reference to the accompanying drawings, in which:

[0031] FIG. 1 is a schematic illustration of a handheld steam cleaner according to the invention, and

[0032] FIG. 2 is a schematic illustration of a steam generator of the handheld steam cleaner.

BRIEF DESCRIPTION OF THE DRAWINGS

[0033] In the attached drawings there is depicted a portable handheld steam cleaning device suitable for domestic use. The device comprises an integrally formed housing having a pistol-grip type handle portion 2, steam nozzle portion 3 and a bulbous body portion 1. The handle portion 2 is connected to the nozzle portion 3 and the bulbous body portion 1 extends downwardly from the handle and nozzle portions 2, 3. The pistol-grip type handle portion 2 extends generally downwardly substantially parallel to a side of the bulbous body portion 1. Located with the body portion 1 are a water reservoir 4 and a detachable soap/detergent tank 5. Positioned within the body portion 1 are an electromagnetic pump 6 and a steam generator 7. The steam generator 7 rests on an internal bracket 24. A liquid fluid line 8 extends from the outlet of water reservoir 4 to the inlet of pump 6. From the pump outlet the liquid fluid line 8 delivers water to the inlet 21 of the steam generator 7. Within the steam generator 7 the liquid is turned to steam and a steam fluid line 9 delivers the steam from an outlet 22 of the steam generator 7 to a steam discharge opening 10 in nozzle 3.

[0034] There is provided on an upper portion of the housing a rotary steam knob 11 which turns a spindle 12 extending to an outlet valve 23 of the water reservoir 4. Turning the knob 11 rotates the spindle to adjust the outlet valve 23. The valve 23 controls water delivery to the

electromagnetic pump 6 which in turn controls the volume of steam emitted from steam discharge opening 10. Also on the upper portion of the housing, adjacent the steam knob 11, is an opening with a filler tube 13 extending to reservoir 4 for re-filling the reservoir 2 with water.

[0035] The soap/detergent tank 5 is removable from the housing for filling. The soap tank 5 is held in place by a release catch operable by a release button 14 to facilitate removal of the soap tank 5. A detachable outlet coupling, which may be a pair of flanges with mating surfaces, connects the soap tank 5 to a soap dispensing line 15 that extends up to the handle 2 of the body 1. Located within the handle 2 is a manually operable soap pump 16. A pumping lever 17 is located in a 'trigger' position of the pistol-grip type handle 2. The lever 17 is mounted on a pivot 18 for reciprocating pumping motion with an index finger of a hand holding the pistol-grip type handle 2. The lever 17 is connected to pump 16 for pumping soap/detergent from the soap tank 5. A soap delivery line 19 extends from an outlet of the soap pump 16 to a soap discharge opening 20 located above the steam discharge opening 10 in the nozzle 3.

[0036] Electrical wiring of the steam cleaner is not shown but is well within the capability and understanding of one skilled in the art. An appliance power inlet connector is provided in the housing 1 at an opening 25 near the base. A power switch 26 is provided on an upper portion of the handle 2 approximate the top of the housing. A live, or line, lead of the wiring is connected via the switch 26 to a heating element 31 of the steam generator 7 and to the electromagnetic pump 7. Return, or neutral, and earth leads of the wiring are also made to the pump 6 and steam generator 7 in known manner.

[0037] FIG. 2 depict detail of the steam generator 7. The steam generator 7 comprises a generally cylindrical body 30 of a heat conductive material, such as any cast metal, with an embedded heating element 31 and water passage 32. The heating element 31 and fluid passage 32 are within close proximity to each other in concentric spirals around the circular body 30 of the steam generator 7. In the depicted embodiment the fluid passage 32 has five (5) spiral loops. The heater element spiral is the inner spiral and has three (3) loops. The fluid passage spirals 32 are formed from a metal tube that is positioned with heating element spirals 31 and formed into the cylindrical body 30 during casting. The center portion of the cylindrical body 30 is hollow to concentrate heat into the outer circumference in which the heating element and water passage spirals 31, 32 are cast.

[0038] In use, the steam cleaner is connected to a power source in known manner and the power switch 26 depressed to activate the steam cleaner, including powering the heating element 31 of the steam generator 7. Once the steam generator 7 has reached its operating temperature water is pumped from the reservoir 2 through liquid fluid lines 8 and to the fluid passage 32 of the steam generator 7. Within fluid passage 32 the water is turned into steam. The steam passes through the steam fluid lines 9 to the discharge opening 10 in nozzle 3. If during the cleaning operation the user decides that soap/detergent is needed to assist with cleaning the soap pump 16 can be operated by repeatedly depressing lever 17 with an index, or other, finger to deliver soap/detergent to the soap discharge opening 20. Soap/detergent exiting the opening 20 will be entrained into the steam jet ejected from steam discharged opening 10.

[0039] The handheld steam cleaner is particularly suitable for domestic use. It is small and easy to set up and use. The steam generator comprising concentric spirals is small and lightweight.

[0040] It should be appreciated that modifications and alternations obvious to those skilled in the art are not to be considered as beyond the scope of the present invention.

1. A handheld steam cleaner comprising:

- a housing having an integral pistol-grip handle and a nozzle,
- a water reservoir located with the housing,
- a pump located in the housing and communicating with the water reservoir for pumping water from the reservoir,
- a steam generator connected with the pump for converting the water into steam and communicating with the nozzle for discharging the steam from the steam cleaner.

2. The handheld steam cleaner of claim 1 wherein the steam generator comprises a generally cylindrical body of heat conductive material encasing a heating element and a passage passing through the body in which the water is heated and converted into the steam.

3. The handheld steam cleaner of claim 2 wherein the body of heat conductive material is disposed around the heating element.

4. The handheld steam cleaner of claim 2 wherein the heating element and the passage have spiral shapes within the body of heat conductive material.

5. The handheld steam cleaner of claim 4 wherein the spiral shapes of the heating element and the passage are concentric.

6. The handheld steam cleaner of claim 1 further comprising a detergent tank located within the housing, a manually operable pump located within the housing, and detergent delivery lines for delivering detergent from the tank, through the manually operable pump, to a detergent discharge opening in the nozzle.

7. The handheld steam cleaner of claim 6 wherein the manually operable pump has a lever pivotally mounted with the handle as a mechanical trigger movable by a finger for operating the pump.

8. The steam cleaner of claim 6 wherein the detergent tank is removably positioned with the housing and coupled with a releasable catch for removing the detergent tank from the housing for filling.

9. A handheld steam cleaner comprising:

- a housing with a handle portion, a nozzle portions and a body portion and in which the handle portion is connected with the nozzle portion and the body portion extends downwardly below the handle portion and the nozzle portion,
- a soap tank, a water reservoir, a water pumps and a steam generator located within the body portion,
- a first passage leading from the water reservoir, through the water pump and the steam generator, to a steam discharge opening in the nozzle portion,
- a soap pump located in the handle portion, and
- a second passage leading from the soap tank, through the soap pump, and to a soap discharge opening in the nozzle portion.

10. The handheld steam cleaner of claim **9** wherein the handle portion is a pistol-grip handle.

11. The handheld steam cleaner of claim **10** wherein the handle extends downwardly substantially parallel to the body portion.

12. The handheld steam cleaner of claim **10** wherein the soap pump includes a trigger lever on the handle portion.

13. The handheld steam cleaner of claim **9** wherein the soap discharge opening is above the steam discharge opening.

14. The handheld steam cleaner of claim **9** wherein the steam generator comprises a generally cylindrical body of heat conductive material encasing a heating element and a

passage passing through the body in which the water is heated and converted into the steam.

15. The handheld steam cleaner of claim **14** wherein the body of heat conductive material is disposed around the heating element.

16. The handheld steam cleaner of claim **14** wherein the heating element and the passage have spiral shapes within the body of heat conductive material.

17. The handheld steam cleaner of claim **16** wherein the spiral shapes of the heating element and the passage are concentric.

* * * * *