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JP 7275166 A
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(54) Abstract Title

Steam jet apparatus for a vacuum cleaner

(57) A steam jet apparatus for selective attachment to the handle of a vacuum cleaner comprises a housing 30, including a reservoir for liquids 31, a cover structure forming a top wall of said housing for attaching to and sealing said reservoir 31 and including an electrical terminal 23 adapted to couple to a power supply 23, a steam generating device 70 attached to the cover structure and configured to be disposed in the said reservoir 31, when the cover structure is attached, and a steam jetting nozzle 33 integrally formed with and adjacent the reservoir 31 for providing a jet of steam to the surface being cleaned. The cover structure preferably includes an inner cover 40 which supports the steam generating device and includes a fluid refill aperture 43, and an outer cover 50 which is connected to the inner cover 40 and includes a fluid refill conduit 55 for replenishing the reservoir 31 with fluid. The outer cover 50 may also include a connection protrusion 51 protruding from an external surface of the cover body adapted to be insert-connected to cover an air suction portion of the handle 20. The steam generating device may be a pair of carbon bars 70 electrically connected to the electric terminal 23. An extension nozzle 60 may also be added to the nozzle 33 of the steam jet apparatus.

FIG.1

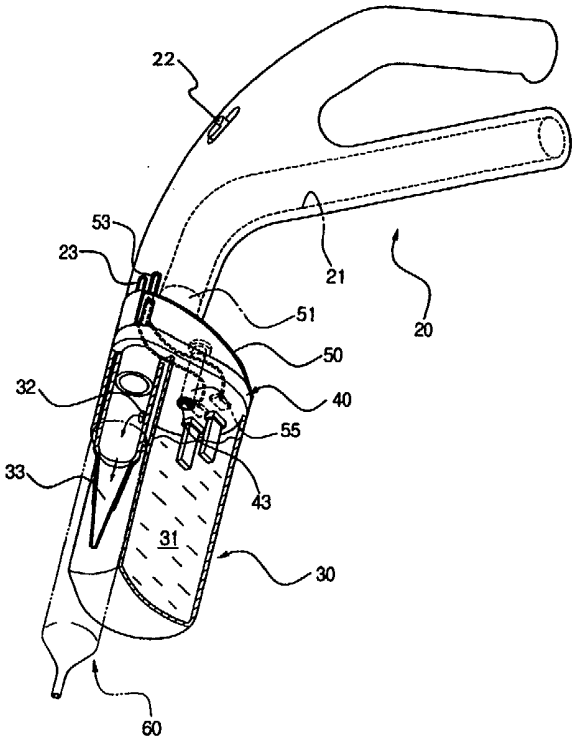

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FIG. 1

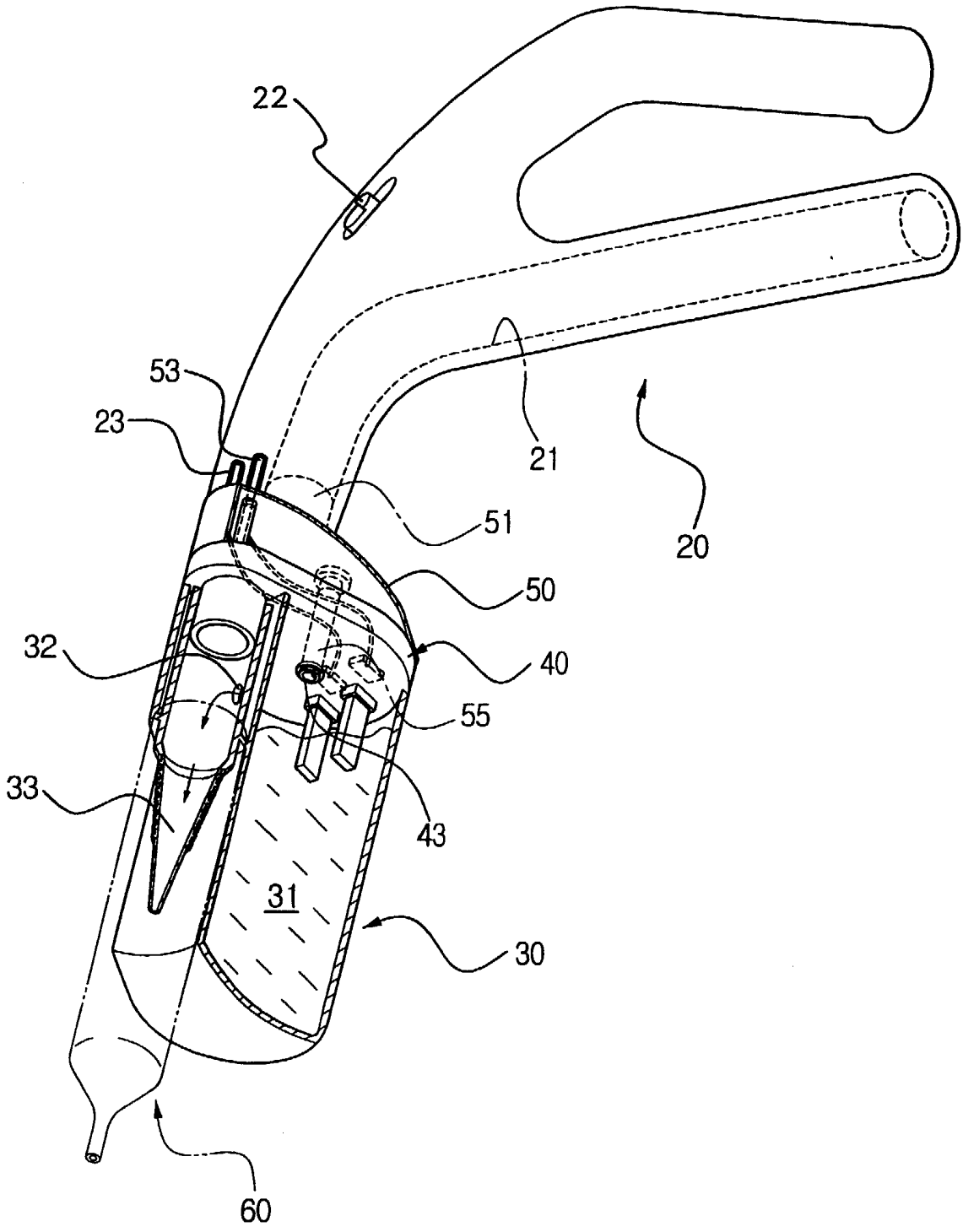
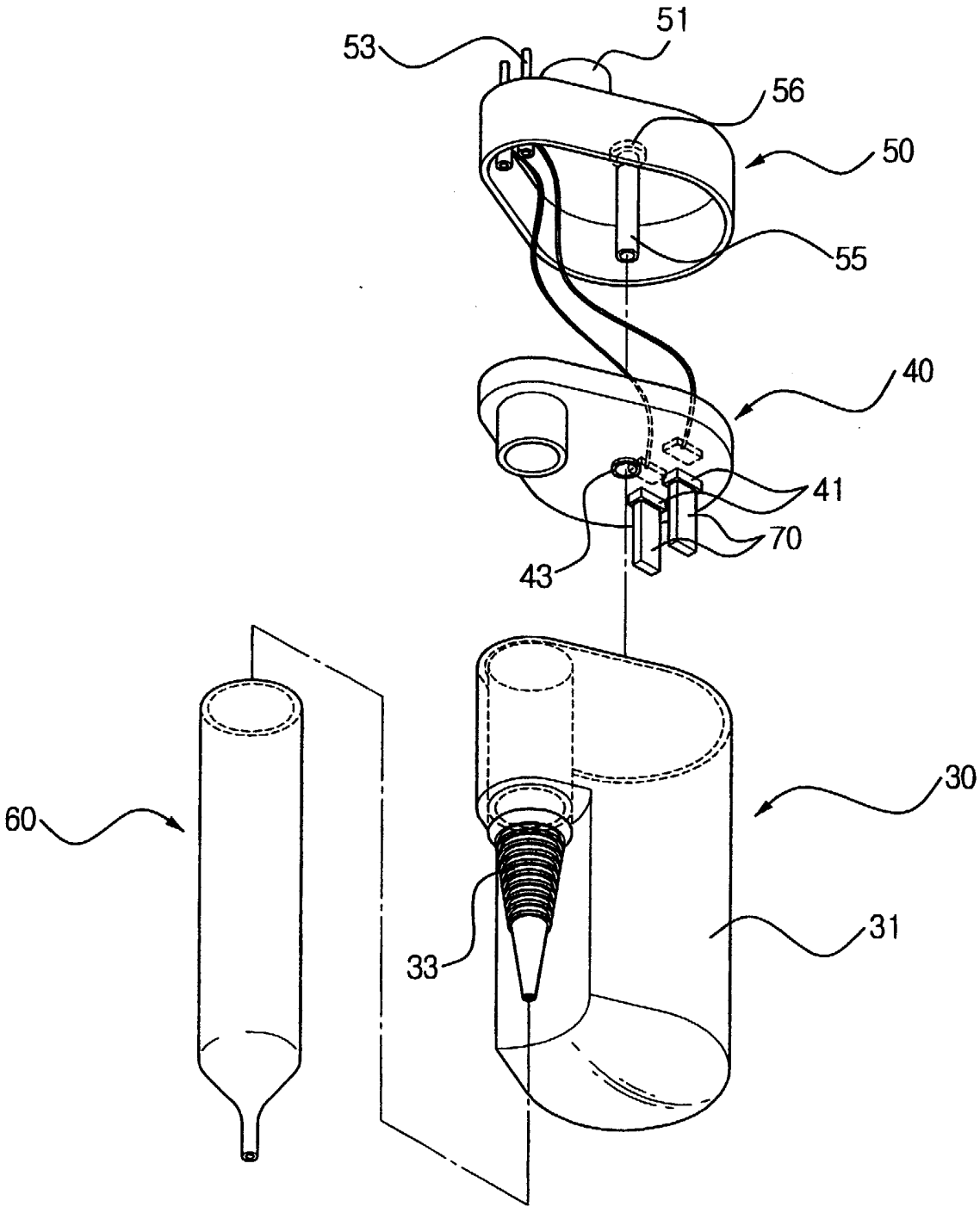


FIG.2



STEAM JET APPARATUS FOR A VACUUM CLEANER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a steam jet apparatus for a vacuum cleaner, and more particularly, to a steam jet apparatus for use in a cleaner, which is separable and can be selectively attached to the handle of the cleaner.

2. Description of the Prior Art

Generally, a vacuum cleaner has a cleaner body for housing a driving motor that generates a suction force, a suction extension pipe connected to the cleaner body, and a suction brush disposed at one end of the suction extension pipe to draw in contaminants from a surface. A handle with an on/off switch is usually provided at one end of the suction extension pipe. The cleaner can be constructed in a manner such that the suction extension pipe with the suction brush, is connected to but movable relative to the handle, so that a user can clean narrow places like corners of a floor or a room while holding the handle. The suction brush is only one of the possible attachment accessories that may be provided.

When such a vacuum cleaner is used for cleaning, dust and foreign substances on the work surface are drawn into the cleaner body together with air. However, it is difficult for the cleaner to draw in and remove stains and microbes from floors, carpets, furniture, drapes and other surfaces.

Accordingly, it is well-known in the art that providing a jet of steam onto the surface helps remove stains and microbes, and there have been various efforts to develop wet vacuum cleaners or cleaners having steam jetting devices incorporated therein. Many of the prior attempts to address these issues have involved equipment which is bulky and heavy, and difficult to use.

SUMMARY OF THE INVENTION

The present invention has been made to overcome the above-mentioned problems of the prior art, and accordingly, it is an object of the present invention to provide a steam jet apparatus for a vacuum cleaner, which can be selectively attached to a handle of the vacuum cleaner as needed during operation.

The above object is accomplished by a steam jet apparatus for a vacuum cleaner which is removably mounted to a handle of the vacuum cleaner body. The handle is connected to a suction extension pipe which is connected to the cleaner body. The handle has a separate power supply terminal provided thereon for powering the steam jet apparatus according to the present invention. The steam jet apparatus is an attachment accessory and includes a housing comprising a reservoir with an upper opening to hold water therein, and a steam jetting nozzle interconnected to the reservoir. The steam jet apparatus also has a steam generating device disposed in the reservoir for generating steam from the water contained in the reservoir. The housing has an outer lid forming the upper portion of the housing body. In addition, an inner lid covering is provided which is connected to the

housing to directly cover the upper opening of the reservoir and the steam jetting nozzle. The inner covering supports the steam generating device . The inner cover and the outer cover are coupled together with the outer cover having an electric terminal that connects the steam generating device to the power supply terminal. The outer cover is removably attached to the handle.

The inner cover preferably has a water refill aperture, and the outer cover preferably has a water refill conduit coupled to the aperture for replenishing the reservoir with water.

The outer cover may include an extending sidewall structure forming a cover body to cover the top of the inner cover. The outer cover may have an electric terminal protruding from an external surface thereof as well as a connection protrusion protruding therefrom. The connection protrusion is preferably sized and configured to be inserted into a mating socket on an air suction portion of the handle.

The steam generating device may include a pair of carbon bars electrically connected to the electric terminal, and supported on the inner cover.

Also, the steam jet apparatus according to the present invention preferably includes a removable extension pipe that can be connected adjacent the tip of the steam jetting nozzle to extend the distance that the jet of steam can travel.

BRIEF DESCRIPTION OF THE DRAWINGS

By way of example only, a specific embodiment of the present invention will now be described with reference to the accompanying drawings, in which:

FIG. 1 is a schematic perspective view, and partial sectional, of a steam jet apparatus for a vacuum cleaner according to a preferred embodiment of the present invention; and

FIG. 2 is an exploded perspective view of the steam jet apparatus of FIG. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1 and 2, a steam jet apparatus for a vacuum cleaner according to a preferred embodiment of the present invention is removably attached to a handle 20 that is provided to an air suction pipe. The air suction pipe is connected to a vacuum cleaner body (not shown).

A suction extension pipe, connected with a suction brush, is removably attached to handle 20. A power switch 22 is provided on handle 20 for actuating the power brush. Also, a power supply terminal 23 is provided to a leading end of the handle 20.

The steam jet apparatus according to the present invention is an attachment accessory for a vacuum cleaner and includes a housing 30 having a reservoir 31 and a steam jetting nozzle 33. An inner cover 40 is connected to an outer cover 50 which forms the upper portion of the housing 30. The inner cover 40 is also connected to a steam generating device .

The upper openings of the reservoir 31 and the steam jetting nozzle 33 are open, and interconnected with each other through a steam conduit 32. The reservoir 31 is configured to preferably have a capacity of approximately 250~300cc of water.

The steam jetting nozzle 33 is integrally formed with the housing 30,and preferably in parallel relation to a side wall of the reservoir 31. On the emitting end of steam jetting nozzle 33 a removable extension pipe 60 may be attached to extend the distance the steam travels when released through the jetting nozzle.

The inner cover 40 is connected to the housing 30 so as to cover the upper openings of the reservoir 31 and the steam jetting nozzle 33. The inner cover 40 has a connection portion 41, to which carbon bars may be connected supported thereon. The inner cover 40 has a water refill aperture 43 formed therein through which the reservoir 31 can be replenished with water.

A preferred steam generating device is supported on the inner cover 40 and includes a pair of carbon bars 70 arranged to be disposed inside reservoir 31. The carbon bars 70 are preferably made of charcoal or black lead, and emit the electricity stored in a condenser. That is, positive (+) and negative (-) charges are supplied to each of the carbon bars 70 causing the carbon bars to discharge thereby boiling the water in the immediate vicinity of the carbon bars to generate steam. This takes approximately 3 to 5 seconds.

In this embodiment, the steam generating device uses a pair of carbon bars 70 to generate steam. However, this should not be considered as limiting. For example, a simple resistance type of heating element can be used instead of carbon bars 70.

Outer cover 50 is connected to inner cover 40 and covers the upper portion of inner cover 40. Outer cover 50 includes the connection structure to removably

connect the steam jet apparatus to the handle 20. The connection structure comprises a connection protrusion 51 on an external surface of outer cover 50 which is configured to be inserted into a mating socket on air suction port 21 of the handle 20. The connection protrusion 51 protrudes from an external surface of outer cover 50, and has an outer diameter corresponding to the socket of the air suction port 21 to be force-fit into the air suction port 21. Also disposed on outer cover 50 is an electrical terminal 53 which is configured to be electrically connected to the power supply terminal 23 of the handle 20 when the steam jet apparatus is connected to the handle. The electrical terminal 53 protrudes from an external surface of outer cover 50, and is electrically connected to the carbon bars 70. Accordingly, by connecting the outer cover 50 to the handle 20, the electrical connection is automatically made to supply electricity from the power supply terminal 23 to the carbon bars 70 through the electrical terminal 53. The electricity supply is turned on and off under the control of the switch 22 disposed on the handle 20.

A water refill conduit 55, in communication with an inlet visible on the upper surface of outer cover 50, is integrally formed on the inner surface of outer cover 50. When outer cover 50 and inner cover 40 are assembled together, the water refill conduit 55 is matingly connected to water refill aperture 43 of the inner cover. At the outer end, or the inlet, of water refill conduit 55, a cap 56 is provided to cover the inlet.

As described above, the steam jet apparatus for a vacuum cleaner constructed according to the present invention has a configuration and structure that can generate

steam from a relatively small amount of water keeping the apparatus of compact size and light weight. Due to its elegant structure, the steam jet apparatus can be selectively attached to the handle 20 of the cleaner with a simple manipulation to employ the steam jet only when necessary. The compact size and simple assembly which accomplishes an electrical connection provides much improved ease and convenience of use. The power supply 23 provided on the handle to power attachments such as a brush, is employed in this instance to power the steam generating device.

For example, a user cleaning the floor or carpet or other surface detaches the suction brush and connects the steam jet apparatus to the handle 20 if he/she finds a stained spot on the floor or on the carpet. Then, by turning on the switch provided on the handle 20, electricity is applied to the carbon bars 70, immediately generating the steam. The steam is expelled through the steam jetting nozzle 33. Accordingly, the user can remove any stains, dirt or microbes quickly and efficiently, by applying steam from the steam jetting apparatus.

As described above, the steam jet apparatus for a vacuum cleaner according to the present invention is compact and light weight and convenient to use. Also, the structure enables the steam jet apparatus to be selectively attached to the handle 20 of the vacuum cleaner easily and only as needed.

By providing a steam jet apparatus as an attachment type of accessory to the vacuum cleaner which can be removably mounted to the handle 20, a manufacturer can offer the steam jet apparatus to consumers at a reasonable price.

Although the preferred embodiments of the present invention have been described, it will be understood by those skilled in the art that the present invention should not be limited to the described preferred embodiments, but various changes and modifications can be made within the spirit and scope of the present invention as defined by the appended claims. For example, although this invention has been described with reference to steam generated by water, it is within the scope of the invention to use any suitable fluid such as cleaning solution or water mixed with a desired solvent.

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CLAIMS

1. A steam jet apparatus for a vacuum cleaner adapted to be removably mounted to a handle of a vacuum cleaner body, the handle being provided to a suction extension pipe connected to the vacuum cleaner body and having a power supply terminal, the steam jetting apparatus comprises:

a housing comprising a reservoir that has an open upper side and is adapted to contain fluid therein, and a steam jetting nozzle interconnected with the reservoir ;

a steam generating device disposed in the reservoir for generating steam from the fluid held in the space portion;

an inner cover connected to the housing to cover the upper side of the reservoir and the steam jetting nozzle, the inner cover supporting the steam generating device ; and

an outer cover connected to the inner cover, the outer cover having an electrical terminal connected to the steam generating device and adapted to couple to the power supply terminal of the handle.

2. The steam jet apparatus of claim 1, wherein the inner cover has a fluid refill aperture , and the outer cover has a fluid refill conduit for replenishing the reservoir with fluid.

3. The steam jet apparatus of claim 1 or claim 2, wherein the outer cover

comprises:

a cover body to cover an upper portion of the inner cover, and having the electrical terminal protruding from an external surface of the cover body; and

a connection protrusion protruding from an external surface of the cover body adapted to be insert-connected to cover an air suction portion of the handle.

4. The steam jet apparatus of any of claims 1 to 3, wherein the steam generating device comprises a pair of carbon bars electrically connected to the electrical terminal, and supported on the inner cover.

5. The steam jet apparatus of any of claims 1 to 4, further comprising a removable jetting extension that is removably connected to the steam jetting nozzle.

6. A steam jet apparatus for a vacuum cleaner comprising:

a housing including a reservoir for containing liquid;

a cover structure forming a top wall of said housing for attaching to and sealing said reservoir, said cover structure including an electrical terminal adapted to couple to a power supply and actuation switch of the vacuum cleaner;

a steam generating device attached to said cover structure and configured to be disposed in said reservoir when said cover structure is attached to said reservoir for heating the liquid and thereby generating steam; and

a steam jetting nozzle integrally formed with and adjacent said reservoir and operatively connected thereto by a steam path and said cover structure for providing a jet of steam to a cleaning surface.

7. The apparatus of claim 6, wherein said cover structure comprises an inner cover for covering and sealing said reservoir and said steam jetting nozzle and supporting said steam generating device.

8. The apparatus of claim 7, wherein said cover structure further comprises an outer cover adapted to cover said inner cover and form a part of said housing, said outer cover being in electrical and fluid communication with said inner cover.

9. The apparatus of claim 8, wherein said outer cover comprises a refill conduit in fluid communication with a refill aperture in said inner cover.

10. The apparatus of claim 9, further comprising a cap for said refill conduit.

11. The apparatus of any of claims 8 to 10, wherein said electrical terminal is integrated into said outer cover.

12. The apparatus of any of claims 8 to 11, wherein said steam generating device comprises a pair of carbon bars in electrical communication with said electrical terminal.

13. The apparatus of any of claims 8 to 12, further comprising a jet extension removably attached to said steam jetting nozzle.

14. A vacuum cleaner accessory for providing steam to cleaning surfaces, the accessory comprising:

a housing including a reservoir for containing liquid;

a cover structure forming a portion of said housing for sealing said reservoir, said cover structure including an electrical terminal adapted to couple to an accessory power supply and actuation switch of the vacuum cleaner;

a steam generating device connected to said cover structure and configured to be disposed in said reservoir for heating the liquid and thereby generating steam when said cover structure is assembled to said reservoir; and

a steam jetting nozzle integrally formed with and adjacent said reservoir and operatively connected thereto by a steam path and said cover structure for providing a jet of steam to cleaning surfaces upon actuation of the switch.

15. The vacuum cleaner accessory of claim 14, wherein said cover structure comprises an inner cover for covering and sealing said reservoir and said

steam jetting nozzle and supporting said steam generating device.

16. The vacuum cleaner accessory of claim 15, wherein said cover structure further comprises an outer cover adapted to cover said inner cover and form a part of said housing, said outer cover being in electrical and fluid communication with said inner cover.

17. The vacuum cleaner accessory of claim 16, wherein said outer cover comprises a refill conduit in fluid communication with a refill aperture in said inner cover.

18. The vacuum cleaner accessory of any of claims 14 to 17, wherein said steam generating device comprises a pair of carbon bars in electrical communication with said electrical terminal.

19. The vacuum cleaner accessory of any of claims 14 to 18, further comprising an attachment structure integral with one of said housing or said cover structure for attaching said accessory to a vacuum cleaner.

20. The vacuum cleaner accessory of claim 19, wherein said attachment structure is a protrusion integrally formed on an external surface of said cover structure, said protrusion configured to be inserted into a mating socket of the

vacuum cleaner.

21. A steam jet apparatus for a vacuum cleaner, substantially as herein described with reference to, and as illustrated in, the accompanying drawings.

22. A vacuum cleaner accessory, substantially as herein described with reference to, and as illustrated in, the accompanying drawings.

23. A vacuum cleaner comprising a steam jet apparatus as claimed in any of claims 1 to 13 or 21 or a vacuum cleaner accessory as claimed in any of claims 14 to 20 or 23.

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Application No: GB 0227860.4
Claims searched: 1-23

Examiner: Rhodri Evans
Date of search: 20 February 2003

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	6,14	JP 7275166 A (Sanou) 24.10.1995 (see all figures and WPI abstract accession number 1996-033769 [04]).

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^{V}:

A4F

Worldwide search of patent documents classified in the following areas of the IPC^{7}:

A47L

The following online and other databases have been used in the preparation of this search report :

WPI, EPODOC, PAJ.