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(54) **PORTABLE VACUUM CLEANER AND
METHOD FOR STORING A VACUUM HOSE**

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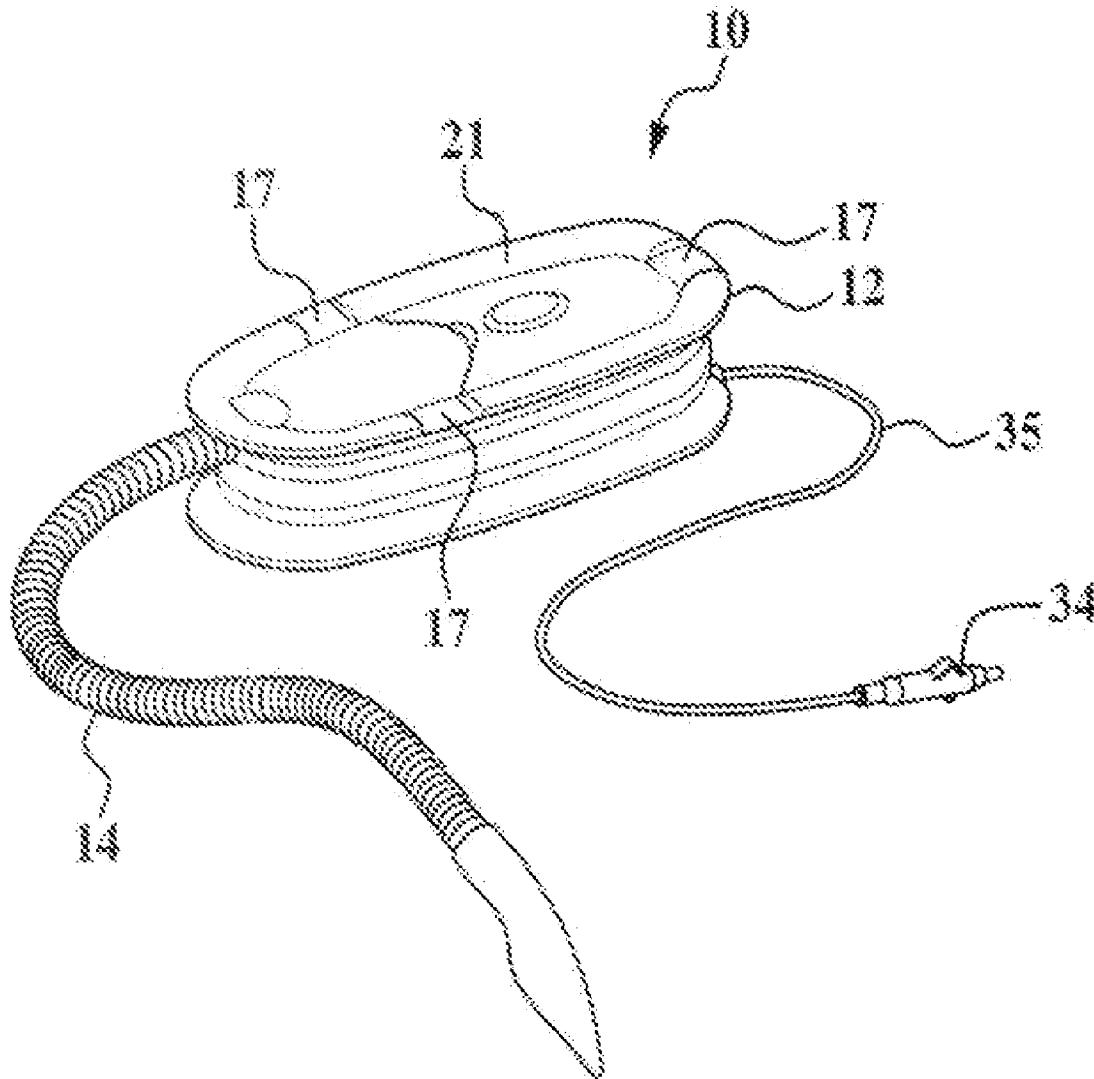
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ABSTRACT

A portable vacuum cleaner and a method for storing a vacuum hose of a portable vacuum cleaner are provided. The portable vacuum cleaner includes a vacuum-generating device. The portable vacuum cleaner further includes a housing configured to hold the vacuum generating device therein. The housing has a groove extending around a periphery of the housing for receiving and holding a vacuum hose therein during storage of the housing. The vacuum hose has first and second ends. The first end is operably coupled to the vacuum generating device.



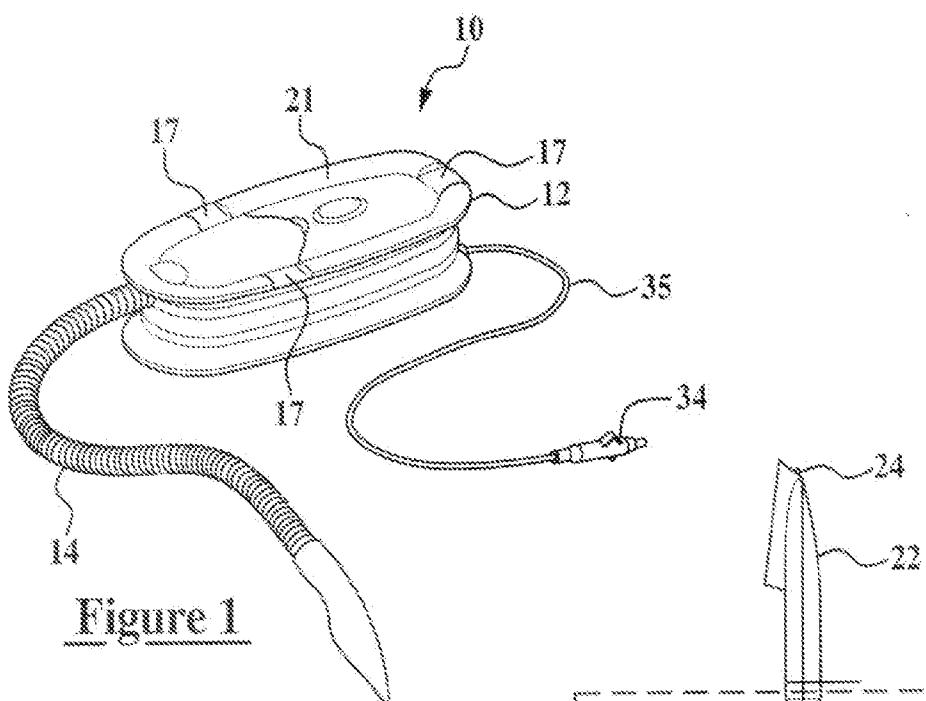


Figure 1

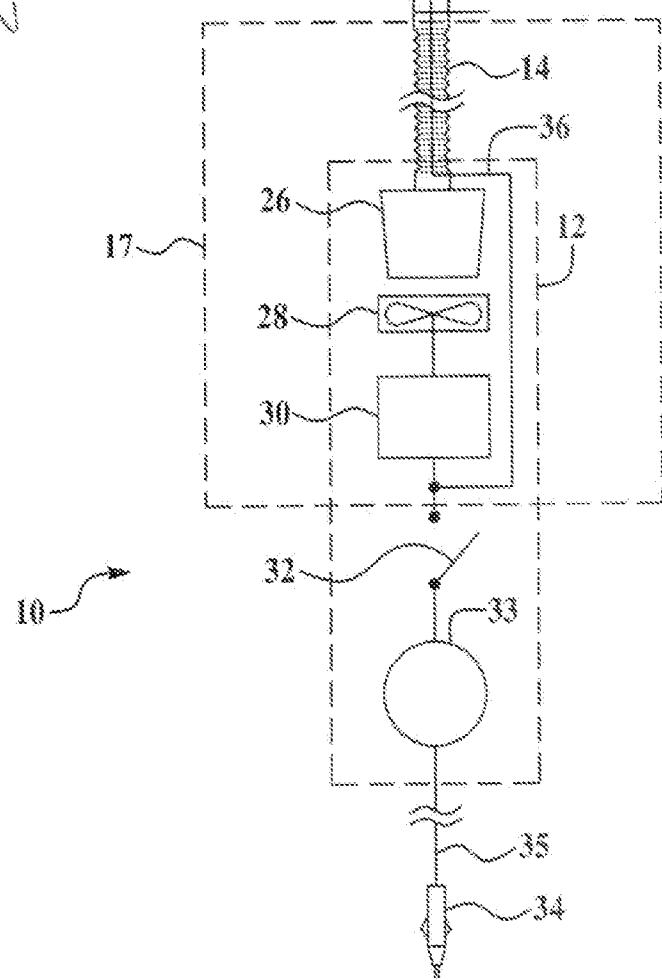


Figure 2

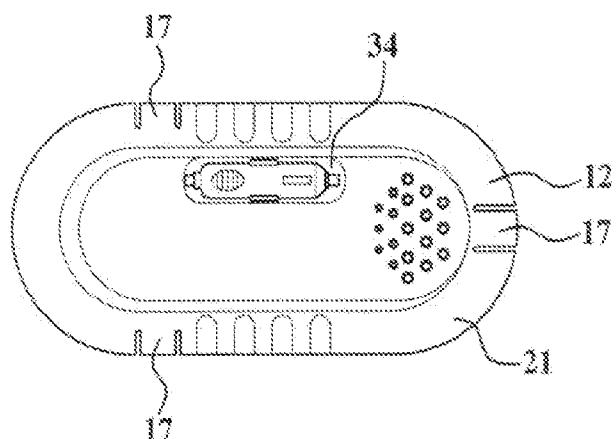


Figure 3

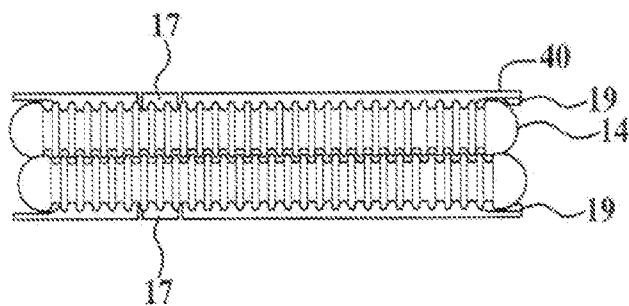


Figure 4

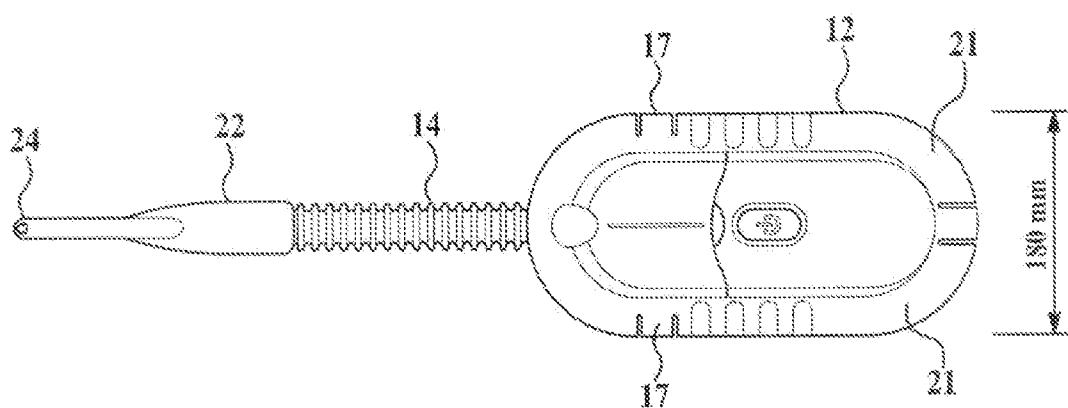


Figure 5

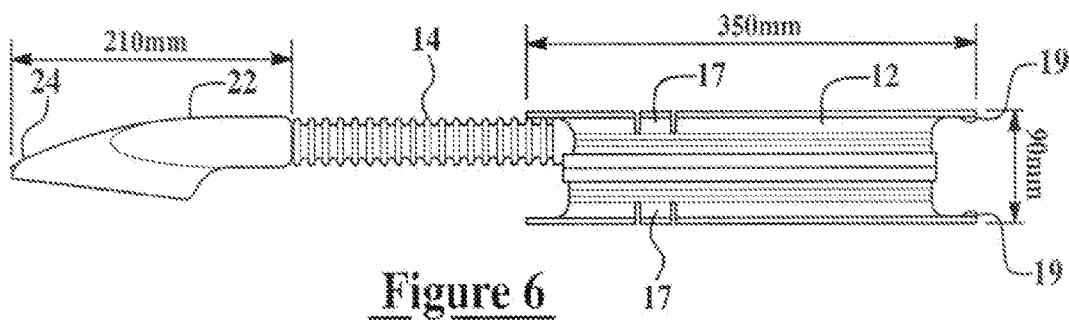
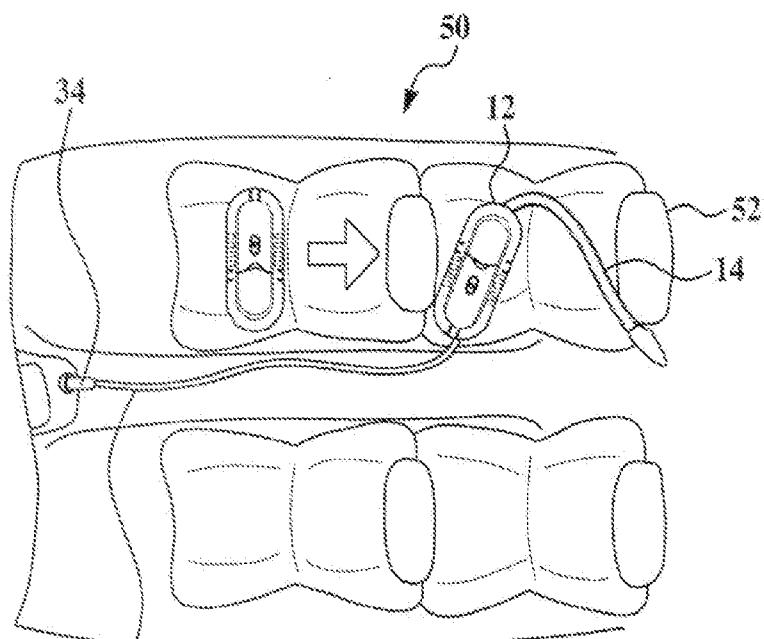


Figure 6



16 Figure 7

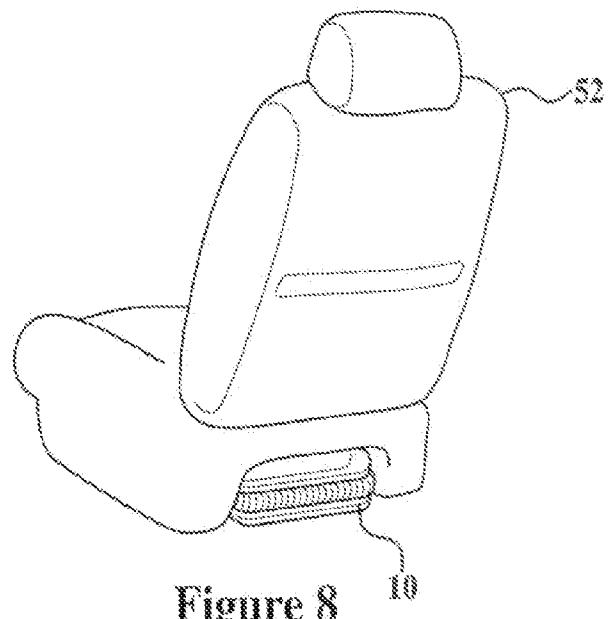


Figure 8

PORABLE VACUUM CLEANER AND METHOD FOR STORING A VACUUM HOSE**CROSS REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims the benefit of U.S. Provisional Patent Application Ser. No. 60/681,737, filed May 17, 2005, the contents of which are incorporated herein by reference thereto.

TECHNICAL FIELD

[0002] This application relates to a portable vacuum cleaner and a method for storing a vacuum.

BACKGROUND

[0003] U.S. Pat. No. 6,081,961 describes a vacuum cleaner that includes a base, a housing, and a vacuum hose. A disadvantage with the vacuum cleaner is that the vacuum cleaner does not allow a user the ability to store the vacuum hose within a portion of the housing. As a result, the user would have difficulty storing the vacuum cleaner in a compact region of a vehicle.

[0004] Accordingly, the inventors herein have recognized that it would be advantageous to have a portable vacuum cleaner configured to store the vacuum hose within a groove extending around a periphery of the housing.

SUMMARY OF THE INVENTION

[0005] A portable vacuum cleaner in accordance with an exemplary embodiment is provided. The portable vacuum cleaner includes a vacuum generating device. The portable vacuum cleaner further includes a housing configured to hold the vacuum-generating device therein. The housing has a groove extending around a periphery of the housing for receiving and holding a vacuum hose therein during storage of the housing. The vacuum hose has first and second ends. The first end is operably coupled to the vacuum-generating device.

[0006] A method for storing a vacuum hose of a portable vacuum cleaner in accordance with another exemplary embodiment is provided. The method includes disposing the vacuum hose in a groove extending around a periphery of a housing of the portable vacuum cleaner. The method further includes retracting, at least partially, a power cord into the housing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. 1 is a schematic of a portable vacuum cleaner in accordance with an exemplary embodiment;

[0008] FIG. 2 is a block diagram of the portable vacuum cleaner of FIG. 1;

[0009] FIG. 3 is a top view of the portable vacuum cleaner of FIG. 1 illustrating an enlarged view of a retractable power cord and a vacuum hose;

[0010] FIG. 4 is a side view of the portable vacuum cleaner of FIG. 1;

[0011] FIG. 5 is a top view of the portable vacuum cleaner of FIG. 1 illustrating a nozzle having a light emitting diode;

[0012] FIG. 6 is a side view of the portable vacuum cleaner of FIG. 1;

[0013] FIG. 7 is a schematic of the portable vacuum cleaner of FIG. 1 disposed within a vehicle; and

[0014] FIG. 8 is a schematic of the portable vacuum cleaner of FIG. 1 stored within a seat in the vehicle.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0015] Referring to FIGS. 1 and 2, a portable vacuum cleaner 10 in accordance with an exemplary embodiment is provided. The portable vacuum cleaner 10 comprises a housing 12, a vacuum hose 14, a vacuum-generating device 17, a nozzle 22, a retraction device 33, a power cord 35, and a power socket 34.

[0016] The housing 12 is provided to hold the vacuum-generating device 17 therein. The housing 12 has a groove or multiple grooves extending around the periphery of the housing 12 for receiving and holding the vacuum hose 14 therein. In particular, the vacuum hose 14 is wrapped around the groove extending around a periphery 40 of the housing several times in an overlapping manner as shown in FIG. 4. Furthermore, the vacuum hose 14 is retained in close contact with the periphery of the housing 12. Because the vacuum hose 14 is compressed against the groove extending around the periphery of the housing 12, the vacuum hose 14 is prevented from being damaged when the portable vacuum cleaner 10 is turned in any direction or if it is dropped on a hard surface. The housing 12 preferably has an oval periphery as shown in FIG. 3. In an exemplary embodiment, the housing 12 has a length of 350 mm, a height of 90 mm, and a width of 180 mm.

[0017] In accordance with an exemplary embodiment, and as illustrated in the Figures, the housing further comprises a plurality of tab members 17, each of which is configured to have a raised portion 19 for retaining the hose around the periphery of the housing when the hose is received in the groove or grooves formed around the housing.

[0018] In accordance with an exemplary embodiment, the tab members are located in a flange portion or portions 21 of the housing. Flange portions 21 define an upper limit and a lower limit of the grooves or grooves that traverse the periphery of the housing. In addition, a central rib or raised area 23 between the two flanges will provide a means for defining two grooves that traverse the periphery of the housing. Of course, more or less than two grooves are contemplated for use in exemplary embodiments of the present invention. In accordance with an exemplary embodiment, the hose and/or the nozzle are configured to have a diameter large enough so that it will cooperate with the groove as well as the tab members in order to secure the same to the housing. In accordance with an exemplary embodiment, the tab members are formed from a resilient material such as plastic or equivalents thereof wherein the tabs are capable of deflecting away from the hose as it is inserted into the groove and thereafter returning to its original position thus, causing the hose to be retained within the groove of the housing as well as providing ease of removal. In other words the tab members are configured for flexible movement with regard to the flange member and will have natural bias thus causing the same to be returned to an un-deflected position after a biasing force has been removed.

[0019] In addition, and in accordance with an exemplary embodiment, the housing of the vacuum cleaner is configured to receive the hose around its periphery to provide a compact exterior profile, which allows the vacuum cleaner to be easily stowed in an area beneath a vehicle seat (see FIG. 8).

[0020] Referring to FIG. 2, the vacuum-generating device 17 is provided to generate a vacuum in the vacuum hose 14. The vacuum-generating device 17 is disposed within the housing 12. The device 17 includes a removable filter 26, a fan 28, a motor 30, and a switch 32.

[0021] The removable filter 26 is provided for collecting dust particles. The removable filter 26 is disposed within the housing 12, which includes a cover (not shown) that is removably secured to the housing 12. The dust particles are filtered and maintained in the filter 26 until the filter 26 is cleaned or replaced by a user.

[0022] The fan 28 is provided for generating a vacuum in the vacuum hose 14 for drawing the dust particles into the housing 12. The fan 28 comprises a first side and a second side. Fan 28 has an exhaust port within the second side and an intake port within the first side. During operation, when an electrical current is routed from a power socket 34 to the motor 30 via a switch 32, the fan 28 is rotated, thereby producing a vacuum within the vacuum hose 14 for directing the dust particles into the filter 26.

[0023] The motor 30 is provided to rotate the fan 28. The motor 30 is preferably a lightweight DC motor.

[0024] The switch 32 is provided for controlling energization of the motor 30. The switch 32 is electrically coupled to the power cord 35. When the switch 32 has a closed operational position, the motor 30 is energized and rotates the fan 28. Alternately, when the switch 32 has an open operational position, the motor 32 is de-energized.

[0025] The vacuum hose 14 is provided for collecting the dust particles and routing the dust particles to the filter 26. The vacuum hose 14 is operably coupled to the housing 12 and is coupled to a first end of the housing 12. The vacuum hose 14 comprises a plastic tube. In an exemplary embodiment, the vacuum hose 14 has a length of at least 3 feet and a diameter of at least 1¼ inch. Referring to FIG. 4, a side view of the portable vacuum cleaner 10 is depicted where the vacuum hose 14 is wrapped around the groove extending around a periphery of the housing 40 for receiving and holding the vacuum hose 14 therein during storage.

[0026] The power cord 35 is provided for energizing the portable vacuum cleaner 10. The power cord 35 is operably coupled to the housing 12 and is electrically coupled between the switch 32 and the power socket 34. To be operable, it is required that the power cord 35 conduct electrical signals. Thus, the power cord 35 is typically composed of several conductors covered by required insulation layers. The power cord 35 has a relatively large length in order to allow the portable vacuum cleaner 10 to operate in any location within the vehicle 50. In an exemplary embodiment, the nozzle 22 has a length of 210 mm.

[0027] The retraction device 33 is provided to retract the power cord 35 at least partially within the housing 12 when the housing 12 is being stored. The device 33 is further configured to allow the power cord 35 to be dispensed out of the housing 12 by a user.

[0028] The power socket 34 is provided to route electrical current from a current source (not shown) to the retractable power cord 35.

[0029] The electrical lead 36 is provided for energizing the light emitting diode 24. The electrical lead 36 preferably is routed from the housing 12 through the vacuum hose 14 to the nozzle 22.

[0030] Referring to FIGS. 2, 5 and 6, the nozzle 22 is provided for collecting the dust particles. The nozzle 22 is configured to be coupled to an end of the vacuum hose 14 and includes a light emitting diode 24 and an electrical lead 36. The nozzle 22 is preferably made of a lightweight plastic material with a high resistance to heat and high endurance in order to optimize its ability to remove the dust particles from carpeting or hard surfaces. The light emitting diode 24 is provided for emitting a light when the motor 30 is energized. The light emitted by the light emitting diode 24 provides a user with better visual ability for locating the dust particles. The light emitting diode 24 is electrically coupled through the electrical lead 36 that extends through the vacuum hose 14 to the switch 32. As shown, the vacuum hose 14 is operably coupled to the housing 12 at the first end and operably coupled to the nozzle 22 at a second end.

[0031] Referring to FIG. 7, a use of the portable vacuum cleaner within a vehicle 50 will now be explained. The vehicle 50 includes seats 52 as shown. The user of the vehicle 50 has placed the portable vacuum cleaner 10 on top of the seat 52. The power cord 35 of the portable vacuum cleaner 10 is connected via the power socket 34 to an electrical source to energize the portable vacuum cleaner 10. Once the portable vacuum cleaner 10 is energized, the user is capable of utilizing the portable vacuum cleaner 10 to collect the dust particles within the vehicle 50. The portable vacuum cleaner 10 may be positioned in any location of the vehicle 50 for operation purposes.

[0032] Referring to FIG. 8, the portable vacuum cleaner 10 is easily stored in a compact manner under the seat 52 of the vehicle 50. In particular, the relatively small size of the portable vacuum cleaner 10 and the unique means for stowing the vacuum hose 14 enables the user to easily store the portable vacuum cleaner 10 within the vehicle 50.

[0033] While the invention has been described with reference to an exemplary embodiment, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the invention. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the invention without departing from the essential scope thereof. Therefore, it is intended that the invention not be limited to the particular embodiment disclosed as the best mode contemplated for carrying out this invention, but that the invention will include all embodiments falling within the scope of the present application.

What is claimed is:

1. A portable vacuum cleaner, comprising:

a vacuum generating device; and

a housing configured to hold the vacuum generating device therein, the housing having a groove extending around a periphery of the housing for receiving and

holding a vacuum hose therein during storage of the housing, the vacuum hose having first and second ends, the first end being operably coupled to the vacuum generating device.

2. The portable vacuum cleaner of claim 1, further comprising a power cord retraction device disposed in the housing, the device configured to retract a power cord at least partially into the housing, the power cord being electrically connected to the vacuum generating device.

3. The portable vacuum cleaner of claim 1, wherein a nozzle is attached to the second end of the vacuum hose.

4. The portable vacuum cleaner of claim 3, wherein the nozzle includes a light emitting diode configured to emit a light.

5. The portable vacuum cleaner of claim 4, wherein an electrical lead is incorporated within the vacuum hose and is electrically coupled to the light emitting diode.

6. The portable vacuum cleaner of claim 1, wherein the periphery of the housing is an oval periphery.

7. The portable vacuum cleaner of claim 1, wherein the housing is configured to be stored within a storage compartment of a vehicle seat of the vehicle.

8. The portable vacuum cleaner of claim 1, wherein the housing further comprises a plurality of retention tabs disposed in an upper flange and a lower flange of the housing, wherein the plurality of retention tabs are configured to engage a portion of the vacuum hose.

9. A method for storing a vacuum hose of a portable vacuum cleaner, the method comprising:

disposing the vacuum hose in a groove extending around a periphery of a housing of the portable vacuum cleaner; and

retracting, at least partially, a power cord into the housing.

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