HAIR CARE APPLIANCE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Application No. 17/737,518 filed on May 5, 2022 and entitled "Hair Care Appliance," to U.S. Application 17/737,565 filed on May 5, 2022 and entitled "Hair Care Appliance," to U.S. Application No. 17/737,596 filed on May 5, 2022 and entitled "Hair Care Appliance," each of which claims priority to U.S. Provisional Application No. 63/279,041 filed on November 12, 2021 and entitled "Hair Care Appliance," each of which is hereby incorporated by reference herein in their entireties.

BACKGROUND

[0002] Hair care appliances are devices used for drying and styling of hair. Hair care appliances can include a variety of components operable to provide a fluid flow via a fluid flow path extending through the device. The fluid flow path receives ambient air and directs the ambient air through the hair care appliance via a motor and fan assembly. The fluid flow path is directed across a heating assembly to generate heated air at an outlet of the hair care appliance. Air is expelled from the hair care appliance via the fluid flow path to enable a user to dry or style hair. One or more attachments are often used with the hair care appliance depending on the user's hair styling or treatment needs.

SUMMARY

[0002a] According to an aspect, there is provided a hair care appliance, including: a handle and a body coupled to the handle at a joint such that the body is movable between a straight configuration in which the body is aligned with a longitudinal axis of the handle, and a fully bent configuration in which the body extends along an axis that is transverse to the longitudinal axis of the handle, the handle and the body having a total length in the straight configuration, and the handle having a length that is about 2/3 the total length and the body having a length that is about 1/3 the total length.

[0003] In general, hair care devices and accessories are provided for use in drying and/or styling hair. In one embodiment, a hair care appliance is provided and can include a handle and a body movably coupled to one another at a joint such that the body can be movable between a straight configuration in which the body can be longitudinally aligned with a longitudinal axis of the handle and a bent configuration in which the body can extend along an axis transverse to the longitudinal axis of the handle. The handle and the body can have a fluid flow path extending there through from an inlet in the handle to an outlet in the body,

and a first diverter disposed in the body and configured to partition fluid in the fluid flow path in both the straight and bent configurations.

[0004] In another embodiment, the diverter can extend in a plane transverse to the longitudinal axis of the body. In another embodiment, the hair care appliance can include a second diverted in the handle. The second diverter can distribute the fluid flow in a uniformly radial manner in the handle. In another embodiment, at least a portion of the joint can extend into the fluid flow path such that fluid flow is non-linear through the joint. In another embodiment, the joint can include a rotation joint rotatable about a plane extending at an angle relative to the longitudinal axis of the handle. In an exemplary embodiment, the angle can have a range of about 30 to 50 degrees. In another embodiment, the hair care appliance can include a heater positioned between the diverter and the outlet. In another embodiment, the hair care appliance can include a heater positioned between the first diverter and the outlet, the first diverter being configured to direct the fluid flow in a radially uniform manner through the heater. The first diverter can be configured to distribute the fluid flow equally into an upper portion and a lower portion through the heater and the outlet. In another embodiment, the first diverter can include rounded edges reducing turbulence of the fluid flow over the diverter. In another embodiment, the fluid flow path can be sealed within the handle and the body.

[0005] In another embodiment a hair care appliance is provided and can include a housing including a handle having an inlet, a body coupled to the handle and having an outlet, and a fluid flow path through the housing between the inlet and the outlet. The body can be movable between a straight configuration in which the body extends along a longitudinal axis of the handle, and a bent configuration in which the body extends along an axis transverse to the longitudinal axis of the handle. The hair care appliance can also include a fan assembly disposed within the housing and configured to generate a flow of fluid at a flow rate from the inlet along the fluid flow path to the outlet. The flow rate in the bent configuration can be no more than 11 percent less than the flow rate in the straight configuration.

[0006] In another embodiment, the body can extend obliquely to the handle in the bent configuration. In another embodiment, the handle can have a length that is greater than a length of the body. In another embodiment, the flow rate in the bent configuration can be in a range of about 18.0 m/s to 31.5 m/s, and the flow rate in the straight configuration can be in a range of about 18.5 m/s to 35.5 m/s. A ratio of a maximum flow rate to a minimum flow rate can be used to demonstrate the consistency of flow rate provided by the hair care appliance in the bent and straight configurations. For example, in an embodiment, a max:min ratio of the

flow rate in the bent configuration can be about 1.7, and a max:min ratio of the flow rate in the straight configuration can be about 1.6. In another embodiment, the fan assembly can be disposed within the handle adjacent to a pivot joint formed between the handle and the body.

[0007] In another embodiment a hair care appliance is provided and can include a handle and a body movably coupled to one another at a joint. The handle and the body can have a fluid flow path extending there through between an inlet in the handle and an outlet in the body. The handle can have a printed circuit board (PCB), a fan assembly having a central shaft and a plurality of vanes extending radially outward from the central shaft, and a hub disposed between the PCB and the fan assembly. The hub can include a central dome configured to direct fluid flowing around the PCB radially outward toward the plurality of vanes.

[0008] In general, hair care devices and accessories are provided for use in drying and/or styling hair. In one embodiment, a hair care appliance is provided and can include a handle and a body coupled to the handle at a joint such that the body can be movable between a straight configuration in which the body can be aligned with a longitudinal axis of the handle, and a bent configuration in which the body can extend along an axis that is transverse to the longitudinal axis of the handle. The handle and the body can have a center of mass that is located below a longitudinal axis of the body and forward of the longitudinal axis of the handle in the bent configuration.

[0009] In another embodiment, the handle can include a first end defining an inlet, and a second end at the joint, and the body can include a first end at the joint and a second end defining an outlet. In another embodiment, a printed circuit board can be located within the handle and is positioned closer to the first end than the second end of the handle. In another embodiment, a motor and fan can be located within the handle and are positioned closer to the second end than the first end of the handle. In another embodiment, a heater can be located within the body and is positioned closer to the second end than the first end of the body. In another embodiment, the hair care appliance can include a heater assembly located in the body and can have a center point offset radially from a longitudinal axis extending through the handle when the body is in the bent configuration. In another embodiment, the handle and body can have a center of gravity that can be offset radially from a longitudinal axis of the handle and the body in the bent configuration and in the straight configuration. The center of gravity in the bent configuration can be offset radially by a distance that is greater than a distance of the center of gravity from the longitudinal axis in the straight configuration.

[0010] In another embodiment, a hair care appliance is provided and can include a handle and a body coupled to the handle at a joint such that the body can be movable between a straight configuration in which the body can be aligned with a longitudinal axis of the handle, and a fully bent configuration in which the body extends along an axis that can be transverse to the longitudinal axis of the handle, the handle and the body having a total length in the straight configuration, and the handle having a length that is about 2/3 the total length and the body having a length that is about 1/3 the total length.

[0011] In another embodiment, in the straight configuration, the joint can be configured to release the body from the handle to initiate rotation of the joint in response to a force in a range of about 3.1 N to 3.6 N. In another embodiment, in the bent configuration, the joint can be configured to release the body from the handle to initiate rotation of the joint in response to a force in a range of about 5.1 N to 5.3 N. In another embodiment, when the joint can be in a position between the straight configuration and the fully bent configuration, the joint can be configured to rotate in response to a force in a range of about 3.6 N to 4.0 N. In another embodiment, the joint can be configured to rotate in response to a torque in a range of about 0.1 N to 0.7 N.

[0012] In another embodiment, a hair care appliance is provided and can include a housing comprising a handle and a body coupled to the handle and movable between a straight configuration in which the body can be aligned with a longitudinal axis of the handle, and a bent configuration in which the body can extend along an axis that is transverse to the longitudinal axis of the handle. The hair care appliance can include a fan assembly disposed within the housing and configured to direct fluid along a fluid flow path from a fluid inlet in the housing to a fluid outlet in the housing. The hair care appliance can include a heater assembly disposed within the housing and configured to heat fluid flowing through the fluid flow path. The body can be cylindrical with a constant outer diameter and the handle is cylindrical with a tapering outer diameter.

[0013] In another embodiment, the hair care appliance can include a rotational joint rotatable to move the body relative to the handle in response to actuation of an actuation mechanism in the handle. In another embodiment, the rotational hinge joint can include a snap hinge assembly including a retainer and a gasket positioned on the retainer. In another embodiment, the snap hinge assembly can be positioned between a handle hinge plate and a body hinge plate separated by a gap formed between the handle hinge plate and the body hinge plate. In another embodiment, the handle hinge plate can include a first plurality of snap fit features configured to couple the handle hinge plate to a handle frame, and the body

hinge plate can include a second plurality of snap fit features configured to couple the body hinge plate to a body frame.

[0014] In another embodiment, a hair care appliance is provided and can include a housing having a handle and a body. The housing can have a fluid inlet, a fluid outlet, and a fluid flow path extending there through between the fluid inlet and the fluid outlet. The hair care appliance can include a heater assembly disposed in the housing along the fluid flow path and configured to heat fluid flowing through the fluid flow path. The heater assembly can include an inner support structure comprising a central shaft and a plurality of planar segments extending along and radially outward from the central shaft. Each planar segment of the plurality of planar segments can be spaced circumferentially from one another. The heater assembly can also include at least one wire element extending circumferentially around the inner support structure such that the inner support structure supports the at least one wire element. Each of the plurality of planar segments can include a cut-out formed therein and configured to allow fluid flow there through.

[0015] In another embodiment, the heater assembly can also include a thermistor having first and second connecting wires that can be mounted to at least one of the plurality of planar segments to suspend the thermistor in the fluid flow path at the fluid outlet. The first and second wires together can form a u-shaped configuration. In another embodiment, the thermistor can be suspended between two adjacent planar segments of the plurality of segments via the first and second wires. The heater assembly can also include a fuse coupled to one of the two adjacent planar segments.

[0016] In another embodiment, the hair care appliance can include a rotational hinge joint between the handle and the body. Wiring powering the heater assembly can be routed along a periphery of the rotational hinge joint and along an inner surface of the handle and the body. In another embodiment, the cut-outs formed in each of the plurality of planar segments can have a shape selected from the group consisting of a rectangular shape, a square shape, a circular shape, a geometric shape, and an ellipsoid shape. In another embodiment, the heater assembly also includes an ionizer coupled to at least one planar segment of the plurality of planar segments. In another embodiment, the heater assembly also includes a cylindrical housing enclosing the inner support structure and the at least one wire element.

[0017] In another embodiment, a hair care appliance is provided and can include a housing comprising a handle having a first end with a fluid inlet formed therein and a second end, and a body having a first end coupled to the second end of the handle and a second end with a fluid outlet formed therein. The hair care appliance can include a fluid pathway extending

through the housing between the fluid inlet in the handle and the fluid outlet in the body. The hair care appliance can also include a fan assembly disposed in the housing along the fluid pathway for directing fluid from the fluid inlet to the fluid outlet. The hair care appliance can also include a heater assembly disposed in the housing along the fluid pathway for heating fluid flowing through the fluid pathway. The hair care appliance can further include a user interface surface extending along a portion of the handle and including at least one button for controlling at least one of the fan assembly and the heater assembly. The user interface surface can extend from the first end of the handle toward the second end.

[0018] In another embodiment, the fluid inlet can extend at least partially around a circumference of the handle at the first end of the handle, and the user interface surface intersects the fluid inlet. In another embodiment, the at least one button can be flush or sub-flush within respect to the user interface surface. In another embodiment, the user interface surface can include an elongate region having opposite edges extending longitudinally along the handle to facilitate gripping of the handle. In another embodiment, the fluid inlet can include a substantially C-shaped cylindrical porous outer housing and a filter disposed therein. In another embodiment, the user interface can intersect the substantially C-shaped cylindrical porous outer housing and the filter. In another embodiment, the user interface can be located in a scalloped portion of the handle. In another embodiment, the user interface can include at least one illumination element illuminating the at least one button or a surface of the user interface. In another embodiment, the hair care appliance can also include a blow-out button for shutting off the heater assembly to cause non-heated fluid to flow through the fluid pathway. In another embodiment, the at least one button controlling the fan assembly can be repeatedly engaged to select at least one velocity setting of the fan assembly. In another embodiment, the at least one button controlling the heater assembly can be repeatedly engaged to select at least one temperature setting of the heater assembly.

DESCRIPTION OF DRAWINGS

[0019] These and other features will be more readily understood from the following detailed description taken in conjunction with the accompanying drawings, in which: