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(54) **BLOW DRYER AND CONTROLS FOR SAME**

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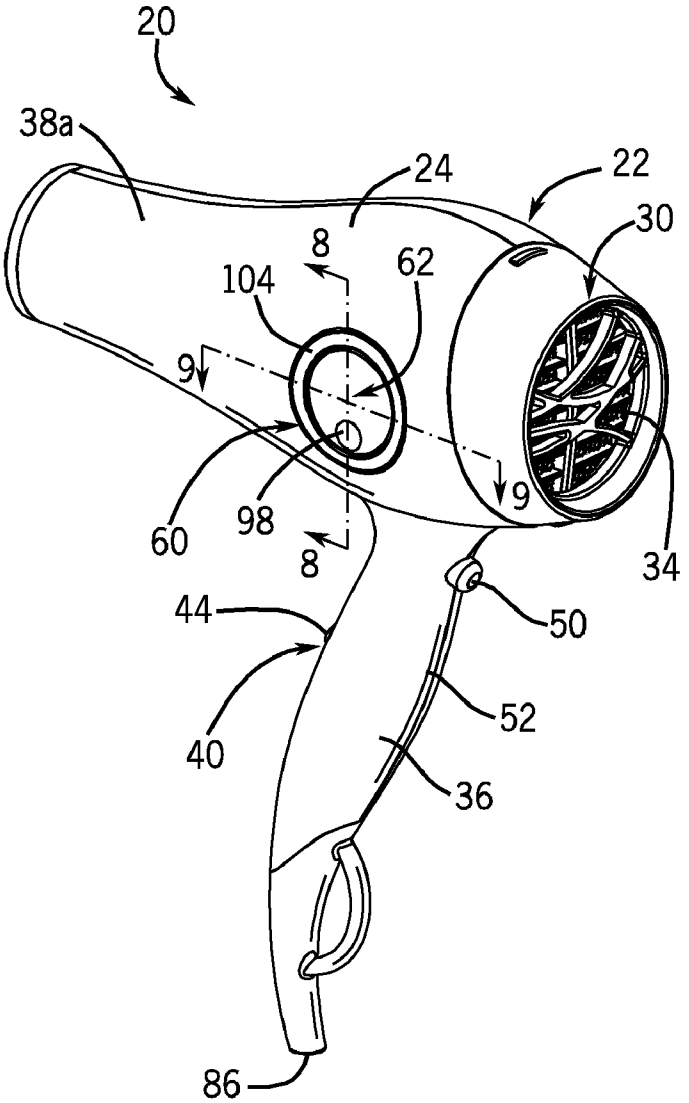
(57) **ABSTRACT**

A hand-held hair dryer has a body with an air intake and an outlet nozzle. A heating element is positioned within the body between the air intake and the outlet nozzle. A handle extends from the body and defines a hand grip. A temperature controller is located on a surface of the body and configured to control the temperature of the heating element. The temperature controller can lie essentially flush with or below a level of the surface of the body around the temperature controller. A motor control switch can be provided on the handle to operate a motor for directing air from the intake to the heating element and then to the outlet nozzle.



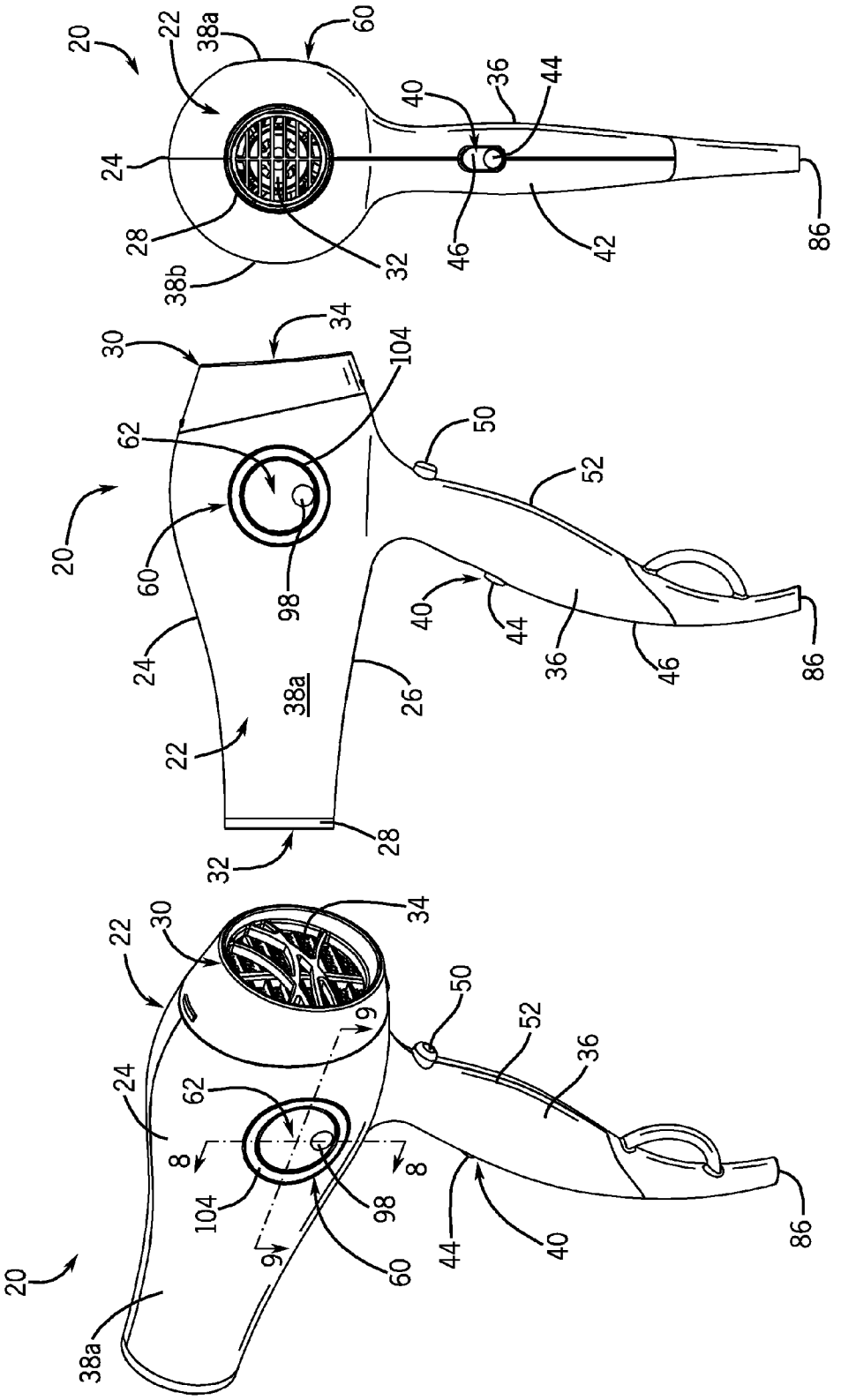


FIG. 3

FIG. 2

FIG. 1

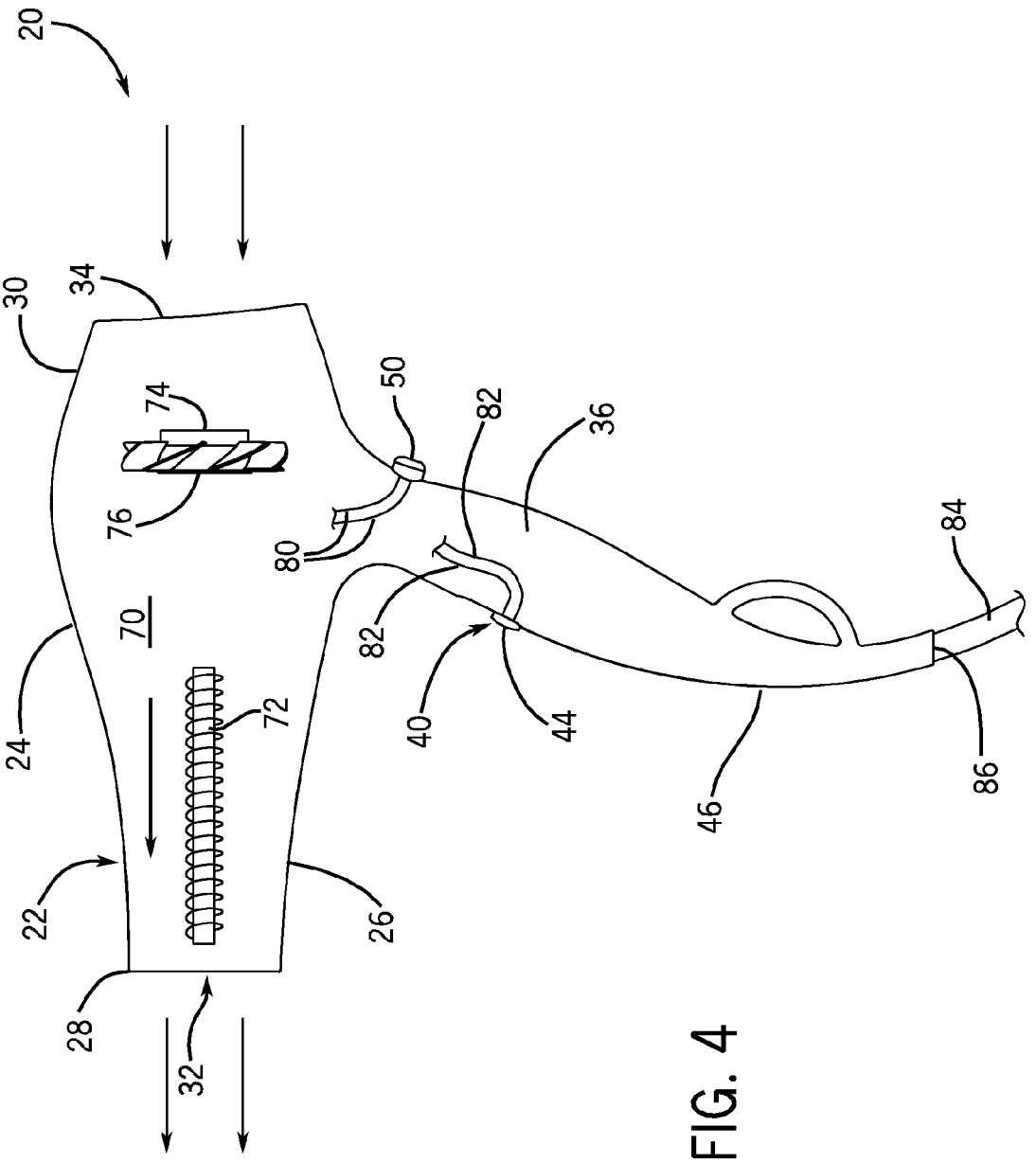


FIG. 4

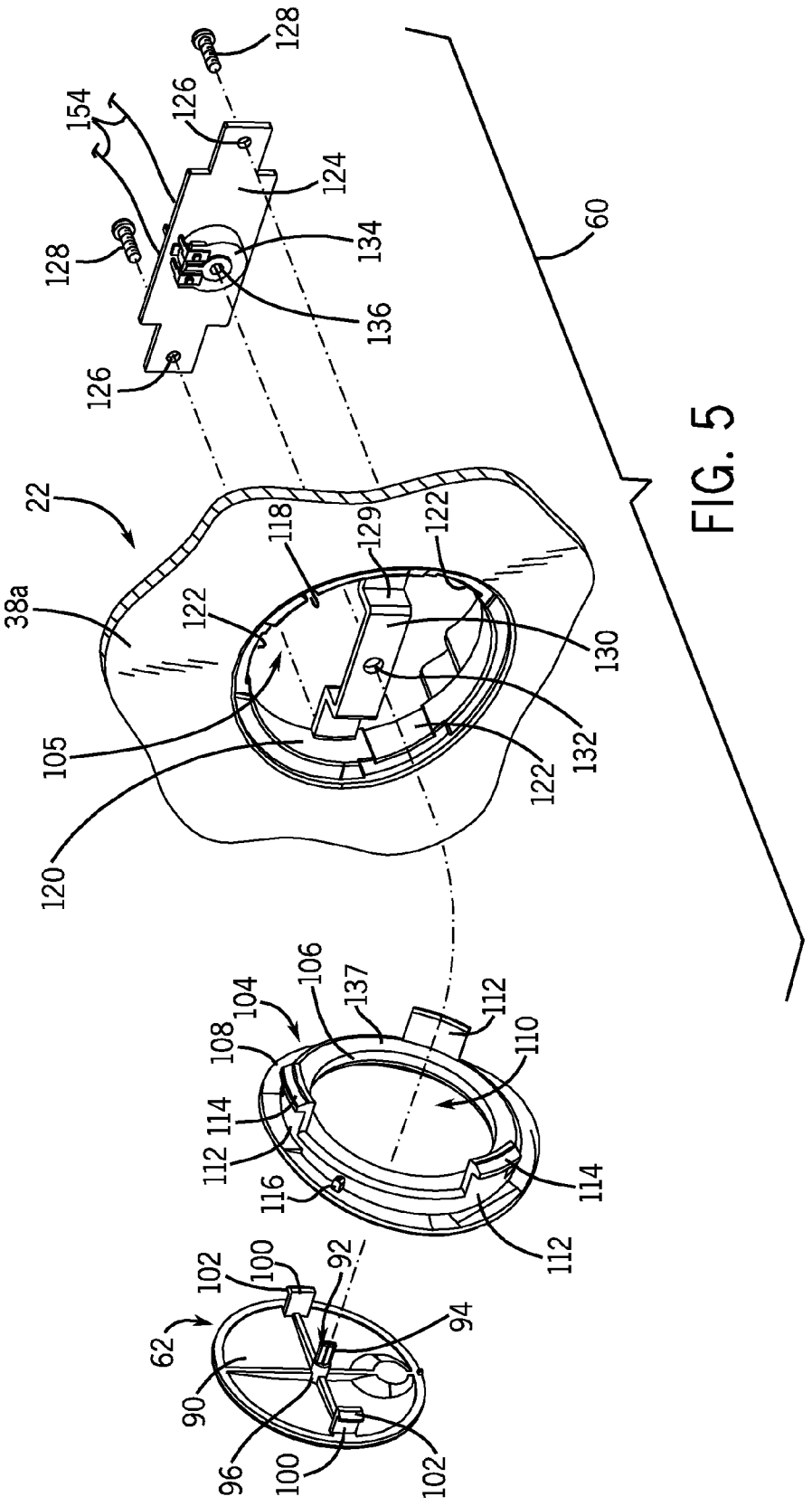

128
126
154
124
134
136
60
22
118
129
122
38a
130
105
120
132
106
104
137
112
108
110
114
116
62
102
100
92
94
90
96

FIG. 5

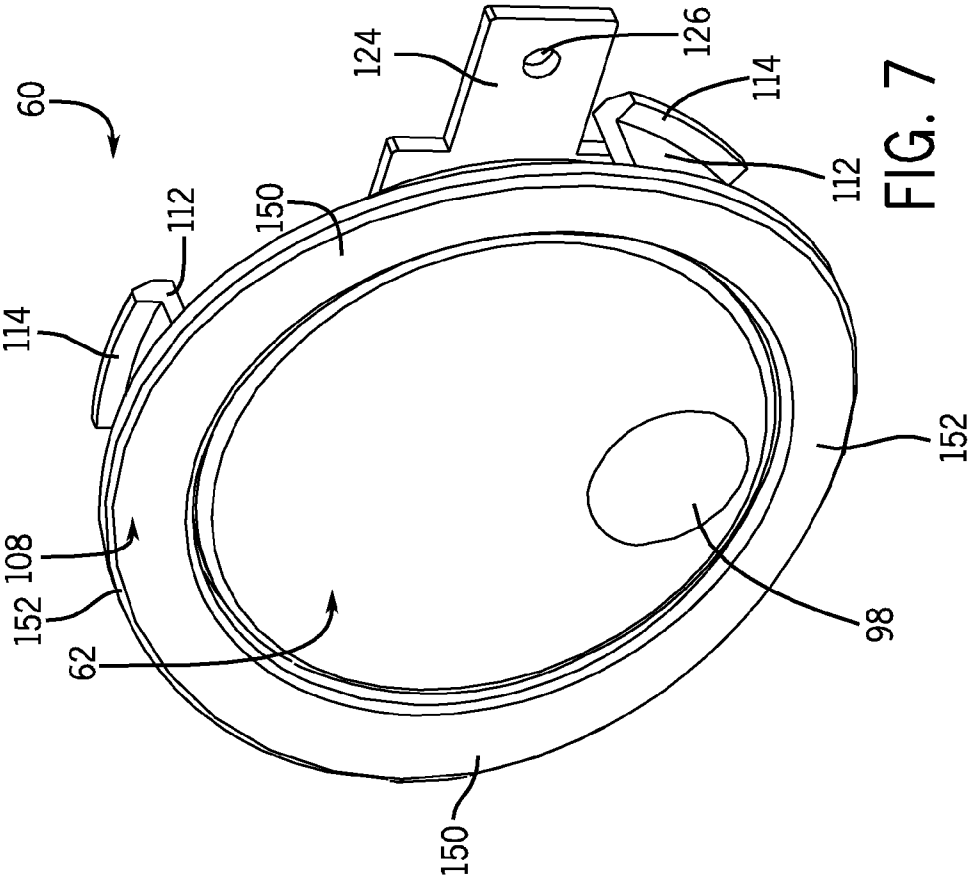

60
124
126
114
112
150
112
114
152
108
152
62
98
150

FIG. 7

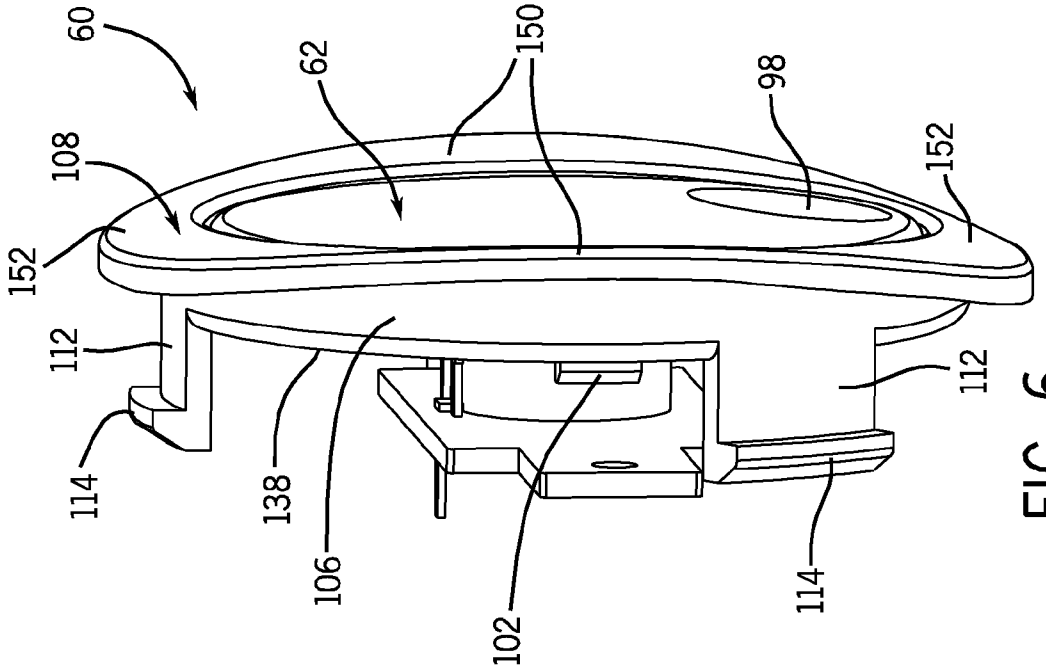

60
62
150
98
152
108
152
112
112
114
138
106
102
114

FIG. 6

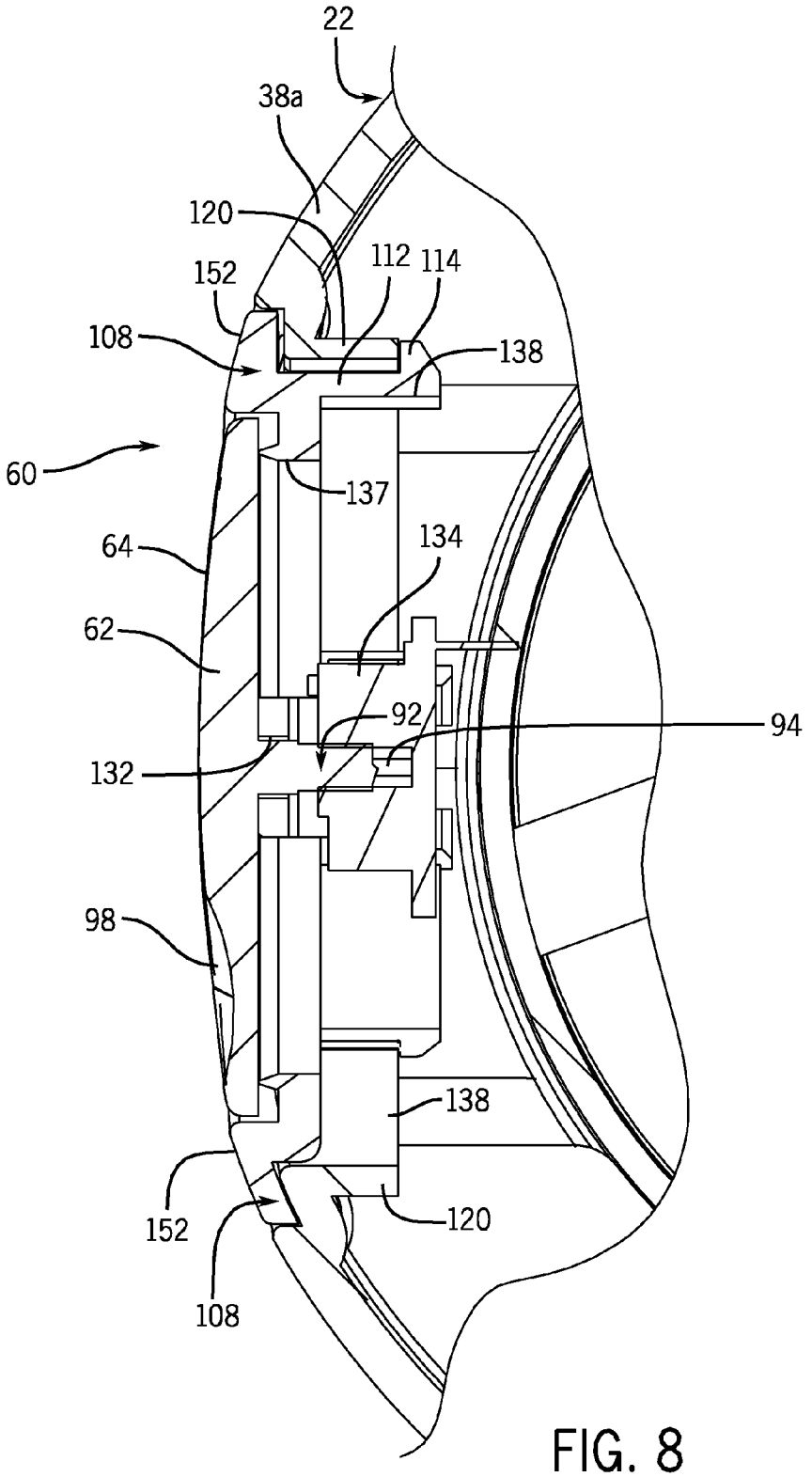

22
38a
120
112
114
152
108
138
60
137
64
134
62
92
94
132
98
138
152
120
108

FIG. 8

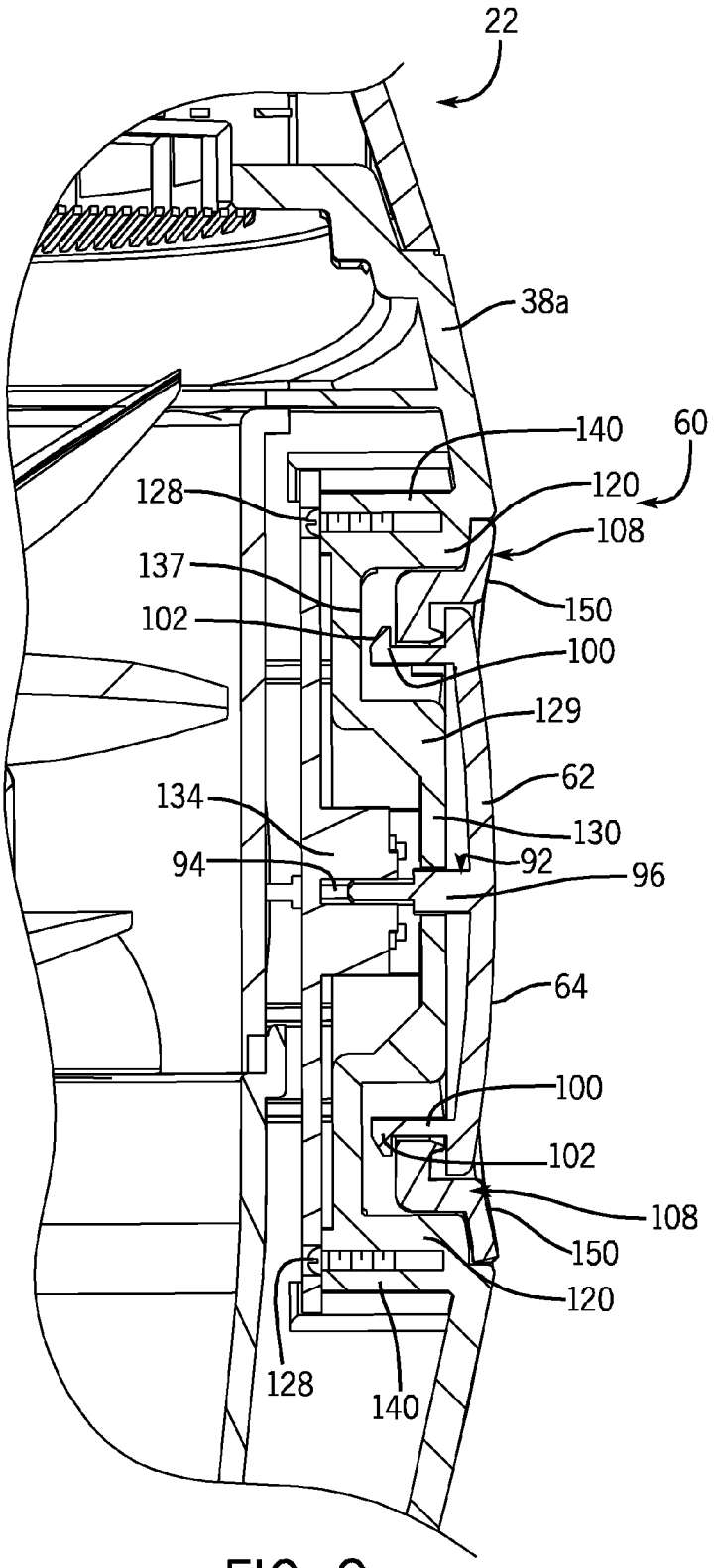

22
38a
140
60
128
120
108
137
150
102
100
129
62
134
130
94
92
96
64
100
102
108
150
120
128
140

FIG. 9

BLOW DRYER AND CONTROLS FOR SAME

BACKGROUND

[0001] 1. Field of the Disclosure

[0002] The present invention is generally directed to hand-held hair dryers, and more particularly to a blow dryer with improved controls and control placement.

[0003] 2. Description of Related Art

[0004] Most hand-held hair dryers or blow dryers generally have a body and a handle that extends from the body. The user holds the blow dryer by the handle and aims an outlet nozzle such that warm or hot air toward is directed toward the user's head to dry their hair. The various controls to operate the blow dryer are typically found on the forward or front facing surface of the handle. The blow dryer controls are typically configured in the form of one or more toggle switches or slide-type switches. A conventional slide or toggle-type switch has two or three discrete settings or positions selectable by the user. The user can turn the blower or fan motor on or off and can typically choose between at least a low speed and high speed fan or motor setting.

[0005] A number of blow dryers also have a control so that the user can choose between optional air temperature settings, such as between low and high heat settings, or between low, medium, and high, heat settings. In addition, some blow dryers have a "cool shot" button located on the handle as well. The cool shot button is also typically located on the handle, but sometimes at a position different from the main blow dryer control switches. A cool shot button can be pressed to turn off the heating element but not the fan motor, thus allowing a user to direct unheated or ambient air from the blow dryer.

[0006] It can be difficult for a user to hold or grasp the blow dryer by the handle and at the same time operate or adjust the various controls, i.e., the switches and/or buttons. This is because these various devices are located on the handle itself, often covered by the user's hand grasping or gripping the handle. Thus, a user must typically hold the body of the blow dryer with one hand while selecting the appropriate operation modes for the various controls and then re-grasp the handle for use. It is also possible, while using the blow dryer, to accidentally or inadvertently alter one or more of the settings of the blow dryer. This is because the user's hand may inadvertently contact one or more of the switches and/or buttons and change its setting unintentionally.

[0007] Manufacturers of hand-held hair dryers or blow dryers have attempted to improve ergonomics of the controls on such devices. In one example, a hair dryer has been produced that eliminates the handle altogether and requires the user to hold the body of the blow dryer like a football. Such a blow dryer has been found by many users to be difficult to hold and operate. This is partly because the blow dryer body with no handle is quite unconventional. The body may also be more expensive to manufacture because the body must be adequately insulated or heat-shielded so that the body does not become too hot to hold during use. In other examples, manufacturers offer blow dryers with handles having the controls placed at different locations on the handle, such as on the sides or the back surface of the handle. These solutions, however, have not provided ready and easy access to, and adjustment of, such controls.

[0008] Some manufacturers utilizing slide-type switches for one or both the fan motor control and the temperature control while other manufacturers utilize a toggle-type switch for one or both of these controls. However, regardless of the type of control, the switches are typically under or directly adjacent the hand of the user grasping the handle during use of the blow dryer. Thus, it is difficult for a user to adjust any of the settings of the blow dryer on the fly, i.e., while using the blow dryer or even while simply holding the blow dryer by the handle.

[0009] In addition, the typical controls with discrete setting positions provided on the blow dryer handle limit the number of setting options from which a user can choose. The typical blow dryer fan motor control may utilize a switch that allows for off, low, or high fan speed settings. The typical blow dryer with heat control may have a heat or temperature control switch that has, at most, a low, medium, and high heat setting. Thus, not including the off position, the typical blow dryer may allow for only six different heat and fan speed combinations selectable by the user.

SUMMARY

[0010] In one example according to the teachings of the present invention, a hand-held hair dryer has a body with an air intake and an outlet nozzle. A heating element is located within the body between the air intake and the outlet nozzle. A handle extends from the body and defines a hand grip. A temperature controller is positioned on a surface of the body and is configured to control the temperature of the heating element. The temperature controller can lie essentially flush with or below a level of the surface of the body around the temperature controller. The temperature controller can be provided on either side surface of the body, or could alternatively be provided on a top or bottom of the body. Such positioning allows a user to access and adjust the temperature controller while grasping the handle of the hair dryer. The flush or recessed configuration of the temperature controller permits the body to be laid on a surface without altering the selected temperature controller position or damaging the temperature controller.

[0011] In one example, the temperature controller can be a rotatable dial that can be positioned on a side of the body and can have an outward facing surface.

[0012] In one example, the hair dryer can include a bezel that snaps into an opening in the body and surrounds the temperature controller.

[0013] In one example, the temperature controller can be a rotatable dial surrounded by a bezel and having an outward facing surface.

[0014] In one example, the temperature controller can include an opening through the surface of the body, a support element within and spanning a width of the opening, and a rotatable dial received in the opening and having a pivot stem extending through a hole in the support element.

[0015] On one example, the hair dryer can include a circuit board mounted to a support element and coupled to the heating element. The circuit board can be configured for controlling the temperature of the heating element according to a position of the temperature controller. In one example, the temperature controller can be a rotatable dial on a surface of the body.

[0016] In one example, the temperature controller can be a rotatable dial on a surface of the body and can have a pivot stem keyed to an opening in a variable resistance device coupled to a circuit board whereby rotation of the dial effects adjustment of the variable resistance device.

[0017] In one example, the temperature controller can include an opening through the surface of the body, a support element within and extending across the opening, a bezel snapped onto the surface of the body and surrounding the opening, and a rotatable dial surrounded by the bezel and having a central pivot stem extending through a hole in the support element, the dial rotatable about the pivot stem.

[0018] In one example, the temperature controller can be a dial that snaps into a bezel on the body.

[0019] In one example, the temperature controller can be a dial that has a pair of snap fingers that is received through and snaps onto a bezel on the body.

[0020] In one example, the temperature controller can be a dial with one or more projections, such as a pair of snap fingers that limit rotational travel of the dial between a minimum heat position defining a minimum temperature setting and a maximum heat position defining a maximum temperature setting.

[0021] In one example, the temperature controller can be a rotatable dial with one or more projections, such as snap fingers, wherein one or both of the projections abut against a stop at the minimum heat position and at the maximum heat position.

[0022] In one example, the hair dryer can include a temperature control circuit board mounted adjacent to a support element on the body and coupled to a pivot stem of a rotatable dial of the temperature controller.

[0023] In one example, the temperature controller can be a rotatable dial with a pivot stem that is keyed to an opening in a variable resistance device on a circuit board whereby rotation of the dial effects adjustment of the variable resistance device.

[0024] In one example according to the teachings of the present invention, a hand-held hair dryer or blow dryer has a body with an air intake, an outlet nozzle, and a flow path therebetween. A fan motor and fan are located within the body and configured to draw air into the air intake, direct the air along the flow path, and force the air from the body through outlet nozzle. A heating element is located within the body between the air intake and the outlet nozzle. A handle extends from the body and defines a grip portion. A motor control switch can be positioned on the handle and configured to operate the fan motor. A temperature controller is located on a side surface of the body and is configured to control the temperature of the heating element. The temperature controller can be provided on either side surface of the body. Such positioning allows a user to access and adjust the temperature controller while grasping the handle of the hair dryer.

[0025] In one example, the temperature controller can be a dial rotatable between a minimum heat position defining a minimum temperature setting and a maximum heat position defining a maximum temperature setting. The dial can be adjustable to any selected heat position and desired temperature setting therebetween.

[0026] In one example, the temperature controller can be a dial having an outward facing surface that lies flush with or below a level of the surface of the body around the dial.

[0027] In one example, a cool shot button can be positioned on the handle and spaced from the motor control switch.

[0028] In one example, a cool shot button can be positioned so as to be operable by one hand of a user grasping the grip portion of the handle, wherein the motor control switch can be positioned so as to be operable by the one hand grasping the grip portion, and wherein the temperature controller can be operable by the other hand of the user with the one hand grasping the grip portion.

[0029] In one example, the temperature controller can lie flush with or below a level of the surface of the body around the temperature controller.

BRIEF DESCRIPTION OF THE DRAWINGS

[0030] Objects, features, and advantages of the present invention will become apparent upon reading the following description in conjunction with the drawing figures, in which:

[0031] FIG. **1** shows a rear perspective view of one example of a hand-held hair dryer or blow dryer constructed in accordance with the teachings of the present invention.

[0032] FIG. **2** shows a side view of the blow dryer shown in FIG. **1**.

[0033] FIG. **3** shows a front view of the blow dryer shown FIG. **1**.

[0034] FIG. **4** shows a side schematic view of the blow dryer shown in FIG. **1** with simplified representations of the basic internal components of the blow dryer.

[0035] FIG. **5** shows an exploded perspective view of the temperature controller on the blow dryer shown in FIG. **1**.

[0036] FIGS. **6** and **7** show alternate perspective views of the assembled temperature controller shown in FIG. **5**.

[0037] FIG. **8** shows a cross-section taken along line **8-8** of the temperature controller on the blow dryer shown in FIG. **1**.

[0038] FIG. **9** shows a cross-section taken along line **9-9** of the temperature controller on the blow dryer shown in FIG. **1**.

DETAILED DESCRIPTION OF THE DISCLOSURE

[0039] The disclosed hand-held hair dryer or blow dryer employs controls that solve or improve upon one or more of the above-noted and/or other problems and disadvantages with prior known blow dryers. In one example, the disclosed blow dryer has a temperature controller in the form of a rotary dial on the side of the body for adjusting the temperature setting of the blow dryer. In one example, the temperature controller has an outward facing surface that is flush with or below a level of a surface of the body around the temperature controller. In one example, the disclosed blow dryer has a temperature controller that can be operated by one hand of a user while grasping the handle of and operating the blow dryer with their other hand. In one example, the disclosed blow dryer has a fan motor control positioned on the handle of the blow dryer and a temperature controller positioned on the body of the blow dryer. In one example, the temperature controller can be operated or adjusted by the user with one hand while their other hand grasps the handle of the blow dryer. These and other objects, features, and advantages of the present invention will become apparent upon reading this disclosure.

[0040] Turning now to the drawings, FIGS. **1-3** shows one example of a hand-held hair dryer or blow dryer **20** constructed in accordance with the teachings of the present invention. In the disclosed example, the blow dryer **20** has a body **22** that is generally circular in cross-section, but which has a varying diameter over its length. The body **22** has a top **24**, a bottom **26**, a front end **28**, and a rear end **30**. The front end **28** has an opening that defines a nozzle outlet **32** for the blow dryer. The rear end **30** has an opening that defines an air intake **34** for the blow dryer. A handle **36** extends downward

from the bottom **26** of the body **22**. The body **22** also has a pair of opposed left and right sides **38** extending from the front end **28** to the rear end **30**. As is known in the art, the body **22** generally has a larger size or diameter near the rear end **30** and tapers to a smaller diameter or size toward the front end **28**. This configuration can help with increasing the velocity of air exiting the nozzle outlet **32**. The handle **36** has an elongate configuration this is shaped and smoothly contoured to form a grip or grasping portion that can be comfortably grasped and held by a user.

[0041] The configuration and construction of the body **22** and handle **36** can vary considerably within the spirit and scope of the present invention. Many aspects of the shape and configuration of the body **22** in this example may be ornamental in nature and not necessarily tied to the function of the blow dryer, and particularly not tied to the function of the invention as disclosed herein. In addition, the materials utilized to fabricate the body **22** can also vary. In many cases, blow dryers of this type are formed of molded plastic or other such materials. Higher-end blow dryers may sometimes be formed of stainless steel, aluminum, or other more expensive materials. The blow dryer **20** disclosed and described herein is not intended to be limited to a specific body shape or configuration, or to specific materials to form the body.

[0042] In general, the blow dryer **20** has a fan speed control or fan motor control **40** provided on a front surface **42** of the handle **36**. The motor control **40** in this example includes a slide switch **44** seated in a slot or pocket **46** in the handle **36**. The motor control **40** can be provided having an off position, a low fan speed position, and a high fan speed position. Alternatively, the fan motor control **40** can be provided having more than two motor speed positions. The fan motor control **40** can be positioned along the handle **36** so that user's index finger or another finger can manipulate the switch **44** while the user's hand grasps the handle. Alternatively, the user can select the appropriate or desired fan speed using either hand, prior to grasping handle **36**.

[0043] The blow dryer **20** in this example also has a cool shot button **50** positioned on a back surface **52** of the handle **36**. The cool shot button **50** protrudes through the handle **36** and is positioned near the top of the handle near where the handle meets the bottom **26** of the body **22**. The cool shot button **50** is best positioned on the handle **36** so that a user can depress the button, as explained below, during use of the blow dryer and while grasping the handle. The placement of the cool shot button **50** in this example is such that the user can depress the button with the thumb of the hand grasping the handle **36**. The button **50** can be placed in alternate locations on the blow dryer **20**, if desired. Alternatively, the cool shot button **50** may be optional and not provided as a part of the blow dryer **20**.

[0044] In accordance with the teachings of the present invention, the disclosed blow dryer **20** also has a temperature controller **60** positioned on the left side **38***a* of the body **22**. As will be evident to those having ordinary skill in the art, the temperature controller **60** can also be positioned on the right side **38***b* of the body, if desired. It is also possible that the temperature controller is positioned on the top **24** or the bottom **26** of the body **22** within the spirit and scope of the present invention. In the disclosed example, the temperature controller **60** has a rotatable or rotary dial **62** with an outward facing or front surface **64**. As described in greater detail below, the temperature controller **60** can be manipulated to adjust the air temperature produced by the blow dryer **20**. The user can manipulate the temperature controller **60** with their free hand while their other hand grasps the handle of the blow dryer **20** during use. Thus, the user can adjust the temperature of air exiting the blow dryer on the fly as needed without having to release the handle or put down the blow dryer, as prior art blow dryers require.

[0045] FIG. **4** illustrates a simplified schematic view of the blow dryer **20** and depicts the typical internal components of the blow dryer. In this example, an air passageway or air flow path **70** is formed along a lengthwise axis of the body **22** between the air intake **34** and the nozzle outlet **32**. A heating element **72** is disposed in the airflow path **70** upstream of the nozzle outlet **32**. As will be evident to those having ordinary skill in the art, the heating element **72** can be positioned virtually anywhere within the body **22** as long as air flowing through the blow dryer is heated by the heating element. The heating element **72** is not described in greater detail herein. The configuration and construction of the heating element **72** can vary considerably within the spirit and scope of the present invention, as long as the heating element is capable of heating air moved through the body **22** along the air flow path **70**.

[0046] A fan motor **74** is also disposed within the body **22** and in this example is positioned near the air intake **34** within the air flow path **70**. A fan **76** is coupled to and driven by the fan motor **74** to draw air into the body through the air intake and force the air through and along the airflow path **70** toward the nozzle outlet **32**. As used herein, the various terms describing the fan motor **74**, fan **76**, motor speed, and fan speed can refer generally to the fan and motor as a unit and how fast the fan rotates and how much air the fan moves. The fan **76** rotates faster and moves more air at higher speeds and rotates slower and moves less air at slower speeds, as is known in the art. The fan motor **74** and fan **76** are also not described in greater detail herein. Again, the configuration and construction of the fan motor **74** and fan **76** can vary considerably within the spirit and scope of the present invention, as long as the fan and motor are capable of moving air through the body **22** along the air flow path **70**.

[0047] FIG. **4** also shows in simplified schematic form a number of wire leads connecting the various controls of the blow dryer **20** to the internal components. For example, the cool shot button **50** is shown connected by wire leads **80** to the heating element **72**. This is shown to represent that the cool shot button **50** can be manipulated to turn off the heating element when the cool shot button is depressed, as desired by a user. Similarly, the motor control **42** and slide switch **44** is shown connected by wire leads **82** to the fan motor **74**. This is shown to represent that the switch **44** can be manipulated to turn the fan motor **74**, and thus the fan **76**, on and off and also to adjust the speed of the fan. An electrical cord **84** is shown extending from the bottom **86** of the handle **36**, whereby the blow dryer **20** can be plugged in for use. The electrical cord **84** is connected to the various controls of the blow dryer as is known in the art, though no such specific connections are depicted herein in the schematic of FIG. **4**. As discussed in greater detail below, the blow dryer **20** can include one or more printed circuit boards or other electronic devices to interconnect the various controls and internal components of the blow dryer and/or to add operational features, as desired.

[0048] An exploded view of the temperature controller **60** is illustrated in FIG. **5** and depicts the components of the controller. In this example, the rotatable dial **62** is a circular disc with a back side **90** opposite the outward or front facing

surface **64**. The dial **62** also has a stem **92** located at the center of the dial and projecting rearward from the back side **90**. A free end **94** of the stem **92** has a non-circular or keyed shape in this example. The proximal end **96** of the stem **92** is circular or round. With reference to FIGS. **2** and **5**, the outward facing surface **64** of the dial **62** has a finger depression **98** formed therein, which can be seen also from the back side **90** as a dimple. A pair of snap fingers **100** project rearward from opposite edges of the dial **62**. The snap fingers **100** are flexible and each has a catch tab **102** projecting radially outward from the end of the respective snap finger.

[0049] The temperature controller **60** in this example also has a bezel **104** that attaches to a surface of the body **22**. In this example, the bezel **104** attaches to the left side **38** of the body **22** and surrounds an opening **105** in the body. The bezel **104** in this example is generally circular and has a cylindrical skirt or ring portion **106** and an annular flange portion **108**. The annular flange portion **108** projects radially outward from one end of the skirt portion **106**. The bezel **104** has an open center **110** with a diameter sized to receive the dial **64** therein. In a disclosed example, three catch legs **112** project rearward from the skirt portion **106** away from the flange portion **108**. The three catch legs **112** are spaced apart equidistant from one another around the circumference of the bezel **104**. As with the aforementioned snap fingers **100**, each of the catch legs **112** also has an outward projecting catch tab **114** at a free end of the respective catch leg. A nub **116** protrudes rearward from a surface of the annular flange portion **108**. A corresponding notch **118** is provided within the opening **105** in the body **22**. When the bezel is installed on the body, the nub **116** aligns with and seats in the notch **118** to indicate proper orientation of the bezel **104** when attached to the body.

[0050] A cylindrical wall **120** extends rearward from the body **22** into and around the opening **105**. In this example, three guide tracks or races **122** are recessed into the cylindrical wall **120** and coincide with the position of the respective catch legs **112** on the bezel **104**. The guide tracks **122** assist in installing and properly aligning the bezel **104** in the opening **105** when installed.

[0051] In a disclosed example, a printed circuit board **124** is mounted to the blow dryer **20** on the interior of the body **22** and across the opening **105**. In this example, the printed circuit board **124** is an elongate object with opposed ends. Each of the opposed ends has a fastener opening **126** formed therethrough for receiving a screw or fastener **128** to secure the printed circuit board to the body **22**. A support bar **129** spans the width of the opening **105** and is connected to or formed as an integral part of the cylindrical wall **120** within the opening. In this example, the support bar **129** has a stepped out central region **130** formed with a stem hole **132** therethrough. The stem hole **132** defines the center of the opening **105** and is configured to receive the stem **92** of the dial **62** when the temperature controller **60** is assembled. The printed circuit board **124** in this example has a puck-shaped potentiometer or variable resistance device **134** mounted to the board. The variable resistance device **134** has a central receptacle or way **136** therein. The keyed portion **94** of the stem **92** is shaped to correspond with the shape of the receptacle or way **136**. The key/way arrangement of the stem portion **94** and receptacle **136** remits the dial **62** to move internal components and vary resistance within the variable resistance device **134**.

[0052] FIGS. **6** and **7** show the temperature controller **60** in an assembled state and including each of the components shown in FIG. **5**. FIGS. **8** and **9** illustrate the assembled and installed temperature controller **60** in cross-section. When assembled, the dial **62** is snapped into the open center **110** of the bezel **104**. The catch tabs **102** on the snap fingers **100** forcibly slide through and past the skirt portion **106** on the bezel **104** and then snap over a back edge **137** of the skirt. Likewise, the bezel **104** is snapped into the opening **105** in the body **22** when installed. The catch legs **112** forcibly slide through the cylindrical wall along the guide tracks **122** when the bezel is inserted. The catch tabs **114** of the catch legs **112** snap into place over a back edge **138** on the cylindrical wall **120**.

[0053] When assembled, the screws are fasteners **128** are inserted through the fastener openings **126** in the printed circuit board **124** and are secured in fastener receptacles **140** provided in the back edge **138** of the cylindrical wall **120**. When assembled, the cylindrical proximal end **96** of the stem **92** lies within the stem hole **132** in the support bar **129**. As noted above, the keyed free end **94** of the stem **92** is received in the way **136** in the variable resistance device **134**. Rotation of the dial **62** will alter the resistance characteristics of the variable resistance device **134** to change the temperature setting of the heating element **72**.

[0054] The dial **62** of the temperature controller **60** is rotated to adjust the temperature setting for the heating element **72** from a minimum, or even a no heat, setting to a maximum heat setting permitted by the heating element. Though not shown herein, markings can be provided both on the dial and on the body, either on the side **38***a* or the bezel **104**, to indicate the relative positioning and thus the selected heat setting of the dial between these minimum and maximum settings. The variable resistance device **134** can be continuously variable so that any temperature setting can be selected by a user between the minimum and maximum settings, thus permitting essentially infinite temperature adjustment between the two settings. Alternatively, a finite selective resistance device can be provided allowing selection from among multiple discrete heat settings, depending on the position of the dial **62**. However, use of the rotary dial **62** allows for a large number of selectable settings, such as 10 or more discrete, optional, heat settings. Combining this type of temperature controller **60** with the motor controller **40**, and its two or three speed settings, allows the user a very large number of adjustment settings. The combined fan motor speed and heat settings can be configured to permit **40**, **60**, or even an infinite number of different selectable options, depending on the type of resistance device utilized.

[0055] In another aspect of the present invention, the dial **62** is positioned and installed in a manner such that the outward facing surface **64** is either flush with or below a level of the surface of the body **22** and bezel that surround the opening **105**. The combination of the dial elevation and the shape of the bezel **104** results in the outward facing surface **64** of the dial being flush with or recessed relative to the surrounding portions of the blow dryer **20**. In the disclosed example, the generally cylindrical shape of the body **22** results in the side **38***a* being curved, not flat. As a result, the bezel **104** also is not flat and instead is contoured to follow the shape of the side **38***a*. To achieve this, the annular flange portion **108** has an undulating or wave contour. Two opposed sides **150** of the flange are elevated so as to be angled or flared forward (see FIGS. **6** and **9**) and the other two opposed sides **152**, oriented orthogonal to the elevated sides, are pinned back so as to be flattened or angled rearward (see FIGS. **6** and **8**). The result-

ant shape of the annular flange **108** follows the contour of the body **22** surrounding the temperature controller **60**. The resultant position of the dial **62**, and particularly the outward facing surface **64**, is that the dial is flush with or below a level of the surface of the side **38***a*, if the body surface were continued without the presence of the temperature controller **60**.

[0056] One benefit achieved by this configuration of the temperature controller is that the dial is recessed relative to the body **22**. Thus, the blow dryer **20** can be set or rested on a surface, and particularly can be set on the side **38***a*, without causing any damage to the temperature controller **60** and also without inadvertently readjusting the setting of the dial **62**. Another benefit achieved from this configuration of the temperature controller **60** is that the user can easily locate the dial **62** and adjust the temperature setting without having to look at the temperature controller **60** during use of the blow dryer and without having to release their grip on the handle **36**.

[0057] Though not shown or described in detail herein, any number of stops can be provided to positively limit the travel of the dial **62** of the temperature controller **60**. The stops can be created to limit travel to the minimum temperature setting, and not beyond the minimum temperature setting in one direction of rotation of the dial. Likewise, the stops can be created to limit travel to a higher maximum temperature setting, and not beyond the maximum temperature setting in the opposite direction of rotation of the dial. The stops can be provided on the cylindrical wall **120**, on the back edge of the bezel **104**, and particularly the skirt portion **106** in this example, or the like. The stops can also be provided on the support bar **129**. Such stops can be simple projections that interact with and contact the snap fingers **100** or other projection on the dial **62** when the dial is rotated (relative to the bezel **104** in this example or relative to the body **22**). In another example, stops can be provided internal to the variable resistance device **134** so as to limit travel or rotation of the dial **62** in each rotation direction.

[0058] The temperature controller **60** can also be electrically connected to the heating element **72** via wire leads **154**, shown schematically in FIG. **5**. Thus, actuation of the dial **62** can affect the heat setting of the heating element **72**. The cool shot button **50**, and particularly the wire leads **80**, can be directed to the printed circuit board **124** instead of directly to the heating element **72**. The printed circuit board **124** can be configured to turn off the heating element when the cool shot button **50** is depressed. The fan motor control **40** can also be wired to the printed circuit board **124** instead of directly to the motor **74**, if desired. The printed circuit board **124** can be configured to add functional and/or safety characteristics to the blow dryer **20**, and particularly with respect to the interaction between the various controls as desired.

[0059] Details in the configuration and construction of the temperature controller **60** as described herein can vary within the spirit and scope of the present invention. How the dial **62** connects with the body **22** can vary. The bezel **104** can be eliminated or can be reconfigured to attach to the body in different ways. Likewise, the dial **62** can be reconfigured to attach either to the body **22** or to the bezel **104** in different ways other than the snap fingers **100** and catch legs **112** described herein. Likewise, details of the opening **105**, including the cylindrical wall **120** and support bar **129**, can also vary from the example shown and described herein.

[0060] Although certain blow dryer controls, components, arrangements, and methods have been described herein in accordance with the teachings of the present disclosure, the scope of coverage of this patent is not limited thereto. On the contrary, this patent covers all embodiments of the teachings of the disclosure that fairly fall within the scope of permissible equivalents.

What is claimed is:

1. A hair dryer comprising:
- a body having an air intake and an outlet nozzle;
- a heating element within the body between the air intake and the outlet nozzle;
- a handle extending from the body and defining a hand grip; and
- a temperature controller on a surface of the body configured to control the temperature of the heating element, the temperature controller lying essentially flush with or below a level of the surface of the body around the temperature controller.

2. A hair dryer according to claim **1**, wherein the temperature controller is a rotatable dial positioned on a side of the body and having an outward facing surface.

3. A hair dryer according to claim **1**, further comprising a bezel that snaps into an opening in the body and surrounds the temperature controller.

4. A hair dryer according to claim **3**, wherein the temperature controller is a rotatable dial surrounded by the bezel and having an outward facing surface.

5. A hair dryer according to claim **1**, wherein the temperature controller further comprises:
- an opening through the surface of the body;
- a support element within and spanning a width of the opening; and
- a rotatable dial received in the opening and having a pivot stem extending through a hole in the support element.

6. A hair dryer according to claim **5**, further comprising a circuit board mounted to the support element and coupled to the heating element, the circuit board configured for controlling the temperature of the heating element according to a rotational position of the dial.

7. A hair dryer according to claim **6**, wherein the pivot stem on the dial is keyed to an opening in a variable resistance device coupled to the circuit board whereby rotation of the dial effects adjustment of the variable resistance device.

8. A hair dryer according to claim **1**, wherein the temperature controller further comprises:
- an opening through the surface of the body;
- a support element within and spanning a width of the opening;
- a bezel snapped onto the surface of the body and surrounding the opening; and
- a rotatable dial surrounded by the bezel and having a central pivot stem extending through a hole in the support element, the dial rotatable about the pivot stem.

9. A hair dryer according to claim **8**, wherein the dial snaps into the bezel.

10. A hair dryer according to claim **8**, wherein the dial has a pair of snap fingers that is received through and snaps onto the bezel.

11. A hair dryer according to claim **10**, wherein the pair of snap fingers limit rotation of the dial between a minimum heat position defining a minimum temperature setting and a maximum heat position defining a maximum temperature setting.

12. A hair dryer according to claim **11**, wherein one or both of the pair of snap fingers abuts against a stop at the minimum heat position and at the maximum heat position.

13. A hair dryer according to claim **8**, further comprising a temperature control circuit board mounted adjacent the support element and coupled to the pivot stem of the dial.

14. A hair dryer according to claim **13**, wherein the pivot stem is keyed to an opening in a variable resistance device on the circuit board whereby rotation of the dial effects adjustment of the variable resistance device.

15. A hand-held hair dryer comprising:

a body having an air intake, an outlet nozzle, and a flow path therebetween;

a motor within the body configured to draw air into the air intake, direct the air along the flow path, and force the air from the body through outlet nozzle;

a heating element within the body between the air intake and the outlet nozzle;

a handle extending from the body and defining a grip portion;

a motor control switch on the handle configured to operate the motor; and

a temperature controller on a surface of the body and configured to control the temperature of the heating element.

16. A hair dryer according to claim **15**, wherein the temperature controller is a dial rotatable between a minimum heat position defining a minimum temperature setting and a maximum heat position defining a maximum temperature setting, the dial adjustable to any selected heat position and desired temperature setting therebetween.

17. A hair dryer according to claim **16**, wherein an outward facing surface of the dial lies flush with or below a level of the surface of the body around the dial.

18. A hair dryer according to claim **15**, further comprising a cool shot button on the handle and spaced from the motor control switch.

19. A hair dryer according to claim **18**, wherein the cool shot button is positioned so as to be operable by one hand of a user grasping the grip portion of the handle, wherein the motor control switch is positioned so as to be operable by the one hand grasping the grip portion, and wherein the temperature controller is operable by the other hand of the user with the one hand grasping the grip portion.

20. A hair dryer according to claim **15**, wherein the temperature controller lies flush with or below a level of the surface of the body around the temperature controller.

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