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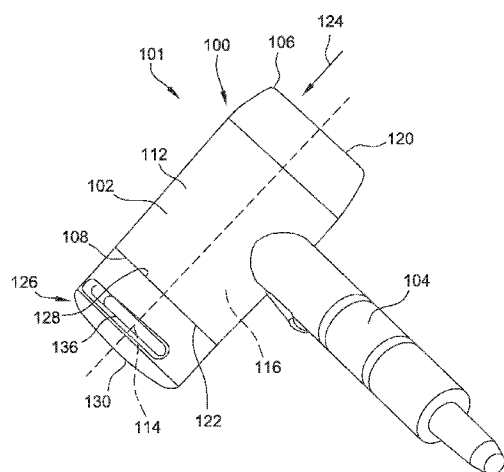


FIG. 1

(57) Abstract: A hair dryer assembly generally comprises a hair dryer and a discharge housing. The hair dryer includes a body defining a cavity, an inlet for airflow to enter the cavity, and an outlet for airflow to exit the cavity. The discharge housing is configured to receive the airflow from the outlet, and includes an inlet end, a closed end opposite the inlet end, and a channel wall intermediate the inlet end and the closed end. The channel wall defines a hair receiving channel and an outlet for airflow to exit the discharge housing. The channel wall extends continuously around the hair receiving channel such that hair within the channel is surrounded by the channel wall. The outlet is configured to direct airflow out of the discharge housing and towards hair within the hair receiving channel. The discharge housing also includes a sidewall extending at least partly around the channel wall.



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HAIR DRYER ASSEMBLY HAVING HAIR RECEIVING CHANNEL

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Provisional Application No. 62/978,051 filed on February 18, 2020, which is incorporated herein by reference in its entirety.

FIELD OF THE DISCLOSURE

[0002] The present disclosure relates generally to hair dryers, and more particularly to a hair dryer assembly having a hair receiving channel.

BACKGROUND OF THE DISCLOSURE

[0003] Hair dryers are configured to generate an airflow that is directed towards hair to dry the hair. At least some known hair dryers include a handle that allows a user to hold the hair dryer and position the hair dryer relative to the hair. The hair dryers may include one or more attachments that are connected to an outlet of the hair dryer for redirecting or otherwise processing the airflow before it is directed to the hair. For example, concentrators may be used to direct the airflow towards hair and focus the airflow on portions of the hair. However, it can be difficult for a user to properly position the hair dryer relative to the hair for a styling operation. Moreover, the hair may not stay in a desired position relative to the hair dryer as the airflow moves through the hair. In addition, the airflow may not be evenly distributed across a section of hair and, thus, the hair may not be evenly dried throughout its thickness.

[0004] Accordingly, it is desirable to provide a hair dryer assembly that directs airflow evenly towards portions of hair and maintains the hair in position relative to the hair dryer as the hair dryer assembly directs airflow towards the hair.

SUMMARY

[0005] In one aspect, a hair dryer assembly generally comprises a hair dryer and a discharge housing. The hair dryer has a body defining a cavity, an inlet for airflow to enter the cavity, and an outlet for airflow to exit the cavity. The discharge housing is configured to receive the airflow from the outlet. The discharge housing includes an inlet end defining

an inlet for the airflow to enter the discharge housing, a closed end opposite the inlet end, and a channel wall intermediate the inlet end and the closed end. The channel wall defines a hair receiving channel and an outlet for airflow to exit the discharge housing. The channel wall extends continuously around the hair receiving channel such that hair within the channel is surrounded by the channel wall. The outlet is configured to direct the airflow out of the discharge housing and towards hair within the hair receiving channel. The discharge housing also includes a sidewall extending at least partly around the channel wall. The sidewall and the channel wall define a space for the airflow to travel through the discharge housing.

[0006] In another aspect, a discharge housing for a handheld hair dryer includes an inlet end defining an inlet for airflow to enter the discharge housing in a first direction and a closed end opposite the inlet end. The discharge housing further includes a top extending between the inlet end and the closed end and a bottom opposite the top. The discharge housing also includes a channel wall extending from the top toward the bottom and defining a hair receiving channel. The channel wall extends continuously around the hair receiving channel such that hair within the channel is surrounded by the channel wall. The discharge housing further includes an outlet for the airflow to exit the concentrator. The discharge housing is configured to direct the airflow through the outlet in a second direction perpendicular to the first direction and towards the hair within the channel.

[0007] In yet another aspect, a discharge housing for a handheld hair dryer includes an inlet end defining an inlet for airflow to enter the discharge housing in a first direction. The discharge housing also includes a channel wall defining a hair receiving channel. The channel wall extends continuously around the hair receiving channel such that hair within the channel is surrounded by the channel wall. The discharge housing further includes an outlet for airflow to exit the discharge housing. The channel wall is configured to direct the airflow through the outlet in a second direction perpendicular to the first direction and towards the hair within the channel.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is a perspective view of a first embodiment of a hair dryer having a discharge housing including a hair receiving channel;

[0009] FIG. 2 is a perspective view of the discharge housing of the hair dryer of FIG. 1;

[0010] FIG. 3 is a top view of the discharge housing of FIG. 2;

[0011] FIG. 4 is a bottom view of the discharge housing of FIG. 2;

[0012] FIG. 5 is a front view of the discharge housing of FIG. 2;

[0013] FIG. 6 is a right elevational view of the discharge housing of FIG. 2;

[0014] FIG. 7 is a rear view of the discharge housing of FIG. 2;

[0015] FIG. 8 is an exploded perspective view of the discharge housing of FIG. 2, the discharge housing including a flow guide positioned within a cavity of the discharge housing;

[0016] FIG. 9 is a cross-section of the discharge housing of FIG. 2 taken along section line A-A of FIG. 3 and showing airflow through the discharge housing;

[0017] FIG. 10 is a perspective view of a second embodiment of a hair dryer including a discharge housing having a hair receiving channel;

[0018] FIG. 11 is a sectional view of the hair dryer of FIG. 10 showing airflow through the hair dryer, the airflow being directed to hair positioned within the hair receiving channel;

[0019] FIG. 12 is a perspective view of another embodiment of a discharge housing for use with a hair dryer such as the hair dryers of FIGs. 1 and 10;

[0020] FIG. 13 is a top view of the discharge housing of FIG. 12;

[0021] FIG. 14 is a sectional view of the discharge housing of FIG. 12;

[0022] FIG. 15 is a perspective view of yet another embodiment of a discharge housing for use with a hair dryer such as the hair dryers of FIGs. 1 and 10, the discharge housing having a compact shape;

[0023] FIG. 16 is a top view of the discharge housing of FIG. 15;

[0024] FIG. 17 is a perspective view of still another embodiment of a discharge housing for use with a hair dryer such as the hair dryers of FIGs. 1 and 10, the discharge housing having an L-shape; and

[0025] FIG. 18 is a top view of the discharge housing of FIG. 17.

[0026] Corresponding reference characters indicate corresponding parts throughout the drawings.

DETAILED DESCRIPTION OF THE DRAWINGS

[0027] Referring to the drawings, and in particular to FIG. 1, one embodiment of a hair dryer assembly is generally indicated at 101. The hair dryer assembly 101 includes a hair dryer, broadly an air-moving appliance, indicated at 100 and a discharge housing indicated at 126. The hair dryer 100 includes a body 102 and a handle 104. In general, the hair dryer 100 is adapted to direct heated air to hair to remove moisture from the hair. In some embodiments, the hair dryer 100 may include a user interface to enable a user to control the hair dryer 100. Suitable user interfaces include, for example and without limitation, screens, buttons, knobs, levers, and/or switches. The hair dryer 100 may have other suitable configurations without departing from the scope of this invention.

[0028] As shown in FIG. 1, the handle 104 extends from the body 102 and is configured to be held by a user during operation of the hair dryer 100. Accordingly, the hair dryer 100 seen in FIG. 1 is handheld. In the illustrated embodiment, the body 102 and the handle 104 are connected together to form a single housing assembly. In other embodiments, the hair dryer 100 may include other handles without departing from the scope of this disclosure.

[0029] In the illustrated embodiment, the body 102 includes a first (or rear) end 106, a second (or front) end 108, and a sidewall 112. The sidewall 112 extends from the first end 106 to the second end 108 about an axis 114. In addition, the sidewall 112 defines a cavity 116. In the illustrated embodiment, the sidewall 112 is generally cylindrical. In addition, in the illustrated embodiment, the sidewall 112 has a decreasing diameter between the first end 106 and the second end 108 such that the body 102 tapers between the first end 106 and the second end 108. In other suitable embodiments, the hair dryer 100 may

include any suitable body 102 that enables the hair dryer 100 to operate as described herein.

[0030] The sidewall 112 defines an inlet 120 at the first end 106 for airflow 124 to enter the cavity 116. In addition, the sidewall 112 defines an outlet 122 at the second end 108 for the airflow 124 to exit the cavity 116. During operation, the hair dryer 100 draws the airflow 124 into the inlet 120, directs the airflow 124 through the cavity 116 along the axis 114, and discharges the airflow 124 through the outlet 122 in a direction parallel to the axis. In some suitable embodiments, the hair dryer 100 may include a grill extending across the inlet 120 and/or the outlet 122 to prevent objects passing through the inlet or the outlet. The hair dryer 100 may include other suitable inlets and/or outlets without departing from some aspects of the disclosure.

[0031] The hair dryer 100 may receive power from any suitable power source. For example, in some embodiments, the hair dryer 100 may include a power cord that connects to an external power source. In further embodiments, the hair dryer may be at least partially powered by an internal power source such as a battery.

[0032] In suitable embodiments, a fan (not shown in FIG. 1) may be positioned in the body 102 and driven by a motor (not shown in FIG. 1) to draw the airflow 124 into the inlet 120 and direct the airflow 124 through the cavity 116. In addition, one or more heating units (not shown in FIG. 1) may be positioned within the cavity 116. The heating units may be configured to increase the temperature of the airflow 124 prior to the airflow 124 being discharged through the outlet 122. In suitable embodiments, the heating units may have a power rating of about 1,000 watts to about 2,600 watts. In addition, the fan and the motor may be configured to discharge the airflow 124 at a desired rate. For example, the hair dryer 100 may be configured to discharge the airflow 124 at a rate in a range of about 10 cubic feet per minute to about 100 cubic feet per minute.

[0033] The hair dryer 100 may have any operating setting that enables the hair dryer to operate as described herein. For example, the motor may have two or more operating speeds. In addition, the hair dryer 100 may include different temperature settings. For example, in some embodiments, the hair dryer 100 may include a heating unit including two or more different temperatures settings. Moreover, the hair dryer 100 may

be configured to deliver airflow 124 having a temperature at or below the temperature of the ambient environment, i.e., a cool stream.

[0034] In the illustrated embodiment, the discharge housing 126 is an attachment adapted for selective attachment to the second end 108 of the body 102 adjacent the outlet 122. The discharge housing 126 is configured to receive the airflow 124 being discharged from the body 102 of the hair dryer 100 through the outlet 122 and redirect the airflow towards hair. Specifically, in the illustrated embodiment, the discharge housing 126 is in the form of a concentrator configured to focus the airflow 124 on a portion of hair. The hair dryer assembly 101 may include other attachments such as a diffuser, a pick, a nozzle, a straightener, and any other suitable attachments. The attachments may be connected to the body 102 in any manner that enables the hair dryer assembly 101 to operate as described herein.

[0035] With reference to FIGs. 2-7, the discharge housing 126 includes a top 132, a bottom 134, a sidewall 136 extending between the top 132 and the bottom 134, and a channel wall 138. The channel wall 138 extends around an axis 146 and defines a hair receiving channel 148. Suitably, the channel wall 138 extends continuously around the hair receiving channel 148 such that hair within the channel is surrounded by the channel wall. The discharge housing 126 is configured to retain the hair within the hair receiving channel 148 during a hair styling operation and to direct the airflow 124 to hair within the hair receiving channel. Moreover, the discharge housing 126 is configured to distribute the airflow 124 more evenly throughout the hair than conventional hair dryers because the channel wall 138 completely surrounds the hair.

[0036] The discharge housing 126 has an inlet end 128 (FIG. 2) and a closed end 130 (FIG. 7) opposite the inlet end. The inlet end 128 is configured to releasably attach to the body 102 (shown in FIG. 1) of the hair dryer 100. For example, the discharge housing 126 may include one or more engagement features 140 (e.g., clips or projections) that are configured to engage corresponding engagement features of the body 102 (shown in FIG. 1). In other embodiments, the discharge housing 126 may be permanently attached to or formed with the body 102 such that the discharge housing 126 is not removable from the hair dryer 100.

[0037] The top 132, the bottom 134, and the sidewall 136 of the discharge housing 126 define a cavity 142 and an inlet 144 at the inlet end 128 for the airflow 124 to enter the cavity. The inlet 144 may be any suitable shape. In the illustrated embodiment, the inlet 144 is an elongate slot with curved sides. In other embodiments, the inlet 144 may be circular, ovular, rectangular, triangular, or any other suitable shape. The inlet 144 may have an area in a range of about 1.5 square centimeters (cm²) to about 80 cm². The shape and size of the inlet 144 correspond to the shape and size of the outlet 122 of the body 102 (shown in FIG. 1) and facilitate the inlet receiving air from the outlet. Suitably, the inlet end 128 is substantially open, i.e., the inlet end 128 does not include a wall or panel extending across the inlet 144.

[0038] As seen in FIG. 4, the channel wall 138 at least partly defines an outlet 156 for airflow 124 to exit the discharge housing 126. The outlet 156 may be any suitable shape and size. For example, the outlet 156 may be circular, ovular, rectangular, triangular, or any other suitable shape. The outlet 156 may have an area in a range of about 1.5 cm² to about 80 cm².

[0039] Also, at least a portion of the top 132, the bottom 134, and the sidewall 136 are substantially planar and extend from the inlet end 128 toward the channel wall 138 and are configured to direct the airflow 124 through the cavity 142 to the channel wall 138. The channel wall 138 extends downward from the top 132 intermediate the inlet end 128 and the closed end 130 and is configured to direct the airflow 124 in a direction generally perpendicular to the axis 114 (FIG. 2). In addition, the sidewall 136 is spaced radially outward from the channel wall 138 and extends at least partly around the channel wall to define an annular space. Accordingly, the discharge housing 126 is ring-shaped. In other embodiments, the discharge housing 126 may be rectangular, cylindrical, and/or any suitable shape.

[0040] The discharge housing 126 is configured to discharge the airflow out of the cavity 142 through the outlet 156 and towards the hair within the channel 148. For example, the outlet 156 is configured to direct the airflow 124 in a direction parallel to the axis 146 of the hair receiving channel 148 such that the airflow travels along the length of the hair positioned within the hair receiving channel. Accordingly, the discharge housing 126 forms a curved or bent flow path for the airflow 124 through the cavity 142 and the

airflow is directed out of the outlet 156 in a direction that is substantially perpendicular to the direction of the airflow being drawn into the inlet 144.

[0041] Also, the discharge housing 126 includes a lip 154 that extends downward from the sidewall 136 and the bottom 134. The lip 154 is contiguous with a portion of the sidewall 136 and the lip 154 and the sidewall 136 define a continuous exterior surface of the discharge housing 126. In the illustrated embodiment, a front portion of the lip 154 extends at an angle relative to the bottom 134. The lip 154 may be curved to provide a smooth transition between the lip 154 and the bottom 134. The lip 154 extends downward and along the axis 146 and beyond the channel wall 138. In addition, the lip 154 tapers radially inward toward the channel wall 138 along the axis 146. Accordingly, the lip 154 may be configured to direct or funnel the airflow 124 that is discharged through the outlet 156 towards the hair within the hair receiving channel 148.

[0042] Referring now to FIG. 8, in the illustrated embodiment, the discharge housing 126 is constructed of at least two pieces (e.g., an upper piece 158 and a lower piece 160) that are connected together. For example, the pieces 158, 160 of the discharge housing 126 are connected together along the sidewall 136 and at the closed end 130 such that the cavity 142 is sealed along the sidewall and at the closed end. The pieces 158, 160 may be connected in any suitable manner. For example, in some embodiments, the pieces 158, 160 are integrally formed. In further embodiments, the pieces 158, 160 of the discharge housing 126 are formed separately and are fastened together. In the illustrated embodiment, the upper piece 158 and the lower piece 160 include corresponding engagement features 162 (e.g., projections and clips) that engage each other to secure the pieces together.

[0043] As shown in FIGs. 8 and 9, the discharge housing 126 includes a flow guide 164 positioned within the cavity 142 to guide the airflow 124 through the cavity and towards the outlet 156. The flow guide 164 is sized and shaped to extend at least partly between the channel wall 138 and the sidewall 136 and between the channel wall 138 and the lip 154. The flow guide 164 may at least partly define the outlet 156. In addition, the flow guide 164 may include one or more ribs 166 to support the channel wall 138, the sidewall 136, and/or the lip 154. The flow guide 164 is curved and configured to guide airflow 124 along the curved flow path between the inlet 144 and the outlet 156. In

addition, the flow guide 164 may be configured to direct the airflow 124 within the cavity 142 toward and around the outlet 156 such that the airflow is disbursed substantially evenly along the circumference of the hair receiving channel 148.

[0044] The discharge housing 126 may include one or more ramps 168 configured to direct the airflow 124 through the discharge housing 126 in conjunction with or instead of the flow guide 164. For example, in the illustrated embodiment, a pair of curved ramps 168 extend downward from the top 132. The ramps 168 extend along the top 132 at angles relative to the axis 114 along which the airflow 124 is received into the discharge housing 126 and the ramps 168 direct the airflow 124 around the channel wall 138 such that the airflow 124 is distributed evenly to the outlet 156.

[0045] With reference to FIG. 9, during operation, a section of hair may be positioned with the hair receiving channel 148. In suitable embodiments, the discharge housing 126 may be configured to generate a secondary airflow and draw the hair into the channel 148. For example, the airflow 124 may generate a negative pressure in the hair receiving channel 148 as the airflow 124 is discharged from the outlet 156 around the perimeter of the hair receiving channel. The hair that is near or in contact with the top 132 may be drawn and funneled into the hair receiving channel 148. In the illustrated embodiment, the top 132 and the channel wall 138 are curved or sloped along the axis 146 and taper radially inward relative to the axis 146 to guide hair into the hair receiving channel 148. When positioned within the hair receiving channel 148, the hair extends along the axis 146 and the channel wall 138 surrounds the hair in the hair receiving channel.

[0046] The hair dryer 100 (shown in FIG. 1) is operated to generate the airflow 124 that is discharged from the body 102 through the outlet 122. The discharge housing 126 receives the airflow 124 into the inlet 144, directs the airflow through the cavity 142, and discharges the airflow through the outlet 156. The airflow 124 may be redirected by the discharge housing 126 such that the airflow is discharged in a direction parallel to the axis of the hair positioned within the hair receiving channel 148. The airflow 124 discharged through the outlet 156 is directed towards the hair within the hair receiving channel 148. Suitably, the airflow 124 is distributed uniformly around the hair within the hair receiving channel 148. The hair dryer 100 (shown in FIG. 1) may be moved along the

length of the hair to deliver the airflow 124 throughout the length of the hair. The discharge housing 126 maintains a desired position of the hair relative to the hair dryer 100 as the hair dryer is moved along the hair and provides for even distribution of the airflow 124 to the hair because the discharge housing maintains the hair within the hair receiving channel 148. In some embodiments, the edges of the discharge housing 126 are rounded to provide a smooth contact surface for the hair as the discharge housing is moved along the length of the hair. The airflow 124 contacts and moves along the length of hair positioned within the hair receiving channel 148. In some embodiments, the airflow 124 transfers heat to and/or removes moisture from the hair. Accordingly, the hair dryer assembly 101 may be used for a hair styling operation such as straightening hair using air entrainment for hair positioned within the hair receiving channel 148.

[0047] Referring now to FIGS. 10 and 11, a second embodiment of a hair dryer assembly is generally indicated at 201. The hair dryer assembly 201 includes a hair dryer, broadly an air-moving appliance, indicated at 200 and a discharge housing indicated at 224. The hair dryer 200 includes a handle 202. The handle 202 has a first end 204 and a second end 206, and extends along a longitudinal axis 208. The handle 202 defines a cavity 210, an inlet 212 at the first end 204 for airflow 214 to enter the cavity, and an outlet 216 at the second end 206 for the airflow to exit the cavity. During operation, the hair dryer 200 draws the airflow 214 into the inlet 212, directs the airflow through the cavity 210 along the longitudinal axis 208, and discharges the airflow through the outlet 216 in a direction parallel to the longitudinal axis. In some suitable embodiments, the hair dryer 200 may include a grill extending across the inlet 212 and/or the outlet 216 to prevent objects passing through the inlet or the outlet. The hair dryer 200 may include other suitable inlets and/or outlets without departing from some aspects of the disclosure.

[0048] The hair dryer 200 may receive power from any suitable power source. For example, in some embodiments, the hair dryer 200 may include a power cord 218 that connects to an external power source. In further embodiments, the hair dryer 200 may be at least partially powered by an internal power source such as a battery.

[0049] In suitable embodiments, a fan 220 may be positioned in the handle 202 and driven by a motor 222 to draw the airflow 214 into the inlet 212 and direct the airflow through the cavity 210. In addition, one or more heating units 223 may be positioned

within the cavity 210. The hair dryer 200 may have any operating setting that enables the hair dryer to operate as described herein. For example, the motor 222 may have two or more operating speeds. In addition, the hair dryer 200 may include different temperature settings. For example, in some embodiments, the hair dryer 200 may include a heating unit including two or more different temperatures settings. Moreover, the hair dryer 200 may be configured to deliver airflow 214 having a temperature at or below the temperature of the ambient environment, i.e., a cool stream.

[0050] The discharge housing 224 is attached to the second end 206 of the handle 202 of the hair dryer 200 adjacent the outlet 216. The discharge housing 224 is configured to receive the airflow 214 being discharged through the outlet 216 and redirect the airflow towards hair. In the illustrated embodiment, the discharge housing 224 is a concentrator and is adapted for selective attachment to the hair dryer 200. The hair dryer assembly 201 may include other attachments such as a diffuser, a pick, a nozzle, a straightener, and any other suitable attachments. The attachments may be connected to the handle 202 in any manner that enables the hair dryer assembly 201 to operate as described herein.

[0051] The discharge housing 224 includes a top 228, a bottom 230, an inlet end 232, and a closed end 234 opposite the inlet end. Also, the discharge housing 224 defines a cavity 236 for airflow 214 to travel through the discharge housing 224. The inlet end 232 is configured to releasably attach to the handle 202. The discharge housing 224 also includes a channel wall 238 extending around an axis 240 and defining a hair receiving channel 242. Suitably, the channel wall 238 extends continuously around the hair receiving channel 242 and the hair within the channel is surrounded by the channel wall. The discharge housing 224 is configured to retain hair within the hair receiving channel 242 during a hair styling operation and direct airflow 214 to portions of hair within the hair receiving channel.

[0052] The discharge housing 224 is attached to the second end 206 of the handle 202 of the hair dryer 200 and extends along the longitudinal axis 208 of the handle. In the illustrated embodiment, the handle 202 is a cylinder and the hair dryer 200 is configured as a wand. As a result, the hair dryer assembly 201 is compact and the hair dryer assembly may be simpler for at least some users to manipulate than at least some conventional hair dryers.

[0053] In reference to FIGs. 12-14, another embodiment of a discharge housing for use with the hair dryer 100 (shown in FIG. 1) or the hair dryer 200 (shown in FIG. 12) is generally indicated at 300. The discharge housing 300 includes a top 304, a bottom 306, an inlet end 308, and a closed end 310 opposite the inlet end. The inlet end 308 is configured to releasably attach to the body 102 of the hair dryer 100 (shown in FIG. 1) or the handle 202 of the hair dryer 200 (shown in FIG. 12) to receive airflow 314. The top 304 and the bottom 306 at least partly define an inlet 326 at the inlet end 308 for the airflow 314 to enter the discharge housing 300. Also, the discharge housing 300 defines a cavity 312 for the airflow 314 to travel through the discharge housing 300.

[0054] The top 304 and the bottom 306 are connected at the closed end 310 such that the cavity 312 is sealed at the closed end. The top 304 and the bottom 306 may be connected in any suitable manner. For example, in some embodiments, the top 304 and the bottom 306 are integrally formed. In further embodiments, the top 304 and the bottom 306 are formed separately and are fastened together. In the illustrated embodiment, the top 304 and the bottom 306 are integrally formed as a single piece.

[0055] In addition, the discharge housing 300 includes a channel wall 316. In the illustrated embodiment, the channel wall 316 extends downward from the top 304 around an axis 318 and at least partly defines a hair receiving channel 320. Suitably, the channel wall 316 extends continuously around the hair receiving channel 320 such that hair within the channel is surrounded by the channel wall. As a result, the discharge housing 300 is configured to retain hair within the hair receiving channel 320 during a hair styling operation and the discharge housing is configured to direct airflow 314 to hair within the hair receiving channel.

[0056] The discharge housing 300 also includes a sidewall 330 extending at least partly around the channel wall 316 and spaced radially outward from the channel wall 316. In addition, the top 304 extends between the channel wall 316 and the sidewall 330. Accordingly, the discharge housing 300 is at least partly ring-shaped. The top 304 and the channel wall 316 are curved or sloped along the axis 318 and taper radially inward relative to the axis 318 to guide hair into the hair receiving channel 320. In other embodiments, the discharge housing 300 may be rectangular, cylindrical, and/or any suitable shape.

[0057] Also, the discharge housing 300 includes a lip 332 that extends downward from the bottom 306 and a collar 334 that extends upward from the bottom and at least partly around the channel wall 316. The collar 334 and the channel wall 316 at least partly define an outlet 336 for airflow 314 to exit the discharge housing 300. The outlet 336 is configured to direct the airflow out of the discharge housing 300 and towards the hair within the channel 320. For example, the outlet 336 is configured to direct the airflow 314 in a direction parallel to the axis 318 of the hair receiving channel 320 such that the airflow travels along the length of the hair positioned within the hair receiving channel. Suitably, the discharge housing 300 defines a curved flowpath for the airflow 314 such that the airflow is directed out of the outlet 336 in a direction that is different from the direction of the airflow when it is received through the inlet 326.

[0058] As shown in FIG. 14, during operation, the discharge housing 300 receives the airflow 314 into the inlet 326, directs the airflow through the cavity 312, and discharges the airflow through the outlet 336. Hair is positioned within the hair receiving channel 320 and the discharge housing 300 directs the airflow 314 out of the outlet 336 towards the hair.

[0059] In reference to FIGs. 15 and 16, yet another embodiment of a discharge housing for use with the hair dryer 100 (shown in FIG. 1) or the hair dryer 200 (shown in FIG. 12) is generally indicated at 400. The discharge housing 400 includes a top 404, a bottom 406, an inlet end 408, and a closed end 410 opposite the inlet end. The inlet end 408 is configured to releasably attach to the body 102 of the hair dryer 100 (shown in FIG. 1) or the handle 202 of the hair dryer 200 (shown in FIG. 12). The discharge housing 400 defines an inlet 412 configured to receive airflow 414 and a cavity 416 for the airflow to travel through the discharge housing 400.

[0060] The discharge housing 400 includes a channel wall 418 defining a hair receiving channel 420 and a collar 422 that is spaced radially outward from and extends at least partly along the channel wall 418. Overall, the discharge housing 400 has a generally rectangular cuboid shape. The hair receiving channel 420 is positioned substantially in the middle of the discharge housing 400. As a result, the discharge housing 400 may be more compact than other housings. In addition, the airflow 414 that is drawn into the discharge housing 400 is immediately redirected towards the outlet of the discharge housing and heat

loss of the airflow 414 as the airflow 414 moves through the discharge housing 400 may be reduced.

[0061] In reference to FIGs. 17 and 18, still another embodiment of a discharge housing for use with the hair dryer 100 (shown in FIG. 1) or the hair dryer 200 (shown in FIG. 12) is generally indicated at 500. The discharge housing 500 includes a top 502, a bottom 504, an inlet end 506, and a closed end 508 opposite the inlet end. The discharge housing 500 defines an inlet 510 at the inlet end 506 configured to receive airflow 512 and a cavity 514 for the airflow to travel through the discharge housing 500. The inlet end 506 is configured to releasably attach to the body 102 of the hair dryer 100 (shown in FIG. 1) or the handle 202 of the hair dryer 200 (shown in FIG. 12).

[0062] The discharge housing 500 includes a channel wall 516 defining a hair receiving channel 518. In addition, the discharge housing 500 includes a flange 520 that extends upward from the top 502 along the hair receiving channel 518. The flange 520 guides hair into the hair receiving channel 518 to reduce stress points on the hair and prevent damage to the hair. The discharge housing 500 also includes a collar 522 that is spaced radially outward from and extends at least partly along the channel wall 516. The collar 522 directs airflow 512 discharged from the discharge housing 500 along hair positioned within the hair receiving channel 518. Overall, the discharge housing 500 is generally bent or L-shaped. Accordingly, the airflow 512 that is drawn into the discharge housing 500 is redirected along the length of hair positioned in the hair receiving channel 518.

[0063] When introducing elements of the present invention or preferred embodiments thereof, the articles "a", "an", "the", and "said" are intended to mean that there are one or more of the elements. The terms "comprising", "including", and "having" are intended to be inclusive and mean that there may be additional elements other than the listed elements.

[0064] As various changes could be made in the above constructions and methods without departing from the scope of the invention, it is intended that all matter contained in the above description and shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

WHAT IS CLAIMED IS:

1. A hair dryer assembly comprising:

a hair dryer having a body defining a cavity, an inlet for airflow to enter the cavity, and an outlet for the airflow to exit the cavity; and

a discharge housing configured to receive the airflow from the outlet, wherein the discharge housing comprises:

an inlet end defining an inlet for the airflow to enter the discharge housing;

a closed end opposite the inlet end;

a channel wall intermediate the inlet end and the closed end, the channel wall defining a hair receiving channel and an outlet for airflow to exit the discharge housing, the channel wall extending continuously around the hair receiving channel such that hair within the channel is surrounded by the channel wall, wherein the outlet is configured to direct the airflow out of the discharge housing and towards hair within the hair receiving channel; and

a sidewall extending at least partly around the channel wall, the sidewall and the channel wall defining a space for the airflow to travel through the discharge housing.

2. A handheld hair dryer as set forth in claim 1, wherein the discharge housing is releasably attached to the body.

3. A handheld hair dryer as set forth in claim 1, wherein the discharge housing further comprises a top extending between the inlet end and the closed end and a bottom opposite the top, the channel wall extending from the top toward the bottom.

4. A handheld hair dryer as set forth in claim 3, wherein the channel wall and the sidewall define the outlet.

5. A handheld hair dryer as set forth in claim 4, wherein the discharge housing further comprises a flow guide extending at least partly through the space and configured to direct the airflow towards the outlet.

6. A handheld hair dryer as set forth in claim 1, wherein the body extends along an axis and is configured to direct the airflow out of the outlet in a first direction parallel to the axis of the body, and wherein the discharge housing is configured to redirect the airflow in a second direction perpendicular to the axis of the body such that the airflow is directed along a length of the hair positioned within the channel.

7. A handheld hair dryer as set forth in claim 6, wherein the discharge housing further comprises ramps configured to direct the airflow through the discharge housing, wherein the ramps extend at angles relative to the axis of the body of the hair dryer.

8. A handheld hair dryer as set forth in claim 1, wherein the body extends along an axis and wherein the channel extends along a channel axis perpendicular to the axis of the body.

9. A handheld hair dryer as set forth in claim 8, wherein the discharge housing further comprises a top extending between the inlet end and the closed end, the channel wall extending downward from the top along the channel axis, wherein the channel wall is curved from the top and tapers radially inward relative to the channel axis.

10. A discharge housing for a handheld hair dryer, the discharge housing comprising:

an inlet end defining an inlet for airflow to enter the discharge housing in a first direction;

a closed end opposite the inlet end;

a top extending between the inlet end and the closed end;

a bottom opposite the top;

a channel wall extending from the top toward the bottom and defining a hair receiving channel, wherein the channel wall extends continuously around the hair receiving channel such that hair within the channel is surrounded by the channel wall; and

an outlet for the airflow to exit the discharge housing, wherein the discharge housing is configured to direct the airflow through the outlet in a second direction perpendicular to the first direction and towards the hair within the channel.

11. A discharge housing as set forth in claim 10, wherein the discharge housing further comprises a sidewall extending at least partly around the channel wall to define a space for the airflow to travel through the discharge housing.

12. A discharge housing as set forth in claim 11, wherein the channel wall and the sidewall define the outlet.

13. A discharge housing as set forth in claim 12 further comprising a flow guide extending at least partly through the space and configured to direct the airflow towards the outlet.

14. A discharge housing as set forth in claim 10, wherein the channel wall is curved from the top and tapers radially inward along the second direction.

15. A discharge housing for a handheld hair dryer assembly, the discharge housing comprising:

an inlet end defining an inlet for airflow to enter the discharge housing in a first direction;

a channel wall defining a hair receiving channel, wherein the channel wall extends continuously around the hair receiving channel such that hair within the channel is surrounded by the channel wall; and

an outlet for airflow to exit the discharge housing, wherein the channel wall is configured to direct the airflow through the outlet in a second direction perpendicular to the first direction and towards the hair within the channel.

16. A discharge housing as set forth in claim 15 further comprising a closed end opposite the inlet end, a top extending between the inlet end and the closed end, and a bottom opposite the top.

17. A discharge housing as set forth in claim 16, wherein the channel wall extends from the top toward the bottom and is curved to funnel the hair into the channel.

18. A discharge housing as set forth in claim 15 further comprising a sidewall extending at least partly around the channel wall to define a space for the airflow to travel through the discharge housing.

19. A discharge housing as set forth in claim 18, wherein the channel wall and the sidewall define the outlet.

20. A discharge housing as set forth in claim 19 further comprising a flow guide extending at least partly through the space and configured to direct the airflow towards the outlet.

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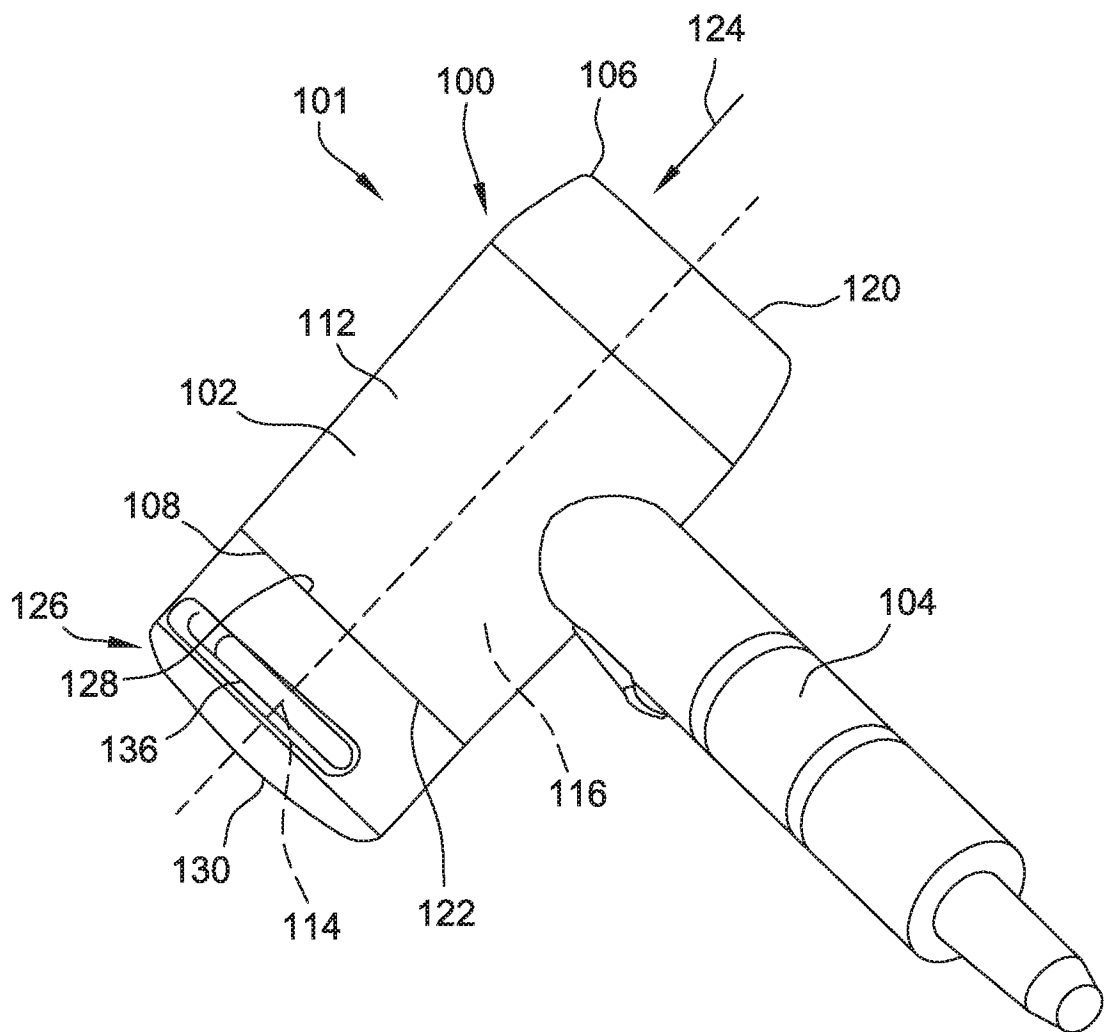


FIG. 1

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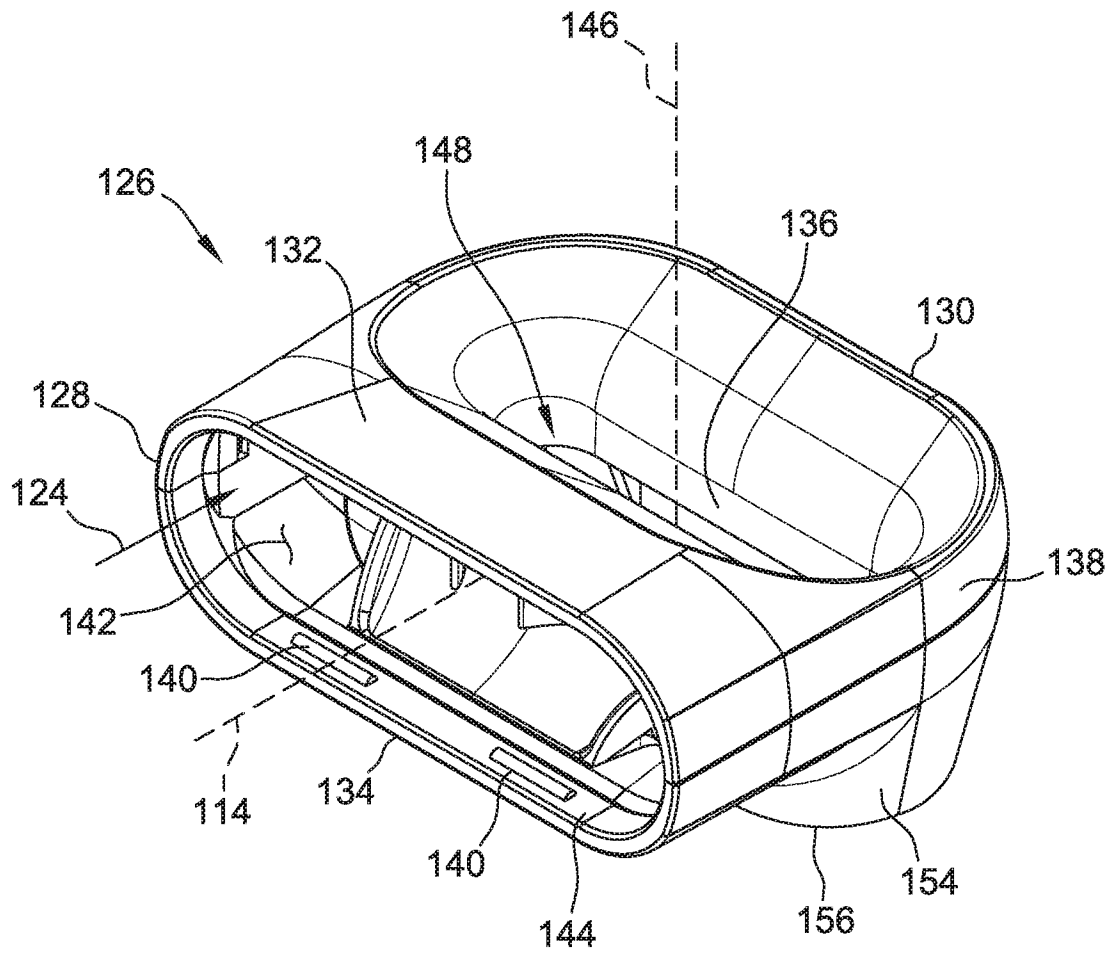


FIG. 2

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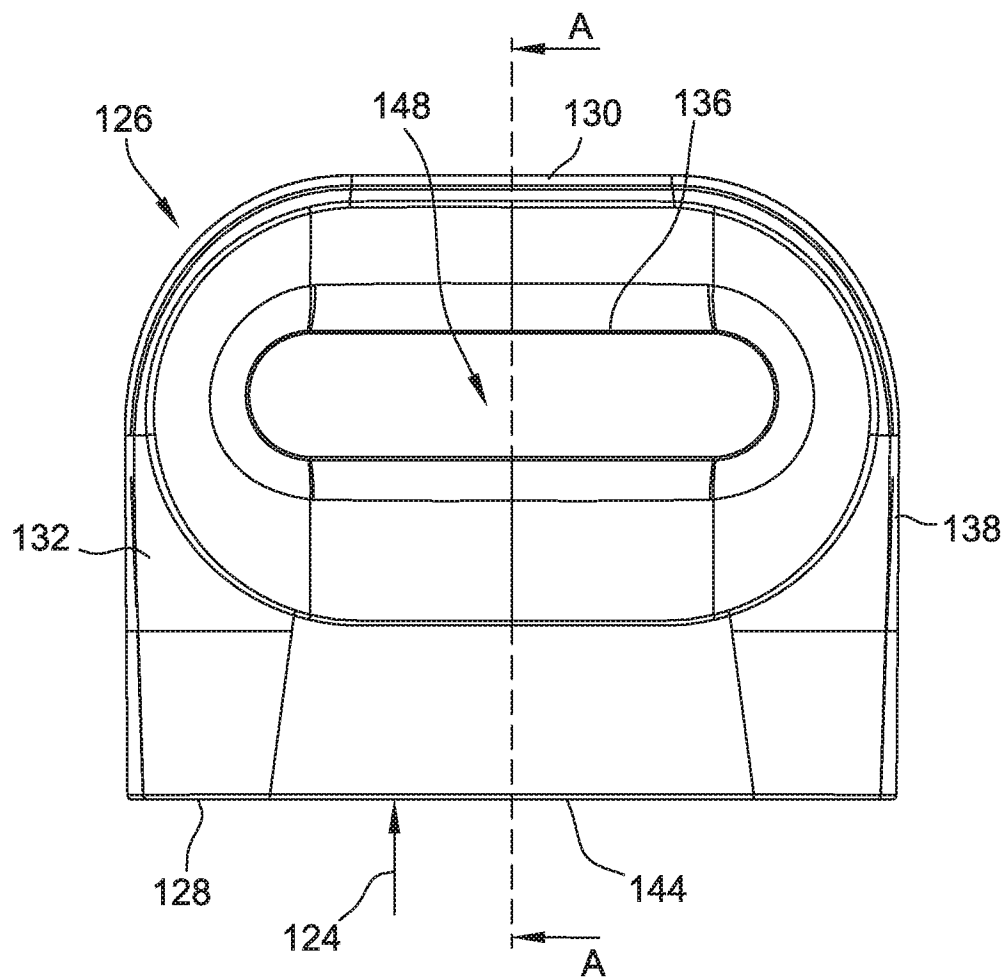


FIG. 3

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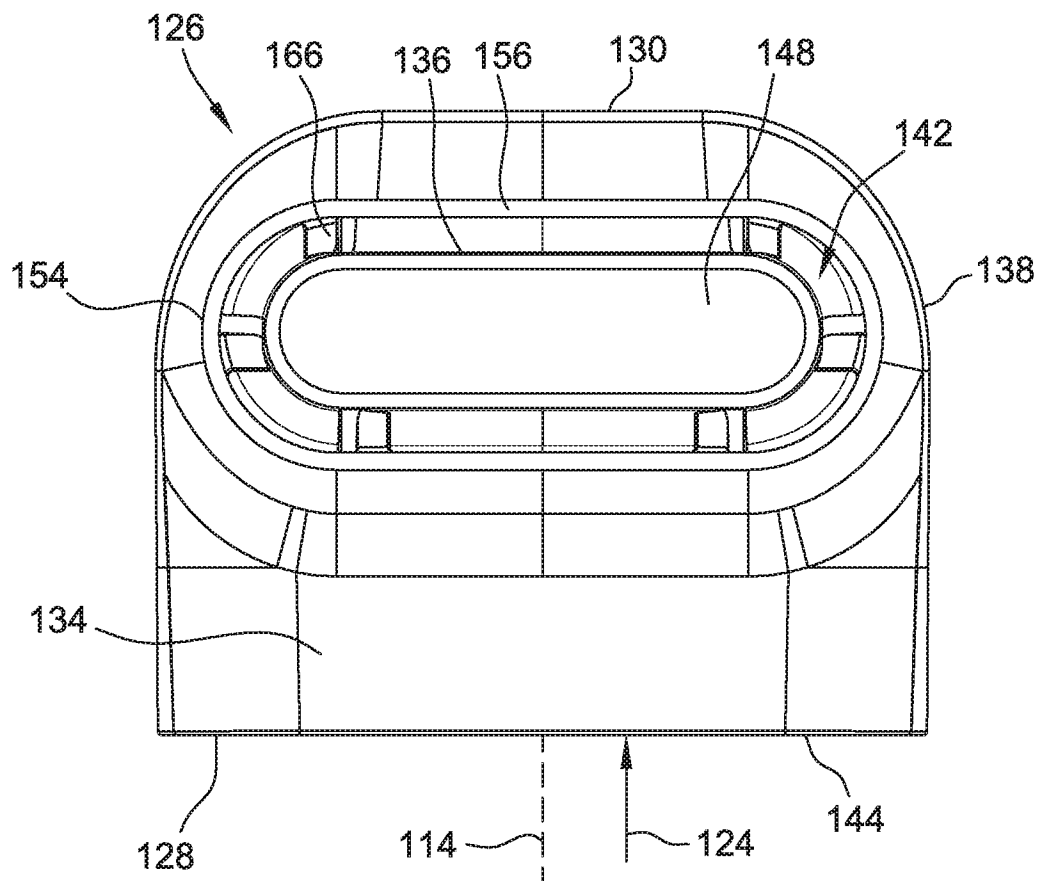


FIG. 4

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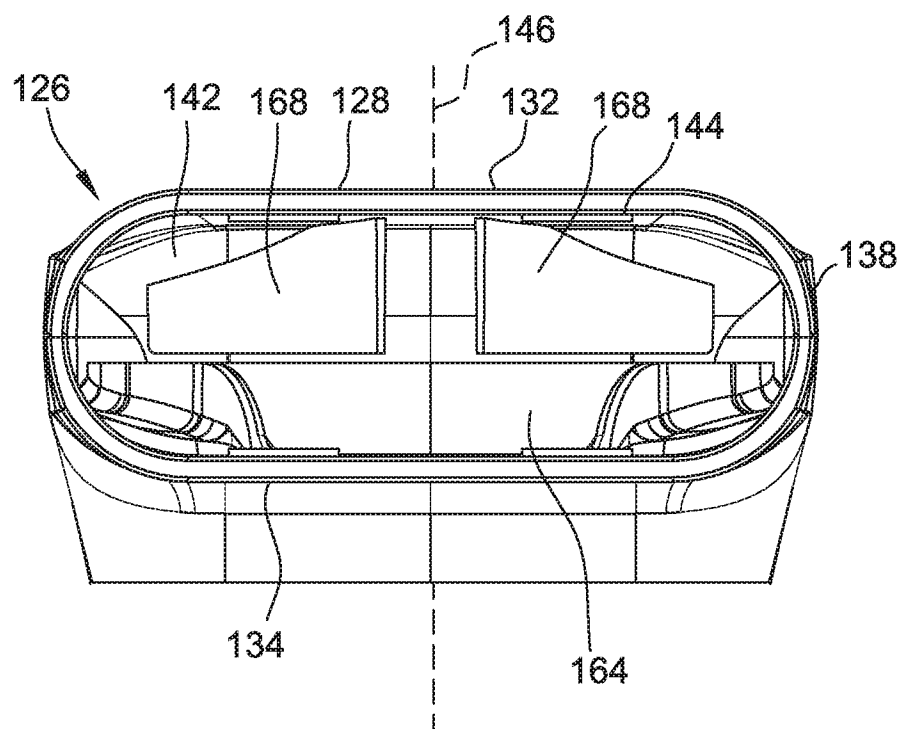


FIG. 5

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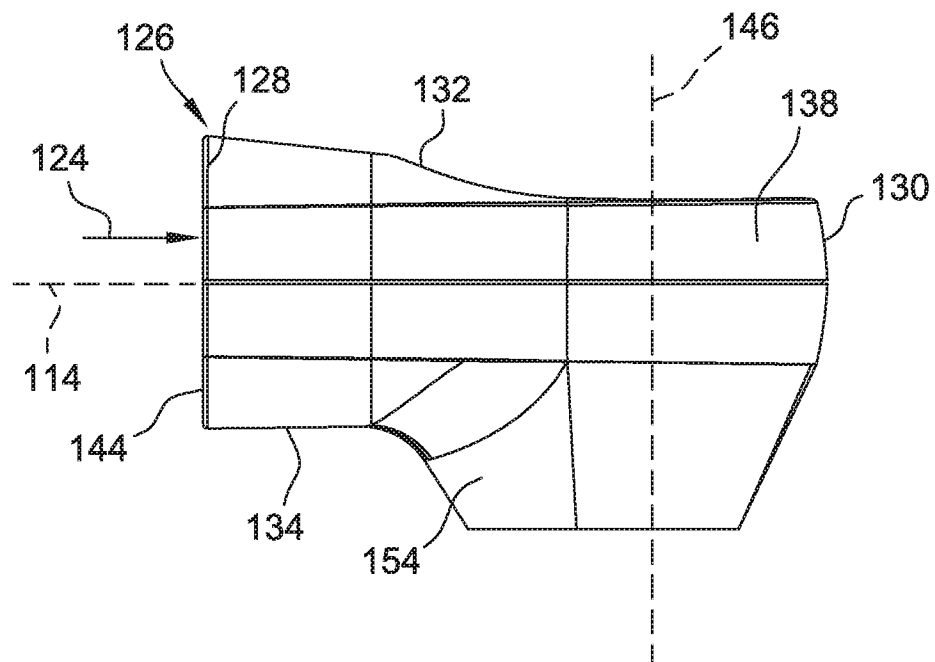


FIG. 6

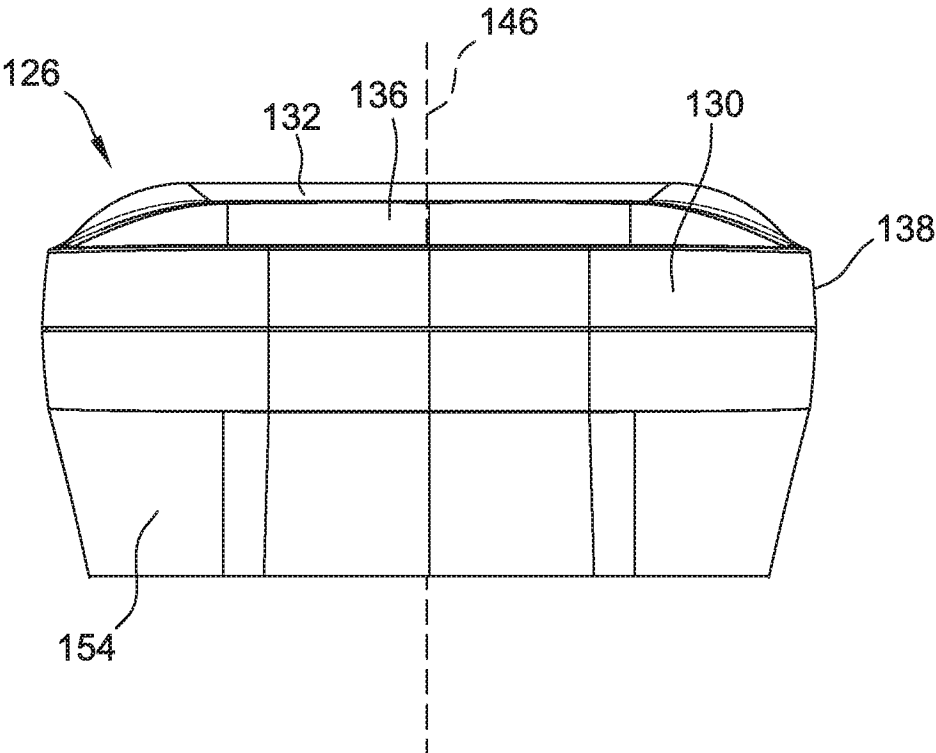


FIG. 7

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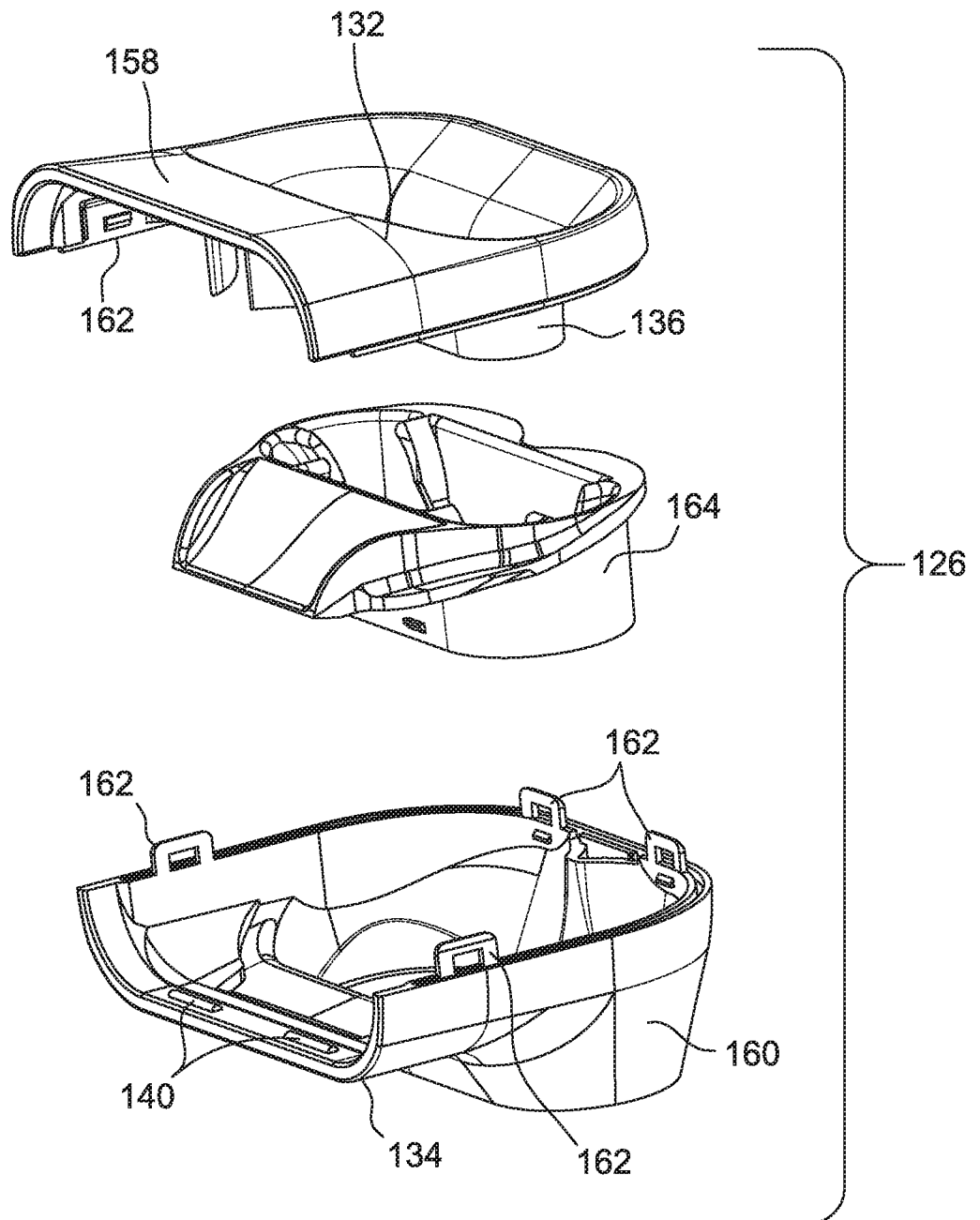


FIG. 8

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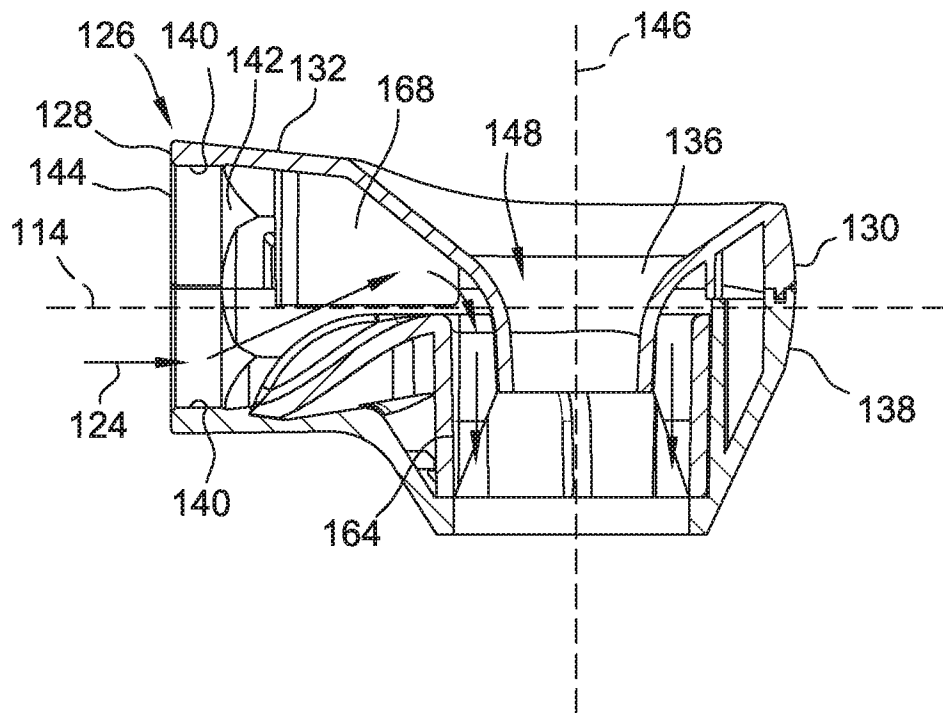


FIG. 9

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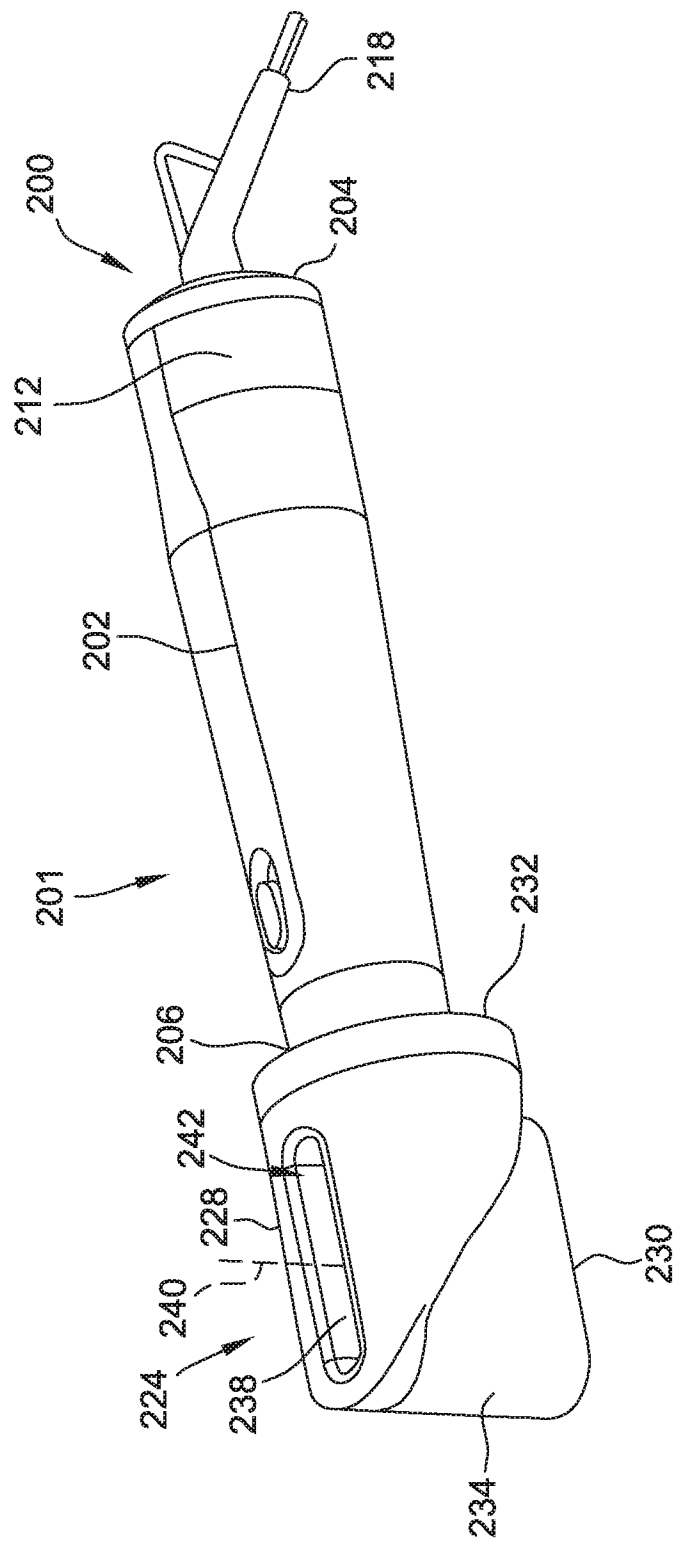
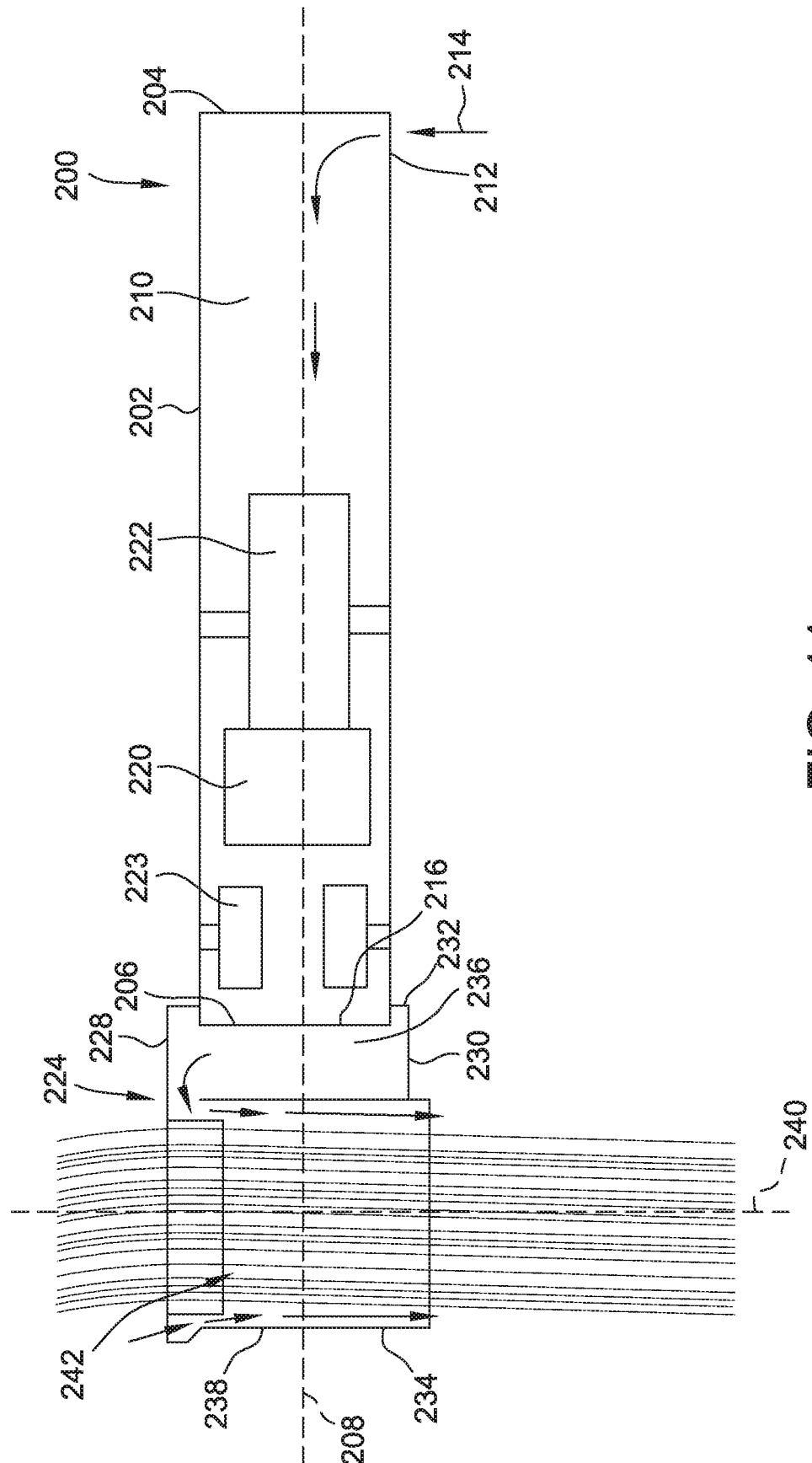


FIG. 10

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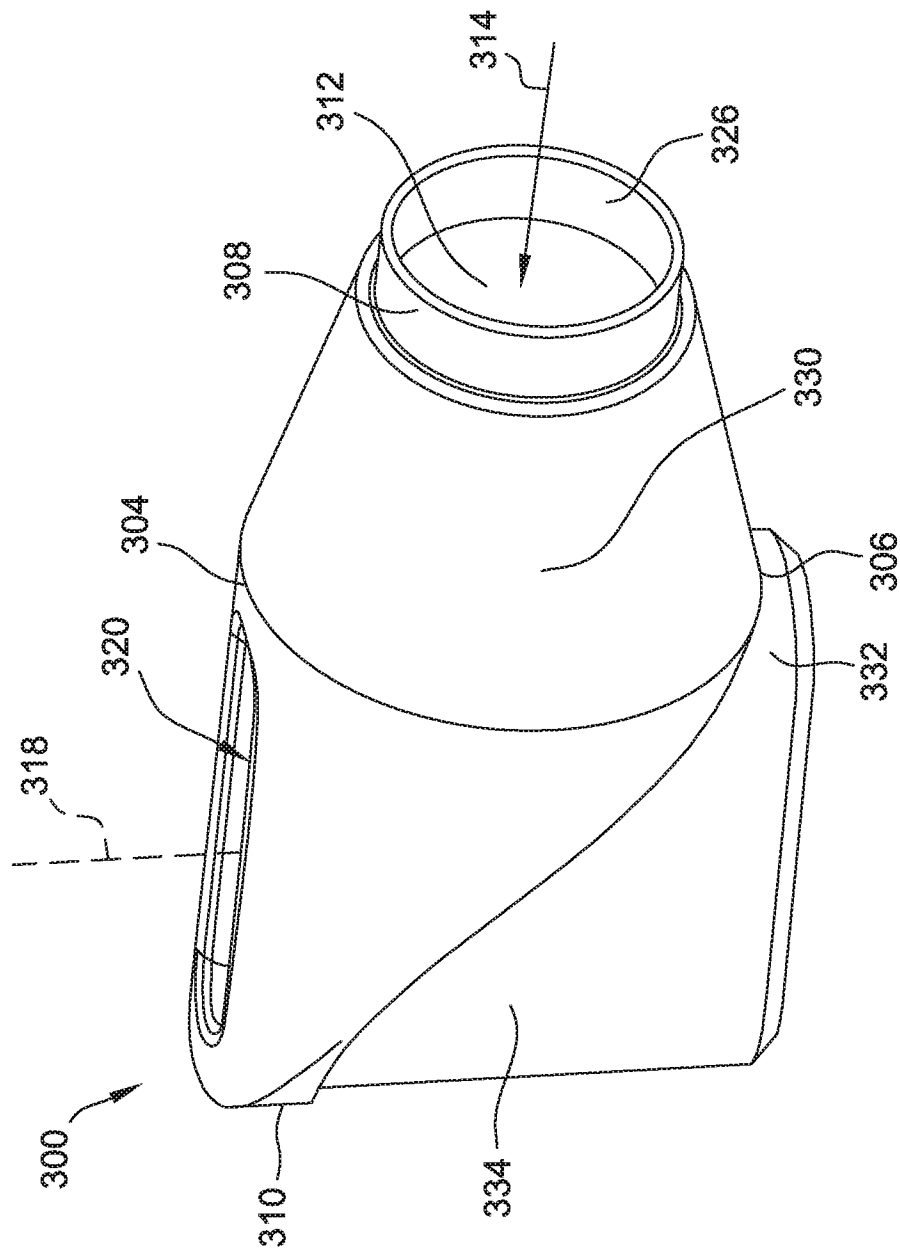


FIG. 12

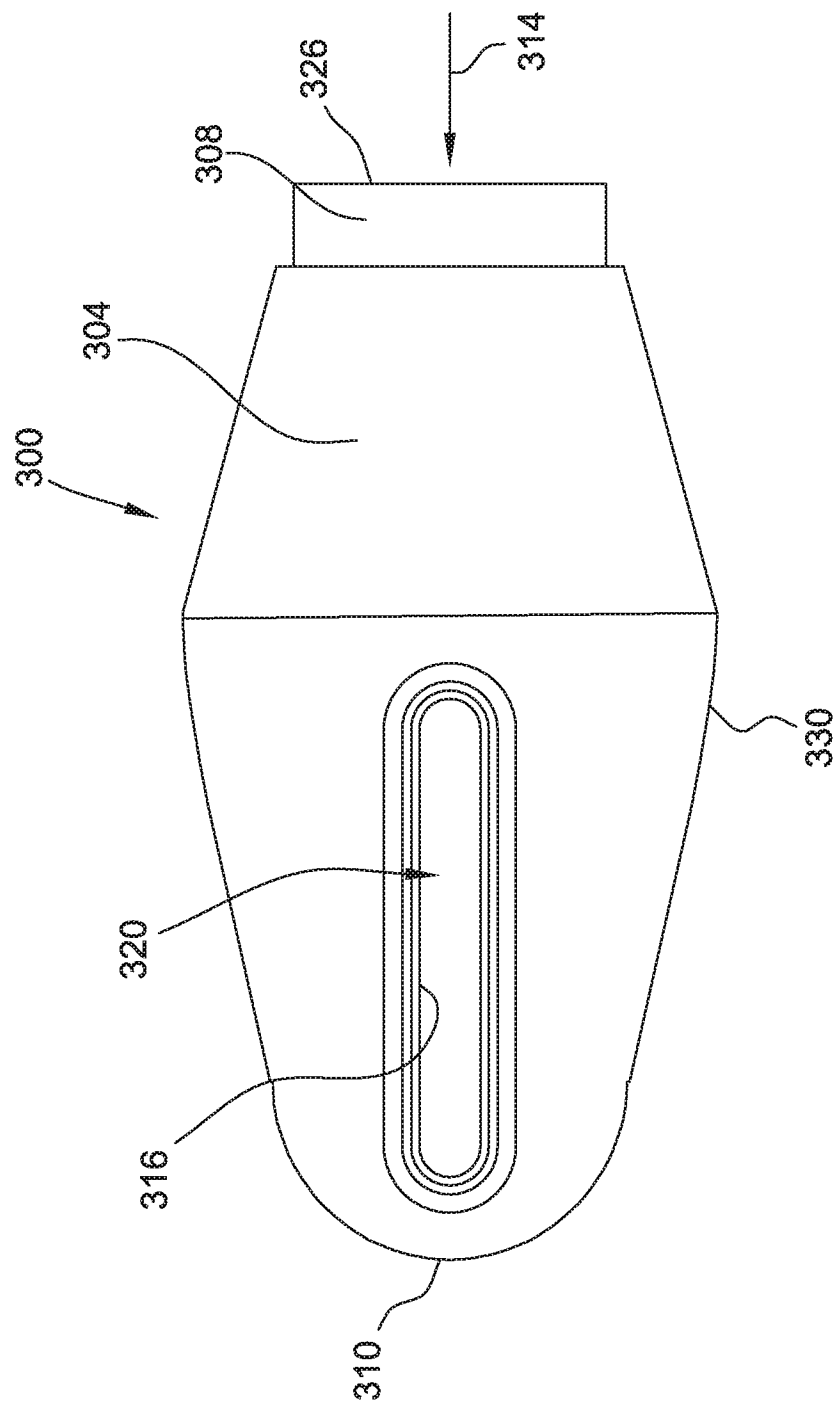


FIG. 13

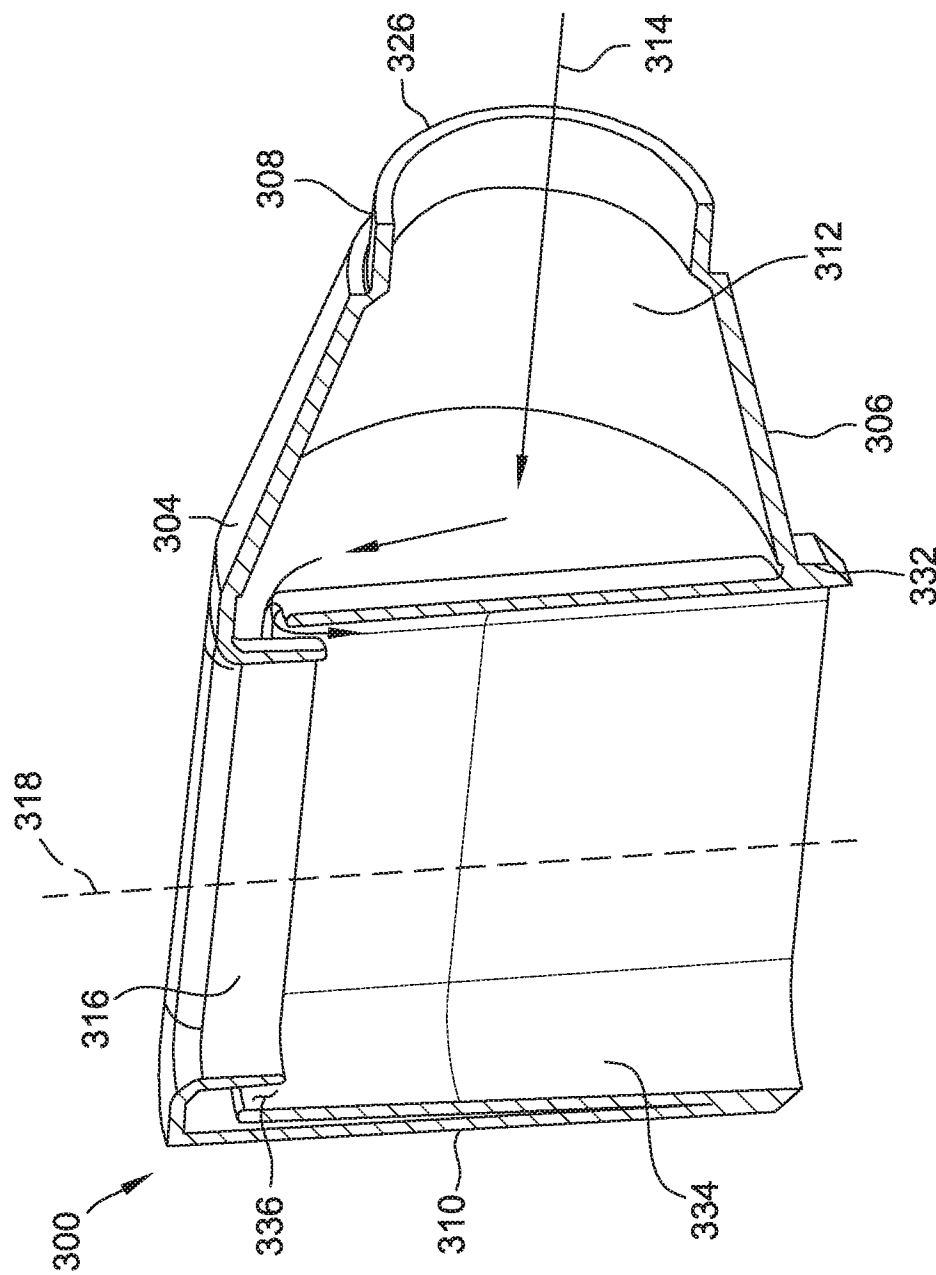


FIG. 14

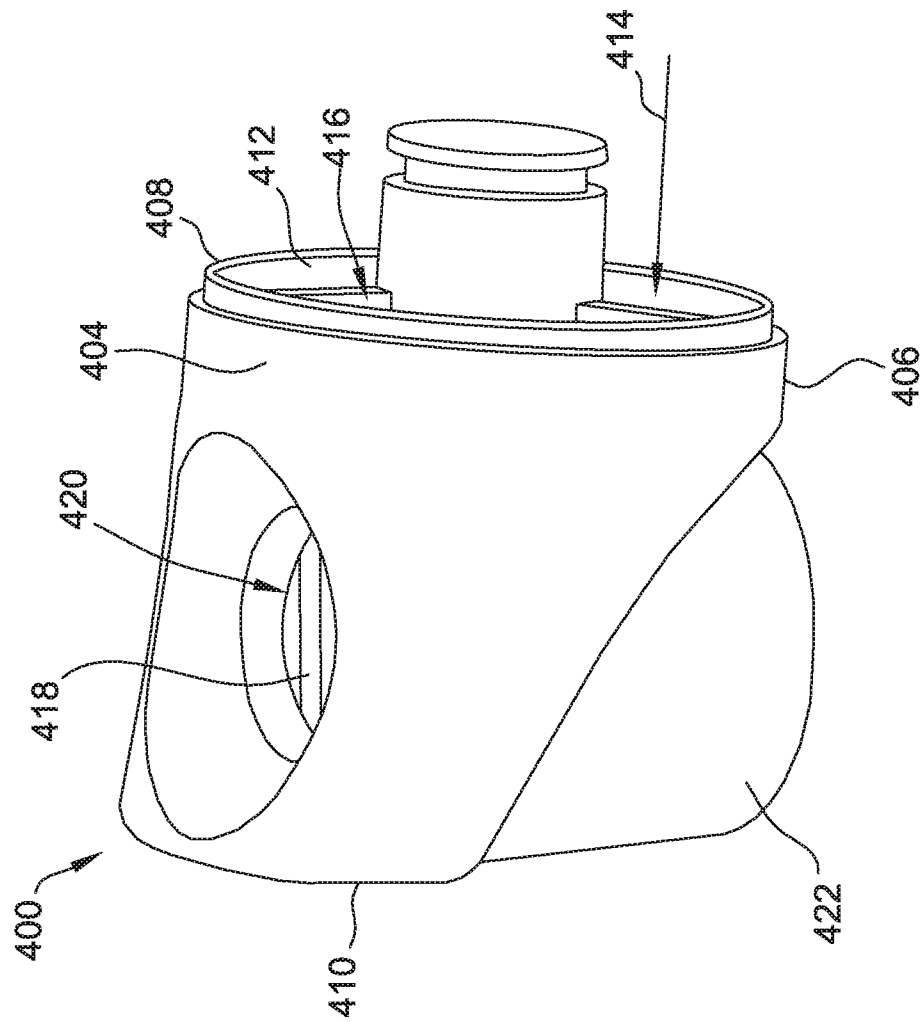


FIG. 15

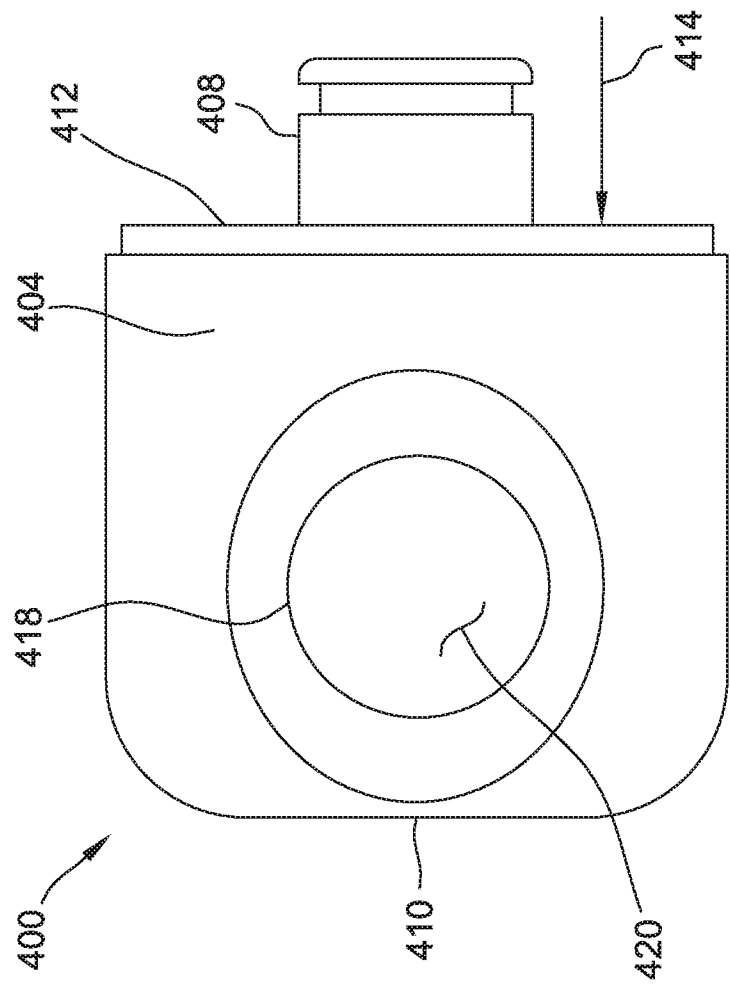


FIG. 16

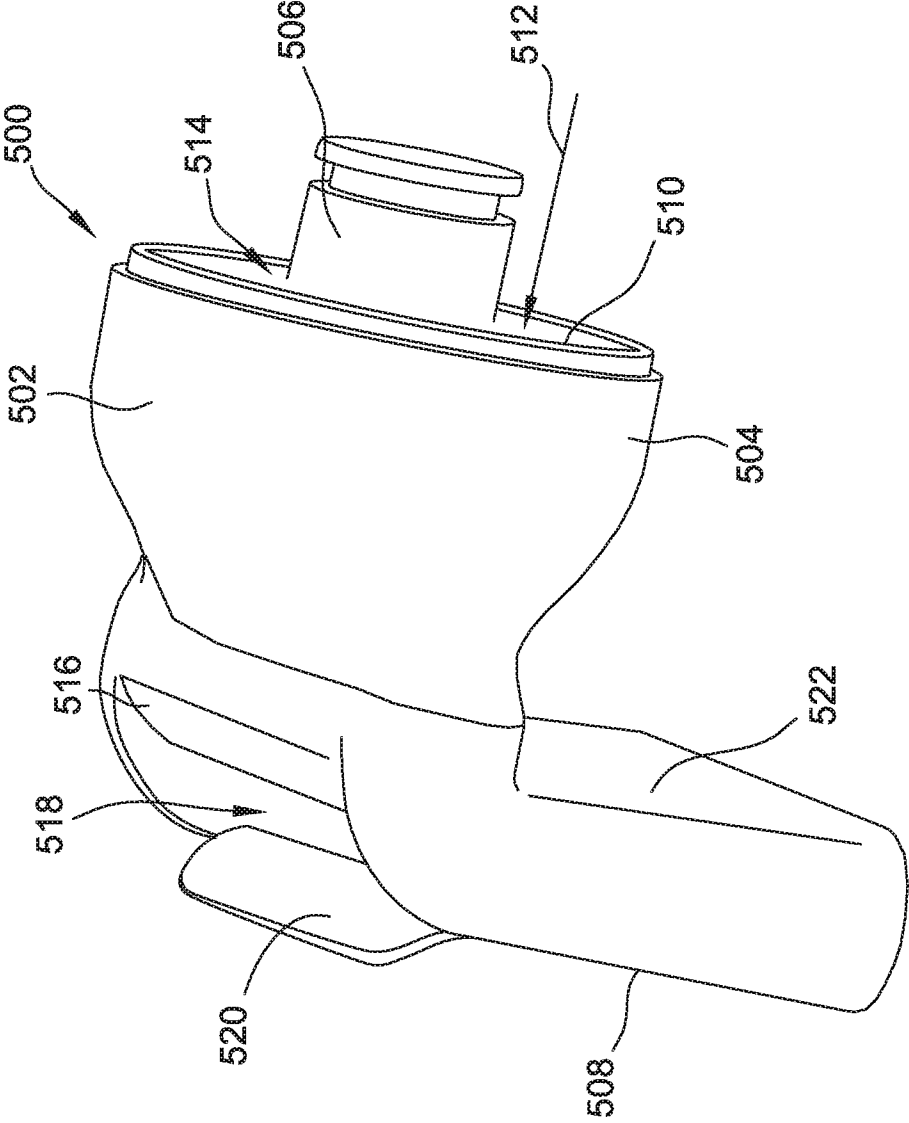


FIG. 17

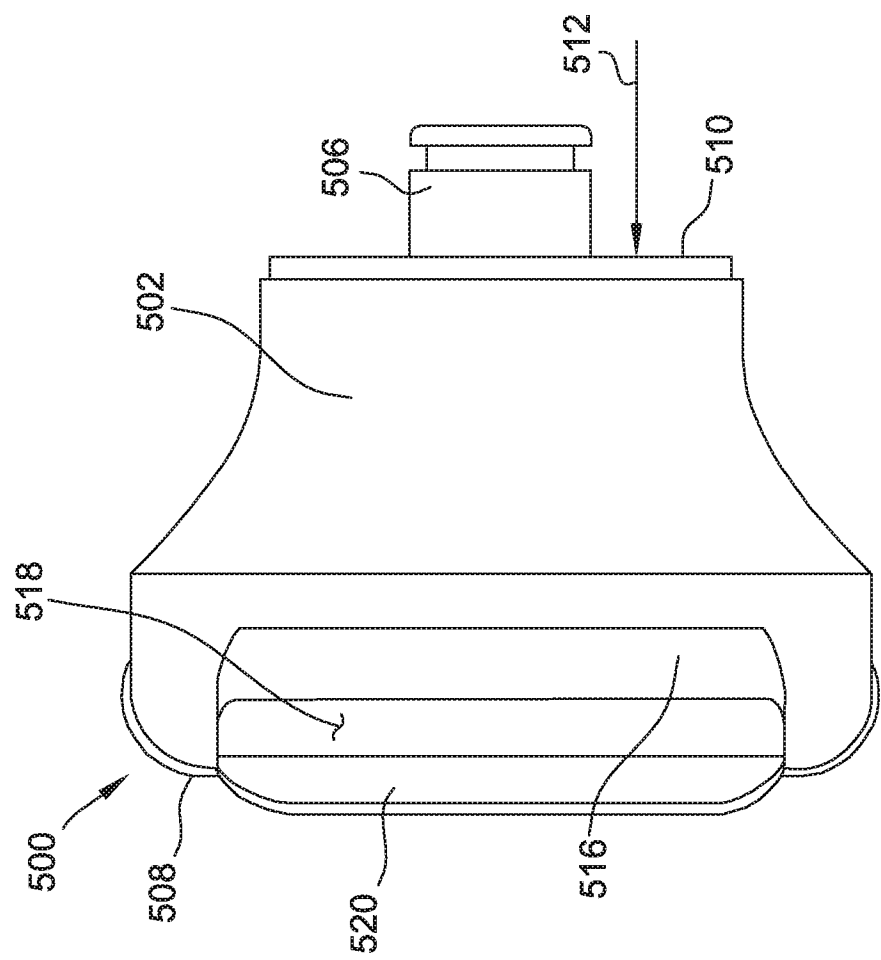


FIG. 18

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 20/53127

A. CLASSIFICATION OF SUBJECT MATTER

IPC - A45D 20/12, A45D 20/10, A45D 20/44, A45D 20/50, A45D 20/00, A45D 20/04 (2020.01)

CPC - A45D 20/12, A45D 20/00, A45D 20/122, A45D 20/10, A45D 20/124, A45D 20/5, A45D 20/122, A45D 1/08, A45D 2/001

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 110,742,383 A (Fenda Tech Co Ltd.), 4 February 2020 (04.02.2020), entire document, especially Figs. 1, 3, 6, 8, and 12.	1-20
A	US 8,066,017 B1 (Born et al.), 29 November 2011 (29.11.2011), entire document.	1-20
A	US 2014/0053426 A1 (Ragosta et al.), 27 February 2014 (27.02.2020), entire document.	1-20

☐

Further documents are listed in the continuation of Box C.

☐

See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"D" document cited by the applicant in the international application

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

18 November 2020

Date of mailing of the international search report

01 MAR 2021

Name and mailing address of the ISA/US

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