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(54) **Rotating air directing apparatus for a hair dryer**

(57) A rotating air directing apparatus for a hair dryer is provided. The apparatus includes a tubular rotating member and a nozzle member disposed adjacent to an outlet opening of the tubular rotating member and adapted to rotate with the tubular rotating member. The nozzle member includes an angled tubular member having a nozzle opening disposed at an acute angle relative to the

outlet opening. A plurality of curved vanes each have a fixed edge at a circumferential inner surface of the tubular rotating member, and an opposing free edge that defines a central open space of the tubular rotating member. Each of the plurality of curved vanes are spaced apart from each other, thereby defining a plurality of curved radial openings between adjacent curved vanes.

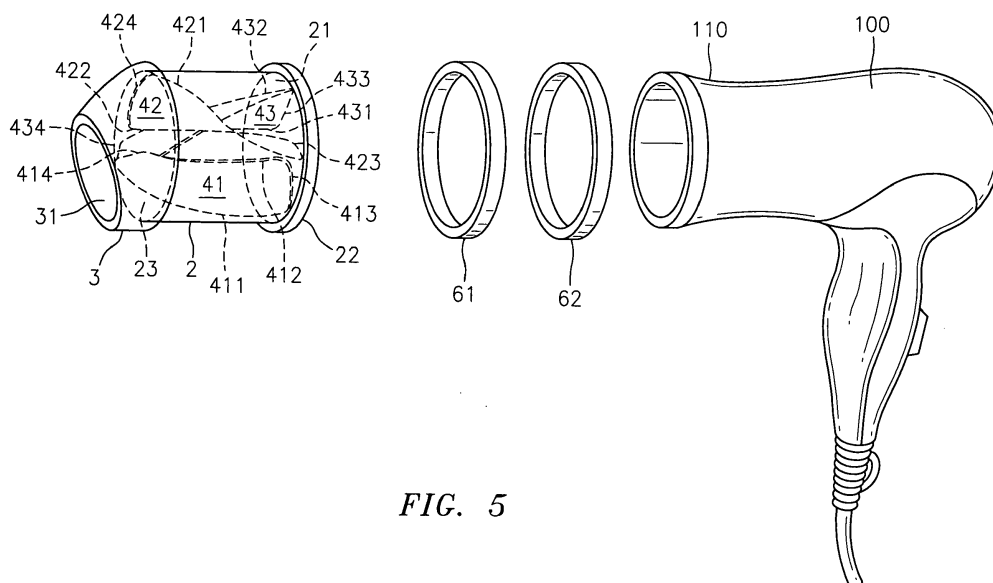


FIG. 5

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The invention relates generally to the field of hair dryers, and more particularly, to devices having a rotating member for directing a circular flow of air from a hair dryer.

2. Description of the Related Art

[0002] A number of devices are known that direct air flow from a hair dryer. These devices include nozzle attachments or outlets that spin while deflecting air at an acute angle. The attachments are enabled to spin through the use of internal vanes that are pushed by the air exiting the hair dryer. The vanes are typically connected to and spin around a central point within the attachment. The direction of the air exiting the rotating attachment is thereby constantly changed, sometimes in a circular pattern. However, the air flow exiting from the attachment remains linear by nature, and the vanes only act to change how the linear flow is directed.

SUMMARY OF THE INVENTION

[0003] The present invention has been made to address at least the above problems and/or disadvantages and to provide at least the advantages described below. Accordingly, an aspect of the present invention relates to a rotating member for directing a circular flow of air from a portable hand-held hair dryer.

[0004] According to one aspect of the present invention, a rotating air directing apparatus for a barrel of a hair dryer is provided. The apparatus includes a tubular adapter member adapted to be removably coupled to the barrel of the hair dryer. The apparatus also includes a tubular rotating member rotatably coupled to the tubular adapter member. The tubular rotating member includes a circumferential inner surface, an inlet opening, an outlet opening, and a plurality of curved vanes. The apparatus further includes a nozzle member disposed adjacent to the outlet opening of the tubular rotating member and adapted to rotate with the tubular rotating member. The nozzle member includes an angled tubular member having a nozzle opening disposed at an acute angle relative to the outlet opening. The plurality of curved vanes each have a fixed edge at the circumferential inner surface that extends from the inlet opening to the outlet opening of the tubular rotating member, and an opposing free edge that defines a central open space of the tubular rotating member. Each of the plurality of curved vanes are spaced apart from each other, thereby defining a plurality of curved radial openings between adjacent curved vanes. Each of the plurality of curved radial openings adjoins the central open space to form a continuous open

path.

[0005] According to another aspect of the present invention, a hair dryer assembly is provided. The assembly includes a hair dryer having a barrel, and a tubular rotating member rotatably coupled to the barrel. The tubular rotating member includes a circumferential inner surface, an inlet opening, an outlet opening, and a plurality of curved vanes. The assembly further includes a nozzle member disposed adjacent to the outlet opening of the tubular rotating member and adapted to rotate with the tubular rotating member. The nozzle member includes an angled tubular member having a nozzle opening disposed at an acute angle relative to the outlet opening. The plurality of curved vanes each have a fixed edge at the circumferential inner surface that curvedly extends from the inlet opening to the outlet opening of the tubular rotating member, and an opposing free edge that defines a central open space of the tubular rotating member that remains open when rotating. Each of the plurality of curved vanes are spaced apart from each other, thereby defining a plurality of curved radial openings between adjacent curved vanes. Each of the plurality of curved radial openings adjoins the central open space to form a continuous open path.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] The above and other aspects, features and advantages of the present invention will be apparent from the following detailed description when taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a diagram illustrating a front view of a rotating air directing apparatus, according to an embodiment of the invention;

FIG. 2 is a diagram illustrating a side view of the apparatus shown in FIG. 1, according to an embodiment of the present invention;

FIG. 3 is a diagram illustrating a rear view of the apparatus shown in FIGS. 1 and 2, according to an embodiment of the present invention;

FIG. 4 is a diagram illustrating an exploded perspective view of the apparatus shown in FIGS. 1, 2 and 3, according to an embodiment of the present invention;

FIG. 5 is a diagram illustrating an exploded perspective view of a hair dryer assembly, according to an embodiment of the invention;

FIG. 6 is a diagram illustrating a perspective view of a rotating air directing apparatus attached to a hair dryer, according to another embodiment of the present invention;

FIG. 7 is a diagram illustrating an exploded perspective view of the apparatus, according to the embodiment of the present invention illustrated in FIG. 6;

FIG. 8 is a diagram illustrating a perspective view of a tubular rotating member in the apparatus, according to the embodiment of the present invention illus-

trated in FIG. 6;

FIG. 9A is a diagram illustrating a partial perspective view of first connection type of a speed reducing element to the tubular rotating member, according to the embodiment of the present invention illustrated in FIG. 6;

FIG. 9B is a diagram illustrating a partial perspective view of a second connection type of a speed reducing element to the tubular rotating member, according to the embodiment of the present invention illustrated in FIG. 6;

FIG. 9C is a diagram illustrating a side view of the tubular rotating member and the nozzle member, according to the embodiment of the present invention illustrated in FIG. 6;

FIG. 10 is a diagram illustrating a cross-sectional view of the assembled apparatus, according to the embodiment of the present invention illustrated in FIG. 6;

FIG. 11A is a diagram illustrating a side view of the tubular rotating member and the nozzle member, according to the embodiment of the present invention illustrated in FIG. 6;

FIG. 11B is a diagram illustrating a front view of the assembled apparatus, according to the embodiment of the present invention illustrated in FIG. 6;

FIG. 11C is a diagram illustrating a side view of the assembled apparatus, according to the embodiment of the present invention illustrated in FIG. 6;

FIG. 12A is a diagram illustrating a side view of air movement exiting the nozzle member, according to the embodiment of the present invention illustrated in FIG. 6; and

FIG. 12B is a diagram illustrating a front view of air movement exiting the nozzle member, according to the embodiment of the present invention illustrated in FIG. 6.

DETAILED DESCRIPTION EMBODIMENTS OF THE PRESENT INVENTION

[0007] Embodiments of the present invention are described in detail with reference to the accompanying drawings. The same or similar components may be designated by the same or similar reference numerals although they are illustrated in different drawings. Detailed descriptions of constructions or processes known in the art may be omitted to avoid obscuring the subject matter of the present invention.

[0008] FIGS. 1-4 and 6-12B show a rotating air directing apparatus for a barrel of a hair dryer, according to embodiments of the present invention. FIG. 5 shows a hair dryer assembly including a rotating air directing apparatus, according to an embodiment of the present invention. The air directing apparatus may be an attachment adapted to be removably secured to the barrel of a hair dryer as shown, for example in FIGS. 1-4 and 6-12B, or may be integral with a hair dryer barrel itself,

as shown for example in FIG. 5. A hair dryer is preferably a handheld portable hair dryer typically used at home or in a salon.

[0009] The rotating air directing apparatus is powered by the force of the air flowing from the hair dryer. The apparatus is designed and configured to create a moving, rotating pattern of heated air flow similar to that achieved when an operator manually manipulates the hair dryer relative to the hair to be dried. A rotating air directing apparatus, or a hair dryer assembly, according to an embodiment of the invention, eliminates the need for the operator to continuously manipulate the hair dryer, thereby reducing operator fatigue.

[0010] As shown, for example in FIG. 4, a rotating air directing apparatus for a barrel of a hair dryer, according to an embodiment of the invention, may include a tubular adapter member 1. The tubular adapter member 1 is adapted to be removably coupled to a barrel 110 of the hair dryer 100. For example, an internal diameter of the tubular adapter member 1 may be dimensioned to fit over an outer diameter of the hair dryer barrel 110 to provide a press-on or friction fit. Alternatively, an outer diameter of the tubular adapter member 1 may have dimensions that fit within an inner diameter of the hair dryer barrel 110 to provide a press-on or friction fit. Other possible arrangements for providing a removable coupling between the tubular adapter member 1 and the barrel 110 of the hair dryer 100 include an engaging groove on one or both of the tubular adapter member 1 and the barrel 110 of the hair dryer 100, a threaded fit and a clamping element.

[0011] The tubular adapter member 1 may be formed from a rigid, lightweight plastic material or any other suitable material or materials. The tubular adapter member 1 may have an outer diameter in a range between approximately 30 mm and 70 mm, for example approximately 53 mm, and a length in a range between approximately 40 and 80 mm, for example approximately 61 mm. However, the tubular adapter member 1 may be any suitable size for coupling to the hair dryer 100.

[0012] A tubular rotating member 2 is rotatably coupled to the tubular adapter member 1. The tubular rotating member 2 includes a circumferential inner surface 21, an inlet opening 22 and an outlet opening 23. For example, an outer diameter of the tubular rotating member 2 may be dimensioned to fit inside the tubular adapter member 1 to provide a freely rotating fit.

[0013] The respective inner and outer surfaces of the tubular adapter member 1 and the tubular rotating member 2 may provide bearing surfaces for the rotational motion. Alternatively, one or more bearing elements may be incorporated into the apparatus to facilitate rotation of the tubular rotating member 2. The bearing elements may be any suitable type, for example, ring bearings, roller bearings or ball bearings. At least one ring bearing may be disposed on an inner surface of the tubular adapter member 1 and/or on an outer surface of the tubular rotating member 2. Moreover, a first ring bearing 61 may

be disposed proximate to the outlet opening 23 of the tubular rotating member 2 on an outer surface of the tubular rotating member 2 and on an inner surface of the tubular adapter member 1. A second ring bearing 62 may be disposed proximate to the inlet opening 22 of the tubular rotating member 2 on an outer surface of the tubular rotating member 2 and on an inner surface of the tubular adapter member 1.

[0014] The tubular rotating member 2 may be formed from a rigid, lightweight plastic material or any other suitable material or materials. A length of the tubular adapter member 1 and the tubular rotating member 2 assembly may be in a range of approximately 60 to 100 mm, for example 82 mm. However, the assembly may be any suitable length for achieving its intended purpose.

[0015] A nozzle member 3 is disposed adjacent to the outlet opening 23 of the tubular rotating member 2 and is adapted to rotate with the tubular rotating member 2. The nozzle member 3 may be rigidly coupled to the tubular rotating member 2 or may be formed integrally therewith to provide a single unitary structure. The nozzle member 3 includes an angled tubular member, which can have, for example, a semi-conical or frusto-conical shape.

[0016] The nozzle member 3 also has a nozzle opening 31 disposed at an acute angle relative to the outlet opening 23 of the tubular rotating member 2. Specifically, a imaginary perpendicular line passing through a center of the nozzle opening 31 forms an angle of less than ninety degrees with an imaginary perpendicular line passing through a center of the outlet opening 23. Due to the configuration of the angled nozzle opening, when the tubular rotating member 2 and the nozzle member 3 rotate, a moving, rotating pattern of heated air flow is created which is similar to that achieved by an operator manually manipulating the hair dryer relative to the hair to be dried. The nozzle member 3 may be formed from a rigid, lightweight plastic material or any other suitable material or materials.

[0017] A plurality of curved vanes is disposed within the tubular rotating member 2. The rotating air directing apparatus may include two, three or more vanes. For example, as shown in FIG. 3, a first curved vane 41, a second curved vane 42 and a third curved vane 43 may be disposed within the tubular rotating member 2. The curved vanes 41, 42, 43 may be rigidly coupled to the tubular rotating member 2 or may be formed integrally therewith to provide a single unitary structure.

[0018] The curved vanes 41, 42, 43 are configured to cause the tubular rotating member 2 and the nozzle member 3 to rotate together when the air stream from the hair dryer flows past the curved vanes 41, 42, 43. The shape and arrangement of the vanes 41, 42, 43 create a vortex or whirling mass of air which imparts a rotating motion on the tubular rotating member 2 and the nozzle member 3. In particular, the plurality of curved vanes 41, 42, 43 include a corresponding plurality of fixed edges 411, 421, 431. Each fixed edge 411, 421, 431 is associated with a

respective one of the curved vanes 41, 42, 43. The fixed edges 411, 421, 431 are fixed to the circumferential inner surface 21 of the tubular rotating member 2.

[0019] The plurality of curved vanes 41, 42, 43 also include a plurality of free edges 412, 422, 432. Each free edge 412, 422, 432 is associated with a respective one of the curved vanes 41, 42, 43. Free edges 412, 422, 432 are spaced apart from the circumferential inner surface 21 of tubular rotating member 2. The plurality of free edges 412, 422, 432 defines a central open space 50, as shown in FIG. 3.

[0020] The plurality of curved vanes 41, 42, 43 also include a plurality of associated inlet side edges 413, 423, 433. Each of the inlet side edges 413, 423, 433 is associated with a respective one of the curved vanes 41, 42, 43. Each of the inlet side edges 413, 423, 433 is disposed proximate to the inlet opening 22 and extends between a respective one of the fixed edges 411, 421, 431 and a respective one of the free edges 412, 422, 432.

[0021] The plurality of curved vanes 41, 42, 43 also include a plurality of outlet side edges 414, 424, 434. Each of the outlet side edges 414, 424, 434 is associated with a respective one of the curved vanes 41, 42, 43. Each of the outlet side edges 414, 424, 434 is disposed distal to the inlet opening 22 and extends between a respective one of the fixed edges 411, 421, 431 and a respective one of the free edges 412, 422, 432.

[0022] Each of the curved vanes 41, 42, 43 is spaced apart from each adjacent curved vane to define a plurality of curved radial openings 401, 402, 403 between adjacent curved vanes. Each of the plurality of curved radial openings 401, 402, 403 adjoins the central open space 50 to form a continuous open path, as shown in FIG. 3.

[0023] FIG. 5 shows an exploded perspective view of a hair dryer assembly, according to another embodiment of the invention. In the embodiment shown in FIG. 5, a rotating air directing apparatus is integrated with the barrel 110 of the hair dryer 100. The components and arrangement thereof may be as previously described for the embodiment shown in FIGS. 1-4, except that the tubular adapter member 1 is not required. Accordingly, the tubular rotating member 2 is rotatably coupled to the barrel 110 of the hair dryer 100, rather than to the tubular adapter member 1.

[0024] FIG. 6 is a diagram illustrating a perspective view of a rotating air directing apparatus attached to a hair dryer, according to an additional embodiment of the present invention. A rotating air directing apparatus 202 is attached to a barrel 210 of a hair dryer 200. The apparatus 202 includes an adapter member 204 that houses the elements of the apparatus 202, and connects the apparatus 202 to the barrel 210 of the hair dryer 200. The apparatus 202 may be connected to the hair dryer 200 in any one of the ways described above with respect to FIGS. 1-4. The apparatus also includes a nozzle member 206 that extends out from a center of the adapter member 204 at a side of the adapter member 204 that is opposite that of the connection to the barrel 210. The

nozzle member 206 is rotatably connected to components disposed in an interior of the adapter member 204, and rotates independent of the adapter member 204.

[0025] Referring now to FIG. 7, a diagram illustrates an exploded view of the apparatus, according to the embodiment of the present invention illustrated in FIG. 6. The apparatus 202 is shown having the adapter member 204, the nozzle member 206, a tubular rotating member 208, a speed reducing element 210, and an air directing member 212. The tubular rotating member 208, the speed reducing element 210, and the air directing member 212 are each disposed within the adapter member 204. The air directing member 212 is disposed in a fixed position within the adapter member, and has a plurality of vanes 214 that direct air received from the hair dryer 200. Specifically, an edge of each of the vanes 214 extends radially out from a central point of the air directing member 212 to a circumference of the air directing member 212. Each vane is tilted/slanted at a specified acute angle from a corresponding plane perpendicular to the circumference of the air directing member 212. The tubular rotating member 208 freely rotates within the adapter member 204 when air directed from the vanes 214 of the air directing member 212 impacts internal curved vanes 216 of the tubular rotating member 208. The curved vanes 216 of the tubular rotating member 208 are similar to those illustrated and described in the tubular rotating member 2 of FIGS. 1-5. While FIGS. 1-5 illustrate vanes having defined free edges and side edges, the free edges may also extend in a curved manner to a fixed edge on the internal circumference of the tubular rotating member 208 without a clear transition between free edges and side edges.

[0026] The speed reducing element 210 is disposed within a groove 218 of the tubular rotating member 208, and assists in reducing the speed at which the tubular rotating member 208 rotates within the adapter member 204. The speed reducing element 210 reduces a rotating speed of the tubular rotating element 208 by expanding beyond the circumference of the tubular rotating member 208 due to centrifugal force when the tubular rotating member 208 is rotating causing contact and friction between the speed reducing element 210 and an interior circumference of the tubular adapter member 204.

[0027] The tubular rotating member 208 also includes ball bearings 220 that are disposed within ball retainers 222 on an external circumference of the tubular rotating member 208. The ball bearings 220 contact an internal ledge and the internal circumferential wall of the adapter member 204 when fully assembled. These contact points allow the tubular rotating member 208 to rotate freely within the adapter member 204 while preventing the tubular rotating member 208 from being able to slip out an end of the adapter member 204 from where the nozzle member 206 extends. The tubular rotating member 208 also includes a plurality of receiving elements 224 on an end of its outer circumference near the nozzle member 206 to assist in the attachment between the nozzle mem-

ber 206 and the tubular rotating member 208. An interior circumference of the nozzle member 206 may have a plurality of protruding elements that fit into the receiving elements 224 to assist in the attachment to the tubular rotating member 208.

[0028] Referring now to FIG. 8, a diagram illustrates a perspective view of the tubular rotating member 208, according to the embodiment of the present invention illustrated in FIG. 6. This perspective view clearly shows an interior of the tubular rotating member 208, in which the three curved vanes 216 are illustrated, and are shown as similar to those illustrated and described with respect to FIGS. 1-5.

[0029] Referring now to FIG. 9A, a diagram illustrates a partial perspective view of a first connection of the speed reducing element 210 to the tubular rotating member 208, according to the embodiment of the present invention illustrated in FIG. 6. The speed reducing element 210 sits within the groove 218 and includes a tab 226 that extends into an aperture 228 within the groove 218 of the tubular rotating member 208. The tab 226 holds the speed reducing element 210 in place within the groove while the tubular rotating member 208 rotates. The diagram of FIG. 9B illustrates a second connection, in which the tab 226 has been ultrasonically welded on the interior of the tubular rotating member 208. The speed reducing element 210 is locked in the groove 218 because a head 230 of the tab 226 is formed when the plastic is melted during ultra-sonic welding, and the head 230 is larger than the aperture 228. FIG. 9C illustrates a side view of the rotating tubular member 208 and the attached nozzle member 206, according to an embodiment of the present invention. The aperture 228 is shown within the groove 218, where the speed reducing element 210 is to be disposed.

[0030] FIG. 10 is a diagram illustrating a cross-sectional view of the assembled apparatus, according to the embodiment of the present invention illustrated in FIG. 6. The adapter member 204 is shown housing the nozzle member 206, the rotating tubular member 208 and the air directing member 210. The air directing member 210 is fixedly disposed within the adapter member 204, while the rotating tubular member 208 and the nozzle member 206 are rotatably disposed within the adapter member 204. A gap is disposed between the air directing member 210 and the rotating tubular member 208, so that the rotating tubular member 208 may rotate freely without contacting the air directing member 208. Air is directed by the vanes 214 of the air directing member 210 to the curved vanes 216 of the rotating tubular member 208 causing the rotating tubular member 208 to rotate within the adapter member 204. The nozzle member 206 rotates with the rotating tubular member 208 due to its connection with the rotating tubular member 208 at the receiving elements 224. Specifically, the nozzle member 206 is connected to the rotating tubular member 208 via ultra-sonic welding. The rotating tubular member 208 rotates freely because the rotating tubular member 208

contacts the adapter member 204 with the ball bearings 220 at an internal edge 232 and an internal circumferential wall 234 of the adapter member 204. The internal circumference of the adapter member 204 also includes protruding elements 236 that are disposed near an end of the adapter member 204 opposite that of the nozzle member 206. The protruding elements 236 assist in detachably connecting the adapter member 204 to the barrel 210 of the hair dryer 200.

[0031] Referring now to FIG. 11A, a diagram illustrates a side view of the tubular rotating member 208 and the nozzle member 206, according to the embodiment of the present invention illustrated in FIG. 6. The nozzle member 206 is shown having an acutely angled opening that extends only partially across a planar circumference of the nozzle member 206. Specifically, the opening of the nozzle member 206 extends from a first end of the planar circumference outwardly at an acute angle to a point beyond the center of the planar circumference of the nozzle member 206 but not reaching the other end of the planar circumference. The opening is preferably ovular in shape.

[0032] FIGS 11 Band 11C illustrate a front and side view of the adapter member 204 and the nozzle member 206, according to an embodiment of the present invention. A center line C/L is drawn through a center of the adapter member 204. In an embodiment of the present invention a highest point of the opening of the nozzle member 206 is illustrated as 7.3 mm above the center line C/L, while a center line of the opening of the nozzle member 206 is illustrated as 6.3 mm below the center line C/L.

[0033] FIGS. 12A and 12B illustrate the air flow from the apparatus, according to the embodiment of the present invention illustrated in FIG. 6. FIG. 12A illustrates a side view and FIG. 12B illustrates a front view of the air flow that results when the nozzle rotates and the air released from the nozzle is rotating. Specifically, the air flow exiting the nozzle is circularly rotating and a direction that the circularly rotating air is output is constantly changed in a circular manner in accordance with the rotating nozzle. This causes a tornado effect that is more effective in drying hair.

[0034] The embodiment of the present invention illustrated in FIGS. 6-12B can also be adapted such that it is part of a hair dryer assembly. This adaptation would involve the use of the barrel of the hairdryer instead of a tubular adapter, as shown in FIG. 5.

[0035] While the invention has been shown and described with reference to certain embodiments thereof, it will be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope of the invention as defined by the appended claims.

Claims

1. A rotating air directing apparatus for a barrel of a hair dryer, the apparatus comprising:

a tubular adapter member adapted to be removably coupled to the barrel of the hair dryer;
a tubular rotating member rotatably coupled to the tubular adapter member, wherein the tubular rotating member comprises a circumferential inner surface, an inlet opening, an outlet opening, and a plurality of curved vanes;
a nozzle member disposed adjacent to the outlet opening of the tubular rotating member and adapted to rotate with the tubular rotating member, wherein the nozzle member comprises an angled tubular member having a nozzle opening disposed at an acute angle relative to the outlet opening; and

wherein the plurality of curved vanes each have a fixed edge at the circumferential inner surface that extends from the inlet opening to the outlet opening of the tubular rotating member, and an opposing free edge that defines a central open space of the tubular rotating member; and

wherein each of the plurality of curved vanes are spaced apart from each other, thereby defining a plurality of curved radial openings between adjacent curved vanes, and wherein each of the plurality of curved radial openings adjoins the central open space to form a continuous open path.

2. The rotating air directing apparatus according to claim 1, further comprising at least one ring bearing disposed on an inner surface of the tubular adapter member and on an outer surface of the tubular rotating member.
3. The rotating air directing apparatus according to claim 2, wherein the at least one ring bearing comprises a first ring bearing proximate to the outlet opening and a second ring bearing proximate to the inlet opening.
4. The rotating air directing apparatus according to claim 1, wherein the plurality of curved vanes are integrally formed with the tubular rotating member.
5. The rotating air directing apparatus according to claim 1, wherein the plurality of curved vanes comprises a first curved vane, a second curved vane and a third curved vane.
6. The rotating air directing apparatus according to claim 1, wherein the nozzle member is integrally formed with the tubular rotating member.

7. The rotating air directing apparatus according to claim 1, wherein each of the plurality of curved vanes comprises one or more side edges extending between the fixed edge and the free edge.
8. The rotating air directing apparatus according to Claim 1, wherein the opposing free edge of each of the plurality of curved vanes is curved so that it contacts both ends of its corresponding fixed edge.
9. The rotating air directing apparatus according to claim 1, wherein the tubular rotating member comprises a plurality of ball bearings in respective ball bearing retainers on a circumferential outer surface of the tubular rotating member.
10. The rotating air directing apparatus according to claim 9, wherein the plurality of ball bearings provide contact between the tubular rotating member and the tubular adapter member at an inner ledge and a circumferential inner surface of the tubular adapter member.
11. The rotating air directing apparatus according to claim 1, further comprising an air directing member fixedly disposed within the tubular adapter member adjacent to the inlet opening of the tubular rotating member.
12. The rotating air directing apparatus according to claim 11, wherein the air directing member comprises a plurality of vanes that each extend radially from a center of the air directing member to a circumference of the air directing member, and are individually slanted to change the direction of air flow.
13. The rotating air directing apparatus according to Claim 12, wherein the plurality of vanes are slanted at an acute angle from a corresponding plane that is perpendicular to the circumference of the air directing member.
14. The rotating air directing apparatus according to claim 1, further comprising a speed reducing element that is disposed in a groove around an outer circumference of the tubular rotating member proximate to the inlet opening.
15. The rotating air directing apparatus according to claim 12, wherein the speed reducing element reduces a rotating speed of the tubular rotating element by expanding beyond the circumference of the tubular rotating member due to a centrifugal force when the tubular rotating member is rotating causing contact and friction between the speed reducing element and an interior circumference of the tubular adapter member.
16. The rotating air directing apparatus according to claim 1, wherein the nozzle opening is ovular in shape having a longest diameter that extends from a point linear with a planar circumference of the outlet opening to a point linearly between a center of the outlet opening and an opposing point on the planar circumference of the outlet opening.
17. The rotating air directing apparatus according to claim 1, wherein the central open space remains open when the rotating tubular member is rotating.
18. A hair dryer assembly comprising:
 - a hair dryer having a barrel;
 - a tubular rotating member rotatably coupled to the barrel, wherein the tubular rotating member comprises a circumferential inner surface, an inlet opening, an outlet opening, and a plurality of curved vanes;
 - a nozzle member disposed adjacent to the outlet opening of the tubular rotating member and adapted to rotate with the tubular rotating member, wherein the nozzle member comprises an angled tubular member having a nozzle opening disposed at an acute angle relative to the outlet opening; and

wherein the plurality of curved vanes each have a fixed edge at the circumferential inner surface that curvedly extends from the inlet opening to the outlet opening of the tubular rotating member, and an opposing free edge that defines a central open space of the tubular rotating member that remains open when rotating; and

wherein each of the plurality of curved vanes are spaced apart from each other, thereby defining a plurality of curved radial openings between adjacent curved vanes, and wherein each of the plurality of curved radial openings adjoins the central open space to form a continuous open path.
19. An apparatus for rotating and directing air from a barrel of a hair dryer, the apparatus comprising:
 - a circumferential inner surface;
 - an inlet opening;
 - an outlet opening; and
 - a plurality of curved vanes, each of which have a fixed edge at the circumferential inner surface that extends from a first region the inlet opening to a second region near the outlet opening of the apparatus, and an opposing free edge that defines a central open space of the apparatus.
20. The apparatus of Claim 19, wherein each of the plurality of curved vanes are spaced apart from each other, thereby defining a plurality of curved radial

openings between adjacent curved vanes, and wherein each of the plurality of curved radial openings adjoins the central open space to form a continuous open path.

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21. The apparatus of Claim 19, wherein the apparatus is rotatably coupled within at least one of the barrel of the hair dryer and a rotating air directing apparatus for the barrel of the hair dryer.

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22. The apparatus of Claim 19, further comprising a nozzle member coupled adjacent to the outlet opening and comprising an angled tubular member having a nozzle opening disposed at an acute angle relative to the outlet opening.

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23. An apparatus for rotating and directing air from a barrel of a hair dryer, the apparatus comprising:

an angled tubular member; 20
an inlet opening; and
an outlet opening disposed at an acute angle relative to the inlet opening and ovalar in shape, having a longest diameter that extends from a point linear with a planar circumference of the inlet opening to a point linearly between a center of the inlet opening and an opposing point on the planar circumference of the inlet opening. 25

24. The apparatus of Claim 23, further comprising a tubular rotating member coupled adjacent to the inlet opening and comprising a circumferential inner surface and a plurality of curved vanes, each having a fixed edge at the circumferential inner surface and a free edge that defines a central open space of the tubular rotating member. 30 35

25. The apparatus of Claim 23, wherein the tubular rotating member is rotatably coupled within at least one of the barrel of the hair dryer and a rotating air directing apparatus for the barrel of the hair dryer. 40

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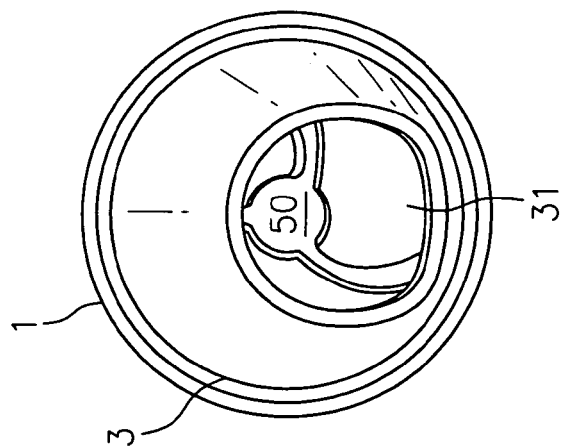


FIG. 1

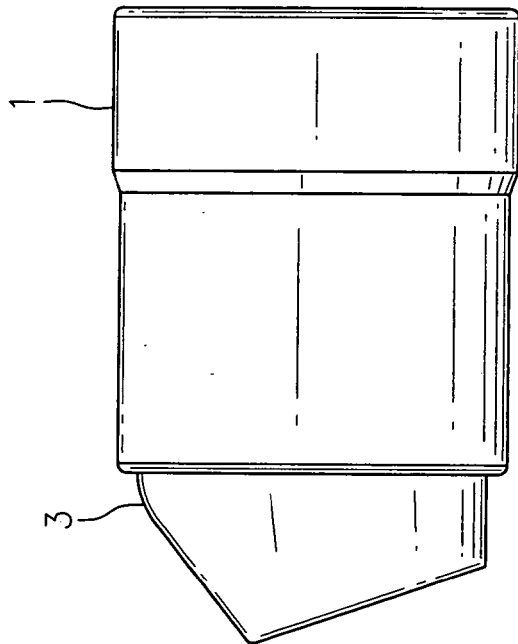


FIG. 2

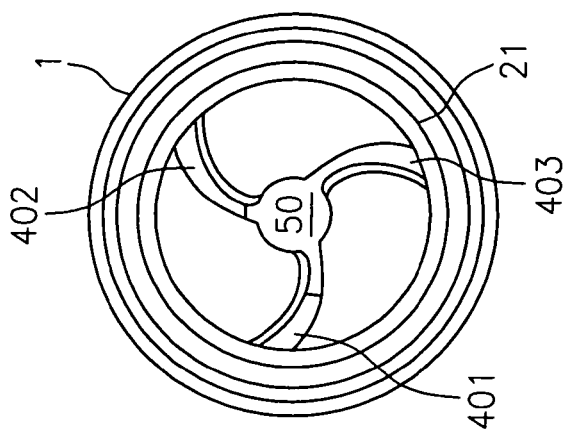


FIG. 3

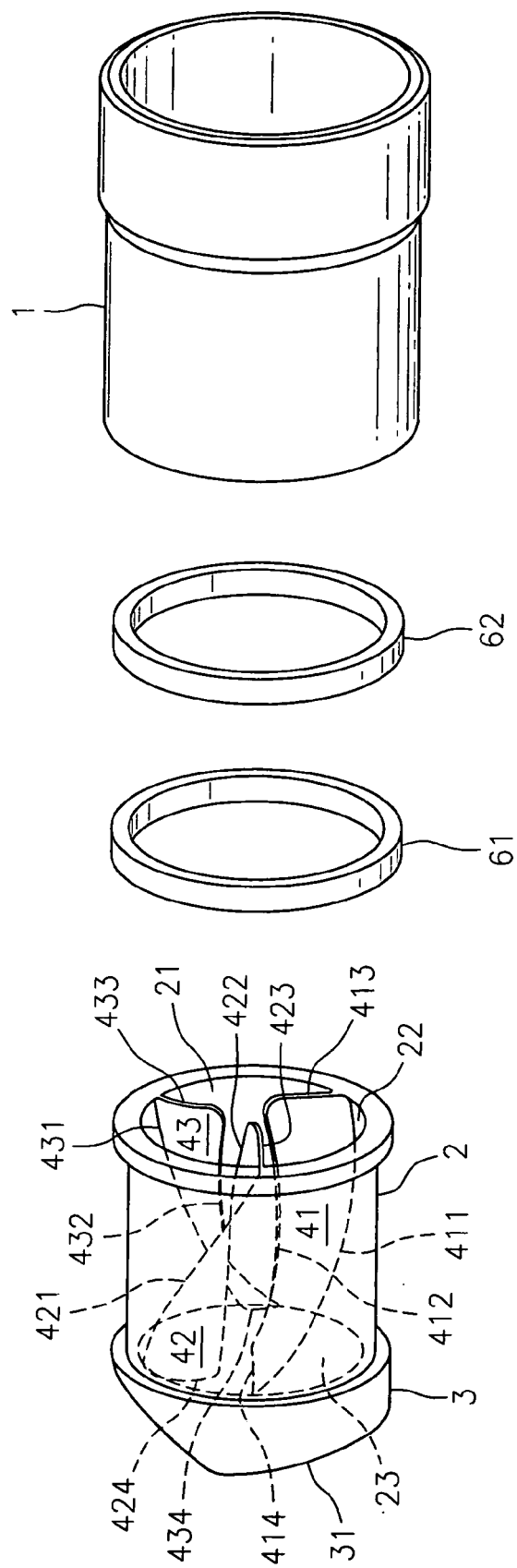


FIG. 4

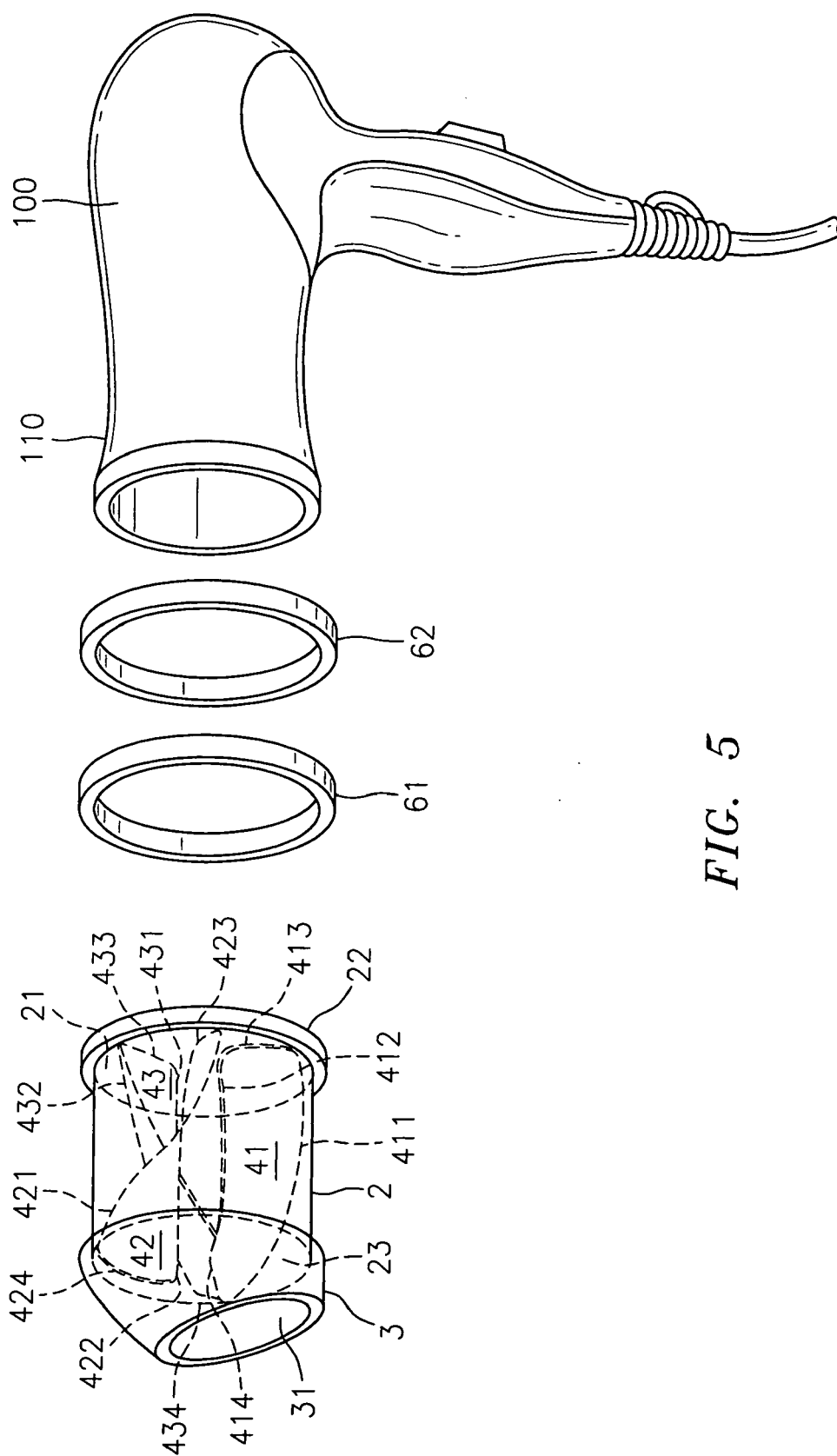


FIG. 5

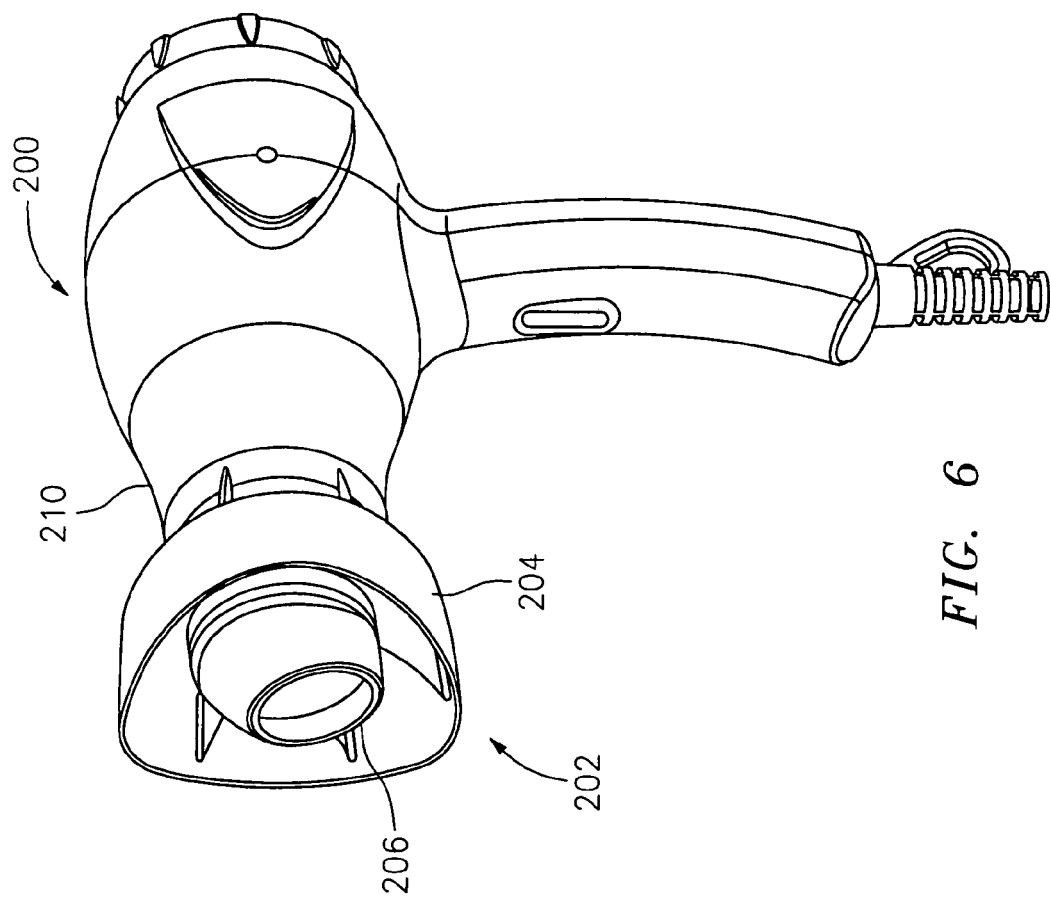


FIG. 6

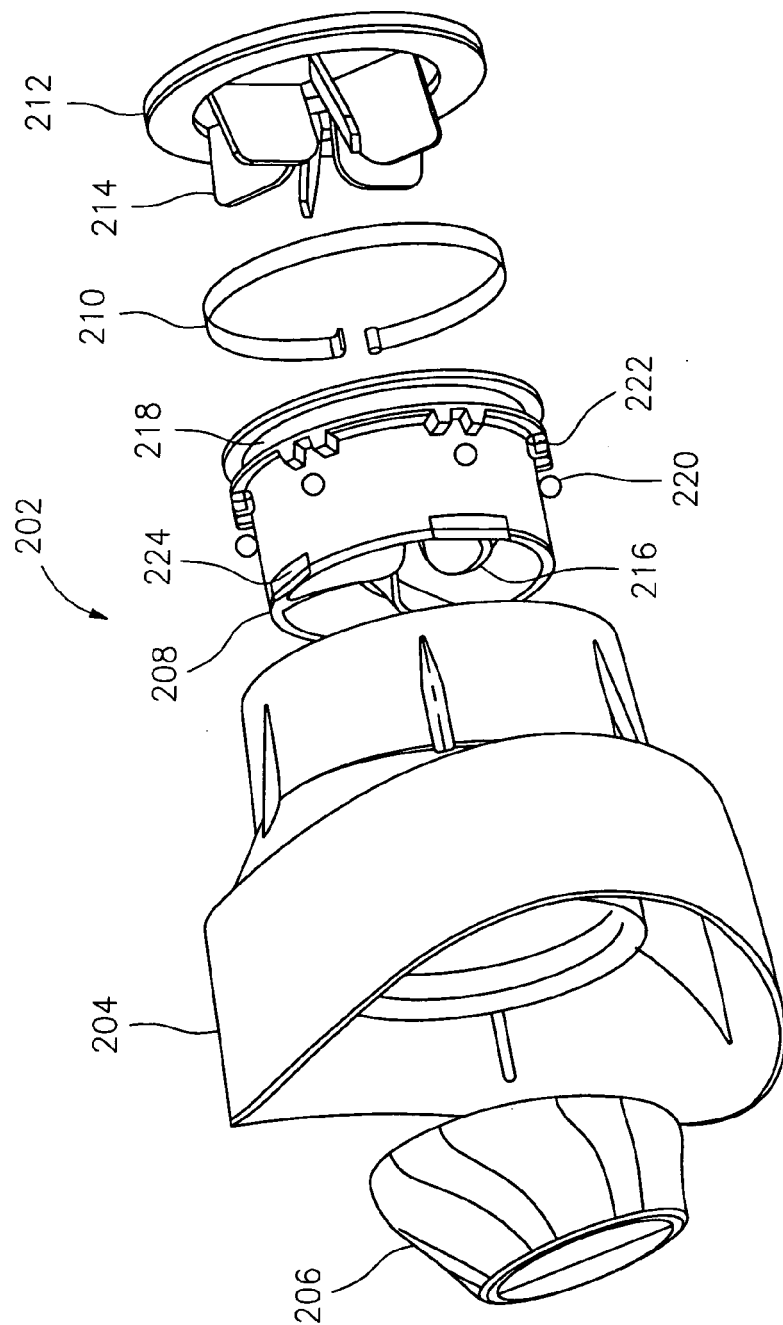


FIG. 7

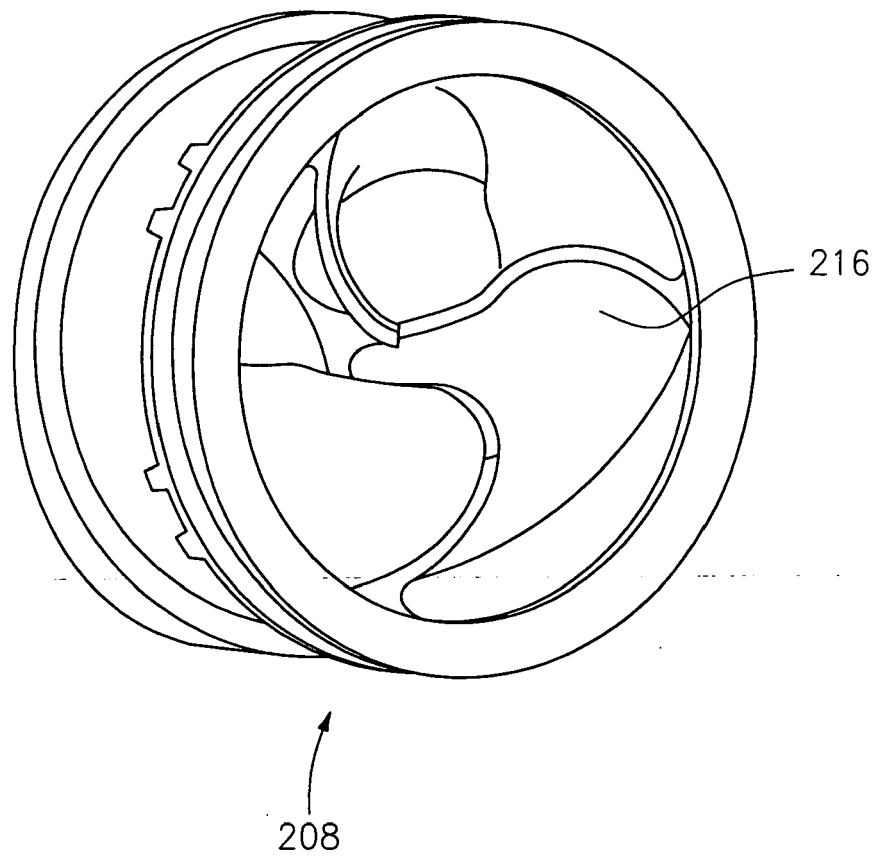
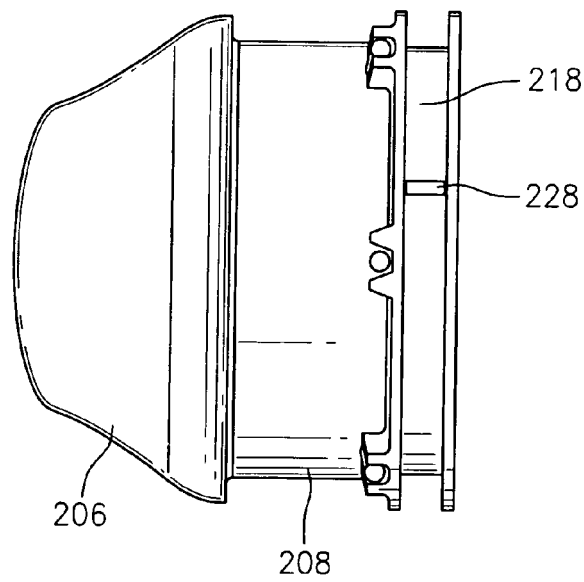
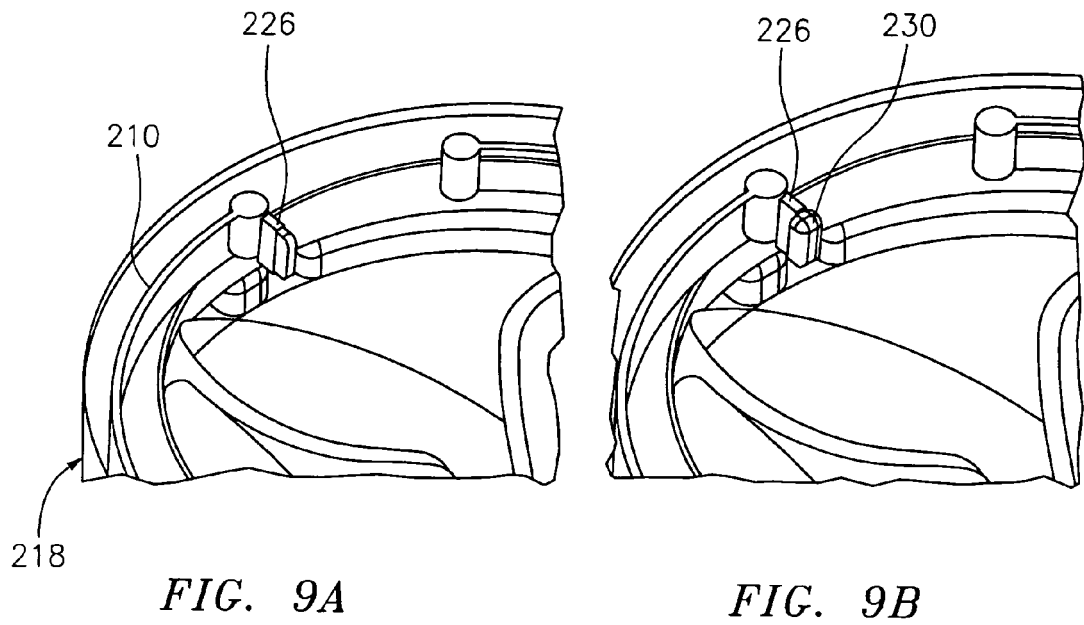


FIG. 8



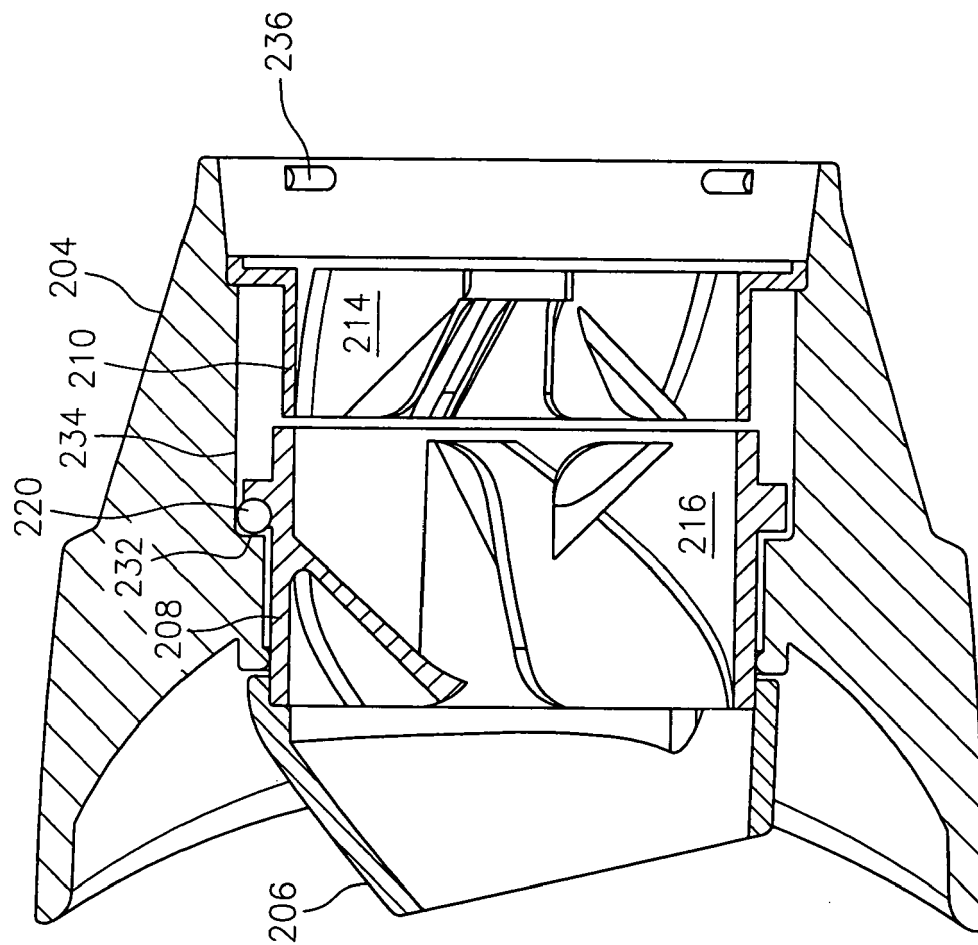


FIG. 10

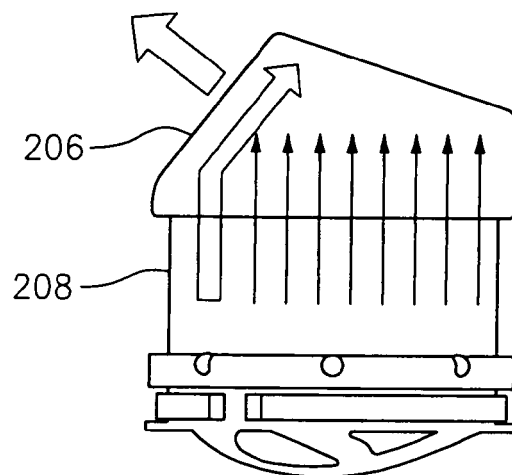


FIG. 11A

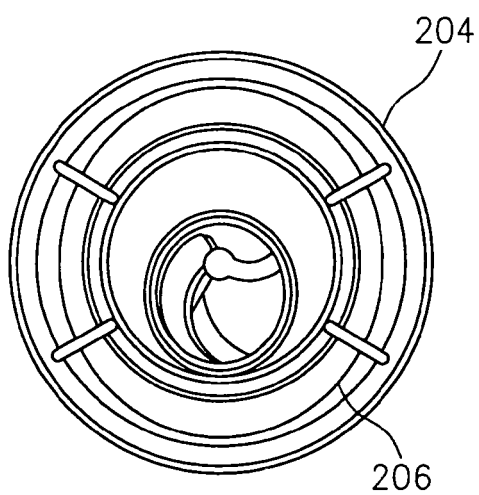


FIG. 11B

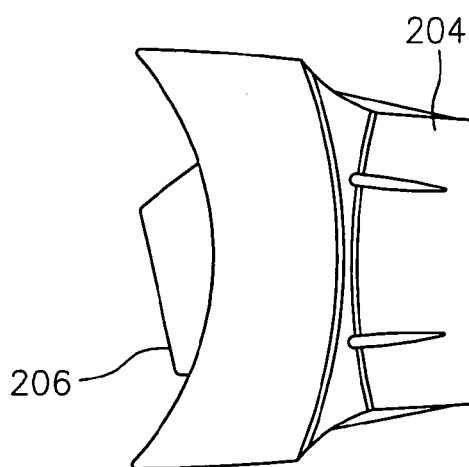


FIG. 11C

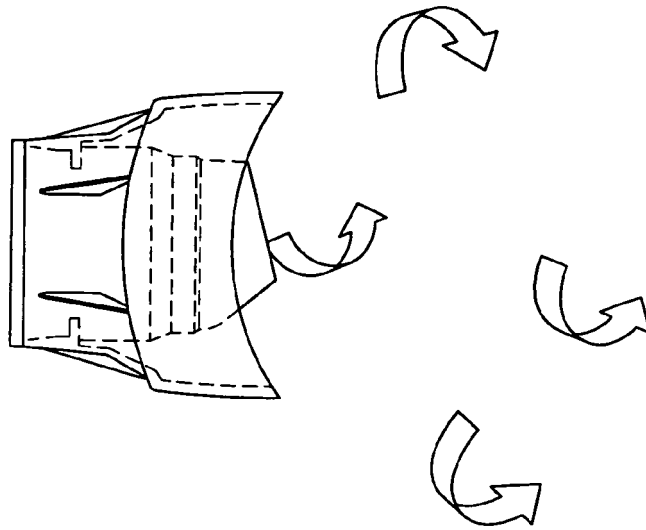


FIG. 12A

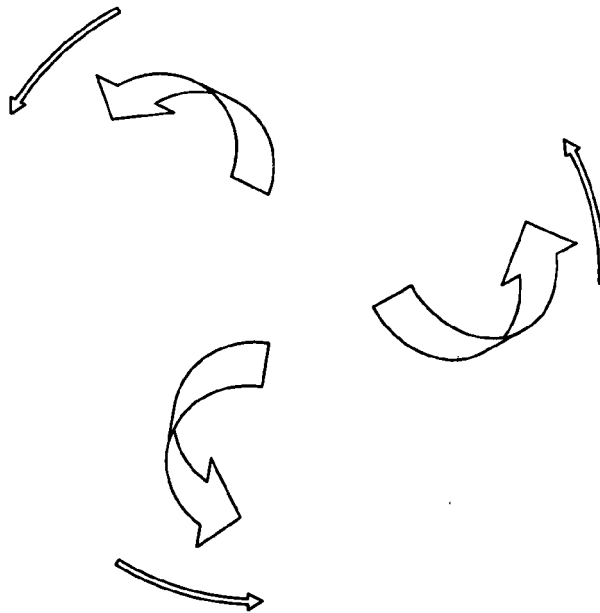


FIG. 12B



EUROPEAN SEARCH REPORT

Application Number
EP 12 00 2454

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			A45D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 July 2012	Examiner Ehksam, Sabine
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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The members are as contained in the European Patent Office EDP file on
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