Figure 15a shows an isometric view of another attachment;

Figure 15b shows different component parts of the other attachment;

Figure 15c shows the different component parts from the inlet end;

Figure 15d shows a cross section through the side of the other attachment;

Figure 15e shows a cross section through the other attachment; and

Figures 16a and 16b show an alternative sock for the other attachment.

Figures 1a and 1b shows a hot styling brush 10 with a handle 20 and a detachable head or attachment 30 which is attaches at the distal end 22 of the handle 20 to the fluid inlet 40.

The handle 20 has an outer wall 26 which is generally tubular and includes the fluid inlet 40 at and adjacent one end 24. The fluid inlet 40 comprises a first set of apertures 44 which extend radially around the handle 20 and along the outer wall 26 of the handle from the handle end 24. The handle end 24 is covered by an end wall 42 which is also perforated with a second set of apertures 46 that extend through the end wall 42 of the handle. Thus, the fluid inlet 40 extends around, along and across the handle 20. The end wall 42 is orthogonal to the outer wall 26 and an inner wall 60 of the handle.

The handle 20 also includes a fan unit 70 which comprises a fan and a motor which drives the fan and in use, draws fluid in through the fluid inlet 40, along a fluid flow path 50 which extends through the length of the handle 20. The fluid is optionally heater by a heater 80 before entering an inner cavity 38 of the head 30.

The head 30 includes a fluid outlet 100 which in this example comprises parallel slots 102 each extending towards a second end 36 of the head and radially around the head

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30. This arrangement enables fluid to exit the head all the way around the head and for the majority of the length of the head 30 maximising a hair styling region of the product.

In use, hair is wrapped around the head 30 whilst air or fluid exits through the slots 102 drying the hair and/or styling the hair into curls or waves. The hair wraps automatically due to the flow of air around the surface of the head 30. The air or fluid can be heated but this is not essential.

Power is provided to the appliance via a power cable 48 which preferably extends from a plug or other power source through the end wall 42 of the handle 20. The handle 20 also houses a PCB 75 which is electrically connected to the cable 48, the fan unit 70 and the heater 80 by internal wiring (not shown). An on/off switch 52 and control buttons 54 are provided and connected to the PCB 75 to allow the user to select one of a range of temperature and flow settings.

Figure 2a shows an exploded view of various parts of the handle 20 in more detail. The handle 20 is tubular and the outer wall 26 of the handle 20 is a cylindrical sleeve made from for example an extruded tube or rolled sheet of metal such as aluminium, an aluminium alloy or a steel. The handle connects to a head 30 at a first end 22 and at the distal, second end 24 a fluid inlet 40 is provided. The fluid inlet 40 is a first means of filtering fluid that enters the fluid flow path 50.

The fluid inlet 40 comprises a plurality of apertures extending around, along and across the handle 20. Having an inlet that extends in three dimensions has advantages particularly when used with hair grooming appliances. Firstly, if the appliance is placed on a surface whilst switched on only a small part of the inlet surface area will be blocked or have restricted flow of fluid into the appliance. This protects the fan unit and particularly the motor of the fan unit from running with too low a flow rate as this can cause overheating of the motor and cause damage to the motor.

Secondly, often hair care appliances are used with a styling product such as a mousse, gel or spray. These products are typically either applied by a hand or directly to the hair as a mist. After application by a hand, some of the product will be retained on the skin which is then transferred to the appliance when held. This can block at least some of the apertures 44 that extend around and along the handle 20. However, the apertures 46 that extend under the handle and across the end wall 42 of the handle will be unaffected. When a product is applied as a mist, it can settle on the appliance and again block or restrict at least some of the apertures of the fluid inlet 40. However, by having apertures that extend around, along and across the handle 20 the risk of blocking the fluid inlet 40 is reduced.

The apertures are preferably circular with a diameter of 0.2 to 1.6 mm. The diameter of the apertures can vary along, around and across the handle 20. It is advantageous to space the apertures regularly around, along and across the fluid inlet 40. Not only is this visually pleasing but it also has the technical advantage that there is no weak region of the fluid inlet 40 where blockage of a portion is more likely or would have more impact on the flow into the fluid inlet 40. The inlet is designed so that the flow into the inlet is even at least around the circumference of the handle 20.

A foam block 48 is provided which in use is inserted into the second end 24 of the handle 20. The foam block 48 is a second means of filtering the fluid that passes through the primary fluid inlet 40 into the primary fluid flow path 50. It is advantageous that the foam block 48 extends beyond or further towards the first end 22 of the handle than the primary fluid inlet 40 as this ensures that fluid that has entered the primary fluid inlet 40 has passed through the foam block 48 so has had two stages of filtration. In other words, the foam block 48 extends from the second end 24 of the handle 20 past the downstream end 44a of the fluid inlet.

The foam block 48 shown is cylindrical and substantially fills the area within the handle 20 at the primary fluid inlet 40. This is to ensure that all fluid that enters the primary fluid inlet through first apertures 44 that extend around and along the handle and fluid

that enters through second apertures 46 that extend across and through the end wall 42 of the handle 20 passes through this second stage of filtration. The foam block 48 extends longitudinally from the second end 24 of the handle 20 further than the first apertures 42 of the primary fluid inlet 40.

The first apertures 44 that extend along and around the outer wall 26 are machined, punched or laser cut from the extruded tube or sheet metal that the outer wall 26 is formed from.

The handle 20 has an outer wall 26 and an inner wall 60, the outer wall 26 slides over the inner wall 60 to form the finished product. The inner wall 60 is a duct which surrounds and defines a fluid flow path 50 through the appliance. The outer wall 26 includes a grippable portion and in these examples, includes the fluid inlet 40 into the fluid flow path 50. An insulting layer of material 28 is provided within the inner wall 60. The insulating layer is a foam or a felt and insulates the handle from noise produced by the fan unit 70, heat produced by the operation of the appliance, vibrations caused by the fan unit and noise produced within the appliance by the flow of fluid through the fluid flow path 50. The insulating layer absorbs energy including airborne noise.

The inner wall 60 provides a housing 62 in which a fan unit 70 is disposed. The housing 62 is cylindrical and has an inwardly protruding ledge 64,66 disposed one at each end of the housing 62 which maintain the position of the fan unit 70 within the handle 20. The inner wall 60 is made from two parts a first part 60a and a second part 60b which is moulded separately. This enables easier assembly of the fan unit 70 within the handle 20 than a one piece inner wall. A similar pair of inwardly protruding ledges 68, 72 maintains the position of the heater 80 within the handle 20.

Although the outer wall 26 of the handle 20 has been described as being made from an extruded tube or a rolled sheet of metal, alternatives methods of manufacture and materials could be used; these include, but are not limited to, a plastic extrusion/moulded tube or a composite tube such as carbon fibre reinforced plastic.

The fluid outlet 100 of the head 30 will now be described in more detail, referring in particular to Figures 3a, 3b, 4a, 4b, 5a and 5b. The head 30 is essentially cylindrical and has a first end 32 for connection to a handle 20 and a second end 36 distal to the first end 32. The head 30 extends longitudinally from the first end 32 to the second end 26 continuing a line described by the handle 20 (Figure 1a) so is approximately the same diameter as the handle. Within the head 30 is an inner cavity 38 and fluid that has been drawn into the fluid flow path 50 within the handle 20 by the fan unit 70 enters the inner cavity 38 via an aperture 302 in the first end 32 of the head 30.

The fluid outlet 100 is formed from a number of parallel slots 102 which extend along the length of the head 30 from the first end 32 to the second end 36. The slots 102 are formed from an overlap 120 (Figure 5b) formed between adjacent plates 110 which results in fluid being directed between a radially inner surface 104 formed from the outer surface 112 of a first plate 110a and a radially outer surface 106 formed from the inner surface 114 of a second plate 110b. The fluid 122 flowing out of the slot 102 is tangential 130 to the outer surface 112 of the plate 110a and joins with the fluid flowing out of the other slots of the fluid outlet 100 forming a fluid flow around the circumference of the head 30. Thus, the fluid 122 is blown out along the external surface of the head and this encourages hair to wrap around the head 30 automatically.

The fluid 122 exiting the slots 102 is attracted to the curved surface of the head 30 by the Coanda effect. This in turn causes hair that is presented to the head 30 to automatically wrap around the surface and then styled into curls. As air is blown down the length of the hair, wet hair is dried more quickly than conventionally and as the wrapping process occurs without the use of bristles, the hair can slide off the head 30 once it is dry or styled so there is no tangling.

To maintain the size of each slot 102, spacers 108 are provided. In this example, a pair of spacers 108 is provided to maintain each slot 102 size. Each one of the pair of

spacers 108 is longitudinally spaced along the slot 102 and the plate 110. The spacers 108 join adjacent plates 110 together.

Advantageously, each plate 110 is lined with a felt like material 308 such as Kevlar or wool (see Figure 3b). The material 308 does not extend over each slot 102 so the fluid exiting the fluid outlet 100 does not pass through the layer of material 308. This layer serves to absorb some of the noise produced by the fluid flowing through the head 30 from the inlet to the head 30 at aperture 302 to the fluid outlet 100. Such a layer of material 308 is as applicable for other heads herein described such as heads 130, 180 and 230.

Figures 6a and 6b show an alternative head 130, all features identical to those previously described have the same reference numerals. The head 130 has a larger diameter than the handle 20 so is used to create larger curls. The head 130 has a first end 32 for connection to the handle 20 and this is the same diameter as the handle 20, within a collar 132 of the head 130, the diameter of the head 130 increases to the larger diameter prior to the fluid outlet 100 formed by slots 142 and then continues at a constant diameter to the second end 136. An inner fluid cavity (not shown) is larger than for the head 30 of Figure 3a. In this example the number of plates 110 and slots 102 is the same i.e. six as for the head described with respect to Figure 3a. Alternatively, a larger or smaller number of plates 110 and slots 142 could be used.

Figure 7a shows a further head 230. This head 230 has a reduced diameter compared with the handle 20. The first end 32 is substantially the same diameter as the handle 20 for connection thereto, and then within a collar 232 the diameter of the head 230 decreases to the reduced diameter prior to the fluid outlet 200 formed by slots 202 and continues at a constant diameter to the second end 236. This head 230 is used to create tighter curls.

The slots 202 for this head extend longitudinally straight from the first end 32 to the second end 236 as was the case for slots 102 in heads 30, 130.

In another embodiment, as shown in Figures 7b and 7c, a further head 280 has slots 282 which curve around the head 280 forming a spiral or helical pattern around the head 280. The slots 282 curve by an angle α of 45° from the longitudinal axis A-A of the handle 20 and head 280. In this example the slots 282 curve in a clockwise direction from the first end 34 of the head 280 towards the second end 236 of the head. The slots 282 are formed as before between adjacent overlapping plates 210 however, in order to form the curved slots 282, the plates 210 do not extend along the longitudinal axis of the head 280 but also curve by an angle of 45°. Using angled slots changes the profile of the fluid exiting from the head. The airflow exiting from the slots is more normal to the slot when angled slots are used. This has benefits including enabling more hair to be wrapped around the head also, the hair is retained on the head more easily leading to a potentially quicker styling process.

The slots can be curved in a clockwise or and anticlockwise direction from the longitudinal axis A-A of the handle 20. Whilst an angle of 45° has been illustrated, improved wrapping is seen even at an angle of 1°.

Figure 8a shows a head 180 which is substantially the same diameter as the handle 20. The slots 182 are curved or spiral around the head 180 in the same manner as head 280.

Figure 8b shows a head 380 which has a larger diameter than the handle, and is similar to head 130 except it has curved or spiralling slots 382 around the head 380.

Figures 9a and 9b show a way of assembling head 30. A first part 150 is formed from the first end 32 and has a collar 152 and a first set of plates 154 which are joined to or formed integrally with the collar 152. A second part 160 is formed from the second end 36 and has an end wall 162 and a second set of plates 164 which are joined to or formed integrally with the end wall 162. The first set of plates 154 and second set of plates 164 each comprise non-adjacent plates 110 enabling the first part 150 and the second part 160 to be slotted together to form the head 30. Between each of the first set of plates 154, a recess 156 is provided in the connecting ring 152 adapted to accommodate the

distal end 164a of the second set of plates 164 from the end wall 162. A similar set of recesses 166 is provided in the end wall 162 and is adapted to accommodate the distal end 154a of the first set of plates from the collar 32.

In order to retain the first part 150 and the second part 160 of the head 30 in the assembled condition, a protruding screw hole 168 is provided. Near the distal end 154a of the first set of plates 154 a support scaffold 170 is provided and this has two functions. A first function is to support the first set of plates 154 and maintain their relative positions towards the distal end 154a and a second function is to provide part of the fixing mechanism. In this example, the support scaffold 170 has a central aperture 172 through which the protruding screw hole 168 passes on assembly of the head 30a and a screw, for example can be inserted to fix the two parts 150, 160 of the head together.

Figures 15a, 15b, 15c, 15d and 15e show a head 400 all features identical to those previously described have the same reference numerals. This head 400 has a reduced diameter compared with the handle 20. The slots 102 extend longitudinally from the first end 32 to the second end 236, however the slots could be curved as described with respect to Figures 7a and 7b.

Internal of the head 400, within the cavity 418 formed within the head 400, an internal sock 420 is provided. This sock 420 is a mesh formed from a metal wire. The sock 420 can be in the knitted form 426 shown in Figure 15b. Alternatively as shown in Figures 16a and 16b the sock 420 is a tube 424 formed from a woven mesh 422 having generally square apertures.

The sock 420 diffuses the fluid flowing in the cavity 418 within the head 400 and slows down the longitudinal velocity of the flow. This results in more even wrapping of hair around the head 400 as the direction of fluid exiting the head 400 is more normal to the slots 102. The sock 420 extends along the length of the slots 102 within the head 400. The size of the apertures in the mesh is important; if they are too small the flow

becomes too restricted and there is an increased chance of them clogging over time. An aperture size of around 1.6mm has been found to provide the benefit without undue restriction.

Figures 10a, 10b, 11a-11c and 12 show various views of another head 300 which has a directed fluid flow. The head 300 has a first cylindrical part 310 and a second triangular part 330 that together form the fluid outlet 320.

The second triangular part 330 has a first end 312 for connection to a handle 20 via a collar 328 and extends longitudinally to a second end 314 The first cylindrical part 310 has an aperture 322 extending from a first end 378 to a second end which is defined by end wall 316. The aperture 322 is defined by a first edge 324 and a second edge 326. . An inner cavity 318 is formed within the head 300 when the second triangular part 330 is slid into the first cylindrical part 310. The first end 278 of the first cylindrical part 310 abuts a downstream end of the collar 328 and the second end 314 of the second triangular part 330 abuts the end wall 316 when the attachment is formed.

The second triangular part 330 has a first end 332 and a second end 334 and if formed from a first side 336, a second side 338 and an internal wall 340. The second triangular part 330 fits within the aperture 322 and extends outwardly beyond the first cylindrical part 310.

The second triangular part 330 is movable relative to the first cylindrical part 310. In this example, the second triangular part 330 is fixed with respect to the handle 20 and the first cylindrical part 310 is moveable relative to both the second triangular part 30 and the handle 20. This enables the outlet slot 342 to be partially defined by one or the other of the first edge 324 and the second edge 326.

In one position, referring now to Figures 12a and 12b, the first edge 324 along with a first side 336 of the second triangular part 330 define the limits of the outlet slot 342. The second triangular part 330 moves with respect to the first cylindrical part 310 so the

outlet slot 342 is alternatively defined by the second edge 326 and the second side 338 as shown in Figures 13a and 13b.

The second triangular part 330 rotates with respect to the first cylindrical part 310 in order to change the position of the outlet slot 342. The first cylindrical part 310 is temporarily retained in a position by the use of a detent mechanism.

The end wall 316 of the first cylindrical part 310 includes a first recess 340 and a second recess 350 each of which adapted to partially accommodate a ball bearing 360. The ball bearing 360 is biased towards the end wall 316 by a spring 362 (see Figure 11b). There are a number of suitable alternatives that could be used instead of this method of retaining one part with respect to the other part such as a plastic bump feature or a piece of sprung metal.

Referring now to Figures 12a and 12b, when the second triangular part 330 is in a first position with respect to the first cylindrical part 310, the outlet slot 342 is formed from first side 336 and first edge 324 and the ball bearing 360 is accommodated by the first recess. By manually rotating the second triangular part 330 with respect to the first cylindrical part 310 the force of the spring 362 retaining the ball bearing 360 within the first recess 340 is overcome and the second triangular part 330 can be rotated with respect to the first cylindrical part 310 to move the ball bearing 360 into the second recess 350 and changing the position of the outlet slot 328 so it is now formed from the second edge 326 and the second side 338.

The first cylindrical part 310 includes bristles 350 arranged in this example in parallel rows 352 on either side of the aperture 322. The rows 352 of bristles 350 extend from near the outlet slot 342 around the head 300 but in this example the bristles 350 do not extend all the way around the head 300, there is a gap in the rows 352 diametrically opposite the outlet slot 320.

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Referring now to Figure 14, when hair 354 is being styled, the action of drawing the bristles 350 down through the hair 354 opens the outlet slot 342 on the side next to the hair 354. The position of the outlet slot 342 is movable by hand or by the friction or force of combing through the hair.

The use of a combination of a directed outlet slot 342 and bristles 350 means that the hair is dried and/or styled more quickly than conventionally as the fluid exiting from the outlet slot 342 is blown down the hair 354. The fluid exiting the outlet slot 342 is attracted to the surface of the second triangular part 330 which in turn attracts the hair 354 to the second triangular part 330. The bristles 350 separate and detangle individual strands of the hair 354 and this combination gives fast drying and a smother result.

In use as shown in Figure 14, this head is designed to be pulled through the hair with the slot 328 adjacent the hair 354. Fluid is blown out of the slot 328 as the appliance is moved along the hair 354 so the hair is both heated and brushed. Having the slot 328 on either side of the head 356 means that the same head 300 can be used for both sides of the head and both the underside and the topside of the hair 354.

In each of the examples given, the head 30, 130, 180, 230, 300 in connected to handle 20 via a collar and a twist lock joint. Referring to Figure 7b, three protrusions 234 are provided on the internal surface of the collar 232 (one not shown). The protrusions 234 are adapted to engage a slot 90 (see Figure 1b) or three separate slots provided near the distal end 22 of the handle 20. The slot 90 extends at least partially around an outer surface of the inner wall 60 and is helical so both a rotational and longitudinal movement is required to attach or remove the head from the handle 20. This is one example of a fixing mechanism, it will be apparent to the skilled person that other equally acceptable alternative mechanisms could be used.

The heads 30, 130, 180 and 230 described with respect to Figures 3a to 9 could be provided with bristles. For these heads 30, 130, 180 and 230 as the slots are arranged all the way around the head, any bristles would be arranged all the way around the head.

An example would be to have one or more rows of bristles at least located on every other plate 110, 210.

The invention has been described in detail with respect to a hot styling brush however, it is applicable to any appliance that draws in a fluid and directs the outflow of that fluid from the appliance including a hairdryer.

The appliance can be used with or without a heater; the action of the outflow of fluid at high velocity has a drying effect.

The heads have been described as being manufactured by attaching a first part to the second part using a screw however, as the skilled person will be aware, a number of different fixing methods can be used such as, but not limited to gluing or using ultrasonic welding.

The fluid that flows through the appliance is generally air, but may be a different combination of gases or gas and can include additives to improve performance of the appliance or the impact the appliance has on an object the output is directed at for example, hair and the styling of that hair. Such additives include but are not limited to hairspray and serums for example.

The heads 30, 130, 230 are all generally cylindrical in shape, however as the skilled person would realise, alternative shapes could be used such as ovals.

The invention is not limited to the detailed description given above. Variations will be apparent to the person skilled in the art.

CLAIMS

1. An attachment for a hand held appliance comprising a body having a wall, a fluid inlet at one end of the wall and a fluid outlet through the wall wherein the fluid outlet comprises at least one slot extending along the wall and wherein the at least one slot is formed by an overlap of a first end of the wall and a second end of the wall.

2. An attachment according to claim 1, wherein the fluid emitted from the fluid outlet is attracted to an external surface of the wall.

3. An attachment according to claim 1 or claim 2, wherein fluid emitted from the fluid outlet flows around the external surface of the wall.

4. An attachment according to any preceding claim, wherein the wall is formed from at least two plates.

5. An attachment according to claim 4, wherein a first one of the at least two plates comprises the first end of the wall.

6. An attachment according to claim 4 or claim 5, wherein a second one of the at least two plates comprises the second end of the wall.

7. An attachment according to claim 5 or claim 6, wherein the first of the at least two plates defines a radially inner surface of the slot.

8. An attachment according to claim 6 or claim 7, wherein the second one of the at least two plates defines a radially outer surface of the slot.

9. An attachment according to any preceding claim, wherein the attachment is generally tubular.

10. An attachment according to claim 9, wherein the wall is formed from at least two plates and the at least two plates extending longitudinally along the tube and radially around the tube.

11. An attachment according to claim 9 or claim 10, wherein the slot extends longitudinally along the tube.

12. An attachment according to any preceding claim, wherein the slot is tangential to the wall.

13. An attachment according to claim 12, wherein fluid exiting the fluid outlet flows along a radially inner surface of the slot.

14. An attachment according to any preceding claim, comprising n slots and n plates.

15. An attachment according to any preceding claim, wherein one of the first end and second end of the wall includes a spacer which defines a thickness of the slot.

16. An attachment according to claim 15, wherein the second end of the wall comprises the spacer.

17. An attachment according to claim 15 or claim 16, wherein a pair of spacers are provided longitudinally spaced along the wall.

18. An attachment according to any preceding claim, wherein the at least one slot is formed as a spiral around the wall.

19. An attachment according to any preceding claim, wherein the spiral is clockwise in the direction of fluid flow.

20. An attachment according to any of claims 1 to 18, wherein the spiral is anticlockwise in the direction of fluid flow.

21. An attachment according to claim 18 or claim 19, wherein the slot is disposed at an angle of 1-89° to a longitudinal direction of the attachment.

22. An attachment according to claim 20 or claim 21, wherein the slot is disposed at an angle of 10-70° to a longitudinal direction of the attachment.

23. An attachment according to claim 20 or claim 21, wherein the slot is disposed at an angle of 30-60° to a longitudinal direction of the attachment.

24. An attachment according to claim 20 or claim 21, wherein the slot is disposed at an angle of 45° to a longitudinal direction of the attachment.

25. An attachment according to any preceding claim, wherein the at least one plate is lined with a material.

26. An attachment according to claim 25, wherein the material absorbs sounds and/or vibrations.

27. An attachment according to claim 25 or claim 26, wherein the material is Kevlar or wool.

28. An attachment according to any preceding claim, further comprising a flow directing element between the fluid inlet and the fluid outlet.

29. An attachment according to claim 28, wherein the flow directing element comprises a perforated layer.

30. An attachment according to claim 29, wherein the perforated layer is formed from a mesh or weave of an elongate material.

31. An attachment according to claim 30, wherein the elongate material is a wire.

32. An attachment according to any of claims 28 to 31, wherein the flow directing element extends substantially along the length of the at least one slot.

33. An attachment according to any of claims 28 to 32, wherein the flow directing element extends substantially around an inner circumference of the attachment.

34. A hand held appliance comprising a handle having a fluid flow path from a fluid inlet to a fluid outlet and a fan unit for drawing fluid into the fluid inlet and an attachment for attaching to the handle, the attachment comprising a body having a wall, a fluid inlet at one end of the wall which, when the attachment is attached to the handle is in fluid communication with the fluid outlet of the handle and a fluid outlet through the wall wherein the fluid outlet comprises at least one slot extending along the wall and wherein the at least one slot is formed by an overlap of a first end of the wall and a second end of the wall.

35. An appliance according to claim 34, wherein the body of the attachment is substantially the same diameter as handle.

36. An appliance according to claim 34, wherein the body of the attachment is a different diameter to that of the handle.

37. An appliance according to claim 36, wherein the attachment has a smaller diameter to handle.

38. An appliance according to claim 36, wherein the attachment has a greater diameter to handle.

39. An attachment according to any of claims 34 to 38, wherein the fluid emitted from the fluid outlet is attracted to an external surface of the wall.

40. An attachment according to any of claims 34 to 39, wherein fluid emitted from the fluid outlet flows around the external surface of the wall.

41 An attachment according to any of claims 34 to 38, wherein the wall is formed from at least two plates.

42. An attachment according to claim 41 wherein a first one of the at least two plates comprises the first end of the wall.

43. An attachment according to claim 41 or claim 42, wherein a second one of the at least two plates comprises the second end of the wall.

33. An attachment according to claim 42 or claim 43, wherein the first of the at least two plates defines a radially inner surface of the slot.

45. An attachment according to claim 43 or claim 44, wherein the second one of the at least two plates defines a radially outer surface of the slot.

46. An attachment according to any preceding claim, wherein the attachment is generally tubular.

47. An attachment according to claim 46, wherein the wall is formed from at least two plates and the at least two plates extending longitudinally along the tube and radially around the tube.

48. An attachment according to claim 46 or claim 47, wherein the slot extends longitudinally along the tube.

49. An attachment according to any of claims 34 to 48, wherein the slot is tangential to the wall.

50. An attachment according to claim 49, wherein fluid exiting the fluid outlet flows along a radially inner surface of the slot.

51. An attachment according to any of claims 34 to 50, comprising n slots and n plates.

52. An attachment according to any of claims 34 to 39, wherein one of the first end and second end of the wall includes a spacer which defines a thickness of the slot.

53. An attachment according to claim 52, wherein the second end of the wall comprises the spacer.

54. An attachment according to claim 52 or claim 53, wherein a pair of spacers are provided longitudinally spaced along the wall.

55. An attachment according to any of claims 34 to 54, wherein the at least one slot is formed as a spiral around the wall.

56. An attachment according to any of claims 34 to 55, wherein the spiral is clockwise in the direction of fluid flow.

57. An attachment according to any of claims 34 to 55, wherein the spiral is anticlockwise in the direction of fluid flow.

58. An attachment according to claim 56 or claim 57, wherein the slot is disposed at an angle of 1-89° to a longitudinal direction of the attachment.

59. An attachment according to claim 56 or claim 57, wherein the slot is disposed at an angle of 10-70° to a longitudinal direction of the attachment.

60. An attachment according to claim 56 or claim 57, wherein the slot is disposed at an angle of 30-60° to a longitudinal direction of the attachment.

61. An attachment according to claim 56 or claim 57, wherein the slot is disposed at an angle of 45° to a longitudinal direction of the attachment.

62. An attachment according to any of claims 34 to 61, wherein the at least one plate is lined with a material.

63. An attachment according to claim 62, wherein the material absorbs sounds and/or vibrations.

64. An attachment according to claim 62 or claim 63, wherein the material is Kevlar or wool.

65. An attachment according to any of claims 34 to 64, further comprising a flow directing element between the fluid inlet and the fluid outlet.

66. An attachment according to claim 65, wherein the flow directing element comprises a perforated layer.

67. An attachment according to claim 66, wherein the perforated layer is formed from a mesh or weave of an elongate material.

68. An attachment according to claim 67, wherein the elongate material is a wire.

69. An attachment according to any of claims 65 to 68, wherein the flow directing element extends substantially along the length of the at least one slot.

70. An attachment according to any of claims 65 to 69, wherein the flow directing element extends substantially around an inner circumference of the attachment.

71. An appliance according to any of claims 34 to 70, wherein the appliance is a hair care appliance.

72. An appliance according to any of claims 34 to 70, wherein the appliance is a hot styling brush.

73. An appliance as substantially herein described with reference to the drawings.

Intellectual Property Office

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Claims searched:	1-73	**Date of search:**	12 September 2014

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-14, 18-20, 25-27, 34-39, 41-51, 55-57, 62-64 & 71-72	EP 0482906 A1 (CHINA PACIFIC TRADE LTD) see figures 5a and paragraph 11
X	1-14, 18-20, 25-27, 34-51, 55-57, 62-64 & 71-72	US 4214597 A (GLASSMAN) see whole document, particularly figures 1-3 & 6 and column 2 line 28 - column 3 line 20

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^{X} :

Worldwide search of patent documents classified in the following areas of the IPC

A45D; F24H

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A45D 20/48 (2006.01) ***A45D 20/50*** (2006.01)

(56) Documents Cited:
GB 2410684 A **GB 2139887 A**
DE 020218747 U **US 20130319450 A1**
JPH02309903
JPH2010263994

(58) Field of Search:
INT CL **A45D**
Other: **EPODOC, WPI**

(54) Title of the Invention: **Attachment for a hair care appliance**
Abstract Title: **An attachment for a hot styling appliance**

(57) An attachment 150 is suitable for use on a hot styling appliance having a head 280 with a generally tubular outer wall and a fluid outlet (102, fig.2a) extending at least partially along the outer wall. The attachment 150 comprises an elongate member which, when attached to the appliance, extends at least partially along the fluid outlet (102, fig.2a). The tubular head 280 may be bristleless. The elongate member 150 may be wider than the outer wall of the head and may extend around a quarter or a third of the outer wall. The elongate member 150 may extend beyond the generally tubular outer wall. The elongate member 150 may be attached to the styling device by means of a cuff 170. Preferably the attachment can pivot between two positions (see figure 6). The elongate attachment may be spaced from the outer surface (see figure 5a).

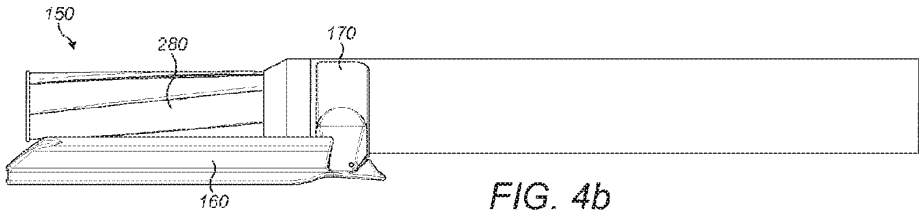


FIG. 4b

GB 2527834 A

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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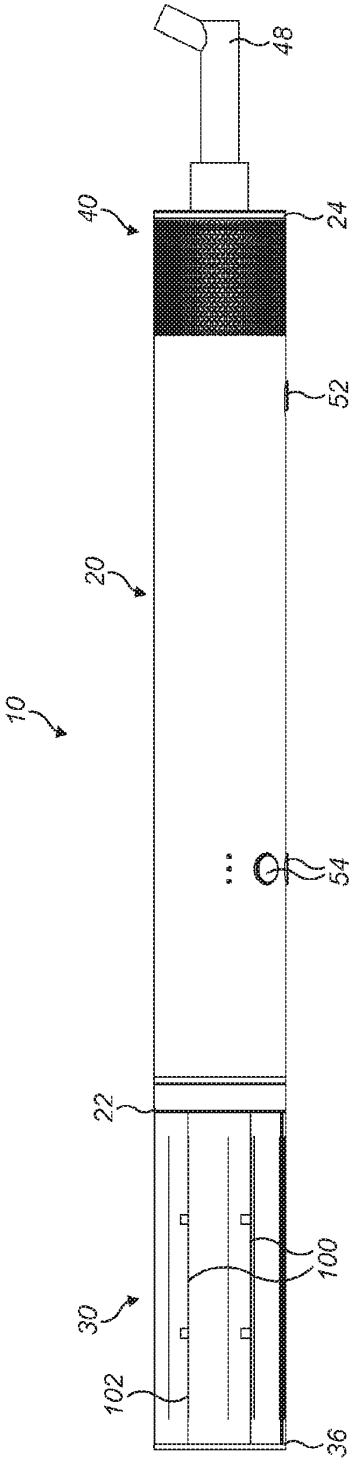


FIG. 1a

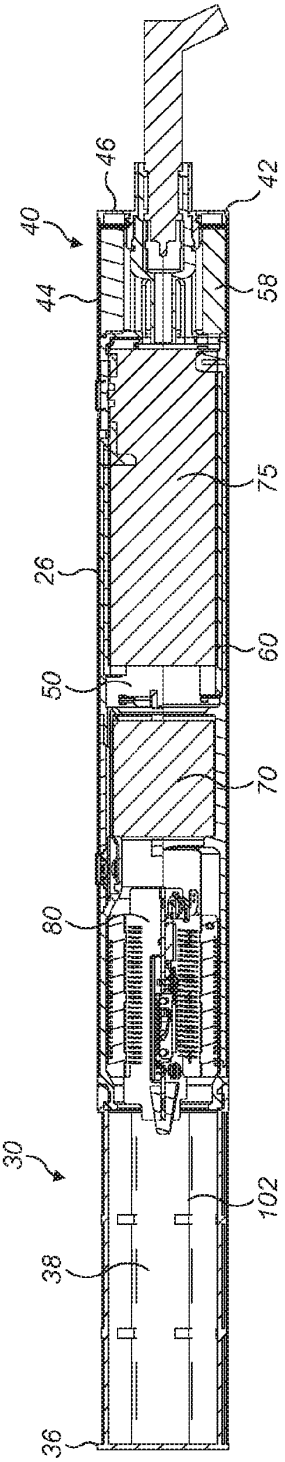


FIG. 1b

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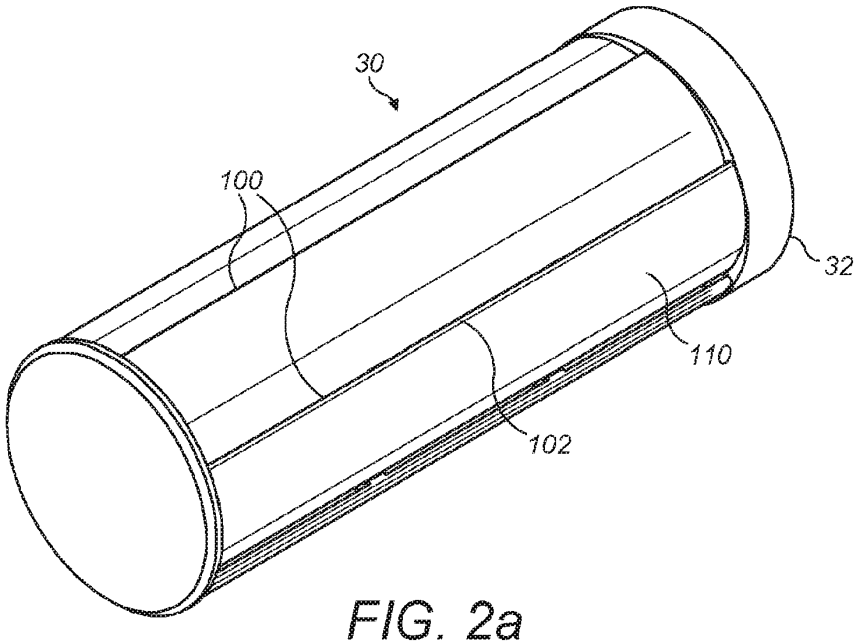


FIG. 2a

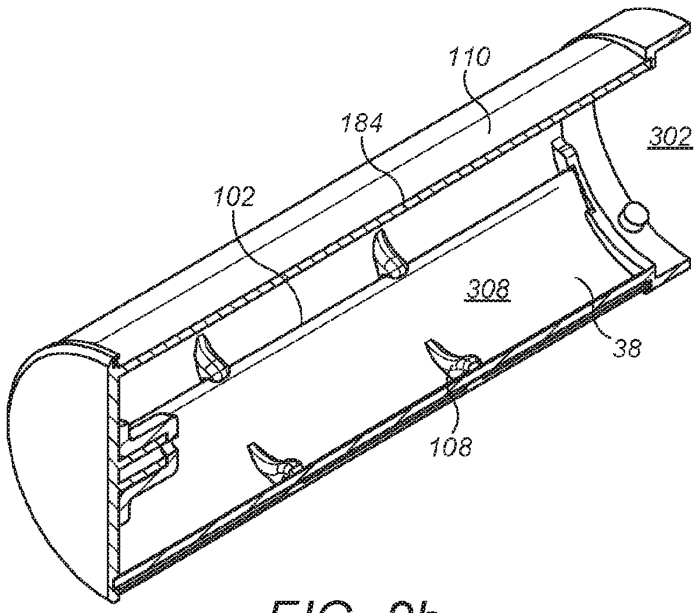


FIG. 2b

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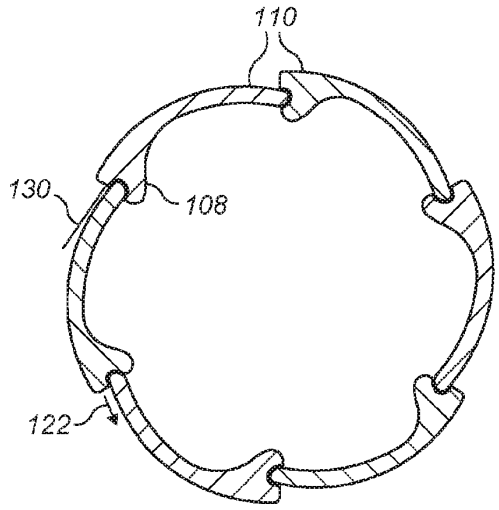


FIG. 3a

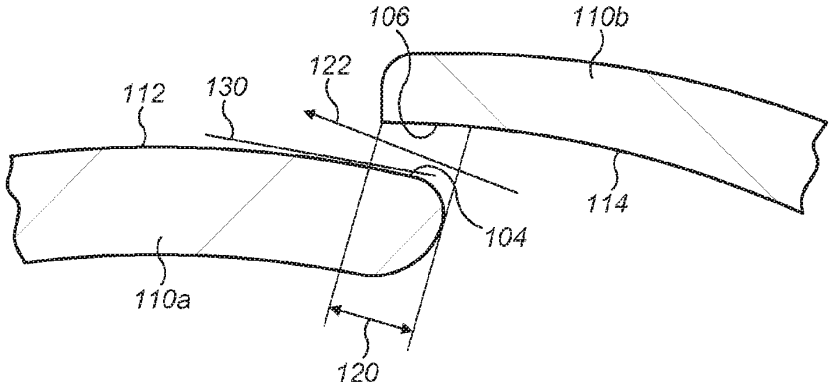


FIG. 3b

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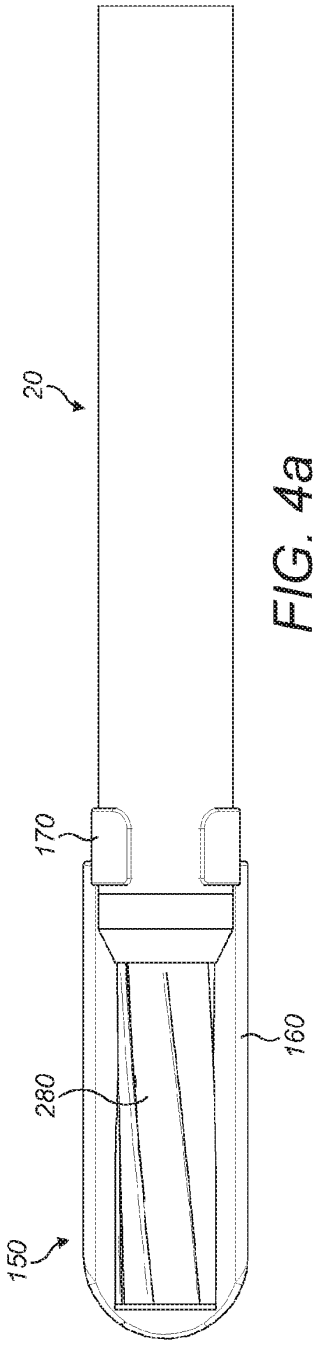


FIG. 4a

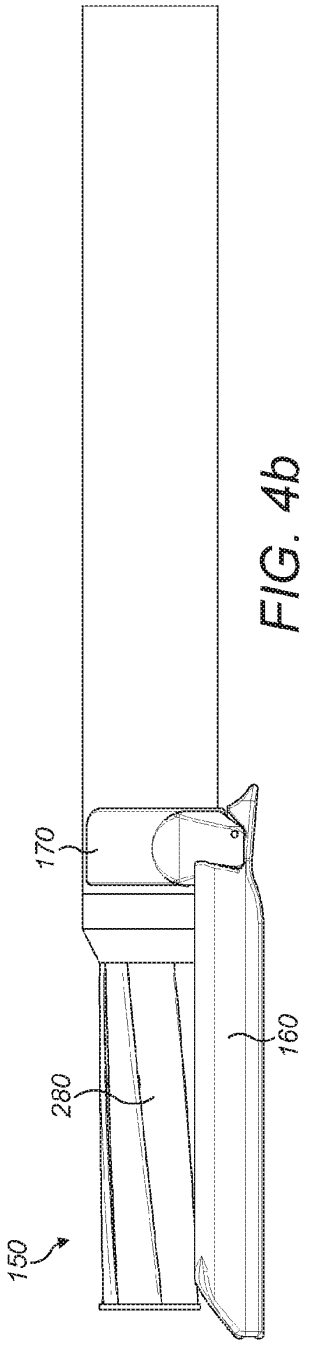


FIG. 4b

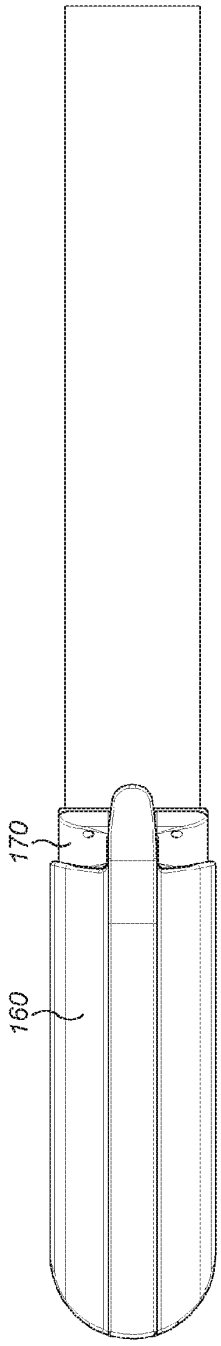


FIG. 4c

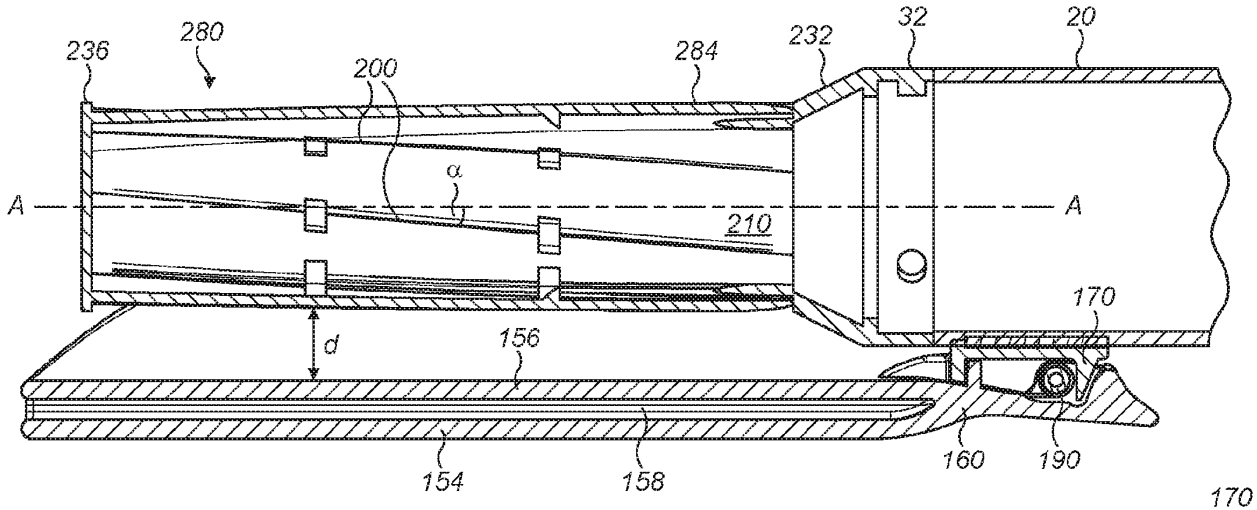


FIG. 5a

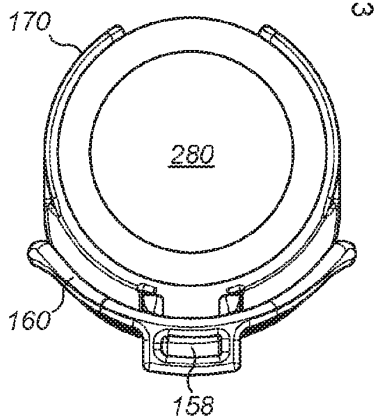


FIG. 5b

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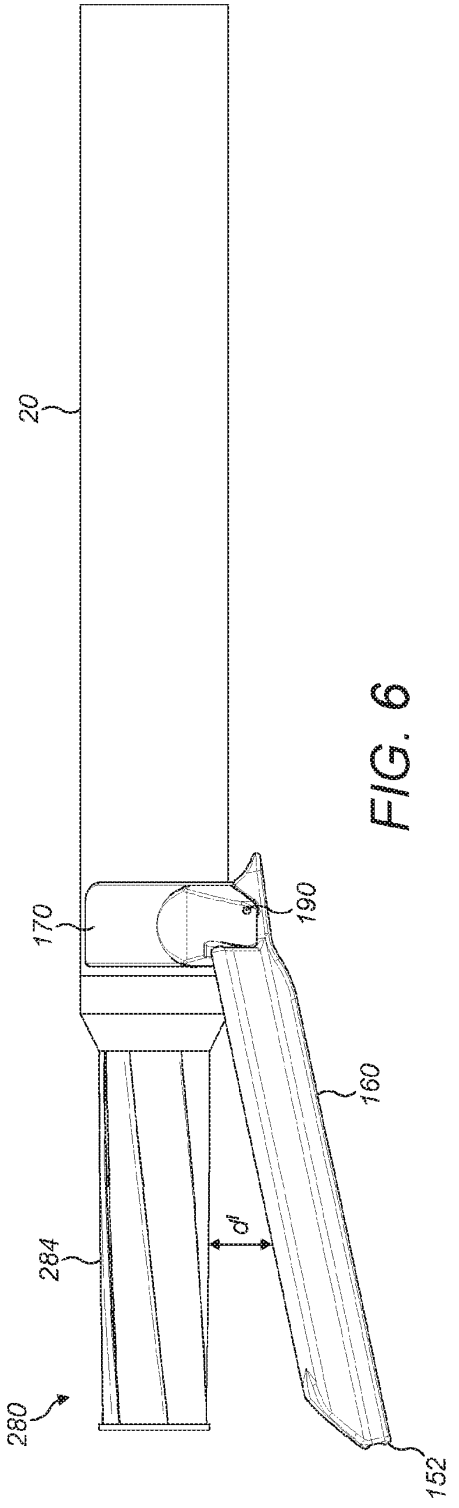


FIG. 6

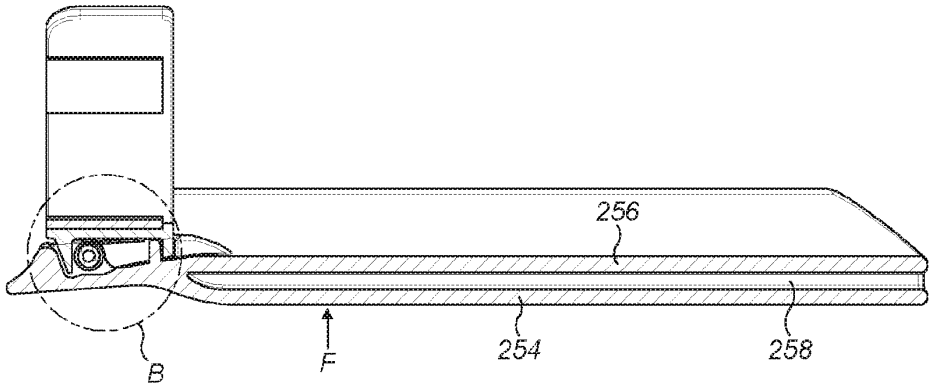


FIG. 7a

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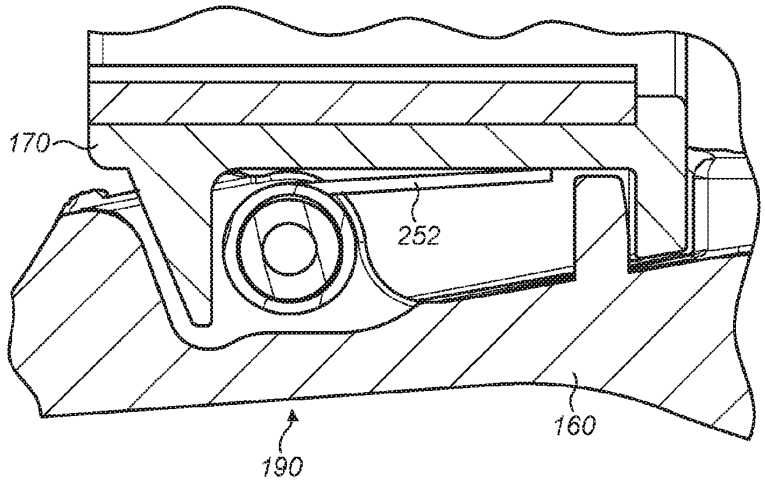


FIG. 7b

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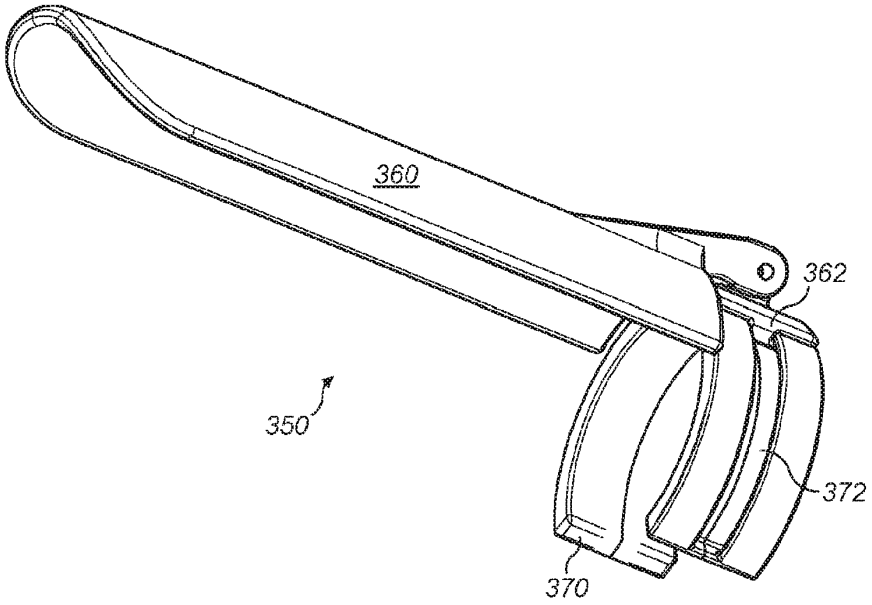


FIG. 8a

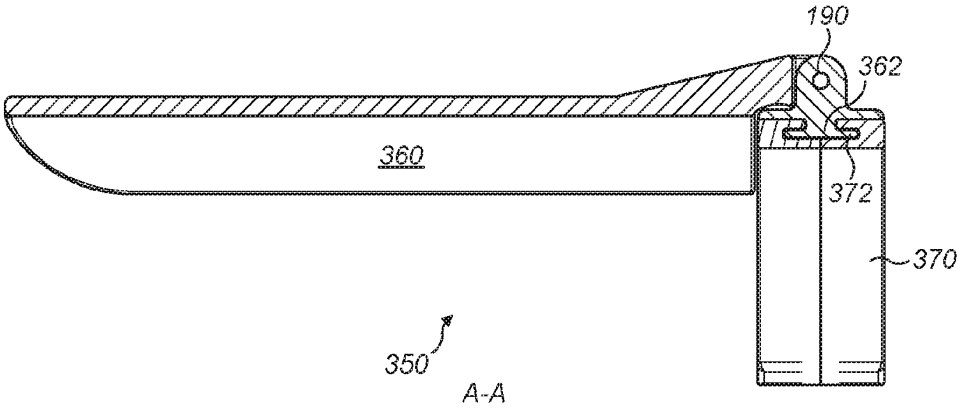


FIG. 8b

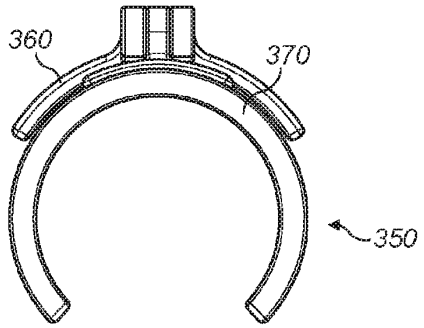


FIG. 8c

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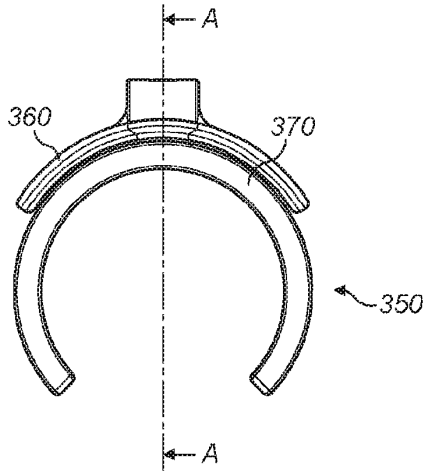


FIG. 8d

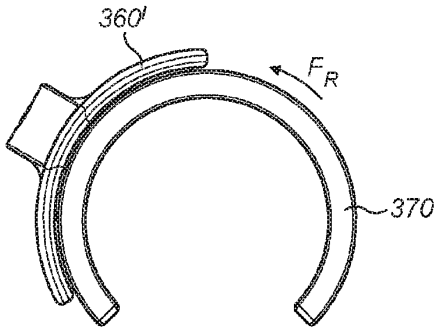


FIG. 8e

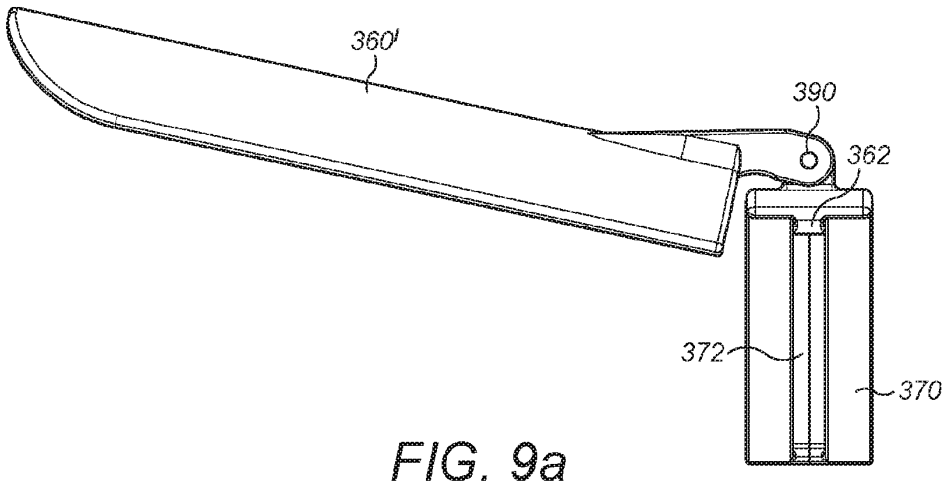


FIG. 9a

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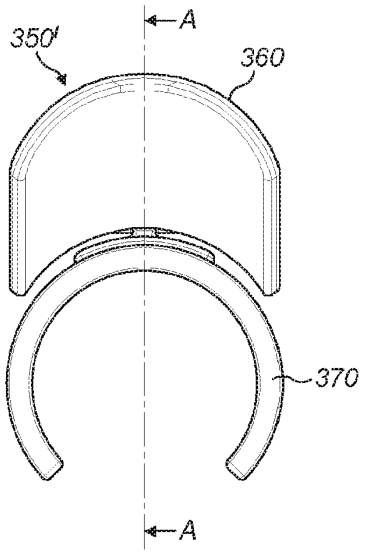


FIG. 9b

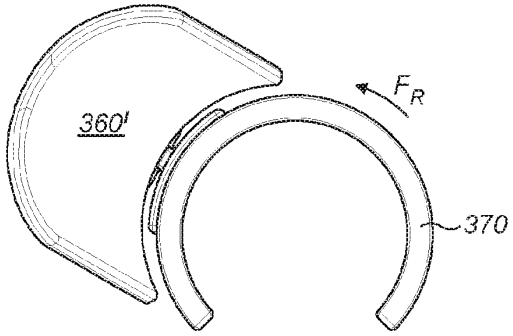


FIG. 9c

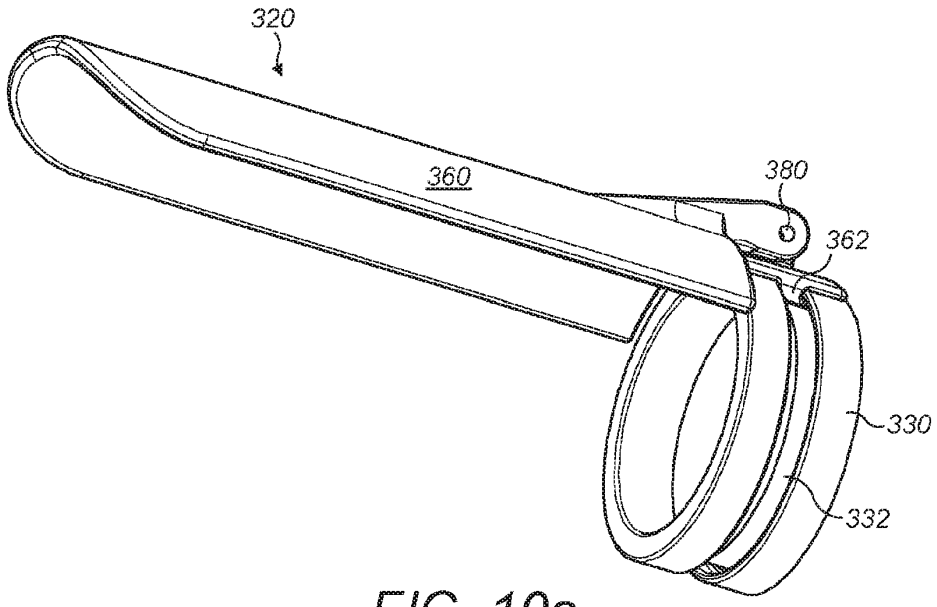


FIG. 10a

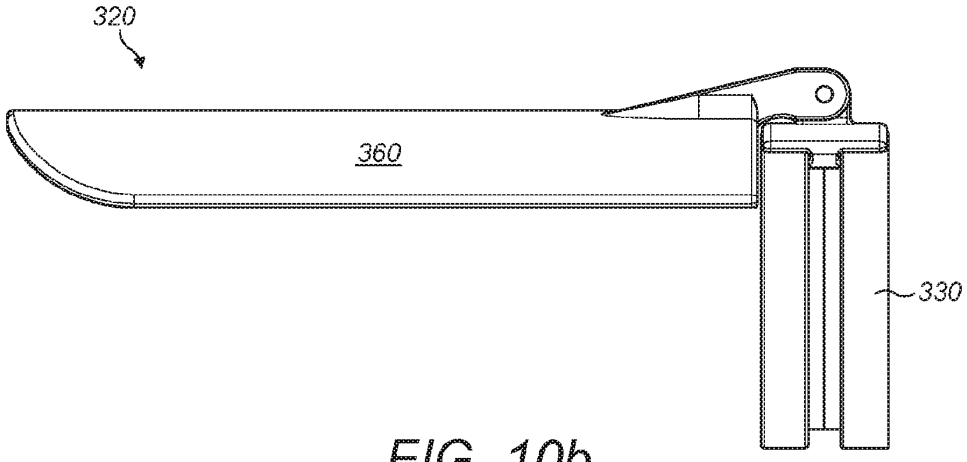


FIG. 10b

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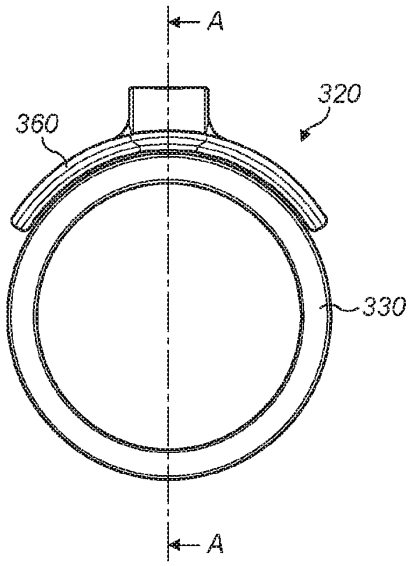


FIG. 10c

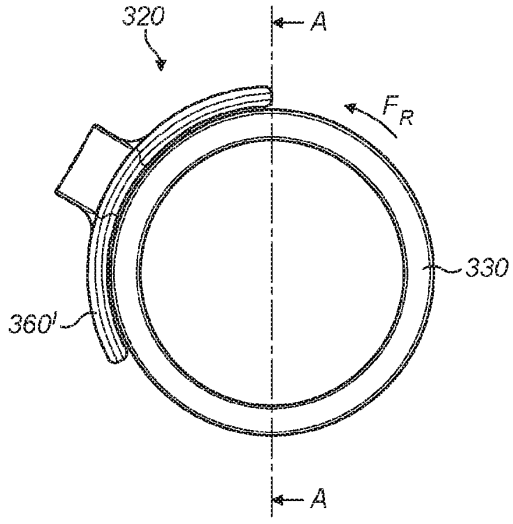


FIG. 10d

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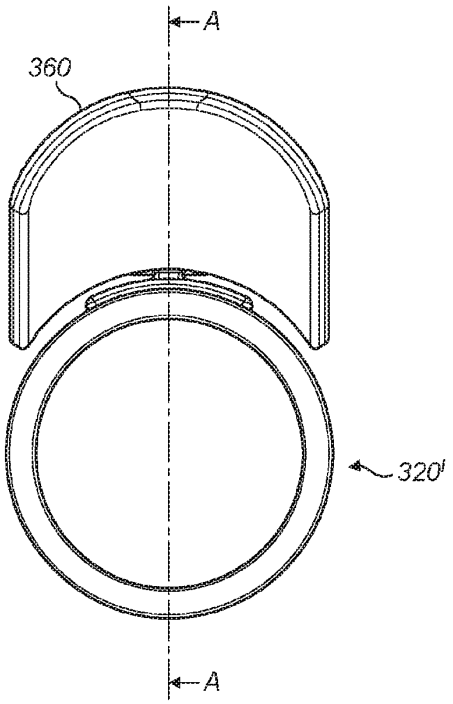


FIG. 11a

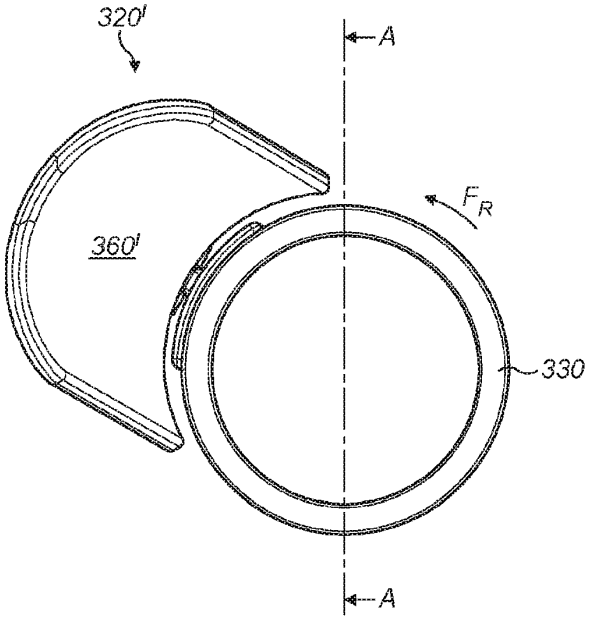


FIG. 11b

Attachment for a Hair Care Appliance

This invention relates to an attachment for a hair care appliance such as a hot styling appliance.

In a conventional hot styling appliance, air is sucked into an inlet by a fan unit and directed towards the hair by an attachment or head. Depending on the style desired, the air may or may not be heated. The head or attachment often includes bristles onto which hair is wrapped and held for styling. The air is generally blown out of the head or attachment normal to the surface of the head or attachment.

Curling irons generally have a heated portion that extends from a handle and a clamp for retaining hair. The hair is either wound round the heated portion and the clamp is used to clip the hair tips or the hair tips are clipped and then the hair is wound around the curling iron. The clip maintains the position of the hair until it is set into a curl.

Straighteners conventionally have either two generally flat heated pads that are used to clamp hair which is then tensioned whilst drying the hair or a flat pad and a bristled pad which detangles the hair whilst applying the tension and head.

In both examples the hair is heated directly.

The present invention provides an attachment for a hot styling appliance.

Preferably, the hot styling appliance comprises

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid

communication with the body providing a fluid outlet for fluid drawn into the fluid inlet.

Preferably, the attachment comprises an elongate member which, when attached to the hot styling appliance, extends at least partially along the fluid outlet. In one embodiment the elongate member is attached to the body. Alternatively, the elongate member is attached to the head either adjacent the body or at or near the distal end of the head from the body. An important feature is that the elongate member extends along the fluid outlet.

Preferably, the head is bristleless; in other words the head is unbristled or non-bristled.

Thus in one embodiment the invention provides an attachment for a hot styling appliance, the appliance comprising

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a bristleless head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid communication with the body providing a fluid outlet for fluid drawn into the fluid inlet,

the attachment comprising an elongate member which, when attached to the appliance, extends at least partially along the fluid outlet.

A bristleless head is a head without bristles extending from head for engaging with hair to hold the hair and detangle the hair.

The heater is located within the body of the appliance so is inaccessible to a user. The user only contacts the fluid that exits from the appliance.

The elongate member acts as heat shield or thermal barrier; the elongate member can be positioned between the fluid outlet and the skin of a user preventing direct contact of

hot fluid that exits the fluid outlet with the skin. The elongate member additionally directs fluid back towards the hair.

Preferably, the elongate member is wider than the generally tubular outer wall of the head. The elongate member extends beyond the generally tubular outer wall. The elongate member has a width that is greater than the diameter of the head. If the outer wall is non-cylindrical, the elongate member is preferably wider than the largest diameter of the outer wall.

Preferably, the elongate member extends around a quarter of the generally tubular outer wall; if the generally tubular outer wall is approximately circular, the elongate member extends about 90° of the circumference of the generally tubular outer wall. It is preferred that the elongate member extends around at least a third of the generally tubular outer wall. Thus, when the generally tubular outer wall is approximately circular, it is preferred that the elongate member extends at least 120° around the circumference of the head.

Also provided is an attachment for a hot styling appliance, the appliance comprising

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid communication with the body providing a fluid outlet for fluid drawn into the fluid inlet, the attachment comprising an elongate member which, when attached to the appliance, extends at least partially along the fluid outlet wherein the elongate member extends beyond the generally tubular outer wall.

If the elongate member is arcuate, the elongate member has a greater radius of curvature than the generally tubular outer wall. The elongate member may be generally rectangular or have a flattened portion with curved sides.

It is preferred that the elongate member has a common centre with the generally tubular outer wall.

By extending beyond the generally tubular outer wall there is much reduced risk of heated fluid flowing around the edges of the elongate member and being close enough to a skin surface to cause discomfort to the user.

In a preferred embodiment the attachment further comprises a cuff which is attached to the elongate member. The cuff provides the means for attaching the attachment to the appliance body or head.

Preferably, when attached to the hot styling appliance, the elongate member has a first position with respect to the head. Preferably, in this first position the elongate member extends substantially parallel to the generally tubular outer wall of the head.

Alternatively, the first position is angled with respect to the generally tubular outer wall of the head. The elongate member can be angled towards the head or away from the head. Preferably, in the first position, the elongate member is spaced from the generally tubular outer wall of the head. It is preferred that the elongate member is substantially equally spaced from the head along the length of the fluid outlet.

Also provided is an attachment for a hot styling appliance, the appliance comprising

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid communication with the body providing a fluid outlet for fluid drawn into the fluid inlet,

the attachment comprising an elongate member which, when attached to the appliance, extends at least partially along the fluid outlet and is spaced from the head.

Preferably, a gap of between 5 and 10mm is provided between the elongate member and the generally tubular outer wall.

In one embodiment, the attachment does not clamp, grip or constrict the hairs that lie between the elongate member and the fluid outlet; hairs can be positioned between the elongate member and the generally tubular outer wall for styling.

Alternatively, the elongate member can grip or clamp hair tips. This embodiment is particularly applicable when the head is bristleless. The elongate member has the gripping function of the bristles.

Preferably, the attachment is adapted to clamp hair. Thus, the attachment holds hair in place for drying and styling.

The invention also provides an attachment comprising an elongate member having a second position with respect to the hot styling appliance. Preferably, in this second position the elongate member is angled with respect to the generally tubular outer wall of the head. Alternatively, the in the second position the elongate member is displaced linearly from the appliance. Preferably, the second position is further from the head than the first position. Thus, a distance between the head and the attachment is larger, bigger or greater in the second position than in the first position.

It is preferred that the elongate member is movable between the first and second positions. Preferably, the elongate member pivots between the first and second positions. Alternatively, the elongate member is displaced towards and away from the head. The elongate member may be placed in a multitude of different positions between the first and second positions.

In a preferred embodiment, the elongate member moves and/or pivots with respect to a cuff for attaching the attachment to the appliance head or body.

Also provided is an attachment for a hot styling appliance, the appliance comprising

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid communication with the body providing a fluid outlet for fluid drawn into the fluid inlet,

the attachment comprising an elongate member which, when attached to the appliance, extends at least partially along the fluid outlet wherein the elongate member has a first position with respect to the head and a second position with respect to the head and the elongate member is movable between the first and second positions.

Also provided is an attachment for a hot styling appliance, the appliance comprising

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid communication with the body providing a fluid outlet for fluid drawn into the fluid inlet,

the attachment comprising an elongate member which, when attached to the appliance, extends at least partially along the fluid outlet wherein the elongate member has a first position with respect to the head and a second position with respect to the head and the elongate member is pivotable between the first and second positions.

In one embodiment the elongate member is biased into the second position. Thus without an external force on the elongate member it will be in the second position.

The attachment may be removably or permanently attached to the hot styling appliance.

When removably attached, the attachment is removable for storage purposes as well as during styling; the elongate member can additionally be attached during styling.

In one embodiment, the head is used for creating curls and hair is wrapped around the head for heating, drying and setting into the curled shape. Depending on the preference of the user, the wrapping process can be done with or without the elongate member being attached.

When permanently attached, the elongate member is preferably biased into the second position for wrapping and then moved into the first position once wrapping has been completed.

It is preferred that the movement of the elongate member from the second position to the first position is actuated by the elongate member coming into contact with the users' head. Thus, the elongate member automatically moves to the first position providing protection as a thermal barrier and deflection of the heat during use.

The attachment may be permanently or removably attached having a single position with respect to the hot styling appliance i.e. the attachment is stationary when attached. In this embodiment, it is preferred that a gap of more than 5mm and preferably around 10mm., Alternatively a gap of at least 10mm is provided between the elongate member and the generally tubular outer wall. This provides sufficient space for hair to be manipulated onto the head of the hot styling appliance for styling purposes.

The attachment can be considered to have one or more of an open and a closed position. The open position is when hair is wrapped and released from the head. The closed position can be used for wrapping, releasing and optionally clamping the hair. In the open position the elongate member is either angled with respect to the head or linearly displaced therefrom. In the closed position the elongate member is parallel to the head. Preferably, the attachment is biased into the open position.

The invention also provides an attachment which is rotatably attachable to the hot styling appliance. Again, in this embodiment the attachment is removably or permanently attached to the hot styling appliance. Thus, when hair is being

manipulated during a drying and styling process the elongate member may rotate around the generally tubular outer wall of the head.

Also provided is an attachment for a hot styling appliance, the appliance comprising

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid communication with the body providing a fluid outlet for fluid drawn into the fluid inlet,

the attachment comprising an elongate member which, when attached to the appliance, extends at least partially along the fluid outlet wherein the attachment is rotatably attachable to the hot styling appliance.

The rotation of the attachment about the head achieved either automatically by forces exerted onto the attachment for example the elongate member or cuff by which the attachment is attachment to the appliance and/or by manual manipulation.

The attachment is either fully rotatable around the head or partially rotatable around the head.

Preferably, the fluid outlet extends at least partially around the generally tubular outer wall. It is preferred that the fluid outlet comprises at least one slot that extends along the generally tubular outer wall. Preferably, the fluid outlet comprises a plurality of slots extending along the generally tubular outer wall. The slots may be equally spaced around the generally tubular outer wall. The fluid outlet preferably extends orthogonally to a longitudinal axis of the head and/or the body. Alternatively, the fluid outlet extends non-orthogonally to a longitudinal axis of the head and/or body. The fluid outlet thus spirals or twists around the longitudinal axis of the head and/or body.

Preferably, the fluid emitted from the fluid outlet is attracted to an external surface of the generally tubular outer wall. Preferably, fluid emitted from the fluid outlet flows around the external surface of the generally tubular outer wall. For this kind of head, the hair wraps automatically around the head of the hot styling appliance. It is preferred that there is no clamping of the hair in order for it to be wrapped around the head. However, alternatively the attachment is used to clamp the hair, preferably at the tips, to hold the hair in place for manipulation.

Another aspect of the invention provides an attachment for a hot styling appliance, the hot styling appliance comprising:

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall and a fluid outlet extending at least partially along the generally tubular outer wall wherein the fluid outlet comprises at least one slot extending along the generally tubular outer wall and wherein the at least one slot is formed by an overlap of a first end of the generally tubular outer wall and a second end of the generally tubular outer wall and wherein the generally tubular outer wall has a radius of curvature,

the attachment comprising an elongate member which, when attached to the appliance extends at least partially along the fluid outlet.

Preferably, the generally tubular outer wall is formed from at least two plates. It is preferred that a first one of the at least two plates comprises the first end of the generally tubular outer wall. Preferably, a second one of the at least two plates comprises the second end of the generally tubular outer wall. It is preferred that the first of the at least two plates defines a radially inner surface of the slot. Preferably, the second one of the at least two plates defines a radially outer surface of the slot.

Preferably, the at least two plates extending longitudinally along the generally tubular outer wall and radially around the tube. Preferably the slot extends longitudinally along the generally tubular outer wall.

It is preferred that the slot is tangential to the generally tubular outer wall. Preferably, fluid exiting the fluid outlet flows along a radially inner surface of the slot. The radially inner surface of the slot becomes the external surface of the head when a downstream end of the overlap between the first end of the generally tubular outer wall and the second end of the generally tubular outer wall is reached. The fluid flows around the head combining with fluid that exits from any further slots which form a part of the fluid outlet. The fluid exiting the fluid outlet is encouraged to follow the line of the radially inner surface creating a flow around the head which pulls hair towards the head and wraps the hair around the attachment in the direction of fluid flow.

Preferably, the head comprises n slots and n plates. It is preferred that one of the first end and second end of the outer wall includes a spacer which defines a thickness of the slot. Preferably, the second end of the outer wall comprises the spacer. It is preferred that a pair of spacers are provided longitudinally spaced along the outer wall. Any spacers maintain the gap between the two parts forming the slot or thickness of the slot.

Preferably, the at least one slot is formed as a spiral around the generally tubular outer wall. It is preferred that the spiral is clockwise in the direction of fluid flow. Alternatively, the spiral is anticlockwise in the direction of fluid flow. Preferably, the slot is disposed at an angle of 1-89° to a longitudinal direction of the head. It is preferred that the slot is disposed at an angle of 10-70° to a longitudinal direction of the head. Preferably, the slot is disposed at an angle of 30-60° to a longitudinal direction of the head. More preferably, the slot is disposed at an angle of 45° to a longitudinal direction of the head.

A curved slot changes the direction that fluid flows out from the fluid outlet tending to give a flow that is more normal to the surface of the head and this improves the hold of the hair around the head.

Preferably, the at least one plate is lined with a material. It is preferred that the material absorbs sounds and/or vibrations. Preferably, the material is Kevlar or wool.

Preferably, the attachment further comprises a cuff for attaching the elongate member to the hot styling appliance.

In one embodiment, the cuff attaches to the body of the hot styling appliance.

In another embodiment, the cuff attaches to the head of the hot styling appliance.

The cuff extends at least partially around the body or head. In the embodiment in which the attachment is fully rotatable around the head, it is preferred that the cuff extends continuously around the head.

Preferably, the attachment comprises a locating feature adapted to cooperate with a corresponding feature on the hot styling appliance whereby the locating feature determines the relative positions of the attachment and hot styling appliance in the longitudinal direction.

This feature enables the attachment to be repeatably located with respect to the hot styling appliance in the same position along the length of the hot styling appliance. Thus, it ensures that a desired length of the fluid outlet is covered by the elongate member. In fact it is preferably that the elongate member extends longitudinally beyond the head of the hot styling appliance.

Thus, a further aspect of the invention provides an attachment comprising an elongate member adapted to extend longitudinally beyond the fluid outlet.

Another aspect of the invention provides an attachment for a hair care appliance, the appliance comprising

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall having a radius of curvature fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid communication with the body providing a fluid outlet for fluid drawn into the fluid inlet, and

the attachment comprising an elongate member which, when attached to the appliance extends along the fluid outlet.

Also provided is a hot styling appliance comprising a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid communication with the body providing a fluid outlet for fluid drawn into the fluid inlet, and an attachment,

the attachment comprising an elongate member which, when attached to the appliance, extends at least partially along the fluid outlet.

Preferably, the fluid outlet comprises at least one slot extending along the generally tubular outer wall.

It is preferred that the at least one slot is formed by an overlap of a first end of the generally tubular outer wall and a second end of the generally tubular outer wall.

Preferably, the fluid emitted from the fluid outlet is attracted to an external surface of the wall.

It is preferred that fluid emitted from the fluid outlet flows around the external surface of the wall.

Preferably, the wall is formed from at least two plates. It is preferred that a first one of the at least two plates comprises the first end of the wall. Preferably, a second one of the at least two plates comprises the second end of the wall. It is preferred that the first of the at least two plates defines a radially inner surface of the slot. Preferably, the second one of the at least two plates defines a radially outer surface of the slot.

It is preferred that the wall is formed from at least two plates and the at least two plates extending longitudinally along the tube and radially around the tube.

Preferably, the slot extends longitudinally along the tube. It is preferred that the slot is tangential to the wall.

Preferably, fluid exiting the fluid outlet flows along a radially inner surface of the slot.

It is preferred that n slots and n plates.

Preferably, one of the first end and second end of the wall includes a spacer which defines a thickness of the slot. It is preferred that the second end of the wall comprises the spacer. Preferably, a pair of spacers is provided longitudinally spaced along the wall.

It is preferred that the at least one slot is formed as a spiral around the wall.

The invention will now be described by example, with reference to the accompanying drawings, of which:

Figure 1a shows an example of a hot styling appliance to which the attachment of the invention is attachable;

Figure 1b shows a cross section through the hot styling appliance shown in Figure 1a;

Figures 2a and 2b show an isometric view and an isometric cross section through a first attachment according to the invention;

Figures 3a and 3b show enlarged cross sections through the first attachment;

Figures 4a, 4b and 4c show different orientations of an attachment according to the invention attached to a hot styling appliance;

Figures 5a and 5b show different cross sections through the attachment of Figure 6a;

Figure 6 shows an attachment in a second position attached to a hot styling appliance;

Figure 7a shows a cross section through an attachment;

Figure 7b shows section B of Figure 7a enlarged;

Figures 8a, 8b, 8c and 8d show different aspects of a rotatable attachment;

Figure 8e shows the rotatable attachment of Figure 8d in a different orientation;

Figures 9a to 9c show the rotatable attachment of Figure 8a in a different position and/or orientation;

Figures 10a to 10d show an alternative attachment; and

Figures 11a and 11b show the alternative attachment in a different position.

Figures 1a and 1b show a hot styling appliance 10 with a handle 20 and a detachable head 30 which is attaches at the distal end 22 of the handle 20 to the fluid inlet 40. It is an example of the sort of appliance that the attachment according to the invention can be used with however; the invention is not limited to the attachment being used with

this particular appliance. The appliance merely needs a fluid inlet, a fluid outlet a fan unit for drawing fluid into the fluid inlet and a heater for heating the fluid before it exits the appliance.

The handle 20 has an outer wall 26 which is generally tubular and includes the fluid inlet 40 at and adjacent one end 24. The fluid inlet 40 comprises a first set of apertures 44 which extend radially around the handle 20 and along the outer wall 26 of the handle from the handle end 24. The handle end 24 is covered by an end wall 42 which is also perforated with a second set of apertures 46 that extend through the end wall 42 of the handle. Thus, the fluid inlet 40 extends around, along and across the handle 20. The end wall 42 is orthogonal to the outer wall 26 and an inner wall 60 of the handle.

The handle 20 also includes a fan unit 70 which comprises a fan and a motor which drives the fan and in use, draws fluid in through the fluid inlet 40, along a fluid flow path 50 which extends through the length of the handle 20. The fluid is optionally heated by a heater 80 before entering an inner cavity 38 of the head 30.

The head 30 includes a fluid outlet 100 which in this example comprises parallel slots 102 each extending towards a second end 36 of the head and disposed radially around the head 30. This arrangement enables fluid to exit the head all the way around the head and for the majority of the length of the head 30 maximising a hair styling region of the product.

In use, hair is wrapped around the head 30 whilst air or fluid exits through the slots 102 drying the hair and/or styling the hair into curls or waves. The hair wraps automatically due to the flow of air around the surface of the head 30. The air or fluid can be heated but this is not essential.

Power is provided to the hot styling appliance via a power cable 48 which preferably extends from a plug or other power source through the end wall 42 of the handle 20. The handle 20 also houses a PCB 75 which is electrically connected to the cable 48, the

fan unit 70 and the heater 80 by internal wiring (not shown). An on/off switch 52 and control buttons 54 are provided and connected to the PCB 75 to allow the user to select one of a range of temperature and flow settings.

The handle 20 is tubular and the outer wall 26 of the handle 20 is a cylindrical sleeve. The handle connects to a head 30 at a first end 22 and at the distal, second end 24 a fluid inlet 40 is provided. The fluid inlet 40 is a first means of filtering fluid that enters the fluid flow path 50.

The fluid inlet 40 comprises a plurality of apertures extending around, along and across the handle 20. Having an inlet that extends in three dimensions has advantages particularly when used with hair grooming appliances. Firstly, if the appliance is placed on a surface whilst switched on only a small part of the inlet surface area will be blocked or have restricted flow of fluid into the appliance. This protects the fan unit and particularly the motor of the fan unit from running with too low a flow rate as this can cause overheating of the motor and cause damage to the motor.

Secondly, often hair care appliances are used with a styling product such as a mousse, gel or spray. These products are typically either applied by a hand or directly to the hair as a mist. After application by a hand, some of the product will be retained on the skin which is then transferred to the appliance when held. This can block at least some of the apertures 44 that extend around and along the handle 20. However, the apertures 46 that extend under the handle and across the end wall 42 of the handle will be unaffected. When a product is applied as a mist, it can settle on the appliance and again block or restrict at least some of the apertures of the fluid inlet 40. However, by having apertures that extend around, along and across the handle 20 the risk of blocking the fluid inlet 40 is reduced.

The apertures are preferably circular with a diameter of 0.2 to 1.6 mm. The diameter of the apertures can vary along, around and across the handle 20. It is advantageous to space the apertures regularly around, along and across the fluid inlet 40. Not only is this

visually pleasing but it also has the technical advantage that there is no weak region of the fluid inlet 40 where blockage of a portion is more likely or would have more impact on the flow into the fluid inlet 40. The inlet is designed so that the flow into the inlet is even at least around the circumference of the handle 20.

A foam block 58 is provided which in use is inserted into the second end 24 of the handle 20. The foam block 58 is a second means of filtering the fluid that passes through the primary fluid inlet 40 into the primary fluid flow path 50. It is advantageous that the foam block 58 extends beyond or further towards the first end 22 of the handle than the primary fluid inlet 40 as this ensures that fluid that has entered the primary fluid inlet 40 has passed through the foam block 58 so has had two stages of filtration.

The foam block 58 shown is cylindrical and substantially fills the area within the handle 20 at the primary fluid inlet 40. This is to ensure that all fluid that enters the primary fluid inlet through first apertures 44 that extend around and along the handle and fluid that enters through second apertures 46 that extend across and through the end wall 42 of the handle 20 passes through this second stage of filtration. The foam block 58 extends longitudinally from the second end 24 of the handle 20 further than the first apertures 42 of the primary fluid inlet 40.

The fluid outlet 100 of the head 30 will now be described in more detail, referring in particular to Figures 2a, 2b, 3a and 3b. The head 30 is essentially cylindrical and has a first end 32 for connection to a handle 20 and a second end 36 distal to the first end 32. The head 30 extends longitudinally from the first end 32 to the second end 26 continuing a line described by the handle 20 (Figure 1a) so is approximately the same diameter as the handle. Within the head 30 is an inner cavity 38 and fluid that has been drawn into the fluid flow path 50 within the handle 20 by the fan unit 70 enters the inner cavity 38 via an aperture 302 in the first end 32 of the head 30.

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The fluid outlet 100 is formed from a number of parallel slots 102 which extend along the length of the head 30 from the first end 32 to the second end 36. The slots 102 are formed from an overlap 120 (Figure 3b) formed between adjacent plates 110 which results in fluid being directed between a radially inner surface 104 formed from the outer surface 112 of a first plate 110a and a radially outer surface 106 formed from the inner surface 114 of a second plate 110b. The fluid 122 flowing out of the slot 102 is tangential 130 to the outer surface 112 of the plate 110a and joins with the fluid flowing out of the other slots of the fluid outlet 100 forming a fluid flow around the circumference of the head 30. Thus, the fluid 122 is blown out along the external surface of the head and this encourages hair to wrap around the head 30 automatically.

The plates 110 form an outer wall 184 of the head 30 through which the fluid outlet 100 extends.

The fluid 122 exiting the slots 102 is attracted to the curved surface of the head 30 by the Coanda effect. This in turn causes hair that is presented to the head 30 to automatically wrap around the surface and then styled into curls. As air is blown down the length of the hair, wet hair is dried more quickly than conventionally and as the wrapping process occurs without the use of bristles, the hair can slide off the head 30 once it is dry or styled so there is no tangling.

To maintain the size of each slot 102, spacers 108 are provided. In this example, a pair of spacers 108 is provided to maintain each slot 102 size. Each one of the pair of spacers 108 is longitudinally spaced along the slot 102 and the plate 110. The spacers 108 join adjacent plates 110 together.

Advantageously, each plate 110 is lined with a felt like material 308 such as Kevlar or wool (see Figure 3b). The material 308 does not extend over each slot 102 so the fluid exiting the fluid outlet 100 does not pass through the layer of material 308. This layer serves to absorb some of the noise produced by the fluid flowing through the head 30 from the inlet to the head 30 at aperture 302 to the fluid outlet 100. Such a layer of

material 308 is as applicable for other heads herein described such as heads 130, 180 and 230.

Referring now to Figures 4a, 4b, 4c, 5a and 5b in particular, the attachment 150 includes a heat shield or elongate member 160 which extends along a head 280. The attachment 150 is removably attached to the hot styling appliance 10 via a cuff 170 which locates around the handle 20 near the head 280. The elongate member 160 extends along the length of the head 280 maintaining a constant distance or gap d (Figure 5a) between the elongate member 160 and the outer wall 284 of the head 280.

In a first embodiment, the attachment 150 is fixed in relation to the head 280, the gap or distance d is defined so hair can be wrapped around the head 280 either whilst the attachment 150 is attached to the hot styling appliance 10 or hair can be wrapped and then the attachment 150 can be attached to the hot styling appliance 10. In order to achieve both types of functionality, the gap or distance d is around 10mm. If the gap or distance d is reduced, then the wrapping action of the hair around the head 150 is compromised when the attachment 150 is in place. If the attachment is only to be attached after the hair has been wrapped then the distance d may be reduced to around 5mm or less.

In a second embodiment, the attachment 150 is movable in relation to the head 280 between a first position shown in Figures 4a, 4b, 4c, 5a and 5b to a second position shown in Figure 6. In the second position the elongate member 150′ is angled with respect to the head 280 and a gap or distance d′ between the outer wall 284 of the head 280 and the elongate member 150′ varies from the cuff 170 to a distal end 152 of the elongate member 150′. In this example the gap or distance d′ increases to around 10mm. In this example, a smaller gap or distance d′ can be tolerated near the handle end of the head 232 regardless of whether the attachment is attached before, during or after wrapping of hair as this restricted gap or distance d′ only extends for a short distance along the length of the head 280.

The head 280 of this example differs to the head 30 described in relation to Figures 1a, 1b, 2a and 2b in that the head 280 has a reduced diameter compared with the handle 20. The first end 32 is substantially the same diameter as the handle 20 for connection thereto, and then within a collar 232 the diameter of the head 280 decreases to the reduced diameter prior to the fluid outlet 200 formed by slots 282 and continues at a constant diameter to the second end 236. This head 280 is used to create tighter curls than head 30..

In addition, the slots 282 curve around the head 280 forming a spiral or helical pattern around the head 280. The slots 282 curve by an angle α of 45° from the longitudinal axis A-A of the handle 20 and head 280 (Figure 5a). In this example the slots 282 curve in a clockwise direction from the first end 34 of the head 280 towards the second end 236 of the head. The slots 282 are formed as before between adjacent overlapping plates 210 however, in order to form the curved slots 282, the plates 210 do not extend along the longitudinal axis of the head 280 but also curve by an angle of 45°. Using angled slots changes the profile of the fluid exiting from the head. The airflow exiting from the slots is more normal to the slot when angled slots are used. This has benefits including enabling more hair to be wrapped around the head also, the hair is retained on the head more easily leading to a potentially quicker styling process.

The slots can be curved in a clockwise or and anticlockwise direction from the longitudinal axis A-A of the handle 20. Whilst an angle of 45° has been illustrated, improved wrapping is seen even at an angle of 1°.

The attachment 150 is shown as being attached to the handle 20 however it could be attached to the head 280 adjacent the first end 32, adjacent the second end 236 or within the collar 232 of the head 280.

The attachment 150 moves from the first position to the second position and vice versa via a pivot 190. Referring now to Figures 7a and 7b, an attachment 250 is biased towards the second position by a spring 252 and it is only on application of a force F

that the attachment 250 closes or moves to the first position as shown. This force can be applied by any of a number of objects such as a user's head or can be applied manually, for example. The force can be relatively low at a few Newtons. Once the force F has been removed, for example by removing the hair from the hot styling appliance or the or moving the attachment away from the user's head the attachment 250 moves back to the second position by the action of the spring 252 i.e. the attachment opens ready to accept another section or tress of hair for curling.

Referring now to Figures 8a, 8b, 8c and 8d attachment 350 has an elongate member 360 which is connected to a cuff 370. The attachment 350 can be stationary with respect to a head and hot styling appliance in a first position as shown where the attachment 350 is generally parallel to the head (not shown), or it can be movable from a first position to a second position where the attachment 350′ is angled with respect to the head (as shown in Figure 9a).

In this embodiment, the elongate member 360 is additionally rotatable about an appliance to which it is attached. The elongate member 360 is partially rotatable about an arc described by cuff 370.

The cuff 370 is provided with a channel 372 into which a connecting member 362 for the elongate member 360 is located. In this example the channel 372 and the connecting member 362 are T-shaped and this ensures that the connecting member 362 can be rotated around the cuff without being accidentally removed from the cuff. Figure 8e shows the elongate member is a rotated position 360′. The elongate member is rotatable manually or by a radial force F_R acting on the elongate member 360′ from the wrapping of the hair.

The rotating aspect can be used on an attachment which is stationary in the first position i.e. only lies parallel to the head when the attachment is attached or, as shown in Figures 9a, 9b and 9c the rotating aspect can be used in conjunction with the ability to move the attachment from a first parallel position to a second angled position with respect to the

head. In order to enable movement between the first position 350 and the second position 350′ the connecting member 362 is joined to the elongate member 360 via a pivot joint 190. The elongate member 360 can be moved to a rotated position 360′ whilst the attachment is in the second position 350′ as well as in the first position 350.

Referring now to Figures 10a, 10b and 10c attachment 320 is fully rotatable around the head as the cuff 330 is a complete circle with a channel 332 for a connecting member 362 to move around to a rotated position 360′ as shown in Figure 10d. As before, the attachment may be stationary or fixed in a substantially parallel orientation with respect to the head or the first position 320 or the attachment is moveable from the first position into a second position where the attachment 320′ is angled with respect to the head (as shown in Figures 11a and 11b). In order to enable the pivoting movement between the first position and the second position, the connecting member 362 is connected to the elongate member 360 via a pivot joint 380.

In this example, the attachment 320 is attached to a head or body by push fitting the cuff 330 over the generally tubular outer wall of the head or the outer wall of the body. A locating feature such as a recessed groove and correspondingly sized pips can be used to repeatedly position the attachment 320 with respect to the head or body to ensure that a desired length of the fluid outlet is covered by the attachment.

Referring now to Figures 5a, 5b and 7a, the elongate member can be provided with a cool wall which improves thermal shielding by the elongate member. The elongate member 150, 250 is formed as a double skinned wall having an outer wall 154, 254 and an inner wall 156, 256 respectively. An air channel 158, 258 is provided between the respective outer wall 154, 254 and inner wall 156, 256. The air channel 158, 258 is a thermal barrier and restricts the conduction of heat from the hot fluid exiting the fluid outlet to the outer wall 154, 254 of the attachment 150, 250.

A cool wall effect could alternatively be achieved using ribs that extend along the elongate member in any orientation preventing a user from contacting the surface directly.

The attachment can be made from a number of materials such as polycarbonate, PES (Polyethersulfone) or PSU (Polysulfone), Nylon, Glass filled PBT (Polybutylene terephthalate). In one embodiment at least the elongate member s transparent or semi transparent. The attachments have been shown as push fitting or locating onto the appliance however, it will be apparent to the skilled person that alternative methods such as clipping the attachment onto the appliance.

Whilst the attachments have been shown to pivot between positions, as an alternative the attachment is moved parallel the appliance and is displaced towards and away from the appliance.

The invention has been described in detail with respect to a hot styling appliance however, it is applicable to any appliance that draws in a fluid and directs the outflow of that fluid from the appliance including a hairdryer.

The appliance can be used with or without a heater; the action of the outflow of fluid at high velocity has a drying and styling effect.

The fluid that flows through the appliance is generally air, but may be a different combination of gases or gas and can include additives to improve performance of the appliance or the impact the appliance has on an object the output is directed at for example, hair and the styling of that hair.

The invention is not limited to the detailed description given above. Variations will be apparent to the person skilled in the art.

CLAIMS

1. An attachment for a hot styling appliance, the appliance comprising

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid communication with the body providing a fluid outlet for fluid drawn into the fluid inlet,

the attachment comprising an elongate member which, when attached to the appliance, extends at least partially along the fluid outlet.

2. An attachment for a hot styling appliance, the appliance comprising

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a bristleless head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid communication with the body providing a fluid outlet for fluid drawn into the fluid inlet,

the attachment comprising an elongate member which, when attached to the appliance, extends at least partially along the fluid outlet.

3. An attachment according to claim 1 or claim 2, wherein the elongate member is wider than the outer wall of the head.

4. An attachment according to any preceding claim, wherein the elongate member extends around a quarter of the outer wall.

5. An attachment according to claim 4, wherein the elongate member extends around at least a third of the outer wall.

6. An attachment according to any preceding claim, wherein the elongate member extends beyond the generally tubular outer wall.

7. An attachment for a hot styling appliance, the appliance comprising

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid communication with the body providing a fluid outlet for fluid drawn into the fluid inlet, the attachment comprising an elongate member which, when attached to the appliance, extends at least partially along the fluid outlet wherein the elongate member extends beyond the generally tubular outer wall.

8. An attachment according to any preceding claim, wherein the elongate member is arcuate.

9. An attachment according to any preceding claim, wherein the attachment comprises a cuff for attaching the attachment to the appliance.

10. An attachment according to any preceding claim, wherein the elongate member has a first position with respect to the head.

11. An attachment according to claim 10, wherein in the first position the elongate member extends substantially parallel to the outer wall of the head.

12. An attachment according to claim 10 or claim 11, wherein in the first position, the elongate member is spaced from the outer wall of the head.

13. An attachment according to any of claims 10to 12, wherein the elongate member is substantially equally spaced from the head along the length of the fluid outlet.

14. An attachment according to claim 10, wherein the elongate member is angled with respect to the generally tubular outer wall of the head.

15. An attachment for a hot styling appliance, the appliance comprising

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid communication with the body providing a fluid outlet for fluid drawn into the fluid inlet,

the attachment comprising an elongate member which, when attached to the appliance, extends at least partially along the fluid outlet and is spaced from the head.

16. An attachment according to any of claims 11 to 15, wherein a gap of between 5 and 10mm is provided between the elongate member and the outer wall.

17. An attachment according to any of claims 10 to 16, wherein the elongate member has a second position with respect to the head.

18. An attachment according to claim 17, wherein in the second position the elongate member is angled with respect to the outer wall of the head.

19. An attachment according to claim 17, wherein in the second position the elongate member is displaced linearly from the appliance.

20. An attachment according to any of claims 17 to 19, wherein the elongate member is movable between the first and second positions.

21. An attachment for a hot styling appliance, the appliance comprising

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid communication with the body providing a fluid outlet for fluid drawn into the fluid inlet,

the attachment comprising an elongate member which, when attached to the appliance, extends at least partially along the fluid outlet wherein the elongate member has a first position with respect to the head and a second position with respect to the head and the elongate member is movable between the first and second positions.

22. An attachment according to any of claims 17, 20 or 21, wherein the elongate member is movable between the first and second position whilst it is attached to the hot styling appliance.

23. An attachment according to any of claims 17 to 22, wherein the elongate member pivots between the first and second positions.

24. An attachment for a hot styling appliance, the appliance comprising

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid communication with the body providing a fluid outlet for fluid drawn into the fluid inlet,

the attachment comprising an elongate member which, when attached to the appliance, extends at least partially along the fluid outlet wherein the elongate member has a first position with respect to the head and a second position with respect to the head and the elongate member is pivotable between the first and second positions.

25. An attachment according to any of claims 17 to 24, wherein the elongate member is biased into the second position.

26. An attachment according to any preceding claim, wherein the elongate member is permanently attached to the hot styling appliance.

27. An attachment according to any preceding claim, wherein the attachment is rotatably attachable to the hot styling appliance.

28. An attachment for a hot styling appliance, the appliance comprising

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid communication with the body providing a fluid outlet for fluid drawn into the fluid inlet,

the attachment comprising an elongate member which, when attached to the appliance, extends at least partially along the fluid outlet wherein the attachment is rotatably attachable to the hot styling appliance.

29. An attachment for a hair care appliance, the appliance comprising:

a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid communication with the body providing a fluid outlet for fluid drawn into the fluid inlet,

the attachment comprising an elongate member which, when attached to the appliance extends at least partially along the fluid outlet.

30. A hot styling appliance comprising a body comprising a fluid inlet, a fan unit, a heater and a fluid flow path from the fluid inlet through the fan unit and heater, and

a head comprising a generally tubular outer wall having a fluid outlet extending at least partially along the generally tubular outer wall which in use is in fluid

communication with the body providing a fluid outlet for fluid drawn into the fluid inlet, and an attachment,

the attachment comprising an elongate member which, when attached to the appliance, extends at least partially along the fluid outlet.

31. An appliance according to claim 30, wherein the fluid outlet comprises at least one slot extending along the generally tubular outer wall.

32. An appliance according to claim 31, wherein the at least one slot is formed by an overlap of a first end of the generally tubular outer wall and a second end of the generally tubular outer wall.

33. An appliance according to claim 31 or claim 32, wherein the fluid emitted from the fluid outlet is attracted to an external surface of the wall.

34. An appliance according to any claim 31 or claim 32, wherein the slot is tangential to the wall.

35. An appliance according to any of claims 31 to 34, wherein the at least one slot is formed as a spiral around the wall.

36. A hot styling appliance as substantially herein described with reference to the drawings.

Intellectual Property Office

Application No: GB1411929.1 **Examiner:** Emma Tonner

Claims searched: 1, 3-6, 8-14, 16-20, 22, 23, 25-27, 29-36 **Date of search:** 3 December 2014

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1, 4, 5, 8, 10, 11, 17, 18, 20, 22, 23, 26, 29, 30	GB2410684 A (CONAIR) see page 3, lines 1-19 and figure 2
X	1, 4, 5, 8, 10-13, 16-18, 20, 22, 23, 26, 29, 30	US2013/0319450 A1 (RAGOSTA et al.) see paragraphs 0056 and 0060
X	1, 4, 5, 8, 10, 11, 17, 18, 20, 22, 23, 26, 29, 30	GB2139887 A (CONAIR) see page 1, lines 93-117
X	1, 4, 5, 8, 10, 11, 17, 18, 20, 22, 23, 26, 29, 30	JPH02309903 A (MATSUSHITA ELECTRICAL WORKS) see English abstract and figure 1
X	1, 4, 5, 8, 10, 11, 17, 18, 20, 22, 26, 29, 30	DE20218747 U (LIN ARLO H T) see English abstract and figures
X	1, 4, 5, 8, 10, 11, 14, 17, 18, 20, 22, 23, 26, 29, 30	JPH2010263994 A (HITACHI MAXELL) see English abstract and figures

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Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^{X} :

Worldwide search of patent documents classified in the following areas of the IPC

A45D

The following online and other databases have been used in the preparation of this search report

EPODOC, WPI

International Classification:

Subclass	Subgroup	Valid From
None		

Electronic Acknowledgement Receipt

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Receipt Date:	01-NOV-2016
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Application Type:	Utility under 35 USC 111(a)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Response to Election / Restriction Filed	ElectionResp_424662093300.pdf	25199 2248445cc58d804e616a6c117e90654815e6cfe6	no	2

Warnings:

Information:					
2		IDS_424662093300.pdf	45767 2bc7876c9d206fb0dbbe26e08a8cb9d944caddb5	yes	3
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
Warnings:					
Information:					
3	Foreign Reference	GB_725095.pdf	509615 67ddd96774f754f2d590c1a2e08ae7f65d0f812f	no	3
Warnings:					
Information:					
4	Foreign Reference	GB_1295924.pdf	781470 f910b4a391021c136fa1ddb888b077b9594fa9d6	no	4
Warnings:					
Information:					
5	Foreign Reference	DE_2618819.pdf	2721034 925c923c2b1790836919 8a54f563b8ae5f33ca78	no	33
Warnings:					
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6	Foreign Reference	JP_6_7217.pdf	1509997 0081d64fad5c3cb77c29a438be8aec084bf60c2c	no	13
Warnings:					
Information:					
7	Foreign Reference	JP_10_71019.pdf	1335350 a398eebb8969707fb9828ce34170015794ca19be	no	12
Warnings:					
Information:					

8	Foreign Reference	JP_10_179238.pdf	1323824 b69e6deb133dcf607e4c9daff79b48541af3913a	no	12
Warnings:					
Information:					
9	Foreign Reference	JP_2004_225705.pdf	2740827 3c0da9fcbbcf20ca5cde96bb2c1319fbd0c33cf3	no	20
Warnings:					
Information:					
10	Foreign Reference	JP_2007_105144.pdf	3138582 b4b6f419e3793d932aa438c08d543dce13258667	no	28
Warnings:					
Information:					
11	Foreign Reference	CN_201691269.pdf	822649 0069561459ea03de404777044e196e334c7630f9	no	9
Warnings:					
Information:					
12	Foreign Reference	KR_10_2012_0095206.pdf	2053726 2262366d19dff796eacf5d11cd44754fde447fcb	no	21
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13	Foreign Reference	CN_203106087.pdf	1194241 d2d926dbfa08e3134d46e9d98e7655c97a6cf097	no	10
Warnings:					
Information:					
14	Foreign Reference	GB_2524304.pdf	3641965 7570fd83cdcd290b24af81d7f0e16ad9564857b6	no	39
Warnings:					
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15	Foreign Reference	GB_2526049.pdf	4040489 78fabbefe047278a2e1c4a864343ce88b44054bf	no	44
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16	Foreign Reference	GB_2527834.pdf	4017722 3a558747e466b8936cc37b55064f474810f896ae	no	45
Warnings:					
Information:					
			Total Files Size (in bytes):	29902457	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/656,357	03/12/2015	Alasdair Michael MACLAINE	424662093300	9085

25227 7590 02/14/2017

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1650 TYSONS BOULEVARD
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MCLEAN, VA 22102

EXAMINER
GILL, JENNIFER FRANCES

ART UNIT	PAPER NUMBER
3776	

NOTIFICATION DATE	DELIVERY MODE
02/14/2017	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

EOfficeVA@mofo.com
PatentDocket@mofo.com
pair_mofo@firsttofile.com

Office Action Summary	Application No. 14/656,357	Applicant(s) MACLAINE, ALASDAIR MICHAEL	
	Examiner JENNIFER GILL	Art Unit 3776	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/1/16*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-35* is/are pending in the application.

5a) Of the above claim(s) *17-35* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-16* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☒ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *3/12/15* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☒ All b)☐ Some** c)☐ None of the:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date *See Continuation Sheet*.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

Continuation of Attachment(s) 2). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :3/12/15,8/21/15,3/7/16,8/3/16,11/1/16.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Information Disclosure Statement

The information disclosure statement(s) (IDS) submitted on 3/12/15, 8/21/15, 3/7/16, 8/3/16, and 11/1/16 was/were filed in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement(s) has/have been considered by the examiner.

Election/Restrictions

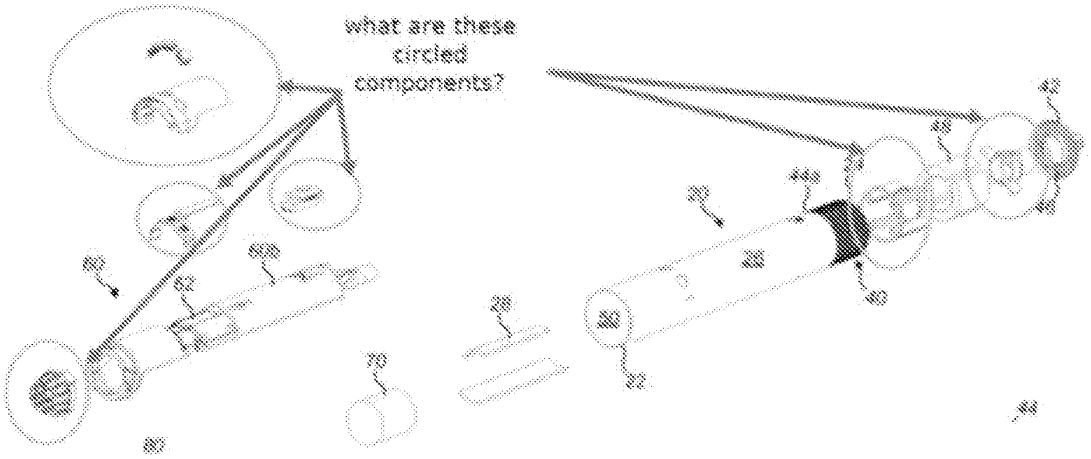
Applicant's election without traverse of sub-species IA in the reply filed on 11/1/16 is acknowledged.

Claims 17-35 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected sub-species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 11/1/16.

Drawings

Figures 1b and 4b are objected to for failing to comply with 37 C.F.R. 1.84(p)(5), which requires reference characters not mentioned in the description not appear in the drawings and reference characters mentioned in the description must appear in the drawings. In this case, reference character "28" is not present in Figure 1b as discussed in [0087] of the disclosure; reference characters "38", "308", and "102" are missing from Figure 4b as discussed in [0094] of the disclosure.

Figure 2a is objected to because there are a number of components with no reference character making it unclear what these pieces are (see annotations below).



Figures 1-2 are objected to because reference character "48" has been used to designate both "a power cord" in Figure 1 and a "foam block" in Figure 2a.

Figure 4a is objected to because the dimension line “100.00” has no units and does not appear to be dimensionally discussed in the disclosure (the disclosure does not indicate what "100.00" is meant to represent or what units, if any, should be present).

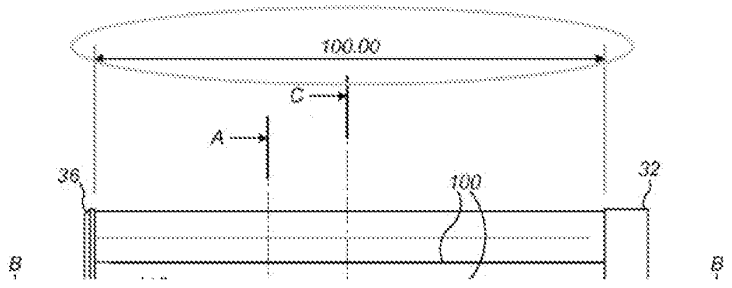


Figure 2a is objected to because this is described as an exploded view of the handle of Figure 1; however, not all elements illustrated in the handle of Figure 1 appear

to be illustrated in the exploded view of Figure 2; specifically, the “PCB 75” of Figure 1 is missing from Figure 2 and the “control buttons 54” are not labeled in Figure 2, nor the “on switch 52”.

Specification

The disclosure is objected to because of the following informalities:

[0061] replace “heater by a heater” with --heated by a heater-- to remedy the typographical error.

Appropriate correction is required.

Claim Objections

Claims 2 and 15 are objected to because of the following informalities:

Claim 2, line 1, replace “the slot” with --the at least one slot-- to be commensurate with claim 1; line 1, replace “the length” with --a length-- to avoid antecedent issues.

Claim 15, line 2, replace "the length" with --a length-- to avoid antecedent issues.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

> (a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 5 is rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 5 recites "wherein the fluid emitted from the outlet is attracted to the surface of the attachment"; however, based on applicant's disclosure, this is a result of the "Coanda effect" [0092]; however, this effect only takes place in jet streams and applicant's device is disclosed to be an attachment for any generic hair dryer, such that one of ordinary skill in the art would not be apprised of how to make and/or use the invention as claimed since it is unclear how applicant's attachment is capable of generating "jet streams". Particularly since it would seem this would be dependent on the device to which the attachment is attached and not a feature of the attachment itself as claimed. Clarification or explanation is requested.

The following is a quotation of 35 U.S.C. 112(b):

> (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8-10 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Claims 8 and 9 each depends from claim 1, which already sets forth an inlet end of the attachment (line 3 of claim 1) and a distal end of the attachment (line 3 of claim 1), making it unclear what this newly recited "the first end" is. "The first end" lacks antecedent basis and is not clearly linked to the inlet end or distal end already set forth in preceding claim 1, making it unclear what "end" this is and how many "ends" the device should have. Applicant can overcome this rejection by changing "the first end" to “the inlet end”. For purposes of examination, the claim will be treated as reciting "the inlet end".

Claim Rejections - 35 USC § 102

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

Claim(s) 1-5, 7, 9-10 is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by, or unpatentable over, Lindsey (USP 5868148).

Claim 1, Lindsey teaches an attachment (10) for a handheld appliance (15) comprising: an inlet (16); a series of outlets in the form of slots (G) extending from near an inlet end of the attachment towards a distal end of the attachment and wherein the outlets (G) are defined by an external surface of the attachment because they are gaps extending through the external surface of the attachment (see Figs 8-13). Fluid emitted from the outlet would be capable of being blown along the external surface and around the external surface of the attachment (see Figs 8-13).

Claim 2, the slots (G) extend substantially along a length of the attachment (10; see Figs 8-13).

Claim 3, the outlet slots (G) are spaced radially around the attachment (10; see Figs 8-13).

Claim 4, the fluid can be emitted from the outlet tangential to the external surface of the attachment (see Fig 9).

Claim 5, the fluid emitted from the outlet appears to be capable of being directed towards, or around, the external surface of the attachment, which meets the claim limitation of "attracted to" the surface, as best understood (see Fig 9).

Claim 7, the outlet comprises at least two slots (G; see Figs 8-13).

Claims 9-10, the attachment (10) has a longitudinal axis extending from the inlet end to the distal end and the slots (G) are non-parallel to the longitudinal axis because the slots (G) are helical with respect to the longitudinal axis (see Fig 12).

Claims 11-13, the device further comprises a flow directing element (16) formed of a perforated (28 & 30) layer of elongate material; since Merriam-Webster defines mesh as "a weblike pattern or construction" and the flow directing element (16) has a series of spaced holes forming a "weblike pattern", the perforated layer is formed from a mesh of elongate material as claimed (see Figs 8-13).

Claims 15-16, the flow directing element (16) extends substantially along a length of the slots (G) and it extends substantially around an inner circumference of the attachment (see Figs 8-13).

Claim(s) 1-8, 11-13, and 15-16 is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by, or unpatentable over, McDougall et al (USP 5212366).

Claim 1, McDougall teaches an attachment (2) for a handheld appliance (1) comprising an inlet (17); an outlet in the form of slots between plates (3, see Fig 5a) and a fluid flow path between the inlet and outlet and the slot extends form near an inlet end of the attachment towards a distal end of the attachment and wherein the outlet slots are at least partially defined by an external surface of the attachment such that fluid emitted from the outlet is blown along an internal and external surface of the attachment (since it flows from the internal to the external surface in use) and fluid emitted from the

outlet can flow around the external surface of the attachment (Col 3, 1-10; see Figs 1-5).

Claim 2, the slots between the plates (3) when in the expanded state extend substantially along a length of the attachment (see Figs 1-2).

Claim 3, the outlet comprises a plurality of slots between the plates (3; see Figs 1-2).

Claim 4, the fluid emitted from the outlet is capable of emitting from the outlet tangential to the external surface of the attachment depending on the expanded state of the plates (3; see Figs 1-5).

Claim 5, the heated fluid emitted from the outlet is attracted to the surface of the attachment by virtue of the metal reinforcement rods (3f) in each plate (3) because metal is a known heat conductor so the heat would be attracted to this surface thereby meeting the claim limitations, as best understood (see Figs 1-5).

Claim 6, the attachment is generally cylindrical (see Figs 1-2).

Claim 7, the outlet comprises at least two slots (see Fig 5a).

Claim 8, the attachment has a longitudinal axis extending from the inlet end to the distal end and the slots are parallel to the longitudinal axis (see Figs 1-5).

Claims 11-13, there is a flow directing element (3d & 3e & 5 & 12 &13) between the inlet and outlet and these elements constitute “flow directing elements” because in use the air flows over or through these elements, thereby causing a redirection of the airflow by their presence (see Figs 1-2). At least one of these flow directing elements is formed as a perforated (3d & 3e) layer (see Figs 1-5). Since Merriam-Webster defines

mesh as “a weblike pattern or construction” and the flow directing element has a series of spaced holes (3d & 3e) forming a “weblike pattern”, the perforated layer is formed from a mesh of elongate material as claimed (see Figs 1-5).

Claim 15-16, the flow directing element (3d & 3e & 5) extend substantially along a length of the at least one slot (see Figs 1-5).

Claim Rejections - 35 USC § 103

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11-16 is/are rejected under 35 U.S.C. 103 as being unpatentable over Lindsey (USP 5868148) in view of Tomaro (USP 4295283).

Claims 11-16, Lindsey discloses the invention essentially as claimed except for the attachment comprising a wire mesh flow directing element extending along the length of slots and around an inner circumference of the attachment. Tomaro, however, teaches an attachment (14) for a handheld appliance (2) wherein the attachment

comprises an internal screen (which constitutes a wire mesh) between the inlet and the outlet and extending along a length of the attachment and around an inner circumference of the attachment in order to further deflect and dissipate air discharged from the housing and in order to prevent the hair of a user from accidentally being caught in the fan (Col 1, 65-Col 2, 5; see Fig 1). Therefore, it would have been obvious to one possessing ordinary skill in the art at the time of filing to modify the device of Lindsey to comprise a wire mesh screen extending along a length of the attachment and around an inner circumference of the attachment in view of Tomaro in order to prevent a user's hair from accidentally entering the device and becoming tangled.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Gill whose telephone number is (571) 270-1797. The examiner can normally be reached on Monday-Friday 10:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, ***please contact the examiner's supervisor, Todd Manahan, at* (571) 272-4713**. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

If there are any inquiries that are not being addressed by first contacting the Examiner or the Supervisor, you may send an email inquiry to TC3700_Workgroup_D_Inquiries@uspto.gov**.**

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. G./
Examiner, Art Unit 3776
/TODD E MANAHAN/

Supervisory Patent Examiner, Art Unit 3776

Notice of References Cited	Application/Control No. 14/656,357	Applicant(s)/Patent Under Reexamination MACLAINE, ALASDAIR MICHA	
	Examiner JENNIFER GILL	Art Unit 3776	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-4,295,283 A	10-1981	Tomaro, deceased; Patrick M.	A45D20/124	239/383
*	B	US-5,212,366 A	05-1993	McDougall; Gregory J.	A45D20/50	132/212
*	C	US-5,868,148 A	02-1999	Lindsey; Francis	A45D20/122	132/129
*	D	US-2014/0366910 A1	12-2014	Habibi; Masood	A45D20/52	132/227
*	E	US-2009/0293901 A1	12-2009	Chan; Wing Kin	A45D2/146	132/245
*	F	US-4,856,542 A	08-1989	Hollenberg; Detlef	A45D2/24	132/248
*	G	US-4,456,020 A	06-1984	van Deursen; Gary E.	A45D2/24	132/237
*	H	US-5,740,820 A	04-1998	Stern; Paule	A45D4/16	132/228
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

ALTERNATIVE TO PTO/SB/08A/B
(Based on PTO 08-08 version)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	14/656,357
				Filing Date	March 12, 2015
				First Named Inventor	Alasdair Michael MACLAINE
				Art Unit	3776
(Use as many sheets as necessary)				Examiner Name	R. K. Doan
Sheet	1	of	1	Attorney Docket Number	424662093300

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	US-4,471,791	09-18-1984	DeRoche	
	2.	US-5,661,910	09-02-1997	Schepisi	
	3.	US-5,868,148	02-09-1999	Lindsey et al.	
	4.	US-2013/0111777	05-09-2013	Jeong	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]
	5. c	JP-57-196907	12-03-1982	Matsushita Electric Works Ltd. (Araki MASAKATSU)	Corresponds to GB 2 100 981 cited below	
	6.	GB-2 100 981	01-12-1983	Matsushita Electric Works Ltd. (Araki MASAKATSU)		
	7.	JP-64-29208	01-31-1989	Matsushita Electric Works Ltd. (Yuzo OKUDAIRA et al.)	Full Translation	x
	8.	JP-2000-516483	12-12-2000	Vital Hair Tools, LLC (Natale SCHEPISI)	Corresponds to US 5,661,910 cited above	

Examiner Signature	/JENNIFER F GILL/	Date Considered	12/01/2016

*EXAMINER: Initial if information considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]

Examiner Signature	/JENNIFER F GILL/	Date Considered	12/01/2016

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[1]Applicant's unique citation designation number (optional). [2]Applicant is to place a check mark here if English language Translation is attached.

va-478482

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.F.G/

ALTERNATIVE TO PTO/SB/08A/B
(Based on PTO 08-08 version)

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	14/656,357
Filing Date	March 12, 2015
First Named Inventor	Alasdair Michael MACLAINE
Art Unit	3776
Examiner Name	J. F. Gill
Attorney Docket Number	424662093300

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	US-3,814,898	06-04-1974	Levine	
	2.	US-2007/0137060	06-21-2007	Woodson	
	3.	US-2011/0198421	08-18-2011	Yoe	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]
	4.	GB-725,095	03-02-1955	Michele		
	5.	GB-1 295 924	11-08-1972	Sperry Rand Corporation		
	6.	DE-26 18 819	11-17-1977	Dov Z. GLUCKSMAN	Machine Translation	x
	7.	JP-6-7217	01-18-1994	Matsushita Electric Works Ltd. (Eiji TSUJI)	Machine Translation	x
	8.	JP-10-71019	03-17-1998	Toshiba Home Tech KK (Hiroshi YAMAMOTO et al.)	Machine Translation	x
	9.	JP-10-179238	07-07-1998	Matsushita Electric Works Ltd. (Kenji KAMATA et al.)	Machine Translation	x
	10.	JP-2004-225705	08-12-2004	Hitachi Maxell (Kenji ENDO)	Machine Translation	x
	11.	JP-2007-105144	04-26-2007	Hitachi Maxell (Takenori OKAMURA et al.)	Machine Translation	x
	12.	CN-201691269	01-05-2011	You HANXIAN	Machine Translation	x
	13.	KR-10-2012-0095206	08-28-2012	Seung-Soo LEE	Machine Translation	x
	14.	CN-203106087	08-07-2013	Zhejiang Fine & Bruidge Electrics Co. Ltd. (Yanfen ZHOU)	Machine Translation	x
	15.	GB-2524304	09-23-2015	Dyson Technology Limited (Alasdair Michael MACLAINE)		
	16.	GB-2526049	11-18-2015	Dyson Technology Limited (Alasdair Michael MACLAINE et al.)		
	17.	GB-2527834	01-06-2016	Dyson Technology Limited (Emma Victoria DORAN)		

Examiner Signature	/JENNIFER F GILL/	Date Considered	12/01/2016

*EXAMINER: Initial if information considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

va-483446

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.F.G/

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14656357	MACLAINE, ALASDAIR MICHAEL
	Examiner	Art Unit
	JENNIFER GILL	3776

CPC- SEARCHED		
Symbol	Date	Examiner
A45D 1/02, 2/06, 2/10, 2/125, 2/127, 2/14, 2/24, 2/2407, 2/2414, 2/2421, 2/245, 2/2457, 2/2485, 2/2492, 20/10, 20/122, 20/124, 20/50	1/25-2/3/17	JG
A46B 9/023, 15/003	1/25-2/3/17	JG

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
132.CLAS (WITH TEXT SEE EAST HISTORY)	1/25-2/3/17	JG
USPC SEARCH WITH TEXT	1/25-2/3/17	JG
CPC SEARCH	1/25-2/3/17	JG
INVENTOR SEARCH	1/25-2/3/17	JG
ASSIGNEE SEARCH	1/25-2/3/17	JG
TEXT SEARCH (SEE EAST HISTORY)	1/25-2/3/17	JG
NPL SEARCH	1/25-2/3/17	JG
CONSULT WITH KIM SANG OF USPC 242	1/25-2/3/17	JG
A45D 1/02, 2/06, 2/10, 2/125, 2/127, 2/14, 2/24, 2/2407, 2/2414, 2/2421, 2/245, 2/2457, 2/2485, 2/2492, 20/10, 20/122, 20/124, 20/50	1/25-2/3/17	JG
A46B 9/023, 15/003	1/25-2/3/17	JG

INTERFERENCE SEARCH

/JENNIFER GILL/ Examiner.Art Unit 3776	

US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

/JENNIFER GILL/ Examiner.Art Unit 3776	

ALTERNATIVE TO PTO/SB/08A/B
(Based on PTO 08-08 version)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	14/656,357
				Filing Date	March 12, 2015
				First Named Inventor	Alasdair Michael MACLAINE
				Art Unit	3776
(Use as many sheets as necessary)				Examiner Name	Not Yet Assigned
Sheet	1	of	1	Attorney Docket Number	424662093300

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	US-3,981,313	09-21-1976	Burke et al.	
	2.	US-2008/0041406	02-21-2008	Le	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]
	3.	JP-62-41606	02-23-1987	Matsushita Electric Works Ltd.	Figs. Only	
	4.	WO-92/14378	09-03-1992	Braun Aktiengesellschaft (Karl-Heinz LANGE et al.)	Machine Translation	X
	5.	WO-98/27842	07-02-1998	Philips Electronics N.V. (Huub EHLHARDT et al.)		

Examiner Signature	/JENNIFER F GILL/	Date Considered	12/01/2016

*EXAMINER: Initial if information considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	6.	International Search Report and Written Opinion mailed May 8, 2015, directed to International Application No. PCT/GB2015/050659; 12 pages	

Examiner Signature	/JENNIFER F GILL/	Date Considered	12/01/2016

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[1]Applicant's unique citation designation number (optional). [2]Applicant is to place a check mark here if English language Translation is attached.

va-456651

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ALTERNATIVE TO PTO/SB/08A/B
(Based on PTO 08-08 version)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	Not Yet Assigned
				Filing Date	Concurrently Herewith
				First Named Inventor	Alasdair Michael MACLAINE
				Art Unit	Not Yet Assigned
(Use as many sheets as necessary)				Examiner Name	Not Yet Assigned
Sheet	1	of	1	Attorney Docket Number	424662093300

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	US-3,857,016	12-24-1974	Meyer et al.	
	2.	US-4,214,597	07-29-1980	Glassman	
	3.	US-2004/0129289	07-08-2004	Hafemann	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]
	4.	GB-1 465 855	03-02-1977	Bristol Myers Company (Henry J. WALTER et al.)		
	5.	SU-1340734	09-30-1987	Aleksandr N. BOBKOV	Partial Translation	X
	6.	EP-0 482 906	04-29-1992	China Pacific Trade Ltd. (Gregory John MCDOUGALL)		
	7.	KR-10-2008-0030428	04-04-2008	Y.S. Creation Co., Ltd. (Yeong SEOK)	Machine Translation	X
	8.	CN-201986906	09-28-2011	Cen LINA	Machine Translation	X

Examiner Signature	/JENNIFER F GILL/	Date Considered	12/01/2016

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NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	9.	Search Report dated September 12, 2014, directed to GB Application No. 1404982.9; 1 page	
	10.	Search Report dated September 16, 2014, directed to GB Application No. 1404985.2; 1 page	

Examiner Signature	/JENNIFER F GILL/	Date Considered	12/01/2016

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[1]Applicant's unique citation designation number (optional). [2]Applicant is to place a check mark here if English language Translation is attached.

va-446281

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.F.G/

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	31	("4214597" | "20150265022" | "20150265023" | "20130111777" | "5868910" | "3857016" | "20070137060" | "3981313" | "4471791" | "20110198421" | "20080041406" | "20040129289" | "5661910" | "3814898" | "3800810").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2016/12/01 12:41
S3	15	(("TWEEDIE") near3 ("Robert")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/01 12:45
S2	6	(("MACLAINE") near3 ("Alasdair")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/01 12:45
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Page 757 of 1998

		"5661910" | "3814898").PN.				
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S26	2	("2007/0137060").URPN.	USPAT	OR	ON	2017/01/30 14:43
S27	35	("3413984" | "3835869" | "3843990" | "3868495" | "3871391" | "3890984" | "3955065" | "4291714" | "4295283" | "4431012" | "4502496" | "4566473" | "4664132" | "4692594" | "4759135" | "4934855" | "5012576" | "5060398" | "5091630" | "5373607" | "5479951" | "5515874" | "5765575" | "D365685" | "D365686" | "D366152" | "D366566" | "D374776").PN. OR ("5868148").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2017/01/30 14:56
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S41	32	("0056531" | "0720169" | "1115057" | "2335179" | "2557510" | "2781047" | "3105503" | "3123079" | "3326495" | "3623491" | "3683940" | "3712310" | "4141370").PN. OR ("4456020").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2017/01/30 18:13
S47	15	a45d20/10.cpc. and (S19 S20 S21 S22 S23 S25 S26 S27 S28 S29 S30 S31 S32 S33 S34 S35 S36 S37 S38 S39 S40 S41 S42 S43 S44 S45 S46)	US-PGPUB; USPAT; USOCR; FPRS	OR	ON	2017/01/30 18:17

S49	53	a46b9/023.cpc. and (S19 S20 S21 S22 S23 S25 S26 S27 S28 S29 S30 S31 S32 S33 S34 S35 S36 S37 S38 S39 S40 S41 S42 S43 S44 S45 S46 S47 S48)	US-PGPUB; USPAT; USOCR; FPRS	OR	ON	2017/01/30 18:19
S48	10	a45d20/122.cpc. and (S19 S20 S21 S22 S23 S25 S26 S27 S28 S29 S30 S31 S32 S33 S34 S35 S36 S37 S38 S39 S40 S41 S42 S43 S44 S45 S46 S47)	US-PGPUB; USPAT; USOCR; FPRS	OR	ON	2017/01/30 18:19
S79	53	a46b9/023.cpc. and (S50 S51 S52 S53 S54 S55 S56 S57 S58 S59 S60 S61 S62 S63 S64 S65 S66 S67 S68 S69 S70 S71 S72 S73 S74 S75 S76 S77 S78)	US-PGPUB; USPAT; USOCR; FPRS	OR	ON	2017/01/31 11:01
S80	6	a46b15/003.cpc. and (S50 S51 S52 S53 S54 S55 S56 S57 S58 S59 S60 S61 S62 S63 S64 S65 S66 S67 S68 S69 S70 S71 S72 S73 S74 S75 S76 S77 S78 S79)	US-PGPUB; USPAT; USOCR; FPRS	OR	ON	2017/01/31 11:01
S76	51	a45d20/50.cpc. and (S50 S51 S52 S53 S54 S55 S56 S57 S58 S59 S60 S61 S62 S63 S64 S65 S66 S67 S68 S69 S70 S71 S72 S73 S74 S75)	US-PGPUB; USPAT; USOCR; FPRS	OR	ON	2017/01/31 11:01
S78	10	a45d20/122.cpc. and (S50 S51 S52 S53 S54 S55 S56 S57 S58 S59 S60 S61 S62 S63 S64 S65 S66 S67 S68 S69 S70 S71 S72 S73 S74 S75 S76 S77)	US-PGPUB; USPAT; USOCR; FPRS	OR	ON	2017/01/31 11:01
S77	15	a45d20/10.cpc. and (S50 S51 S52 S53 S54 S55 S56 S57 S58 S59 S60 S61 S62 S63 S64 S65 S66 S67 S68 S69 S70 S71 S72 S73 S74 S75 S76)	US-PGPUB; USPAT; USOCR; FPRS	OR	ON	2017/01/31 11:01
S63	15	(("TWEEDIE") near3 ("Robert")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/01/31 11:01
S62	6	(("MACLAINE") near3 ("Alasdair")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/01/31 11:01
S53	15	("4214597" | "20150265023" | "20130111777" | "3857016" | "20070137060" | "3981313" | "4471791" | "20110198421" | "5868148" | "20080041406" | "20150265024" | "20140366910" | "20040129289" | "5661910" | "3814898").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2017/01/31 11:01
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S58	2	("3204645").URPN.	USPAT	OR	ON	2017/01/31 11:01
S59	9	("2910989").URPN.	USPAT	OR	ON	2017/01/31 11:01
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S52	0	("2015/0265023").URPN.	USPAT	OR	ON	2017/01/31 11:01
S54	2	("2014/0366910").URPN.	USPAT	OR	ON	2017/01/31 11:01
S68	6	("2014/0083446").URPN.	USPAT	OR	ON	2017/01/31 11:01

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S64	1	("20130319450").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2017/01/31 11:01
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S56	2	("2007/0137060").URPN.	USPAT	OR	ON	2017/01/31 11:01
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S81	104	a45d2/10.cpc. and (S50 S51 S52 S53 S54 S55 S56 S57 S58 S59 S60 S61 S62 S63 S64 S65 S66 S67 S68 S69 S70 S71 S72 S73 S74 S75 S76 S77 S78 S79 S80)	US-PGPUB; USPAT; USOCR; FPRS	OR	ON	2017/01/31 11:04
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		S55 S56 S57 S58 S59 S60 S61 S62 S63 S64 S65 S66 S67 S68 S69 S70 S71 S72 S73 S74 S75 S76 S77 S78 S79 S80 S81 S82 S83 S84)	PGPUB; USPAT; USOCR; FPRS			11:54
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S96	67	a45d2/14.cpc. and (S50 S51 S52 S53 S54 S55 S56 S57 S58 S59 S60 S61 S62 S63 S64 S65 S66 S67 S68 S69 S70 S71 S72 S73 S74 S75 S76 S77 S78 S79 S80 S81 S82 S83 S84	US-PGPUB; USPAT; USOCR;	OR	ON	2017/01/31 12:54

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S97	15	a45d2/2414.cpc. and (S50 S51 S52 S53 S54 S55 S56 S57 S58 S59 S60 S61 S62 S63 S64 S65 S66 S67 S68 S69 S70 S71 S72 S73 S74 S75 S76 S77 S78 S79 S80 S81 S82 S83 S84 S85 S87 S88 S89 S90 S91 S92 S93 S94 S95 S96)	US-PGPUB; USPAT; USOCR; FPRS	OR	ON	2017/01/31 12:57
S98	34	a45d2/2421.cpc. and (S50 S51 S52 S53 S54 S55 S56 S57 S58 S59 S60 S61 S62 S63 S64 S65 S66 S67 S68 S69 S70 S71 S72 S73 S74 S75 S76 S77 S78 S79 S80 S81 S82 S83 S84 S85 S87 S88 S89 S90 S91 S92 S93 S94 S95 S96 S97)	US-PGPUB; USPAT; USOCR; FPRS	OR	ON	2017/01/31 12:58
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			EPO; JPO			

EAST Search History (Interference)

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2/ 1/ 2017 7:11:07 PM
C:\ Users\ jgill\ Documents\ EAST\ Workspaces\ 14656357.wsp

ALTERNATIVE TO PTO/SB/08A/B
(Based on PTO 08-08 version)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	14/656,357
				Filing Date	March 12, 2015
				First Named Inventor	Alasdair Michael MACLAINE
				Art Unit	3776
(Use as many sheets as necessary)				Examiner Name	R. K. Doan
Sheet	1	of	1	Attorney Docket Number	424662093300

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	US-2015/0265022	09-24-2015	MacLaine	
	2.	US-2015/0265023	09-24-2015	MacLaine et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature	/JENNIFER F GILL/	Date Considered	12/01/2016

*EXAMINER: Initial if information considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]

Examiner Signature	/JENNIFER F GILL/	Date Considered	12/01/2016

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[1]Applicant's unique citation designation number (optional). [2]Applicant is to place a check mark here if English language Translation is attached.

va-469365

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.F.G/

ALTERNATIVE TO PTO/SB/08A/B
(Based on PTO 08-08 version)

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 2

Complete if Known	
Application Number	14/656,357
Filing Date	March 12, 2015
First Named Inventor	Alasdair Michael MACLAINE
Art Unit	3776
Examiner Name	J. F. Gill
Attorney Docket Number	424662093300

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	US-3,696,818	10-10-1972	Weber	
	2.	US-3,835,869	09-17-1974	Newman et al.	
	3.	US-4,430,808	02-14-1984	Toyomi et al.	
	4.	US-4,827,105	05-02-1989	Brown, Jr.	
	5.	US-5,091,630	02-25-1992	Djuric	
	6.	US-5,513,665	05-07-1996	Chan	
	7.	US-5,546,674	08-20-1996	Lange et al.	
	8.	US-5,842,286	12-01-1998	Cantor	
	9.	US-2002/0092196	07-18-2002	Tobin et al.	
	10.	US-7,124,763	10-24-2006	Hafemann	
	11.	US-2009/0145002	06-11-2009	Brewer et al.	
	12.	US-8,122,896	02-28-2012	Obermann	
	13.	US-2013/0160316	06-27-2013	Hadden	
	14.	US-2014/0144037	05-29-2014	Hadden	

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Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]
	15.	DE-6928170	07-12-1969	Lebrecht Knipping	Partial Translation	X
	16.	GB-1 407 403	09-24-1975	Hoover Limited (Percival Keith HARRIS)		
	17.	WO-79/00374	06-28-1979	Remington Products, Inc. (Siegfried GODEL)		
	18.	DE-79 25 952	01-24-1980	Rowenta-Werke GmbH	Machine Translation	X
	19.	JP-60-100902	06-04-1985		Machine Translation	X
	20.	JP-60-134402	09-07-1985		Partial Translation	X
	21.	JP-10-42932	02-17-1998	Yodogawa Denki Seisakusho KK (Kadotaka FUKUYAMA)	Machine Translation	X
	22.	JP-2013-59580	04-04-2013	Izumi Prod Co. (Kenichi TANAKA)	Machine Translation	X
	23.	EP-2 823 726	01-14-2015	SEB S.A. (Martial MAISONNEUVE et al.)	Machine Translation	X

Examiner Signature		Date Considered	

*EXAMINER: Initial if information considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

va-493728

ALTERNATIVE TO PTO/SB/08A/B
(Based on PTO 08-08 version)

Substitute for form 1449/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** *(Use as many sheets as necessary)*				***Complete if Known***	
				Application Number	14/656,357
				Filing Date	March 12, 2015
				First Named Inventor	Alasdair Michael MACLAINE
				Art Unit	3776
				Examiner Name	J. F. Gill
Sheet	2	of	2	Attorney Docket Number	424662093300

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	24.	MacLaine et al., U.S. Office Action mailed February 10, 2017, directed to U.S. Application No. 14/656,432; 18 pages	
	25.	MacLaine, Office Action mailed January 6, 2017, directed to U.S. Patent Application No. 14/656,375; 7 pages	

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va-493728

Electronic Patent Application Fee Transmittal

Application Number:	14656357
Filing Date:	12-Mar-2015
Title of Invention:	ATTACHMENT FOR A HAND HELD APPLIANCE
First Named Inventor/Applicant Name:	Alasdair Michael MACLAINE
Filer:	Christopher Elmose Gloria/Donna Bernecker
Attorney Docket Number:	424662093300

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt	
EFS ID:	28954333
Application Number:	14656357
International Application Number:	
Confirmation Number:	9085
Title of Invention:	ATTACHMENT FOR A HAND HELD APPLIANCE
First Named Inventor/Applicant Name:	Alasdair Michael MACLAINE
Customer Number:	25227
Filer:	Christopher Elmose Gloria/Donna Bernecker
Filer Authorized By:	Christopher Elmose Gloria
Attorney Docket Number:	424662093300
Receipt Date:	18-APR-2017
Filing Date:	12-MAR-2015
Time Stamp:	15:43:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

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Payment was successfully received in RAM	$180
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1	Transmittal Letter	IDS_424662093300.pdf	25007 5822acccaf6edb795b4a72944c1c30208355a867	no	2
Warnings:					
Information:					
2	Foreign Reference	DE_6928170.pdf	1247288 b0d784ffcfa5c214e8934f6c4f2a707d210f7bf7	no	13
Warnings:					
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3	Foreign Reference	GB_1407403.pdf	723995 5fb3d64aa07c0545ade2a793ba30ef566570523a	no	5
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4	Foreign Reference	WO_79_00374.pdf	3311811 be8c982edb6849c0701bdcaa0fcb52bffa50b611	no	24
Warnings:					
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5	Foreign Reference	DE_7925952.pdf	669182 72d1d857df58218f0b012fe10c6915df8bb10879	no	9
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9	Foreign Reference	EP_2823726.pdf	1974744 7f8ab39426c63c3fe972f6da6764285d4e683f27	no	22
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I hereby certify that this paper is being transmitted via the Office electronic filing system in accordance with 37 CFR § 1.6(a)(4).

Dated: April 18, 2017
Electronic Signature for Donna Bernecker: /dbernecker/

Patent
Docket No. 424662093300

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Alasdair Michael MACLAINE

Application No.: 14/656,357 | Confirmation No.: 9085

Filed: March 12, 2015 | Art Unit: 3776

For: ATTACHMENT FOR A HAND HELD APPLIANCE | Examiner: Jennifer Frances Gill

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. § 1.97 & § 1.98

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 C.F.R. § 1.97 and § 1.98, Applicants submit for consideration in the above-identified application the documents listed on the attached Form PTO/SB/08a/b. Copies of the foreign documents and non-patent literature are submitted herewith. The Examiner is requested to make these documents of record.

This Information Disclosure Statement is submitted after receipt of a first Office Action on the merits but before mailing of a final Office Action or Notice of Allowance. The required fee is submitted herewith.

Applicants would appreciate the Examiner initialing and returning the Form PTO/SB/08a/b, indicating that the information has been considered and made of record herein.

va-493729

The information contained in this Information Disclosure Statement under 37 C.F.R. § 1.97 and § 1.98 is not to be construed as a representation that: (i) a complete search has been made; (ii) additional information material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the above information constitutes prior art to the subject invention.

In the unlikely event that the transmittal form is separated from this document and the Patent and Trademark Office determines that an extension and/or other relief (such as payment of a fee under 37 C.F.R. § 1.17 (p)) is required, Applicants petition for any required relief including extensions of time and authorize the Commissioner to charge the cost of such petition and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing (424662093300). However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Dated: April 18, 2017

Respectfully submitted,

Electronic signature: /christopher gloria/
Christopher Gloria
Registration No.: 71,907
MORRISON & FOERSTER LLP
1650 Tysons Blvd, Suite 400
McLean, Virginia 22102
(703) 760-7389

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DESCRIPTION DE6928170

[0001]

a ". · ii

[0002]

* · III

[0003]

Lebrecht Kaipping

[0004]

ALTENA / Westphalia. , Altena, the 12/07/1969

[0005]

Haarb ehandlune s k a m m

[0006]

The innovation concerns a connectable to a source of warm air comb for treating hair, but especially for curly Place of washed hair.

[0007]

Characterized the renewal contemporary comb is characterized in that the comb back on the inside of an integrally disposed in substantially conical tubular piece while having his teeth protrudes through an introduced at the opposite slot cover slot. The tube is divided longitudinally to the connecting sleeve and the slot is narrowed in removable smaller part against the ridge end, so that by the stream of hot air is evenly distributed evenly along the whole length of the ridge. The slitting ng is advantageously

[0008]

a) from gußtechnischen reasons,

[0009]

b) due to the comb cleaning, and

[0010]

c) provided for the treatment of hair.

[0012]

· & Diams; · Tt iota iota · "iota iota tilt

[0013]

With the renewal according to comb it is possible to put in a very short time even hairstyles, the ultra-slim design and the cheap hot air supply over the previously known hair treatment combing prove very

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beneficial.

[0014]

Further features of the fire and details of the advantages achieved by the same result from the following description of an embodiment shown in the accompanying drawing. FIG 1 a renewal proper hair treatment comb.

[0015]

in lateral general view with partly broken Ansteckmuffe, Fig. 2 a Uraufsieht in direction of the arrow II

[1]

of Fig.1; Fig. 3 is a front view in the direction of arrow III of FIG. 1

[0017]

Fig. 4 shows a section IV-IV of FIG. 1, FIG. 5 is a view of the slot cover in the direction of the arrow V of FIG. 1.

[0018]

The coupling sleeve 4 of the hair treatment comb 1 ends in half diagonally to a cut surface 5, while the other half after a short distance to a parallel to the longitudinal axis of the coupling sleeve 4 and flattened to

[0019]

continued perpendicular conical ridge holding piece 2

[0020]

is.

[0021]

<F> The Seitenwan.de comb retaining piece 2 are at the top

[0022]

edges along with thin strips 14 which engage both sides each have a groove 15 of which can be placed on the ridge holding piece 2 slot cover 3 behind. This is a counterpart to the comb holder part 2 with the same tapered and parallel with the longitudinal axis almost cross-section, through which slot 8 the teeth of the comb 7 project, which is inside a glove with his back 13 on the ridge holding piece centered. Ber slot cover 3 is formed with a projection 18, which is provided with the connecting sleeve 4 in under cross pin. 6 For safe and just easily detachable mounting of the slot cover 3 at the crest holding piece 2 additionally short cams 16 are provided on the strips 14th The pins 17 serve as stops, so that the projection 18 of Schlitzdeokels 3 is held close to the cut surface. 5 To facilitate lifting of the slot cover 3 a grip strip is cast at the end. In order to prevent eddy current formation at least one aperture 11 is provided at the front end of the comb holding piece second

The projecting into the slot 8 pin 9 offer the ridge 12 a gewijBsse stability.

[0024]

& ACgr; '

[0025]

As the material, a suitable plastic is proposed.

The renewal proper hair treatment comb 1 is ansohließbar both to a hot air generator, and a hot air duct.

[0026]

Schut zansprüche

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CLAIMS DE6928170

S c h u t zansprüche

1.

To a hot air source connectable comb for drying and curling Set of hair or for refreshing hairstyles, characterized in that it is integral with its comb back (15) on the inner wall of a substantially conical tubular piece, consisting of the comb holding stucco (2) and the slot cover (3) is cast and the teeth (7) thereby vertically through the slot (8) of the slot cover (3) protrude.

2.

Comb according to claim 1, characterized in that the pipe section of the hair treatment comb (1) to the Aßsehlußnr ff & © (4) is divided to extend to the longitudinal axis.

3.

Comb according to claims 1 and 2, characterized in that the connecting sleeve (4) for half to one parallel to the longitudinal axis flattened and to a right angle conical comb holding piece (2) is continued for the other half after a short distance with an oblique cutting surface (5) ends.

4.

Comb according to claims 1 to 3, characterized in that

that the slot cover (3) with its neck (18) on the comb holder part (2) is forced open removable.

»Rl ti mm" & ACgr. · "-

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t * »» l lt 1 1 l "!

[111]

111* 11 ll l

◙ "> l: *" iota 'i · t

5.

Comb according to claims 1 to 4, characterized> characterized in that the projection (18) at least one in the Anschlußnruffe (4) engaging under the inside pin (6),

6.

Comb according to claims 1 "to 5, characterized in that the comb support piece (2) has on the longitudinal edge strips (14) and the slot cover (3) also at the longitudinal edges gutters (15).

7.

Comb according to claims 1 to 6, characterized in that at the end of the slotted cover at least a pin (17) is provided inside, through which the lug (16) to the sectional area (5) of the connecting sleeve (4) is printed sealingly.

8.

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Comb according to claims 1 to 7, characterized in that the slot (8) in parallel to the outer edge is tapered towards the end and in the slot (8) otherwise against the comb (12) directed pins (9) are integrally cast.

9.

Comb according to claims 1 to 8, characterized in that at the end of the slot cover (3) has a grip bar (io) is integrally cast parallel to the mating surface.

fi & diams; 'iff

Vol I

1&

ogr ;

Comb according to claims 1 to 9 »characterized in that at the end of the comb holding piece (2) thus at the front side two openings (11), one on each side of the comb back (13); are introduced, but whose axes are directed parallel to the ridge (12) against the comb tips.

11.

Comb according to claims 1 to & ACgr. & ogr ., thereby marked \

characterized in that the slot surface of the slotted cover

(3)

. Opposite the flattened surface of the comb retaining member (2) against the projection (18) slightly towards koniäch runs.

12.

Comb according to claims 1 to 11, characterized in that it consists with the tube piece from plastic and thereby be connected to a hot air generator, and to a hot air duct.

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Bitte beachten: Zutreffendes ankreuzen; stark umrandete Felder freilassen!

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Ort: Altena/ Westf.
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Haarbehandlungskamm 7

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In Anspruch genommen wird die **Auslandspriorität** der Voranmeldung
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Altena, den 12.7.1969

H a a r b e h a n d l u n g s k a m m

Die Neuerung betrifft einen an eine Warmluftquelle anschließbaren Kamm zum Behandeln von Haar, insbesondere aber zum Lockenlegen von gewaschenen Haar.

Gekennzeichnet ist der neuerungsgemäße Kamm dadurch, daß der Kammrücken an der Innenseite eines in wesentlichen konischen Rohrstückes einstückig angeordnet ist und dabei mit seinen Zähnen durch einen an dem gegenüberliegenden Schlitzdeckel eingebrachten Schlitz ragt. Das Rohrstück ist bis auf die Anschlußmuffe längsgeteilt und der Schlitz ist im abnehmbaren kleineren Teil gegen das Kammende hin verengt, sodaß dadurch der Warmluftstrom gleichmäßig an der ganzen Länge des Kammes gleichmäßig verteilt wird.Die Längsteilung ist vorteilhafterweise

a) aus gußtechnischen Gründen,

b) der Kammreinigung wegen, und

c) der Haarbehandlung wegen vorgesehen.

/2

6928170

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Mit den neuerungsgemäßen Kamm ist es möglich, in kürzester Zeit Frisuren selbst zu legen, wobei die besonders schlanke Ausführung und die günstige Warmluftzuführung gegenüber den bisher bekanntgewordenen Haarbehandlungskämmen sich sehr vorteilhaft erweisen.

Weitere Merkmale der Neuerung und Einzelheiten der durch dieselben erzielten Vorteile ergeben sich aus der nachstehenden Beschreibung einer in der beigefügten Zeichnung dargestellten Ausführungsform.

Es zeigen:

Fig. 1 einen neuerungsgemäßen Haarbehandlungskamm in seitlicher Gesamtansicht mit zum Teil aufgebrochener Ansteckmuffe,

Fig. 2 eine Draufsicht in Pfeilrichtung II der Fig.1,

Fig. 3 eine Vorderansicht in Pfeilrichtung III der Fig. 1

Fig. 4 einen Schnitt IV-IV der Fig. 1,

Fig. 5 eine Ansicht des Schlitzdeckels in Pfeilrichtung V der Fig. 1.

Die Anschlußmuffe 4 des Haarbehandlungskammes 1 endet zur Hälfte schräg nach einer Schnittfläche 5, während die andere Hälfte nach einer kurzen Strecke zu einem parallel zur Längsachse der Anschlußmuffe 4 abgeflachten und dazu

/3

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rechtwinkelig konischen Kammhaltestück 2 fortgesetzt ist.

Die Seitenwände vom Kammhaltestück 2 sind an den Oberkanten entlang mit dünnen Leisten 14 versehen, hinter die beiderseits je eine Rinne 15 des auf den Kammhaltestück 2 aufsetzbaren Schlitzdeckels 3 greifen. Dieser ist ein Gegenstück zum Kammhaltestück 2 mit denselben konischen und fast mit der Längsachse parallelen Querschnitt, durch dessen Schlitz 8 die Zähne 7 des Kammes 12 ragen, der mit seinem Rücken 13 innen am Kammhaltestück 2 mittig angegossen ist. Der Schlitzdeckel 3 ist mit einem Ansatz 18 ausgebildet, der mit in die Anschlußmuffe 4 innen untergreifenden Zapfen 6 versehen ist. Zur sicheren und eben leicht lösbaren Halterung des Schlitzdeckels 3 am Kammhaltestück 2 sind an den Leisten 14 zusätzlich kurze Nocken 16 vorgesehen. Die Stifte 17 dienen als Anschläge, damit der Ansatz 18 des Schlitzdeckels 3 dicht an die Schnittfläche 5 gehalten wird. Zum leichteren Abheben des Schlitzdeckels 3 ist am Ende eine Griffleiste 1o angegossen. Zur Verhinderung einer Wirbelstrombildung ist am stirnseitigen Ende des Kammhaltestückes 2 mindestens eine Öffnung 11 vorgesehen. Die in den Schlitz 8 ragenden Zapfen 9 bieten dem Kamm 12 eine gewisse Stabilität.

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Als Material wird ein geeigneter Kunststoff vorgeschlagen. Der neuerungsgemäße Haarbehandlungskamm 1 ist sowohl an einen Warmlufterzeuger, als auch an eine Warmluftleitung anschließbar.

S c h u t z a n s p r ü c h e

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Schutzansprüche

1. An eine Warmluftquelle anschließbarer Kamm zum Trocknen und Lockenlegen von Haaren oder zum Auffrischen von Frisuren, dadurch gekennzeichnet, daß er einstückig mit seinem Kammrücken (13) an der Innenwand eines im wesentlichen konischen Rohrstückes, bestehend aus dem Kammhaltestück (2) und dem Schlitzdeckel (3) angegossen ist und die Zähne (7) dabei senkrecht durch den Schlitz (8) des Schlitzdeckels (3) ragen.

2. Kamm nach Anspruch 1, dadurch gekennzeichnet, daß das Rohrstück des Haarbehandlungskammes (1) bis auf die Anschlußmuffe (4) zur Längsachse verlaufend geteilt ist.

3. Kamm nach den Ansprüchen 1 und 2, dadurch gekennzeichnet, daß die Anschlußmuffe (4) zur Hälfte zu einem parallel zur Längsachse abgeflachten und dazu rechtwinkelig konischen Kammhaltestück (2)fortgesetzt ist, die andere Hälfte nach einer kurzen Strecke mit einer schrägen Schnittfläche (5) endet.

4. Kamm nach den Ansprüchen 1 bis 3, dadurch gekennzeichnet, daß der Schlitzdeckel (3) mit seinem Ansatz (18) auf das Kammhaltestück (2) abnehmbar aufgesprengt ist.

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5. Kamm nach den Ansprüchen 1 bis 4, dadurch gekennzeichnet, daß der Ansatz (18) mindestens einen in die Anschlußmuffe (4) innen untergreifenden Zapfen (6) aufweist.

6. Kamm nach den Ansprüchen 1 bis 5, dadurch gekennzeichnet, daß das Kammhaltestück (2) an den Längskanten Leisten (14) und der Schlitzdeckel (3) ebenfalls an den Längskanten Rinnen (15) aufweist.

7. Kamm nach den Ansprüchen 1 bis 6, dadurch gekennzeichnet, daß am Ende des Schlitzdeckels innen mindestens ein Zapfen (17) vorgesehen ist, durch den der Ansatz (18) an die Schnittfläche (5) der Anschlußmuffe (4) abdichtend gedrückt wird.

8. Kamm nach den Ansprüchen 1 bis 7, dadurch gekennzeichnet, daß der Schlitz (8) gegen das Ende zu und zwar parallel zu den Außenkanten konisch verläuft und im Schlitz (8) sonst gegen den Kamm (12) gerichtete Zapfen (9) angegossen sind.

9. Kamm nach den Ansprüchen 1 bis 8, dadurch gekennzeichnet, daß am Ende des Schlitzdeckels (3) eine Griffleiste (1o) parallel zur Paßfläche angegossen ist.

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10. Kamm nach den Ansprüchen 1 bis 9, dadurch gekennzeichnet, daß am Ende des Kammhaltestückes (2) also an der Stirnseite zwei Öffnungen (11), je eine beiderseits vom Kammrücken (13), eingebracht sind, dessen Achsen parallel zum Kamm (12) aber gegen die Kammspitzen gerichtet sind.

11. Kamm nach den Ansprüchen 1 bis 10, dadurch gekennzeichnet, daß die Schlitzfläche des Schlitzdeckels (3), gegenüber der abgeflachten Fläche des Kammhaltestückes (2) gegen den Ansatz (18) hin leicht konisch aufläuft.

12. Kamm nach den Ansprüchen 1 bis 11, dadurch gekennzeichnet, daß er mit dem Rohrstück aus Kunststoff besteht und dabei an einen Warmlufterzeuger, wie auch an eine Warmluftleitung anschließbar ist.

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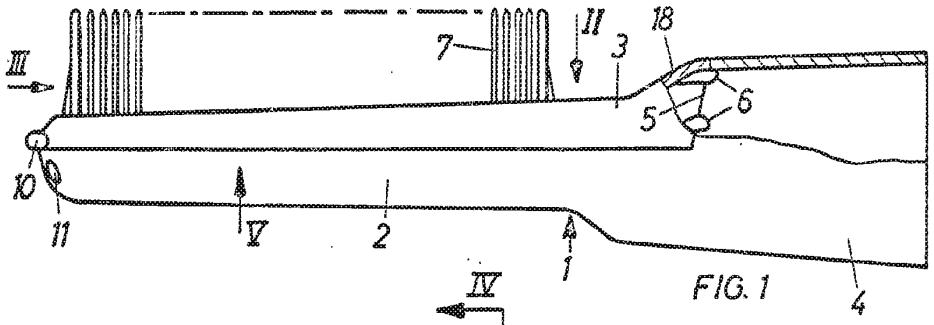


FIG. 1

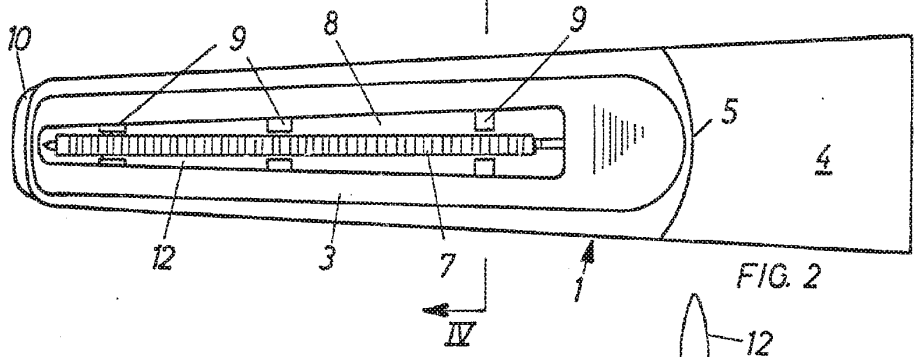


FIG. 2

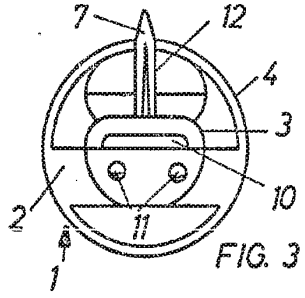


FIG. 3

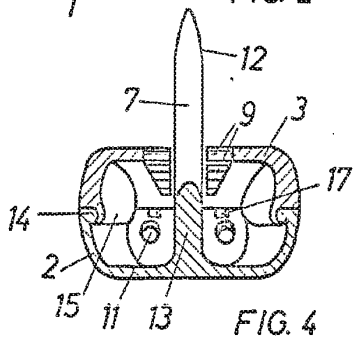


FIG. 4

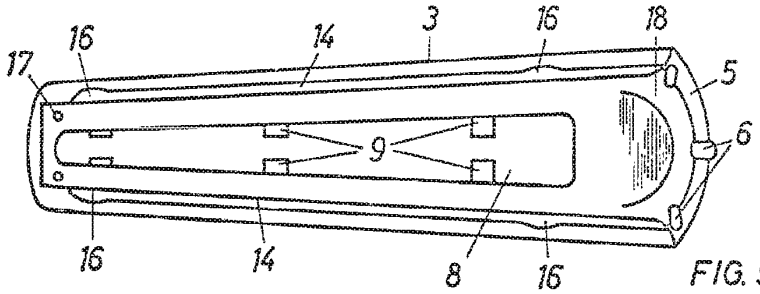


FIG. 5

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PATENT SPECIFICATION (11) 1 407 403

1 407 403

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A4V 11
A5R 79D

(72) Inventor PERCIVAL KEITH HARRIS

(54) HAIR DRESSING IMPLEMENTS

(71) We, HOOVER LIMITED, a Company registered under the Laws of England, of Perivale, Greenford, Middlesex, England, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to hair dressing implements which term is intended to embrace at least brushes and combs. The invention is of particular application to a form of implement for use with a hair dryer, for example of the type arranged to produce a flow of warm air which is conducted through a flexible hose and thence through the implement itself which is hollow and finally through apertures in the implement to be directed on to the hair.

It is convenient for this type of implement to be formed in two separable parts the first of which, hereinafter referred to as the one part, has a spigot attachment for connection to the hose and the other of which comprises a brush or comb constructed for ready attachment to and detachment from the one part. In this way the parts can be separated, not only for cleaning purposes, but also enabling the one part to have attached to it either a comb or a brush. For this reason it is desirable that the part which affords the brush or comb should be readily detachable from the one part, and preferably by one hand.

According to the present invention, therefore, a hair dressing implement comprises at least two readily separable parts which in an assembled condition together define an air passageway for the path of air which is communicated to the assembly, one part affording a tubular portion which is adapted to be connected to an air supply hose and the other part affording hair treating projections, the said parts affording co-operating catch means for securing them together in the assembled condition and releasing means being provided which comprise a portion of the said other part which, in the assembled condition, extends across the air passageway and projects through an aperture in the said one part the arrangement being such that depression of the projection separates the catch means.

The catch means preferably comprises inter-engaging shoulders on the two parts and where these parts are formed as plastics mouldings the catch means may be engaged and disengaged by slight distortion of one or other of the parts.

The invention may be carried into practice in various ways but one specific embodiment will be described by way of example with reference to the drawings accompanying the provisional specification in which:—

Figure 1 is a side elevation of part of an attachment for a hair dryer;

Figure 2 is an end elevation as seen in the direction of the arrow A in Figure 1;

Figure 3 is a top plan view of the attachment part of Figure 1;

Figure 4 is an under plan view of the attachment part of Figure 1;

Figure 5 is a transverse cross section on the line A—A of Figure 4;

Figure 6 is a side elevation of a comb for attachment to the part of Figures 1—5;

Figure 7 is an under plan view of the comb as viewed in the direction of the arrow B in Figure 6;

Figure 8 is an end elevation as viewed in the direction of the arrow C in Figure 6;

Figure 9 is an end elevation as viewed in the direction of the arrow D in Figure 6;

Figure 10 is a side elevation of a brush for attachment to the part of Figures 1—5, and

Figure 11 is an end elevation as viewed in the direction of the arrow E in Figure 10.

Referring firstly to Figures 1—4, these show one part having a spigot to which a flexible hose from a hair dryer can be secured. The one part accordingly incorporates a tubular end 10 to receive the hose. The one part is formed as a plastics moulding, for example of polystyrene, and has an elongated section 11 formed by two concave side walls

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12 which taper downwards in a direction away from the tubular end 10 and which terminate in an end wall 14. The lower edge of each wall 12 is straight and the two lower edges lie within a single plane to enable the comb of Figures 6—9 or the brush of Figures 10 and 11 to be attached thereto to form either a complete comb implement or a complete brush implement for use with the hair dryer.

Each side wall 12, adjacent its lower edge, is provided with a small latching abutment 16 the detail of which is shown in cross section in Figure 5. Thus, as seen in Figure 5, each abutment 16 is provided with an under-cut shoulder 17 to enable the comb or the brush to be latched thereto.

As shown in Figures 1 and 2 adjacent the lower side of the tubular end 10 are a pair of upstanding spaced lugs 19 which are arranged to receive a locating projection on the comb or brush in a manner to be described.

The side walls 12 terminate at their upper edges in a generally flat ridge 22 in which a slot 23 is formed to receive a releasing pin formed on the comb and the brush again, as will be described.

Turning now to the comb of Figures 6—9, this comprises an integral moulding so formed as to be releasably attachable to the one part illustrated in Figures 1—5. The comb incorporates an elongated body 30 having two parallel side rails 31 and a centre rail 32, the latter having three rows of comb teeth 33 projecting downwardly therefrom. The two side rails 31 are each interconnected with the centre rail 32 by a number of transverse ribs 34 in order to define two rows of six exhaust apertures 35. At the left hand end in Figures 6 and 7 the rails are interconnected by a transverse wall 36 which is also seen in Figure 8 and upstanding from which is a small projection 40 which is arranged to engage inside the end wall 14 of the one part for location purposes.

At its other end the comb affords a horizontal projection 41 which is arranged to extend between the two lugs 19 of the spigot, when the comb and one part are assembled together.

To co-operate with the two latching abutments 16 of the spigot, the upper edges of the side rails 31 each have a complementary latching abutment 45 having an under-cut shoulder 46. The material from which the one part is manufactured, together with the thickness of the side walls 12, permits the side walls 12 to flex slightly in order that the abutments 16 and 45 can be connected and disconnected manually.

Manual connection can simply be obtained, once the projection 41 is located between the lugs 19, simply by pressing the comb and one part together.

In order to facilitate disconnection, the comb has a releasing pin 50 integrally formed thereon and which extends upwardly from the centre rail 32. The pin is so located and of such a length that when the comb and one part are attached to one another the upper end of the pin 50 projects slightly through the slot 23 in the one part. Finger pressure on the pin is adequate to release the abutments 16 and 45 which are otherwise holding the comb and one part latched together.

Figures 10 and 11 show the form of a brush which can alternatively be attached to the one part of Figures 1—5. The brush comprises a moulded back 60 having two rows of slots 61 therein and six rows of nylon bristles 62 projecting downwardly therefrom as shown in Figure 11. The brush is located in latched relationship with the spigot by means of a pair of abutments 64 which are substantially identical to the abutments 45. The brush also has a release pin 65 formed thereon for the same purpose as the pin 50.

WHAT WE CLAIM IS:—

1. A hair dressing implement comprises at least two readily separable parts which in an assembled condition together define an air passageway for the path of air which is communicated to the assembly, one part affording a tubular portion which is adapted to be connected to an air supply hose and the other part affording hair treating projections, the said parts affording co-operating catch means for securing them together in the assembled condition and releasing means being provided which comprise a portion of the said other part which, in the assembled condition, extends across the air passageway and projects through an aperture in the said one part the arrangement being such that depression of the projection separates the catch means.

2. An implement as claimed in Claim 1 in which the catch means comprises inter-engaging shoulders on the two parts.

3. An implement as claimed in Claim 2 in which the parts are formed as plastics mouldings and the catch means is engaged and disengaged by slight distortion of one or other of the parts.

4. An implement as claimed in any one of the preceding Claims in which the projections comprise brush bristles.

5. An implement as claimed in any one of Claims 1 to 3 in which the projections comprise comb teeth.

6. A hair dressing set comprising an implement as claimed in Claim 4 and an alternative part, securable to the one part instead of said other part the alternative part affording projections in the form of comb teeth.

7. A hairdressing implement substantially as described herein with reference to Figures

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1 to 5 and Figures 6 to 9, or Figures 1 to 5 and Figures 10 and 11 of the drawings accompanying the provisional specification.

KILBURN & STRODE,
Chartered Patent Agents,
Agents for the Applicants.

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1407403 PROVISIONAL SPECIFICATION
2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 1

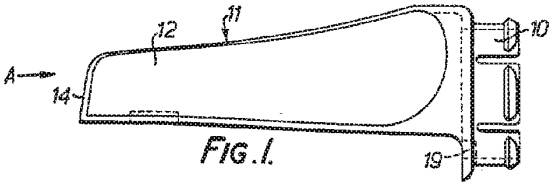


FIG. 1.

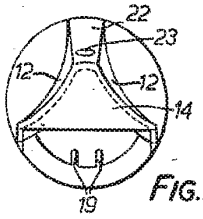


FIG. 2.

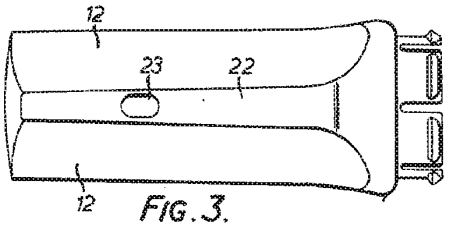


FIG. 3.

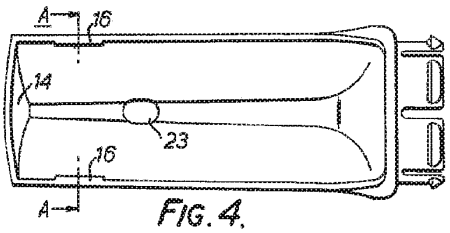


FIG. 4.

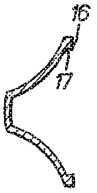


FIG. 5.

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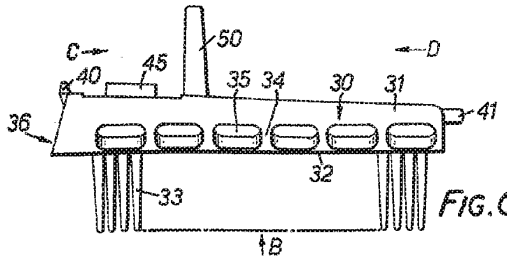


FIG. 6.

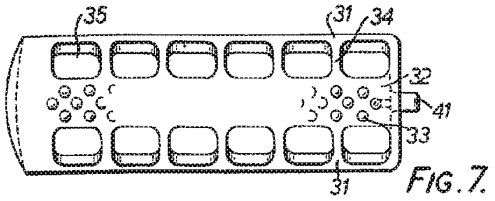


FIG. 7.

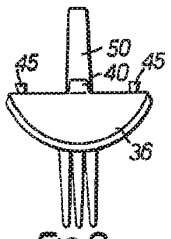


FIG. 8.

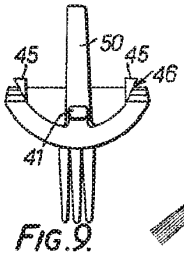


FIG. 9.

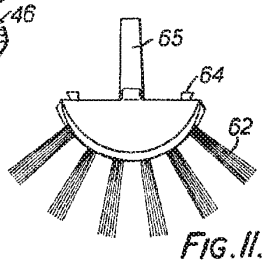


FIG. 11.

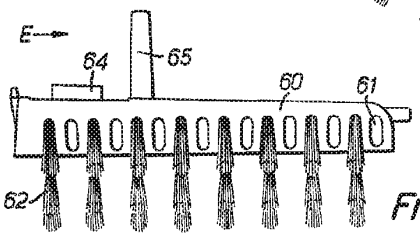


FIG. 10.

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PCT

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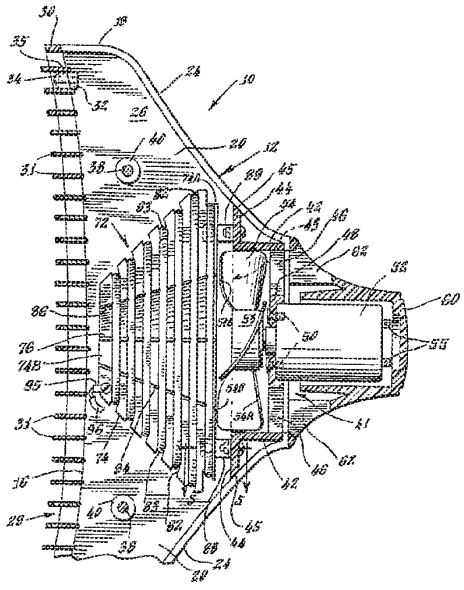
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(54) Title: HAND-HELD ELECTRIC HAIR DRYER

(57) Abstract

A hand-held electric hair dryer which comprises a handle supporting a wing-shaped hollow casing having a motor driven axial fan carried by the rear wall of the casing. An air inlet is provided in the rear wall of the casing, whereby an airstream generated by the fan enters the casing for flow therethrough. The airstream exits through an elongated air discharge opening formed in an arcuate-shaped front wall of the casing. An interior portion of the rear wall of the casing adjacent the air inlet is flat and extends on a plane substantially normal to the axis of rotation of the fan, and a portion of the fan projects beyond the flat portion in the direction of the discharge opening. The shape and location of the interior portion of the rear wall adjacent the air inlet and the projection of a portion of the fan beyond the flat portion causes the airstream generated by the fan not only to move forward toward the discharge opening but also causes a portion of the airstream to move along the rear wall of the casing as well as toward the front wall. In this manner, air exits from the discharge opening to present a substantially equal or uniform velocity gradient across the discharge outlet. A heater is provided within the casing between the fan and the discharge opening to heat the air prior to its leaving the discharge opening.



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A HAND-HELD ELECTRIC HAIR DRYER

BACKGROUND OF THE INVENTION

This invention relates to improvements in portable electric hair drying appliances and more particularly to hair dryers that may be hand-held for ready manipulation about the head of a user to dry the hair.

Portable hand-held hair drying appliances are well-known and there are generally considered to be three basic types in widespread use. These basic types of hand-held hair dryers may be characterized as firstly, a pistol-type which utilizes a centrifugal fan, wherein the handle portion depends from the main body and is arranged perpendicular to a hot air exhaust outlet such as is disclosed in U.S. Patent No. 4,019,260. A second hair dryer is the circular-type which includes an axial fan wherein the handle portion is arranged in line with the hot air exhaust outlet such as is disclosed in U.S. Patent No. 4,039,774. A third type is the hatchet type dryer which incorporates a cross flow fan, wherein the handle portion is in line with the main body and the hot air exhaust outlet is arranged at a right angle with respect to the main body and handle portion, such as is disclosed in U.S. Design Patent No. 228,817. The foregoing hair dryers may be more aptly viewed as styling dryers inasmuch as they are almost invariably used in conjunction with combing or brushing of the hair to build up and set or style the hair. As such, these styling dryers have gained widespread acceptance.

Users are particularly interested in reducing the time required to dry the hair. In the design of hand-held dryers, the designer of the product will work with both the airflow and temperature of the air to optimize the design in terms of performance, keeping in mind at all times, cost considerations. A preferred arrangement for a hand-held hair dryer is to have an elongated discharge opening to

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project air over a larger portion of the head than the pistol type or circular type dryer. However, typically a cross-flow fan has been used with an elongated discharge outlet but such dryers have a number of disadvantages, among which is the cost of the fan.

Accordingly, it is an object of the present invention to provide a novel portable hand-held electric hair dryer.

Another object is to provide a novel hair dryer which has an elongated discharge opening in a hollow casing which carries a motor driven fan, and means are provided to effect a uniform distribution of air at the discharge opening with a substantially equal velocity flow gradient.

A further object is to provide a novel hair dryer which includes an axial fan for generating an airstream to be discharged through an elongated discharge opening.

A still further object is to provide a novel and improved hair dryer which includes a heater assembly which covers substantially less than the length of an elongated discharge opening.

SUMMARY OF THE INVENTION

The present invention comprehends a novel portable hair dryer having a hollow casing which includes an elongated discharge opening in the front wall of the casing, and an axial fan which generates an airstream within the casing for exit through the discharge opening. The axial fan is so arranged with respect to an interior portion of the rear wall of the casing as to cause a portion of the generated airstream to move along the rear wall as well as toward the discharge opening to provide for a uniform distribution of discharged air from the casing to effect a substantially equal velocity flow gradient along said discharge opening. A handle is provided at an angle to the casing to permit a user to comfortably hold and manipulate the dryer with respect to the hair. A heater assembly is

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disposed in the casing in the path of flow of the air-airstream to heat the air prior to discharge from the casing. The heater is elliptically-shaped in transverse cross section and extends substantially less than the entire length of the discharge opening.

The hair dryer of the present invention is designed and constructed for mass production and incorporates readily assembled components and sub-assemblies to thereby reduce costs and to provide for ease of manufacture.

These and other objects and features of this invention will become apparent with reference to the following specification and to the drawings.

DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a perspective view of the novel hair dryer of the present invention;

FIG. 2 is a fragmentary front elevational view of the hair dryer of FIG. 1 with some vanes removed to show the interior of the hair dryer;

FIG. 3 is a fragmentary side elevational view taken along lines 3-3 of FIG. 2;

FIG. 4 is a sectional view taken along line 4-4 of FIG. 2;

FIG. 5 is a sectional and fragmentary view taken along lines 5-5 of FIG. 4;

FIG. 6 is a schematic representation showing an undesirable velocity flow gradient of the airstream taken along the discharge opening of the hair dryer with the fan in a non-preferred position;

FIG. 7 is a schematic representation of the present invention showing a desirable velocity flow gradient of the airstream taken along the discharge opening of the hair dryer with the fan in the preferred position.

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DETAILED DESCRIPTION

Referring now to the drawings and more particularly to FIG. 1 a novel hair dryer is generally indicated by reference 10. Hair dryer 10 comprises a hollow elongated casing 12 carried by a transversely extended handle 14 which is shaped for easy and comfortable manipulation by a user. The casing is wing-shaped and has a front wall 16, a pair of end walls 17 and 18, bottom and top horizontally disposed walls 20 and 22 respectively, and a rear wall 24, to form a compartment 26. Front wall 16 is completely open between end walls 17 and 18 to form a discharge opening or outlet 28. In effect, the extent of discharge opening 28 occupies the same area as rear wall 24. A detachable grill 30 is provided in the discharge opening and includes spaced vanes 31 to prevent entry of fingers of a user and the like, from entering casing 12. Projections 32 extend from bottom wall 20, and grill 30 is secured at such projections by screws 34 which extend through tabs 35 formed in the grill. For ease of manufacture and assembly, casing 12 is made in two parts, an upper part 12A and a lower part 12B (FIG. 2) which set at a parting line 36 as best shown in FIG. 1. Upper and lower casings parts 12A and 12B are secured together at two places in compartment 26 by threaded members 38 received in bosses 40 molded to upper and lower casing parts 12A and 12B.

Bottom and top walls 20 and 22 (FIG. 3) diverge from front wall 16 to meet and merge with rear wall 24 (FIG. 1). As best seen in FIGS. 1 and 2 the bottom and top walls are curved or contoured adjacent rear wall 24 to form an air inlet 41 for casing 12 (FIGS. 3, 4). Air inlet 41 accommodates a cylindrical-shaped tube or conduit 42 having an outlet orifice 43 and a pair of diametrically opposed and perpendicularly extending ears 44 (FIG. 2, 4). The outer surface edges 45 of ears 44 fit snugly against rear wall 24, whereby said ears 44 become in effect an interior portion of the rear wall adjacent air inlet 41. Conduit 42 has a plurality of spaced ribs or spokes 46 molded therein

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and a central bearing portion 48 for securing thereto, by way of screws 50, an electric motor 52 which has mounted thereon an axial fan 53. Fan 53 has blades 54 which are provided with a leading edge 54A and a trailing edge 54B. Electric motor 52 has a pair of motor terminals 55 for connection by wires (not shown) to an on-off electric switch (not shown) operable by a switch actuator 56 (FIG. 1) in handle 14. A power cord 58 is partly shown and protrudes from the base of handle 14 for connection to a power source (not shown) to thereby cause energization of motor 52 upon actuation of the switch to an on position.

Motor 52 is disposed within and enclosed by a protecting cap portion 60 which has a plurality of radially spaced vanes or ribs 62. Operation of fan 53 causes air to flow through vanes 62 into air inlet 41 and past spokes 46 into casing 12. Cap 60 is provided with recesses 61 having seating surfaces 64 (FIG. 3) which are secured by a pair of threaded members 66 extending through projections 68 of rear wall 24 and to tabs 70 formed in spokes 46 of conduit 42. In this manner, cap 60 and conduit 42 are securely held and fastened to upper and lower casing parts 12A and 12B.

A heater assembly 72 is provided in casing 12 between discharge outlet 28 and air inlet 41. Heater assembly 72 is substantially frustoconical, and in transverse cross section is shown to be elliptical in shape and extends substantially less than the entire length of discharge opening 28. Heater assembly 72 includes an insulated plate member 74 which extends along the major axis of the assembly and a transversely extending plate member 76 is arranged normal to the plate 74 and along the minor axis of the ellipse. As better seen in FIG. 4, plate 74 is enlarged at its base 74A, adjacent to fan 53, and has a shorter edge 74B adjacent front wall 16. Plate member 76 is similarly shaped in that its enlarged base 76A and shorter edge 76B are adjacent fan 53 and front wall 16,

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respectively. The side edges of plate members 74 and 76 are notched as at 82 to receive a coiled electrical resistance element 83 which is helically wound on plate members 74 and 76. A pair of flow directing plate members 84 and 86 are criss-crossed at the intersection of plate members 74 and 76 to occupy the quadrants (as best seen in FIG. 2) formed by the plate members 74 and 76. Plate members 84 and 86 are similarly provided with notched portions along their edges to also receive and support the coiled resistance element.

Two L-shaped brackets 88 are provided at the base portion of plate 74 and one leg 88A (FIG. 5) of each bracket 88 is secured to plate 74 by a rivet 90 and another leg 88B of each bracket 88 is secured to ear 44 by a threaded-nut assembly 92. In this manner, heater 72 is detachably secured to ears 44. One of the brackets 88 also serves to provide an electrical connection between an end 83A of resistance element 83 and the end of an insulated wire 94 (partly shown) which has its other end (not shown) connected in handle 14 to power cord 58. Another end of resistance element 83 is connected by a terminal 95 to insulated wire 96 (partly shown) on shorter edge 74B of plate 74.

As seen more particularly in FIGS. 3 and 4 the trailing edges 54B of blades 54 of fan 53 project beyond the plane of ears 44 in the direction of discharge opening 28. The projection of a portion of fan 53 and the shape and disposition of ears 44 are an important feature of the present invention which may be more completely understood by an explanation in reference to the schematic representations in FIGS. 6 and 7.

First, it should be explained that in the operation of an axial fan in a conduit, the fan blades cause the air to be thrown out against the inner periphery of the conduit where the air increases in pressure as it moves from the leading edge of the blade to the trailing edge. The air

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reaches its maximum pressure as it leaves the trailing edge of the blade to cause swirling and turbulence of air in the area. The turbulent air in effect dissipates some of the energy of the air issuing from the blades, and further acts to constrict the stream of pressurized air to what might be generally seen, in transverse cross-section, as an axially moving cylinder of air. The swirling and turbulent air also tends to reduce the diameter of the axially moving cylinder of air to less than the blade diameter of the fan, and the main thrust of the cylinder of air due to the pitch of the blades is in an axial direction or concentric to the axis of rotation of the fan. The effect of this in respect to a velocity flow gradient of the airstream exiting the discharge opening may be seen in FIG. 6.

In FIG. 6 fan 53 is shown, contrary to the present invention, withdrawn into conduit 42 and a line 100 represents the velocity gradient of the airstream leaving discharge outlet 28. The lines A and B represent the magnitude of velocity of the air at opening 28, but they are not to be taken in any strict quantitative sense because they are merely for illustration. Since it is desired to have a uniform distribution of air across the length of the discharge outlet, hair dryer devices which would produce this uneven velocity gradient of air flow are undesirable.

FIG. 7 is a schematic representation of the present invention showing a desirable arrangement of fan 53 which causes a uniform distribution of air at discharge opening 28, wherein the velocity gradient of the discharge air is substantially uniform or equal across the opening. It is believed that this effect is obtained because of the projection of the trailing edges 54B of blades 54 beyond outlet orifices 43 of conduit 42. As the compressed air leaves conduit 42, the projecting edges 54B of blades 54 exert a centrifugal or radial force on the column of air

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pr airstream leaving outlet orifice 43. A portion of the airstream is thus directed perpendicular, or normal to the axial direction of the moving cylinder of air, and swirling or turbulence of air adjacent the periphery of conduit 42 is reduced to some extent. By providing ears 44 with flat surfaces on a plane normal to the axis of rotation of the fan and having trailing edges 54B extending beyond the flat surfaces in the direction of the discharge opening, that portion of the airstream that is radially directed moves along the surface of ears 44 and the inner surface of rear wall 24 towards end walls 17 and 18. A forward movement is imparted to the radially directed air by the diverging shape of the inner surface of rear wall 24 as it extends from ears 44 to the end walls 17 and 18 resulting in a substantially axial movement of the air throughout the casing toward discharge opening 28. Thus, the distrubution of air as it leaves outlet 28 is provided with a substantially equal velocity gradient represented by line 102 across the length of the outlet. Differing distrubutions of axial and radial airflow can be had at exhaust orifice 43 of conduit 42 by changing the amount of extension of blade edges 54B outwardly of orifice 43 in order to vary the velocity gradient of the exiting air across discharge outlet 28. The arrows A and B representing the velocity flow of the airstream as in FIG. 6, are used for purposes of illustration and explanation only and are not to be taken in any absolute quantitative sense.

The column of air issuing from conduit 42 does not only have an axial thrust to it. The air column is also cyclonic or swirling in nature and as it flows through the heater assembly it is interrupted by plate members 74 and 76. If it were not for the inclusion of plate members 84 and 86 in the heater assembly, plate members 74 and 76 would cause areas of reduced air flow, or what are termed as air shadow areas, on portions of resistance element 83. These portions would tend to produce a red glow, or hot

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spot on the element 83 and thereby cause undesirable localized heating of the adjacent walls of casing 12. The addition of plate members 84 and 86 cause a redirection of the airstream passing through the heater assembly to reduce the incidence of hot spots on the resistance element.

Further to reducing undesirable localized heating of the walls of casing 12 an elongated aperture 104, FIGS. 1 and 3, is provided in top wall 22 of casing 12 adjacent tube 42. During operation of hair dryer 10 relatively cool air is drawn into compartment 26 through elongated aperture 104 by the heated airstream moving along the inner surface of top wall 22 immediately adjacent heater 72. The cooler incoming air mixes with and moderates the heated airstream along the inner surface of top wall 22 to form a thermal barrier. The thermal barrier prevents localized heating of the top wall immediately adjacent the uppermost portions of the resistance element.

Aperture 104 also provides means for faster cooling of the hair dryer immediately after shut-off by allowing residual heat in the hair dryer to escape through the aperture.

A barrier member 106 extending from the outlet end of tube 42 and beneath aperture 104 is provided to prevent direct contact of external foreign objects with portions of resistance element 83 exposed by aperture 104.

In the use of hair dryer 10, front wall 16 may often be positioned with respect to the user's head in such a manner that the end portions of outlet 28 will extend beyond the head and exiting air will not strike the user's head. At other times, the front wall may be in a position where the middle of the outlet 28 is closer to the head than are the end portions of the outlet. This may exist when the front wall 16 has a portion above the top of the head and a portion along the side of the head. In this

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case air from the outlet ends may or may not strike the head or when it reaches the head the temperature of the air may be less than that issuing from the middle of outlet 28 and striking the head. The present invention avoids these possibilities by making front wall 16 arcuate-shaped as well shown in FIGS. 1 and 4. It will be apparent from the foregoing description and drawings that the novel hand-held hair dryer includes the advantage among other advantages, of providing an efficient hair dryer for rapidly drying the hair of the user. The structure of the hair dryer permits the utilization of a less expensive axial fan which, in combination, effects a uniform distribution and substantially equal velocity gradient of air through an elongated discharge outlet to cover more area of the user's head to enhance the drying time. Furthermore, the several parts and components of the novel hand-held hair dryer lend themselves readily to mass production techniques.

While there has been described one embodiment of the invention, it will be apparent to those skilled in the art that variations may be made without departing from the spirit and scope of the appendant claims.

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What is Claimed is:

1. A hand-held electric hair dryer comprising:

a. a hollow casing having a rear wall and a discharge opening spaced from and opposite said rear wall, the extent of said discharge opening occupying substantially the same area as said rear wall;

b. a handle for supporting the casing;

c. an air inlet for said casing formed in a central portion of said rear wall opposite said discharge opening;

d. a cylindrical conduit having a longitudinal axis arranged in said casing in axial alignment with said air inlet, one end of said conduit forming an outlet orifice spaced from said air inlet in the direction of the discharge opening;

e. a motor driven axial fan supported by said casing adjacent to and in axial alignment with said air inlet, said axial fan having a plurality of blades arranged for rotation in said conduit with portions of said blades extending outwardly of and in a predetermined spaced relationship to said outlet orifice in the direction of said discharge opening, said axial fan being operable for generating an airstream constrained to flow through said conduit and outwardly of the discharge opening;

f. heating means disposed on said casing between said outlet orifice and said discharge opening for heating the airstream prior to exiting the discharge opening, and

g. surface means on said rear wall extending from said outlet orifice on a plane normal to the axis of said conduit and cooperatively associated with said predetermined spaced relationship of said extending portions of the blades for providing the airstream exiting said discharge opening with a substantially equal velocity gradient across the extent of said discharge opening.

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2. The hair dryer of Claim 1 wherein said surface means include an interior portion of said rear wall joined with said conduit at said outlet orifice in a plane normal to the axis of rotation of said blades.

3. The hair dryer of Claim 2 wherein said conduit is formed with diametrically opposed flat ears disposed normal to the axis of said conduit.

4. The hair dryer of Claim 3 wherein said rear wall has an elongated shape and said casing is provided with a pair of spaced end walls and a front wall spaced from said rear wall by said end walls and said discharge opening is rectangular-shaped extending longitudinally in the direction of said end walls.

5. The hair dryer of Claim 4 wherein said discharge opening extends from one end wall to the other end wall and is substantially greater than the diameter of said conduit.

6. The hair dryer of Claim 5 wherein said heater means is arranged in said casing in alignment with said conduit, said heater means being generally elliptical in transverse cross section with the major axis of said heater means extending longitudinally of said casing for a distance substantially less than the entire length of said discharge opening.

7. The hair dryer of Claim 6 wherein said heater means includes an electrical resistance element helically wound about a heater support, said support including a first plate extending along the major axis and toward the end walls of said casing, and a second plate lying transversely of said first plate and extending along the minor axis of the heater means toward the top and bottom of said casing.

8. The hair dryer of Claim 7 wherein said first plate and said second plate becomes smaller in dimension as they extend from the rear wall to the front wall of said casing.

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9. The hair dryer of Claim 8 wherein air directing means are provided in said heater support for redirecting the airstream through the heater means as the air flows to the discharge outlet to minimize excessive localized heating of said resistance element and adjacent casing walls.

10. The hair dryer of Claim 5 wherein the front wall of said casing is arcuate shaped and said discharge opening is formed coextensive with said front wall with the middle portion of said discharge opening being closer to said air inlet in the direction of airflow and the end portion of said discharge opening being further away from said air inlet in the same direction.

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AMENDED CLAIMS
(received by the International Bureau on 1 May 1979 (01.05.79))

1. (Amended)

A hand-held electric hair dryer comprising;

a hollow casing including a rear wall and a front wall substantially coextensive with said rear wall, said front wall being spaced from and opposite said rear wall;

a handle for supporting said casing;

a discharge opening formed in said front wall substantially coextensive therewith;

an air inlet for said casing formed in a central portion of the rear wall adjacent said air inlet;

a cylindrical shaped conduit arranged in said central portion of the rear wall adjacent said air inlet;

an outlet orifice formed in one end of said conduit spaced from said air inlet in the direction of the discharge opening;

a motor driven axial fan including a plurality of blades arranged for rotation in said conduit, said blades having edge portions projecting beyond said outlet orifice;

heating means disposed in said casing between said outlet orifice and said discharge opening; characterized by

surface means arranged on said rear wall extending from and coplanar with said outlet orifice on a plane normal to the axis of rotation of said blades, said projecting edge portions of the blades extending a predetermined distance beyond the plane of said surface means.

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2. The hair dryer of Claim 1 wherein said surface means include an interior portion of said rear wall joined with said conduit at said outlet orifice in a plane normal to the axis of rotation of said blades.

3. The hair dryer of Claim 2 wherein said conduit is formed with diametrically opposed flat ears disposed normal to the axis of said conduit.

4. The hair dryer of Claim 3 wherein said rear wall has an elongated shape and said casing is provided with a pair of spaced end walls and a front wall spaced from said rear wall by said end walls and said discharge opening is rectangular-shaped extending longitudinally in the direction of said end walls.

5. The hair dryer of Claim 4 wherein said discharge opening extends from one end wall to the other end wall and is substantially greater than the diameter of said conduit.

6. The hair dryer of Claim 5 wherein said heater means is arranged in said casing in alignment with said conduit, said heater means being generally elliptical in transverse cross section with the major axis of said heater means extending longitudinally of said casing for a distance substantially less than the entire length of said discharge opening.

7. The hair dryer of Claim 6 wherein said heater means includes an electrical resistance element helically wound about a heater support, said support including a first plate extending along the major axis and toward the end walls of said casing, and a second plate lying transversely of said first plate and extending along the minor axis of the heater means toward the top and bottom of said casing.

8. The hair dryer of Claim 7 wherein said first plate and said second plate becomes smaller in dimension as they extend from the rear wall to the front wall of said casing.

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9. The hair dryer of Claim 8 wherein air directing means are provided in said heater support for redirecting the airstream through the heater means as the air flows to the discharge outlet to minimize excessive localized heating of said resistance element and adjacent casing walls.

10. The hair dryer of Claim 5 wherein the front wall of said casing is arcuate shaped and said discharge opening is formed coextensive with said front wall with the middle portion of said discharge opening being closer to said air inlet in the direction of airflow and the end portion of said discharge opening being further away from said air inlet in the same direction.

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STATEMENT UNDER ARTICLE 19

Replace page 11 with new page 11 presented herewith.

The difference between the replaced page 11 lies in that Claim 1 is now Claim 1. (Amended).

The amended Claim 1 is presented in the manner suggested by Rule 6.3. The preamble has been simplified and subparagraph "g." of prior Claim 1 has been rephrased as the characterizing clause of amended Claim 1. The surface means is now defined as extending from and coplanar with the outlet orifice and the plane of the surface means is related in respect to the axis of rotation rather than the "axis of said conduit and cooperatively associated with said predetermined relationship". The reference to the airstream and velocity gradient has been deleted.

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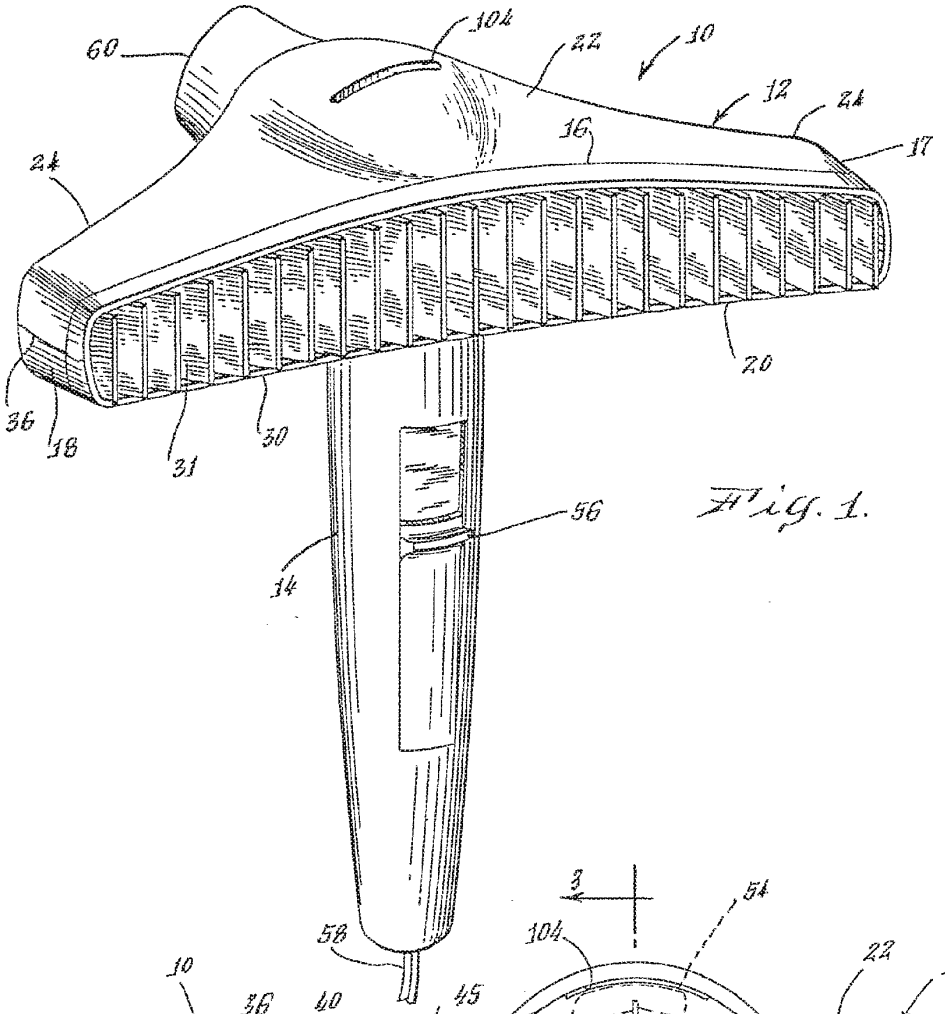


Fig. 1.

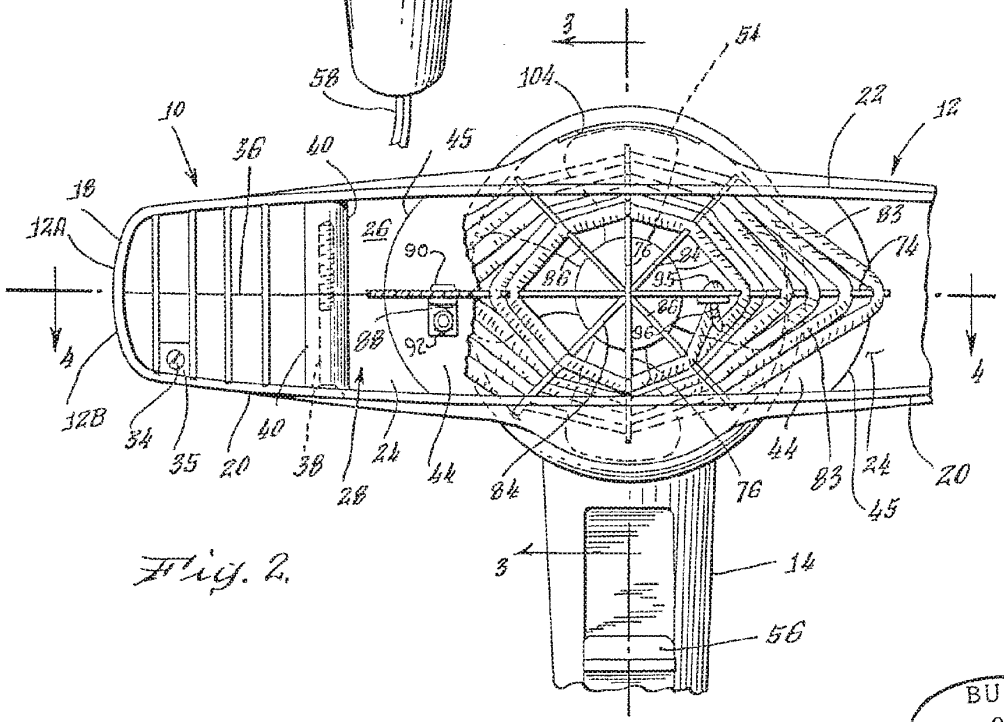
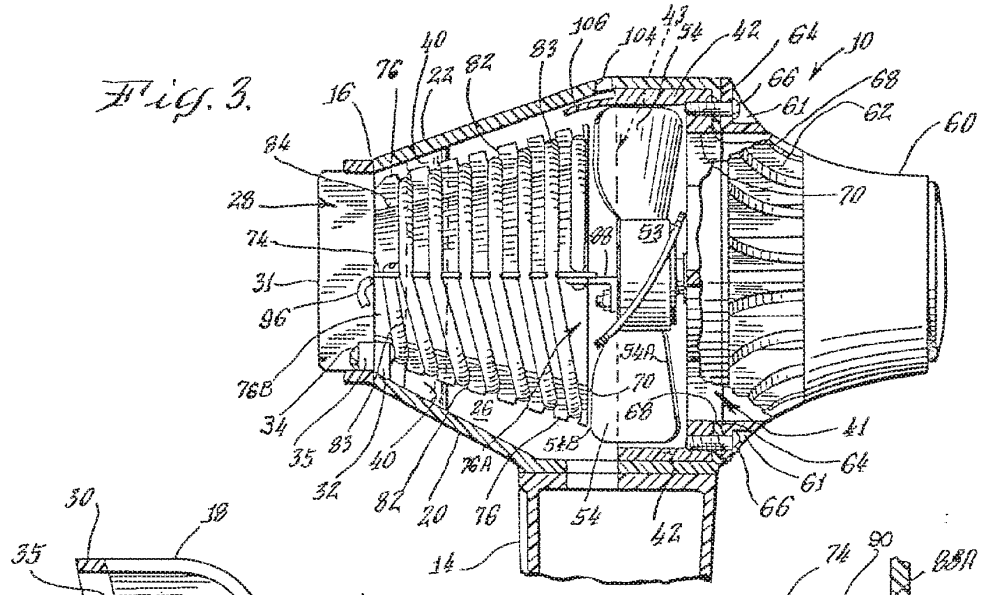


Fig. 2.

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Fig. 3.



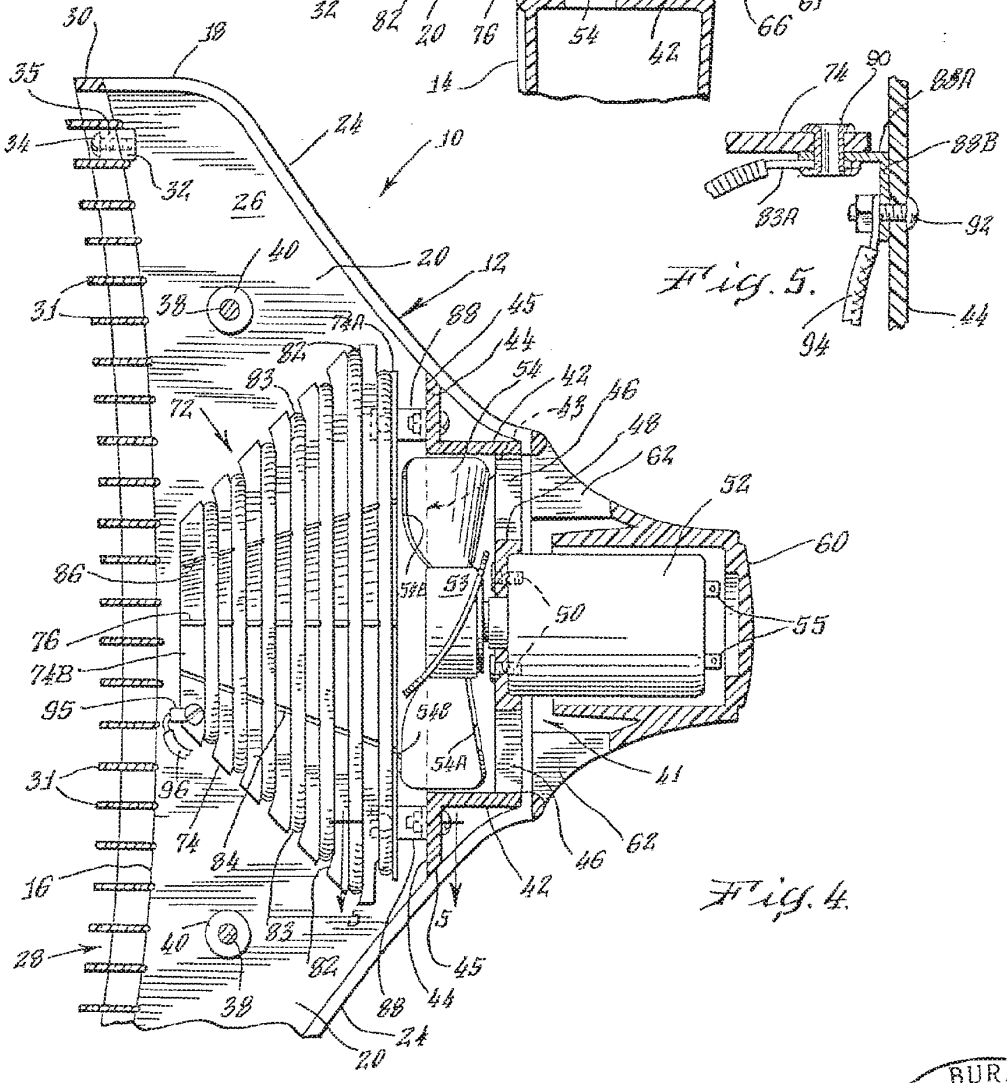


Fig. 4.

Fig. 5.

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Fig. 6.

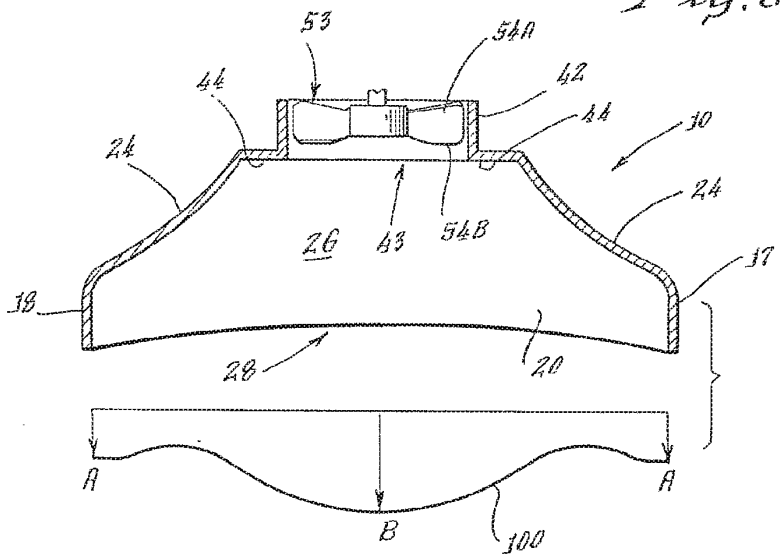
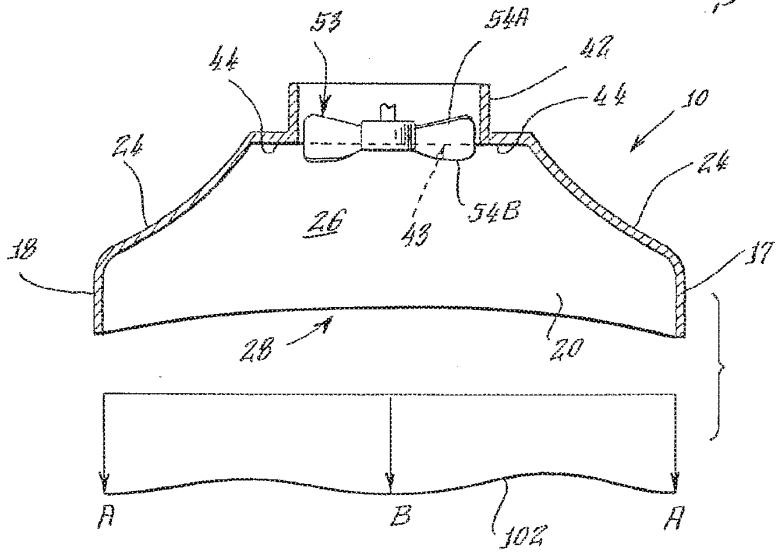


Fig. 7.



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INTERNATIONAL SEARCH REPORT

PCT/US78/00212

International Application No

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC

INT. CL. A 45D 20/12
US CL. 219/370

99/00374

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols
U.S.	219/368-371, 373 - 377; 338/58, 270 - 321 34/96 - 98; 243R; 415/213C, 207 132/19, 11R, 32; D28/13; 417/423

Documentation Searched other than Minimum Documentation
to the Extent that such Documents are included in the Fields Searched [5]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category *	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]
X	US, A 3,831,000 PUBLISHED 20 AUGUST 1974 WATERS et. al.	
X	US, A 1,951,675 PUBLISHED 20 MARCH 1934 SCHLESINGER	1-3
X	CA, A 459,131 PUBLISHED 23 AUGUST 1949 KENT ALLOYS LIMITED	1-3
P	US, A 4,122,329 PUBLISHED 24 OCTOBER 1978 GODEL	1-3
X	US, A 1,997,387 PUBLISHED 09 APRIL 1935 McCORD	4,5,10
A	US, s DES 240 969 PUBLISHED 10 AUGUST 1976 FAHNSTROM ET. AL.	4,5,10
A	FR, A 1,091,797 PUBLISHED 14 APRIL 1955 VELECTA	4,5,10
A	The Sunday Star and Daily News issued 10 September 1972, See P.7 and 7G.	4,5,10
X	US, A 1,468,593 PUBLISHED 18 SEPTEMBER 1923 ERB	6-9

* Special categories of cited documents: [15]

"A" document defining the general state of the art

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

"L" document cited for special reason other than those referred to in the other categories

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

"P" document published prior to the international filing date but on or after the priority date claimed

"T" later document published on or 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

IV. CERTIFICATION

Date of the Actual Completion of the International Search [3]	Date of Mailing of this International Search Report [3]
25 JANUARY 1979	04 APR 1979
International Searching Authority [1]	Signature of Authorized Officer [19]
ISA/US	Bernard Roskoski BERNARD ROSKOSKI

Form PCT/ISA/210 (second sheet) (October 1977)

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FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

X	US, A 3119087 PUBLISHED 21 JANUARY 1964 SCRIBNER	6-9
A	US, A 2,677,041 PUBLISHED 27 APRIL 1954 OLIVER ET. AL.	6-9
A	US, A 3047211 PUBLISHED 31 JULY 1962 HAY	1-3

V ☒ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE [10]

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers ..... because they relate to subject matter [12] not required to be searched by this Authority, namely:

2. ☒ Claim numbers ..... because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out [13], specifically:

VI ☒ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING [11]

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

Remark on Protest

☐ The additional search fees were accompanied by applicant's protest.

☐ No protest accompanied the payment of additional search fees.

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DESCRIPTION DE7925952

[0002]

ROWENTA WERKE GMBH, Forest Road 202-256, 6050 in Offenbach CMa)

Corrugated and curly hair comb with louver

[0003]

The innovation concerns a corrugated and curly hair comb with a podded nail holder whose sleeve-like opening with the blow-out of a hand hair dryer can be connected and parallel to the axis of the outer shell has a comb-tooth row is arranged and the both sides of the comb tooth row having discharge slots in his coat.

[0004]

In a known device of this type the air outlet slots are arranged parallel to each other but indeed radially ter for Zinkenha 1 = Hchse in its sheath. Between the slots, the comb teeth and guide walls are provided to guide the air. The In the blade holder incoming air is deflected at the reaching into the cavity baffles and out through the slots. This has the disadvantage that they form considerable turbulence on the baffles and the gebläsesei t i gen air ski ltzen a larger amount of air exits as to the more distant from the fan slots. This means that the air is distributed unevenly over the ridge completely.

[0005]

The novelty is the object of a corrugated and curls comb the initially he 1 ä jt.j "to create t s way in which these disadvantages are avoided and dsr air flow through the air outlet slots approximately evenly on all slots verte Mt wi rd.

[0006]

This object is achieved by the characterizing features of claim 1. 2

[0007]

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[0008]

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[0010]

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This ensures that the zinc maintenance interior can not form turbulence and funded by the blower is approximately uniformly distributed on the air outlet holes at the increasingly stepped vanes are individual partial streams of hot air is deflected so that the Austritts16cher be uniformly applied Very advantageous is the formation of the air guiding device as a separate, removably mounted in Zinkenhalter component, whereby the manufacturing wesent-1 l wi verbi11 igt rd.

[0013]

An embodiment of the innovation is illustrated in the drawings and will be described in more detail below. Show it:

[0014]

Figure 1 is a bottom view;

[0015]

Figure 2 is a longitudinal section;

[0016]

Figure 3 shows a section along the line A-A of FIG. 2

[0017]

The renewal contemporary corrugated and curly hair comb 1 comprises the padded nail holder 2 with integrated Kammzinkenreihe. 3 Parallel to Kammzinkenrei hey 3 discharge slots 4 are provided in the blade holder. 2 The blade holder 2 is closed at its narrow end with a closing part 5 and has a hülsenförmige opening 6 for mounting on a hand hair dryer, not shown. On the inner wall 7 of the blade holder 2 fixing ribs 8 are formed for holding an insert. 9 The insert 9 is the surface of the inner wall 7 adapted and carries vanes 10th The vanes 10 are facing with your mouth the 6 area on the insert 9 befest igt, and your free ends 12 -eichen into the cavity 11 of the blade holder. 2 in the direction of the closure member 5, the spacing of the free ends 12 to rise to the insert 10 of step-shaped and each slit k a guide blade is associated.

[0018]

Bezugszeichen:

[0019]

<Tb> 1 = corrugated and curly hair comb <Tb> 2 = blade holder <Tb> 3 = comb tooth row <Tb> 4 = slot diffusers <Tb> 5 = closure member <Tb> 6 = opening <Tb> 7 = inner wall <Tb> & dgr; = fixing ribs <Tb> 9 = use <Tb> 10 = vanes <Tb> 11 = hollow space <Tb> 12 = end of the vane

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CLAIMS DE7925952

Protection claims:

1.

Corrugated and curly hair comb with a podded blade holder., Whose sleeve-like opening with the blow-out of a hand hair dryer can be connected and axially parallel to its Außenmante arranged a comb tooth row and the In was nem shell has on both sides of Kammzinkenrei he discharge slots, characterized in that in the slots C <1> + *) opposite the region of the hollow body inner wall (7), an insert is removably mounted, which carries the hollow interior of the body facing portion of the insert (9) vanes, is assigned to each slot C <1> O a vane OO) , the vanes C10) are fastened with its blower region facing one side to the insert C9), the free ends of the guide vanes (12) extend into the cavity £ 11) and the distances between the free ends C12) of the guide vanes (10) for use (9) increase with increasing distance from the blower.

2.

Corrugated and curls comb according to claim 1, characterized in that the insert (9) is adapted to the inner wall surface of the blade holder (2).

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(19) BUNDESREPUBLIK DEUTSCHLAND
DEUTSCHES PATENTAMT

(11) Gebrauchsmuster U1

A45D 20-50 GM 79 25 952

AT 13.09.79 ET 24.01.80 VT 24.01.80
Bez: Well- und Lockenkamm mit Luftleit-
einrichtung
Anm: Rowenta-Werke GmbH, 6050 Offenbach

Die Angaben sind mit den nachstehenden Abkürzungen in folgender Anordnung aufgeführt:

(51)	Int. Cl.		(21) GM-Nummer
NKl:	Nebenklasse(n)		
(22) AT:	Anmeldetag	ET: Eintragungstag	(43) VT: Veröffentlichungstag
(30) Pr:	Angaben bei Inanspruchnahme einer Priorität: (32) Tag	(33) Land	(31) Aktenzeichen
(23)	Angaben bei Inanspruchnahme einer Ausstellungspriorität: Beginn der Schaustellung		Bezeichnung der Ausstellung
(54) Bez.:	Bezeichnung des Gegenstandes		
(71) Anm.:	Anmelder – Name und Wohnsitz des Anmelders bzw. Inhabers		
(74) Vtr:	Vertreter – Name und Wohnsitz des Vertreters (nur bei ausländischen Inhabern)		
	Modellhinweis		

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ROWENTA-WERKE GMBH, Waldstraße 202-256, 6050 Offenbach (Main)

Well- und Lockenkamm mit Luftleiteinrichtung

Die Neuerung betrifft einen Well- und Lockenkamm mit einem hohlkörperartigen Zinkenhalter, dessen hülsenförmige Öffnung mit dem Ausblasende eines Handhaartrockners verbindbar ist und an dessen Außenmantel achsparallel eine Kammzinkenreihe angeordnet ist und der in seinem Mantel beidseitig der Kammzinkenreihe Ausblasschlitze aufweist.

Bei einem bekannten Gerät dieser Gattung sind die Luftauslaßschlitze zwar einander parallel aber radial zur Zinkenhalterachse in dessen Mantel angeordnet. Zwischen den Schlitzen sind die Kammzinken und Leitwände zur Führung der Luft vorgesehen. Die in den Zinkenhalter einströmende Luft wird an den in den Hohlraum hineinreichenden Leitwänden umgelenkt und durch die Schlitze geführt. Dieses hat den Nachteil, daß sich an den Leitwänden erhebliche Turbulenzen bilden und an den gebläseseitigen Luftschlitzen eine größere Luftmenge austritt als an den weiter vom Gebläse entfernt liegenden Schlitzen. Dieses bedeutet, daß die Luft über den Kamm vollkommen ungleichmäßig verteilt wird.

Der Neuerung liegt die Aufgabe zugrunde einen Well- und Lockenkamm der eingangs erläuterten Art zu schaffen, bei dem diese Nachteile vermieden werden und der Luftdurchsatz durch die Luftauslaßschlitze annähernd gleichmäßig auf alle Schlitze verteilt wird.

Gelöst wird diese Aufgabe durch die kennzeichnenden Merkmale der Ansprüche 1 bis 2.

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Hierdurch wird erreicht, daß sich im Zinkenhalterinneren keine Turbulenzen bilden können und die vom Gebläse geförderte Luft annähernd gleichmäßig auf die Luftaustrittslöcher verteilt wird. An den zunehmend abgestuften Leitschaufeln werden einzelne Teilströme der Warmluft abgelenkt, so daß die Austrittslöcher gleichmäßig beaufschlagt werden. Sehr vorteilhaft ist die Ausbildung der Luftleiteinrichtung als ein separates, lösbar im Zinkenhalter befestigtes Bauteil, wodurch die Fertigung wesentlich verbilligt wird.

Ein Ausführungsbeispiel der Neuerung ist in den Zeichnungen dargestellt und wird im folgenden näher beschrieben.
Es zeigen:

Figur 1 eine Unteransicht;
Figur 2 einen Längsschnitt;
Figur 3 einen Schnitt nach der Linie A-A der Figur 2.

Der neuerungsgemäße Well- und Lockenkamm 1 besteht aus dem hohlkörperartigen Zinkenhalter 2 mit angeformter Kammzinkenreihe 3. Parallel zur Kammzinkenreihe 3 sind Ausblasschlitze 4 in dem Zinkenhalter 2 vorgesehen. Der Zinkenhalter 2 ist an seinem schmalen Ende mit einem Verschlußteil 5 verschlossen und weist eine hülsenförmige Öffnung 6 auf zum Aufstecken auf einen nicht dargestellten Handhaartrockner. An der Innenwandung 7 des Zinkenhalters 2 sind Befestigungsrippen 8 angeformt zur Halterung eines Einsatzes 9. Der Einsatz 9 ist der Oberfläche der Innenwandung 7 angepaßt und trägt Leitschaufeln 10. Die Leitschaufeln 10 sind mit ihrem der Öffnung 6 zugewandten Bereich an dem Einsatz 9 befestigt,und ihre freien Enden 12 reichen in den Hohlraum 11 des Zinkenhalters 2. In Richtung auf das Verschlußteil 5 steigen die Abstände der freien Enden 12 zum Einsatz 10 stufenförmig an und jedem Schlitz 4 ist eine Leitschaufel zugeordnet.

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Bezugszeichen:

1 = Well- und Lockenkamm
2 = Zinkenhalter
3 = Kammzinkenreihe
4 = Ausblasschlitze
5 = Verschlußteil
6 = Öffnung
7 = Innenwandung
8 = Befestigungsrippen
9 = Einsatz
10 = Leitschaufeln
11 = Hohlraum
12 = Ende der Leitschaufel

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Schutzansprüche:

1. Well- und Lockenkamm mit einem hohlkörperartigen Zinkenhalter, dessen hülsenförmige Öffnung mit dem Ausblasende eines Handhaartrockners verbindbar ist und an dessen Außenmante achsparallel eine Kammzinkenreihe angeordnet ist und der in sei nem Mantel beidseitig der Kammzinkenreihe Ausblasschlitze aufweist, dadurch gekennzeichnet, daß in dem den Schlitzen (4) gegenüberliegenden Bereich der Hohlkörperinnenwandung (7) ein Einsatz lösbar gehaltert ist, der zum Hohlkörperinneren weisende Bereich des Einsatzes (9) Leitschaufeln trägt, jedem Schlitz (4) eine Leitschaufel (10) zugeordnet ist, die Leitschaufeln (10) mit ihrem dem Gebläse zugewandten Bereich einseitig an dem Einsatz (9) befestigt sind, die freien Enden der Leitschaufeln (12) in den Hohlraum (11) reichen und die Abstände der freien Enden (12) der Leitschaufeln (10) zum Einsatz (9) mit zunehmender Entfernung vom Gebläse ansteigen.

2. Well- und Lockenkamm nach Anspruch 1, dadurch gekennzeichnet, daß der Einsatz (9) der Oberfläche der Innenwandung des Zinkenhalters (2) angepaßt ist.

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13.09.79

FIG. 1

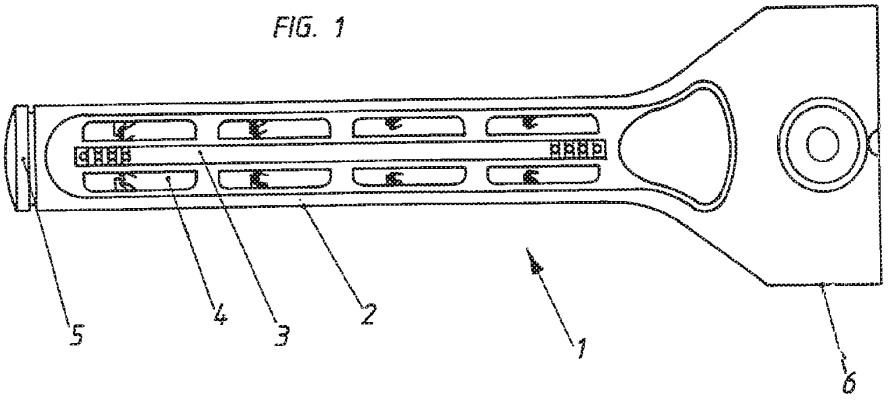


FIG. 2

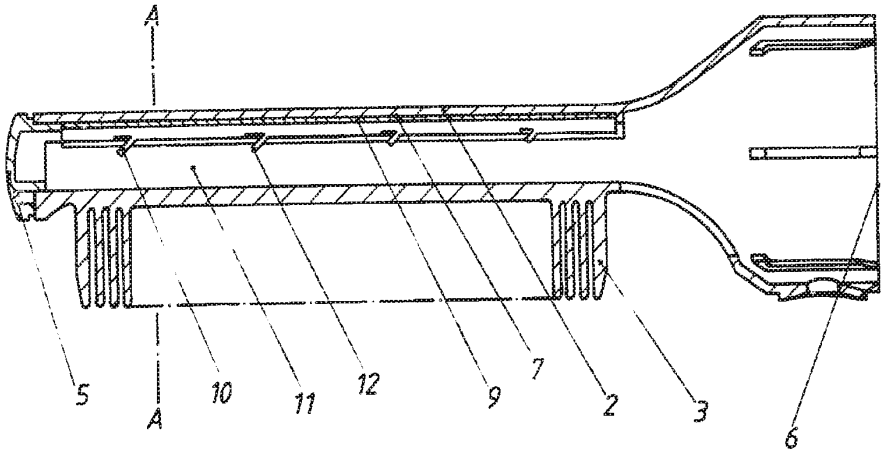
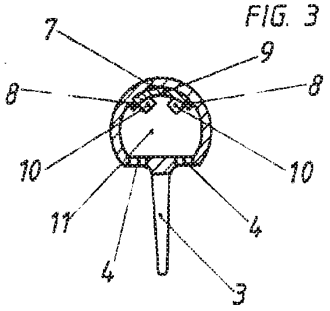


FIG. 3



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DESCRIPTION JPS60134402

[0001]

Brief description of the drawings

[0002]

Side view of FIGS. 1 and 2 is a conventional example, FIG. 3 is a front of an embodiment of a snake devised diagram, Figure 4 is the cross-sectional "front view, FIG. 5 is a perspective view, to no Figure 6 FIG. 8 is a front view of a use state. 6 ... attachment body, 7 ... the main body of the air dryer,, 8 ... connection port, 9 ... plug and handle, 10 ... hot-air outlet.

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CLAIMS JPS60134402

1.

A retractable and bendable attachment body a connection port comprising a hollow cylindrical body which closes the opening to the other end, the hot air discharge port formed in a straight line across the axial direction substantially the entire length of one side of the attachment body to attachment for a hair dryer with a door. (2) the hot-air outlet in the range of utility model claims was gradually narrow the opposite side of the connecting port a long hole shape which is continuous in the axial direction first (1) Adoraiya attachment according to the claim. (3) the attachment body of the other end Adoraiya for attachment to the scope paragraph (1) the description of the utility model registration claim that has become a hot poor conductor made handle. -

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⑲日本国特許庁（JP）　⑪実用新案出願公開

⑫公開実用新案公報（U）　昭60－134402

⑤Int.Cl.⁴	識別記号	庁内整理番号	㊸公開　昭和60年(1985)9月7日
A 45 D 20/12		J－7715－3B	

審査請求　未請求　（全　頁）

⑤④考案の名称　ヘアードライヤ用アクツチメント

㉑実　願　昭59－22882

㉒出　願　昭59(1984)2月20日

⑦②考案者　高島　清　門真市大字門真1048番地　松下電工株式会社内

⑦②考案者　西島　鑿　門真市大字門真1048番地　松下電工株式会社内

⑦①出願人　松下電工株式会社　門真市大字門真1048番地

⑦④代理人　弁理士　宮井　暎夫

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明　細　書

1．考案の名称

ヘアードライヤ用アタッチメント

2．実用新案登録請求の範囲

(1)　一端部に接続口を開口し他端部を閉塞した中空筒体であって伸縮自在かつ屈曲自在なアタッチメント本体と、このアタッチメント本体の一側部の軸方向略全長にわたって一直線状に形成された熱風吐出口とを備えたヘアードライヤ用アタッチメント。

(2)　前記熱風吐出口は軸方向に連続した長孔状であって前記接続口の反対側を漸次細幅とした実用新案登録請求の範囲第(1)項記載のヘアードライヤ用アタッチメント。

(3)　前記アタッチメント本体の前記他端部は熱不良導体製把手となっている実用新案登録請求の範囲第(1)項記載のヘアードライヤ用アタッチメント。

3．考案の詳細な説明

〔技術分野〕

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この考案はヘアードライヤ用アタッチメントに関するものである。

〔背景技術〕

一般にヘアードライヤは、頭髪の乾燥とセット（整髪）に用いられ、性能面および使い勝手の面からつぎのような点が要望される。すなわち、

(1)セット時には頭髪がばらつかないように熱風吐出口を小さくして熱風を集中させ、乾燥時には熱風吐出口を大きくして大量の風を広範囲にわたって吐出すること、

(2)頭部は曲面状となっているので頭髪全体に万遍なく熱風を与えるためには、熱風吹出し角度が簡単に可変調節できるようになっていること、

である。

そこで、従来第1図および第2図に示すものがあった。すなわち、第1図は、ドライヤ本体1の吐出口にノズル2を着脱自在に設けたものである。これはノズル2の装着により熱風吐出口を小さくして熱風を集中させることができるため、前記(1)の要望に対応している。しかし、ノズル2を着脱

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しなければならないため使い勝手が悪いという欠点がある。またノズル2を外した状態でも吐出範囲が狭く頭部全体に熱風を当てるためにはヘアードライヤ全体を動かして熱風吹出し角度を変えねばならないためやはり使い勝手が悪いという欠点がある。

第2図はドライヤ本体3とヒータ部分4とを柔軟な導管5で結んだものである（実開昭56－85603号）。これはヒータ部分4を把持して熱風の吐出角度を変えることができ、セットおよび乾燥が簡便になるもので、前記(2)の要望に対応している。しかし、導管5がじゃまになりかえって操作性が悪くなる。また吐出範囲が狭く、乾燥およびセット等の時間的性能は悪い。さらに乾燥．セットに対応できるように風量を可変できるようになっていない。

〔考案の目的〕

したがって、この考案の目的は、使い勝手が良く、しかも性能の優れたヘアードライヤ用アタッチメントを提供することである。

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〔考案の構成〕

この考案は、アタッチメント本体を中空筒体であって伸縮自在かつ屈曲自在に構成し、その一側部の軸方向略全長にわたって一直線状に熱風吐出口を形成したものである。すなわち、伸縮により風量調節ができるため使い勝手がよく、また屈曲により頭部の曲面に沿った曲りを得ることができ効率的なセットができ、性能面も優れる。

この考案の一実施例を第3図ないし第8図に示す。すなわち、このアタッチメントは、アタッチメント本体6を蛇腹状で屈曲かつ伸縮自在の中空筒体に形成し、その一端部をドライヤ本体7への接続口8とし、他端部を合成樹脂等よりなる熱不良導体製の風漏れ防止用栓兼把手9で閉塞し、さらに一側部の軸方向略全長にわたって長孔状の熱風吐出口10を形成し、その幅を接続口8側の幅aが広くその反対側の幅bが漸次狭くなるようにしている。

第6図ないし第8図は使用状態を示している。すなわち、第6図および第7図は髪の形に応じて

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アタッチメント本体６を曲げ、熱風吐出口１０から熱風を効率良く髪に吹付けている。第８図はアタッチメント本体６を短縮して熱風吐出口１０を小さくすることにより、髪の所定の部位に集中して熱風を吹きかけている。

このように構成したため、この実施例はつぎのような作用効果を有する。すなわち、

(1)髪の形，頭の形等により自由に形状が考えられるため、温風の吹出し角度も自由になり、髪の乾燥，セット等に便利になる。

(2)広範囲に一度に温風を当てることができ、乾燥時間が早くなる。

(3)アタッチメント本体６の部分で風向および吹出し面積が自在に調整できるため、ドライヤ本体７をいちいち動かす必要がなく、操作が簡便になる。

(4)ドライヤ本体７から、アタッチメント本体６により直接蛇腹状吐出口を構成でき、構造が簡単である。

(5)アタッチメント本体６の先端には熱不良導体で

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形成した栓兼把手９を設けているので熱風吹出し角度および吹出し面積の調節がし易い。

(6) 熱風吐出口１０は先端側を狭くし、かつ栓兼把手９で閉じられているため、先端側ほど抵抗が大きくなり、風は根元の抵抗の少ない方からも吹出し、吐出口１０の全体から平均的に風を吹出すことができる。

なお、前記実施例ではアタッチメント全長に亘って蛇腹状としているが、本考案はこれに限定されるものではなく、アタッチメントの軸方向に複数箇所蛇腹を分散させて設けても同様の作用効果が得られる。また、熱風吐出口は軸方向に連続して溝状としているが、複数の孔を軸方向全長に亘って分散させて設けても同様の作用効果が得られる。

〔考案の効果〕

以上のように、この考案のヘアードライヤ用アタッチメントによれば、使い勝手が良く性能面で優れ、しかも構造が簡単であるという効果がある。

4. 図面の簡単な説明

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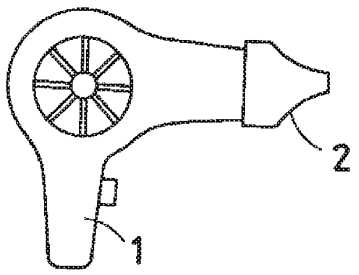
第１図および第２図は従来例の側面図、第３図はこの考案の一実施例の正面図、第４図はその断面図、第５図は斜視図、第６図ないし第８図は使用状態の正面図である。

６…アタッチメント本体、７…ドライヤ本体、８…接続口、９…栓兼把手、１０…熱風吐出口

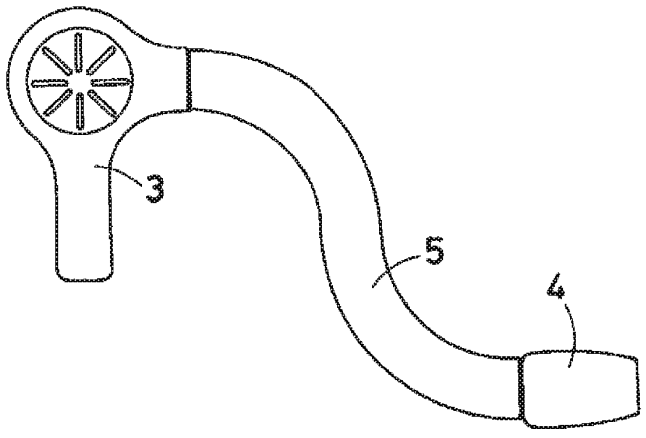
代理人　弁理士　宮　井　暎　夫

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第 1 図



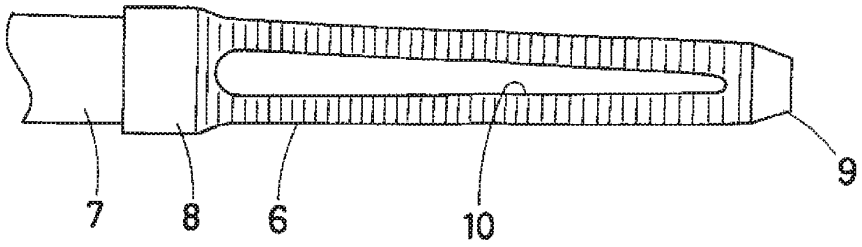
第 2 図

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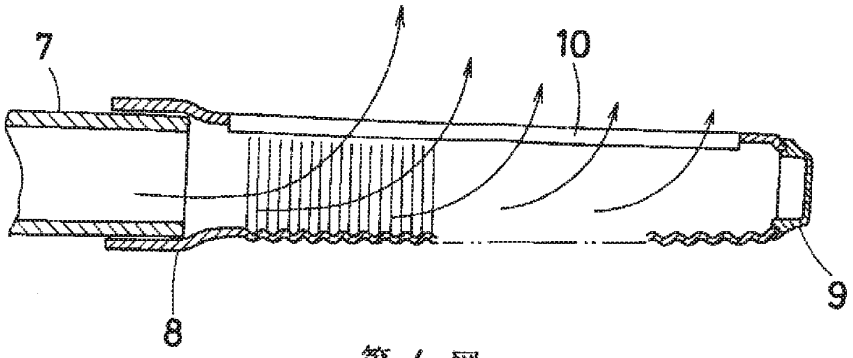
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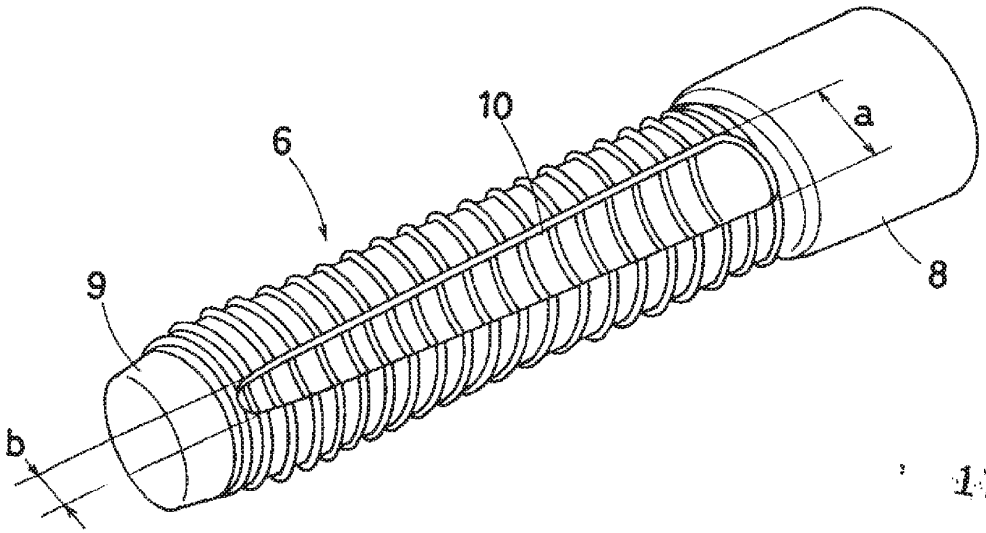
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第 3 図



第 4 図



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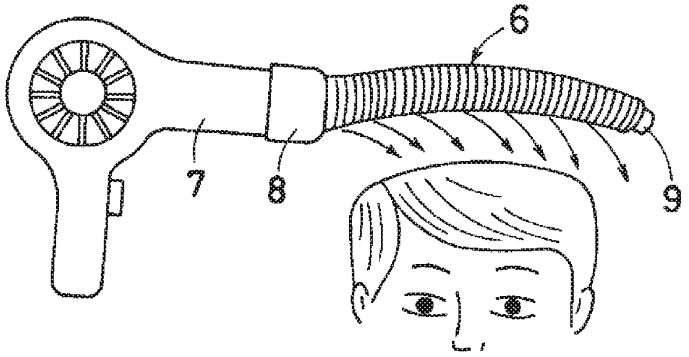
第 5 図

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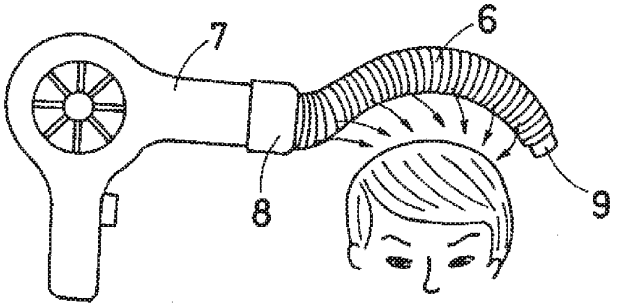
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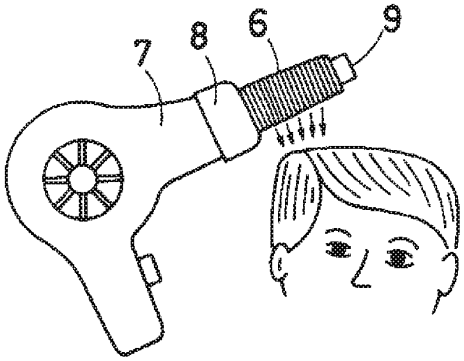
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第 6 図



第 7 図



第 8 図

18

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Bibliographic data: JPH1042932 (A) — 1998-02-17

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DRIER WITH CURLER

Page bookmark JPH1042932 (A) - DRIER WITH CURLER

Inventor(s): FUKUYAMA KADOTAKA ±

Applicant(s): YODOGAWA DENKI SEISAKUSHO KK ±

Classification: - international: ***A45D20/12; A45D4/04;*** (IPC1-7): A45D20/12; A45D4/04

- cooperative:

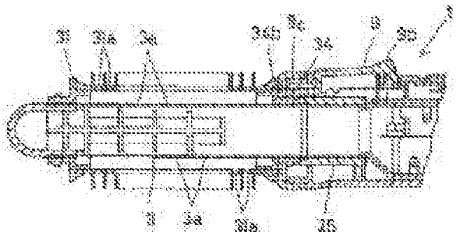
Application number: JP19960208264 19960807 Global Dossier

Priority number(s): JP19960208264 19960807

Abstract of JPH1042932 (A)

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PROBLEM TO BE SOLVED: To use a lightweight material for a curler and quickly and uniformly apply curls at multiple positions of hairs. SOLUTION: A curler 31 is inserted into the cylinder 3 of a drier 1 and hooked on the cylinder 3 of the drier 1, and hairs are wound on the curler 31 while the drier 1 is rotated. A switch is turned on to operate an electric motor, the heater of a heater section is heated, and hot air is blown out from small holes 3a of the cylinder 3 uniformly around the curler 31. The hairs wound on the curler 31 are uniformly warmed. A bobbin 34 is removed from the cylinder 3, the curler 31 is kept on the hairs by a hairpin, and curls are applied to the hairs when the curler 31 and the hairs are cooled.



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DESCRIPTION JPH1042932

[0001]

[Field of the invention The present invention relates to a curler with a hair dryer to put the habit around the hair.

[0002]

2. Description of the Related Art| well-known of the way, to an apparatus for attaching a curl to the hair, what a wide variety is provided. For example, if you heat the curler in advance, wrapped around the curlers in hair, thereby warming the hair, there is a device to put the curl. Or, in advance to secure the hair brush to the warm air outlet of the hair dryer, wrapped around the hair to the hair brush, sending the warm air to the inside of the hair brush from the warm air outlet of the hair dryer, the hot air blown from each of the holes of the side wall of the hair brush, thereby warming the hair, there is a device or the like to put a curl.

[0003]

The present invention is, however, in the case of a device for heating the curler in advance, it is necessary to apply the made of a material having a large specific heat in curlers, since the specific gravity becomes heavier thing of such material, curlers becomes heavy, when wearing the curlers for this, there is a disadvantage that discomfort.

[0004]

On the other hand, in the case of a device for feeding the warm air to the hair brush from the hair dryer, so remain fixed a hair brush to the hair dryer, there is only sequentially processing each portion of the hair, a long time to process the whole of hair required was. In addition, unlike the amount to blow the warm air by each of the holes of the side walls of the hair brush, this was the cause of the non-uniformity of the curl.

[0005]

Accordingly, an object of the present invention can be applied lightweight material on curlers, also be a plurality of portions of the hair, to provide a curler with hairdryer which can be given a curl promptly and uniformly it is in.

[0006]

In order to solve the above problems BRIEF SUMMARY OF THE INVENTION In the curlers with a hairdryer of the present invention, a dryer main body for at least a built-in electric fan and the heater, detachably to the warm air blowout port of the dryer body and curlers attached, and a warm air dispersing means which is disposed inside the curler, previously formed a plurality of holes in the side wall of the curler, the warm air to the inside of the curler from the warm air blowout port of the dryer body blown and, blown allocated to each of the holes of the side walls of the curler by this warm air is warm air dispersion means.

[0007]

If such a configuration, fitted with a curler into warm air outlet of the dryer body, wrapped around the hair to the curler, blowing warm air to the inside of the curler from the warm air outlet of the dryer body, the temperature of the this warm air and distributed to each of the holes of the side walls of the curler by wind dispersion means, blown from these holes, this makes it possible to warm uniformly the hair wound on the curlers. After this, remove the curlers from the warm air outlet of the dryer body, if holding

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the hair in curlers by hairpin, it is possible to put a curl to the hair.

[0008]

Prepared in advance a plurality of curlers or a plurality of hairpin, for each of these curlers, repeating the above process, it can be attached quickly to curl into the respective portions of the hair.

[0009]

[Embodiment of the present invention will now be described with reference to the embodiment to the accompanying drawings of the present invention.

[0010]

1 and 2 show a dryer 1 according to an embodiment of the curler with a hairdryer of the present invention. The drier 1 comprises a drier body 2, a connecting and a fixed cylindrical body 3 to the outlet port 2a of the dryer main body 2.

[0011]

Dryer main body 2 has a power supply cord 4, the rotating connector 5, a switch 6, the electric motor 7, the heater unit 8, and the push button 9. Rotating connector 5 comprises a cylindrical body 11 fixed to the dryer body 2, fixed to one end of the power cord 4, a rotor 12 which is rotatably supported on the inside of the cylinder 11. The cylindrical body 11, the inner contact 13 and outer contact 14, as shown in FIG. 3 that is connected to the switch 6 is provided, the rotating body 12 has a central axis 15 and connected to a power supply cord 4 concentric It is provided an annular shaft 16.

[0012]

Even if the rotating cylindrical body 11 together with the dryer 1, the rotation is not transmitted to the rotor 12, it does not have the power cord 4 is twisted. The contact of the inner contact 13 and the central axis 15, and the contact of the outer contact 14 and the annular shaft 16 is maintained, the power cord 4 and the switch 6 is always connected.

[0013]

Heater the power cord 4 is connected to the commercial AC power source, if you turn on the switch 6, of the electric motor 7 and the heater unit 8 through a path to say the commercial AC power supply and power cord 4 → rotating connector 5 → switch 6 is connected to the 17, along with the electric motor 7 is activated, the heater 17 of the heater unit 8 generates heat.

[0014]

The rotating shaft of the electric motor 7, and secure the fan 18, and the electric motor 7 is activated, the fan 18 is rotated.

[0015]

Heater portion 8 includes a heater 17, a frame 19 which supports surround the heater 17. The frame body 19 is comprised of a mica frame 19a and the synthetic resin frame 19b.

[0016]

Push button 9, the which pivot shaft 9a is pivotally supported by the coil spring 20, together with the right side of the pressing portion 9b is urged upward, the left side of the claw portion 9c is urged downward

[0017]

Cylindrical body 3, be of metal, fitted cap 21 on its left end, and close the left end. Further, the side wall of the cylindrical body 3 to form a plurality of small holes 3a. Further, on the inner side of the cylindrical body 3, it is inserted warm air dispersion 22 such as shown in FIG. This warm air dispersion 22, the center of the struts 23, and has mutually diameter is a different first through fifth disc 24-1 ~ 24-5, each disc 24-1 ~ by struts 23 connecting the 24-5. Fitting the head 23a of the strut 23 to the inside of the cap 21, the four branches 25 of the second disk 24-2 are brought into contact with the inner wall of the cylindrical body 3, the warm air dispersion 22 the tubular body it is supported in the 3

[0018]

Further, the cylindrical body 3, securing the annular portion 26. This annular portion 26 forms a plurality of irregularities 26a such as shown in FIG.

[0019]

Here, turn on the switch 6, together with to operate the electric motor 7, when the heat the heater 17 of the heater unit 8, by the fan 18 of the electric motor 7, air is sucked through the mesh part 2b of the

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bottom of the dryer body 2 it is. This air passes through the vicinity of the heater 17 of the heater unit 8, is heated by the heater 17, becomes hot air, the warm air is guided to the inside of the cylindrical body 3.

[0020]

The warm air is sequentially abuts against the first to fifth circular board 24-1 ~ 24-5 hot air dispersion 22 is distributed little by little each time, blown from each of the small holes 3a of the cylindrical body 3. Thus, each of the air volume to be blown from the small holes 3a of the cylindrical body 3 becomes substantially equal, uniformly warm air around the cylindrical body 3 is blown.

[0021]

Next, FIG. 6 shows a curler 31 in an embodiment of the curler with a hairdryer of the present invention. This curler 31 is a cylindrical, forming a large number of small holes 31a in the side wall.

[0022]

In the region of half the curlers 31 (180 ° in plan view), in plural stages, in each stage, to form a five comb teeth 32, the remaining half of the region, also a plurality of stages divided into, to form each of the guide bar 33.

[0023]

Further, the upper and lower ends of the curler 31 is fitted to each bobbin 34. These bobbins 34, to form a plurality of irregularities 34a.

[0024]

Well, to use this curler with dryer, plugged into the cylindrical body 3 of the dryer 1 the curler 31, as shown in Figure 7. At this time, the unevenness 34a of the bobbin 34 of the curler 31 is fitted to each unevenness 26a of the annular portion 26, also the claw portion 9c of the push button 9 is caught in the groove 34b of the bobbin 34. Thus, the rotation of the curler 31 is prohibited, the curler 31 is engaged with the cylindrical body 3 of the dryer 1.

[0025]

In this state, while rotating the dryer 1, winding the hair in curlers 31. Since connecting the dryer 1 as a power cord 4 through the rotation connector 5, it is rotated the drier 1, need not have the power cord 4 twisting.

[0026]

Subsequently, to turn on the switch 6, together with to operate the electric motor 7, to heat the heater 17 of the heater unit 8, blown through the small hole 31a of the curler 31 the warm air from each of the small holes 3a of the cylindrical body 3, unevenness around the curler 31 to blow out without warm air. As a result, is uniformly warm hair wound on the curlers 31.

[0027]

In addition, by pressing the pressing portion 9b of the push button 9 of the dryer 1 as shown in FIG. 8, by pulling up on the claw portion 9c of the push button 9 on the upper side, remove the claw portion 9c from the groove 34b of the bobbin 34, extracting the curler 31 from the cylindrical body 3. And, keep in hair curlers 31 by hairpin (not shown). When the curler 31 and the hair is cool, curl to the hair stick. After this, remove the curlers 31 and the hairpin from the hair.

[0028]

In this embodiment, since the specific heat of the curler 31 may be small, it is possible to apply a material of light weight in the curler 31. Therefore, even if wear curler 31, need without discomfort.

[0029]

In addition, by hot air dispersion 22 of the inside of the cylindrical body 3, the hot air is dispersed, since the blown out the uniformly warm air around the curler 31, hair wound on the curler 31 is uniformly warmed, curl stick without irregularities.

[0030]

Furthermore, prepared in advance a plurality of curlers 31 and a plurality of hairpin, for each of these curlers, repeating the above process, it can be attached quickly to curl into the respective portions of the hair.

[0031]

The present invention is not limited to the above embodiments, it can be modified in various ways. For

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example, by omitting the cylindrical body, this place provided inside the warm air dispersion of curlers in, may be removably attached to the curler into the air outlet of the dryer body. Further, in order to lock the curler, and engagement of irregularities adopts the locking of the pawl portion of the push button, which is not only, may be employed other structures. Further, it may be variously changed the shape and size of the curler.

[0032]

[Effect] As described above, according to the curlers with a hairdryer of the present invention, fitted with a curler into warm air outlet of the dryer body, wrapped around the hair to the curler, the inside of the curler from the warm air outlet of the dryer body in blowing hot air, and distributed to each of the holes of the side walls of the curler this warm air by hot air dispersion means, blown from these holes, and uniformly warm the hair of this by the wound on the curlers, the curl it can be attached uniformly.

[0033]

The curler, it is possible to apply a material of light weight, even wear the curlers need without discomfort.

[0034]

In addition, by hot air dispersion means, the warm air is dispersed, since the blown out the uniformly warm air around the curler, to warm the hair wound on the curlers uniformly, it is possible to put a curl evenly .

[0035]

In addition, by preparing a plurality of curlers and multiple hairpin in advance, in each of these curlers, repeating the previous treatment, it can be attached quickly to curl in each portion of the hair.

[0036]

Brief description of the drawings

[0037]

Figure 1 side view of a dryer in accordance with one embodiment of the curler with a hair dryer of the present invention

[0038]

Cross-sectional view showing the dryer of Figure 2 Figure 1

[0039]

Figure 3 schematically shows a structure of a rotation connector of drier of FIG. 1

[0040]

Figure 4 a perspective view showing a hot air dispersion of the tubular body in the dryer shown in FIG. 1

[0041]

Perspective view of a cylindrical body in the dryer of Figure 5 Figure 1

[0042]

FIG 6 (a) is a side view showing a curler in one embodiment of the curler with a hairdryer of the present invention, FIG. (B) is a plan view showing the same curler

[0043]

Figure 7 cross-section showing operation of a curler with a hairdryer for this embodiment

[0044]

Shows the effect of the push button in dryer of Figure 8 Figure 1

[0045]

Description of the code

[0046]

1 Dryer 2 dryer body 3 cylindrical body 4 power cord 5 rotating connector 6 switch 7 electric motor 8

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heater unit 9 push-button 11 cylindrical portion 12 rotating body 13 inside contact 14 outside contact 15 central axis 16 an annular shaft 17 heater 18 fan 19 frame 20 coil spring 21 cap 22 warm air dispersion 26 annular portion 31 curlers 32 comb teeth 33 guide bar 34 bobbin

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CLAIMS JPH1042932

1.

Comprising a drier body for at least a built-in electric fan and the heater, the curlers detachably attached to the hot air blow-off port of the dryer body, and a hot air dispersing means which is disposed inside the curler, more on the side walls of the curler leave the pore-forming, and from the warm air outlet of the dryer body blow warm air on the inside of the curler, with curlers blown been distributed to each of the holes of the side walls of the curler by this warm air is warm air dispersion means Hairdryer.

2.

A dryer main body for at least a built-in electric fan and the heater, is inserted a tubular member projecting to the dryer body, and the warm air dispersion disposed inside the cylindrical body, detachably on the outside of the cylindrical body and a curler, the cylindrical body is closed with the tip, is obtained by forming a plurality of holes in its side wall, warm air dispersion, as across the tubular body, and as the diameter of things, the as approaching the distal end of the cylinder, diameter of which was arranged by separating the different plate piece, curler, curlers hairdryer is obtained by forming a plurality of holes in its side wall.

3.

Curlers with hairdryer according to claim 2, further comprising a locking means for rotatably engaging removably curlers plugged on the outside of the cylindrical body.

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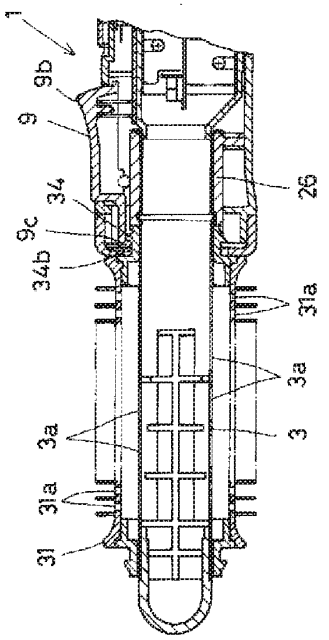
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(54)【発明の名称】　カーラー付きドライヤー

(57)【要約】

【課題】　カーラーに軽量な材質を適用することができ、また髪の毛の複数箇所であっても、巻き癖を速やかにかつ一様に付けることができるカーラー付きドライヤーを提供する。

【解決手段】　カーラー３１をドライヤー１の筒体３に差し込み、カーラー３１をドライヤー１の筒体３に係止する。この状態で、ドライヤー１を回転させながら、カーラー３１に髪の毛を巻き付ける。スイッチ６をオンにし、電動モータ７を作動させるとともに、ヒータ部８のヒータ１７を発熱させ、温風を筒体３の各小孔３ａから吹き出させ、カーラー３１の周囲にむら無く温風を吹き出させる。これにより、カーラー３１に巻き付けられた髪の毛が一様に温められる。ボビン３４を筒体３から抜き取り、カーラー３１をヘアーピンによって髪の毛に留めておき、カーラー３１や髪の毛が冷えると、この髪の毛に巻き癖が付く。



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【特許請求の範囲】
【請求項１】　電動ファン及びヒータを少なくとも内蔵するドライヤー本体と、このドライヤー本体の温風吹き出し口に着脱自在に取り付けられるカーラーと、このカーラーの内側に配される温風分散手段とを備え、
カーラーの側壁に複数の孔を形成しておき、ドライヤー本体の温風吹き出し口から該カーラーの内側に温風を吹き込むと、この温風が温風分散手段によって該カーラーの側壁の各孔に振り分けられて吹き出すカーラー付きドライヤー。
【請求項２】　電動ファン及びヒータを少なくとも内蔵するドライヤー本体と、このドライヤー本体に突設された筒体と、この筒体の内側に配された温風分散体と、この筒体の外側に着脱自在に差し込まれるカーラーとを備え、
筒体は、その先端を閉塞して、その側壁に複数の孔を形成したものであり、
温風分散体は、筒体を横切る様に、かつ大径のもの程、該筒体の先端に近づく様に、径が異なる複数の板片を離間させて配置したものであり、
カーラーは、その側壁に複数の孔を形成したものであるカーラー付きドライヤー。
【請求項３】　筒体の外側に差し込まれたカーラーを着脱自在に係止する係止手段を更に備える請求項２に記載のカーラー付きドライヤー。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】この発明は、髪の毛に巻き癖を付けるカーラー付きドライヤーに関する。
【０００２】
【従来の技術】周知の様に、髪の毛に巻き癖を付けるための装置には、多種多様なものが提供されている。例えば、カーラーを予め加熱してから、このカーラーを髪の毛に巻き付け、これにより髪の毛を温めて、巻き癖を付ける装置がある。あるいは、ヘアーブラシをヘアードライヤーの温風吹き出し口に固定しておき、このヘアーブラシに髪の毛を巻き付けて、ヘアードライヤーの温風吹き出し口からヘアーブラシの内側へと温風を送り出し、この温風をヘアーブラシの側壁の各孔から吹き出させ、これにより髪の毛を温めて、巻き癖を付ける装置等がある。
【０００３】
【発明が解決しようとする課題】しかしながら、カーラーを予め加熱する装置の場合、大きな比熱を有する材質のものをカーラーに適用する必要があり、この様な材質のものは比重も重くなるので、カーラーが重くなり、このためにカーラーを着用したときに、不快感を伴うと言う欠点があった。
【０００４】一方、ヘアードライヤーからヘアーブラシへと温風を送り出す装置の場合、ヘアーブラシをヘアードライヤーに固定したままなので、髪の毛の各箇所を逐次処理するしかなく、髪の毛の全体を処理するのに長時間を要した。また、ヘアーブラシの側壁の各孔によって温風の吹き出す量が異なり、これが巻き癖のむらの原因となった。
【０００５】そこで、この発明の課題は、カーラーに軽量な材質を適用することができ、また髪の毛の複数箇所であっても、巻き癖を速やかにかつ一様に付けることができるカーラー付きドライヤーを提供することにある。
【０００６】
【課題を解決するための手段】上記課題を解決するために、この発明のカーラー付きドライヤーにおいては、電動ファン及びヒータを少なくとも内蔵するドライヤー本体と、このドライヤー本体の温風吹き出し口に着脱自在に取り付けられるカーラーと、このカーラーの内側に配される温風分散手段とを備え、カーラーの側壁に複数の孔を形成しておき、ドライヤー本体の温風吹き出し口から該カーラーの内側に温風を吹き込むと、この温風が温風分散手段によって該カーラーの側壁の各孔に振り分けられて吹き出す。
【０００７】この様な構成であれば、ドライヤー本体の温風吹き出し口にカーラーを取り付け、このカーラーに髪の毛を巻き付けて、ドライヤー本体の温風吹き出し口からカーラーの内側に温風を吹き込み、この温風を温風分散手段によってカーラーの側壁の各孔に振り分けて、これらの孔から吹き出させ、これによりカーラーに巻き付けられた髪の毛を一様に温めることができる。この後、ドライヤー本体の温風吹き出し口からカーラーを取り外し、ヘアーピンによって髪の毛をカーラーに留めておけば、髪の毛に巻き癖を付けることができる。
【０００８】複数のカーラーや複数のヘアーピンを予め用意しておき、これらのカーラー毎に、先の処理を繰り返せば、髪の毛の各箇所に巻き癖を速やかに付けることができる。
【０００９】
【発明の実施の形態】以下、この発明の実施形態を添付図面を参照して説明する。
【００１０】図１及び図２は、この発明のカーラー付きドライヤーの一実施形態におけるドライヤー１を示している。このドライヤー１は、ドライヤー本体２と、このドライヤー本体２の吹き出し口２ａに接続及び固定された筒体３を備えている。
【００１１】ドライヤー本体２は、電源コード４、回動コネクタ５、スイッチ６、電動モータ７、ヒータ部８、及び押しボタン９を有する。回動コネクタ５は、ドライヤー本体２に固定された円筒体１１と、電源コード４の一端に固定され、円筒体１１の内側で回転自在に支持された回転体１２を備える。円筒体１１には、スイッチ６に接続された図３に示すような内側接触子１３及び外側接触子１４を設け、回転体１２には、電源コード４に接

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続された同心円状の中心軸１５及び環状軸１６を設けている。

【００１２】ドライヤー１と共に円筒体１１が回転しても、この回転が回転体１２には伝達されず、電源コード４が捩じれることはない。また、内側接触子１３と中心軸１５の接触、及び外側接触子１４と環状軸１６の接触が保たれ、電源コード４とスイッチ６が常に接続される。

【００１３】この電源コード４を商用交流電源に接続してから、スイッチ６をオンにすると、この商用交流電源が電源コード４→回動コネクタ５→スイッチ６と言う経路を通じて電動モータ７及びヒータ部８のヒータ１７に接続され、電動モータ７が作動するとともに、ヒータ部８のヒータ１７が発熱する。

【００１４】電動モータ７の回動軸には、ファン１８を固定しており、この電動モータ７が作動すると、このファン１８が回転する。

【００１５】ヒータ部８は、ヒータ１７と、このヒータ１７を囲んで支持する枠体１９を有する。この枠体１９は、マイカ枠１９ａ及び合成樹脂枠１９ｂからなる。

【００１６】押しボタン９は、その枢支軸９ａが枢支されており、コイルバネ２０によって、右側の押圧部９ｂが上方に付勢されるとともに、左側の爪部９ｃが下方に付勢されている。

【００１７】筒体３は、金属製のものであって、その左端にキャップ２１を嵌合して、この左端を閉じている。また、この筒体３の側壁には、多数の小孔３ａを形成している。さらに、この筒体３の内側には、図４に示す様な温風分散体２２を挿入している。この温風分散体２２は、その中央の支柱２３、及び相互に径が異なる第１乃至第５円板２４-1～２４-5を有しており、支柱２３によって各円板２４-1～２４-5を連結している。支柱２３の頭部２３ａをキャップ２１の内側に嵌合し、第２円板２４-2の４本の枝２５を筒体３の内壁に当接させて、この温風分散体２２を筒体３内に支持している。

【００１８】また、筒体３には、環状部２６を固定している。この環状部２６には、図５に示す様な複数の凹凸２６ａを形成している。

【００１９】ここで、スイッチ６をオンにして、電動モータ７を作動させるとともに、ヒータ部８のヒータ１７を発熱させると、電動モータ７のファン１８によって、ドライヤー本体２の底部の網部分２ｂを通じて空気が吸引される。この空気は、ヒータ部８のヒータ１７の周辺を通過して、このヒータ１７によって加熱され、温風となり、この温風が筒体３の内側に導かれる。

【００２０】この温風は、温風分散体２２の第１乃至第５円板２４-1～２４-5に順次突き当たって、その度に少しずつ分散され、筒体３の各小孔３ａから吹き出す。これにより、筒体３の各小孔３ａから吹き出すそれぞれの風量が略均等になり、筒体３の周囲にむら無く温風が吹き出す。

【００２１】次に、図６は、この発明のカーラー付きドライヤーの一実施形態におけるカーラー３１を示している。このカーラー３１は、筒状であって、その側壁に多数の小孔３１ａを形成している。

【００２２】また、カーラー３１の半分（平面視において１８０°）の領域には、複数段に分けて、各段毎に、５本の櫛歯３２を形成し、残りの半分の領域には、同じく複数段に分けて、それぞれのガイド桟３３を形成している。

【００２３】さらに、カーラー３１の上下端には、各ボビン３４を嵌合している。これらのボビン３４には、複数の凹凸３４ａを形成している。

【００２４】さて、このカーラー付きドライヤーを使用するには、図７に示す様にカーラー３１をドライヤー１の筒体３に差し込む。このとき、カーラー３１のボビン３４の各凹凸３４ａが環状部２６の各凹凸２６ａに嵌合し、また押しボタン９の爪部９ｃがボビン３４の溝３４ｂに引っ掛かる。これにより、カーラー３１の回転が禁止され、このカーラー３１がドライヤー１の筒体３に係止される。

【００２５】この状態で、ドライヤー１を回転させながら、カーラー３１に髪の毛を巻き付ける。このドライヤー１を回動コネクタ５を介して電源コード４に接続しているので、このドライヤー１を回転させても、電源コード４が捩じれずに済む。

【００２６】引き続いて、スイッチ６をオンにし、電動モータ７を作動させるとともに、ヒータ部８のヒータ１７を発熱させ、温風を筒体３の各小孔３ａからカーラー３１の各小孔３１ａを通じて吹き出させ、カーラー３１の周囲にむら無く温風を吹き出させる。これにより、カーラー３１に巻き付けられた髪の毛が一様に温められる。

【００２７】さらに、図８に示す様にドライヤー１の押しボタン９の押圧部９ｂを押下して、この押しボタン９の爪部９ｃを上方に引き上げて、この爪部９ｃをボビン３４の溝３４ｂから外し、カーラー３１を筒体３から抜き取る。そして、カーラー３１をヘアーピン（図示せず）によって髪の毛に留めておく。カーラー３１や髪の毛が冷えると、この髪の毛に巻き癖が付く。この後、カーラー３１とヘアーピンを髪の毛から外す。

【００２８】この実施形態では、カーラー３１の比熱が小さくても構わないので、このカーラー３１に軽量の材質を適用することができる。このため、カーラー３１を着用しても、不快感を伴わずに済む。

【００２９】また、筒体３の内側の温風分散体２２によって、温風を分散させ、カーラー３１の周囲にむら無く温風を吹き出させるので、このカーラー３１に巻き付けられた髪の毛が一様に温められ、巻き癖がむら無く付く。

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【００３０】さらに、複数のカーラー３１や複数のヘアーピンを予め用意しておき、これらのカーラー毎に、先の処理を繰り返せば、髪の毛の各箇所に巻き癖を速やかに付けることができる。

【００３１】なお、この発明は、上記実施形態に限定されるものでなく、多様に変形することができる。例えば、筒体を省略して、この代わりにカーラーの内側に温風分散体を設け、このカーラーをドライヤー本体の吹き出し口に着脱自在に取り付けても構わない。また、カーラーを係止するために、凹凸の嵌合と、押しボタンの爪部の係止を採用しているが、これればかりでなく、他の構造を採用しても良い。さらに、カーラーの形状や大きさ等を多様に変形しても構わない。

【００３２】

【効果】以上説明した様に、この発明のカーラー付きドライヤーによれば、ドライヤー本体の温風吹き出し口にカーラーを取り付け、このカーラーに髪の毛を巻き付けて、ドライヤー本体の温風吹き出し口からカーラーの内側に温風を吹き込み、この温風を温風分散手段によってカーラーの側壁の各孔に振り分けて、これらの孔から吹き出させ、これによりカーラーに巻き付けられた髪の毛を一様に温めて、巻き癖をむら無く付けることができる。

【００３３】このカーラーには、軽量の材質を適用することができるので、このカーラーを着用しても、不快感を伴わずに済む。

【００３４】また、温風分散手段によって、温風を分散させ、カーラーの周囲にむら無く温風を吹き出させるので、このカーラーに巻き付けられた髪の毛を一様に温めて、巻き癖をむら無く付けることができる。

【００３５】さらに、複数のカーラーや複数のヘアーピンを予め用意しておき、これらのカーラー毎に、先の処理を繰り返せば、髪の毛の各箇所に巻き癖を速やかに付けることができる。

【図面の簡単な説明】

【図１】この発明のカーラー付きドライヤーの一実施形態におけるドライヤーを示す側面図

【図２】図１のドライヤーを示す断面図

【図３】図１のドライヤーにおける回動コネクタの構造を概略的に示す図

【図４】図１のドライヤーにおける筒体内の温風分散体を示す斜視図

【図５】図１のドライヤーにおける筒体を示す斜視図

【図６】図６（ａ）はこの発明のカーラー付きドライヤーの一実施形態におけるカーラーを示す側面図、同図（ｂ）は同カーラーを示す平面図

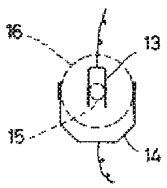
【図７】この実施形態のカーラー付きドライヤーの使用状態を示す断面図

【図８】図１のドライヤーにおける押しボタンの作用を示す図

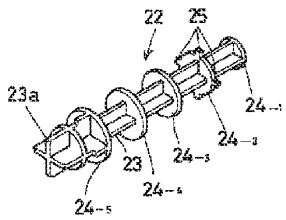
【符号の説明】

１　ドライヤー
２　ドライヤー本体
３　筒体
４　電源コード
５　回動コネクタ
６　スイッチ
７　電動モータ
８　ヒータ部
９　押しボタン
１１　円筒部
１２　回転体
１３　内側接触子
１４　外側接触子
１５　中心軸
１６　環状軸
１７　ヒータ
１８　ファン
１９　枠体
２０　コイルバネ
２１　キャップ
２２　温風分散体
２６　環状部
３１　カーラー
３２　櫛歯
３３　ガイド桟
３４　ボビン

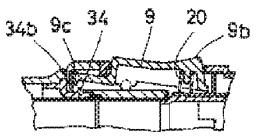
【図３】



【図４】

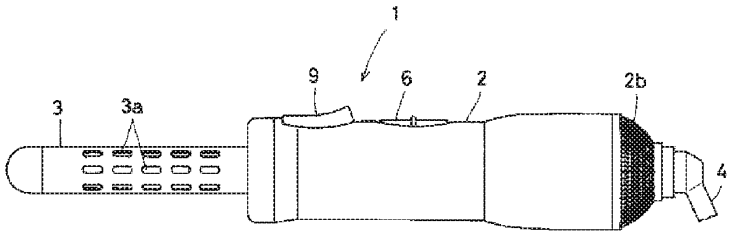


【図８】

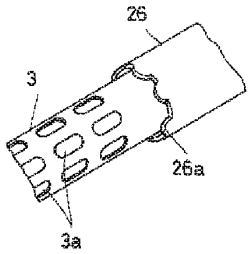


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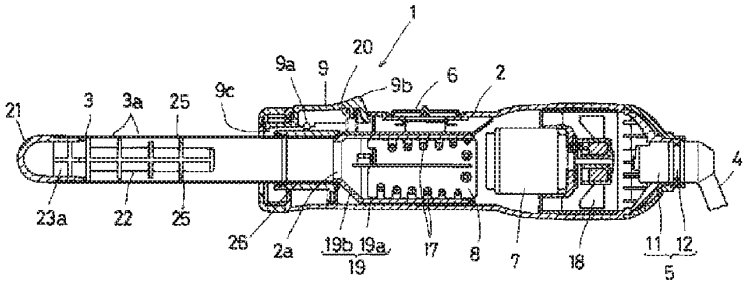
【図1】


1
9
6
2
2b
3
3a
4

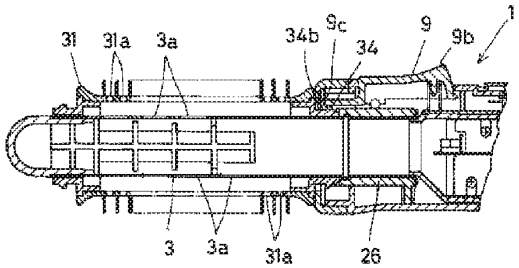
【図5】


26
3
26a
3a

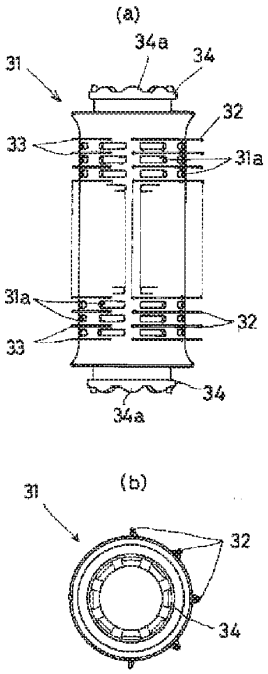
【図2】


1
20
9a
9
9b
6
2
21
3
3a
25
9c
4
23a
22
25
26
2a
19b
19a
19
17
8
7
18
11
12
5

【図7】


31
31a
3a
34b
9c
34
9
9b
1
3
3a
31a
26

【図６】



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CURL DRYER

Page bookmark	JP2013059580 (A) - CURL DRYER
Inventor(s):	TANAKA KENICHI ±
Applicant(s):	IZUMI PROD CO ±
Classification:	- international: ***A45D4/06; A45D6/02; A45D6/06; A46B11/00; A46B11/08; A46B15/00***
	- cooperative:
Application number:	JP20110201325 20110915 Global Dossier
Priority number(s):	JP20110201325 20110915

Abstract of JP2013059580 (A)

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PROBLEM TO BE SOLVED: To make hot air smoothly impinge on the entire hair when the hair is dressed by curling the hair or eliminating frizz using a roll brush or a blow brush, and to facilitate twisting of the hair like curls and dressing of the hair by properly heating the hair in a wide range. ;SOLUTION: The curl dryer includes: an axial body 20 that is a hollow shape extending from the proximal end connected to an outlet to the tip end inside a cover 22 and that discharges hot air from the outer circumference to the inner face of the cover 22; and a bristle holding body 22 that is made of metal to become at least a part of the cover 22. In the bristle holding body 22, there are formed a through hole 46 that holds bristles 24A by making them penetrated from inside; and a hot air outlet 48 that blows off between the bristles 24A the hot air guided from the outer circumference of the shaft body 20 to the inner face of the cover 22 to lead the hot air to the hair. ;COPYRIGHT: (C)2013,JPO&INPIT;PROBLEM TO BE SOLVED: To make hot air smoothly impinge on the entire hair when the hair is dressed by curling the hair or eliminating frizz using a roll brush or a blow brush, and to facilitate twisting of the hair like curls and dressing of the hair by properly heating the hair in a wide range.SOLUTION: The curl dryer includes: an axial body 20 that is a hollow shape extending from the proximal end connected to an outlet to the tip end inside a cover 22 and that discharges hot air from the outer circumference to the inner face of the cover 22; and a bristle holding body 22 that is made of metal to become at least a part of the cover 22. In the bristle holding body 22, there are formed a through hole 46 that holds bristles 24A by making them penetrated from inside; and a hot air outlet 48 that blows off between the bristles 24A the hot air guided from the outer circumference of the shaft body 20 to the inner face of the cover 22 to lead the hot air to the hair.

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DESCRIPTION JP2013059580

[Challenge] roll brush or using a blow brush or take a hair habit or curl hair per smoothly in the entire hair warm air is when to arrange the hair, also a wide range of hair, such as curling and properly heated to facilitate shaping is to facilitate trimmed the hair. From A was connected to the air outlet the base a hollow shape which extends toward the distal end of the cover 22 and the shaft 20 for discharging toward the outer periphery thereof a warm air into the cover 22 the inner surface, at least one of the cover 22 and a metallic bristle holder 22 as a unit, bristle and the through hole 46 for holding by penetrating the bristles 24A from inside the bristle holder 22, the hot air guided to the cover 22 the inner surface from the outer periphery of the shaft 20 and the warm air discharge port 48 that leads to hair blowing from between the 24A is formed. .FIELD 6

Carl Dryer

[0001]

The present invention, or with habit hair curled the hair while blowing warm air to the hair, the present invention relates to curl hair dryer to be used for or established a hair.

[0002]

This type of curl dryer, roll brush and the bristles of a cylindrical bristle-winding trunk outer periphery all circumferential directions protrudes radially, provided bristle part of the cylindrical cover cut-out opening in the longitudinal direction blow brushes are known. And curled the hair while applying to the hair was blown out from the root vicinity of these bristles the warm air to the outside, give them hair habit, and or take a hair habit, is intended to prepare the hair.

[0003]

Patent Document 1, to form a number of bristles 11 together here the whole hair winding cylinder 3 as synthetic resin, is disclosed that forms a plurality of hot air holes 12 between the root near the bristles 11 there. Here on the inside of this hair winding body 3, the base is passed through the shaft 2 connected to the warm air outlet, such as a dryer, a long groove 10 in the axial direction formed on the outer periphery of the shaft body 2, hair winding body 3 to form the passage of warm air between the inner surface, and guides through this groove 10 the warm air to Yutakafuana 12.

[0004]

Patent Document 2, the hair brush body 55 formed integrally with bristles on the outside of the fixed inner tube 54 is provided, the hot air is introduced into the stationary inner tube 54, from the vent 22,64 which open into these outer circumference It has been described roll brush A1 leading to the (paragraph 0037,0053, 4 and 6).

[0005]

JP-A-7-136013 JP-2007-105144 JP

[0006]

These things conventionally is shaped by hand winding cylinder or brush body of synthetic resin, it holds the bristles, also blowout position of warm air is limited to the discharge port. Therefore, a limited position of the hair warm air hits, can not be uniformly heat the entire hair. Also difficult part of the hair is curled and shaping due to a lack of heating, but to lay the entire hair efficiently there is a problem that it is difficult.

[0007]

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This invention has been made in view of such circumstances, per smoothly throughout the hair warm air when arranging the hair or taking hair habit curled hair with a roll brush and blow brush, also a wide a range of hair properly heating an object of the present invention is to provide a curl dryer habit with was easy establiished a easy to hair and such as curling.

[0008]

This object according to the present invention includes a connected one end (base portion) long cylindrical cover in the direction blowoff said warm air to the hot air outlet port, such as a dryer, and bristles held in at least a portion of the cover comprising, in the curl dryer was set to blow warm air toward the outside from the origin vicinity of the bristles, said from the outer periphery from the connected base in the air outlet a hollow shape which extends toward the distal end of the inner cover a shaft member for discharging toward the cover inner surface of the warm air, and a metallic bristles holding body comprising at least a portion of said cover, said the bristles holding member and a through hole for holding by penetrating the bristles from the inside , wherein a shaft member outer peripheral blows warm air is guided to cover the inner surface from between the bristles from the guiding hair warm air discharge port is formed, is accomplished by Karl drier, characterized in that.

[0009]

According to the invention, one shaft is to be discharged toward the cover inner surface of the warm air from the outer periphery, at least a part of the cover surrounding the shaft body and a metallic bristles holder, the through hole of the bristle holder the bristles held through from the inside, since to form the blown warm air to be directed towards the inner surface of the cover from the outer periphery of the shaft body from between the bristles leads to hair warm air discharge port, the outer periphery of the shaft member warm air on the inner surface of the bristles holder is guided efficiently, it is possible to warm air to hair wound around the bristles holding body and the cover hits efficiently to heat the hair. Moreover, since the bristles holding member hits the warm air blown from the shaft outer circumference on the inner surface which is made of metal, the entire bristle holder is sufficiently heated, hair wound on the surface is efficiently heated. Because of this hair curling and straightening can be efficiently.

[0010]

Roll in plan view Figure 2 as viewed from the tip side of the sectional view taken along line III-III also roll brush in side view similarly FIG perspective view roll brush portion thereof curl dryer using a roll brush which is an embodiment of the present invention bottom view side cross section of the roll brush portion showing also a side view of an exploded perspective view axis of the roll brush of the brush (a) and right side view (B) and plan view (C) bristles connected body side view (a) and right side view (B) and plan view (C)

[0011]

Shaft is a three-dimensional framework structure with gradually reduced in diameter toward the distal end, the idea to fix the deflector plates for guiding the projecting said warm air from the inside of the shaft body outward in hot air outlet of the bristles holder from the outer periphery desirably, thus the warm air that has flowed from one end of the shaft body (base) if it is possible to guide the inner surface of the smooth bristle holder by these deflectors (claim 2).

[0012]

In this case, the outer peripheral side edge of all the deflector is closer to the inner surface of the metal bristles holder, than the inner diameter side of the deflection plates the inner diameter side of the deflection plate positioned on the distal end side of the shaft located proximally by displacing the central axis side of the shaft body turn, and the shaft body in uniform the flow of warm air to the outside in the axial direction and smoothly, it is further equalized in the longitudinal direction of the discharge of warm air brush can (claim 5).

[0013]

The cover may be a cylindrical roll brush, the roll brush has a cylindrical metal bristles holder and the through-hole and the hot air outlet of the bristles is supported is formed on the shaft body, a plurality of and a bristles connection body formed by connecting the base of the bristles, the outer bristles to hold the connecting portions of the bristles connecting member between the inner surface of the metallic bristles holding member and the shaft member through the through hole It may be configured to project the (claim 3).

[0014]

In this case, bristles coupling body and a concatenation side by side along a plurality of bristles in a straight line, a plurality of ribs provided along the longitudinal direction on the outer periphery of the plurality of bristles coupling body, each of the connecting portions shaft can be held between the inner surface of the cylindrical bristle holder (claim 4) That side-by-side along the bristles connected body to the circumference of the bristles from the inner surface of the cylindrical bristle holder is allowed to penetrate into the through-hole, bristles hold the body of the shaft body and each bristles connected body along a rib of the shaft in this state It can be assembled by entering the good assembly property.

[0015]

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Warm air discharge port provided in the cylindrical bristle holder is good to form a plurality in the longitudinal direction of the shaft between a and the deflection plates of the bristles connecting member (longitudinally spaced deflection plates of shaft body) (claim 6). If hot air discharge ports to elongated in the longitudinal direction of the shaft body can be made larger and the opening area of the discharge of hot air to more smoothly. Note that the hot air discharge ports may be circular. The through-holes through which the bristles, if as is the hot air from the gap bristle and the through hole is made larger than the diameter of the base of the bristles to flow out, the discharge position of the hot air is guided to the hair further will be increased, the hot air guided to the hair is more uniform.

[0016]

The cover may be blow brush having bristles in a part of the circumferential direction. In this case, the outer cover halves having an opening formed by cutting a part of the outer peripheral surface in the longitudinal direction, warm air is guided from the through-hole and the shaft member is mounted on the opening of the cover half through the bristles it may be configured to include a metallic bristles holder of the hot air discharge opening which leads to that formed cross-section semicircular (Ametoijo) (claim 7).

[0017]

Karl dryer shown in FIG 1 is obtained by using a roll brush. in this figure, reference numeral 10 denotes a main body of the dryer, the electric blower fan into a substantially cylindrical grip shared case 12 of the main body 10, a heater (not both shown), etc. is accommodated, the outer surface it is possible to turn on and off control these by manual operation of a switch 14 provided. Note that the lock button 16 is provided near the switch 14, the lock button 16 is intended to be used for attaching and detaching the roll brush 18 to be described later. The upper end of the case 12 is a circular aperture, wherein the roll brush 18 is connected to the hot air warmed by the heater from the opening flows out.

[0018]

Roll brush 18 has a shaft body 20 shown in FIG. 7 and 8, a metal bristle holder 22, is a combination of such bristles connecting body 24. Shaft 20 has a cylindrical connecting portion 26 be in its base side connected to the opening of the case 12, apart axially by a plurality of (six) leg portions 28 smaller in diameter than the connecting portion 26 it is obtained by integrally formed a shaft framework unit 30 connected with a resin (eg PC, polycarbonate, etc.) on. Thus warm air passage 32 for guiding the warm air to the outside of the shaft framework section 30 between these legs 28 is formed.

[0019]

Shaft framework unit 30, as shown in FIGS. 7 and 8, in the three-dimensional framework structure with gradually reduced in diameter toward the distal end from among ring 36 fixed by ribs spaced gaps on the inside of the cylindrical portion 34 of the base side is there. That is, the longitudinal ribs 38 of six extending parallel to the axial direction, these longitudinal ribs 38 and annular rib 40 serving as a deflecting plate of the tie present invention at predetermined intervals, is fixed to the distal end of the longitudinal rib 38 tip cover and a section 42. Here the longitudinal ribs 38 is a thin plate shape from the center of the shaft framework unit 30 in the radial direction, the longitudinal ribs 38 and the warm air path is an opening that opens from the inside to the outside of the shaft framework portion 30 between the annular rib 40 44 is formed.

[0020]

The width of the longitudinal ribs 38, i.e. from the center radial width of the shaft framework 30, proximal (inner ring 36 side) is narrow, (stepwise) progressively toward the distal end cover portion 42 side widened to are (see FIG. 8 (B)). Outer edges of the longitudinal ribs 38 is its width so as to retain the bristles connecting bodies 24 are held between the metallic bristle holder 22 from the inside is set. That bristles connecting body 24, as shown in FIG 7 and 9, it is the concatenation integrally formed by the connecting portions 24B of the bristles 24A arranged in a row. The bristles connecting body 24 is a synthetic resin having suitable flexibility and is for example made of TPE (thermoplastic elastomer). Outer edge of the longitudinal ribs 38 engage the bristles 24A the opposite side of the connecting portion groove 24C formed on the back surface of 24B (see FIG. 9 (C)), the vertical ribs 38 are metal, as shown in FIG. 3 it is to hold the connecting portion 24B between the bristle holder 22.

[0021]

Here metallic bristles holding member 22, be comprised a cylindrical cover of the present invention, a metal (heat conductivity good metal such as aluminum or copper is preferable.) is obtained by forming a cylinder divided into two parts with a shape along the axis of the semi-cylindrical halves 22A is divided, 22A opposing edges of has a flange portion 22B which is bent inwardly (inner diameter side) . These halves 22A, as shown in FIG. 2 and 7, the through hole 46 and the hot air discharge port 48 which bristles 24A penetrates are several openings as appropriate. Through holes 46 are arranged in a straight line in the axial direction corresponding to the bristles 24A of bristles coupling body. Warm air discharge port 48 is appropriate number opening between the array straight of these through-hole 46.

[0022]

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And these halves 22A becomes a cylindrical shape by matching the flange portion 22B from each other. On the other hand the shaft framework portion 30 of the shaft body 20, as shown in FIG. 3, two pair of flange clamping ribs 46 parallel to face the longitudinal ribs 38 be between the longitudinal ribs 38 in the circumferential direction of the symmetry They are integrally formed each in one set position. Two opposed flanges clamping rib 46 is held in a state of butting the flange portion 22B provided on each half 22A of the metal bristles holding body 22, a flange portion 22B superimposed, across the 22B.

[0023]

Each half 22A is in a state of penetrating the bristles 24A in advance bristles coupling member 24 from inside the through hole 46, as is apparent from FIGS. 6 and 7, the cylindrical portion 34 of the shaft framework portion 30 and the lower edge on engaging the formed groove on the edge, it is fixed by engaging the upper edge to the cap 50 that is secured to the distal end cover portion 42 of the shaft framework portion 30 of the. That is inserted between the flange clamping rib 46 of the shaft body framework portion 30 against the flange portion 22B of each half 22A. While engaged with this time groove 24C of the connecting portion 24 of each bristle connecting member 24 in the vertical ribs 38, assembled to each half 22A to the shaft framework section 30. Note the cap 50 is fixed by screwing the tapping screw 52 inserted from above into the center boss portion of the distal end cover portion 42.

[0024]

The deflector 40 is in this embodiment provided in the longitudinal direction into four stages of the shaft framework portion 30 as shown in FIG. Longitudinal ribs 38 of the shaft framework unit 30, since the inner edge (center side edge) is displaced gradually center side toward the front end, the stepwise central side ones inner edge of the deflection plate 40 is also the distal end side It will be extended. Warm air that has flowed into this for shaft framework unit 30 sequentially strikes the deflector 40 of each stage is derived from the warm air passage 44 of the shaft framework portion 30 to the outer peripheral side.

[0025]

The roll brush 18 connects the cylindrical connecting portion 26 to the main body side of the warm air blowout port of the dryer, causing blown hot air by operating the switch 14. Some of the warm air, as shown by arrows in FIG. 6, through the hot air passage 32 flows to the outside of the metal bristles holding body 22, most remaining cylindrical portion 34 of the base side of the shaft framework section 30 the flowing into the shaft body frame section 30 through. Entered the warm air into the shaft framework section 30, the inner surface of the through the warm air passage 44 are sequentially deflected to the outside by the deflection plate 40 of each stage of the inner edge is extended sequentially to the inside to the flow direction a metal bristle holder 22 it is directed to. Thus the ejection amount of the warm air is equalized in the longitudinal direction of the roll brush 18. This warm air flows out from the hot air discharge port 48 of the metal bristle holder 22. Also if there is a gap between the through-hole 46 and the bristles 24A are also hot air from the gap flows out.

[0026]

The roll brush 18 at the time of use, the hair has a main body portion 10 is wound into a roll brush 18, curled hair, or with a hair habit, or fix the hair habit. Some of this time the warm air flows from the hot air passage 32 on the outside of the metal bristles holding member 22, and the remaining warm air flowing out from the hot air discharge port 48. Hair held in this order winding a metal bristles holding body 22 and bristles 24A will be hit a sufficient amount of warm air, hair heating is promoted.

[0027]

Also since the metallic bristle holder 22 is made of metal, heat from being heated by the entering hot air on the inner surface, hair is wound around here by heat transfer from the surface of the metallic bristles holder 22 it is. Therefore, the heating of the hair will be further promoted, thereby improving the efficiency of such hair curl.

[0028]

10 dryer of the main body portion 18 roll brush as Carl dryer 20 shaft 22 cylindrical cover to become a metal bristle holder 24 bristles connected body 24A bristles 24B connecting part Of 26 base-side connecting portion 30 shaft framework part 32, 44 hot air passage, 34 base side of the cylindrical portion 40 deflection plate 46 bristles through-hole 48 hot air discharge port

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CLAIMS JP2013059580

1.

And long cylindrical cover to one end connecting direction blowoff said warm air to the hot air outlet port, such as a dryer, and a bristles held in at least a portion of the cover, outwardly from the root vicinity of said bristles in Carl dryer was set to blow out warm air, A shaft member for discharging toward the cover inner surface of the warm air from the outer periphery from a connected base to said air outlet a hollow shape which extends toward the distal end of the inner cover, And a metallic bristles holding body comprising at least a portion of said cover, The a through hole in the bristle holder for holding by penetrating the bristles from the inside, said a shaft body warm air is guided from the outer peripheral blown from between the bristles leads to hair warm air discharge port is formed there, Carl dryer, characterized in that.

2.

Shaft is three-dimensional framework structure with gradually reduced in diameter toward the distal end, wherein the deflection plate for guiding the projecting said warm air from the inside of the shaft body outward in hot air outlet of the bristles holder is fixed from the outer periphery Carl dryer of claim 1.

3.

The cover is a cylindrical roll brush, the roll brush has a cylindrical metal bristles holder and the through-hole and the hot air outlet of the bristles is supported is formed on the shaft body, the base of the plurality of bristles and a bristles connecting body obtained by connecting, The bristles coupling body curl dryer according to claim 1 or 2, connecting portion is held bristles protrude outwardly through said through hole of between the inner surface of the metallic bristles holding body and the shaft body

4.

Bristles connecting body is obtained by connecting side by side along a plurality of bristles in a straight line, a plurality of bristles connected bodies plurality each of the connecting portion is provided along the longitudinal direction on the outer periphery of the shaft of the longitudinal rib and the cylindrical bristle Karl dryer according to claim 3 which is held between the inner surface of the holding body.

5.

The outer peripheral side of all the deflector approaches the inner surface of the metal bristles holder, the center axis side of the shaft body in order from the inner diameter side of the deflection plates the inner diameter side of the deflection plate positioned at the tip end of the shaft is positioned proximally Carl dryer of claim 1, which is displaced.

6.

Warm air discharge port, while a and curling dryer according to claim 4 which is plurally formed along the longitudinal direction of the shaft to the deflection plates of the bristles connecting body.

7.

Cover is a blow brush having bristles in a part of the circumferential direction, the blow brush, the cover half having an opening formed by cutting a part of the outer peripheral surface in the longitudinal direction, mounted to the opening of the cover half It is curling dryer of claim 1, and a through-hole and made of a metal cross-section semicircular warm air is guided from the shaft body and leads out warm air discharge port is formed bristles holder passing the bristles.

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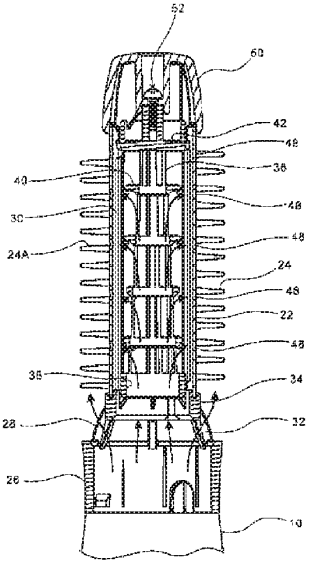
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FA15　GA01

(54)【発明の名称】カールドライヤー

(57)【要約】
【課題】ロールブラシやブローブラシを用いて髪をカールしたり髪癖をとったりして髪を整える際に髪全体に温風が円滑に当たり、また広い範囲の髪を適切に加熱してカールなどの癖付けがし易くし髪を整え易くする。
【解決手段】吹き出し口に接続された基部からカバー２２内を先端に向かって伸びる中空形状であってその外周から温風をカバー２２内面に向かって吐出する軸体２０と、カバー２２の少なくとも一部となる金属製ブリッスル保持体２２とを備え、ブリッスル保持体２２にはブリッスル２４Ａを内側から貫通させて保持する貫通孔４６と、軸体２０の外周からカバー２２内面に導かれる温風をブリッスル２４Ａの間から吹き出して髪に導く温風吐出口４８とが形成されている。
【選択図】図６



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【特許請求の範囲】
【請求項１】
ドライヤなどの温風吹き出し口に一端が接続され前記温風吹き出し方向に長い筒状のカバーと、このカバーの少なくとも一部に保持されたブリッスルとを備え、前記ブリッスルの根本付近から外側に向かって温風を吹き出すようにしたカールドライヤーにおいて、
前記吹き出し口に接続された基部から前記カバー内を先端に向かって伸びる中空形状であってその外周から前記温風をカバー内面に向かって吐出する軸体と、
前記カバーの少なくとも一部となる金属製ブリッスル保持体とを備え、
前記ブリッスル保持体には前記ブリッスルを内側から貫通させて保持する貫通孔と、前記軸体の外周より導かれる温風を前記ブリッスルの間から吹き出して髪に導く温風吐出口とが形成されている、
ことを特徴とするカールドライヤー。
【請求項２】
軸体は先端に向かって次第に縮径した立体骨組み構造であり、その外周から外側に突出し前記温風を軸体の内側からブリッスル保持体の温風吐出口に導く偏向板が固定されている請求項１のカールドライヤ。
【請求項３】
前記カバーは円筒状のロールブラシであり、このロールブラシは、ブリッスルの貫通孔と温風吐出口とが形成され軸体に支持された円筒状の金属製ブリッスル保持体と、複数のブリッスルの基部を連結したブリッスル連結体とを備え、
この金属製ブリッスル保持体の内面と前記軸体との間に前記ブリッスル連結体の連結部が保持されブリッスルが前記貫通孔を貫通して外側に突出している請求項１または２のカールドライヤー。
【請求項４】
ブリッスル連結体は複数のブリッスルを直線に沿って並べて連結したものであり、複数のブリッスル連結体はそれぞれの連結部が軸体の外周に長手方向に沿って設けた複数の縦リブと円筒状ブリッスル保持体の内面との間に保持されている請求項３のカールドライヤー。
【請求項５】
全ての偏向板の外周側は金属製ブリッスル保持体の内面に接近し、軸体の先端側に位置する偏向板の内径側が基部側に位置する偏向板の内径側より順に軸体の中心軸側に変位している請求項１のカールドライヤー。
【請求項６】
温風吐出口は、各ブリッスル連結体の間でかつ偏向板の間に軸体の長手方向に沿って複数形成されている請求項４のカールドライヤー。
【請求項７】
カバーは周方向の一部にブリッスルを有するブローブラシであり、このブローブラシは、外周面の一部を長さ方向に切り欠いた開口を有するカバー半体と、このカバー半体の開口に装着され前記ブリッスルを通す貫通孔と軸体から導かれる温風を外へ導く温風吐出口とが形成された横断面半円弧状の金属製ブリッスル保持体とを備える請求項１のカールドライヤー。
【発明の詳細な説明】
【技術分野】
【０００１】
この発明は、髪に温風を吹き付けながら髪をカールしたり髪を癖付けしたり、髪を整えたりするために用いるカールドライヤーに関するものである。
【背景技術】
【０００２】
この種のカールドライヤーには、円筒状の毛巻き胴外周から全周囲方向にブリッスルが放射状に突出したロールブラシや、円筒状カバーの一部をその長手方向に切り欠いた開口

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にブリッスルを設けたブローブラシが知られている。そしてこれらのブリッスルの根本付近から温風を外側に吹き出させ髪に当てながら髪をカールしたり、髪癖を付けたり、髪癖ととったりして、髪を整えるものである。

【０００３】

特許文献１には、毛巻き胴３全体を合成樹脂製としてここに多数のブリッスル１１を一体に形成し、ブリッスル１１の根本付近の間に複数の温風孔１２を形成したものが開示されている。ここにこの毛巻き胴３の内側には、基部をドライヤなどの温風吹き出し口に接続した軸体２を通し、この軸体２の外周に形成した軸方向に長い溝１０と、毛巻き胴３の内面との間に温風の通路を形成し、この溝１０を通して温風を温風孔１２に導くものである。

【０００４】

特許文献２には、固定内筒５４の外側にブリッスルを一体に形成したブラシ体５５を設け、固定内筒５４内に導かれる温風を、これらの外周に開口する通気口２２、６４から髪に導くロールブラシＡ１が記載されている（段落００３７、００５３、図４、６）。

【先行技術文献】

【特許文献】

【０００５】

【特許文献１】特開平７－１３６０１３号公報

【特許文献２】特開２００７－１０５１４４号公報

【発明の概要】

【発明が解決しようとする課題】

【０００６】

これら従来のものは、ブリッスルを保持する手巻き胴、あるいはブラシ体が合成樹脂で成形され、また温風の吹き出し位置は吐出口に限定されている。このため、温風が当たる髪の位置が限定され、髪全体を均一に加熱することができない。また一部の髪が加熱の不足によりカールや癖付けがしにくく、髪全体を能率良く整えることが困難であるという問題があった。

【０００７】

この発明はこのような事情に鑑みなされたものであり、ロールブラシやブローブラシを用いて髪をカールしたり髪癖をとったりして髪を整える際に髪全体に温風が円滑に当たり、また広い範囲の髪を適切に加熱してカールなどの癖付けがし易くし髪を整え易くしたカールドライヤーを提供することを目的とする。

【課題を解決するための手段】

【０００８】

この発明によればこの目的は、ドライヤなどの温風吹き出し口に一端(基部)が接続され前記温風吹き出し方向に長い筒状のカバーと、このカバーの少なくとも一部に保持されたブリッスルとを備え、前記ブリッスルの根本付近から外側に向かって温風を吹き出すようにしたカールドライヤーにおいて、前記吹き出し口に接続された基部から前記カバー内を先端に向かって伸びる中空形状であってその外周から前記温風をカバー内面に向かって吐出する軸体と、前記カバーの少なくとも一部となる金属製ブリッスル保持体とを備え、前記ブリッスル保持体には前記ブリッスルを内側から貫通させて保持する貫通孔と、前記軸体の外周からカバー内面に導かれる温風を前記ブリッスルの間から吹き出して髪に導く温風吐出口とが形成されている、ことを特徴とするカールドライヤー、により達成される。

【発明の効果】

【０００９】

この発明によれば、軸体はその外周から前記温風をカバー内面に向かって吐出する一方、軸体を囲むカバーの少なくとも一部を金属製のブリッスル保持体とし、このブリッスル保持体の貫通孔にブリッスルを内側から通して保持し、軸体の外周よりカバーの内面に向かって導かれる温風をブリッスルの間から吹き出して髪に導く温風吐出口とを形成したから、軸体の外周からブリッスル保持体の内面に温風が能率良く導かれ、ブリッスル保持体

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やカバーに巻きつけられた髪に温風が能率良く当たり、髪を加熱することができる。またブリッスル保持体は金属製であってその内面に軸体外周から吹き出す温風が当たるので、ブリッスル保持体全体が十分に加熱され、この表面に巻きつけられた髪が能率良く加熱される。このため髪のカールや癖取りが能率良くできる。

【図面の簡単な説明】

【００１０】

【図１】本発明の一実施例であるロールブラシを用いたカールドライヤの斜視図

【図２】そのロールブラシ部分の側面図

【図３】同じく図２におけるIII－III線断面図

【図４】同じくロールブラシの先端側から見た平面図

【図５】図２におけるロールブラシの底面図

【図６】ロールブラシ部の側断面図

【図７】同じくロールブラシ部の分解斜視図

【図８】軸体の側面図（Ａ）と右側面図（Ｂ）と平面図（Ｃ）

【図９】ブリッスル連結体の側面図（Ａ）と右側面図（Ｂ）と平面図（Ｃ）

【発明を実施するための形態】

【００１１】

軸体は先端に向かって次第に縮径した立体骨組み構造とし、その外周から外側に突出し前記温風を軸体の内側からブリッスル保持体の温風吐出口に導く偏向板を固定しておくのが望ましく、このようにすれば軸体の一端（基部）から流入した温風をこれらの偏向板によって円滑にブリッスル保持体の内面に導くことができる（請求項２）。

【００１２】

この場合に、全ての偏向板の外周側の縁は金属製ブリッスル保持体の内面に接近させ、軸体の先端側に位置する偏向板の内径側を基部側に位置する偏向板の内径側より順に軸体の中心軸側に変位させることにより、軸体内から外側への温風の流れを軸方向に均一化しかつ円滑にして、ブラシの長手方向に温風の吐出を一層均等化することができる（請求項５）。

【００１３】

前記カバーは円筒状のロールブラシとすることができ、このロールブラシは、ブリッスルの貫通孔と温風吐出口とが形成され軸体に支持された円筒状の金属製ブリッスル保持体と、複数のブリッスルの基部を連結したブリッスル連結体とを備え、この金属製ブリッスル保持体の内面と前記軸体との間に前記ブリッスル連結体の連結部を保持してブリッスルを前記貫通孔を貫通して外側に突出させる構成とすることができる（請求項３）。

【００１４】

この場合には、ブリッスル連結体は複数のブリッスルを直線に沿って並べて連結したものとし、複数のブリッスル連結体はそれぞれの連結部が軸体の外周に長手方向に沿って設けた複数のリブと円筒状ブリッスル保持体の内面との間に保持することができる（請求項４）。すなわち円筒状ブリッスル保持体の内面からブリッスルを貫通孔に貫通させてブリッスル連結体を円周に沿って並べ、この状態で各ブリッスル連結体を軸体のリブに沿わせて軸体をブリッスル保持体内に進入させることにより組み立てることができ、組み立て性がよい。

【００１５】

円筒状ブリッスル保持体に設ける温風吐出口は、各ブリッスル連結体の間でかつ偏向板の間（軸体の長手方向に離れた偏向板の間）に軸体の長手方向に沿って複数形成するのがよい（請求項６）。温風吐出口は軸体の長手方向に長い形状にすれば、その開口面積を大きくして温風の吐出を一層円滑にすることができる。なおこの温風吐出口は円形であっても良い。また、ブリッスルが通る貫通孔は、ブリッスルの基部の径よりも大きくしてブリッスルと貫通孔の間隙からも温風が外へ流出するようにすれば、髪に導かれる温風の吐出位置がさらに増えることになり、髪に導かれる温風が一層均一化される。

【００１６】

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カバーは周方向の一部にブリッスルを有するブローブラシであってもよい。この場合は、外周面の一部を長さ方向に切り欠いた開口を有するカバー半体と、このカバー半体の開口に装着され前記ブリッスルを通す貫通孔と軸体から導かれる温風を外へ導く温風吐出口とが形成された横断面半円弧状（雨樋状）の金属製ブリッスル保持体とを備える構成とすることができる（請求項７）。

【実施例１】

【００１７】

図１に示すカールドライヤーは、ロールブラシを用いたものである。この図において、符号１０はドライヤの本体部であり、この本体部１０の略円筒状のグリップ兼用のケース１２の中には電動送風ファン、ヒータ（共に図示せず）などが収容され、外面に設けたスイッチ１４の手動操作によってこれらをオンオフ制御することができる。なおスイッチ１４に近接してロックボタン１６が設けられ、このロックボタン１６は後記するロールブラシ１８を着脱する際に用いるものである。ケース１２の上端は円形の開口であり、ここにロールブラシ１８が接続され、この開口からヒータで暖められた温風が流出する。

【００１８】

ロールブラシ１８は図７、８に示す軸体２０と、金属製ブリッスル保持体２２と、ブリッスル連結体２４などを組み合わせたものである。軸体２０は、その基部側にあって前記ケース１２の開口に接続される円筒状の連結部２６と、この連結部２６より小径で複数の（６本の）脚部２８によって軸方向に離して接続された軸体骨組み部３０とを樹脂（例えばＰＣ、ポリカーボネートなど）で一体に形成したものである。従ってこれらの脚部２８の間に温風を軸体骨組み部３０の外側に導く温風通路３２が形成される。

【００１９】

軸体骨組み部３０は図７、８に示すように、その基部側の円筒部３４の内側に間隙をあけてリブによって固定された内リング３６から先端に向かって次第に縮径した立体骨組み構造である。すなわち、軸方向に平行に伸びる６本の縦リブ３８と、これらの縦リブ３８を所定間隔ごとに繋ぎ本発明の偏向板となる環状リブ４０と、縦リブ３８の先端に固定された先端蓋部４２とを有する。ここに縦リブ３８は軸体骨組み部３０の中心から放射方向に薄い板状であり、縦リブ３８と環状リブ４０の間に軸体骨組み部３０の内側から外側に開く開口である温風通路４４が形成される。

【００２０】

また縦リブ３８の 幅、すなわち軸体骨組み部３０の中心から放射方向の幅は、基部側（内リング３６側）が狭く、先端蓋部４２側に向かって次第に（段階的に）広くなっている（図８（Ｂ）参照）。縦リブ３８の外側縁は金属製ブリッスル保持体２２との間に保持されるブリッスル連結体２４を内側から保持するようにその幅が設定されている。すなわちブリッスル連結体２４は、図７、９に示すように、一列に並ぶブリッスル２４Ａを連結部２４Ｂによって一体形成し連結したものである。このブリッスル連結体２４は適度な柔軟性を有する合成樹脂、例えばＴＰＥ（熱可塑性エラストマー）で作られる。前記縦リブ３８の外縁は、ブリッスル２４Ａと反対側の連結部２４Ｂの裏面に形成した凹溝２４Ｃ（図９（Ｃ）参照）に係合し、縦リブ３８は図３に示すように金属製ブリッスル保持体２２との間に連結部２４Ｂを保持するものである。

【００２１】

ここに金属製ブリッスル保持体２２は、本発明の筒状のカバーとなるものであって、金属（アルミニュームや銅などの熱伝導性が良い金属が望ましい。）の円筒を軸に沿って２分割した形状に形成したものであり、分割した半円筒状半体２２Ａ、２２Ａの対向縁は内側（内径側）に折曲されたフランジ部２２Ｂとなっている。これら半体２２Ａには、図２、７に示すように、ブリッスル２４Ａが貫通する貫通孔４６と温風吐出口４８とが適宜数開口している。貫通孔４６はブリッスル連結体のブリッスル２４Ａに対応して軸方向に直線上に配列されている。温風吐出口４８は、これらの貫通孔４６の配列直線の間に適宜数開口されている。

【００２２】

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またこれらの半体２２Ａは、フランジ部２２Ｂを互いに突き合わせることにより円筒状になる。一方前記軸体２０の軸体骨組み部３０には、図３に示すように、縦リブ３８の間にあって縦リブ３８と平行で対向する２枚一組のフランジ挟持用リブ４６が周方向の対称位置にそれぞれ１組ずつ一体に形成されている。対向する２枚のフランジ挟持用リブ４６は、金属製ブリッスル保持体２２の各半体２２Ａに設けたフランジ部２２Ｂを突き合わせた状態で、重ね合わせたフランジ部２２Ｂ、２２Ｂを挟んで保持する。

【００２３】

各半体２２Ａは、予めブリッスル連結体２４のブリッスル２４Ａを貫通孔４６に内側から貫通させた状態で、図６、７から明らかなように、その下縁を軸体骨組み部３０の円筒部３４の上縁に形成した凹溝に係合し、その上縁を軸体骨組み部３０の先端蓋部４２に固定されるキャップ５０に係合させて固定する。すなわち各半体２２Ａのフランジ部２２Ｂを突き合わせて軸体骨組み部３０のフランジ挟持用リブ４６の間に挿入する。この時各ブリッスル連結体２４の連結部２４の凹溝２４Ｃを縦リブ３８に係合させながら、各半体２２Ａを軸体骨組み部３０に組み付ける。なおキャップ５０は、その中心に上方から差し込んだタッピングネジ５２を先端蓋部４２のボス部に螺入することにより固定される。

【００２４】

前記偏向板４０は、この実施例では図６に示すように軸体骨組み部３０の長手方向に４段階に設けられている。軸体骨組み部３０の縦リブ３８は、内縁（中心側の縁）が先端に向かって次第に中心側に変位しているから、偏向板４０の内縁も先端側のものが段階的に中心側に伸びることになる。このため軸体骨組み部３０の中に流入した温風は、各段階の偏向板４０に順次当たって、軸体骨組み部３０の温風通路４４から外周側へ導かれる。

【００２５】

このロールブラシ１８は、円筒状の連結部２６をドライヤーの本体部側の温風吹き出し口に接続し、スイッチ１４の操作により温風を吹き出させる。温風の一部は図６に矢印で示すように、温風通路３２を通って金属製ブリッスル保持体２２の外側に流れ、残りの大部分は軸体骨組み部３０の基部側の円筒部３４を通って軸体骨組み部３０の中に流れる。軸体骨組み部３０の中に入った温風は、流れ方向に順次内側へ内縁が伸びる各段階の偏向板４０によって外側に順次偏向され温風通路４４を通って金属製ブリッスル保持体２２の内面に導かれる。従って温風の吐出量は、ロールブラシ１８の長手方向に均等化される。この温風は金属製ブリッスル保持体２２の温風吐出口４８から外に流出する。また貫通孔４６とブリッスル２４Ａとの間に間隙がある場合は、この間隙からも温風が外に流出する。

【００２６】

このロールブラシ１８を使用する時には、本体部１０を持って髪をロールブラシ１８に巻きつけて、髪をカールしたり、髪癖を付けたり、髪癖を直したりする。この時温風の一部は温風通路３２から金属製ブリッスル保持体２２の外側に流れ、残りの温風は温風吐出口４８から外に流れる。このため金属製ブリッスル保持体２２に巻き付きかつブリッスル２４Ａに保持された髪に十分な量の温風が当たることになり、髪の加熱が促進される。

【００２７】

また金属製ブリッスル保持体２２は金属製であるから、その内面に入った温風により加熱されるから、ここに巻き付いている髪はこの金属製ブリッスル保持体２２の表面からの伝熱によっても加熱される。従って髪の加熱は一層促進され、髪のカールなどの能率が向上する。

【符号の説明】

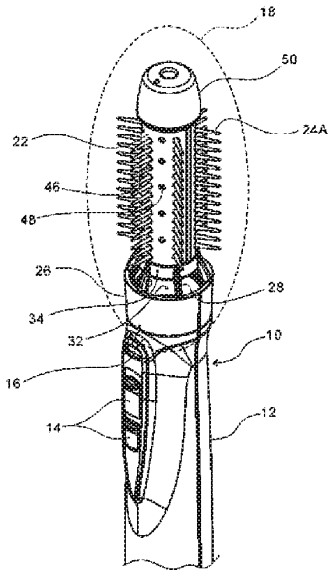
【００２８】

１０　ドライヤーの本体部
１８　カールドライヤーとしてのロールブラシ
２０　軸体
２２　筒状のカバーとなる金属製ブリッスル保持体
２４　ブリッスル連結体

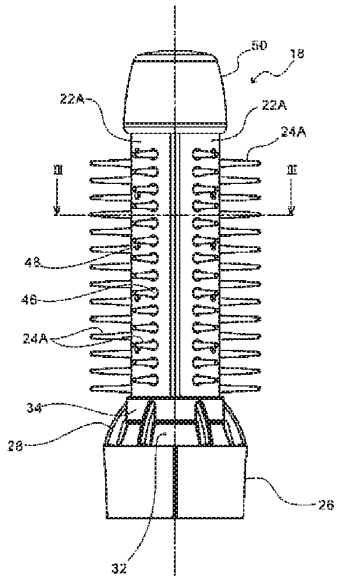
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２４Ａ　ブリッスル
２４Ｂ　連結部
２６　基部側の連結部
３０　軸体骨組み部
３２、４４　温風通路、
３４　基部側の円筒部
４０　偏向板
４６　ブリッスル貫通孔
４８　温風吐出口

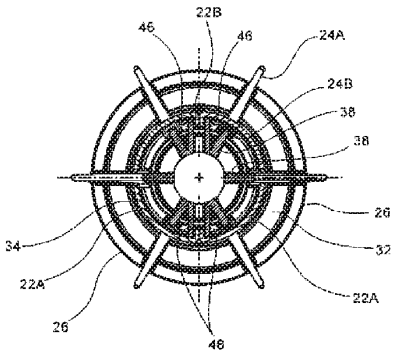
【図１】



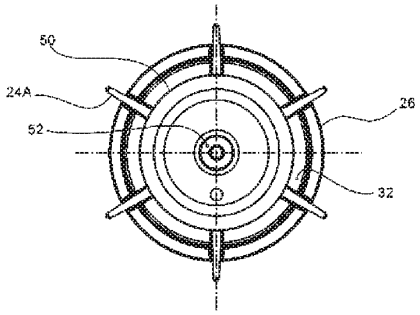
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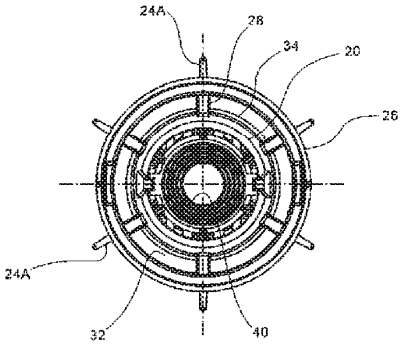
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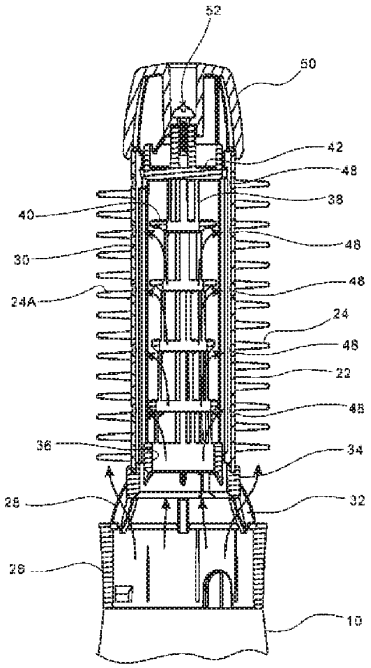
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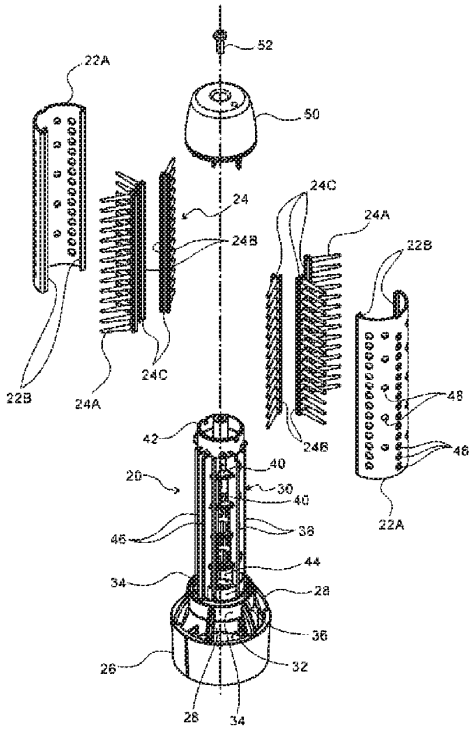
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【図６】

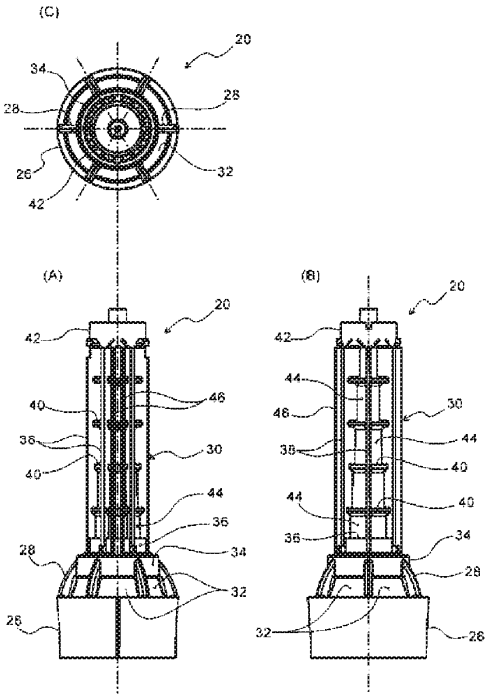


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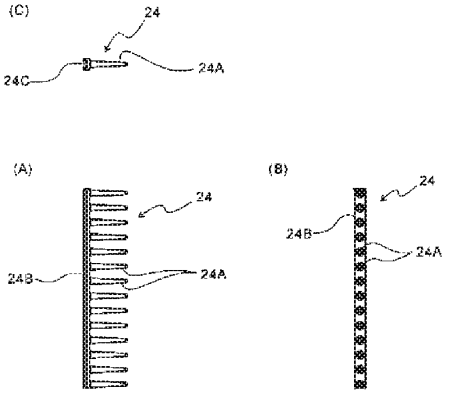


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【図８】


(C)
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34
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28
26
32
42
(A)
20
42
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40
36
30
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44
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34
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(B)
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48
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38
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【図９】


(C)
24
24C
24A
(A)
24
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24A
(B)
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24B
24A

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ABSTRACT EP2823726

A hair accessory device for blowing, including, - a diffusion tube (21) elongated axis which includes: - an open end (22) to adapt the hairdressing device and the opposite end (23) being at least partly closed, - between the matching end (22) and the opposite end (23), a diffusion chamber (25) of the air shaft, - lateral openings (27) for diffusion of air arranged in the peripheral wall (26) of the diffusion chamber (25), - means (30) of the air deflector disposed inside the diffusion chamber (25) according to the invention, the deflecting means (30) comprise at least one annular deflector (31, 32, 33) including a central opening (35). The invention also provides a hairdressing apparatus equipped with such an accessory.

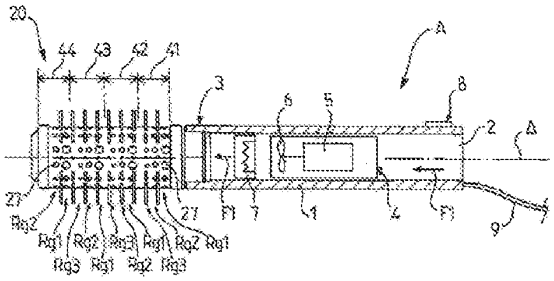


FIG.1

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DESCRIPTION EP2823726

[0001]

The present invention relates to the technical field of hair dryers and, in particular, hand electric hair dryers used by professional and / or individuals. In a preferred but non-exclusive application, the invention relates to blowers brushes.

[0002]

A hand blower will generally include an elongate tubular body which is open at its two ends one of which defines an air inlet and the other an air outlet adapted to carry a removable accessory or not. The tubular body contains a motorized fan unit comprising a propeller integral with the drive shaft of an electric motor. Most often the tubular body has dimensions adapted to form a grip handle and enable its taking direct labor. The tubular body is further equipped with a connecting cord to the power line as well as the electric motor operation control organs. During operation of the hair dryer, the fan motor assembly draws air through the entrance at the back of the tubular body for discharging the output by at the front of the latter. Generally, the blower comprises, inside the tubular body, downstream of the propeller means for electrically heating the supply air.

[0003]

To allow shaping of the hair during their drying, the blower is fitted with a tubular accessory comprising on its periphery the air diffusion openings blown and optionally bristles and / or pimples. In order, to ensure as efficient drying as possible by getting a good air distribution through the orifices of the accessory, the brush uses a motorized fan unit high power, for example in the order of 1000W. Similarly, to encourage this good distribution, a patent application JP2013059580 proposed to incorporate within the tubular accessory of the air deflection means including an axial hub bearing radial fins directing the air blown towards the diffusion openings.

[0004]

Such blower generally satisfactory as regards its primary function of hair drying. However, if the quality of the air distribution is observed, it is clear that notwithstanding the power of the engine blower air is not spread evenly over the length of the accessory and the temperature Supply air is also not uniform. Moreover, such a blower present the drawback of being particularly noisy which induces fatigue when its use extended by a professional or a nuisance to the user and those around him.

[0005]

It therefore appeared the need for a new type of accessory that offers superior air broadcast quality than existing accessories to eventually be able to reduce the power of blowing or heating while getting drying performance at least equivalent to that of blowers brushes according to the prior art.

[0006]

To achieve these objectives, the invention relates to a hair accessory device for blowing including: an elongated diffusion tube of axis Δ that includes: an open end of adaptation on the hairdressing device and the opposite end being at least partially closed, between the adapter tip and the opposite end, a diffusion chamber with the air of axis Δ, side openings the air diffusion arranged in the peripheral wall of the diffusion chamber, air deflection means disposed within the diffusion chamber.

[0007]

According to the invention, the accessory is characterized in that the deflection means comprise at

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least one annular baffle including a central opening and the outer circumference of each annular deflector is in contact with the peripheral wall.

[0008]

The implementation of an annular baffle including a central opening, that is to say an open deflector and devoid of obstacles in its center, ensures a better homogeneity of the distribution of the air blown on the length of the diffusion chamber without causing pressure losses such as those resulting deflection means according to JP2013059580 request. Thus, output rate equivalent accessory, it becomes possible to reduce the power of the motor-fan group of hairdressing device with the accessory of the invention and therefore the noise generated by said Barber device.

[0009]

According to one characteristic of the invention, when the accessory comprises a deflector, the passage section of the side openings Released arranged after said baffle decreases from one opening to the other in the direction F1 of the flow of air . This can be repeated after each deflector when the accessory has several. This combination deflector followed, in the direction of passage of air, by a tapered section (preferably reduced when in combination with an annular deflector) openings improves the homogeneity of the distribution of the air blown over the length of the diffusion chamber without inducing losses.

[0010]

According to one characteristic of the invention, the central opening of each deflector has a circular shape.

[0011]

According to another characteristic of the invention, the central opening of each deflector is coaxial with the axis Δ of the diffusion chamber.

[0012]

According to a preferred embodiment of the invention feature of the invention, the deflection means comprise at least two spaced annular baffles to each other along axis Δ. Implementation of a plurality of baffles homogenizes the diffusion of air along the diffusion chamber.

[0013]

According to a variant of this preferred embodiment, the passage section of the central opening of the baffles decreases with an annular deflector the annular deflector assembly as claimed in the direction of flow of the air from the entrance. This variant allows to maintain the homogeneity of the distribution compensating for losses.

[0014]

According to another variant of the preferred embodiment, the annular baffles divide the diffusion chamber length compartments as measured parallel to the axis Δ substantially equal. This variant also allows to maintain the homogeneity of the distribution compensating for losses.

[0015]

According to yet another variant of the preferred embodiment, the annular baffles divide the diffuser chamber into compartments and for the same compartment, the passage section of the distribution openings decreases from one opening to the other in the direction F1 the flow of air.

[0016]

According to another characteristic of the preferred embodiment, two consecutive annular baffles are linked by at least one spacer. This variant facilitates the establishment of annular baffles in the assembly of the accessory according to the invention.

[0017]

In a variant of this characteristic, each strut is located in contact with the inner face of the peripheral wall and has a shape complementary to the latter. This variant allows to limit or even eliminate the influence of spacers on the flow of air in the diffusion chamber.

[0018]

According to one characteristic of the invention, each annular baffle includes a central opening bordered by an annular wall which extends to the inner face of the peripheral wall. Preferably but not exclusively, the outer edge of the annular wall is in contact with the inner surface of the peripheral wall. This provision limits or prevents the passage of air between the deflector ring and the peripheral wall so as to reduce the operating noise.

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[0019]

In a variation of this feature, the face, called the downstream of the annular wall, facing the end of adjustment, each annular deflector converges towards the central opening. Thus, the side facing the adapter tip diverges from the central opening towards the peripheral wall so as to gradually influence the direction of flow of air to reduce pressure drops and air noise. The divergent nature shall be construed as opposed to a flat surface which extend perpendicularly to the axis Δ and the air flow from the central opening to the peripheral wall. Thus, the entry oriented face may for example have a frusto-pyramidal shape with the apex oriented in the adaptation tip.

[0020]

According to another variant of this feature, the face, called the downstream of the annular wall directed towards the tip of adaptation, each baffle is concave. Such a concave shape optimizes the progressive inflection of the air flow so as to best reduce pressure losses. By concave, it should be understood that the side facing the adapter tip has, in axial cross-section, an arc shape having the recess is oriented adaptation tip. Thus, at the central opening, the tangent to the side facing the end of adjustment can be substantially parallel to the axis Δ whereas at the peripheral wall, the tangent to the side facing the end of adjustment may be substantially normal to the axis Δ. The concave nature of the side facing the end of adaptation confers a form and a function to annular deflector scoop.

[0021]

According to one characteristic of the invention, the radius of curvature of the face, called the downstream end facing the adaptation of the annular wall of the annular baffles increases with an annular deflector to the next annular deflector in the direction of flow air from the end of adjustment. This increased radius allows in particular to compensate for losses in the diffusion chamber and optimize the uniformity of diffusion.

[0022]

According to one characteristic of the invention, the outer surface of the peripheral wall has a cylindrical shape of axis Δ revolution.

[0023]

According to another characteristic of the invention, the diffusion openings are distributed over the length and circumference of the peripheral wall. Preferably but not exclusively, the diffusion openings are evenly distributed over the peripheral wall.

[0024]

According to the invention the diffusion openings may have different shapes. Thus, the diffusion openings may be circular or oval. The diffusion openings may also have an elongated or oblong shape oriented parallel or inclined with respect to axis Δ. The diffusion openings may also have a polygonal shape such as triangular or square. Note that the openings of distribution of a same accessory can have all the same shape and size or, conversely, have different shapes and / or sizes.

[0025]

According to yet another feature of the invention, the accessory comprises bristles and / or pins extending radially outwardly from the peripheral wall.

[0026]

The invention also provides a hair blowing apparatus comprising: a hollow body which is open to said outlet end and which comprises an air inlet, a motor-fan unit arranged in the hollow body between the inlet and the outlet and adapted to draw air through the entry and discharge through the outlet. According to the invention the apparatus comprises a hair accessory according to the invention the adjustment end is connected to the outlet end of the hollow body.

[0027]

According to a feature of the hairdressing apparatus according to the invention, the accessory is designed to be movable in axial rotation on itself. It is for example driven by a gearmotor.

[0028]

Of course, the various characteristics, variations and forms of implementation of the method according to the invention may be combined with each other in various combinations to the extent that they are not incompatible or mutually exclusive of the other.

[0029]

In addition, various other features of the invention emerge from the annexed description given with reference to drawings which illustrate a non-limiting embodiment of an apparatus and a hair accessory

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according to the invention. Figure 1 is a schematic elevation partially broken a hair blowing device according to the invention. Figure 2 is a schematic perspective view of an accessory according to the invention fitted to the hairdressing device shown in Figure 1. Figure 3 is a cut-away schematic perspective view of the accessory shown in Figure 2. Figure 4 is a schematic perspective view of deflection means equipping the accessory shown in Figures 2 and 3. Figure 5 is a diagrammatic axial section of the deflection means illustrated in Figure 4. Note that in these figures the structural and / or functional common to the different variants can have the same references.

[0030]

A hair blowing device according to the invention as shown in Figure 1 and generally designated by the reference A, comprises a hollow elongated body 1 extending along a longitudinal axis Δ. The hollow body 1 comprises an air inlet 2 located, in the example shown, at the rear of the body 1. The hollow body 1 also comprises, at its front, an outlet end 3 of the air. The hairstyle A device also includes a motor-fan unit 4 between the input 2 and output 3 and adapted to draw air through the inlet 2 and the discharge through the outlet 3 as shown by the arrows F1 . The motor-fan unit 4 comprises an electric motor 5 whose drive shaft is secured to a propeller or turbine 6. According to the illustrated example, hairdressing apparatus A also comprises, downstream of the fan motor assembly 4 relative to the direction F1 of air circulation, electrical means 7 for heating the air.

The motor-fan unit 4 and 7 the heating means are then controlled by control means 8 accessible from the outside of the apparatus A. The electrical supply for the hair-styling device A is performed by means of a cord 9 grid connection being understood that a device according to the invention may also include a battery power supply system.

[0031]

In the example shown, the body 1 has a generally cylindrical shape adapted to enable handling of the hair A device located in a region, for example, in the motor-fan group 4.

[0032]

The embodiment of such an apparatus A hairstyle is well known to the skilled person so it is not necessary to describe it in more detail here.

[0033]

The outlet end 3 of the hairstyle A device is further adapted to receive an accessory device 20 for hair blowing according to the invention. As seen more particularly in Figures 2 and 3, the accessory 20 includes a diffusion tube 21 elongate axis Δ. The diffusion tube 21 has an open end 22 for adaptation on the hairdressing apparatus A at its outlet end 3. The adapter tip 22 of the accessory 20 and the outlet end 3 of the unit A are preferably adapted to allow a rotational movement of the accessory itself about the axis Δ. The accessory 20 can then be adapted to removably or not the hairdressing apparatus A.

[0034]

The end 23, opposite the adjustment end 22 of the diffusion tube 21 is at least in part, in this case completely sealed by, in the example shown, a plug 24 attached to the end 23 . The diffusion tube 21 then defines a diffusion chamber 25 which is located between the ends 22 and 23 and which extends along the axis Δ presenting, in this case, a rotationally symmetrical with respect to the latter.

[0035]

The diffusion chamber 25 comprises a peripheral wall 26 that has an outer surface having a cylindrical shape of axis Δ revolution. The peripheral wall 26 comprises openings 27 for air diffusion that provide communication between the external environment and the diffusion chamber 25. The openings 27 are lateral and are spread over the length and the diffusion chamber rim 25 so as to ensure as uniform distribution as possible around the diffusion chamber 25, air blown by the hairdressing apparatus AT.

[0036]

The accessory 20 also comprises bristles or barbs 28 extending radially outwardly of the peripheral wall 26 of the diffusion chamber 25 so that the accessory 20 form what is commonly known as a cylindrical brush. The pins 28 are in this case aligned in axial rows which are located between axial rows of side apertures 27.

[0037]

To ensure good distribution of the air blown by the hairdressing apparatus A through the accessory 20 the latter also comprises deflection means 30 which are arranged inside the diffusion chamber 25 as the shows more particularly in Figure 3.

[0038]

According to the invention, the deflection means 30 include at least one annular deflector open at its center. In the example shown, the deflecting means comprise three annular baffles 31, 32, 33 open in

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their center. The outer circumference of each annular deflector 31, 32, 33 is in contact with the peripheral wall 26, thus preventing the air blown from passing between the outer wall of the baffle and the peripheral wall 26 of the diffusion chamber 25. Of course, the deflection means 30 may comprise more or less than three annular baffles.

[0039]

Each annular deflector 31, 32, 33 comprises a central circular opening 35 which is bordered by an annular wall 36 which extends to the internal face 37 of the peripheral wall 26 as shown in Figure 3. In the example shown and to ensure axial immobilisation in rotation of the annular baffles 31, 32, 33 in the diffusion chamber 25, the inner face 37 carries axial ribs 38 and the outer edge 39 of each annular wall 36 has notches 40 of a shape complementary to that of axial ribs 38.

[0040]

In the example illustrated, the three annular baffles 31, 32, 33 divide the plenum chamber 25 into four compartments 41, 42, 43, 44 which each have a length substantially equal to 1. To set this length, each annular deflector is linked to the next deflector by at least one, in this case, three spacers 45 arranged at 120 ° from each other. Each spacer 45 is located in contact with the internal face 37 of the peripheral wall 26 and has a shape complementary to the latter. In the example shown each spacer 45 has a shape complementary to the gutter shape of each axial rib 38. This form of gutter imparts some rigidity to the struts 45 allowing a forcible engagement of the deflecting means 30 inside the diffusion chamber 25 by the end 23 before introduction of the plug 24. Moreover, the first annular baffle 31 also includes three feet 46 of similar shape to that of the spacers 45.

The annular baffle 31 is said first in that it is located downstream of the other deflectors in the direction of airflow. The feet 46 are intended to bear against an inner flange 47 of the diffusion chamber 25 during the establishment of the deflection means 30 in the latter.

[0041]

In the example shown, the central opening 35, each annular deflector 31 to 33, has a circular shape. In addition, the S31 passage section of the central opening 35 of the first annular baffle 31 is greater than the passage section S32 of the central baffle 35 of the second annular opening 32 which is itself greater than the section of S33 passage of the central opening 35 of the third deflector 33. The annular baffles 31-33 are referred to as first and second third with respect to the flow direction of the air blown by the hairdressing device A as shown by the arrows F1. Thus, the passage section of the central opening 35 of the deflectors 31-33 decreases by a deflector baffle to the next in the direction F1 of the flow of air from the open end 22 of adjustment. In this context and in the circular central apertures 35, this feature results in a reduction of the diameter of the central opening 35 of a deflector baffle to the next in the direction F1 of flow of the air from the adaptation end 22.

This reduction in flow sections S31 to S33 helps guide the flow of air to the outside.

[0042]

In the example illustrated, the face 50 of each annular wall 36 oriented towards the adapter end 22, also called the downstream face 50, converges towards the central opening 35. In this case, each downstream face 50 has, furthermore, a concave shape. Here, each downstream face 50 has in cross section as seen more particularly in Figure 5 an arc shape corresponding to an arc. Furthermore, the R31 radius of curvature of the downstream face 50 of the first annular baffle 31 is lower than R32 radius of curvature of the downstream face 50 of the second annular baffle 32 while the R32 radius of curvature that the downstream face 50 of the second deflector ring 32 is itself smaller than the radius of curvature R33 of the downstream face 50 of the third annular baffle 33. Thus, the radius of curvature of the downstream face of each annular deflector increases with an annular deflector to the other in the direction F1 of the flow of air from the adapter end 22.

This provision limits the pressure drop inside the diffusion chamber 25 accompanying the change of direction of the airflow.

[0043]

Moreover, in the example shown, mailing openings 27 have a circular shape and are arranged in annular rows spaced along the diffusion chamber 25. The centers of the diffusion openings 27 of the same row are then situated in the same plane perpendicular to the axis Δ and the distribution apertures of the same row have the same diameter.

[0044]

Furthermore, in order to homogenize the output of the air flow on each of the diffusion openings 27 within each compartment 41 to 44, the diameter of the diffusion openings 27 decreases from one row to the other, in the direction F1 airflow for diffusion openings 27 and the corresponding rows located in relation to the same compartment. Thus, for the same compartment, the distribution of apertures of the passage section 27 decreases from one opening to the other in the direction F1 of the air flow. In this case and as shown in Figure 1, the peripheral wall 26 includes three rows Rg1, Rg2 and Rg3, diffusion openings 27 in relation to the first compartment 41. The diffusion openings 27 in the first row Rg1 have a diameter greater than that of diffusion openings in the second Rg2 which 27 broadcast the openings have a diameter greater than that of the distribution openings of the third Rg3.

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[0045]

It is the same for the second 42 and third compartments 43 each having three rows of diffusion openings 27 and to the fourth compartment 44 has two rows of diffusion openings 27.

[0046]

It should be noted that in the example shown the first Rg1 ranks have diffusion openings 27 whose diameter is substantially equal from one compartment to the other, it is the same for the second row as well as, where optionally, the third Rg3 ranks.

[0047]

According to the embodiment described above in relation to the figures; diffusion openings have a circular shape. However, according to the invention the diffusion openings may have any other shape such as, for example, oblong.

[0048]

Of course, various other modifications can be made to a hair accessory device for blowing the invention under the claims.

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CLAIMS EP2823726

1.

Hair accessory device for blowing including: - A diffusion tube (21) elongate Δ axis which comprises: - An open end (22) adaptation of the hairdressing device and the opposite end (23) being at least partly closed, - Between the matching end (22) and the opposite end (23), a diffusion chamber (25) with the air of axis Δ, - Side openings (27) of air distribution arranged in the peripheral wall (26) of the diffusion chamber (25) - Means (30) of the air deflector disposed inside the diffusion chamber (25), characterized in thatthe deflection means (30) comprise at least one annular deflector (31, 32, 33) comprising a central opening (35), the outer circumference of each annular deflector (31, 32, 33) being in contact with the peripheral wall (26).

2.

Accessory according to claim 1, characterized in thatthe lateral section of passage of diffusion openings (27) arranged after the deflector (31) decreases from one opening to the other in the direction F1 of the air flow.

3.

Accessory according to one of the preceding claims, characterized in thatthe deflection means (30) comprise at least two annular baffles (31, 32, 33) spaced from each other along axis Δ.

4.

Accessory according to claim 3, characterized in thatthe flow area of the central opening (35) of the baffles decreases with an annular deflector (31) to the annular deflector (32) following in the direction of flow of the air from the entrance.

5.

Accessory according to claim 3 or 4, characterized in thatthe annular baffles (31, 32, 33) divides the diffusion chamber (25) into compartments (41, 42, 43, 44) in length, measured parallel to the axis Δ substantially equal.

6.

Accessory according to one of claims 3 to 5, characterized in thatthe annular baffles (31, 32, 33) divides the diffusion chamber (25) into compartments (41, 42, 43, 44) andin that, for the same compartment, the passage section of the distribution openings (27) decreases from one opening to the other in the direction F1 of the flow of air.

7.

Accessory according to one of claims 3 to 6, characterized in thattwo annular baffles (31, 32, 33) consecutive are linked by at least one spacer (45).

8.

Accessory according to claim 7, characterized in thateach spacer (45) is located in contact with the inner face (37) of the peripheral wall (26) and has a shape complementary to the latter.

9.

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Accessory according to one of the preceding claims, characterized in thatthe opening station (35), each annular deflector (31, 32, 33) is bordered by an annular wall (36) extending to the face inner (37) of the peripheral wall (26).

10.

Accessory according to claim 9, characterized in thatthe face, called the downstream (50) of the annular wall (36) facing the end of adjustment (22) of each annular deflector (31, 32, 33), converges towards the central opening (35).

11.

Accessory according to claim 9 or 10, characterized in that for each annular deflector (31, 32, 33), the face, called the downstream (50) of the annular wall (36) facing the end of adaptation (22) is concave.

12.

Accessory according to one of claims 3 to 7 and Claim 11, characterized in thatthe radius of curvature of the face, called the downstream (50) facing the adapter end of the annular wall (36) of annular baffles (31, 32, 33) increases with an annular deflector to the next annular deflector in the direction (F1) of the flow of air from the adapter end (22)

13.

Accessory according to one of the preceding claims, characterized in thatthe outer surface of the peripheral wall (26) has a cylindrical shape of axis Δ revolution.

14.

Accessory according to one of the preceding claims, characterized in thatthe diffusion openings (27) are distributed over the length and circumference of the peripheral wall (26).

15.

Accessory according to one of the preceding claims, characterized in that it comprises bristles and / or pins (28) extending radially outwardly of the peripheral wall (26).

16.

Hairstyling blowing including: - A hollow body (1) which is open to said outlet end (3) and which comprises an air inlet (2), - A motor-fan unit (4) disposed in the hollow body between the inlet and the outlet and adapted to draw air through the inlet (2) and discharging it through the outlet (3), characterized in that it comprises an accessory (20) according to any preceding claim wherein the adapter end is connected to the outlet end of the hollow body

[1]

Hairdressing device according to the preceding claim, characterized in quel'accessoire (20) is arranged to be movable in axial rotation on itself. 1. Hair accessory device for blowing including: - A diffusion tube (21) elongate Δ axis which comprises: - An open end (22) adaptation of the hairdressing device and the opposite end (23) being at least partly closed, - Between the matching end (22) and the opposite end (23), a diffusion chamber (25) with the air of axis Δ, - Side openings (27) of air distribution arranged in the peripheral wall (26) of the diffusion chamber (25) - Means (30) of the air deflector disposed inside the diffusion chamber (25), the deflecting means (30) comprising at least one annular deflector (31, 32, 33) including a central opening (35), the outer circumference of each annular deflector (31, 32, 33) being in contact with the peripheral wall (26).

characterized in that the lateral distribution openings passage section (27) arranged after the deflector (31) decreases from one opening to the other in the direction F1 of the air flow.

2.

Accessory according to claim 1, characterized in that the deflecting means (30) comprise at least two annular baffles (31, 32, 33) spaced from each other along axis Δ.

3.

Accessory according to claim 2, characterized in that the passage section of the central opening (35) of the baffles decreases with an annular deflector (31) to the annular deflector (32) following in the direction of air flow from the entrance.

4.

Accessory according to claim 2 or 3, characterized in that the annular deflectors (31, 32, 33) divides the diffusion chamber (25) into compartments (41, 42, 43, 44) in length, measured parallel to the axis Δ substantially equal.

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5.

Accessory according to one of claims 2 to 4, characterized in that the annular deflectors (31, 32, 33) divides the diffusion chamber (25) into compartments (41, 42, 43, 44) and in that, for one compartment, the passage section of the distribution openings (27) decreases from one opening to the other in the direction F1 of the flow of air.

6.

Accessory according to one of claims 2 to 5, characterized in that two annular baffles (31, 32, 33) consecutive are linked by at least one spacer (45).

7.

Accessory according to Claim 6, characterized in that each spacer (45) is located in contact with the inner face (37) of the peripheral wall (26) and has a shape complementary to the latter.

8.

Accessory according to one of the preceding claims, characterized in that the central opening (35), each annular deflector (31, 32, 33) is bordered by an annular wall (36) extending up to the inner face (37) of the peripheral wall (26).

9.

Accessory according to claim 8, characterized in that the face, called the downstream (50) of the annular wall (36) facing the end of adjustment (22) of each annular deflector (31, 32, 33) , converges towards the central opening (35).

10.

Accessory according to claim 8 or 9, characterized in that for each annular deflector (31, 32, 33), the face, called the downstream (50) of the annular wall (36) facing the end of adaptation (22) is concave.

11.

Accessory according to one of Claims 2 to 6 and claim 10, characterized in that the radius of curvature of the face, called the downstream (50) facing the adapter end of the annular wall (36) of the deflectors annular (31, 32, 33) increases with an annular deflector to the next annular deflector in the direction (F1) of the flow of air from the adapter end (22).

12.

Accessory according to one of the preceding claims, characterized in that the outer surface of the peripheral wall (26) has a cylindrical shape of axis Δ revolution.

13.

Accessory according to one of the preceding claims, characterized in that the distribution openings (27) are distributed over the length and circumference of the peripheral wall (26).

14.

Accessory according to one of the preceding claims, characterized in that it comprises bristles and / or pins (28) extending radially outwardly of the peripheral wall (26).

15.

Hairstyling blowing including: - A hollow body (1) which is open to said outlet end (3) and which comprises an air inlet (2), - A motor-fan unit (4) disposed in the hollow body between the inlet and the outlet and adapted to draw air through the inlet (2) and discharging it through the outlet (3), characterized in that it comprises an accessory (20) according to any preceding claim wherein the adapter end is connected to the outlet end of the hollow body.

16.

Hairdressing device according to the preceding claim, characterized in that the accessory (20) is adapted to be movable in axial rotation on itself.

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(54) Accessoire pour appareil de coiffure soufflant et appareil équipé d'un tel accessoire

(57) L'invention concerne un accessoire pour appareil de coiffure soufflant, comprenant :
- un tube de diffusion (21) allongé d'axe Δ qui comprend :
- une extrémité ouverte (22) d'adaptation sur l'appareil de coiffure et l'extrémité opposée (23) étant en partie au moins obturée,
- entre l'extrémité d'adaptation (22) et l'extrémité opposée (23), une chambre de diffusion (25) de l'air d'axe Δ,
- des ouvertures latérales (27) de diffusion de l'air aménagées dans la paroi périphérique (26) de la chambre de diffusion (25),
- des moyens (30) de déflection de l'air disposés à l'intérieur de la chambre de diffusion (25)

Selon l'invention, les moyens de déflection (30) comprennent au moins un déflecteur annulaire (31, 32, 33) comprenant une ouverture centrale (35).

L'invention concerne également un appareil de coiffure équipé d'un tel accessoire.

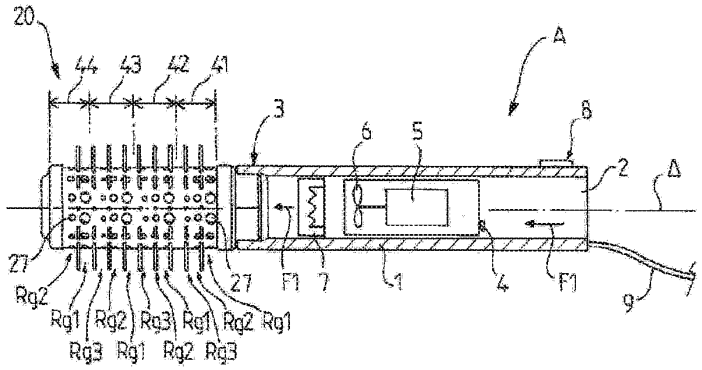


FIG.1

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Description

[0001] La présente invention concerne le domaine technique des sèche-cheveux et, notamment, des sèche-cheveux électriques à main utilisés par les professionnels et/ou les particuliers. Dans une application préférée mais non exclusive, l'invention se rapporte aux brosses soufflantes.

[0002] Une brosse soufflante à main comprend généralement un corps tubulaire allongé qui est ouvert à ses deux extrémités dont l'une définit une entrée d'air et l'autre une sortie d'air adaptée pour porter un accessoire amovible ou non. Le corps tubulaire renferme un groupe moto-ventilateur qui comprend une hélice solidaire de l'arbre d'entraînement d'un moteur électrique. Le plus souvent le corps tubulaire présente des dimensions adaptées pour former une poignée de préhension et permettre sa prise en main directe. Le corps tubulaire est, en outre, équipé d'un cordon de raccordement au réseau électrique ainsi que d'organes de commande du fonctionnement du moteur électrique. Pendant le fonctionnement du sèche-cheveux, le groupe moto ventilateur aspire de l'air par l'entrée située à l'arrière du corps tubulaire pour le refouler par la sortie située à l'avant de ce dernier. Généralement, la brosse soufflante comprend, à l'intérieur du corps tubulaire, en aval de l'hélice des moyens de chauffage électrique de l'air soufflé.

[0003] Pour permettre une mise en forme des cheveux au cours de leur séchage, la brosse soufflante est équipée d'un accessoire tubulaire comprenant sur sa périphérie des ouvertures de diffusion de l'air soufflé ainsi qu'éventuellement des poils et/ou des picots. Afin, d'assurer un séchage aussi efficace que possible en obtenant une bonne diffusion de l'air par les orifices de l'accessoire, la brosse met en oeuvre un groupe moto-ventilateur de forte puissance par exemple de l'ordre de 1000W. De même, en vue de favoriser cette bonne diffusion, une demande de brevet JP2013059580 a proposé d'incorporer à l'intérieur de l'accessoire tubulaire des moyens de déflection de l'air comprenant un moyeu axial qui porte des ailettes radiales orientant l'air soufflé vers les ouvertures de diffusion.

[0004] Une telle brosse soufflante donne globalement satisfaction en ce qui concerne sa fonction première de séchage des cheveux. Toutefois, si l'on observe la qualité de la diffusion de l'air, il apparaît clairement que nonobstant la puissance du groupe moto-ventilateur l'air ne se diffuse pas de manière homogène sur la longueur de l'accessoire et que la température de l'air soufflé n'est également pas uniforme. De plus, une telle brosse soufflante présente l'inconvénient d'être particulièrement bruyante ce qui induit une fatigue lors de son usage prolongé par un professionnel ou encore une nuisance pour l'utilisateur et son entourage.

[0005] Il est donc apparu le besoin d'un nouveau type d'accessoire qui offre une qualité de diffusion de l'air supérieure à celle des accessoires existants afin d'éventuellement pouvoir réduire la puissance de soufflage voire de chauffage tout en obtenant des performances de séchage au moins équivalentes à celle des brosses soufflantes selon l'art antérieur.

[0006] Afin d'atteindre ces objectifs, l'invention concerne un accessoire pour appareil de coiffure soufflant, comprenant :

- un tube de diffusion allongé d'axe Δ qui comprend :
  - une extrémité ouverte d'adaptation sur l'appareil de coiffure et l'extrémité opposée étant en partie au moins obturée,
  - entre l'extrémité d'adaptation et l'extrémité opposée, une chambre de diffusion de l'air d'axe Δ,
  - des ouvertures latérales de diffusion de l'air aménagées dans la paroi périphérique de la chambre de diffusion,
- des moyens de déflection de l'air disposés à l'intérieur de la chambre de diffusion.

[0007] Selon l'invention, l'accessoire est caractérisé en ce que les moyens de déflection comprennent au moins un déflecteur annulaire comprenant une ouverture centrale et la circonférence externe de chaque déflecteur annulaire est en contact avec la paroi périphérique.

[0008] La mise en oeuvre d'un déflecteur annulaire comprenant une ouverture centrale, c'est-à-dire un déflecteur ouvert et dépourvu d'obstacle en son centre, permet d'assurer une meilleure homogénéité de la diffusion de l'air soufflé sur la longueur de la chambre de diffusion sans induire les pertes de charge telles que celles qui résultent des moyens de déflection selon la demande JP2013059580. Ainsi, à débit en sortie de l'accessoire équivalent, il devient possible de réduire la puissance du groupe moto-ventilateur de l'appareil de coiffure équipé de l'accessoire selon l'invention et donc le bruit généré par ledit appareil de coiffure.

[0009] Selon une caractéristique de l'invention, quand l'accessoire comporte un déflecteur, la section de passage des ouvertures latérales de diffusion agencées après ledit déflecteur diminue d'une ouverture à l'autre dans le sens F1 de l'écoulement de l'air. Ceci peut être reproduit après chaque déflecteur quand l'accessoire en possède plusieurs. Cette combinaison déflecteur suivi, dans le sens de passage de l'air, par une section évolutive (de préférence diminuée quand en combinaison avec un déflecteur annulaire) des ouvertures améliore l'homogénéité de la diffusion de l'air soufflé sur la longueur de la chambre de diffusion sans induire les pertes de charge.

[0010] Selon une caractéristique de l'invention, l'ouverture centrale de chaque déflecteur possède une forme circulaire.

[0011] Selon une autre caractéristique de l'invention, l'ouverture centrale de chaque déflecteur est coaxiale à l'axe Δ de la chambre de diffusion.

[0012] Selon une forme préférée de réalisation de l'invention caractéristique de l'invention, les moyens de dé-

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flection comprennent au moins deux déflecteurs annulaires distants l'un de l'autre le long de l'axe Δ. La mise en oeuvre de plusieurs déflecteurs permet d'homogénéiser la diffusion de l'air le long de la chambre de diffusion.

[0013] Selon une variante de cette forme préférée de réalisation, la section de passage de l'ouverture centrale des déflecteurs diminue d'un déflecteur annulaire au déflecteur annulaire suivant dans le sens d'écoulement de l'air à partir de l'entrée. Cette variante permet de maintenir l'homogénéité de la diffusion en compensant les pertes de charge.

[0014] Selon une autre variante de la forme préférée de réalisation, les déflecteurs annulaires divisent la chambre de diffusion en compartiments de longueur, mesurée parallèlement à l'axe Δ, sensiblement égale. Cette variante permet également de maintenir l'homogénéité de la diffusion en compensant les pertes de charge.

[0015] Selon encore une autre variante de la forme préférée de réalisation, les déflecteurs annulaires divisent la chambre de diffusion en compartiments et, pour un même compartiment, la section de passage des ouvertures de diffusion diminue d'une ouverture à l'autre dans le sens F1 de l'écoulement de l'air.

[0016] Selon encore une caractéristique de la forme préférée de réalisation, deux déflecteurs annulaires consécutifs sont liés par au moins une entretoise. Cette variante permet de faciliter la mise en place des déflecteurs annulaires lors de l'assemblage de l'accessoire selon l'invention.

[0017] Selon une variante de cette caractéristique, chaque entretoise est située au contact de la face interne de la paroi périphérique et possède une forme complémentaire de cette dernière. Cette variante permet de limiter voire d'annuler l'influence des entretoises sur l'écoulement de l'air dans la chambre de diffusion.

[0018] Selon une caractéristique de l'invention, chaque déflecteur annulaire comprend une ouverture centrale bordée par une paroi annulaire qui s'étend jusqu'à la face interne de la paroi périphérique. De manière préférée mais non exclusive, le bord externe de la paroi annulaire est en contact avec la surface interne de la paroi périphérique. Cette disposition limite voire empêche le passage de l'air entre le déflecteur annulaire et la paroi périphérique de manière à réduire les bruits de fonctionnement.

[0019] Selon une variante de cette caractéristique, la face, dite aval, de la paroi annulaire, orientée vers l'extrémité d'adaptation, de chaque déflecteur annulaire, converge vers l'ouverture centrale. Ainsi, la face orientée vers l'extrémité d'adaptation diverge de l'ouverture centrale vers la paroi périphérique de manière à infléchir progressivement la direction d'écoulement de l'air pour réduire les pertes de charges et les bruits aériens. Le caractère divergent doit s'interpréter par opposition à une surface plane qui s'étendrait perpendiculairement à l'axe Δ et au flux d'air depuis l'ouverture centrale jusqu'à la paroi périphérique. Ainsi, la face orientée vers l'entrée peut, par exemple, présenter une forme tronc-pyramidale avec le sommet orienté vers l'extrémité d'adaptation.

[0020] Selon une autre variante de cette caractéristique, la face, dite aval, de la paroi annulaire orientée vers l'extrémité d'adaptation, de chaque déflecteur, est concave. Une telle forme concave permet d'optimiser la progressivité de l'inflexion du flux d'air de manière à réduire au mieux les pertes de charges. Par concave, il convient d'entendre que la face orientée vers l'extrémité d'adaptation possède, en section droite axiale, une forme arquée dont le creux est orienté vers l'extrémité d'adaptation. Ainsi, au niveau de l'ouverture centrale, la tangente à la face orientée vers l'extrémité d'adaptation peut être sensiblement parallèle à l'axe Δ tandis qu'au niveau de la paroi périphérique, la tangente à la face orientée vers l'extrémité d'adaptation peut être sensiblement normale à l'axe Δ. Le caractère concave de la face orientée vers l'extrémité d'adaptation confère une forme et une fonction d'écope au déflecteur annulaire.

[0021] Selon une caractéristique de l'invention, le rayon de courbure de la face, dite aval, orientée vers l'extrémité d'adaptation de la paroi annulaire des déflecteurs annulaires augmente d'un déflecteur annulaire au déflecteur annulaire suivant dans le sens d'écoulement de l'air à partir de l'extrémité d'adaptation. Cette augmentation du rayon de courbure permet, notamment, de compenser les pertes de charge dans la chambre de diffusion et d'optimiser l'uniformité de la diffusion.

[0022] Selon une caractéristique de l'invention, la surface externe de la paroi périphérique possède une forme cylindrique de révolution d'axe Δ.

[0023] Selon une autre caractéristique de l'invention, les ouvertures de diffusion sont réparties sur la longueur et le pourtour de la paroi périphérique. De manière préférée mais non exclusive, les ouvertures de diffusion sont uniformément réparties sur la paroi périphérique.

[0024] Selon l'invention les ouvertures de diffusion peuvent présenter différentes formes. Ainsi, les ouvertures de diffusion peuvent présenter une forme circulaire ou ovale. Les ouvertures de diffusion peuvent également présenter une forme allongée ou oblongue orientée parallèlement ou inclinée par rapport à l'axe Δ. Les ouvertures de diffusion peuvent aussi posséder une forme polygonale telle que triangulaire ou carrée. Il est à noter que les ouvertures de diffusion d'un même accessoire peuvent présenter toutes les mêmes formes et dimensions ou, au contraire, posséder des formes et/ou des dimensions différentes.

[0025] Selon encore une autre caractéristique de l'invention, l'accessoire comprend des poils et/ou des picots s'étendant radialement à l'extérieur de la paroi périphérique.

[0026] L'invention concerne également un appareil de coiffure soufflant comprenant :

- un corps creux qui est ouvert à une extrémité dite de sortie et qui comprend une entrée d'air,
- un groupe moto-ventilateur disposé dans le corps creux entre l'entrée et la sortie et adapté pour aspirer

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l'air par l'entrée et le refouler par la sortie.

Selon l'invention l'appareil de coiffure comprend un accessoire conforme à l'invention dont l'extrémité d'adaptation est raccordée à l'extrémité de sortie du corps creux.

[0027] Selon une caractéristique de l'appareil de coiffure conforme à l'invention, l'accessoire est destiné à être mobile en rotation axiale sur lui même. Il est par exemple entrainé par un motoréducteur.

[0028] Bien entendu, les différentes caractéristiques, variantes et formes de mise en oeuvre du procédé selon l'invention peuvent être associées les unes avec les autres selon diverses combinaisons dans la mesure où elles ne sont pas incompatibles ou exclusives les unes des autres.

[0029] Par ailleurs, diverses autres caractéristiques de l'invention ressortent de la description annexée effectuée en référence aux dessins qui illustrent une forme non limitative de réalisation d'un appareil et d'un accessoire de coiffure conforme à l'invention.

- La figure 1 est une élévation schématique partiellement arrachée d'un appareil de coiffure soufflant selon l'invention.
- La figure 2 est une perspective schématique d'un accessoire selon l'invention équipant l'appareil de coiffure illustré à la figure 1.
- La figure 3 est une perspective schématique arrachée de l'accessoire illustré à la figure 2.
- La figure 4 est une perspective schématique de moyens de déflection équipant l'accessoire illustré aux figures 2 et 3.
- La figure 5 est une coupe axiale schématique des moyens de déflection illustrés à la figure 4.

Il est à noter que sur ces figures les éléments structurels et/ou fonctionnels communs aux différentes variantes peuvent présenter les mêmes références.

[0030] Un appareil de coiffure soufflant selon l'invention, tel qu'illustré à la figure 1 et désigné dans son ensemble par la référence A, comprend un corps creux allongé 1 s'étendant selon un axe longitudinal Δ. Le corps creux 1 comprend une entrée d'air 2 située, selon l'exemple illustré, à l'arrière du corps 1. Le corps creux 1 comprend également, au niveau de son avant, une extrémité de sortie 3 de l'air. L'appareil de coiffure A comprend aussi un groupe moto-ventilateur 4 situé entre l'entrée 2 et la sortie 3, et adapté pour aspirer l'air par l'entrée 2 et le refouler par la sortie 3 comme le montrent les flèches F1. Le groupe moto-ventilateur 4 comprend un moteur électrique 5 dont l'arbre d'entraînement est solidaire d'une hélice ou turbine 6. Selon l'exemple illustré, l'appareil de coiffure A comprend aussi, en aval du groupe moto-ventilateur 4 par rapport au sens F1 de circulation de l'air, des moyens électriques 7 de chauffage de l'air. Le groupe moto-ventilateur 4 et les moyens de chauffage 7 sont alors pilotés par des moyens de commande 8 accessibles à partir de l'extérieur de l'appareil A. L'alimentation électrique de l'appareil de coiffure A est effectuée au moyen d'un cordon 9 de raccordement au réseau électrique étant entendu qu'un appareil selon l'invention peut également comprendre un système d'alimentation électrique par batterie.

[0031] Selon l'exemple illustré, le corps 1 présente une forme générale cylindrique adaptée pour permettre une prise en main de l'appareil de coiffure A dans une région située, par exemple, au niveau du groupe moto-ventilateur 4.

[0032] Le mode de réalisation d'un tel appareil de coiffure A est bien connu de l'homme du métier de sorte qu'il n'est pas nécessaire de le décrire ici plus en détail.

[0033] L'extrémité de sortie 3 de l'appareil de coiffure A est en outre adaptée pour recevoir un accessoire 20 pour appareil de coiffure soufflant conforme à l'invention. Comme cela ressort plus particulièrement des figures 2 et 3, l'accessoire 20 comprend un tube de diffusion 21 allongé d'axe Δ. Le tube de diffusion 21 possède une extrémité ouverte 22 d'adaptation sur l'appareil de coiffure A au niveau de son extrémité de sortie 3. L'extrémité d'adaptation 22 de l'accessoire 20 et l'extrémité de sortie 3 de l'appareil A sont de préférence adaptées pour permettre un mouvement de rotation de l'accessoire sur lui-même autour de l'axe Δ. L'accessoire 20 peut alors être adapté de manière amovible ou non sur l'appareil de coiffure A.

[0034] L'extrémité 23, opposée à l'extrémité d'adaptation 22, du tube de diffusion 21 est en partie au moins, dans le cas présent complètement, obturée par, selon l'exemple illustré, un bouchon 24 rapporté sur l'extrémité 23. Le tube de diffusion 21 définit alors une chambre de diffusion 25 qui se trouve située entre les extrémités 22 et 23 et qui s'étend selon l'axe Δ en présentant, dans le cas présent, une symétrie de révolution par rapport à ce dernier.

[0035] La chambre de diffusion 25 comprend une paroi périphérique 26 qui possède une surface externe présentant une forme cylindrique de révolution d'axe Δ. La paroi périphérique 26 comprend des ouvertures 27 de diffusion de l'air qui assurent une communication entre le milieu extérieur et la chambre de diffusion 25. Les ouvertures 27 sont latérales et sont réparties sur la longueur et le pourtour de la chambre de diffusion 25 de manière à assurer une diffusion aussi uniforme que possible, autour de la chambre de diffusion 25, de l'air soufflé par l'appareil de coiffure A.

[0036] L'accessoire 20 comprend également des poils ou des picots 28 qui s'étendent radialement à l'extérieur de la paroi périphérique 26 de la chambre de diffusion 25 de sorte que l'accessoire 20 forme ce qui est communément appelé une brosse cylindrique. Les picots 28 sont dans le cas présent alignés en rangées axiales entre lesquelles sont situées des rangées axiales d'ouvertures latérales 27.

[0037] Afin d'assurer une bonne diffusion de l'air soufflé par l'appareil de coiffure A au travers de l'accessoire 20 ce dernier comprend également des moyens de dé-

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flection 30 qui sont disposés à l'intérieur de la chambre de diffusion 25 comme le montre plus particulièrement la figure 3.

[0038] Selon l'invention, les moyens de déflection 30 comprennent au moins un déflecteur annulaire ouvert en son centre. Selon l'exemple illustré, les moyens de déflection comprennent trois déflecteurs annulaires 31, 32, 33 ouverts en leur centre. La circonférence externe de chaque déflecteur annulaire 31, 32, 33 est en contact avec la paroi périphérique 26, évitant ainsi que de l'air soufflé ne passe entre la paroi externe du déflecteur et la paroi périphérique 26 de la chambre de diffusion 25. Bien entendu, les moyens de déflection 30 peuvent comprendre plus ou moins de trois déflecteurs annulaires.

[0039] Chaque déflecteur annulaire 31, 32, 33 comprend une ouverture centrale 35 circulaire qui est bordée par une paroi annulaire 36 qui s'étend jusqu'à la face interne 37 de la paroi périphérique 26 comme le montre la figure 3. Selon l'exemple illustré et afin d'assurer une immobilisation en rotation axiale des déflecteurs annulaires 31, 32, 33 dans la chambre de diffusion 25, la face interne 37 porte des nervures axiales 38 et le bord extérieur 39 de chaque paroi annulaire 36 possède des encoches 40 d'une forme complémentaire à celle des nervures axiales 38.

[0040] Selon l'exemple illustré, les trois déflecteurs annulaires 31, 32, 33 divisent la chambre de diffusion 25 en quatre compartiments 41, 42, 43, 44 qui possèdent chacun une longueur l sensiblement égale. Afin de définir cette longueur, chaque déflecteur annulaire est lié au déflecteur suivant par au moins une, dans le cas présent, trois entretoises 45 disposées à 120° les unes des autres. Chaque entretoise 45 est située au contact de la face interne 37 de la paroi périphérique 26 et présente une forme complémentaire de cette dernière. Selon l'exemple illustré chaque entretoise 45 possède une forme de gouttière complémentaire de la forme de chaque nervure axiale 38. Cette forme de gouttière confère une certaine rigidité aux entretoises 45 permettant un engagement à force des moyens de déflection 30 à l'intérieur de la chambre de diffusion 25 par l'extrémité 23 avant mise en place du bouchon 24. Par ailleurs, le premier déflecteur annulaire 31 porte également trois pieds 46 de forme analogue à celle des entretoises 45. Le déflecteur annulaire 31 est dit premier en ce qu'il est situé en aval des autres déflecteurs par rapport au sens de circulation de l'air. Les pieds 46 sont destinés à venir en appui sur un rebord intérieur 47 de la chambre de diffusion 25 lors de la mise en place des moyens de déflection 30 dans cette dernière.

[0041] Selon l'exemple illustré, l'ouverture centrale 35, de chaque déflecteur annulaire 31 à 33, possède une forme circulaire. De plus, la section de passage S31 de l'ouverture centrale 35 du premier déflecteur annulaire 31 est plus grande que la section de passage S32 de l'ouverture centrale 35 du deuxième déflecteur annulaire 32 qui est elle-même plus grande que la section de passage S33 de l'ouverture centrale 35 du troisième déflecteur 33. Les déflecteurs annulaires 31 à 33 sont qualifiés de premier deuxième et troisième par rapport au sens d'écoulement de l'air soufflé par l'appareil de coiffure A tel qu'indiqué par les flèches F1. Ainsi, la section de passage de l'ouverture centrale 35 des déflecteurs 31 à 33 diminue d'un déflecteur au déflecteur suivant dans le sens d'écoulement F1 de l'air à partir de l'extrémité ouverte d'adaptation 22. Dans le cadre présent et compte tenu de la forme circulaire des ouvertures centrales 35, cette caractéristique se traduit par une réduction du diamètre de l'ouverture centrale 35 d'un déflecteur au déflecteur suivant dans le sens d'écoulement F1 de l'air à partir de l'extrémité d'adaptation 22. Cette diminution des sections de passage S31 à S33 permet de guider le flux d'air vers l'extérieur.

[0042] Selon l'exemple illustré, la face 50 de chaque paroi annulaire 36 orientée vers l'extrémité d'adaptation 22, dite également face aval 50, converge vers l'ouverture centrale 35. Dans le cas présent, chaque face aval 50 présente, de plus, une forme concave. Ici, chaque face aval 50 présente en section droite transversale comme cela ressort plus particulièrement de la figure 5 une forme arquée correspondant à un arc de cercle. Par ailleurs, le rayon de courbure R31 de la face aval 50 du premier déflecteur annulaire 31 est inférieur au rayon de courbure R32 de la face aval 50 du deuxième déflecteur annulaire 32 tandis que le rayon de courbure R32 que la face aval 50 du deuxième déflecteur annulaire 32 est lui-même inférieur au rayon de courbure R33 de la face aval 50 du troisième déflecteur annulaire 33. Ainsi, le rayon de courbure de la face aval de chaque déflecteur annulaire augmente d'un déflecteur annulaire à l'autre dans le sens d'écoulement F1 de l'air à partir de l'extrémité d'adaptation 22. Cette disposition permet de limiter les pertes de charge à l'intérieur de la chambre de diffusion 25 en accompagnant le changement de direction du flux d'air.

[0043] Par ailleurs, selon l'exemple illustré, les ouvertures de diffusion 27 présentent une forme circulaire et sont disposées en rangs annulaires répartis le long de la chambre de diffusion 25. Les centres des ouvertures de diffusion 27 d'un même rang sont alors situés dans un même plan perpendiculaire à l'axe Δ et les ouvertures de diffusion d'un même rang possèdent un même diamètre.

[0044] Par ailleurs, afin d'homogénéiser la sortie du flux d'air sur chacune des ouvertures de diffusion 27, au sein de chaque compartiment 41 à 44, le diamètre des ouvertures de diffusion 27 diminue d'un rang à l'autre, dans le sens d'écoulement F1 de l'air, pour les ouvertures de diffusion 27 et les rangs correspondants situés en relation avec un même compartiment. Ainsi, pour un même compartiment, la section de passage des ouvertures de diffusion 27 diminue d'une ouverture à l'autre dans le sens F1 de d'écoulement de l'air. Dans le cas présent et comme le montre la figure 1, la paroi périphérique 26 comprend trois rangs Rg1, Rg2 et Rg3, d'ouvertures de diffusion 27 en relation avec le premier compartiment 41.

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Les ouvertures de diffusion 27 du premier rang Rg1 possèdent un diamètre supérieur à celui des ouvertures de diffusion du deuxième rang Rg2 dont les ouvertures de diffusion 27 possèdent un diamètre supérieur à celui des ouvertures de diffusion du troisième rang Rg3.

[0045] Il en est de même pour les deuxième 42 et troisième 43 compartiments qui possèdent chacun trois rangs d'ouvertures de diffusion 27, ainsi que pour le quatrième compartiment 44 qui possède deux rangs d'ouvertures de diffusion 27.

[0046] Il doit être noté que selon l'exemple illustré les premiers rangs Rg1 possèdent des ouvertures de diffusion 27 dont le diamètre est sensiblement égal d'un compartiment à l'autre, il en est de même pour les deuxièmes rangs ainsi que pour, le cas échéant, les troisièmes rangs Rg3.

[0047] Selon l'exemple de réalisation décrit précédemment en relation avec les figures ; les ouvertures de diffusion possèdent une forme circulaire. Toutefois, selon l'invention les ouvertures de diffusion peuvent présenter une toute autre forme telle que, par exemple, oblongue.

[0048] Bien entendu, diverses autres modifications peuvent être apportées à un accessoire pour appareil de coiffure soufflant conforme à l'invention dans le cadre des revendications annexées.

Revendications

1. Accessoire pour appareil de coiffure soufflant, comprenant :

   - un tube de diffusion (21) allongé d'axe Δ qui comprend :

     - une extrémité ouverte (22) d'adaptation sur l'appareil de coiffure et l'extrémité opposée (23) étant en partie au moins obturée,
     - entre l'extrémité d'adaptation (22) et l'extrémité opposée (23), une chambre de diffusion (25) de l'air d'axe Δ,
     - des ouvertures latérales (27) de diffusion de l'air aménagées dans la paroi périphérique (26) de la chambre de diffusion (25),

   - des moyens (30) de déflection de l'air disposés à l'intérieur de la chambre de diffusion (25),

   caractérisé en ce que les moyens de déflection (30) comprennent au moins un déflecteur annulaire (31, 32, 33) comprenant une ouverture centrale (35), la circonférence externe de chaque déflecteur annulaire (31, 32, 33) étant en contact avec la paroi périphérique (26).

2. Accessoire selon la revendication 1, **caractérisé en ce que** la section de passage des ouvertures latérales de diffusion (27) agencées après le déflecteur (31) diminue d'une ouverture à l'autre dans le sens F1 de d'écoulement de l'air.

3. Accessoire selon l'une des revendications précédentes, **caractérisé en ce que** les moyens de déflection (30) comprennent au moins deux déflecteurs annulaires (31, 32, 33) distants l'un de l'autre le long de l'axe Δ.

4. Accessoire selon la revendication 3, **caractérisé en ce que** la section de passage de l'ouverture centrale (35) des déflecteurs diminue d'un déflecteur annulaire (31) au déflecteur annulaire (32) suivant dans le sens d'écoulement de l'air à partir de l'entrée.

5. Accessoire selon la revendication 3 ou 4, **caractérisé en ce que** les déflecteurs annulaires (31, 32, 33) divisent la chambre de diffusion (25) en compartiments (41, 42, 43, 44) de longueur, mesurée parallèlement à l'axe Δ, sensiblement égale.

6. Accessoire selon l'une des revendications 3 à 5, **caractérisé en ce que** les déflecteurs annulaires (31, 32, 33) divisent la chambre de diffusion (25) en compartiments (41, 42, 43, 44) et **en ce que**, pour un même compartiment, la section de passage des ouvertures de diffusion (27) diminue d'une ouverture à l'autre dans le sens F1 de l'écoulement de l'air.

7. Accessoire selon l'une des revendications 3 à 6, **caractérisé en ce que** deux déflecteurs annulaires (31, 32, 33) consécutifs sont liés par au moins une entretoise (45).

8. Accessoire selon la revendication 7, **caractérisé en ce que** chaque entretoise (45) est située au contact de la face interne (37) de la paroi périphérique (26) et possède une forme complémentaire de cette dernière.

9. Accessoire selon l'une des revendications précédentes, **caractérisé en ce que** l'ouverture centrale (35), de chaque déflecteur annulaire (31, 32, 33), est bordée par une paroi annulaire (36) qui s'étend jusqu'à la face interne (37) de la paroi périphérique (26).

10. Accessoire selon la revendication 9, **caractérisé en ce que** la face, dite aval, (50) de la paroi annulaire (36), orientée vers l'extrémité d'adaptation (22), de chaque déflecteur annulaire (31, 32, 33), converge vers l'ouverture centrale (35).

11. Accessoire selon la revendication 9 ou 10, **caractérisé en ce que**, pour chaque déflecteur annulaire (31, 32, 33), la face, dite aval, (50) de la paroi annulaire (36) orientée vers l'extrémité d'adaptation (22) est concave.

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12. Accessoire selon l'une des revendications 3 à 7 et la revendication 11, **caractérisé en ce que** le rayon de courbure de la face, dite aval, (50) orientée vers l'extrémité d'adaptation de la paroi annulaire (36) des déflecteurs annulaires (31, 32, 33) augmente d'un déflecteur annulaire au déflecteur annulaire suivant dans le sens (F1) d'écoulement de l'air à partir de l'extrémité d'adaptation (22).

13. Accessoire selon l'une des revendications précédentes, **caractérisé en ce que** la surface externe de la paroi périphérique (26) possède une forme cylindrique de révolution d'axe Δ.

14. Accessoire selon l'une des revendications précédentes, **caractérisé en ce que** les ouvertures de diffusion (27) sont réparties sur la longueur et le pourtour de la paroi périphérique (26).

15. Accessoire selon l'une des revendications précédentes, **caractérisé en ce qu'**il comprend des poils et/ou des picots (28) s'étendant radialement à l'extérieur de la paroi périphérique (26).

16. Appareil de coiffure soufflant comprenant :

- un corps creux (1) qui est ouvert à une extrémité dite de sortie (3) et qui comprend une entrée d'air (2),
- un groupe moto-ventilateur (4) disposé dans le corps creux entre l'entrée et la sortie et adapté pour aspirer l'air par l'entrée (2) et le refouler par la sortie (3),

caractérisé en ce qu'il comprend un accessoire (20) selon l'une des revendications précédentes dont l'extrémité d'adaptation est raccordée à l'extrémité de sortie du corps creux.

17. Appareil de coiffure selon la revendication précédente, **caractérisé en ce que** l'accessoire (20) est destiné à être mobile en rotation axiale sur lui même.

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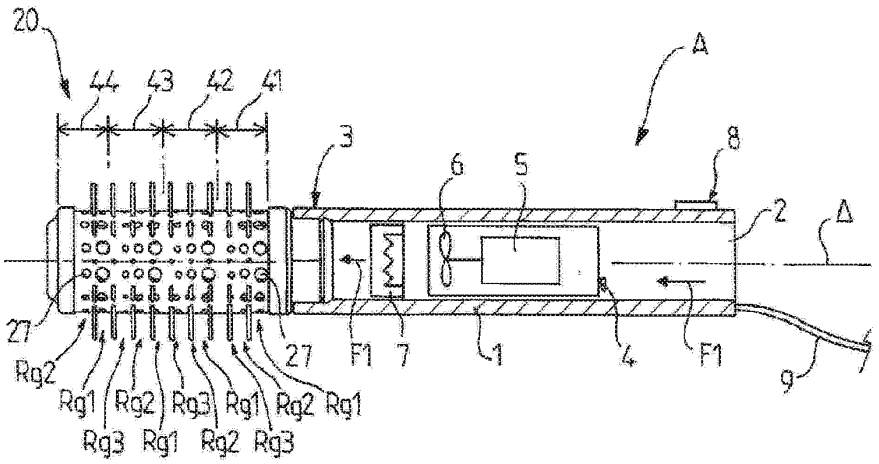


FIG.1

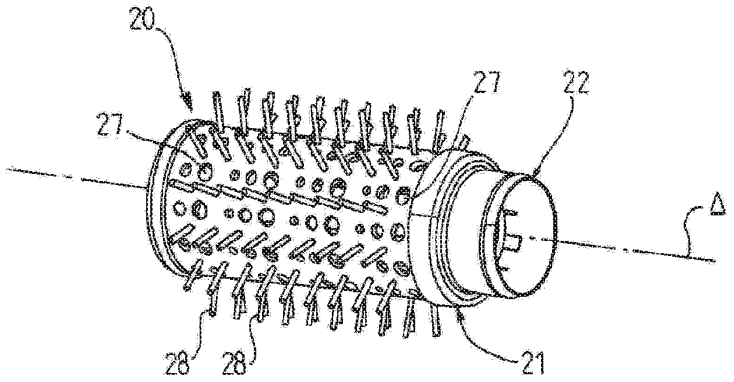


FIG.2

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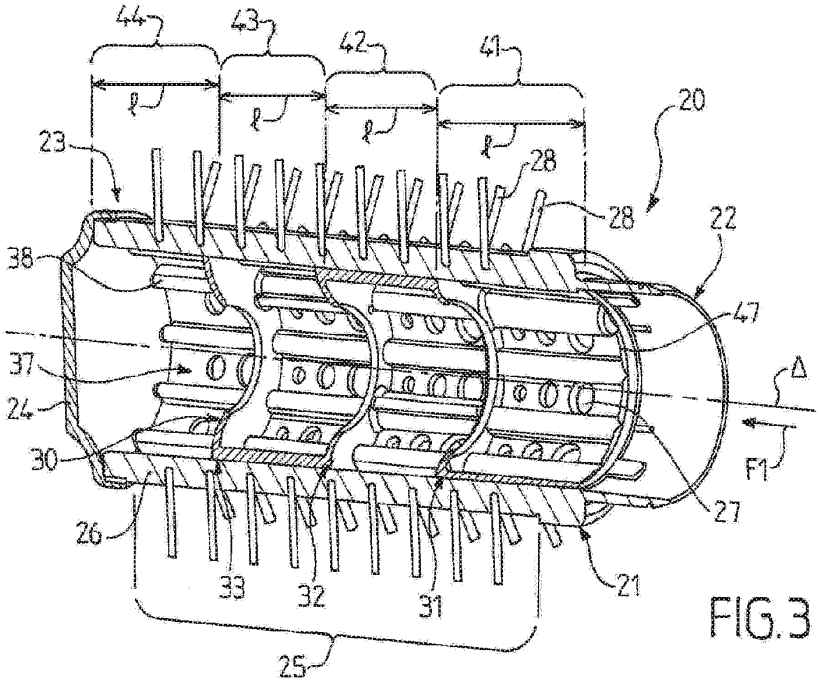


FIG.3

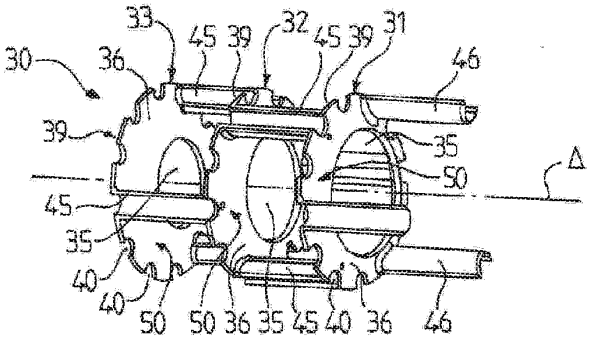


FIG.4

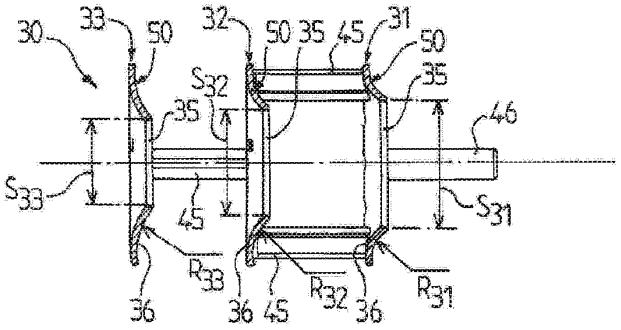


FIG.5

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RAPPORT DE RECHERCHE EUROPEENNE

Numéro de la demande
EP 14 17 5748

DOCUMENTS CONSIDERES COMME PERTINENTS

Catégorie	Citation du document avec indication, en cas de besoin, des parties pertinentes	Revendication concernée	CLASSEMENT DE LA DEMANDE (IPC)
X	GB 2 097 669 A (MATSUSHITA ELECTRIC WORKS LTD) 10 novembre 1982 (1982-11-10) * page 1, ligne 103 - page 3, ligne 5; figures 1-4, 6, 9-10 *	1,9, 13-16	INV. A45D20/50 A45D20/52
A,D	JP 2013 059580 A (IZUMI PROD CO) 4 avril 2013 (2013-04-04) * alinéa [0019] - alinéa [0025]; figures 5-7 *	1,3-5, 7-17	
A	US 6 094 837 A (CANTOR JOSEF [US]) 1 août 2000 (2000-08-01) * figure 2 *	1,13-17	

DOMAINES TECHNIQUES RECHERCHES (IPC)

A45D
A46B

Le présent rapport a été établi pour toutes les revendications

Lieu de la recherche	Date d'achèvement de la recherche	Examinateur
La Haye	31 octobre 2014	Hinrichs, Wiebke

CATEGORIE DES DOCUMENTS CITES

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ANNEXE AU RAPPORT DE RECHERCHE EUROPEENNE RELATIF A LA DEMANDE DE BREVET EUROPEEN NO. EP 14 17 5748

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31-10-2014

Document brevet cité au rapport de recherche	Date de publication	Membre(s) de la famille de brevet(s)	Date de publication
GB 2097669 A	10-11-1982	DE 3213607 A1	25-11-1982
		FR 2504787 A1	05-11-1982
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EPO FORM P0459

Pour tout renseignement concernant cette annexe : voir Journal Officiel de l'Office européen des brevets, No.12/82

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RÉFÉRENCES CITÉES DANS LA DESCRIPTION

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Documents brevets cités dans la description

- JP 2013059580 B **[0003] [0008]**

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DESCRIPTION JPS60100902

[0001]

TECHNICAL FIELD This invention is interchangeably attached to the styling for the dryer, and, to a <sheet, attachment of the styling for the dryer with a styling member such as a roll with a brush or a bottle. In the prior art conventional attachment hairdressing dryer, because of the tendency of the hot air exiting the dryer flows out biased to the hot air outlet at the tip portion of the attachment, it is difficult to uniformly heat the hair during styling work , there is a disadvantage that it takes a long time to become work and inefficiency. Therefore, to increase the electric heater and the capacity of the motor that is furnished to the dryer, more hot in and by supplying a large quantity of hot air to the attachment side, it has been also been attempts to overcome the disadvantages MoeOsamu, these cases in, because the hot air of the multi-leaf at a high temperature to more than necessary from the hot air outlet of the distal end portion of the attachment to flow out, the hair of the user by this hot air there was a defect that spoil too heated. Purpose This invention has been made to solve the defects mentioned above, an object of the hot air from the hot air outlet of attachment to each unit uniformly flows out with a simple configuration, be performed in a short period of time well hairdressing work efficiency This makes it, is to provide an attachment of the novel hair setting dryer is no risk of damage to the hair. in the present invention in order to achieve the structure above object, for hot air Runin direction to the hot air passage is arranged to guide plate suitable number at right angles to the substantially equal intervals, each guide plate the hot air flow human end, along with the put in the hot air passage is on the one plane that forms the Hasufuku with respect to the direction of extension of the hot air passage so as to be gradually narrowed toward the tip, the hot air hot air outflow end at right angles to the guide plate employing the configuration in which disposed on the outlet face. First embodiment will be described below with reference to the first embodiment embodying the present invention the comb attachment in Figure 1-Figure 5. First, briefly explaining the structure of hairdressing dryer 1, 2 an air inlet which is opened at the rear end face of the dryer 1 in Fig. 1, impeller is rotationally driven by a motor 4 3, 5 electric heater, 6 power cord, T is the power switch. 21 is a hot air blower opening which is opened at the tip. And, t or when you turn ON the power switch 1, with Kori impeller 3 is rotated to the motor 4 electric heater 5 is heated by an electric heater 5 is sucked into the outside air in the dryer 1 from the air inlet 2 is heated to become a hot air, it is discharged toward the next described attachment body B from the hot air blowing port 21. Mounting was formed attachment body St- for comb in this embodiment by a cylindrical mounting portion 28 provided at Motomizu at the tip of the dryer 1. is detachably mounted on the tubular portion 29, the engagement (not shown) at the time of use It is held inseparably by means, at the time of non-use is adapted to be separated from the dryer 1 by pressing the desorption button 10 provided in the dryer 1.

Further, Fig. 2, as shown in FIG. 5, the distal end side of the attachment body 8 has a comb attachment portion 30 of the cross section URN U bend down, inside thereof to said hot air blowing port 21 of the dryer 1 along with the hot air passage 32 communicating communication is formed, a pair of clasp 16 before and after is fixed to the back plate 80 the inner surface of the & of the mounting portion 30. Both the clasp 16 and the pair of elastic gripping piece 1B is formed bent, comb 11 between these resilient holding pieces 16B are detachably supported by engagement recess 11 and provided on both side surfaces thereof. On the other hand, attached to the guide plate 14 is equidistant <plurality forming a substantially right angle to the direction of extension of the hot air passage 32 of the attachment body 8 in the base 110 opposite side surfaces of Lil (4 Like in this example), by hot air stream human end of each guide plate 14 is placed on inlet diagonal 13 of the hot air passage 32 (see FIG. 2), attachment body 8 the hot air outflow end of each guide plate 14 at right angles to the guide plate 14 They are arranged in a hot air outlet 12 on the surfaces of the. Then, the hot air passage s2 is adapted to become thinner gradually toward the leading end of the attachment body 8. Therefore, hot air flowed into the hot air passage 32 of the attachment body 8 from the hot air blowing port 21 of the dryer 1 is uniformly shunted by the guide plate 14, at right angles while changing the direction flowing out of the hot air outlet 12. Therefore, by performing the styling work with the attachment for the configured comb as above, <because the outflow along the substantially uniform hot air hidden teeth 11b over the entire length of the sheet 11, to force by <Lil) the hair becomes uniform temperature is heated each part uniformly and evenly. Therefore, unlike the conventional hot air flows out unevenly from the hot air

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outlet 12 of the distal end portion of the comb 11, there is no fear that only the hair of this portion is heated in a short time using a hair dressing evenly Further 2, it is possible to perform efficiently hairdressing work, with this configuration, since the uniform hot air from the hot air outlet 12 of the attachment body 6 flows out, the capacity of the motor 4 and the electric heater 5 of the dryer 1 a can be reduced, respectively as compared with the conventional, there is no fear that too much heat damage to the hair. Moreover, in the comb attachment in this embodiment, as shown in FIG. 8, since the projecting end surface of each guide plate 14 provided over the entire length of the comb 11 is in contact with the inner surface of the side wall of the attachment body 8, it is possible to strongly fix the comb 11 during attachment with a simple structure of only the pair of clasp 16, the comb 11 is also no risk of rattling when in use

Incidentally, if the length of the Konokushi 11 is about 8o Tomo can obtain an excellent hair setting effect by providing five or six guide plate 14. Further, it is provided with the guide plate 14 on both sides of the comb 11 in this embodiment, be formed integrally with the side walls the inner surface of the attachment body B so as to protrude the respective guide plate 14 into a hot air passage 32 good. Next the second embodiment, especially rigid bristle this invention, curly, a second embodiment embodying the short brush attachment used type only for only the hair and the like? It is described with reference to FIG. 6 to eighth FIG. The attachment body 1T of the brush attachment is composed from the working portion 35. forming a substantially rectangular mounting portion 34 and the distal end side forming the base end side of the cylindrical, the interior of these mounting portions 34 and the action @ 35 dryer hot air passage 36 communicating communication is formed in one of the hot air blowing port 2T. Further, the equally flocking 21 is provided on the lower plate 35 and the acting portion 35, the plurality of hot air outlet 1B are columns set along the hot air passage 36. As the upper surface of the lower side plate 35a of the working portion 35 projects to the hot air passage 36 of the attachment body 1T, guide plate of the multiple number (it5 sheets in this embodiment) at right angles to the hot air Runin direction 20 is arranged fixed at regular intervals, along with the hot air stream human end of each guide plate 20 is disposed on the inlet diagonal 19, a hot air outlet 18 and their hot air outlet end at right angles to each guide plate 20 it is arranged on the surface. Then, the hot air passage 36 is adapted to become thinner gradually toward the leading end of the attachment body IT. Thus, more than in the constructed attachment brush like, after the hot air flowing in from the hot air blowing port 21 of the dryer 1 in attachment body IT hot air passage 36 is uniformly shunted by respective guide plates 20, each induction flowing out of the hot air outlet II changes direction at a right angle along the plate 20. Hot air flowing out of the hot air outlet 18 formed in the action portion 35 of the order attachment body 17, since a substantially uniform from the attachment body 170 proximal end portion up to the distal end portion, hair carded into flocked 21 each section it is evenly heated. Therefore, it is possible to perform hairdressing work like the L attachment want the According to a brush attachment of this embodiment in a short time efficiently. Note that if the length of the attachment body 110 acting portion 35 is about 100 111 it is possible to obtain an excellent hair setting efficacy be provided 5-7 sheets of guide plate 20.

The third embodiment embodying the third embodiment Fig. 9 to 11 pinned roll attachment to be used with the invention with reference to FIG Karl finishing or the like of the hair will be described. Attachment body 22 of the pin with roll attachment in this embodiment the mounting portion 38 of larger diameter on the base end side, the tip is the mounted s3B integrally formed is configured from the working section 39. having a cylindrical shape that is closed there. Are large number of implanted so as to project radially bi / 23 for hot air up to extend along the longitudinal direction of the attachment body 22 is outwardly in the working portion 390 a peripheral wall. Said the acting portion 390 a peripheral wall inner surface of the attachment body 22 is fixed (five in this example) a plurality of equally spaced along a circular guide plate 25 in the longitudinal direction of the attachment body 22, their respective guide plate 25 sequentially become a small-diameter What about guide plate 25 of the tip is in the center of. Shunt hole 26 is Toru設 respectively. Meanwhile, in order to uniformly flow out hot air over the entire length of the hot-air outlet port 24 formed in the working portion 39 of the attachment body 22, the length of the hot-air outlet port 24 to M equal parts (M-1) sheets of the guide plate 25 is disposed on the inner surface of the peripheral wall of the working section 39, diameter al to M equally divided Endan area which is calculated the diameter of the shunt hole 26 of each guide plate 25 in the inner diameter aO of the action part 39, Once you have to ct6, the hot air that flows into the hot air passage 4o can be allowed to flow from the hot air outlet 24 and M equally in each guide plate 25. Such diameter dn of each shunt hole 26 can be calculated by the following equation. dn = Ji-1 / 1mdO ····· (1) n = 1.2. ····· (M-1) - shows the proportion of the diameter dn of each shunt hole 26 to the inside diameter aO action part 38 in the case where a hot-air outlet 24 6 equally divided in the following table as an example. Be carried out the styling work with the first table diversion (in the case of 6 equal parts) The value of the pore diameter or more configured role for attachment with a bottle as, hot air of the attachment body 22 from the hot air blowing port 2T of the dryer 1 hot air flowed into the passage 40 is evenly shunted by the respective guiding plate 25 heating, since it is flowing out radially from the hot air outlet 24, a uniform temperature the hair over the entire length of the working portion 39 of the attachment body 22 can do. Therefore it is possible to perform similarly hairdressing work with both Atanchime / bets described above to efficiently short time. The present invention is not limited to the configuration of each embodiment described above, for example, or configured by integrally molding a an attachment body 8 of the comb and <shea 11 in the first embodiment, the first each guide plate 2G in example 2 was extended between the attachment body 220 acting portion 350 both sidewall inner surface, or in detachable from the attachment body 22 and lower plate 35a of the working portion 35 provided with bristles 21, the third or applied to the working portion 350 attachment for a brush with a roll which has been subjected to flocking the peripheral wall outer surface of the attachment body 22 in place of the bi / 23 in the examples, or, dryers and attachment body and the inseparably type which is integrally formed or applied to dryer can also be embodied by arbitrarily changing the various parts of the configuration and shape without departing from the scope of the invention.

According to the present invention As described effect more, by the action of the guide plate which is

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disposed in the hot air passage of the attachment body, since flows out from the hot air outlet in a state in which the hot air flowing from the dryer is diverted to each unit uniformly , it is possible to perform in a short time be efficiently hairdressing work with a simple configuration, it exhibits the excellent effect that there is no risk of damaging too heated hair.

[0002]

Brief description of the drawings

[0003]

FIG. 5 from the first figures are showing a first embodiment embodying the present invention a comb attachment, essential portion cutaway front view Figure 1 is mounted is showing the state, Fig. 2 attachment body and comb longitudinal section mounting showing the configuration of a, FIG. 8 is a bottom view of the attachment body, perspective view of FIG. 4 comb, FIG. 5 is an enlarged sectional view of mu a line of FIG. 2. Figure 6 from FIG. 8 is shows a second embodiment embodying the present invention a brush attachment, Figure 6 is a vertical sectional view of the attachment body, FIG. 7 is a bottom view of the attachment body, the FIG. 8 is a sectional view taken along line B-B of Figure 6. Figure 11 from Figure 9 are those showing a third embodiment embodying the present invention to a pin with roll attachment, a front view of FIG. 9 attachment body, the 10 figure 9 Figure 00-C eniarged cross-sectional view taken along the line, FIG. 11 is a sectional view taken along line D-D of the first 10 Fig. Dryer 1, attachment body 8 and 17 ° 22, comb 11 as a styling member, also flocking 21, same bottle 23, hot air outlet 12,18,24, induction plate 14.2G, 25, hot air passage 32,36.40 ° patent applicant Michihiko Kawano representative patent attorney Onda Hiroshisen 1 ', I', "5'ti Chowa 7; (tiil'IF, '-' 1fil 1984 08 May 06 2, dry for the name styling of invention Atatchimen 1-3 ,? of V li positive the relationship between the crane's incident: patent applicant name for the field of International Trade (name) 4, attorney address Yubinbango500 岐車 City Hashizume cho second device <0582> 65-1810 (representative) dedicated fax <0582> 66 ~1339 (jillfo6, the description of the column of the claims of the Hokoyama-Tadashin in% (1) specification correction as Exhibit. (2) specification page 2, line 18 of the "comb ... [] - the description of the Le 1 is corrected as" <death or brush ". (3) Same page 10 of the 13 row to the page 13 line 4 can be carried out [Third Embodiment .... Or described and application of], to delete the one described. (5) 1 Figure 9 ... cross-sectional view of the first row to the sixth row the page 15. To delete the description of ". (6) the same page of the seventh row to line 11 [Atatchimen 1 body 8 ... hot air passage 32, 36, 40. . 1 according to correction as follows. "Attachment body 8, 17, comb 11, also flocking 21 as a styling member, hot air outlet 12 ° 18, induction plate 14..20, hot air passage 32 and 36 °" (7) Zhu Symbol in the Exhibit attached copy drawings to remove the FIG. 9 to 11 Figure street. 2 "2, range 1 of the appended claims, is connected to the hairdressing dryer (1), the hot air passage (32) where hot air passes flowing from the dryer (1) inside the attachment body provided with (36) (8) to (17), hot air passage (32) (36) K along hot air outlet (12> (18) and e opening, the hot air outlet (12) (18) [Dr. or Brata 1 of styling member (11) (21 Yu 鬻設 only, arranged side by side almost at right angles to be of a suitable number of guide plate (14) (20) f the pot at regular intervals with respect to the hot air passage (32) (36) hot air Runin direction is in, each guide plate <14) (20) Δ hot air flow human end, oblique to the direction of extension of the hot air passage (32) (36) towards the tip gradually narrowing as hot air passage (32) (36) along with placing on one plane forming the Jo, hot air outflow end guide plate (14) the hot air outlet at right angles to the (20) (12) (18) hairdressing dry hair, characterized in that disposed on the surface 7 attachment.

2, each of the guide plate (14) (20) of the claims which in the hot air flow people end disposed in a hot air flow population diagonal 3-line <13) (19) on top of the hot air passage (32) (36) of range first term attachment of hair styling dryer described. "4-

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CLAIMS JPS60100902

1.

is connected to the tire (1), the hot air passage where hot air passes flowing from the dryer (1) in the interior (32) (36) attachment body (8) provided with (4G) (. 17) (22), the hot air passage (32) (36) hot air outlet along the (4G) (12) (18) (24) opened the, comb in the hot air outlet (12) (18) (24), brush or roll with a bottle, the styling member (11) (21) (23) is provided etc., the hot air passage (32) (38 ') (40) guide plate of a suitable number of sheets that form a nearly perpendicular to the hot air Runin direction in the (14) (20) (25) disposed side by side at substantially equal intervals, the hot air flow human end of each guide plate (14) (20) (25), said hot air passageway (32) (the as) (40) within the distal end toward gradually narrowing as hot air passage (32) (3t1) with put on one plane that forms the Hasufuku with respect to the direction of extension of the (40), hot air outflow end guide plate (14) (2G) (25) the hot-air outlet (12) (18) (24) attachment of hairdressing dryer, characterized in that disposed on a surface at right angles to. 2, wherein each guide plate (14) (20) hot air passage (32) the hot air flow human end of the (36) hot air flow population diagonal (13) (19) of the claims that were disposed on the scope of claim 1 wherein the attachment of the styling for the dryer 3 the guide plate (25) is disposed at substantially equal intervals on the inner surface of the peripheral wall of the cylindrical attachment body (22), the shunt hole which becomes gradually smaller diameter as those of the tip to their center (26) of permeability respectively attachment of hairdressing dryer according to Patent claim 1, wherein those that are set.

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⑭発明の名称　整髪用ドライヤのアタッチメント

㉑特　願　昭58－209586

㉒出　願　昭58(1983)11月8日

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明　細　書

1. 発明の名称

整髪用ドライヤのアタッチメント

2. 特許請求の範囲

1　整髪用ドライヤ（1）に連結され、内部にドライヤ（1）から流入する熱風が通過する熱風通路（32）（36）（40）を設けたアタッチメント本体（8）（17）（22）に、熱風通路（32）（36）（40）に沿つて熱風流出口（12）（18）（24）を開口し、その熱風流出口（12）（18）（24）にはくし、ブラシ、またはピン付ロール等の整髪部材（11）（21）（23）を設け、前記熱風通路（32）（36）（40）内には熱風流入方向に対してほぼ直角をなす適当枚数の誘導板（14）（20）（25）をほぼ等間隔に並設し、各誘導板（14）（20）（25）の熱風流入端を、前記熱風通路（32）（36）（40）が先端に向かつて徐々に細くなるように熱風通路（32）（36）（40）の延びる方向に対し斜状をなす一平面上に置くとともに、熱風流出端は誘導板（14）（20）（25）に直角をなす前記熱風流出口（12）（18）（24）面上に配置したことを特徴とする整髪用ドライヤのアタッチメント。

2　前記各誘導板（14）（20）の熱風流入端を熱風通路（32）（36）の熱風流入口対角線（13）（19）上に配設した特許請求の範囲第1項記載の整髪用ドライヤのアタッチメント。

3　前記誘導板（25）は筒状のアタッチメント本体（22）の周壁内面にほぼ等間隔に配設され、それらの中央には先端のものほど徐々に小径となる分流孔（26）がそれぞれ透設されたものである特許請求の範囲第1項に記載の整髪用ドライヤのアタッチメント。

3. 発明の詳細な説明

技術分野

この発明は整髪用ドライヤに交換可能に取着され、かつ、くし、ブラシまたはピン付ロール等の整髪部材を備えた整髪用ドライヤのアタッチメントに関するものである。

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従来技術

従来の整髪用ドライヤのアタッチメントにおいては、ドライヤから出る熱風がアタッチメントの先端部分にある熱風流出口に偏つて流出する傾向があるために、整髪作業時に毛髪を均一に加熱することが困難で、作業が非能率となつて時間がかかるという欠点があつた。そこで、ドライヤに内装された電気ヒータ及びモータの容量を高めて、より高温でかつ多量の熱風をアタッチメント側に供給して、前記した欠点を解消しようとする試みもなされてきたが、こうした場合には、アタッチメントの先端部の熱風流出口から必要以上に高温で多量の熱風が流出するため、この熱風により使用者の毛髪が加熱され過ぎて傷むという欠陥があつた。

目的

この発明は上記した欠陥を解消するためになされたものであり、その目的は簡単な構成によりアタッチメントの熱風流出口から熱風を各部均一に流出して、整髪作業を能率よく短時間に行うことができるとともに、毛髪を傷めるおそれがない新規な整髪用ドライヤのアタッチメントを提供することにある。

(3)

構成

上記した目的を達成するためにこの発明においては、前記熱風通路内には熱風流入方向に対して略直角をなす適当枚数の誘導板を略等間隔に並設し、各誘導板の熱風流入端を、前記熱風通路が先端に向かつて徐々に細くなるように熱風通路の延びる方向に対し斜状をなす一平面上に置くとともに、熱風流出端は誘導板に直角をなす前記熱風流出口面上に配置するという構成を採用した。

第一実施例

以下、この発明をくし用アタッチメントに具体化した第一実施例を第1図～第5図に基づいて説明する。

まず、整髪用ドライヤ1の構成を簡単に説明すると、第1図において2はドライヤ1の後端面に開口された空気吸入口、3はモータ4により回転駆動される羽根車、5は電気ヒータ、6は電源コード、7は電源スイッチ、27は先端に開口された熱風送風口である。そして、電源スイッチ7をONしたときには、モータ4により羽根車3が回転されるとともに電気ヒータ5が加熱され、外気が空気吸入口2よりドライヤ1内に吸込まれ電気ヒータ5により加熱されて熱風となり、熱風送風口27から次に述べるアタッチメント本体8に向けて吐出される。

(4)

この実施例におけるくし用のアタッチメント本体8は基端に設けた円筒状の装着部28にてドライヤ1の先端に形成した取付筒部29に着脱自在に装着され、使用時には図示しない係止手段により分離不能に保持されるとともに、非使用時にはドライヤ1に設けた脱着ボタン19を押してドライヤ1から分離されるようになつている。また、第2図，第5図に示すように、アタッチメント本体8の先端側は断面略コ字状のくし取付部30となつており、その内部にはドライヤ1の前記熱風送風口27に連通する熱風通路32が形成されるとともに、この取付部30の背板30aの内側面には前後一対の留金16が固定されている。両留金16には一対の弾性把持片16aが折曲形成され、これらの弾性把持片16a間にくし11がその両側面に設けた係止凹部11aにて着脱可能に支持されている。

(5)

一方、くし11の基部11cの両側面にはアタッチメント本体8の前記熱風通路32の延びる方向に対して略直角をなす複数枚（この実施例では4枚）の誘導板14が等間隔に取付けられ、各誘導板14の熱風流入端は熱風通路32の流入口対角線13（第2図参照）上に配置されるとともに、各誘導板14の熱風流出端は誘導板14に直角をなすアタッチメント本体8の熱風流出口12面上に配置されている。そして、前記熱風通路32がアタッチメント本体8の先端に向かうほど徐々に細くなるようになつている。従つて、ドライヤ1の熱風送風口27からアタッチメント本体8の熱風通路32内に流入された熱風は、各誘導板14により均等に分流され、直角に方向を変えて熱風流出口12から流出される。

(6)

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従つて、以上のように構成されたくし用のアタッチメントを使用して整髪作業を行なえば、くし11の全長に渡つてほぼ均一な熱風がくし歯11bに沿つて流出するので、くし11によつてすかれた毛髪は各部一様にむらなく加熱されて均一温度となる。それゆえ、従来とは異なり、熱風がくし11の先端部分の熱風流出口12から偏つて流出して、この部分の毛髪のみが加熱されるというおそれがなく、整髪料をむらなく使用して短時間に能率よく整髪作業を行うことができる。また、このように構成すれば、アタッチメント本体8の熱風流出口12から均一な熱風が流出するため、ドライヤ1内のモータ4および電気ヒータ5の容量を従来と比較してそれぞれ小さくすることができ、加熱し過ぎて毛髪を傷めるというおそれはない。

そのうえ、この実施例のくし用アタッチメントにおいては、第8図に示すように、くし11の全長に渡つて設けた各誘導板14の突出端面がアタッチメント本体8の側壁内面に接触しているため、

一対の留金16だけの簡単な構成で取着時にくし11を強力に固定することができるとともに、使用時にくし11がガタつくというおそれもない。

なお、このくし11の長さが80㎜程度の場合には、5または6枚の誘導板14を設ければ良好な整髪効果を得ることができる。また、この実施例においては誘導板14をくし11の両側面に設けたが、各誘導板14を熱風通路32内に突出するようにアタッチメント本体8の両側壁内面に一体的に形成してもよい。

第二実施例

次に、この発明を特に堅い毛、くせ毛、短かい毛等の整付けに使用されるブラシ用アタッチメントに具体化した第二実施例を第6図～第8図に基づいて説明する。

このブラシ用アタッチメントのアタッチメント本体17は基端側の円筒状をなす装着部34と先端側の楕円直方体をなす作用部35とから構成され、これらの装着部34および作用部35の内部にはドライヤ1の熱風送風口27に連通する熱風

通路36が形成されている。また、作用部35の下側板35aには均等に植毛21が設けられるとともに、多数個の熱風流出口18が前記熱風通路36に沿つて列設されている。

前記作用部35の下側板35aの上面にはアタッチメント本体17の前記熱風通路36内に突出するように、熱風流入方向に対して直角をなす複数枚数（この実施例では5枚）の誘導板20が等間隔に配設固定され、各誘導板20の熱風流入端は流入口対角線19上に配置されるとともに、それらの熱風流出端は各誘導板20に対し直角をなす熱風流出口18面上に配置されている。そして、前記熱風通路36がアタッチメント本体17の先端に向かうほど徐々に細くなるようになつている。

従つて、以上のように構成されたブラシ用アタッチメントにおいては、ドライヤ1の熱風送風口27からアタッチメント本体17の熱風通路36内に流入した熱風が各誘導板20によつて均等に分流された後、各誘導板20に沿つて直角に方向を変えて熱風流出口18から流出される。このた

めアタッチメント本体17の作用部35に形成した各熱風流出口18から流出する熱風は、アタッチメント本体17の基端部から先端部に至るまでほぼ均一となるので、植毛21にすかれた毛髪が各部均等に加熱される。それゆえ、この実施例のブラシ用アタッチメントによれば前記したくし用アタッチメントと同様に整髪作業を能率良く短時間に行うことができる。

なお、アタッチメント本体17の作用部35の長さが100㎜程度の場合には5～7枚の誘導板20を設ければ良好な整髪効果を得ることができる。

第三実施例

第9図～第11図に基づきこの発明を毛髪のカール仕上げ等に使用されるピン付ロール用アタッチメントに具体化した第三実施例について説明する。

この実施例のピン付ロール用アタッチメントのアタッチメント本体22は基端側の大径の装着部38と、その装着部38と一体形成され先端が閉

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鎖された円筒状をなす作用部３９とから構成されている。その作用部３９の周壁にはアタッチメント本体２２の長手方向に沿つて延びるように熱風流出口２４が等角度で複数本透設されるとともに、その周壁外面には各熱風流出口２４に沿つて毛髪取り用のピン２３が外方に向かつて放射状に突出するように多数本植設されている。

前記アタッチメント本体２２の作用部３９の周壁内面には円形の誘導板２５がアタッチメント本体２２の長手方向に沿つて等間隔に複数個（この実施例では５個）配設され、それらの各誘導板２５の中央には先端の誘導板２５ほど順次小径となる。分流孔２６がそれぞれ透設されている。

ところで、アタッチメント本体２２の作用部３９に形成した各熱風流出口２４の全長に渡つて熱風を均一に流出させるためには、熱風流出口２４の長さをＭ等分するように（Ｍ－１）枚の誘導板２５を作用部３９の周壁内面に配設し、各誘導板２５の分流孔２６の直径を作用部３９の内径ｄ０で算出される円断面積をＭ等分する直径ｄ１～ｄ

(11)

６にしておけば、前記熱風通路４０内に流入する熱風を各誘導板２５で均等分して各熱風流出口２４から流出させることができる。

このような各分流孔２６の直径ｄｎは次式で計算することができる。

$$d_n = \sqrt{1 - \frac{n}{m}}\, d_0 \quad \cdots\cdots (1)$$

$$n = 1, 2, \cdots\cdots (m-1)$$

一例として次表に熱風流出口２４を６等分した場合の作用部３９の内径ｄ０に対する各分流孔２６の直径ｄｎの比率を示す。

第１表　分流孔直径の値（６等分の場合）

（ｄ０は作用部３９の内径を示す）

ｄｎ	ｄ１	ｄ２	ｄ３	ｄ４	ｄ５
ｄｎ／ｄ０	0.913	0.816	0.707	0.577	0.408

以上のように構成されたピン付ロール用アタッチメントを使用して整髪作業を行なえば、ドライヤ１の熱風送風口２７からアタッチメント本体２２の熱風通路４０に流入された熱風が各誘導板２５により均等に分流されて、各熱風流出口２４から放射状に流出されるため、アタッチメント本体

(12)

２２の作用部３９の全長に渡つて毛髪を均一温度に加熱することができる。従つて前記した両アタッチメントと同様に整髪作業を効率よく短時間に行うことができる。

なお、この発明は前記した各実施例の構成に限定されるものではなく、例えば、前記第１実施例においてくし用のアタッチメント本体８とくし１１とを一体成形して構成したり、前記第２実施例において各誘導板２０をアタッチメント本体２２の作用部３５の両側壁内面間に架設して、植毛２１を設けた作用部３５の下側板３５ａをアタッチメント本体２２に対し着脱可能にしたり、前記第三実施例においてピン２３に替えてアタッチメント本体２２の作用部３５の周壁外面に植毛を施したブラシ付ロール用のアタッチメントに応用したり、あるいは、ドライヤーとアタッチメント本体とを分離不能に一体形成したタイプのドライヤーに応用したり、この発明の趣旨を逸脱しない範囲で各部の構成や形状を任意に変更して具体化することも可能である。

(13)

効果

以上詳述したようにこの発明によれば、アタッチメント本体の熱風通路内に配設した誘導板の作用により、ドライヤーから流入する熱風が各部均等に分流された状態で熱風流出口から流出するので、簡単な構成により整髪作業を能率よく短時間に行うことができるとともに、毛髪を加熱し過ぎて傷めるおそれがないという優れた効果を奏する。

4. 図面の簡単な説明

第１図から第５図はこの発明をくし用アタッチメントに具体化した第一実施例を示すものであり、第１図は取付け状態を示す要部破断正面図、第２図はアタッチメント本体とくしとの取付け構成を示す縦断面図、第３図はアタッチメント本体の下面図、第４図はくしの斜視図、第５図は第２図のＡ－Ａ線における拡大断面図である。第６図から第８図はこの発明をブラシ用アタッチメントに具体化した第二実施例を示すものであり、第６図はアタッチメント本体の縦断面図、第７図はアタッチメント本体の下面図、第８図は第６図のＢ－Ｂ

(14)

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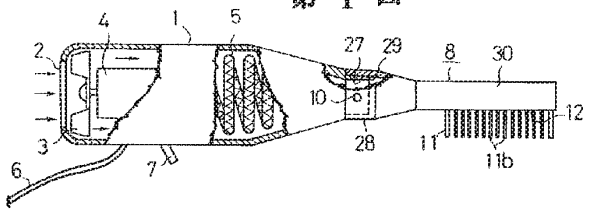
線における断面図である。第９図から第１１図はこの発明をピン付ロール用アタッチメントに具体化した第三実施例を示すものであり、第９図はアタッチメント本体の正面図、第１０図は第９図のＯ－Ｏ線における拡大断面図、第１１図は第１０図のＤ－Ｄ線における断面図である。

ドライヤー１、アタッチメント本体８，１７，２２、整髪部材としてのくし１１、同じく植毛２１、同じくピン２３、熱風流出口１２，１８，２４、誘導板１４，２０，２５、熱風通路３２，３６，４０。

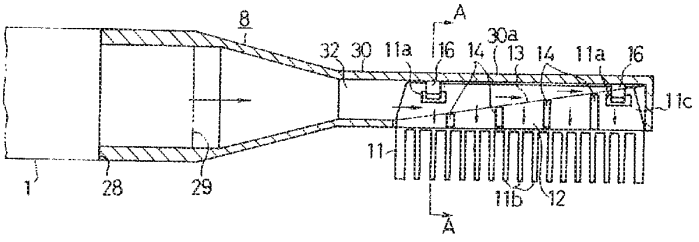
特許出願人　　川野通彦

代理人　　弁理士 恩田博宣

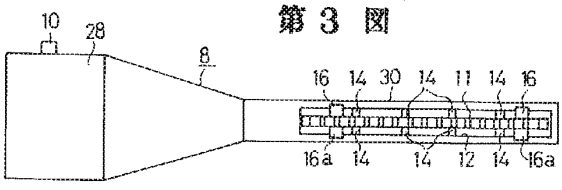
第１図



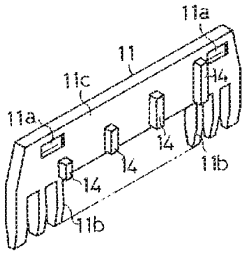
第２図



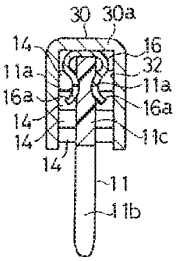
第３図



第４図

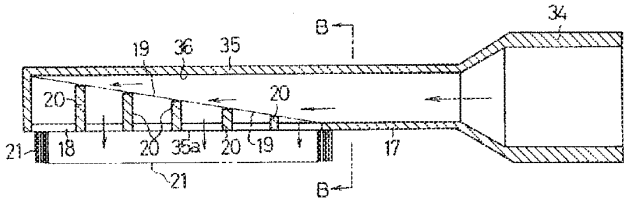


第５図

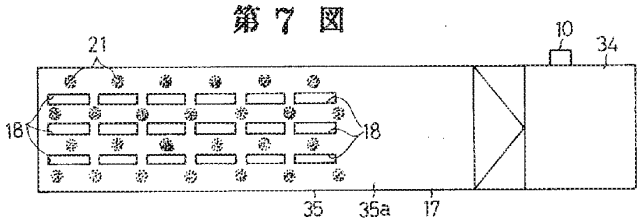


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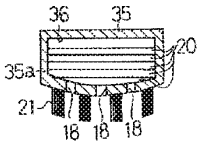
第 6 図



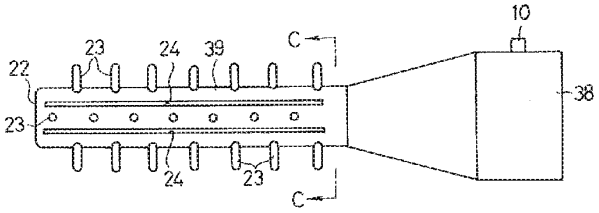
第 7 図



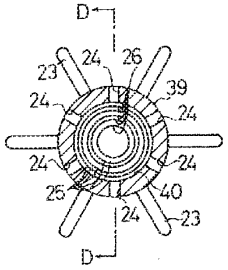
第 8 図



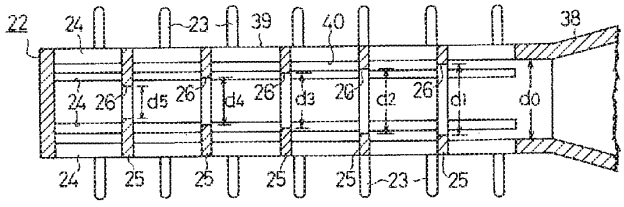
第 9 図



第10図



第11図



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自発手続補正書

昭和59年08月06日

特許庁長官　志賀　学　殿

1．事件の表示
昭和58年特許願第209586号

2．発明の名称
整髪用ドライヤのアタッチメント

3．補正をする者
事件との関係：　特許出願人
氏名　川野　通彦
（名称）

4．代理人
住所　〒500　岐阜市端詰町2番地
TEL（0582）65-1810（代表）
ファックス専用（0582）66-1339
氏名　6875　弁理士　恩田博宣

5．補正の対象
明細書の特許請求の範囲、発明の詳細な説明の欄及び図面

6．補正の内容
（1）明細書の特許請求の範囲の欄の記載を別紙の通り補正する。
（2）明細書第2頁第18行の「くし・・・ロール」の記載を「くしまたはブラシ」と補正する。
（3）同第10頁第13行～同第13頁第4行の「第三実施例・・・行うことができる。」の記載を削除する。
（4）同13頁第12行～第16行の「前記・・・応用したり、」の記載を削除する。
（5）同第15頁第1行～第6行の「第9図・・・断面図である。」の記載を削除する。
（6）同頁第7行～第11行の「アタッチメント本体8・・・熱風通路32，36，40。」の記載を次の通り補正する。
「アタッチメント本体8，17、整髪部材としてのくし11、同じく植毛21、熱風流出口12，18、誘導板14，20、熱風通路32，36。」
（7）別紙添付複写図面中朱記の通り第9図～第11図を削除する。

－2－

「2．特許請求の範囲
1．整髪用ドライヤ（1）に連結され、内部にドライヤ（1）から流入する熱風が通過する熱風通路（32）（36）を設けたアタッチメント本体（8）（17）に、熱風通路（32）（36）に沿って熱風流出口（12）（18）を開口し、その熱風流出口（12）（18）にはくしまたはブラシ等の整髪部材（11）（21）を設け、前記熱風通路（32）（36）内には熱風流入方向に対してほぼ直角をなす適当枚数の誘導板（14）（20）をほぼ等間隔に並設し、各誘導板（14）（20）の熱風流入端を、前記熱風通路（32）（36）が先端に向かって徐々に細くなるように熱風通路（32）（36）の延びる方向に対し斜状をなす一平面上に置くとともに、熱風流出端は誘導板（14）（20）に直角をなす前記熱風流出口（12）（18）面上に配置したことを特徴とする整髪用ドライヤのアタッチメント。
2．前記各誘導板（14）（20）の熱風流入端を熱風通路（32）（36）の熱風流入口対角

－3－

線（13）（19）上に配設した特許請求の範囲第1項記載の整髪用ドライヤのアタッチメント。」

－4－

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I hereby certify that this paper is being transmitted via the Office electronic filing system in accordance with 37 CFR § 1.6(a)(4).

Dated: May 15, 2017
Electronic Signature for Donna Bernecker: /dbernecker/

Docket No.: 424662093300
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Alasdair Michael MACLAINE

Application No.: 14/656,357 | Confirmation No.: 9085

Filed: March 12, 2015 | Art Unit: 3776

For: ATTACHMENT FOR A HAND HELD APPLIANCE | Examiner: Jennifer Frances Gill

AMENDMENT UNDER 37 C.F.R. 1.111

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed February 14, 2017, please amend this application as follows.

Amendments to the specification begin on page 2 of this paper.

Amendments to the claims begin on page 4 of this paper.

Amendments to the drawings begin on page 8.

Remarks begin on page 9 of this paper.

An appendix containing replacement drawings follows the remarks.

va-490757

AMENDMENTS TO THE SPECIFICATION

Please amend paragraph [0076] as follows:

[0076] The handle 20 also includes a fan unit 70 which comprises a fan and a motor which drives the fan and in use, draws fluid in through the fluid inlet 40, along a fluid flow path 50 which extends through the length of the handle 20. The fluid is optionally ~~heater~~ heated by a heater 80 before entering an inner cavity 38 of the head 30. A nozzle 23 may be included at distal end 22 of handle 20 to shape fluid flow as it enters the head 30.

Please amend paragraph [0079] as follows:

[0079] Power is provided to the appliance via a power cable [[48]] 47 which preferably extends from a plug or other power source through the end wall 42 of the handle 20 into the cable mount 45. The handle 20 also houses a PCB 75 which is electrically connected to the cable 48, the fan unit 70 and the heater 80 by internal wiring (not shown). An on/off switch 52 and control buttons 54 are provided and connected to the PCB 75 to allow the user to select one of a range of temperature and flow settings.

Please amend paragraph [0084] as follows:

[0084] A foam block 48 is provided which, in use, is inserted into the second end 24 of the handle 20 and may be positioned within the handle 20 by a foam block mount 49. The foam block 48 is a second means of filtering the fluid that passes through the primary fluid inlet 40 into the primary fluid flow path 50. It is advantageous that the foam block 48 extends beyond or further towards the first end 22 of the handle than the primary fluid inlet 40 as this ensures that fluid that has entered the

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primary fluid inlet 40 has passed through the foam block 48 so has had two stages of filtration. In other words, the foam block 48 extends from the second end 24 of the handle 20 past the downstream end 44a of the fluid inlet.

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AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An attachment for a hand held appliance comprising an inlet; an outlet; and a fluid flow path between the inlet and the outlet, wherein the outlet comprises at least one slot extending from near an inlet end of the attachment towards a distal end of the attachment and wherein the outlet is at least partially defined by an external surface of the attachment ~~wherein fluid emitted from the outlet is blown along the external surface and wherein fluid emitted from the outlet flows~~ and is configured to direct fluid flow emitted from the outlet along and around the external surface of the attachment.

2. (Currently Amended) The attachment of claim 1, wherein the at least one slot extends substantially along [[the]] a length of the attachment.

3. (Original) The attachment of claim 1, wherein the outlet comprises a plurality of slots radially spaced around the attachment.

4. (Original) The attachment of claim 1, wherein the fluid emitted from the outlet is tangential to the external surface of the attachment.

5. (Currently Amended) The attachment of claim 1, wherein the attachment is configured so that, in use, the fluid emitted from the outlet is attracted to the surface of the attachment.

6. (Original) The attachment of claim 1, wherein the attachment is generally cylindrical.

7. (Original) The attachment of claim 1, wherein the outlet comprises two slots.

8. (Currently Amended) The attachment of claim 1, wherein the attachment has a longitudinal axis extending from the ~~first~~ inlet end to the distal end and the at least one slot is parallel to the longitudinal axis.

9. (Currently Amended) The attachment of claim 1, wherein the attachment has a longitudinal axis extending from the ~~first~~ inlet end to the distal end and the at least one slot is non-parallel to the longitudinal axis.

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10. (Original) The attachment of claim 9, wherein the at least one slot is helical with respect to the longitudinal axis.

11. (Original) The attachment of claim 1, further comprising a flow directing element between the inlet and the outlet.

12. (Original) The attachment of claim 11, wherein the flow directing element comprises a perforated layer.

13. (Original) The attachment of claim 12, wherein the perforated layer is formed from a mesh or weave of an elongate material.

14. (Original) The attachment of claim 13, wherein the elongate material is a wire.

15. (Currently Amended) The attachment of claim 12, wherein the flow directing element extends substantially along [[the]] a length of the at least one slot.

16. (Original) The attachment of claim 12, wherein the flow directing element extends substantially around an inner circumference of the attachment.

17. (Withdrawn-Currently Amended) A hand held appliance comprising a handle having a fluid flow path from [[an]] handle inlet to [[an]] a handle outlet, [[and]] a fan unit for drawing fluid into the ~~fluid~~ handle inlet, and an attachment for attaching to the handle, the attachment comprising an inlet; an outlet; and a fluid flow path between the inlet and the outlet, wherein the outlet comprises at least one slot extending from near an inlet end of the attachment towards a distal end of the attachment and wherein the outlet is at least partially defined by an external surface of the attachment and ~~fluid emitted from the outlet is blown along the external surface and wherein fluid emitted from the outlet flows~~ is configured to direct fluid flow emitted from the outlet along and around the external surface of the attachment.

18. (Withdrawn-Currently Amended) The appliance of claim 17, wherein the at least one slot extends substantially along [[the]] a length of the attachment.

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19. (Withdrawn) The appliance of claim 17, wherein the outlet comprises a plurality of slots radially spaced around the attachment.

20. (Withdrawn) The appliance of claim 17, wherein the fluid emitted from the outlet is tangential to the external surface of the attachment.

21. (Withdrawn-Currently Amended) The appliance of claim 17, wherein the attachment is configured so that, in use, the fluid emitted from the outlet is attracted to the surface of the attachment.

22. (Withdrawn) The appliance of claim 17, wherein the attachment is generally cylindrical.

23. (Withdrawn) The appliance of claim 17, wherein the outlet comprises two slots.

24. (Withdrawn-Currently Amended) The appliance of claim 17, wherein the attachment has a longitudinal axis extending from the ~~first~~ inlet end to the distal end and the at least one slot is parallel to the longitudinal axis.

25. (Withdrawn-Currently Amended) The appliance of claim 17, wherein the attachment has a longitudinal axis extending from the ~~first~~ inlet end to the distal end and the at least one slot is non-parallel to the longitudinal axis.

26. (Withdrawn) The appliance of claim 25, wherein the at least one slot is helical with respect to the longitudinal axis.

27. (Withdrawn) The appliance of claim 17, further comprising a flow directing element between the inlet and the outlet.

28. (Withdrawn) The appliance of claim 27, wherein the flow directing element comprises a perforated layer.

29. (Withdrawn) The appliance of claim 28, wherein the perforated layer is formed from a mesh or weave of an elongate material.

30. (Withdrawn) The appliance of claim 29, wherein the elongate material is a wire.

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31. (Withdrawn-Currently Amended) The appliance of claim 27, wherein the flow directing element extends substantially along [[the]] a length of the at least one slot.

32. (Withdrawn) The appliance of claim 27, wherein the flow directing element extends substantially around an inner circumference of the attachment.

33. (Withdrawn) The appliance of claim 17, wherein the appliance is a hair care appliance.

34. (Withdrawn) The appliance of claim 17, wherein the appliance is a hot styling appliance.

35. (Withdrawn) The appliance of claim 17, wherein the appliance is a hot styling brush.

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AMENDMENTS TO THE DRAWINGS

FIGs. 1a and 1b have been amended to replace instances of reference numeral 48 (which indicates the power cable) with reference numeral 47. FIG. 2a has been amended to include references numerals 45, 49, 23, 52, and 54. FIG. 4a has been amended to remove the dimensioning lines and number.

Attachment: An appendix containing one set (seventeen sheets) of replacement drawings.

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REMARKS

Claims 1-35 are currently pending. Claims 17-35 have been withdrawn from consideration. Claims 1, 2, 5, 8, 9, 15, 17, 18, 21, 24, 25, and 31 have been amended. The specification and drawings have been amended, as noted in the preceding sections. No new matter has been added.

With respect to all claim amendments, Applicant has not dedicated to the public or abandoned any unclaimed subject matter. These amendments have been made only in the interest of progressing the prosecution of this application, and do not indicate that these amendments are necessary for patentability. Moreover, Applicant has not acquiesced to any rejections and/or objections made by the Patent Office. Applicant reserves the right to pursue prosecution of any presently excluded claim embodiments in a future continuation and/or divisional application.

I. Drawing Objections

FIG. 1b is objected to for failing to include a reference character (28) that is allegedly discussed in a portion of the specification that describes FIG. 1b (paragraph [0087]). This is incorrect. Paragraph [0087] describes FIG. 2a, a figure that does include reference character 28. Accordingly, Applicant respectfully requests that this objection be withdrawn.

The Examiner also objects to FIG. 4b for failing to include reference characters (38, 308, and 102) that are allegedly discussed in a portion of the specification that describes FIG. 4b (paragraph [0094]). This is also incorrect. First, FIG. 4b does include reference character 38. Second, reference characters 308 and 102 are included in paragraph [0079], which describes FIG. 3b—a figure that does include these reference characters. Accordingly, Applicant respectfully requests that this objection be withdrawn.

FIG. 2a is objected to for including components having no reference character. To address the Examiner's concern, FIG. 2a has been amended to include:

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- Reference character 54, to indicate components of "control buttons 54" described in paragraph [0079] of the specification.
- Reference character 52, to indicate the "on/off switch 52" described in paragraph [0079] of the specification.
- Reference character 45, to indicate a mount for power cable 47. Paragraph [0079] has been amended to recite that "Power is provided to the appliance via a power cable [[48]] 47 which preferably extends from a plug or other power source through the end wall 42 of the handle 20 into cable mount 45." The nature of this component (i.e., its function as a cable mount) would be readily apparent to a person of skill in the art from the drawings and disclosure, and thus, the inclusion of this description adds no new matter.
- Reference character 49, to indicate a mount for foam block 48. Paragraph [0084] has been amended to recite that "A foam block 48 is provided which, in use, is inserted into the second end 24 of the handle 20 and may be positioned within the handle 20 by foam block mount 49." The nature of this component (i.e., its function as a mount for the foam block) would be readily apparent to a person of skill in the art from the drawings and disclosure, and thus, the inclusion of this description adds no new matter.
- Reference character 23, to indicate a nozzle that is included at a distal end of handle 20 to shape the fluid flow as it enters the head 30. Paragraph [0076] of the specification has been amended to recite that "A nozzle 23 may be included at distal end 22 of handle 20 to shape fluid flow as it enters the head 30." The nature of this component (i.e., its function as a nozzle for shaping fluid flow into the head) would be readily apparent to a person of skill in

the art from the drawings and disclosure, and thus, the inclusion of this description adds no new matter.

Accordingly, Applicant respectfully requests that this objection be withdrawn.

FIGs. 1a-2b are objected to because reference character "48" has been used to designate different elements. To address the Examiner's concern, FIGs. 1a and 1b have been amended to replace instances of reference character 48 with reference character 47 to be consistent with the specification's use of reference character 47 for the power cord. Accordingly, Applicant respectfully requests that this objection be withdrawn.

FIG. 4a is objected to because the dimension line "100.00" has no units and does not appear to be dimensionally discussed in the disclosure. To address the Examiner's concern, FIG. 4a has been amended to remove the dimension and dimension lines. Accordingly, Applicant respectfully requests that this objection be withdrawn.

FIG. 2a is objected to for failing to include "control buttons 54," "on/off switch 52," and "PCB 75." As noted above, FIG. 2a has been amended to include labels for control buttons 54 and on/off switch 52. With respect to the lack of PCB 75, Applicant respectfully disagrees that every component shown in the cross section of FIG. 1b needs to be shown in the exploded view of FIG. 2a. There is no requirement that an exploded view explode each and every component. A person of skill in the art would easily understand that the PCB is not shown in FIG. 2a simply for convenience and ease of illustration. Accordingly, Applicant respectfully requests that this objection be withdrawn.

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II. Objection to the Specification

The Examiner indicates that the specification is objected to because of a typographical error in paragraph [0061]. It is believed that the Examiner is referring to paragraph [0076]. Paragraph [0076] has been amended to correct the typographical error identified by the Examiner, thus rendering this objection moot.

III. Objections to the Claims

Claims 2 and 15 are objected to because of certain informalities. These claims have been amended as suggested by the Examiner. Accordingly, Applicant respectfully requests that these objections be withdrawn.

IV. 35 USC 112(a) Rejection

Claim 5 is rejected under 35 USC 112(a) as failing to comply with the enablement requirement. The Examiner asserts that one of skill in the art would not be enabled, from the disclosure, to make an attachment in which "fluid emitted from the outlet is attracted to the surface of the attachment," as recited in claim 5. The Examiner is incorrect. The Coanda effect is "the tendency of a jet of fluid emerging from an orifice to follow an adjacent flat or curved surface and to entrain fluid from the surroundings so that a region of lower pressure develops." ("Coanda Effect." *Merriam-Webster.com*. Merriam-Webster, n.d. Web. 10 May 2017.) This effect can be achieved, for example, by the configuration of the outlet illustrated in FIG. 5b and described in paragraphs [0091]-[0092] in which the fluid "flowing out of the slot 102 is tangential 130 to the outer surface 112 of the plate 110 a and joins with the fluid flowing out of the other slots of the fluid outlet 100 forming a fluid flow around the circumference of the head 30." Through the Coanda

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effect, the fluid tends to travel close to outer surface 112 of the plate 110a, which encourages hair to wrap around the head 30 automatically. Thus, claim 5 is enabled, at least by the above disclosure.

The Examiner states that the Coanda effect "only takes place in jet streams." The Examiner is incorrect and appears to be confusing a "jet" with a "jet stream." A "jet stream" is a long narrow current of high-speed winds. This is not required to generate the Coanda effect. As noted above, the Coanda effect is produced by "a jet of fluid emerging from an orifice." A jet is simply "a usually forceful stream of fluid (such as water or gas) discharged from a narrow opening or a nozzle." ("Jet." *Merriam-Webster.com*. Merriam-Webster, n.d. Web. 10 May 2017.) A jet would easily be generated by a fluid flow generated by a hair dryer flowing out of a slot configured as shown in FIG. 5b and described in paragraphs [0091]-[0092]. Thus, an attachment in which "fluid emitted from the outlet is attracted to the surface of the attachment," as recited in claim 5, is enabled by the disclosure. Accordingly, this rejection should be withdrawn.

V. 35 USC 112(b) Rejections

Claims 8-10 are rejected under 35 USC 112(b) as being indefinite for reciting "the first end" when it is unclear what the first end is. These claims have been amended as suggested by the Examiner. Accordingly, Applicant respectfully requests that this rejection be withdrawn.

VI. 35 USC 102 and 35 USC 103 Rejections

Claims 1-5, 7 and 9-10 are rejected under 35 USC 102(a)(1) on Lindsey (US 5,868,148). Claims 11-16 are rejected under 35 USC 103 over Lindsey in view of Tomaro (US 4,295,283). These rejections are respectfully traversed.

Claim 1, as amended, recites:

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> An attachment for a hand held appliance comprising an inlet; an outlet; and a fluid flow path between the inlet and the outlet, wherein the outlet comprises at least one slot extending from near an inlet end of the attachment towards a distal end of the attachment and wherein the outlet is at least partially defined by an external surface of the attachment and is configured to direct fluid flow emitted from the outlet along and around the external surface of the attachment.

Thus, claim 1 requires an outlet that "is configured to direct fluid flow emitted from the outlet along and around the external surface of the attachment."

An example of a portion of an outlet, according to one embodiment of claim 1, is shown in FIG. 5b of the application, which is reproduced below for convenience.

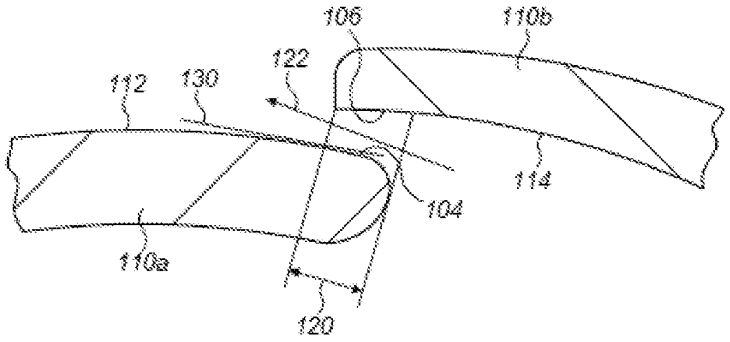


FIG. 5b

In the embodiment of FIG. 5b, the outlet is configured such that fluid 122 flows out of the slot tangentially (130) to the external surface (112) of the attachment (plate 110 a). (Published Application at ¶¶ [0091]-[0092].) The fluid joins with the fluid flowing out of other portions of the outlet forming a fluid flow around the circumference of the attachment. (*Id.*) Thus, the fluid 122 is blown out along the external surface of the attachment and this encourages hair to wrap around the attachment automatically. (*Id.*)

Lindsey fails to disclose or suggest an outlet that "is configured to direct fluid flow emitted from the outlet along and around the external surface of the attachment," as recited in amended claim 1. The outlet of Lindsey directs fluid flow away from the external surface of the attachment, not along and around it. This is illustrated in FIGs. 8 and 9 of Lindsey (reproduced below) in which the flow paths caused by the configuration of the outlet are labeled "P."

FIG. 8.

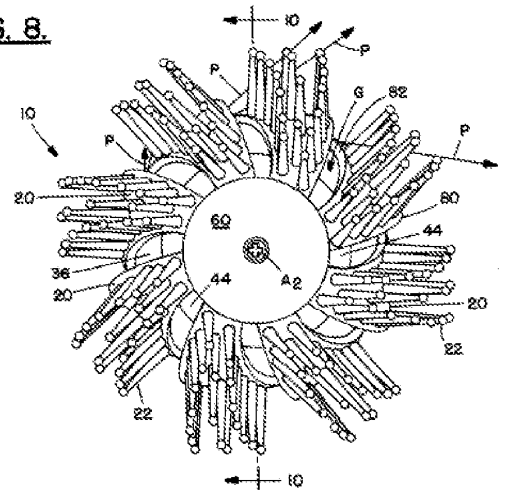
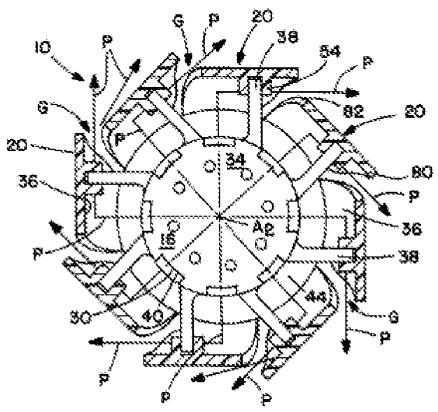


FIG. 9.



As illustrated in these figures, the outlet of Lindsey's device directs the flow paths away from the external surface of the attachment. Lindsey explains that the flow paths are directed such that air discharged from one vane is directed over and through the prongs of the adjacent vanes, which extend outwardly from the external surface of the attachment. (Lindsey at col. 10, lines 28-37.) Thus, the airflow is directed at an angle above the external surface of the attachment such that the air flows through the prongs. In contrast, amended claim 1 requires the outlet to be configured to direct fluid flow "along and around the external surface of the attachment." Lindsey fails to disclose or suggest this feature. Tomaro fails to cure this deficiency.

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Accordingly, this rejection should be withdrawn. The rejection of dependent claims 2-16 should be withdrawn at least for their respective dependencies.

Claims 1-8, 11-13 and 15-16 are rejected under 35 USC 102(a)(1) on McDougall (US 5,212,366). This rejection is respectfully traversed.

McDougall also fails to disclose or suggest an outlet that "is configured to direct fluid flow emitted from the outlet along and around the external surface of the attachment," as recited in amended claim 1. The Examiner relies on openings between adjacent barrel elements as disclosing the outlet of claim 1. However, the outlets are not configured to "direct fluid flow emitted from the outlet along and around the external surface of the attachment," as required by amended claim 1. In fact, even assuming, *arguendo*, that some portion of the air flow exiting one of the openings were to flow along the external surface of the adjacent barrel element (which there is no disclosure or suggestion of), it would immediately be blocked by an outwardly extending wall portion of the barrel element from which the brush teeth 3b extends. This is illustrated in the below annotation of FIG. 5b.

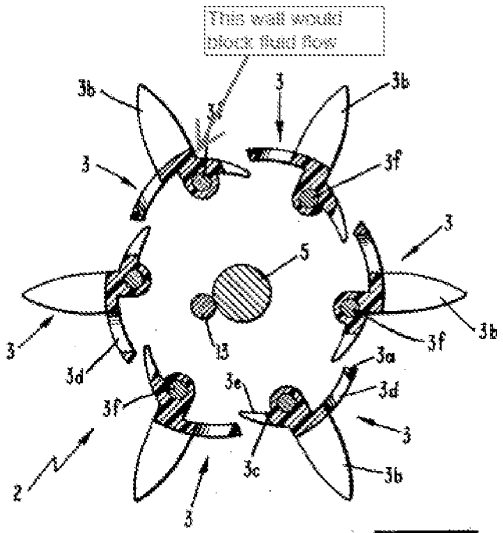


Fig. 5a

The above-indicated wall would prevent air from flowing along and around the external surface of the attachment. Thus, not only does McDougall fail to disclose or suggest that the outlet is configured to "direct fluid flow emitted from the outlet along and around the external surface of the attachment," McDougall's attachment would prevent such fluid flow.

Accordingly, this rejection should be withdrawn. The rejection of dependent claims 2-16 should be withdrawn at least for their respective dependencies.

In view of the above, early action allowing claims 1-35 is solicited.

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In the event the U.S. Patent and Trademark Office determines that an extension and/or other relief is required, Applicants petition for any required relief, including extensions of time, and authorize the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. **424662093300**.

Dated: May 15, 2017

Respectfully submitted,

Electronic signature: /christopher gloria/
Christopher Gloria
Registration No.: 71,907
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McLean, Virginia 22102
(703) 760-7389

va-490757

APPENDIX

va-490757

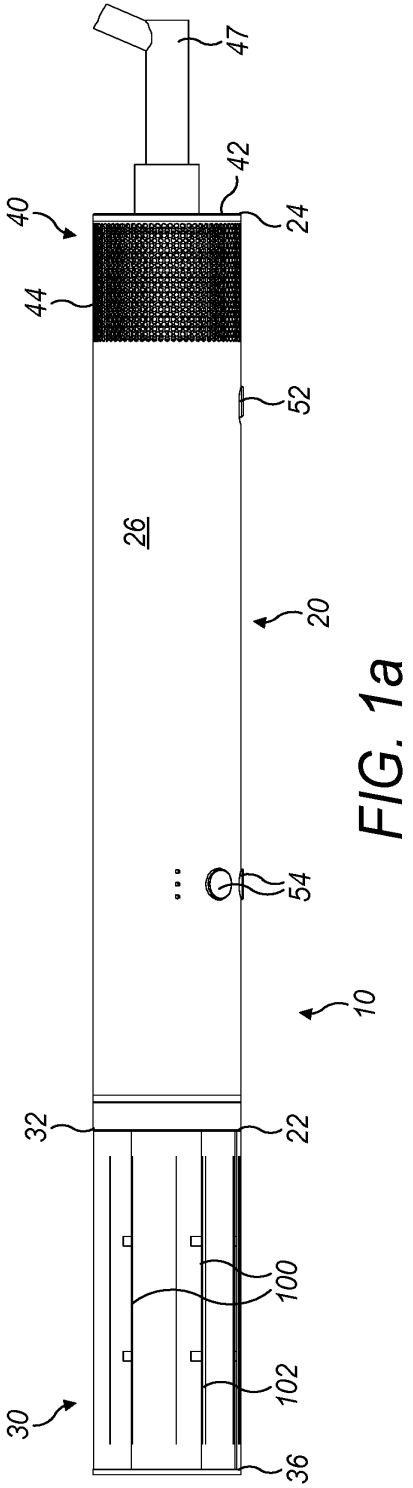

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FIG. 1a

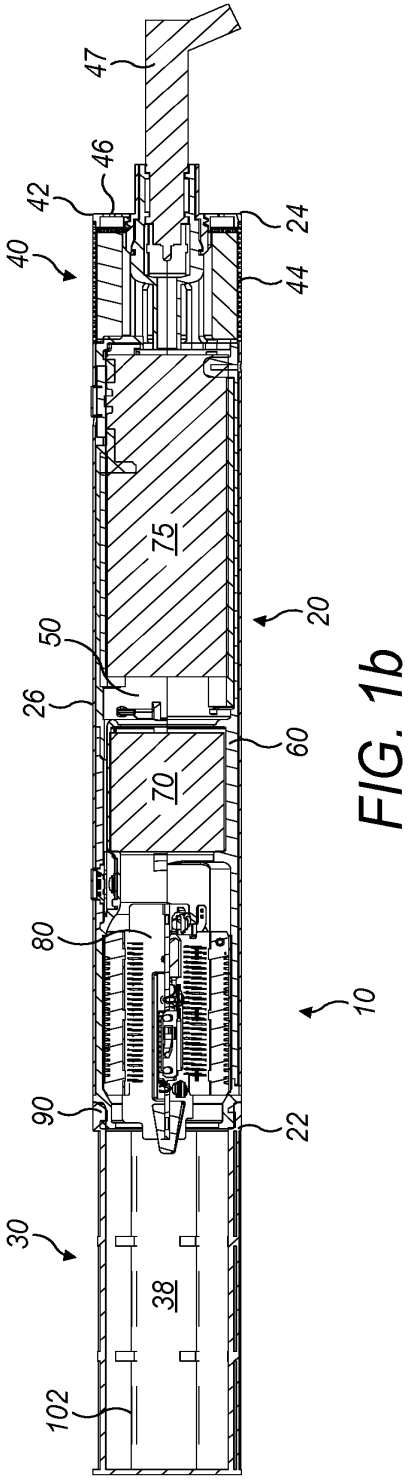

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FIG. 1b

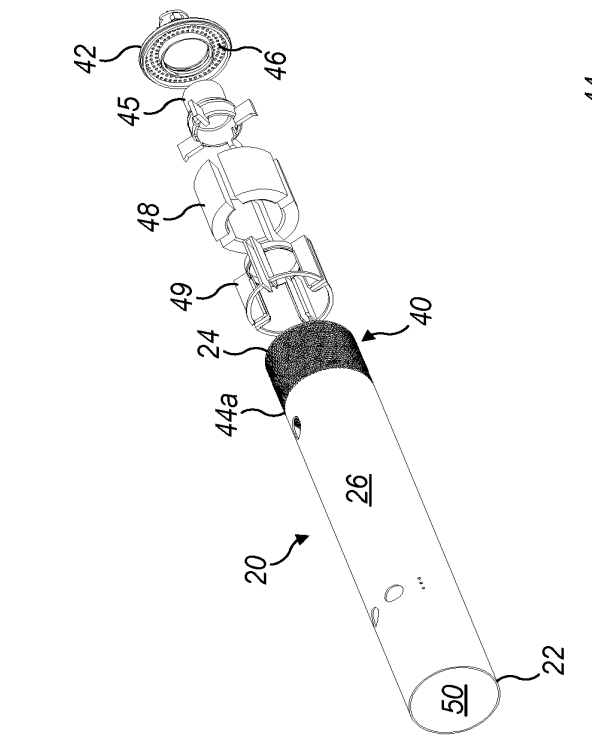

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44a
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FIG. 2a

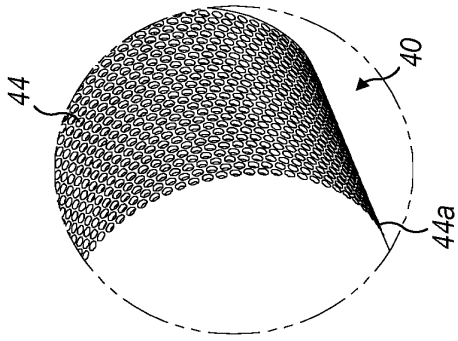
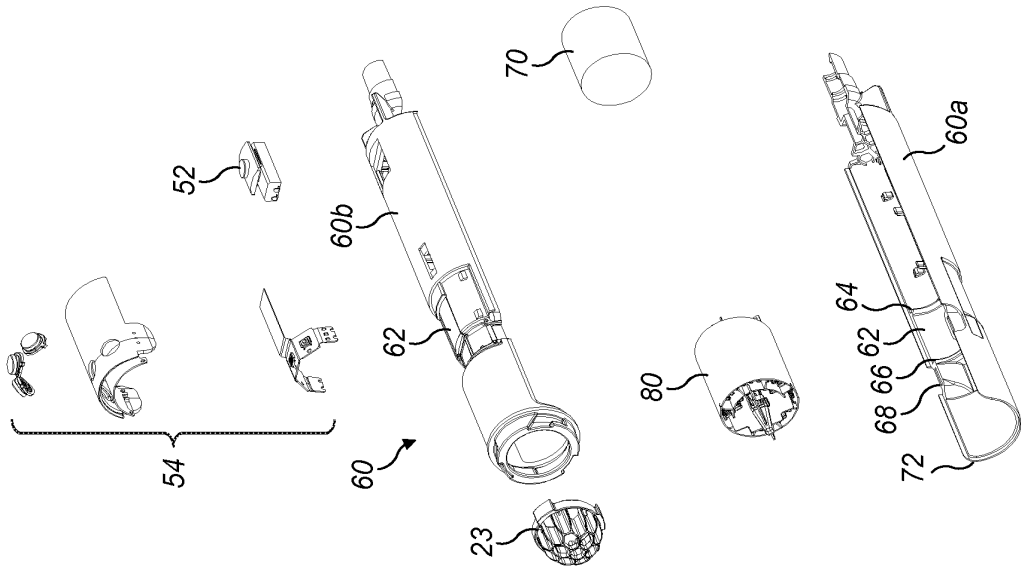

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44a

FIG. 2b


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60b
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60a
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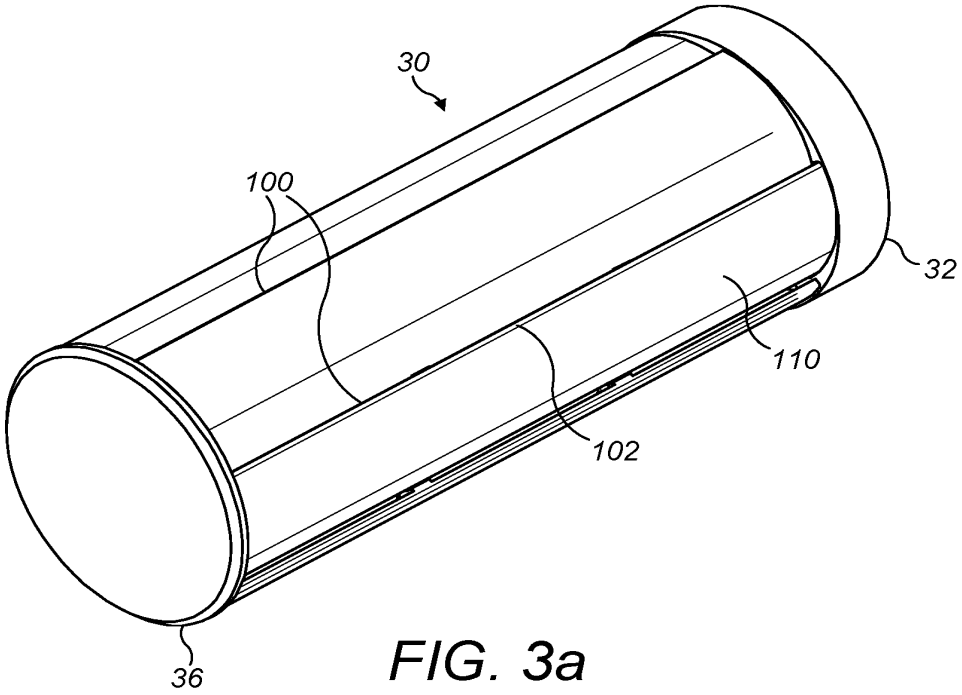


FIG. 3a

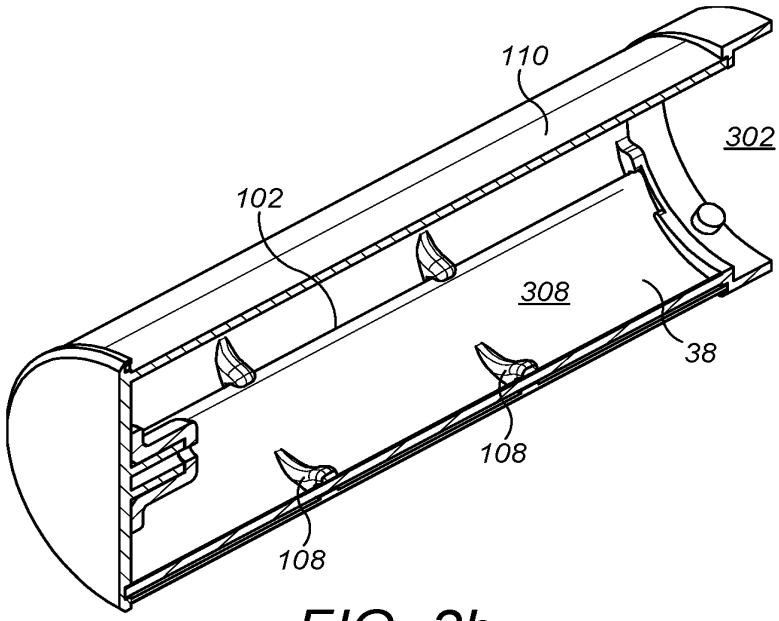


FIG. 3b

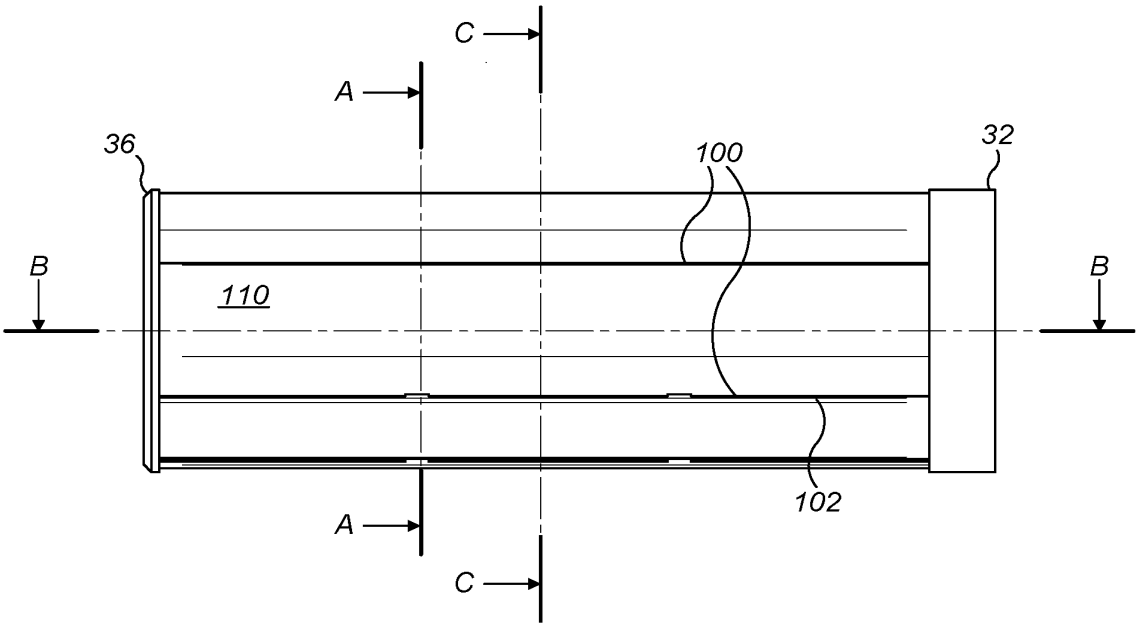


FIG. 4a

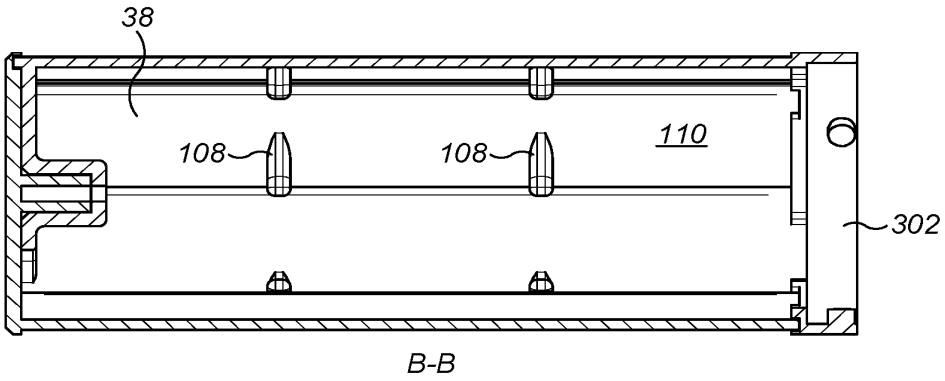


FIG. 4b

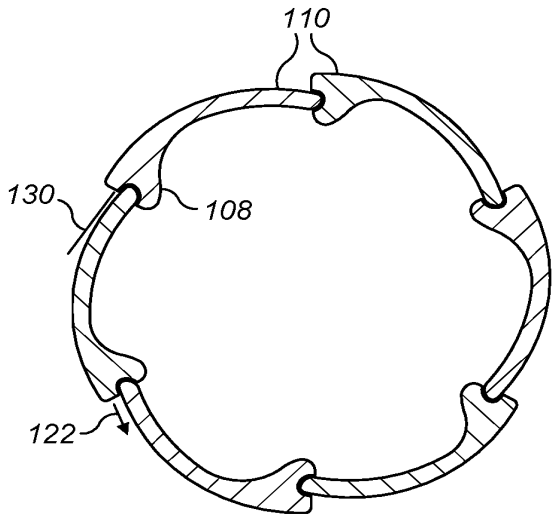


FIG. 5a

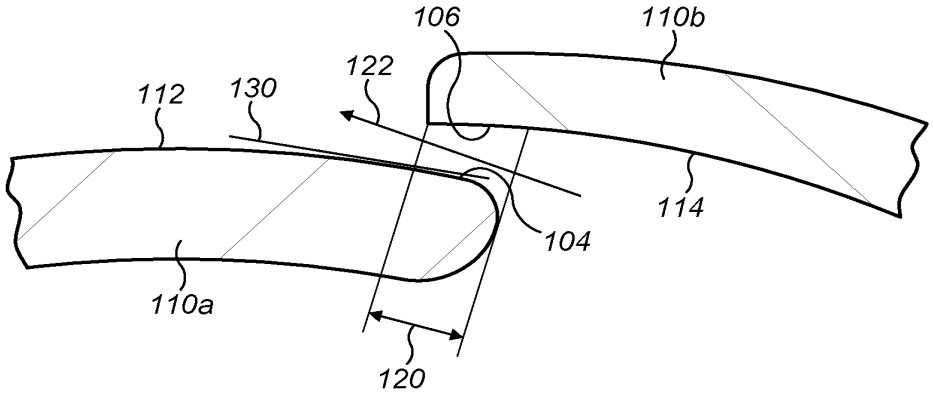


FIG. 5b

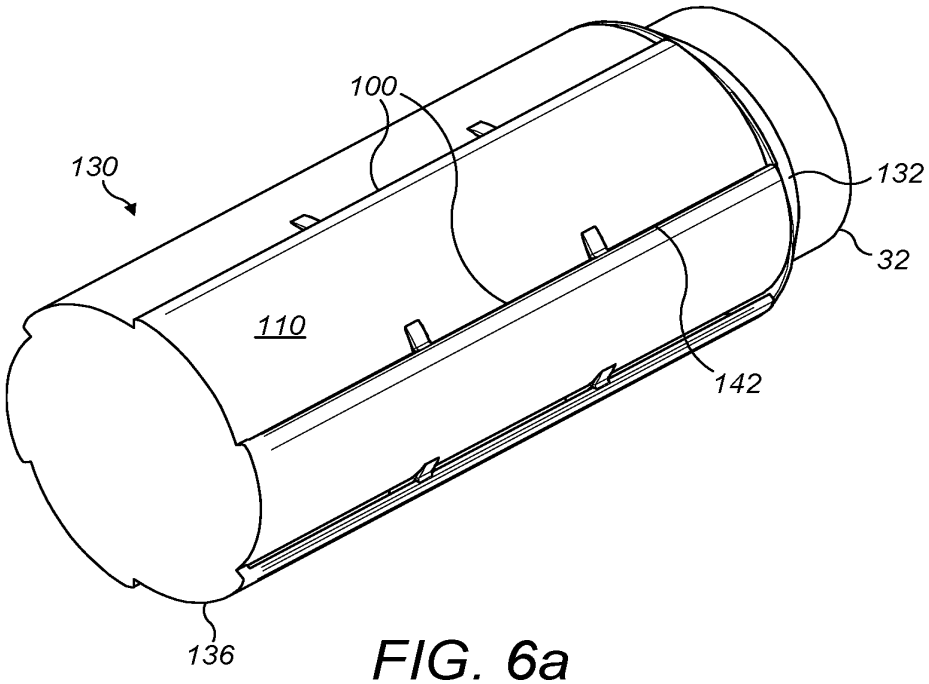


FIG. 6a

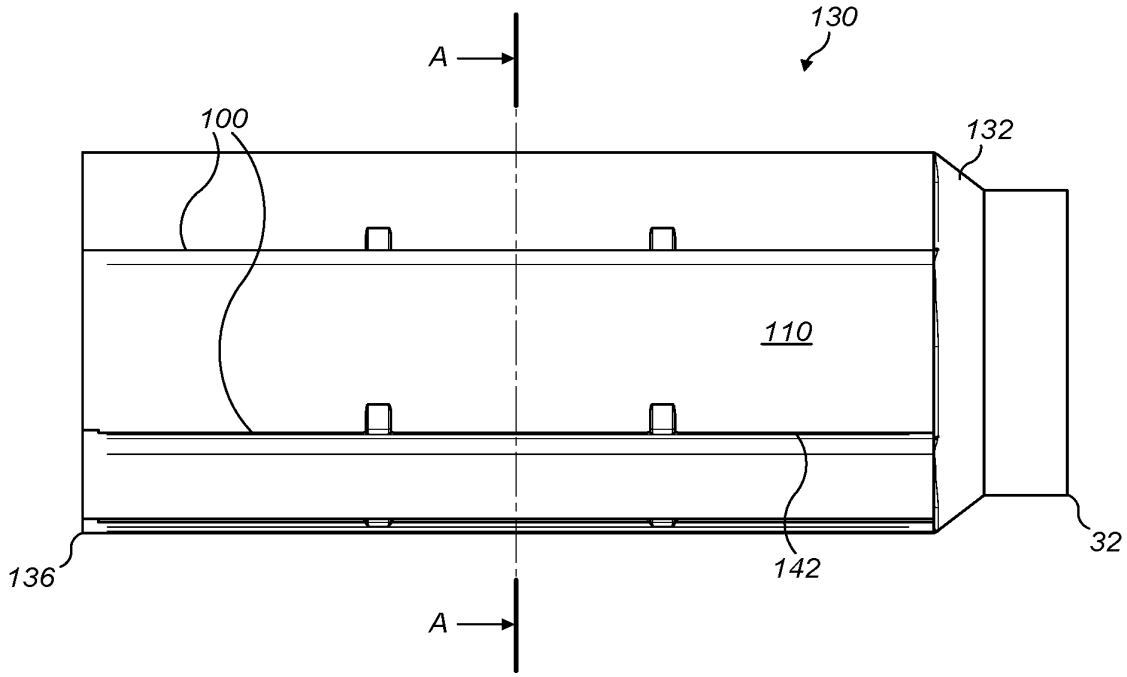


FIG. 6b

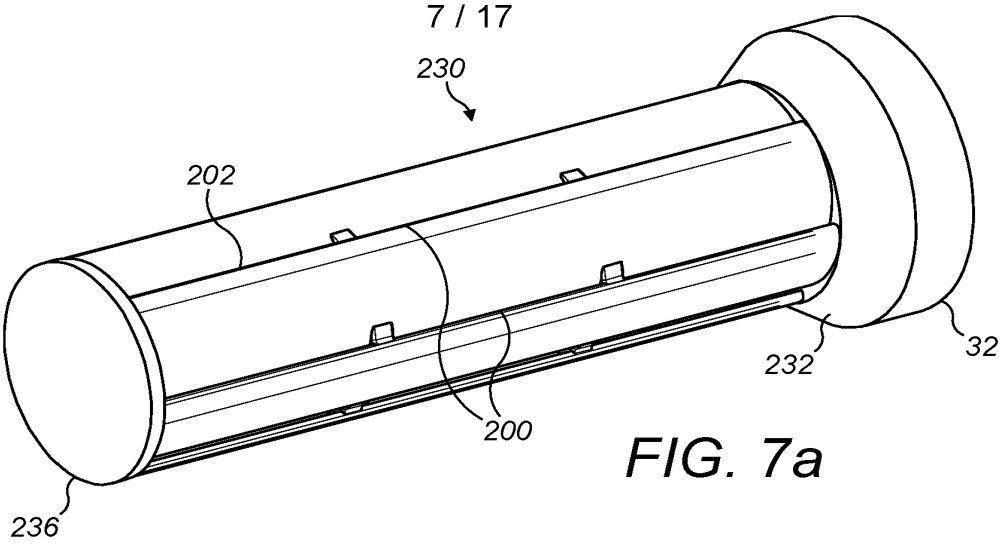


FIG. 7a

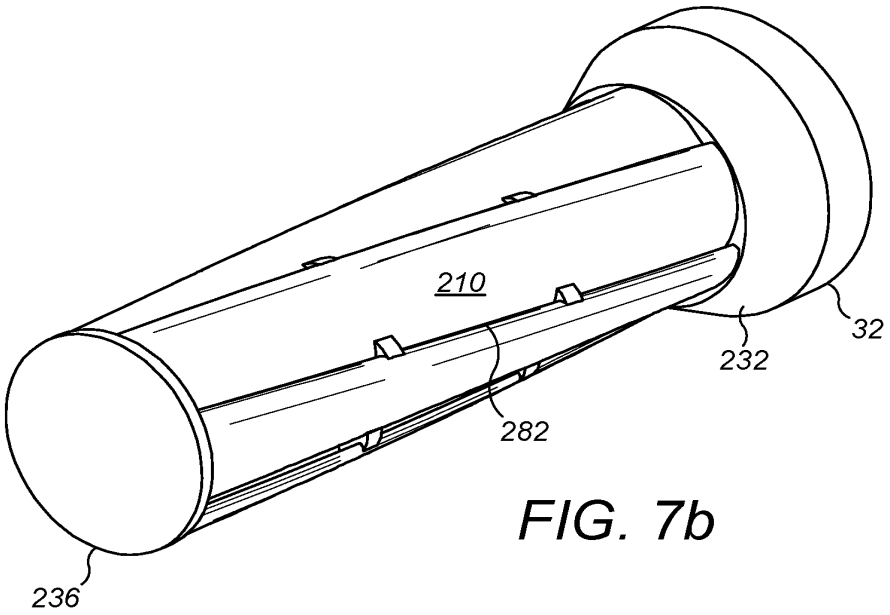


FIG. 7b

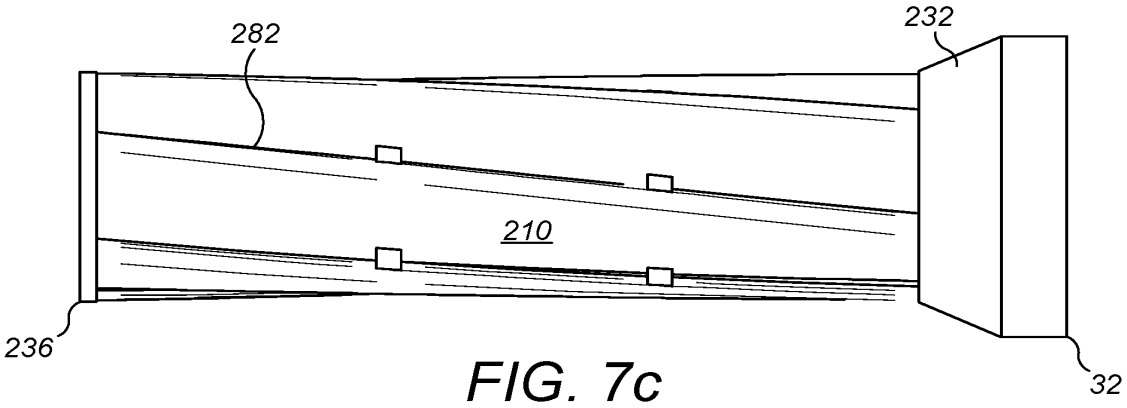


FIG. 7c

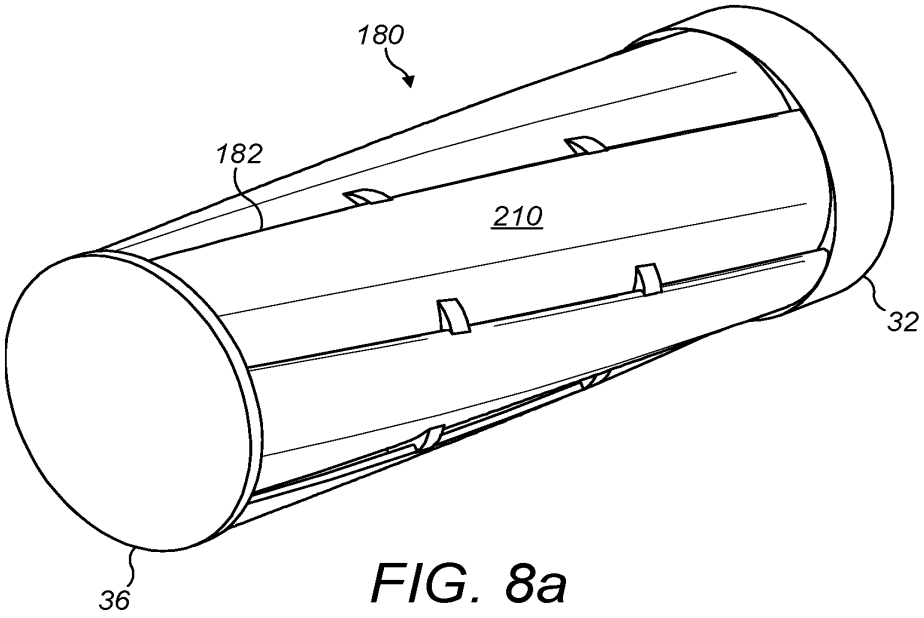


FIG. 8a

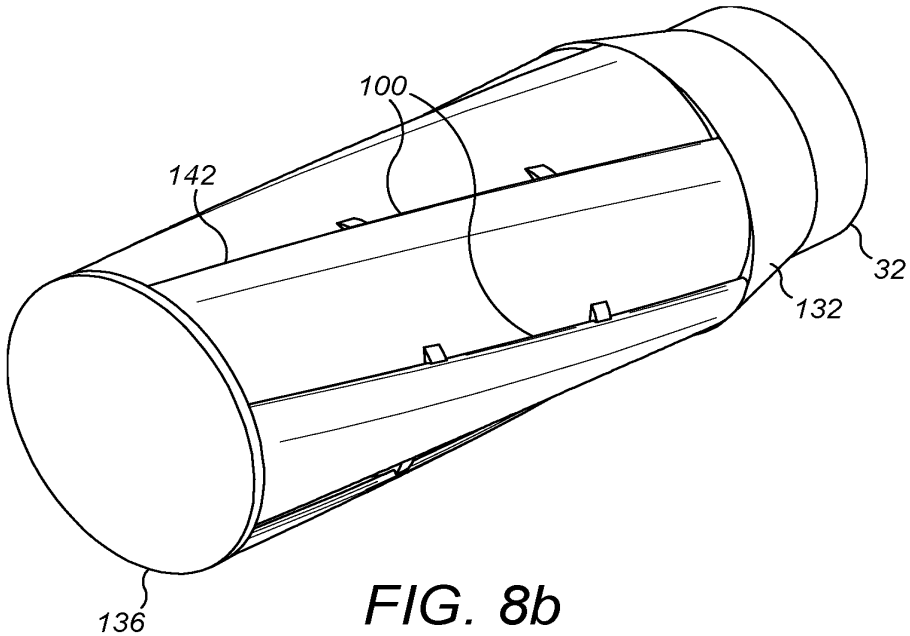


FIG. 8b

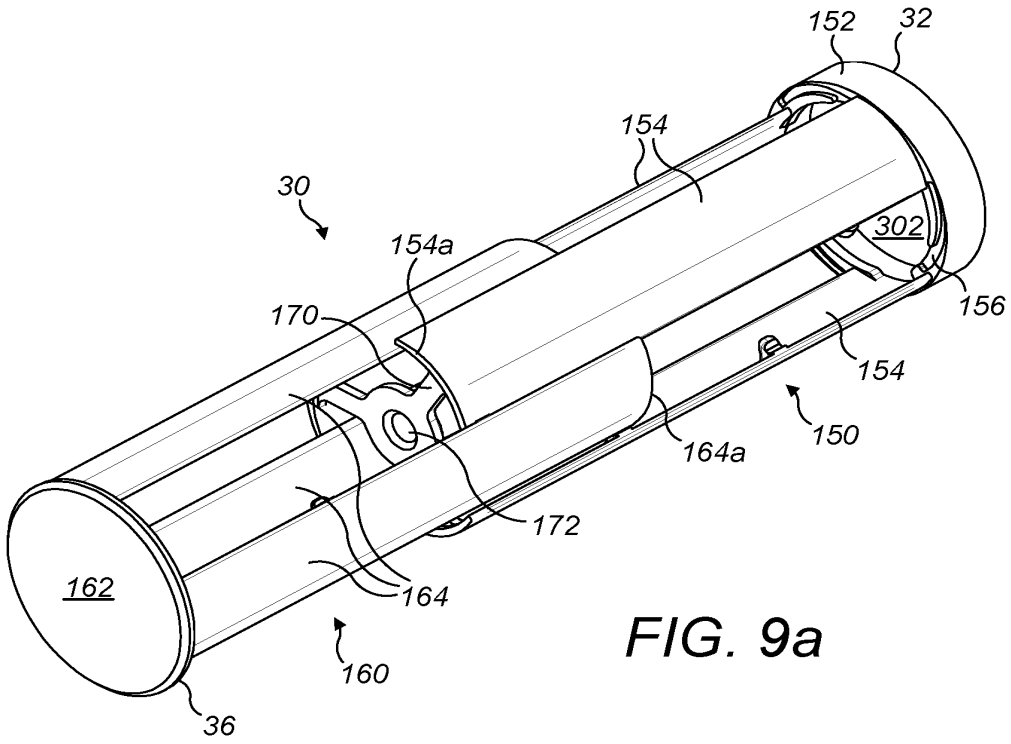

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FIG. 9a

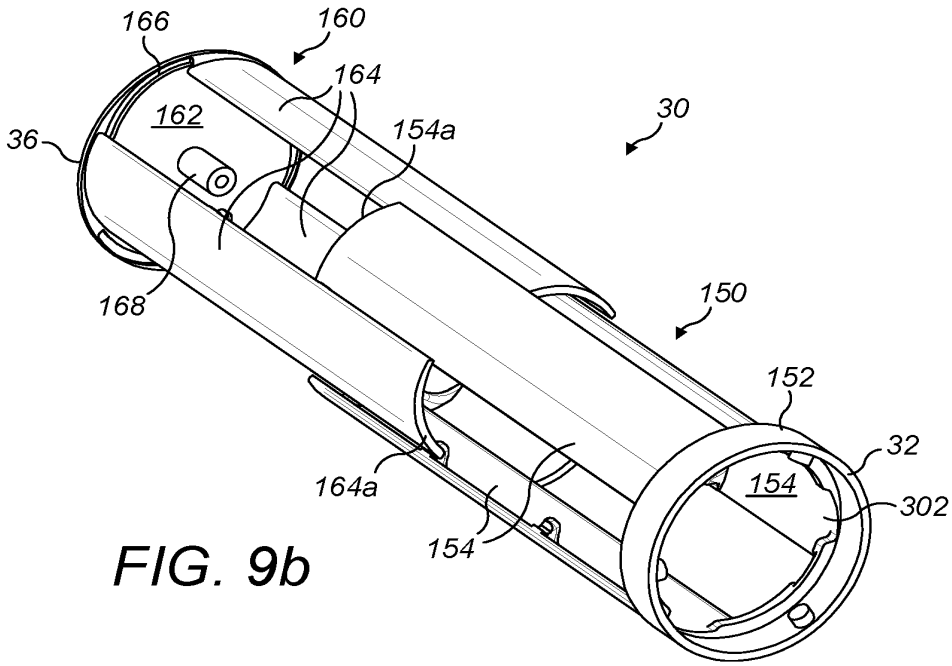

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FIG. 9b

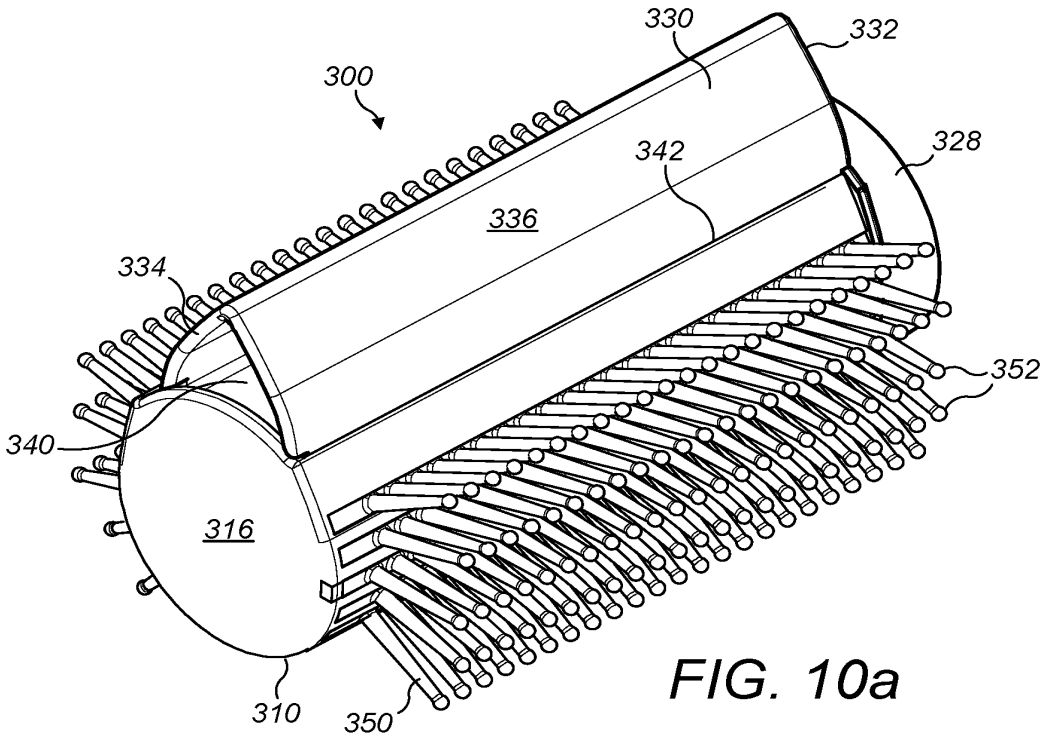


FIG. 10a

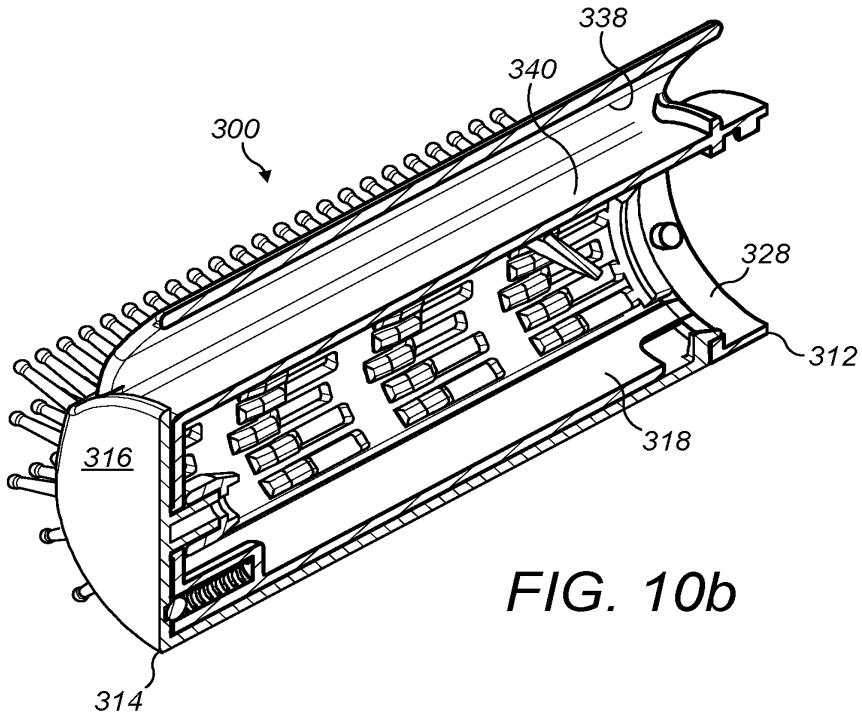


FIG. 10b

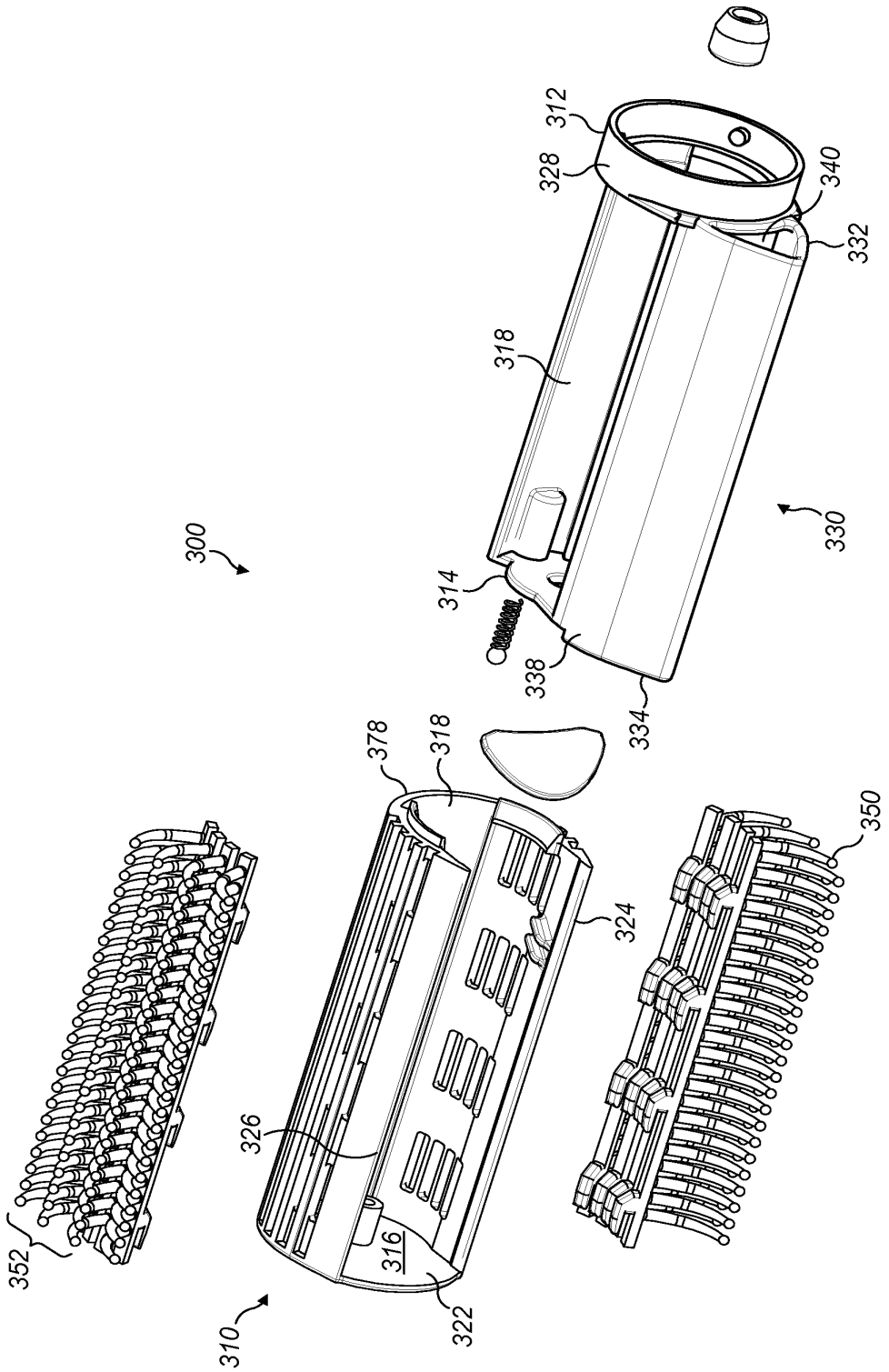

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FIG. 11a

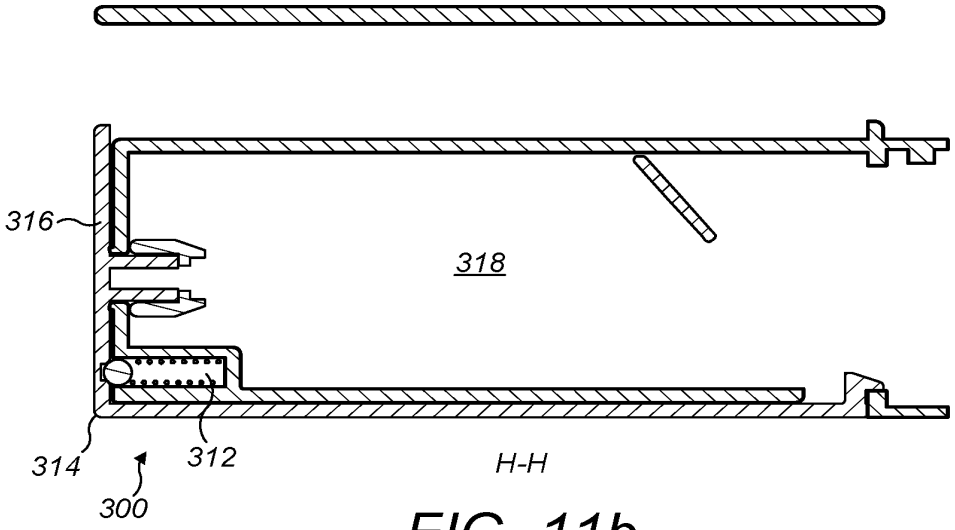


FIG. 11b

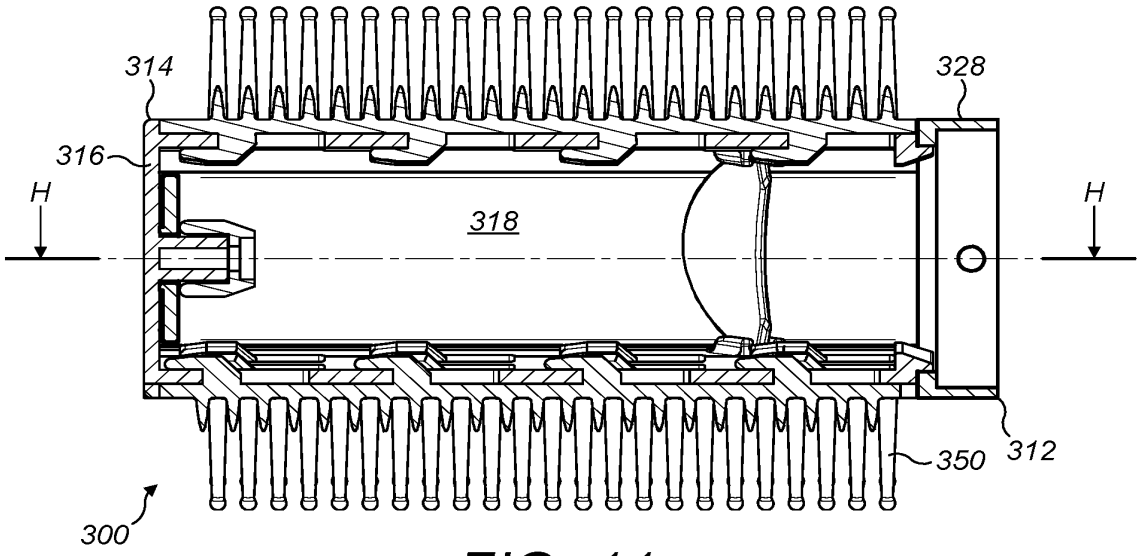


FIG. 11c

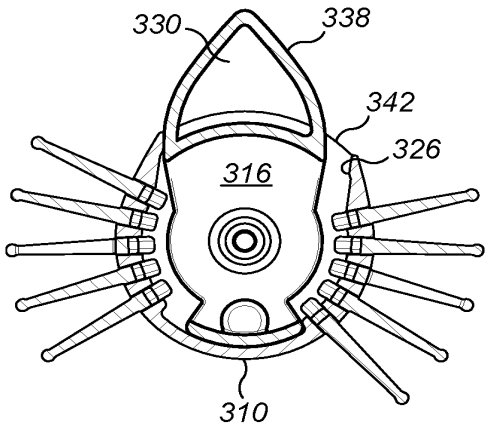


FIG. 12a

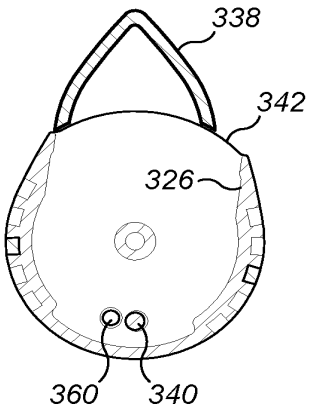


FIG. 12b

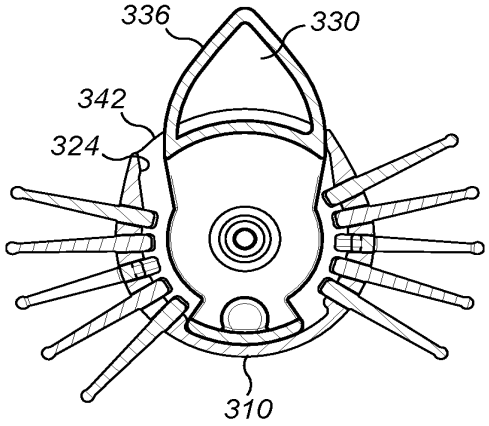


FIG. 13a

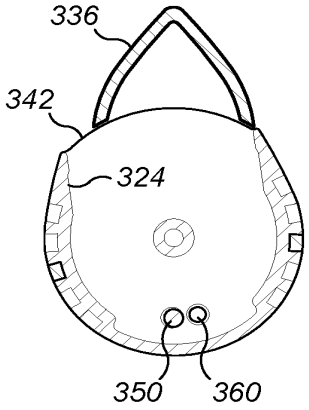


FIG. 13b

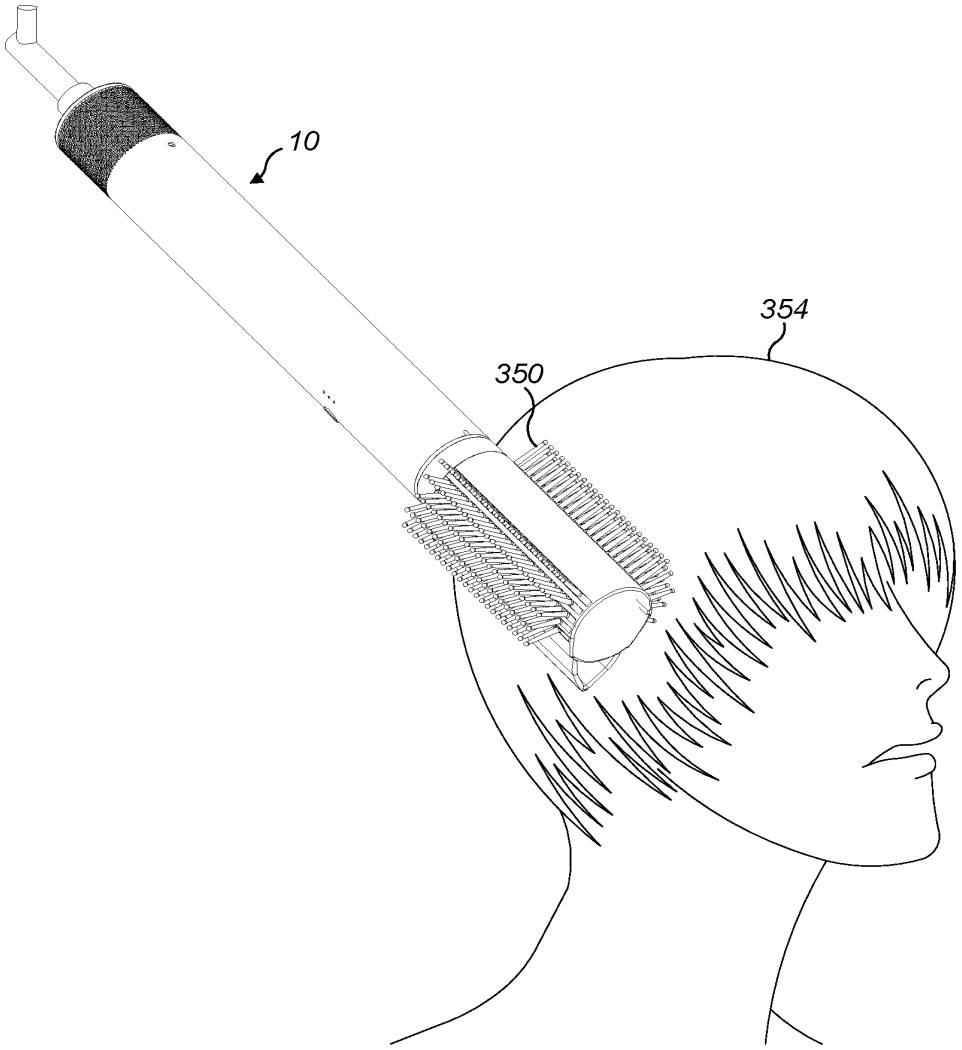


FIG. 14

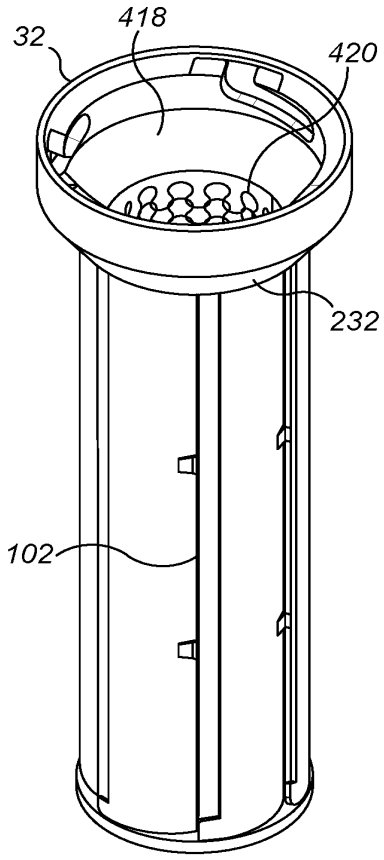


FIG. 15a

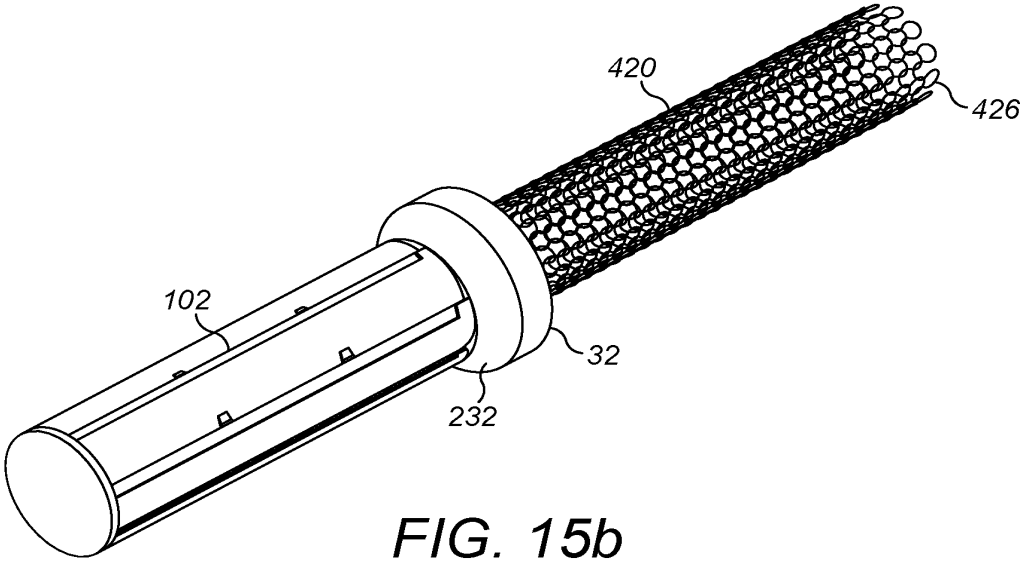


FIG. 15b

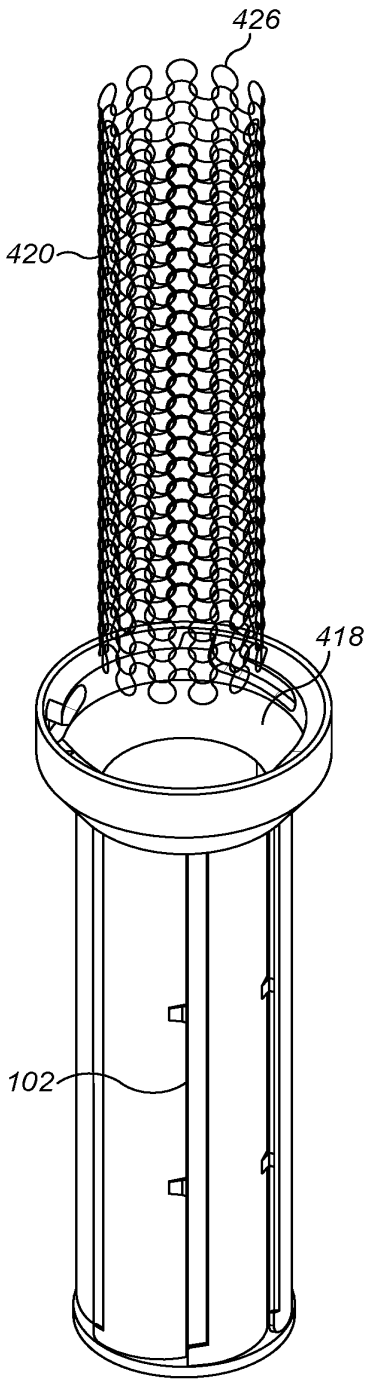


FIG. 15c

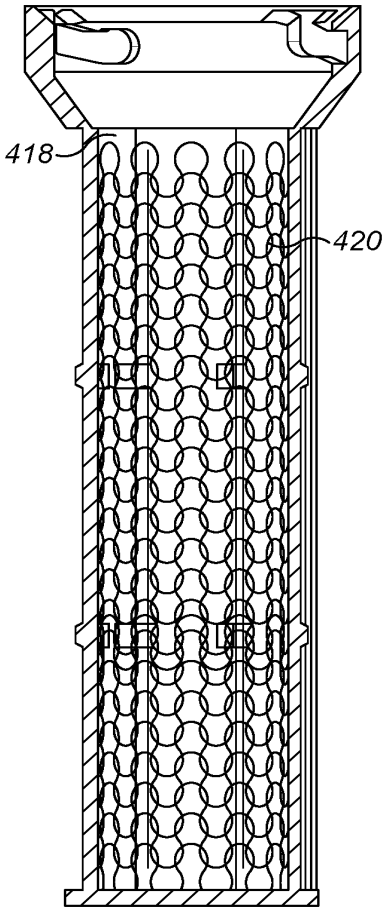


FIG. 15d

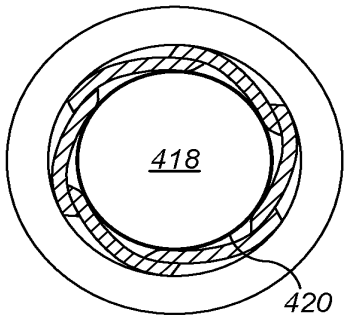


FIG. 15e

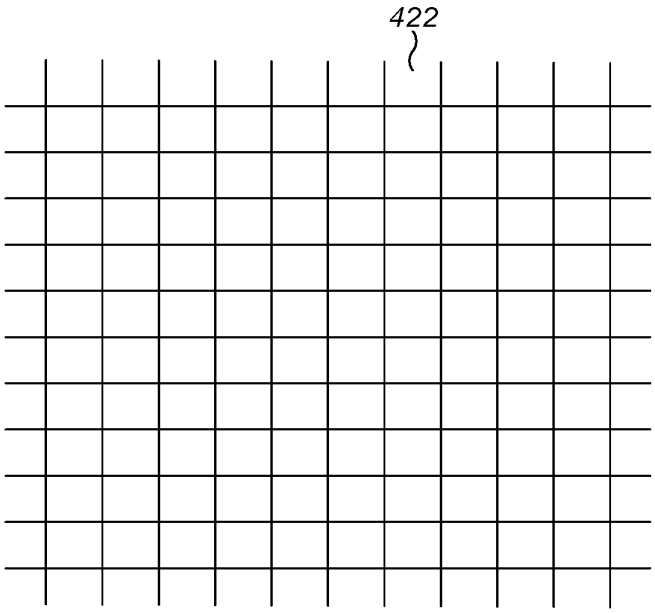


FIG. 16a

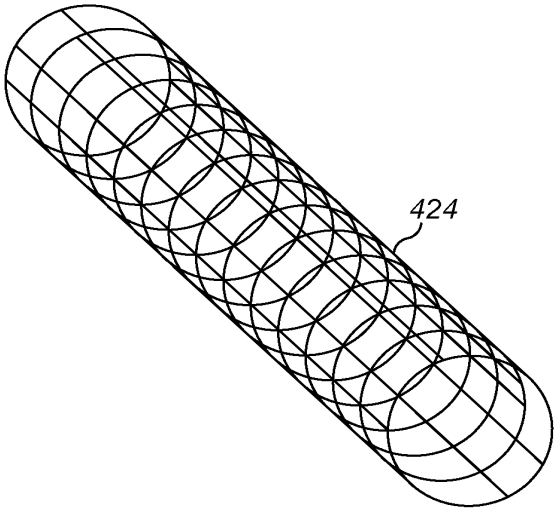


FIG. 16b

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Application Number:	14656357
International Application Number:	
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1		Amend_424662093300.pdf	145926 46e18012bf17ad40e589804ebf138a30687dbb97	yes	19

	Multipart Description/PDF files in .zip description				
	Document Description		**Start**		**End**
	Amendment/Req. Reconsideration-After Non-Final Reject		1		1
	Specification		2		3
	Claims		4		7
	Applicant Arguments/Remarks Made in an Amendment		8		19
Warnings:					
Information:					
2	Drawings-only black and white line drawings	ReplacementDraws_424662093300.pdf	1015570 3ef9fea697c038e83a8fc151daca1295977ac504	no	17
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/656,357	Filing Date 03/12/2015	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **05/15/2017**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 35	Minus	** 35	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

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(Use as many sheets as necessary)				Examiner Name	J. F. Gill
Sheet	1	of	1	Attorney Docket Number	424662093300

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Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS

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	1.	WO-2007/077040	07-12-2007	Leopoldo Matteo BAZZICALUPO; Raffaella MANGIAROTTI		
	2.	WO-2015/140506	09-24-2015	Dyson Technology Limited (Alasdair MACLAINE)		

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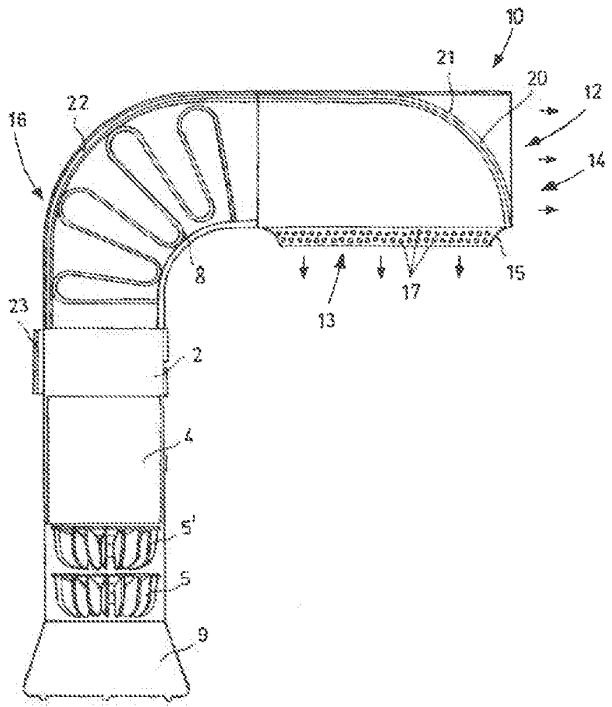
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[Continued on next page]

(54) Title: HAIRDRYER DEVICE



(57) Abstract: Hairdryer device (10) of the type equipped with at least one handle (2), with at least one dispensing barrel (3), with at least one electric motor (4) and with at least one inlet fan (5) functionally connected to the motor (4) to take in air from the outside and dispense it through an outlet mouth. The device also has a first outlet mouth (12) arranged on the front of barrel (3), at least one second outlet mouth (13), arranged on the side of barrel (3) to dispense an airflow substantially perpendicular to the first outlet mouth (12) and selection means (14) to alternate the dispensing of the flow between the first and second mouth according to the user's requirements.

WO 2007/077040 A2

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

HAIRDRYER DEVICE

The present invention refers to a hairdryer device.

Conventional hairdryer devices are made up of a handle, a dispensing barrel arranged substantially perpendicular to the handle, an electric motor, contained in the barrel and an inlet fan functionally connected to the motor to take in air from the outside and dispense it, possibly after having passed through an electrical resistance, from an outlet mouth, arranged on the front of the barrel.

From observing the posture and movement of the arms of hairdressers whilst using conventional hairdryers, like the one described above, it can be seen that when straightening hair the hairdresser is forced to lift the arm and twist the wrist to direct the airflow from above to below.

Such an operation becomes necessary, during straightening of hair, to make the hair shiny, since by directing the hot airflow from the top of the head towards the tips of the hair the squamae of the hair close up, which makes them shiny.

In order to be able to carry out this type of drying, in the current state of the art, it is necessary to add an accessory (air concentrator) on the end of the hairdryer. This element has a series of

disadvantages in terms of comfort:

- on the one hand it does not solve the ergonomic problems, since the grip and the arm and wrist movements remain unnatural (lifting of the arm and twisting of the wrist) and even made more tiring by the extension of the hairdryer that means that the arm has to be lifted even higher;
- on the other hand, by absorbing the heat from the air coming out from the end of the hairdryer, the air concentrator overheats with the risk of burning the fingers when it has to be held to detach it, and then move on to a different operation.

These and other factors, above all considered over a continuous day of work lasting about eight hours lead to needless tiring that can, over time, cause serious and temporarily incapacitating pathologies such as tendinitis.

Indeed, prolonged and/or repetitive flexing-extension movements of the wrist cause an increase in pressure inside the carpal tunnel.

Moreover, the repeated stretching of the nerves and of the tendons that run behind the tunnel can cause inflammation that reduces the size of the carpal tunnel resulting in the compression of the median nerve.

In light of the above there is clearly a need to

provide a hairdryer device, like the one according to the present invention, which allows the problems of the prior art to be solved by providing a device capable of varying the type and direction of the airflow being dispensed according to the type of drying and the degree of shine that one wishes to obtain.

The purpose of the present invention is, therefore, to avoid the aforementioned drawbacks and in particular to make a hairdryer device that allows the hair treatment process (straightening, smoothing, brushing, etc.) to be carried out allowing the wrist to remain in the most natural possible position, i.e. the one in which the muscles are typically relaxed (which occurs in conditions of microgravity).

Another purpose of the present invention is to provide a hairdryer device, which eliminates the possibility of burning the fingers due to the removal of the air concentrator, before it has cooled down.

Another purpose of the present invention is to provide a hairdryer device capable of being positioned on a support base without auxiliary support elements, thus capable of standing upright.

Finally, another purpose of the present invention is to provide a hairdryer device that is particularly simple and functional at a relatively low cost.

These and other purposes according to the present

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invention are accomplished by a hairdryer device as outlined in claim 1.

Further characteristics of the device are the object of the dependent claims.

The characteristics and advantages of a hairdryer device according to the present invention shall become clearer from the following description, given as a non-limiting example, referring to the attached schematic drawings, in which:

-figure 1 is a schematic side elevation view in section of a first embodiment of the hairdryer device according to the present invention;

-figure 2 is a schematic front view in section of a first embodiment of the hairdryer device according to the present invention;

-figure 2a is a schematic view from below of the blade-shaped opening of the hairdryer device according to the present invention; and

-figure 3 is a schematic side elevation view in section of a second embodiment of the hairdryer device according to the present invention;

-figure 4 is a schematic side elevation view in section of a further embodiment of the hairdryer device according to the present invention equipped with special selection means of the airflow; and

- figures 5 and 5a are two front views of a

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further embodiment of the hairdryer device according to the present invention equipped with special selection means of the airflow.

With reference to the figures, a hairdryer device is shown, wholly indicated with 10.

The device 10 comprises at least one handle 2, at least one dispensing barrel 3 arranged substantially perpendicular to the handle 2, an electric motor 4 and at least one inlet fan 5,5' functionally connected to the motor 4 to take in air from the outside and dispense it through an outlet mouth.

In order to operate, the hairdryer device 10 has a connection to an energy source, such as, in a known way, a connection, not shown, to the mains.

The device 10 also has, in a *per sé* known way, at least one electrical resistance 8 arranged downstream of the electric motor 4 to heat, if so desired, the airflow to be dispensed and at least one filter 9 arranged upstream of the intake fans 5,5'.

Advantageously, according to the present invention the device 10 also comprises at least one first outlet mouth 12 arranged on the front of barrel 3, at least one second air inlet mouth 13 arranged on the side of barrel 3 to dispense an airflow, substantially perpendicular to the first mouth 12 and selection means 14 to alternate the dispensing of the flow between the

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first 12 and the second outlet mouth 13 according to the type of drying that one wishes to obtain.

The secondary outlet mouth 13 is arranged on the side of the barrel 3 and consists of a blade-shaped opening 11, in other words of a size substantially larger than the rest, as shown in figure 2a.

In particular, the predominant direction is that parallel to the axis of symmetry of the barrel 3.

The special blade-shaped configuration of the opening 11 allows the closing of the squamae of the hair during drying to be made easier and to be carried out to a greater degree, making the straight hair particularly shiny.

The second outlet mouth 13 also has a projecting portion 15 with section substantially radially converging going away from the barrel 3, as shown in figure 2.

The blade-shaped opening 11 is arranged on top of the projecting portion 15.

On the inclined sides of the projecting portion 15 a plurality of holes 17 are foreseen that are also inclined, which by Venturi effect, during the operation of the device 10, take in cold air from the outside so as to compact the flow being dispensed from the second outlet mouth 13.

The cold air coming from the outside mixes,

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therefore, with the hot air coming from the barrel 3 compacting the flow being dispensed and, therefore, resulting in the squamae of the hair closing to a greater extent, which make them shinier.

To better direct the flow entering through the holes 17, a deflecting fin 32 is foreseen, as shown in figure 2, arranged perpendicular to the opening 11.

The alternation between the dispensing of the two air flows occurs, as stated earlier, thanks to suitable selection means 14 or selectors actuated by suitable controls 16.

According to a first embodiment shown in figure 1, the selection means 14 are represented by a curtain element 20 that can slide in two guides 21 formed inside the barrel 3 to close or open the first front outlet mouth 12.

The sliding of the curtain 20 is obtained through control means 16 represented, in this case, by a mechanical connection member 22 and by at least one slider 23 arranged on the handle 2 and able to be actuated manually from the outside.

By making the slider 23 slide in one direction, the curtain 20 slides in the guides 21 to close the front outlet mouth 12, whereas by making the slider 23 slide in the opposite direction, the curtain 20 slides back to open the front outlet mouth 12.

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Although in the present description reference is made to two side guides 21 it is also possible to foresee just one or more than two of them without departing from the scope of protection of the present invention.

According to another embodiment, the selection means 14 are represented by a diaphragm 31 arranged at the first outlet mouth 12.

The diaphragm 31 is hinged at an end thereof to the barrel 3 and can rotate between a closed position and an open position to open or close the first outlet mouth 12.

For this purpose, the diaphragm has a shape and size such as to completely block the first outlet mouth 12 in closed position.

According to this embodiment, the diaphragm 31 is held in open position by suitable elastic means 33, and in closed position by suitable locking means, not shown, suitable for locking said diaphragm onto the mouth 12 and counteracting said elastic means 33.

With the locking means unlocked, the diaphragm 31 rotates under the action of the elastic means to leave the first outlet mouth 12 free to dispense the airflow at the front.

Alternatively, the diaphragm 31 can be hinged at two of its opposite ends to the barrel 3 so as to

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define a rotation axis that is substantially vertical, in other words substantially parallel to the handle 2, or horizontal, in other words perpendicular to the handle 2.

The diaphragm 31 can, therefore, rotate between a closed position, in which it is arranged perpendicular to the airflow and blocks the first outlet mouth 12 (fig.4) and an open position (represented for example with a broken line in fig.4), in which it is arranged parallel to the airflow so as to allow it to be dispensed from the mouth 12.

According to yet another embodiment, not shown, the selection means 14 of the airflow are represented by at least one butterfly valve consisting of two semicircular sections hinged at the straight sides.

The two semicircular sections open and close thanks to a mechanical connection member arranged on the body of the hairdryer and to a manual gripping element actuated from the outside.

According to yet another embodiment, the selection means 14 of the air are represented by two bladed air deflectors suitable for lying on top of one another or coming together to open or close the outlet of the airflow through the first mouth 12.

In particular, when the deflectors are arranged at 90° to one another air passes, whereas when the blades

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come together the passage of air is blocked.

According to yet another embodiment, the selection means 14 of the air are represented by a plurality of bladed air deflectors 44 hinged to the barrel 3 so as to be able to rotate between a position in which they are arranged perpendicular to the airflow, forming a single shutter 31 that blocks the first outlet mouth 12 (fig.5) and an open position in which they are all arranged parallel to each other and to the airflow so as to allow the latter to be dispensed from the mouth 12 (fig.5a).

Alternatively, the reciprocity between the two flows can also be obtained by providing a portion of barrel 3 shaped like a rotatable sleeve.

In particular, the aforementioned sleeve, arranged at the end of the barrel 3, can rotate to open or close the opening 11.

In any case, once the front curtain or the alternative selection means 14 that opens the first outlet mouth 12 is open, it is not necessary to close the second outlet mouth 13, arranged on the side of the barrel 3. Indeed, the force of the airflow directed towards the front outlet is unable to create an airflow from the underlying second outlet mouth 13. Rather, due to the Venturi effect, the main flow directed towards the front air outlet or primary mouth 12 creates a cold

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airflow that penetrates from the outlet below 13, determining a suitable mixing of the two airflows - the hot one, coming from the resistance 8, and the cold one, coming in from the mouth 13, respectively.

According to another advantageous aspect of the present invention, the electric motor 4 is a single-phase or three-phase electronic motor with eòectronic control.

The particular motor 4 is of a particularly small size that allows the device 10 to be configured with a particularly slim tube-shaped structure. The hairdryer device 10 according to the present invention thus consists of a new electronic motor of reduced diameter that can be controlled through an electronic board capable of modulating the dispensing speed of the airflow as desired.

In other words, with the device 10 according to the present invention, the airflow is not dispensed at determined speeds, but in continuous variation according to the user's requirements.

The small size of the new electronic motor allows it to be positioned inside a handle, allowing the barycentre to be moved from the body of the barrel (as in conventional hairdryers) to the area of the grip or handle.

The movement of the barycentre, which is now

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substantially aligned with the axis of symmetry of the handle, makes it possible to have a product that is able to be rested on the base of the handle and to remain stable, upright on a plane, making it easier to be held more ergonomically at the moment of use.

Alternatively, it is possible to foresee a conventional electric motor 4 that must, however, be positioned inside the handle, allowing the barycentre to be moved from the body of the barrel (as in conventional hairdryers) to the area of the grip or handle.

The hairdryer device according to the present invention, in a variant that is not shown, foresees that both the first outlet mouth 12, and the second outlet mouth 13, be positioned on a sleeve able to rotate by 360° on the barrel 3. In this way, an airflow is obtained dispensed from the mouth 13 with variabile inclination according to the user's requirements.

The hairdryer device, in a further variant that is not shown, also foresees a third outlet mouth of the air arranged in the top part of the barrel 3.

At the third outlet mouth 12 a second integrated accessory intended for the treatment of curly hair is foreseen. The integrated accessory is represented by a diffuser provided with a plurality of silicon rubber-ended points suitable for carrying out a massage and a

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further curling of the root of the hair. The integration of this second accessory in the very structure of the hairdryer device allows the risks of burning hands and fingers whenever touching the air nozzle and/or the diffuser before the hairdryer has cooled down to be eliminated.

From the description that has been made the characteristics of the device object of the present invention are clear, just as the relative advantages are also clear, including:

- possibility of carrying out the hair treatment process (straightening, smoothing, brushing, etc.) allowing the wrist to remain in the most natural possible position, i.e. the one in which the muscles are typically relaxed;

-possibility of keeping the device upright on a plane without the help of external support means;

-simplicity of construction and functionality;

-relatively low manufacturing costs.

Finally, it is clear that the device thus conceived can undergo numerous modifications and variations, all of which are covered by the invention. For example, although in the present description the outlet mouths 12,13 are integral with the barrel 3 it is, nevertheless, possible to make them on a distinct portion able to be fixed through suitable releasable

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means to the barrel 3 itself so as to obtain the same result in functional terms. Moreover, all of the details can be replaced by technically equivalent elements. In particular, it is possible within the the present invention to make a hairdryer accessory, such a hairdryer comprising at least one dispensing barrel 3 to which such an accessory can be fixed through attachment means. Such an accessory comprises a first outlet mouth 12, arranged on the front of said barrel 3, and at least one second outlet mouth 13, arranged on the side of said barrel 3 to dispense an airflow, substantially perpendicular to said first mouth 12. Moreover, it is possible to foresee the presence of at least one third mouth for the air arranged at the top of such a barrel 3. Moreover, the attachment means between the barrel and the accessory allow it to rotate with respect to such a barrel.

In practice, the materials used, as well as the sizes, can be whatever according to the technical requirements.

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CLAIMS

1.Hairdryer device (10) of the type equipped with at least one handle (2), at least one dispensing barrel (3), with at least one electric motor (4) and with at least one inlet fan (5) functionally connected to said motor (4) to take in air from the outside and dispense it through at least one outlet mouth characterised in that it comprises a first outlet mouth (12), arranged on the front of said barrel (3), at least one second outlet mouth (13), arranged on the side of said barrel (3) to dispense an airflow, substantially perpendicular to said first mouth (12) and selection means (14) to alternate the dispensing of the airflow between the first (12) and the second mouth (13) according to the user's requirements.

2.Hairdryer device (10) according to claim 1, characterised in that said second air inlet mouth (13) comprises a projecting portion (15) with section converging radially towards the outside, with respect to said barrel (3), and a substantially blade-shaped opening (11) arranged on the distal end of said projecting portion (15) with respect to said barrel (3).

3.Hairdryer device (10) according to claim 1, characterised in that said second air inlet mouth (13) comprises at least one air inlet hole (17) to take in

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air from the outside by Venturi effect and at least one deflecting fin (32), arranged perpendicular to said blade-shaped opening (11), to direct the airflow coming in through said hole (17).

4.Hairdryer device (10) according to claim 1, characterised in that it comprises control means (16) to activate said selection means (14) of the airflow.

5.Hairdryer device (10) according to claim 1, characterised in that said selection means (14) of the airflow comprise at least one curtain element (20) able to slide in at least one guide (21), made in said barrel (3) to open or close said first mouth (12).

6.Hairdryer device (10) according to claim 1, characterised in that said control means (16) comprise a mechanical connection member (22) acting on a slider (23) arranged on said handle (2) to make said curtain (20) slide.

7.Hairdryer device (10) according to claim 4, characterised in that said means (14) for selecting the airflow comprise at least one diaphragm (31) arranged at the first outlet mouth (12) suitable for rotating between a closed position and an open position to open or close the first outlet mouth (12).

8.Hairdryer device (10) according to claim 7, characterised in that said control means (16) comprise elastic means (33) for holding said diaphragm (31) in

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open position and locking means suitable for locking said diaphragm (31) on the mouth (12) counteracting said elastic means (33).

9.Hairdryer device (10) according to claim 7, characterised in that the diaphragm (31) is hinged at two of its opposite ends to said barrel (3) so as to define a rotation axis.

10.Hairdryer device (10) according to claim 4, characterised in that said selection means (14) of the airflow comprise at least one butterfly valve comprising two semi-circular sections hinged to said barrel (3) suitable for opening or closing to open or close said first mouth (12).

11.Hairdryer device (10) according to claim 7, characterised in that said control means comprise a mechanical connection member arranged on the body of the hairdryer and a gripping element that can be actuated from the outside.

12.Hairdryer device (10) according to claim 4, characterised in that said selection means (14) of the airflow comprise two blade-shaped air deflectors suitable for lying on top of one another or coming together to open or close the outlet of the airflow through said first mouth (12).

13.Hairdryer device (10) according to claim 4, characterised in that said selection means (14) of the

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airflow comprise a plurality of blade-shaped air deflectors (44) hinged to the barrel 3 so as to be able to rotate between a position in which said air deflectors (44) are arranged perpendicular to the airflow, forming a single shutter (31) that blocks said first outlet mouth (12) and an open position in which they are all arranged parallel to each other and to the airflow so as to allow the latter to be dispensed from said mouth (12).

14.Hairdryer device (10) according to claim 4, characterised in that said selection means (14) of the airflow comprise a rotatable sleeve, arranged at the end of said barrel (3), to rotate between a position in which it opens said opening (11) and a position in which it closes said opening (11).

15.Hairdryer device (10) according to claim 1, characterised in that said motor (4) is an electronic motor.

16.Hairdryer device (10) according to claim 15, characterised in that said electronic motor (4) is a single-phase electronic motor.

17.Hairdryer device (10) according to claim 15, characterised in that said electronic motor (4) is a three-phase electronic motor.

18.Hairdryer device (10) according to claim 15, characterised in that it comprises electronic means

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suitable for controlling said electronic motor to continuously vary the dispensing speed of the airflow.

19.Hairdryer device (10) according to claim 1 or 15, characterised in that said motor (4) is positioned in said handle (2).

20.Hairdryer device (10) according to any one of the previous claims, characterised in that said first outlet mouth 12 and the second outlet mouth 13 are positioned on a rotatable sleeve on said barrel (3).

21.Accessory for a hairdryer, such a hairdryer comprising at least one dispensing barrel (3) to which such an accessory can be fixed through attachment means characterised in that it comprises a first outlet mouth (12), arranged on the front of said barrel (3), and at least one second outlet mouth (13), arranged on the side of said barrel (3) to dispense an airflow, substantially perpendicular to said first mouth (12).

22.Accessory according to claim 21, comprising at least one third air mouth arranged above such a barrel (3).

23.Accessory according to claim 21, in which the attachment means between the barrel and the accessory allow it to rotate with respect to such a barrel.

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Page 964 of 1998

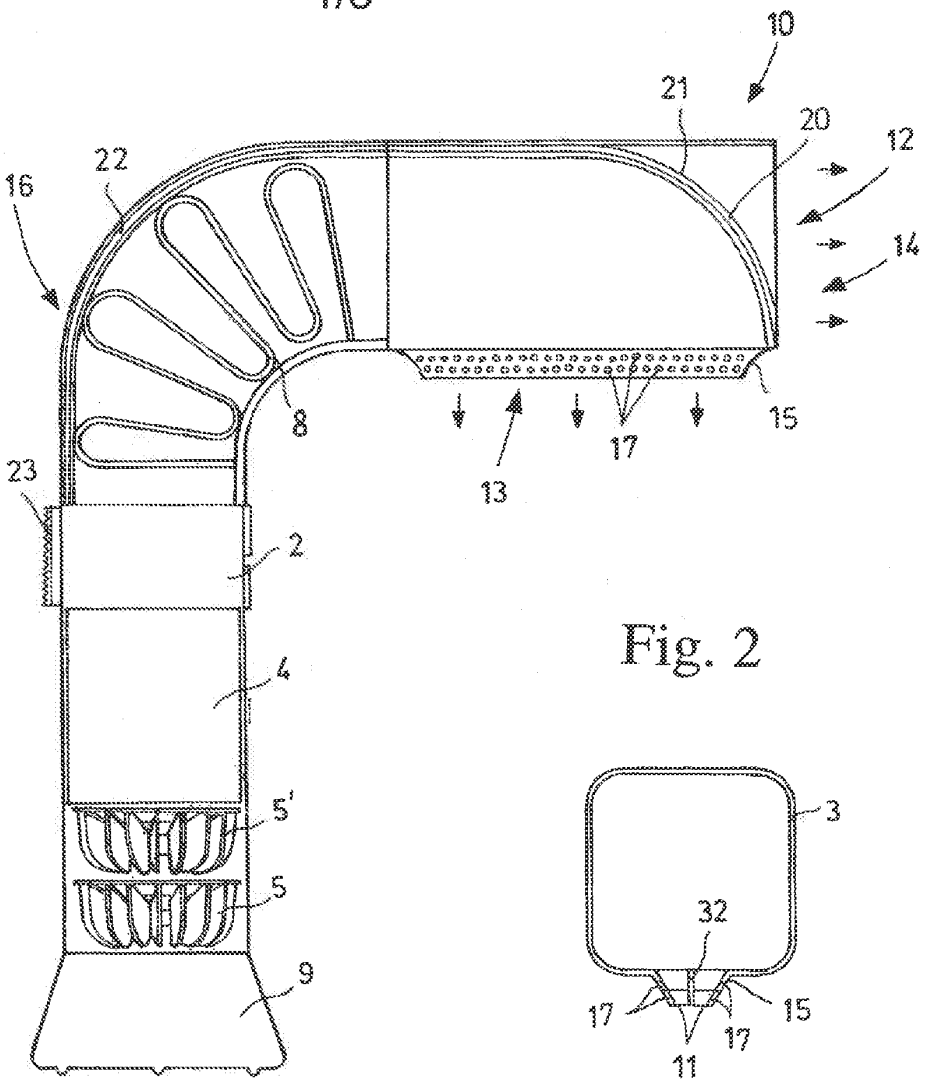


Fig. 2

Fig. 1

Fig. 3

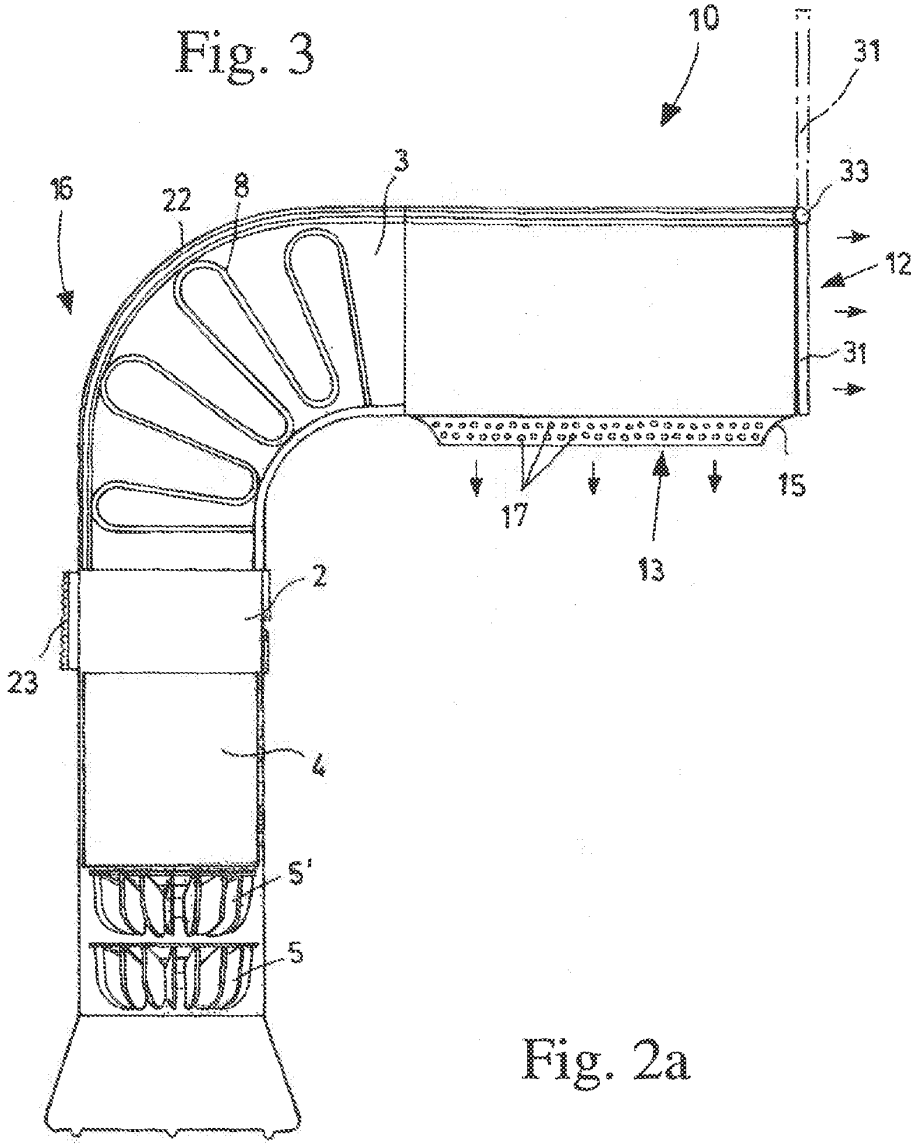
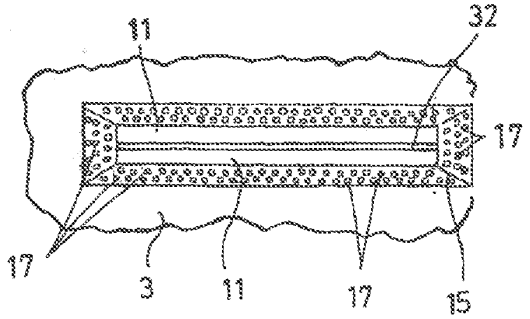


Fig. 2a



SNSDOCID: <WO_____2007077040A2_I_>

Fig. 4

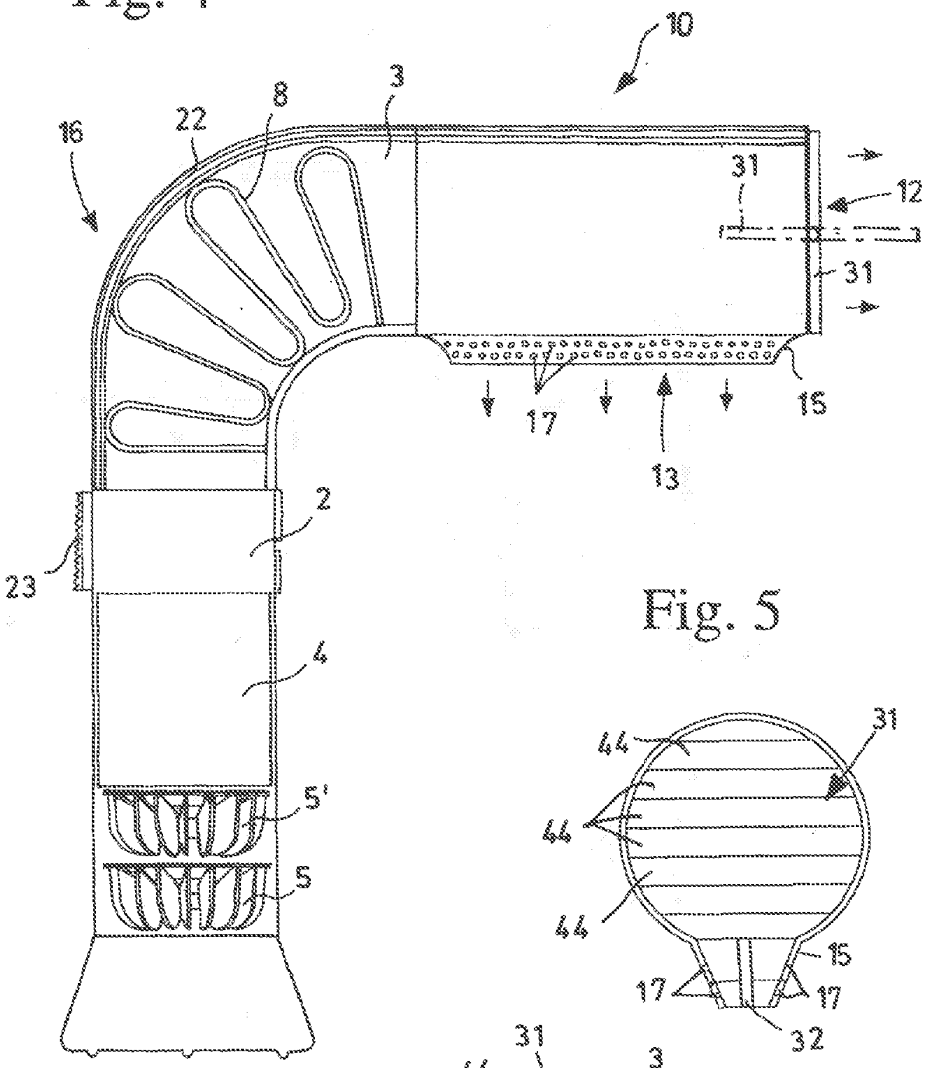


Fig. 5

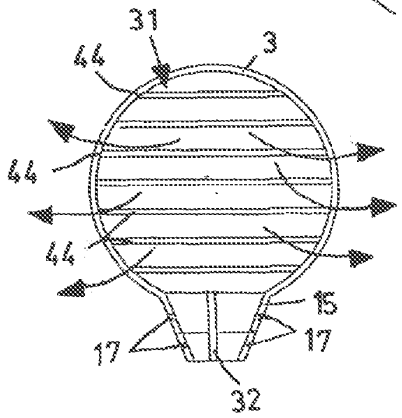


Fig.5a

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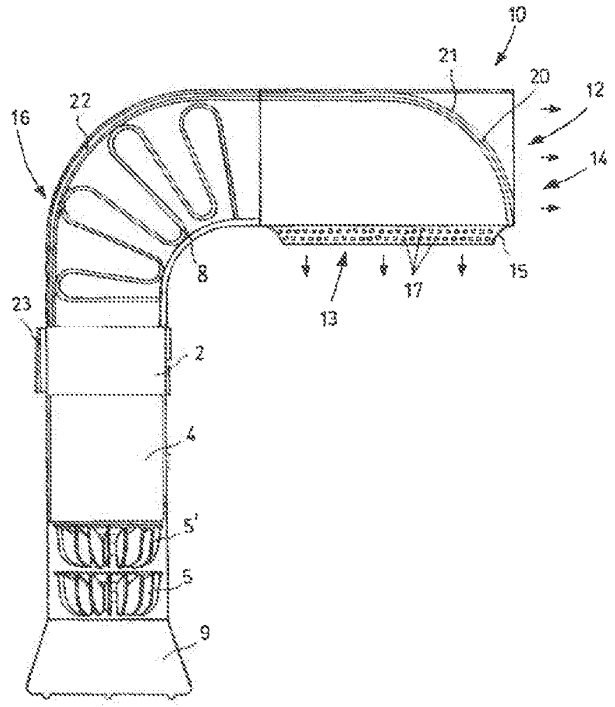
(74) Agent: **DE GREGORI, Antonella**; Barzano'& Zanardo Milano S.P.A., Via Borgonuovo 10, I-20121 Milan (IT).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: HAIRDRYER DEVICE



(57) Abstract: Hairdryer device (10) of the type equipped with at least one handle (2), with at least one dispensing barrel (3), with at least one electric motor (4) and with at least one inlet fan (5) functionally connected to the motor (4) to take in air from the outside and dispense it through an outlet mouth. The device also has a first outlet mouth (12) arranged on the front of barrel (3), at least one second outlet mouth (13), arranged on the side of barrel (3) to dispense an airflow substantially perpendicular to the first outlet mouth (12) and selection means (14) to alternate the dispensing of the flow between the first and second mouth according to the user's requirements.

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Published:
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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2006/012657

A. CLASSIFICATION OF SUBJECT MATTER
INV. A45D20/12

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)
A45D

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 198 556 A (CROWLEY GEORGE C [US] ET AL) 15 April 1980 (1980-04-15)	1
Y	column 3, line 43 - column 8, line 3	2
X	US 6 094 837 A (CANTOR JOSEF [US]) 1 August 2000 (2000-08-01)	1,21
Y	column 4, line 14 - column 5, line 18	2
Y	US 5 275 183 A (LANDRY CONRAD [CA]) 4 January 1994 (1994-01-04) column 4, line 39 - column 6, line 7	2
Y	GB 2 067 097 A (PEARLDUCK INC) 22 July 1981 (1981-07-22) page 1, lines 60-118	2

☐ 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

"E" earlier document 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	Date of mailing of the international search report
11 May 2007	07/09/2007

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Koob, Michael

Form PCT/ISA/210 (second sheet) (April 2005)

SNSDOCID: <WO 2007077040A3 | >

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2006/012657

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

see additional sheet(s)

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

SNSDOCID: <WO_____2007077040A3_I_>

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1,2,21

A hairdryer having a first outlet, a second outlet perpendicular to the first outlet and selection means to alternate the airflow between these outlets whereby the second outlet has a converging projection with a blade-shaped opening, as well as an accessory for a hairdryer with such two outlets.

---

2. claim: 3

A hairdryer having a first outlet, a second outlet perpendicular to the first outlet and selection means to alternate the airflow between these outlets whereby the second outlet has air inlet holes and a deflecting fin.

---

3. claims: 4-14

A hairdryer having a first outlet, a second outlet perpendicular to the first outlet and selection means to alternate the airflow between these outlets whereby features of the selections means are claimed.

---

4. claims: 15-19

A hairdryer having a first outlet, a second outlet perpendicular to the first outlet and selection means to alternate the airflow between these outlets whereby features of the motor are claimed.

---

5. claims: 20,23

A hairdryer having a first outlet, a second outlet perpendicular to the first outlet and selection means to alternate the airflow between these outlets whereby both outlets are positioned on a rotatable sleeve as well as an accessory which is rotatable with respect to the hairdryer.

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6. claim: 22

An accessory for a hairdryer having a first outlet, a second outlet perpendicular to the first outlet and a third outlet.

SNSDOCID: <WO_____2017077040A1_1_>

INTERNATIONAL SEARCH REPORT

information on patent family members

International application No
PCT/EP2006/012657

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4198556 A	15-04-1980	NONE	
US 6094837 A	01-08-2000	WO 0066962 A1	09-11-2000
US 5275183 A	04-01-1994	NONE	
GB 2067097 A	22-07-1981	NONE	

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1404985.2 20 March 2014 (20.03.2014) GB

(71) Applicant: **DYSON TECHNOLOGY LIMITED** [GB/GB]; Tetbury Hill, Malmesbury, Wiltshire SN16 0RP (GB).

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(74) Agents: **FOWLER, Maria** et al.; Intellectual Property Department, Dyson Technology Limited, Tetbury Hill, Malmesbury, Wiltshire SN16 0RP (GB).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

(54) Title: ATTACHMENT FOR A HAND HELD APPLIANCE

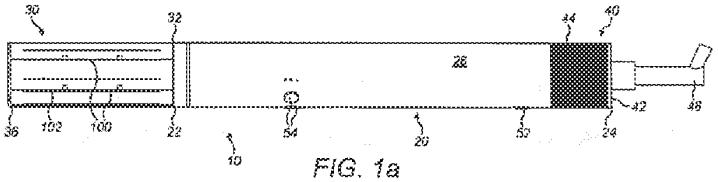


FIG. 1a

(57) Abstract: Disclosed is an attachment for a hand held appliance comprising an inlet; an outlet; and a fluid flow path between the inlet and the outlet, wherein the outlet comprises at least one slot extending from near an inlet end of the attachment towards a distal end of the attachment and wherein the outlet is at least partially defined by an external surface of the attachment wherein fluid emitted from the outlet is blown along the external surface. The slot may extend substantially along the length of the attachment and fluid emitted from the outlet is attracted to the surface of the attachment. The outlet may comprise a plurality of slots radially spaced around the attachment. Fluid emitted from the outlet flows around the external surface of the attachment and is tangential to the external surface of the attachment. The attachment has a longitudinal axis extending from the first end to the distal end and the at least one slot may be parallel to the longitudinal axis, alternatively the at least one slot is non-parallel to the longitudinal axis. The attachment may further comprise a flow directing element between the inlet and the outlet. Also disclosed is an appliance including such as attachment.

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BNSDOCID: <WO_____2015140506A1_1_>

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Attachment for a Hand Held Appliance

This invention relates to an attachment for a hand held appliance, in particular a hair care appliance such as a hot styling brush.

In a conventional hot styling brush, air is sucked into an inlet by a fan unit and directed towards the hair by an attachment or head. Depending on the style desired, the air may or may not be heated. The head or attachment often includes bristles onto which hair is wrapped and held for styling. The air is generally blown out of the head or attachment normal to the surface of the head.

The present invention provides an attachment for a hand held appliance comprising an inlet, an outlet, and a fluid flow path between the inlet and the outlet, wherein the outlet comprises at least one slot extending from near an inlet end of the attachment towards a distal end of the attachment and wherein the outlet is at least partially defined by an external surface of the attachment wherein fluid emitted from the outlet is blown along the external surface.

Preferably, the slot extends substantially along the length of the attachment.

It is preferred that the outlet comprises a plurality of slots radially spaced around the attachment.

Preferably, fluid emitted from the outlet flows around the external surface of the attachment. It is preferred that the fluid emitted from the outlet is tangential to the external surface of the attachment. Preferably, the fluid emitted from the outlet is attracted to the surface of the attachment.

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By having the fluid exiting the fluid outlet travelling around the outer surface of the head hair is attracted to the surface and easily wraps around to create the style.

It is preferred that the attachment is generally cylindrical.

Preferably, the outlet comprises two slots.

It is preferred that the attachment has a longitudinal axis extending from the first end to the distal end and the at least one slot is parallel to the longitudinal axis.

Alternatively, the attachment has a longitudinal axis extending from the first end to the distal end and the at least one slot is non-parallel to the longitudinal axis. It is preferred that the at least one slot is helical with respect to the longitudinal axis.

A curved slot changes the direction that fluid flows out from the fluid outlet tending to give a flow that is more normal to the surface of the attachment and this improves the hold of the hair around the attachment.

Preferably, the attachment further comprises a flow directing element between the inlet and the outlet. The flow directing element also changes the direction that fluid flows out from the fluid outlet tending to give a flow that is more normal to the surface of the attachment and this improves the hold of the hair around the attachment. In addition, the flow directing element reduces the velocity of the fluid within the attachment which in turn reduces the noise produced by the attachment.

It is preferred that the flow directing element comprises a perforated layer. Preferably, the perforated layer is formed from a mesh or weave of an elongate material. It is preferred that the elongate material is a wire. Preferably, the flow directing element extends substantially along the length of the at least one slot. It is preferred that the flow directing element extends substantially around an inner circumference of the attachment.

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According to a second aspect, the invention provides a hand held appliance comprising a handle having a fluid flow path from an inlet to an outlet and a fan unit for drawing fluid into the fluid inlet and an attachment for attaching to the handle, the attachment comprising an inlet; an outlet; and a fluid flow path between the inlet and the outlet, wherein the outlet comprises at least one slot extending from near an inlet end of the attachment towards a distal end of the attachment and wherein the outlet is at least partially defined by an external surface of the attachment and fluid emitted from the outlet is blown along the external surface.

According to a third embodiment, the invention provides an attachment for a hand held appliance comprising a first part and a second part, the first part comprising a first end of the attachment and at least one plate extending from the first end, the second part comprising a second end of the attachment and at least one further plate extending from the second end wherein when the first part and the second part are connected at least two slots are formed between the at least one plate and the at least one further plate, the at least two slots defining a fluid outlet for the attachment.

Preferably, the first end of the attachment comprises a fluid inlet into the attachment.

It is preferred that the first end of the attachment includes a supporting ring for supporting the at least one plate.

Preferably, the supporting ring comprises at least one recess for housing an end of the at least one further plate.

It is preferred that the supporting ring is additionally a collar for attaching the attachment to the appliance.

Preferably, the first part of the attachment includes a supporting scaffold located at or near a distal end to the first end of the first part of the attachment.

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It is preferred that the supporting scaffold is attached to the at least one plate.

Preferably, the supporting scaffold includes a part of a fixture for fixing the first part and the second part together.

It is preferred that the second end of the attachment includes at least one further recess for housing an end of the at least one plate.

Preferably, the second end of the attachment includes another part of a fixture for fixing the first and the second part together.

It is preferred that one or more of the at least one plate and the at least one further plate are arcuate.

Preferably, one or more of the at least one plate and the at least one further plate extend orthogonally from a respective end.

Alternatively, the at least one plate and the at least one further plate curve round a longitudinal axis of the attachment.

Preferably, the at least one plate and the at least one further plate are helical.

It is preferred that the at least one plate and the at least one further plate are helical in a clockwise direction from the first end.

A curved slot changes the direction that fluid flows out from the fluid outlet tending to give a flow that is more normal to the surface of the attachment and this improves the hold of the hair around the attachment.

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Preferably, a gap formed between the at least one plate and the at least one further plate is defined by a spacer.

It is preferred that a pair of spacers is provided longitudinally spaced along the at least one plate and the at least one further plate.

Any spacers maintain the gap between the two parts forming the slot or thickness of the slot. It is advantageous for these to all be substantially equal is this creates an even flow around the attachment.

Preferably, at least one of the at least one plate and the at least one further plate is lined with a material.

It is preferred that every plate is lined with material.

Preferably, the material absorbs sounds and/or vibrations.

It is preferred that the material is Kevlar or wool.

Preferably, the attachment further comprises a flow directing element between the fluid inlet and the fluid outlet. The flow directing element also changes the direction that fluid flows out from the fluid outlet tending to give a flow that is more normal to the surface of the attachment and this improves the hold of the hair around the attachment. In addition, the flow directing element reduces the velocity of the fluid within the attachment which in turn reduces the noise produced by the attachment.

It is preferred that the flow directing element comprises a perforated layer.

Preferably, the perforated layer is formed from a mesh or weave of an elongate material.

It is preferred that the elongate material is a wire.

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Preferably, the flow directing element extends substantially along the length of the at least one slot.

It is preferred that the flow directing element extends substantially around an inner circumference of the attachment.

According to a fourth aspect, the invention provides a hand held appliance comprising a handle having a fluid flow path from a fluid inlet to a fluid outlet and a fan unit for drawing fluid into the fluid inlet and an attachment for attaching to the handle, the attachment comprising a first part and a second part, the first part comprising a first end of the attachment and at least one plate extending from the first end, the second part comprising a second end of the attachment and at least one further plate extending from the second end wherein when the first part and the second part are connected at least two slots are formed between the at least one plate and the at least one further plate, the at least two slots defining a fluid outlet for the attachment.

In one embodiment the appliance is a hair care appliance.

In another embodiment the appliance is a hot styling appliance such as a hot styling brush.

The invention will now be described by example, with reference to the accompanying drawings, of which:

Figure 1a shows an example of an appliance according to the invention;

Figure 1b shows a cross section through the appliance shown in Figure 1a;

Figure 2a shows an exploded view of some of the handle components of the device of Figure 1a;

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Figure 2b shows an enlarged section of the fluid inlet;

Figures 3a and 3b show an isometric view and an isometric cross section through a first attachment according to the invention;

Figures 4a and 4b show a side view and a side view cross section through the first attachment;

Figures 5a and 5b show cross sections through the first attachment;

Figures 6a and 6b show an isometric view and a side view through a second attachment;

Figure 7a shows an isometric view through another attachment;

Figures 7b and 7c show an isometric view and a side view through a further attachment;

Figure 8a shows an isometric view of a fifth attachment;

Figure 8b shows an isometric view of a sixth attachment;

Figure 9 shows a two part assembly for an attachment;

Figures 10a and 10b show an isometric view and an isometric cross section through a further attachment according to the invention;

Figures 11a, 11b and 11c show a side view and a side view cross sections through the further attachment;

Figures 12a and 12b show cross sections through the further attachment in a first position;

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Figures 13a and 13b show cross sections through the further attachment in a second position;

Figure 14 shows schematically the further attachment in use; and

Figure 15a shows an isometric view of another attachment;

Figure 15b shows different component parts of the other attachment;

Figure 15c shows the different component parts from the inlet end;

Figure 15d shows a cross section through the side of the other attachment;

Figure 15e shows a cross section through the other attachment; and

Figures 16a and 16b show an alternative sock for the other attachment.

Figures 1a and 1b shows a hot styling brush 10 with a handle 20 and a detachable head or attachment 30 which is attaches at the distal end 22 of the handle 20 to the fluid inlet 40.

The handle 20 has an outer wall 26 which is generally tubular and includes the fluid inlet 40 at and adjacent one end 24. The fluid inlet 40 comprises a first set of apertures 44 which extend radially around the handle 20 and along the outer wall 26 of the handle from the handle end 24. The handle end 24 is covered by an end wall 42 which is also perforated with a second set of apertures 46 that extend through the end wall 42 of the handle. Thus, the fluid inlet 40 extends around, along and across the handle 20. The end wall 42 is orthogonal to the outer wall 26 and an inner wall 60 of the handle.

The handle 20 also includes a fan unit 70 which comprises a fan and a motor which drives the fan and in use, draws fluid in through the fluid inlet 40, along a fluid flow path 50 which extends through the length of the handle 20. The fluid is optionally heater by a heater 80 before entering an inner cavity 38 of the head 30.

The head 30 includes a fluid outlet 100 which in this example comprises parallel slots 102 each extending towards a second end 36 of the head and radially around the head 30. This arrangement enables fluid to exit the head all the way around the head and for the majority of the length of the head 30 maximising a hair styling region of the product.

In use, hair is wrapped around the head 30 whilst air or fluid exits through the slots 102 drying the hair and/or styling the hair into curls or waves. The hair wraps automatically due to the flow of air around the surface of the head 30. The air or fluid can be heated but this is not essential.

Power is provided to the appliance via a power cable 48 which preferably extends from a plug or other power source through the end wall 42 of the handle 20. The handle 20 also houses a PCB 75 which is electrically connected to the cable 48, the fan unit 70 and the heater 80 by internal wiring (not shown). An on/off switch 52 and control buttons 54 are provided and connected to the PCB 75 to allow the user to select one of a range of temperature and flow settings.

Figure 2a shows an exploded view of various parts of the handle 20 in more detail. The handle 20 is tubular and the outer wall 26 of the handle 20 is a cylindrical sleeve made from for example an extruded tube or rolled sheet of metal such as aluminium, an aluminium alloy or a steel. The handle connects to a head 30 at a first end 22 and at the distal, second end 24 a fluid inlet 40 is provided. The fluid inlet 40 is a first means of filtering fluid that enters the fluid flow path 50.

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The fluid inlet 40 comprises a plurality of apertures extending around, along and across the handle 20. Having an inlet that extends in three dimensions has advantages particularly when used with hair grooming appliances. Firstly, if the appliance is placed on a surface whilst switched on only a small part of the inlet surface area will be blocked or have restricted flow of fluid into the appliance. This protects the fan unit and particularly the motor of the fan unit from running with too low a flow rate as this can cause overheating of the motor and cause damage to the motor.

Secondly, often hair care appliances are used with a styling product such as a mousse, gel or spray. These products are typically either applied by a hand or directly to the hair as a mist. After application by a hand, some of the product will be retained on the skin which is then transferred to the appliance when held. This can block at least some of the apertures 44 that extend around and along the handle 20. However, the apertures 46 that extend under the handle and across the end wall 42 of the handle will be unaffected. When a product is applied as a mist, it can settle on the appliance and again block or restrict at least some of the apertures of the fluid inlet 40. However, by having apertures that extend around, along and across the handle 20 the risk of blocking the fluid inlet 40 is reduced.

The apertures are preferably circular with a diameter of 0.2 to 1.6 mm. The diameter of the apertures can vary along, around and across the handle 20. It is advantageous to space the apertures regularly around, along and across the fluid inlet 40. Not only is this visually pleasing but it also has the technical advantage that there is no weak region of the fluid inlet 40 where blockage of a portion is more likely or would have more impact on the flow into the fluid inlet 40. The inlet is designed so that the flow into the inlet is even at least around the circumference of the handle 20.

A foam block 48 is provided which in use is inserted into the second end 24 of the handle 20. The foam block 48 is a second means of filtering the fluid that passes through the primary fluid inlet 40 into the primary fluid flow path 50. It is advantageous that the foam block 48 extends beyond or further towards the first end 22

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of the handle than the primary fluid inlet 40 as this ensures that fluid that has entered the primary fluid inlet 40 has passed through the foam block 48 so has had two stages of filtration. In other words, the foam block 48 extends from the second end 24 of the handle 20 past the downstream end 44a of the fluid inlet.

The foam block 48 shown is cylindrical and substantially fills the area within the handle 20 at the primary fluid inlet 40. This is to ensure that all fluid that enters the primary fluid inlet through first apertures 44 that extend around and along the handle and fluid that enters through second apertures 46 that extend across and through the end wall 42 of the handle 20 passes through this second stage of filtration. The foam block 48 extends longitudinally from the second end 24 of the handle 20 further than the first apertures 42 of the primary fluid inlet 40.

The first apertures 44 that extend along and around the outer wall 26 are machined, punched or laser cut from the extruded tube or sheet metal that the outer wall 26 is formed from.

The handle 20 has an outer wall 26 and an inner wall 60, the outer wall 26 slides over the inner wall 60 to form the finished product. The inner wall 60 is a duct which surrounds and defines a fluid flow path 50 through the appliance. The outer wall 26 includes a grippable portion and in these examples, includes the fluid inlet 40 into the fluid flow path 50. An insulting layer of material 28 is provided within the inner wall 60. The insulating layer is a foam or a felt and insulates the handle from noise produced by the fan unit 70, heat produced by the operation of the appliance, vibrations caused by the fan unit and noise produced within the appliance by the flow of fluid through the fluid flow path 50. The insulating layer absorbs energy including airborne noise.

The inner wall 60 provides a housing 62 in which a fan unit 70 is disposed. The housing 62 is cylindrical and has an inwardly protruding ledge 64,66 disposed one at each end of the housing 62 which maintain the position of the fan unit 70 within the handle 20. The inner wall 60 is made from two parts a first part 60a and a second part

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60b which is moulded separately. This enables easier assembly of the fan unit 70 within the handle 20 than a one piece inner wall. A similar pair of inwardly protruding ledges 68, 72 maintains the position of the heater 80 within the handle 20.

Although the outer wall 26 of the handle 20 has been described as being made from an extruded tube or a rolled sheet of metal, alternatives methods of manufacture and materials could be used; these include, but are not limited to, a plastic extrusion/moulded tube or a composite tube such as carbon fibre reinforced plastic.

The fluid outlet 100 of the head 30 will now be described in more detail, referring in particular to Figures 3a, 3b, 4a, 4b, 5a and 5b. The head 30 is essentially cylindrical and has a first end 32 for connection to a handle 20 and a second end 36 distal to the first end 32. The head 30 extends longitudinally from the first end 32 to the second end 26 continuing a line described by the handle 20 (Figure 1a) so is approximately the same diameter as the handle. Within the head 30 is an inner cavity 38 and fluid that has been drawn into the fluid flow path 50 within the handle 20 by the fan unit 70 enters the inner cavity 38 via an aperture 302 in the first end 32 of the head 30.

The fluid outlet 100 is formed from a number of parallel slots 102 which extend along the length of the head 30 from the first end 32 to the second end 36. The slots 102 are formed from an overlap 120 (Figure 5b) formed between adjacent plates 110 which results in fluid being directed between a radially inner surface 104 formed from the outer surface 112 of a first plate 110a and a radially outer surface 106 formed from the inner surface 114 of a second plate 110b. The fluid 122 flowing out of the slot 102 is tangential 130 to the outer surface 112 of the plate 110a and joins with the fluid flowing out of the other slots of the fluid outlet 100 forming a fluid flow around the circumference of the head 30. Thus, the fluid 122 is blown out along the external surface of the head and this encourages hair to wrap around the head 30 automatically.

The fluid 122 exiting the slots 102 is attracted to the curved surface of the head 30 by the Coanda effect. This in turn causes hair that is presented to the head 30 to

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automatically wrap around the surface and then styled into curls. As air is blown down the length of the hair, wet hair is dried more quickly than conventionally and as the wrapping process occurs without the use of bristles, the hair can slide off the head 30 once it is dry or styled so there is no tangling.

To maintain the size of each slot 102, spacers 108 are provided. In this example, a pair of spacers 108 is provided to maintain each slot 102 size. Each one of the pair of spacers 108 is longitudinally spaced along the slot 102 and the plate 110. The spacers 108 join adjacent plates 110 together.

Advantageously, each plate 110 is lined with a felt like material 308 such as Kevlar or wool (see Figure 3b). The material 308 does not extend over each slot 102 so the fluid exiting the fluid outlet 100 does not pass through the layer of material 308. This layer serves to absorb some of the noise produced by the fluid flowing through the head 30 from the inlet to the head 30 at aperture 302 to the fluid outlet 100. Such a layer of material 308 is as applicable for other heads herein described such as heads 130, 180 and 230.

Figures 6a and 6b show an alternative head 130, all features identical to those previously described have the same reference numerals. The head 130 has a larger diameter than the handle 20 so is used to create larger curls. The head 130 has a first end 32 for connection to the handle 20 and this is the same diameter as the handle 20, within a collar 132 of the head 130, the diameter of the head 130 increases to the larger diameter prior to the fluid outlet 100 formed by slots 142 and then continues at a constant diameter to the second end 136. An inner fluid cavity (not shown) is larger than for the head 30 of Figure 3a. In this example the number of plates 110 and slots 102 is the same i.e. six as for the head described with respect to Figure 3a. Alternatively, a larger or smaller number of plates 110 and slots 142 could be used.

Figure 7a shows a further head 230. This head 230 has a reduced diameter compared with the handle 20. The first end 32 is substantially the same diameter as the handle 20

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for connection thereto, and then within a collar 232 the diameter of the head 230 decreases to the reduced diameter prior to the fluid outlet 200 formed by slots 202 and continues at a constant diameter to the second end 236. This head 230 is used to create tighter curls.

The slots 202 for this head extend longitudinally straight from the first end 32 to the second end 236 as was the case for slots 102 in heads 30, 130.

In another embodiment, as shown in Figures 7b and 7c, a further head 280 has slots 282 which curve around the head 280 forming a spiral or helical pattern around the head 230. The slots 282 curve by an angle α of 45° from the longitudinal axis A-A of the handle 20 and head 280. In this example the slots 282 curve in a clockwise direction from the first end 34 of the head 280 towards the second end 236 of the head. The slots 282 are formed as before between adjacent overlapping plates 210 however, in order to form the curved slots 282, the plates 210 do not extend along the longitudinal axis of the head 280 but also curve by an angle of 45°. Using angled slots changes the profile of the fluid exiting from the head. The airflow exiting from the slots is more normal to the slot when angled slots are used. This has benefits including enabling more hair to be wrapped around the head also, the hair is retained on the head more easily leading to a potentially quicker styling process.

The slots can be curved in a clockwise or and anticlockwise direction from the longitudinal axis A-A of the handle 20. Whilst an angle of 45° has been illustrated, improved wrapping is seen even at an angle of 1°.

Figure 8a shows a head 180 which is substantially the same diameter as the handle 20. The slots 182 are curved or spiral around the head 180 in the same manner as head 280.

Figure 8b shows a head 380 which has a larger diameter than the handle, and is similar to head 130 except it has curved or spiralling slots 382 around the head 380.

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Figures 9a and 9b show a way of assembling head 30. A first part 150 is formed from the first end 32 and has a collar 152 and a first set of plates 154 which are joined to or formed integrally with the collar 152. A second part 160 is formed from the second end 36 and has an end wall 162 and a second set of plates 164 which are joined to or formed integrally with the end wall 162. The first set of plates 154 and second set of plates 164 each comprise non-adjacent plates 110 enabling the first part 150 and the second part 160 to be slotted together to form the head 30. Between each of the first set of plates 154, a recess 156 is provided in the connecting ring 152 adapted to accommodate the distal end 164a of the second set of plates 164 from the end wall 162. A similar set of recesses 166 is provided in the end wall 162 and is adapted to accommodate the distal end 154a of the first set of plates from the collar 32.

In order to retain the first part 150 and the second part 160 of the head 30 in the assembled condition, a protruding screw hole 168 is provided. Near the distal end 154a of the first set of plates 154 a support scaffold 170 is provided and this has two functions. A first function is to support the first set of plates 154 and maintain their relative positions towards the distal end 154a and a second function is to provide part of the fixing mechanism. In this example, the support scaffold 170 has a central aperture 172 through which the protruding screw hole 168 passes on assembly of the head 30a and a screw, for example can be inserted to fix the two parts 150, 160 of the head together.

Figures 15a, 15b, 15c, 15d and 15e show a head 400 all features identical to those previously described have the same reference numerals. This head 400 has a reduced diameter compared with the handle 20. The slots 102 extend longitudinally from the first end 32 to the second end 236, however the slots could be curved as described with respect to Figures 7a and 7b.

Internal of the head 400, within the cavity 418 formed within the head 400, an internal sock 420 is provided. This sock 420 is a mesh formed from a metal wire. The sock 420 can be in the knitted form 426 shown in Figure 15b. Alternatively as shown in Figures

16a and 16b the sock 420 is a tube 424 formed from a woven mesh 422 having generally square apertures.

The sock 420 diffuses the fluid flowing in the cavity 418 within the head 400 and slows down the longitudinal velocity of the flow. This results in more even wrapping of hair around the head 400 as the direction of fluid exiting the head 400 is more normal to the slots 102. The sock 420 extends along the length of the slots 102 within the head 400. The size of the apertures in the mesh is important; if they are too small the flow becomes too restricted and there is an increased chance of them clogging over time. An aperture size of around 1.6mm has been found to provide the benefit without undue restriction.

Figures 10a, 10b, 11a-11c and 12 show various views of another head 300 which has a directed fluid flow. The head 300 has a first cylindrical part 310 and a second triangular part 330 that together form the fluid outlet 320.

The second triangular part 330 has a first end 312 for connection to a handle 20 via a collar 328 and extends longitudinally to a second end 314. The first cylindrical part 310 has an aperture 322 extending from a first end 378 to a second end which is defined by end wall 316. The aperture 322 is defined by a first edge 324 and a second edge 326. . An inner cavity 318 is formed within the head 300 when the second triangular part 330 is slid into the first cylindrical part 310. The first end 278 of the first cylindrical part 310 abuts a downstream end of the collar 328 and the second end 314 of the second triangular part 330 abuts the end wall 316 when the attachment is formed.

The second triangular part 330 has a first end 332 and a second end 334 and is formed from a first side 336, a second side 338 and an internal wall 340. The second triangular part 330 fits within the aperture 322 and extends outwardly beyond the first cylindrical part 310.

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The second triangular part 330 is movable relative to the first cylindrical part 310. In this example, the second triangular part 330 is fixed with respect to the handle 20 and the first cylindrical part 310 is moveable relative to both the second triangular part 330 and the handle 20. This enables the outlet slot 342 to be partially defined by one or the other of the first edge 324 and the second edge 326.

In one position, referring now to Figures 12a and 12b, the first edge 324 along with a first side 336 of the second triangular part 330 define the limits of the outlet slot 342. The second triangular part 330 moves with respect to the first cylindrical part 310 so the outlet slot 342 is alternatively defined by the second edge 326 and the second side 338 as shown in Figures 13a and 13b.

The second triangular part 330 rotates with respect to the first cylindrical part 310 in order to change the position of the outlet slot 342. The first cylindrical part 310 is temporarily retained in a position by the use of a detent mechanism.

The end wall 316 of the first cylindrical part 310 includes a first recess 340 and a second recess 350 each of which adapted to partially accommodate a ball bearing 360. The ball bearing 360 is biased towards the end wall 316 by a spring 362 (see Figure 11b). There are a number of suitable alternatives that could be used instead of this method of retaining one part with respect to the other part such as a plastic bump feature or a piece of sprung metal.

Referring now to Figures 12a and 12b, when the second triangular part 330 is in a first position with respect to the first cylindrical part 310, the outlet slot 342 is formed from first side 336 and first edge 324 and the ball bearing 360 is accommodated by the first recess. By manually rotating the second triangular part 330 with respect to the first cylindrical part 310 the force of the spring 362 retaining the ball bearing 360 within the first recess 340 is overcome and the second triangular part 330 can be rotated with respect to the first cylindrical part 310 to move the ball bearing 360 into the second

recess 350 and changing the position of the outlet slot 328 so it is now formed from the second edge 326 and the second side 338.

The first cylindrical part 310 includes bristles 350 arranged in this example in parallel rows 352 on either side of the aperture 322. The rows 352 of bristles 350 extend from near the outlet slot 342 around the head 300 but in this example the bristles 350 do not extend all the way around the head 300, there is a gap in the rows 352 diametrically opposite the outlet slot 320.

Referring now to Figure 14, when hair 354 is being styled, the action of drawing the bristles 350 down through the hair 354 opens the outlet slot 342 on the side next to the hair 354. The position of the outlet slot 342 is movable by hand or by the friction or force of combing through the hair.

The use of a combination of a directed outlet slot 342 and bristles 350 means that the hair is dried and/or styled more quickly than conventionally as the fluid exiting from the outlet slot 342 is blown down the hair 354. The fluid exiting the outlet slot 342 is attracted to the surface of the second triangular part 330 which in turn attracts the hair 354 to the second triangular part 330. The bristles 350 separate and detangle individual strands of the hair 354 and this combination gives fast drying and a smother result.

In use as shown in Figure 14, this head is designed to be pulled through the hair with the slot 328 adjacent the hair 354. Fluid is blown out of the slot 328 as the appliance is moved along the hair 354 so the hair is both heated and brushed. Having the slot 328 on either side of the head 356 means that the same head 300 can be used for both sides of the head and both the underside and the topside of the hair 354.

In each of the examples given, the head 30, 130, 180, 230, 300 in connected to handle 20 via a collar and a twist lock joint. Referring to Figure 7b, three protrusions 234 are provided on the internal surface of the collar 232 (one not shown). The protrusions 234 are adapted to engage a slot 90 (see Figure 1b) or three separate slots provided near the

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distal end 22 of the handle 20. The slot 90 extends at least partially around an outer surface of the inner wall 60 and is helical so both a rotational and longitudinal movement is required to attach or remove the head from the handle 20. This is one example of a fixing mechanism, it will be apparent to the skilled person that other equally acceptable alternative mechanisms could be used.

The heads 30, 130, 180 and 230 described with respect to Figures 3a to 9 could be provided with bristles. For these heads 30, 130, 180 and 230 as the slots are arranged all the way around the head, any bristles would be arranged all the way around the head. An example would be to have one or more rows of bristles at least located on every other plate 110, 210.

The invention has been described in detail with respect to a hot styling brush however, it is applicable to any appliance that draws in a fluid and directs the outflow of that fluid from the appliance including a hairdryer.

The appliance can be used with or without a heater; the action of the outflow of fluid at high velocity has a drying effect.

The heads have been described as being manufactured by attaching a first part to the second part using a screw however, as the skilled person will be aware, a number of different fixing methods can be used such as, but not limited to gluing or using ultrasonic welding.

The fluid that flows through the appliance is generally air, but may be a different combination of gases or gas and can include additives to improve performance of the appliance or the impact the appliance has on an object the output is directed at for example, hair and the styling of that hair. Such additives include but are not limited to hairspray and serums for example.

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The heads 30, 130, 230 are all generally cylindrical in shape, however as the skilled person would realise, alternative shapes could be used such as ovals.

The invention is not limited to the detailed description given above. Variations will be apparent to the person skilled in the art.

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