

Attachment for a Hand Held Appliance

- 5 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
10 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 a
15 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.

- 20 Preferably, the fluid emitted from the fluid outlet is attracted to an external surface of the wall. Preferably, 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
25 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.

Preferably, the attachment is generally tubular with the at least two plates extending longitudinally along the tube and radially around the tube. Preferably the slot extends longitudinally along the tube.

- 5 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. The radially inner surface of the slot becomes the external surface of the attachment when a downstream end of the overlap between the first end of the wall and the second end of the wall is reached. The fluid flows around the attachment combining with fluid that exits from any further slots
10 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 attachment which pulls hair towards the attachment and wraps the hair around the attachment in the direction of fluid flow.

- 15 Preferably, the attachment comprises n slots and n plates.

It is preferred that one of the first end and second end of the wall includes a spacer which defines a thickness of the slot.

- 20 Another aspect of the invention provides 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 wherein the at least one slot is formed by an overlap of a first end of the wall and a
25 second end of the wall and wherein one of the first end and second end of the wall includes a spacer which defines a thickness of the slot.

Preferably, the second end of the wall comprises the spacer.

- 30 It is preferred that a pair of spacers are provided longitudinally spaced along the wall.

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 as this creates an even flow around the attachment.

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Preferably, the at least one slot is formed as a spiral around the 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 $1-89^\circ$ to a longitudinal direction of the attachment. It is preferred that the slot is
10 disposed at an angle of $10-70^\circ$ to a longitudinal direction of the attachment. Preferably, the slot is disposed at an angle of $30-60^\circ$ to a longitudinal direction of the attachment. More preferably, the slot is disposed at an angle of 45° to a longitudinal direction of the attachment.

15 Another aspect of the invention provides 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 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 and wherein the slot is disposed at an angle of $1-89^\circ$ to a
20 longitudinal direction of the attachment.

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, 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.

It is preferred that the attachment further comprises a flow directing element between
30 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.

- 5 Another aspect of the invention provides 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 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 and wherein the attachment further comprises a flow directing
10 element between the fluid inlet and the fluid outlet.

Preferably, the flow directing element comprises a perforated layer. It is preferred that the perforated layer is formed from a mesh or weave of an elongate material.

- Preferably, the elongate material is a wire. It is preferred that the flow directing element
15 extends substantially along the length of the at least one slot. Preferably, the flow directing element extends substantially around an inner circumference of the attachment.

- According to a second aspect, the invention provides a hand held appliance comprising
20 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
25 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.

- Another aspect of 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
30 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 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 and wherein fluid emitted from the fluid outlet flows around the external surface of the wall.

Another aspect of 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 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 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 and wherein one of the first end and second end of the wall includes a spacer which defines a thickness of the slot.

Another aspect of 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 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 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 and wherein the slot is disposed at an angle of 1-89° to a longitudinal direction of the attachment.

Preferably, the body of the attachment is substantially the same diameter as handle.

Alternatively, the body of the attachment is a different diameter to that of the handle.

Preferably, the attachment has a smaller diameter to handle.

Alternatively, the attachment has a greater diameter to handle.

In one embodiment, the appliance is a hair care appliance.

In one embodiment, the appliance is a hot styling appliance such as a hot styling brush.

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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;

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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;

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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;

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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;

30 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;

5 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;

10 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

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Figure 15a shows an isometric view of another attachment;

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

25 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

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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.

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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
10 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
15 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
20 102 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.

25 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.

30 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.

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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.

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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.

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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 insulating 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 36 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.

- 5 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.

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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

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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.

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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.

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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 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.

5 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
10 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.

15 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.

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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
30 354 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 smoother 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 is 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.

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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.

15 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
5 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 hair is wrapped around the attachment in the direction of fluid flow.
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3. An attachment according to claim 1 or claim 2, wherein the fluid emitted from the fluid outlet is attracted to an external surface of the wall.
4. An attachment according to any preceding claim wherein fluid emitted from the
15 fluid outlet flows around the external surface of the wall.
5. An attachment according to any preceding claim, wherein the wall is formed from at least two plates.
- 20 6. An attachment according to claim 5, wherein a first one of the at least two plates comprises the first end of the wall.
7. An attachment according to claim 5 or claim 6, wherein a second one of the at least two plates comprises the second end of the wall.
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8. An attachment according to claim 6 or claim 7, wherein the first of the at least two plates defines a radially inner surface of the slot.
9. An attachment according to claim 7 or claim 8, wherein the second one of the at
30 least two plates defines a radially outer surface of the slot.

10. An attachment according to any preceding claim, wherein the attachment is generally tubular.
11. An attachment according to claim 10, 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.
12. An attachment according to claim 10 or claim 11, wherein the slot extends longitudinally along the tube.
13. An attachment according to any preceding claim, wherein the slot is tangential to the wall.
14. An attachment according to claim 13, wherein fluid exiting the fluid outlet flows along a radially inner surface of the slot.
15. An attachment according to any preceding claim, comprising n slots and n plates.
16. 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.
17. 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 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 and wherein one of the first end and second end of the wall includes a spacer which defines a thickness of the slot.
18. An attachment according to claim 16 or claim 17, wherein the second end of the wall comprises the spacer.

19. An attachment according any of claims 16 to 18, wherein a pair of spacers are provided longitudinally spaced along the wall.

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

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

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

15 23. An attachment according to claim 21 or claim 22, wherein the slot is disposed at an angle of 1-89° to a longitudinal direction of the attachment.

24. 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 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 and wherein the slot is disposed at an angle of 1-89° to a longitudinal direction of the attachment.

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

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26. An attachment according to claim 21 or claim 22, wherein the slot is disposed at an angle of 30-60° to a longitudinal direction of the attachment.

27. An attachment according to claim 21 or claim 22, wherein the slot is disposed at an angle of 45° to a longitudinal direction of the attachment.

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

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

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

31. 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.

32. An attachment according to claim 31, wherein hair is wrapped around the attachment in the direction of fluid flow.

33. An appliance according to claim 31 or claim 32, wherein the body of the attachment is substantially the same diameter as handle.

34. An appliance according to claim 31 or claim 32, wherein the body of the attachment is a different diameter to that of the handle.

35. An appliance according to claim 34, wherein the attachment has a smaller diameter to handle.

36. An appliance according to claim 34, wherein the attachment has a greater diameter to handle.

37. An attachment according to any of claims 31 to 36, wherein the fluid emitted from the fluid outlet is attracted to an external surface of the wall.

38. 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 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 and wherein fluid emitted from the fluid outlet flows around the external surface of the wall.

39. An attachment according to any of claims 31 to 38, wherein fluid emitted from the fluid outlet flows around the external surface of the wall.

40. An attachment according to any of claims 31 to 39, wherein the wall is formed from at least two plates.

41. An attachment according to claim 40 wherein a first one of the at least two plates comprises the first end of the wall.

42. An attachment according to claim 40 or claim 41, wherein a second one of the at least two plates comprises the second end of the wall.

43. An attachment according to claim 40 or claim 41, wherein the first of the at least two plates defines a radially inner surface of the slot.

44. An attachment according to claim 41 or claim 42, wherein the second one of the at least two plates defines a radially outer surface of the slot.

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

46. An attachment according to claim 45, 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.

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47. An attachment according to claim 45 or claim 46, wherein the slot extends longitudinally along the tube.

15 48. An attachment according to any of claims 31 to 47, wherein the slot is tangential to the wall.

49. An attachment according to claim 48, wherein fluid exiting the fluid outlet flows along a radially inner surface of the slot.

20 50. An attachment according to any of claims 31 to 49, comprising n slots and n plates.

51. An attachment according to any of claims 31 to 40, wherein one of the first end and second end of the wall includes a spacer which defines a thickness of the slot.

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52. 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
30 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

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 and wherein one of the first end and second end of the wall includes a spacer which defines a thickness of the slot.

5 53. An attachment according to claim 51 or claim 52, wherein the second end of the wall comprises the spacer.

54. An attachment according to any of claims 51 to 53, wherein a pair of spacers are provided longitudinally spaced along the wall.

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55. An attachment according to any of claims 31 to 54, wherein the at least one slot is formed as a spiral around the wall.

56. An attachment according to any of claims 31 to 55 wherein the spiral is
15 clockwise in the direction of fluid flow.

57. An attachment according to any of claims 31 to 55, wherein the spiral is anticlockwise in the direction of fluid flow.

20 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. 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
25 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 wherein the at least one slot is formed by an overlap of a first end of the wall and a
30 second end of the wall and wherein the slot is disposed at an angle of 1-89° 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 10-70° to a longitudinal direction of the attachment.

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61. 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.

62. 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.

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63. An attachment according to any of claims 31 to 57, wherein the at least one plate is lined with a material.

64. An attachment according to any of claims 31 to 63, further comprising a flow directing element between the fluid inlet and the fluid outlet.

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65. An appliance according to any of claims 31 to 64, wherein the appliance is a hair care appliance.

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66. An appliance according to any of claims 31 to 64, wherein the appliance is a hot styling brush.

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

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