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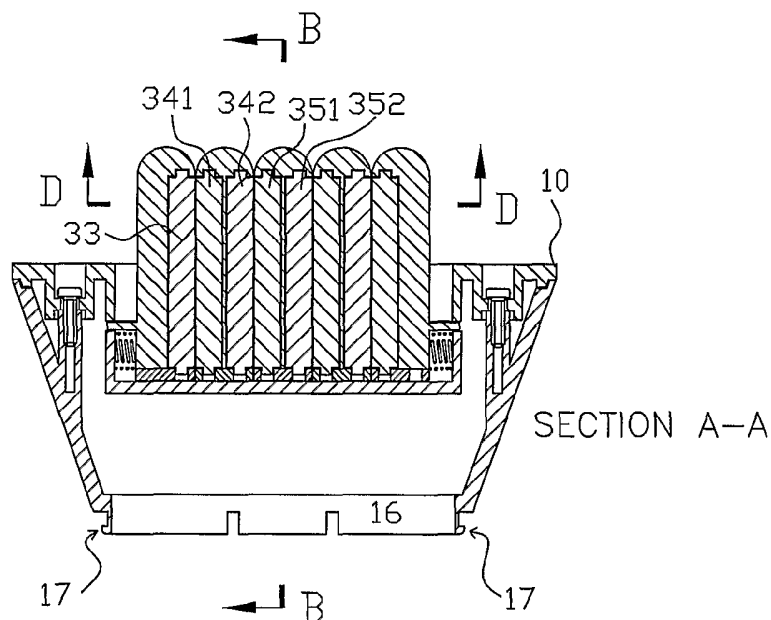
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(54) Title: HAIR STYLING ATTACHMENT



(57) Abstract: A hair styling attachment including a main housing (10) and at least a pair of hair treating members (21, 22, 23, 24, 25), the hair treating member includes at least a thermally conductive hair treating surface, the pair of hair treating members being adjacently disposed with the corresponding hair treating surfaces on the pair of adjacent hair treating members generally in compressive contact, the corresponding hair treating surfaces on the pair of adjacent hair treating members being relatively displaceable to form a gap (41, 42, 43, 44) for receiving the hair to be treated, the main housing (10) includes an air inlet and the hair treating surface being communicable with the air inlet.

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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.

HAIR STYLING ATTACHMENT

FIELD OF THE INVENTION

This invention relates to hair styling attachments, devices and apparatus
5 and, more particularly, to hair styling attachments, devices and apparatus which
operate with a hot or warm air source in the hair styling, setting or treating
process. More specifically, although of course not solely limited thereto, this
invention relates to attachments, devices and apparatus for hair straightening.

BACKGROUND OF THE INVENTION

10 Hair style setting attachments, devices and apparatus (collectively "hair
formers") are widely used to effect designed or desirable hair styling for personal
grooming or other requirements such as theatrical needs. In general, hair formers
with the particular hair forming members can form specific designs of hair styling.
For example, hair rollers or curlers are used to produce a curly effect on hair and
15 hair straighteners are used to straighten hair which is otherwise curly.

Typically, to straighten hair a hair-dresser holds a comb or brush by one
hand, engages the portion of hair to be straightened, imparting straightening
tension to that portion of the hair by pulling towards the free end of the hair and
then blow hot or warm hair onto that portion of the hair to impart more permanent
20 hair styling setting to that portion of the hair. This requires the service of a hair-
dresser and may not be comfortable to the customer because different customers
may have different susceptibility to the straightening tension and different levels of
straightening tension may be required to treat hair of different qualities.

Furthermore the traditional way of hair straightening requires two separate styling parts, namely, the comb or brush and the hair dryer or hot air blower. Since both hands are required, this may be inconvenient. Hence, it will be highly desirable if there can be provided an improved hair styling attachment, device or apparatus which alleviates the shortcomings associated with the above-mentioned conventional hair styling means and methods. More specifically, it is highly desirable to provide hair styling attachment, device or apparatus with integral means to simultaneously apply heat and tension to the hair for hair straightening.

OBJECT OF THE INVENTION

Accordingly, it is an object of the present invention to provide a hair styling attachment, device or apparatus which alleviates shortcomings associated with conventional means, methods and apparatus for hair styling, especially hair straightening. More specifically, it is an object of the present invention to provide a hair styling attachment, device or apparatus with integral means to simultaneously impart heat and tension to the hair or hair straightening. At a minimum, it is an object of this invention to provide the public with a useful choice of a hair styling attachment, device or apparatus.

SUMMARY OF THE INVENTION

According to the present invention, there is provided a hair styling attachment including a main housing and at least a pair of hair treating members, said hair treating member includes at least a thermally conductive hair treating surface, said pair of hair treating members being adjacently disposed with the corresponding hair treating surfaces on said pair of adjacent hair treating members generally in compressive contact, said corresponding hair treating

surfaces on said pair of adjacent hair treating members being relatively displaceable to form a gap for receiving the hair to be treated, said main housing includes an air inlet and said hair treating surface being communicable with said air inlet.

5 According to another aspect of the present invention, a hair styling apparatus including a hair styling attachment of claim 5 and a hot air blower.

 Preferably, said adjacent hair treating surfaces on said pair of adjacent hair treating members being resiliently displaceable to form said hair engaging gap.

 Preferably, said hair treating members includes a first end and a second
10 end, the first end being a free end and the second end being mounted on said main housing, the first end of at least one of said hair treating member of said pair of hair treating members being resiliently deflectable and/or displaceable with respect to said main housing.

 Preferably, said hair treating member includes a generally cylindrical main
15 body with a first cylindrical axis, said hair treating member includes at least a cylindrical roller with its cylindrical axis substantially parallel to and off-set from said first cylindrical axis so that at least part of the cylindrical surface of said cylindrical roller is exposed from said cylindrical surface of said cylindrical main body and forming said cylindrical body and from said hair treating surface.

20 Preferably, said main housing includes an upstream end and a downstream end, said hair treating members include a first and a second end, said first end being a free end and protrudes beyond said downstream end.

Preferably, said first end of said hair treating member being deflectable and/or displaceable relative to said main housing and said corresponding hair treating surfaces being generally convexly disposed with respect to each other.

5 Preferably, said hair treating member resembles a finger with a generally cylindrical body.

Preferably, said hair treating member includes a generally elongated and thermally insulated main body mounted with a metallic surface to form said hair treating surface.

10 Preferably, said metallic surface being generally curved with the same curvature extending along an axis of curvature, said axis of curvature being generally parallel to the longitudinal axis of said insulated main body.

15 Preferably, said attachment includes a plurality of hair treating members, wherein a first and a second hair treating surfaces are formed on some of said plurality of hair treating members, said hair treating surfaces on the same hair treating member being generally diametrically disposed on said cylindrical body.

Preferably, air entering said upstream end of said main housing can exit through the gap formed between adjacent hair treating members.

Preferably, said main housing includes an attachment means for coupling said device to a hot air blower.

20 Preferably, said attachment includes a plurality of hair treating members, wherein said plurality of hair treating members are linearly disposed.

Preferably, bristles generally parallel to the longitudinal axis said hair treating members are disposed on said main housing.

Preferably, the second ends of an adjacent pair of hair treating members co-operatively forms an hair engaging aperture, said hair engaging aperture being
5 convergent towards said upstream end of said main housing.

Preferably, said styling device being detachable from said hot air blower.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the present invention will be explained in further detail below by way of examples and with reference to the accompanying
10 drawings, in which:-

Fig. 1 is a top plan view of a preferred embodiment of a hair caring attachment of the present invention;

Fig. 2 is a cross-sectional view along the section line A-A of the attachment of Fig. 1;

15 Fig. 3 is a cross-sectional view along the section line B-B of the attachment of Fig. 1;

Fig. 4 is a cross-sectional view along the section line C-C of the attachment of Fig. 1;

20 Fig. 5 is a cross-sectional view along the section line D-D of the attachment of Fig. 1;

Fig. 5A shows the front and side views of an exemplary hair treating member.

Fig. 6 shows the same cross-sectional view as Fig. 2 but with the hair treating members displaced relative to each other;

5 Fig. 7 is a sectional view along the line C-C corresponding to Fig. 6;

Fig. 8 illustrates engagement of hair by a pair of adjacent hair treating members; and

Fig. 9 illustrates the displacement of one of the hair treating member the hair is engaged between the left-most pair of the hair treating members.

10 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the Figures, the hair styling device which is a hair styling attachment **1** for the present example includes a main housing **10** and a plurality of hair treating members **21-25**. The main housing **10** includes a generally frusto-conical body with an upstream end **12**, a downstream end **13** and a circumferential wall **14** interconnecting the upstream end and the downstream end. The downstream end of the main body **10** includes a top member **15** on which a sub-assembly including the plurality of the hair treating members **21-25** and a mounting base **26** is attached. The upstream end **16** of the main housing includes an air-inlet aperture and coupling means for attaching to a hot air blower such as a hair dryer. The coupling means includes a collar member **16** which extends generally along the axial direction of the frusto-conical main body and is provided with a circumferential flange **17** for, for example, latching engagement with the nozzle of the hot air blower.

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The hair treating member **21-25** includes an elongated main body with a generally circular or rounded cross-section and a thermally conductive hair treating surface. The elongated main bodies of the plurality of the hair treating members are generally aligned with their longitudinal axes generally parallel and
5 the corresponding hair treating surfaces in contiguous compressive contact.

In the present example, each of the main bodies of the hair treating members are generally cylindrical with a dome-shaped top or first end with the second end mounted on the base **26** of the main housing. The main bodies are preferably made of a thermally insulated material so as to avoid injuring the scalp
10 of a user, although, of course, a thermally conductive main body can also be used. The dome-shaped first ends of the adjacent pairs of hair treating members cooperate to form a plurality of hair engaging apertures so that the hair treating members are adapted to more conveniently approach and engage the hair to be
15 straightened. At least a roller is mounted with its longitudinal axis off-set from the cylindrical axis of the main body **51-55** of the hair treating member so that part of the curved surface is protruded from the cylindrical surface of the main body **51-55** of the hair treating members exposed to form the hair treating surface. While the rollers have a generally cylindrical body in this example, it will be noted that roller body of other geometry with a longitudinal extending curved surface can be
20 used. For those hair treating members not disposed at the extreme ends i.e., hair treating members **22-24**, a pair of rollers are mounted on each of the main bodies **52-54**. These rollers are mounted off-set from the cylindrical axis of the main body and are disposed so that the curved cylindrical surfaces of the corresponding cylindrical rollers are slightly pressing against each other under spring bias.

Referring to Figs. 4 and 7-9, the hair treating members **21-25** are mounted on a base housing **26** and are disposed so that the longitudinal axes of the hair treating members are generally parallel to each other with the partially cylindrical hair treating surfaces facing each other and in generally compressive contact.

5 The hair treating members are generally linearly disposed and mounted on a channel formed on the base housing **26**. Some of the hair treating members, for example, **21, 22, 24** and **25** are mounted with spring biasing so that they are urged by a lateral urging force along the transversal direction, i.e. the direction which is generally transversal to the axial or longitudinal axis of the cylindrical

10 body, towards their neutral positions.

The hair treating members are disposed so that they can be slightly displaced or deflected by acting against the spring urging force to form a plurality of hair treating gaps **41-44**. The channel provides a guide to the deflection or displacement of the movable hair treating members. It will be observed that the

15 hair treating fingers **21-25** generally resemble a collection of parallelly disposed fingers each with a top free end protruding beyond the top member **15** of the main housing **10**. The hair treating members **21-25** include a rounded or dome-shaped head **61-65** and the adjacent heads co-operate to form a hair engaging aperture which is convergent towards the downstream end of the main body so that they

20 can gradually approach the hair and easily engage a small bundle of hair between the gaps formed by the adjacent hair treating members. It will be appreciated that the convergent apertures formed between adjacent rounded or dome-shaped heads assist convenient engagement of the desirable portion of hair.

Turning now to the operation of this preferred embodiment, the hair styling

25 attachment **1** is coupled onto the outlet nozzle of a hot hair blower so that hot air

is delivered towards the plurality of hair treating members via the upstream end air inlet **12**. The circumferential wall **14** of the main body defines an air enclosure so that the air entering the upstream end **12** will travel towards the downstream end **13**. When hair treating gaps are formed upon engagement of the hair between the gaps, a portion of the hot air will exit through the base aperture between the adjacent displaced hair treating members and generally travel along the partially cylindrical hair treating surface. This will cause the hair treating surfaces to be heated up and, since the hair is caught under tension, movement of the hair treating members towards the end of the hair by, for example, moving the hair styling device will straighten the hair in a manner similar to ironing the hair by the hair treating surfaces.

It will be appreciated that the present attachment or features of this attachment can be incorporated with a hot air blowing device to form a standalone unit or apparatus for the same hair styling purposes.

While the present invention has been explained by reference to the preferred embodiments described above, it will be appreciated that the embodiments are only illustrated as examples to assist understanding of the present invention and are not meant to be restrictive on its scope. In particular, the scope, ambit and spirit of this invention are meant to include the general principles of this invention as inferred or exemplified by the embodiments described above. More particularly, variations or modifications which are obvious or trivial to persons skilled in the art, as well as improvements made on the basis of the present invention, should be considered as falling within the scope and boundary of the present invention.

Furthermore, while the present invention has been explained by reference to an hair styling attachment, it should be appreciated that the invention can apply, whether with or without modifications, to other hair styling devices or apparatus incorporating features of the present invention without loss of generality.

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CLAIMS

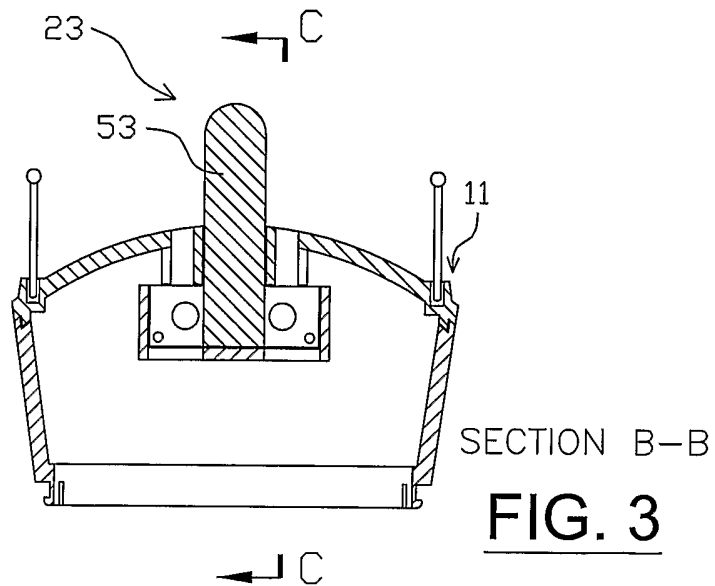
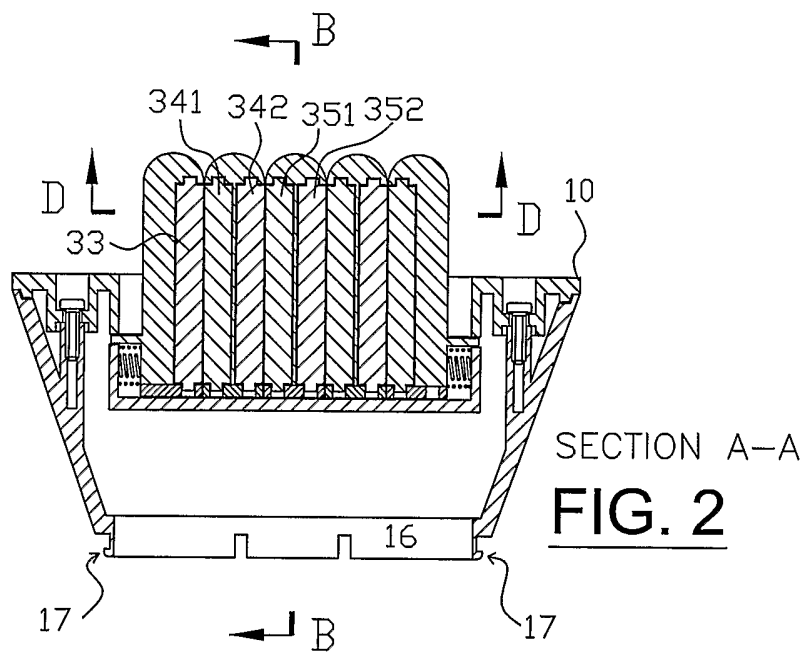
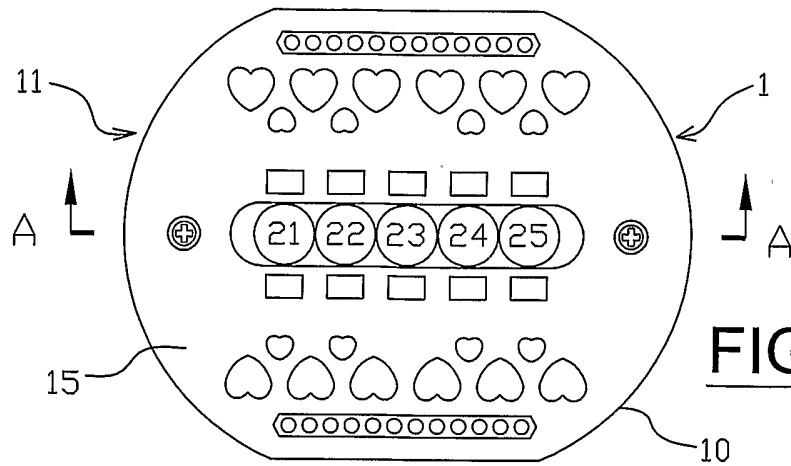
1. A hair styling attachment including a main housing and at least a pair of hair treating members, said hair treating member includes at least a thermally conductive hair treating surface, said pair of hair treating members being
5 adjacently disposed with the corresponding hair treating surfaces on said pair of adjacent hair treating members generally in compressive contact, said corresponding hair treating surfaces on said pair of adjacent hair treating members being relatively displaceable to form a gap for receiving the hair to be treated, said main housing includes an air inlet and said hair
10 treating surface being communicable with said air inlet.
2. A hair styling attachment according to claim 1, wherein said adjacent hair treating surfaces on said pair of adjacent hair treating members being resiliently displaceable to form said hair engaging gap.
3. A hair styling attachment according to claim 1, wherein said hair treating
15 members includes a first end and a second end, the first end being a free end and the second end being mounted on said main housing, the first end of at least one of said hair treating member of said pair of hair treating members being resiliently deflectable and/or displaceable with respect to said main housing.
- 20 4. A hair styling attachment according to claim 3, wherein said hair treating member includes a generally cylindrical main body with a first cylindrical axis, said hair treating member includes at least a cylindrical roller with its cylindrical axis substantially parallel to and off-set from said first cylindrical axis so that at least part of the cylindrical surface of said cylindrical roller is

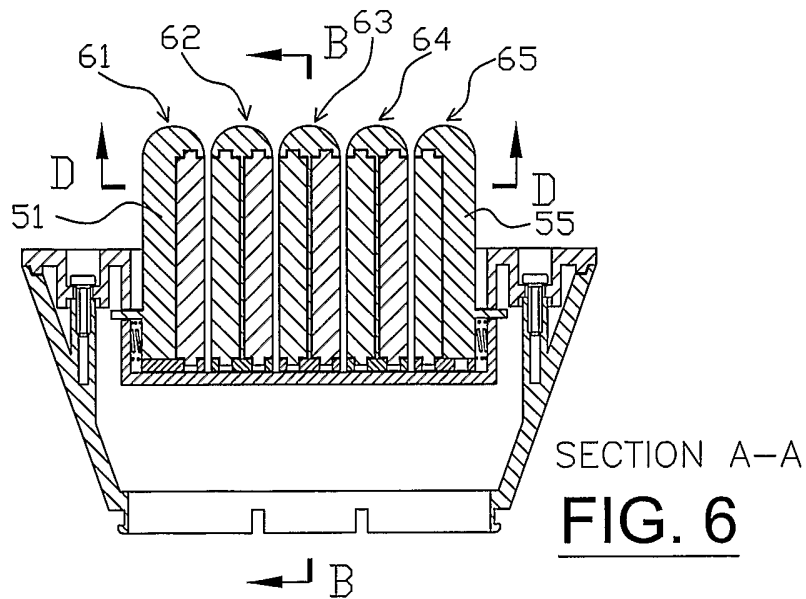
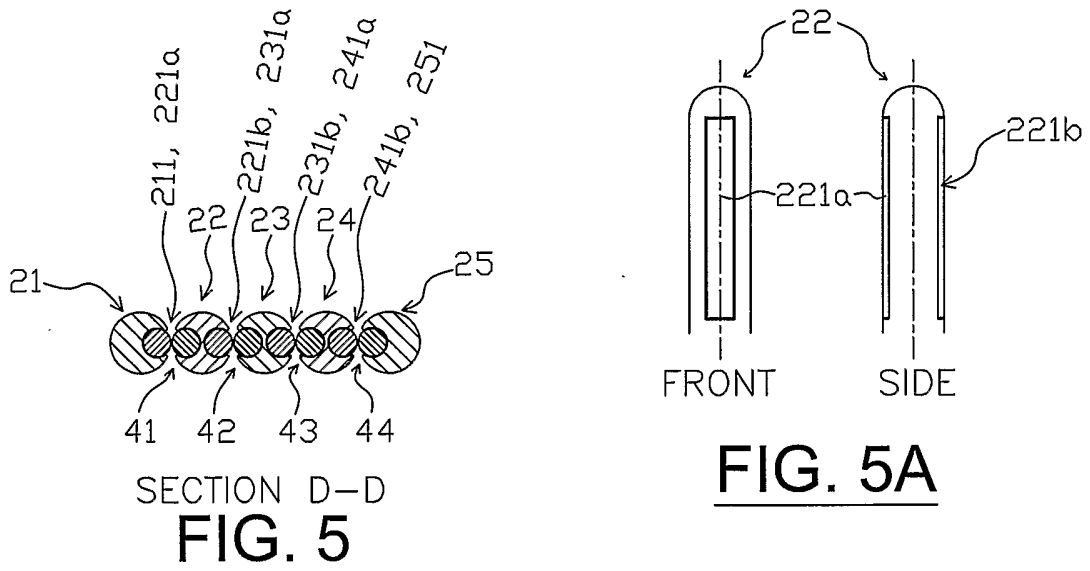
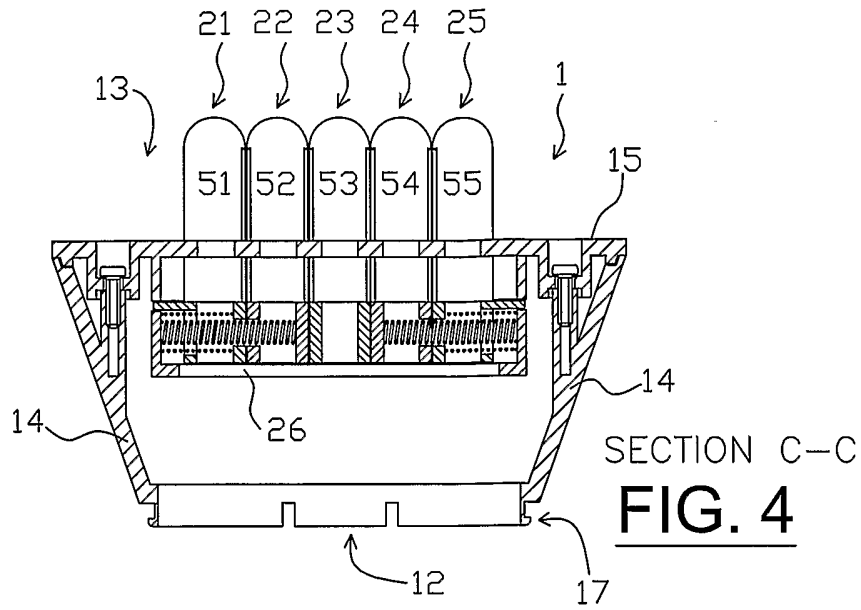
exposed from said cylindrical surface of said cylindrical main body and forming said cylindrical body and from said hair treating surface.

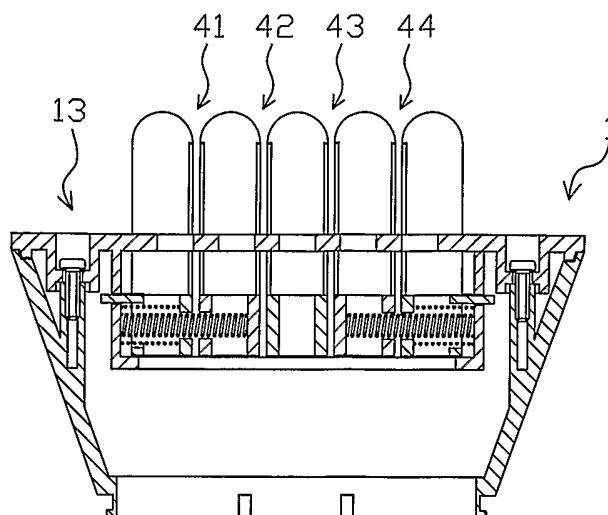
5. A hair styling attachment according to claim 1, wherein said main housing includes an upstream end and a downstream end, said hair treating members include a first and a second end, said first end being a free end and protrudes beyond said downstream end.
6. A hair styling attachment according to claim 5, wherein said first end of said hair treating member being deflectable and/or displaceable relative to said main housing and said corresponding hair treating surfaces being generally convexly disposed with respect to each other.
7. A hair styling attachment according to claim 5, wherein said hair treating member resembles a finger with a generally cylindrical body.
8. A hair styling attachment according to claim 5, wherein said hair treating member includes a generally elongated and thermally insulated main body mounted with a metallic surface to form said hair treating surface.
9. A hair styling attachment according to claim 8, wherein said metallic surface being generally curved with the same curvature extending along an axis of curvature, said axis of curvature being generally parallel to the longitudinal axis of said insulated main body.
10. A hair styling attachment according to claim 7 and including a plurality of hair treating members, wherein a first and a second hair treating surfaces are formed on some of said plurality of hair treating members, said hair treating

surfaces on the same hair treating member being generally diametrically disposed on said cylindrical body.

- 5
11. A hair styling treatment according to claim 5, wherein air entering said upstream end of said main housing can exit through the gap formed between adjacent hair treating members.
12. A hair styling attachment according to claim 11, wherein said main housing includes an attachment means for coupling said device to a hot air blower.
- 10
13. A hair styling attachment according to claim 5 and including a plurality of hair treating members, wherein said plurality of hair treating members are linearly disposed.
14. A hair styling attachment according to claim 5, wherein bristles generally parallel to the longitudinal axis said hair treating members are disposed on said main housing.
- 15
15. A hair styling attachment according to claim 5, wherein the second ends of an adjacent pair of hair treating members co-operatively forms an hair engaging aperture, said hair engaging aperture being convergent towards said upstream end of said main housing.
16. A hair styling apparatus including a hair styling attachment of claim 5 and a hot air blower.
- 20
17. A hair styling apparatus of claim 15, wherein said styling device being detachable from said hot air blower.







SECTION C-C

FIG. 7

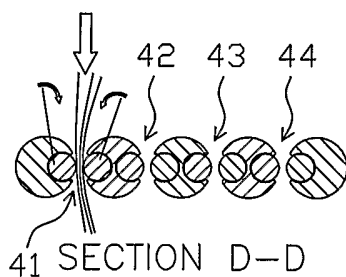


FIG. 8

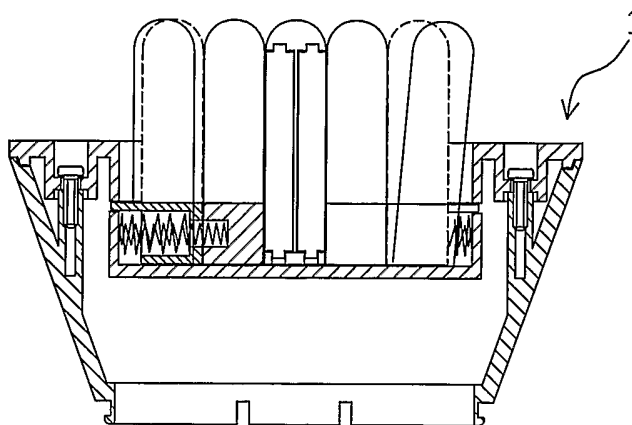


FIG. 9

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
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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)
IPC 7 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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	US 5 660 191 A (DEBOURG JEAN-PIERRE ET AL) 26 August 1997 (1997-08-26) column 1, line 48-63; figures 1,2 ----- -/--	1

Further documents are listed in the continuation of box C. Patent family members are listed in annex.

° Special categories of cited documents :

A document defining the general state of the art which is not considered to be of particular relevance	*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
E earlier document but published on or after the international filing date	*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
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)	*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.
O document referring to an oral disclosure, use, exhibition or other means	*&* document member of the same patent family
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 10 May 2004	Date of mailing of the international search report 01/06/2004
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Name and mailing address of the ISA 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	Authorized officer Lang, D
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INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB2004/000198

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Information on patent family members

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