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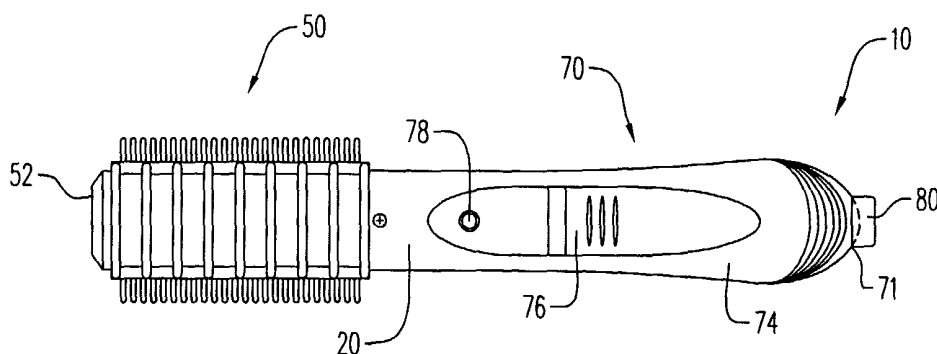
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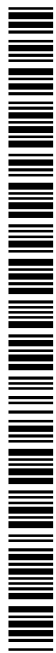
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(54) Title: HAIR STRAIGHTENING DEVICE



(57) Abstract: A hair straightener or straightening device is provided that includes a handle adapted to be attached to a housing. The housing has a heat transmissive plate surrounded by a cover formed by curved rings and teeth, which serve to guide and tension the hair along the heat transmissive plate. The transmissive plate is heated by hot air. The air is directed and diverted to heat the transmissive plate to a temperature hot enough to straighten hair.



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HAIR STRAIGHTENING DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

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The present invention relates to a hair styling product. More particularly, the present invention relates to a hair straightener or straightening device that uses hot air to straighten or smooth the hair.

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2. Description of the Prior Art

A variety of different devices and methods may be used for straightening hair. For example, the user may employ a hairbrush to place tension on his or her hair while applying heated air with a hair dryer. In particular, the user gathers a portion of hair and extends it away from the user's head. The extended hair portion is then treated with heated air to enable it to retain its extended shape. However, this method is a two-handed procedure that requires agility, concentration and, thus, can be strenuous and tiresome for the user.

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An alternative method for hair straightening is use of a styler/dryer appliance. The appliance has various styling attachments, such as a brush or a comb, which attach to the nozzle of the hair dryer, and typically having an elongated body with a head portion in which the hot air flow exits laterally therefrom. Thus, the appliance can be manipulated in the same fashion as a common brush, namely one's hair being dried and styled as the user merely brushes or combs his or her hair. The air outlet in a styler/dryer is a larger area than that of the typical blower/dryer and, consequently, the air exits through this outlet at a lower velocity. This lower velocity and less concentrated air flow will not tend to adversely blow or scatter the user's hair as much as the high velocity air in the blower/dryer,

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thereby facilitating the styling operation. U.S. Patent No. 5,842,286 discloses an example of such a styler/dryer.

5 Hair can also be straightened by applying a relaxing agent to break down the natural curls of the hair. A hair dryer is then typically used to dry the hair and, in some cases, provides the requisite heat necessary to activate the relaxing agent.

10 Further, a curling iron or similar device may facilitate straightening of hair by compressing the hair between flat surfaces of heated iron.

SUMMARY OF THE INVENTION

15 It is an object of the present invention to provide a device for straightening hair.

It is another object of the present invention to provide a hair straightener that straightens the user's hair by using hot air.

20 It is still another object of the present invention to provide a hair straightener in which a various attachments can be readily attached and detached from the body or handle of the device.

25 These and other objects and advantages of the present invention are achieved by the hair straightener of the present invention. The hair straightener comprises a handle having a heat generator and a convector to direct heat away from the handle, a housing connected to the handle and having a heatable surface with one or more vents to release the heat from the housing, a guide for directing hair onto the housing, and a heat
30 distributor adjacent the housing to direct heat from the handle through the vents. The heat generated from the heat generator is directed by the

convector into the housing. The heat distributor moves the heat through the housing, thereby heating the heatable surface of the housing and directing heat out of the vents to facilitate the straightening of hair secured by the guide.

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The present invention also provides an attachment for a hair care device. The attachment comprises: a housing having a heatable surface with vents to release the heat from the housing, a guide for directing hair onto the housing, and a cone-shaped heat distributor in the housing to
10 direct heat from the handle through the vents. The cone-shaped heat distributor also directs heat through the housing, thereby heating the heatable surface of the housing and directing heat out of the vents to facilitate the straightening of hair secured by the guide.

15 BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and still further objects and advantages of the present invention will be more apparent from the following detailed explanation of the preferred embodiments of the invention in connection with the
20 accompanying drawings:

Fig. 1 is a top view of the hair straightener of the present invention;

Fig. 2 is a side view of the hair straightener of Fig. 1;

25

Fig. 3 is a side view of a portion the hair straightener of Fig. 1, turned ninety degrees;

Fig. 4 is an opposite side view of the portion of the hair straightener
30 of Fig. 3;

Fig. 5 is an end view of the portion of the hair straightener of Fig. 3;

Fig. 6 is an exploded view of the components of the hair straightener of Fig. 1; and

5

FIG. 7 is a schematic diagram showing the path of the airflow through the hair straightener of Fig. 1.

DETAILED DESCRIPTION OF THE INVENTION

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Referring to the figures and, in particular, Figs. 1 and 2, a hair straightener or straightening device of the present invention is generally represented by reference numeral 10. Hair straightener 10 has a body that includes a housing 50 and a handle 70 adapted to be connected to the housing via an adapter 20. Preferably, housing 50 and handle 70 are in axial alignment.

Referring to Figs. 1 and 2, handle 70 has a lower handle 72 and an upper handle 74 that are adapted to be removably connected together. They can be secured together by conventional means, such as, for example, one or more screws or mating surfaces, one of which is female and the other of which is male that are adapted to snap fit to each other. Handle 70 also has a switch (not shown) and switch cover 76, preferably in upper handle 74, that is adapted to activate a power source. The switch cover 76 is secured to handle 70, such as, for example, one or more screws 78. At the end 71 of handle 70, opposite body 50 is a cap or end cap 80. End cap 80 is preferably removable. Between end 71 and cap 80, there can be positioned a filter 82. It is noted that the portion of handle 70 that encloses filter 82 has a plurality of holes or apertures 81 to permit the filter to breathe.

30

Preferably, cap 80 is the connection from handle 70 to a power source, such as, for example, an AC power source.

Both lower handle 72 and upper handle 74 are made of an appropriate material, such as plastic, metal, rubber or wood. Preferably, the material is plastic.

Referring to Fig. 3, housing 50 has a heatable surface or heat transmissive plate 56 with one or more vents 58 that permit the release of the heat from the housing. Housing 50 is adapted to receive a covering 60 about its outer exterior. Preferably, covering 60 is a two-piece structure that surrounds heat transmissive plate 56. Covering 60 has two or more, and preferably a series (which is at least three) of rings 61, and two or more, and preferably a series of, guides or teeth or series of tines 62. The series of rings 61, are preferably curved, and surround the exterior of housing 50. The teeth or series of tines 62 protrude from housing 50 to evenly distribute hair. The covering 60 is held together at the top by a tip 52 and at the bottom by adapter 20. Adapter 20 operatively connects and secures housing 50 and covering 60 to handle 70 and allows for the transmission of air from the handle to the housing. Further, adapter 20 prevents any rotation or movement of covering 60, thereby allowing for hair to be securely guided for straightening.

Heat transmissive plate 56 is preferably made of a material that is capable of absorbing heat from the hot air produced by the fan located in handle 70 and transmitting the absorbed heat to the user's hair. Such a material is metal, such as aluminum, or a heat conducting polymer, such as a talc-filled nylon, or a metal filled polycarbonate. Preferably, covering 60 is made of plastic. The rings 61 and teeth 62 may be made of plastic, rubber, or any mixtures thereof. However, the curved rings 61 and teeth 62 may also be integral to covering 60 as shown in the figures.

Referring to Fig. 7, housing 50 is preferably cylindrical. Housing 50 has an air restrictor or air baffle 66 that is connected to a heat distributor or air diverter 64. Preferably, the connection is removable. Baffle 66 is
5 preferably located in the center of housing 50. Heat transmissive plate 56 surrounds the air baffle 66 and air diverter 64. The one or more vents 58 of heat transmissive plate 56 direct the heated air. The heat distributor or diverter 64 in housing 50 directs heat from handle 70 through the one or more vents 58. Preferably, diverter 64 is cone-shaped to facilitate the
10 direction of heat. In a preferred embodiment, the tip of the cone-shape of diverter 64 is directed to handle 70.

As shown in Fig. 6, heat transmissive plate 56 is preferably laterally curved so that the hair may glide over its upper surface. Also, heat
15 transmissive plate 56 is situated underneath covering 60 such that curved rings 61 surround heat transmissive plate 56. The rings 61 are designed so that neither the user's scalp nor neck, come into contact with heat transmissive plate 56. The rings 61 help to separate and guide the user's hair. The plurality of teeth 62 of covering 60 weave through the user's hair
20 and pull the hair to create tension so that the hair is drawn evenly and tightly across heat transmissive plate 56. Thus, the tension of pulling the user's hair straightens the hair, and the action of drawing the hair across heat transmissive plate 56 causes the hair to be straightened.

25 As stated above, the heat generated from a heating coil or other type of heat generator (not shown), in handle 70, is directed by a fan or other type of convector (not shown), also in handle 70, into housing 50, and diverter 64 moves the heat through the housing, thereby heating transmissive plate 56 and directing heat out of the one or more vents 58 to
30 facilitate the straightening of the hair secured by the guide.

Housing 50 is preferably connected to handle 70 by adapter 20, which is preferably configured to releasably receive and secure both housing 50 and handle 70. Adapter 20 also preferably is configured to enable housing 50 to be releasably connected to various different hair care devices. However, any other method of connection which allows for the transferability of housing 50 to other hair care devices may also be used. Thus, housing 50 can be readily attached and detached from handle 70, and readily attached onto another hair care device such as, for example, a hair dryer.

10

Fig. 6 also shows adapter 20 and housing 50 with components thereof that make up and connect the housing to handle 70. These components include cap 52, air baffle 66, air diverter 64, heat transmissive plate 56 with vents 58, and covering 60 with rings 61 and teeth 62. Air baffle 66 preferably has a plurality of openings and functions to restrict the flow of air from handle 70 to housing 50 and to distribute the airflow evenly through and between each vent 58 in housing 50. Air diverter 64, as described above, facilitates the transfer of heated air from housing 50 to heat transmissive plate 56 and vents 58. Fig. 7 illustrates the air flow pattern through housing 50.

20

An additional feature of the present invention is a "cool shot button" that allows for momentary removal of heat from device 10 yet continues the flow of air to cool and set hair after straightening. This is preferably accomplished by the arrangement of the heat generator with the convector. Preferably, a portion of the heat generator serves as a voltage dropping, series resistor for the convector. Thus, preferably when the "cool shot button" is actuated, the heat generator is switched off and the portion of the heat generator that is in series with the convector remains open. This allow for the convector to continue to operate and generate an airflow while the heat generator ceases to produce heat thereby creating cool shot of air.

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It should be understood that the foregoing description is only illustrative of the invention. Various alternatives and modifications can be devised by those skilled in the art without departing from the invention.

- 5 Accordingly, the present invention is intended to embrace all such alternatives, modifications and variances.

WHAT IS CLAIMED IS:

1. A hair straightening device, comprising:
 - 5 a housing having a heatable surface with one or more vents;
a handle releasably connected to said housing, said handle having a heat generator;
 - 10 a convector in said handle for urging heat from said heat generator through said housing;
wherein said housing receives a cover about said heatable surface for separating hairs and preventing contact between said heatable surface
15 and the scalp of a user.
2. The hair straightening device of claim 1, wherein said cover has a series of teeth protruding outwardly from said housing to facilitate hair being pulled evenly and tightly across said heatable surface.
20
3. The hair straightening device of claim 1, wherein said cover is held in position by said adapter.
4. The hair straightening device of claim 1, wherein said cover is
25 made of a nonconductive material.
5. The hair straightening device of claim 1, wherein said heatable surface is made of a material capable of being heated by hot air.
- 30 6. The hair straightening device of claim 1, wherein said heatable surface is made of a heat conducting metal.

7. The hair straightening device of claim 1, wherein said
heatable surface is made of a heat conducting polymer.

5 8. The hair straightening device of claim 1, wherein said
heatable surface is laterally curved to facilitate hair gliding over said
surface.

9. The hair straightening device of claim 1, wherein said housing
10 has located therein an air baffle.

10. The hair straightening device of claim 9, wherein said air
baffle is removably connected to an air diverter.

15 11. The hair straightening device of claim 9, wherein said air
baffle has a plurality of openings for restricting and distributing the flow of
air between said one or more vents in said heatable surface of said
housing.

20 12. The hair straightening device of claim 11, wherein said plurality
of openings evenly distribute the flow of air between said one or more vents
in said heatable surface of said housing.

13. The hair straightening device of claim 10, wherein said air
25 diverter directs air from said handle through said vents in said heatable
surface of said housing.

14. The hair straightening device of claim 10, wherein said air
diverter is cone-shaped.

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15. The hair straightening device of claim 1, wherein said handle is made of a nonconductive material.

16. The hair straightening device of claim 1, wherein said handle
5 is connected to said housing by an adapter.

17. The hair straightening device of claim 16, wherein said adapter allows for the transmission of air from said handle to said housing.

10 18. The hair straightening device of claim 16, wherein said adapter enables said housing to be releasably connected to various different hair care devices.

19. The hair straightening device of claim 1, wherein said handle
15 has a switch for activating a power source.

20. The hair straightening device of claim 1, further comprising a filter.

20 21. The hair straightening device of claim 18, wherein said handle has a plurality of holes disposed therein adjacent said filter to allow said filter to breathe.

22. A hair straightening device, comprising:
25 a handle;
a heater in said handle;
a fan in said handle;
an attachment releasably connected to said handle, said attachment having a heatable surface with one or more vents for releasing heated air
30 generated by said heater and forced, by said fan, through said attachment,

wherein said handle has a button mechanism allowing for the momentary removal of heat from the device and enabling the continued flow of air to cool and set hair after it is straightened.

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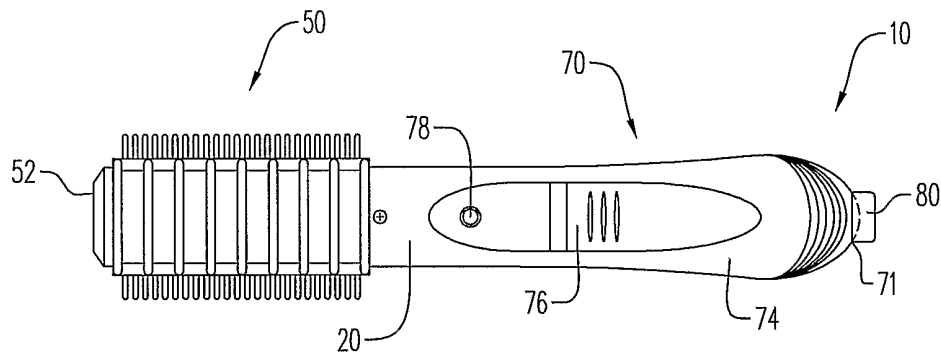


FIG. 1

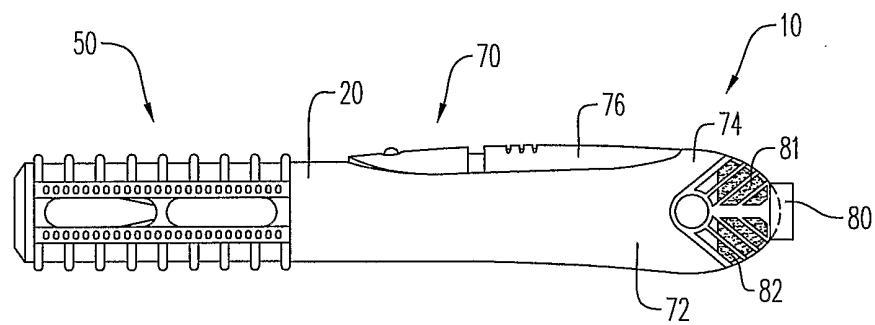


FIG. 2

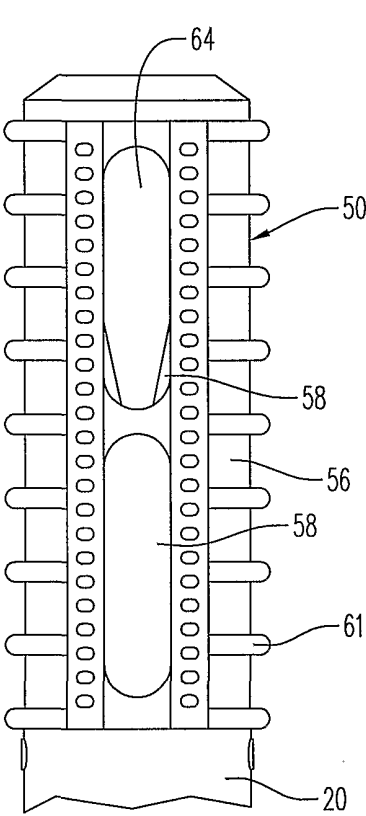


FIG. 3

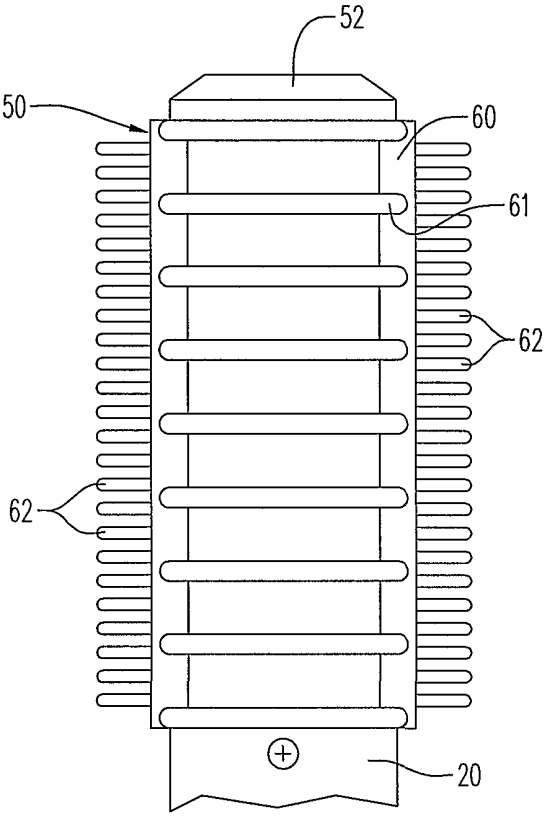


FIG. 4

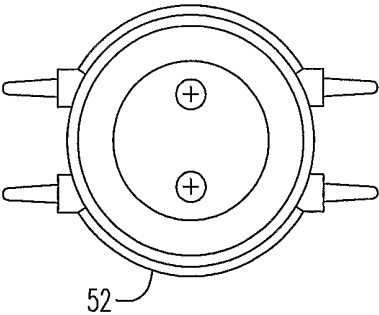


FIG. 5

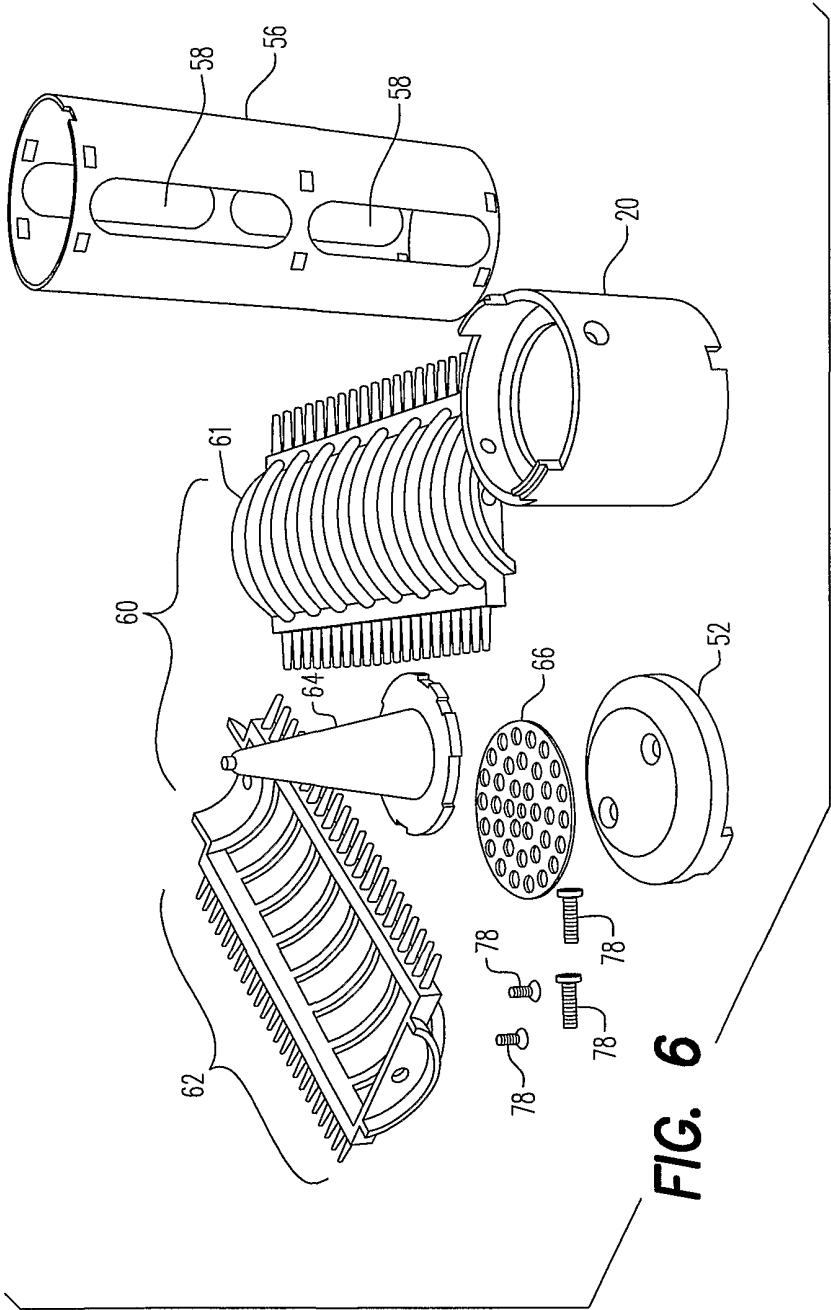


FIG. 6

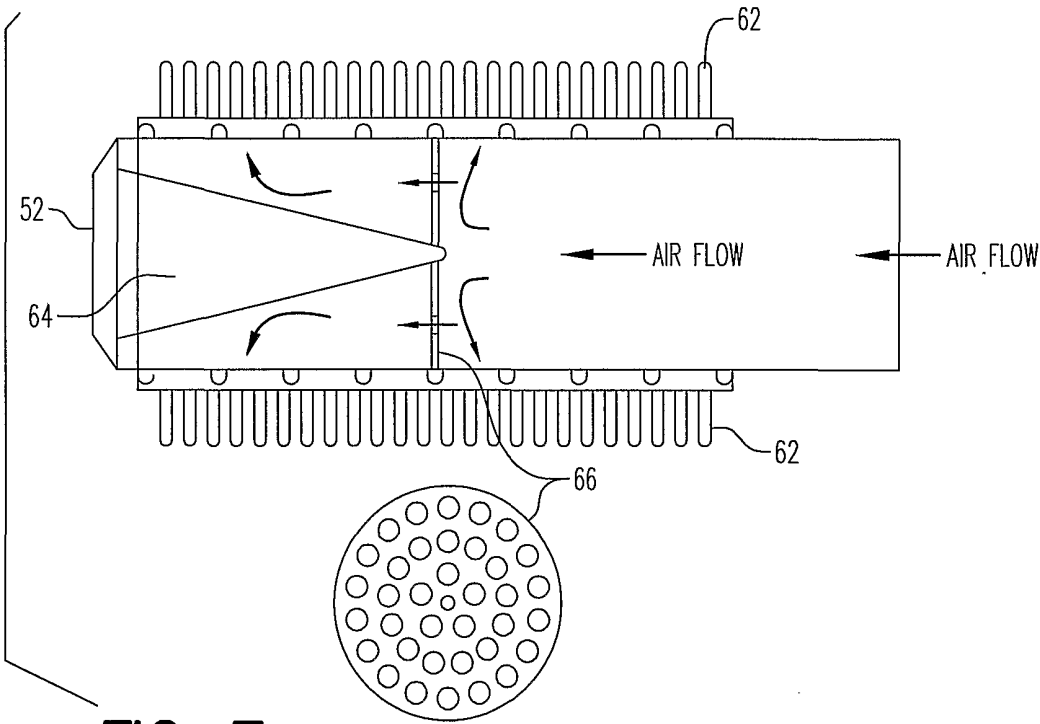


FIG. 7