



RAI's PTAB Presentation

Philip Morris Products, S.A. v. RAI Strategic Holdings, Inc.

No. IPR2020-01602

Attorneys: *James Kokoski, Roesel, and Ankenbrand*
Filed: *February 6, 2021*



Elements Missing From Prior Art

1

Claims 1 & 15: “the mixture . . . wicked into contact”

2

Claims 1 & 15: “puff-actuated controller . . . for regulating current flow . . . during draw”

3

Claims 11 & 23: “wherein the cartridge is electrically conductive”

4

Claims 14 & 24: “the absorbent fibrous material is in contact with the electrical resistance heater”

'123 Patent



(12) **United States Patent**
Robinson et al. (10) **Patent No.:** US 9,901,123 B2
(45) **Date of Patent:** *Feb. 27, 2018

(54) **TOBACCO-CONTAINING SMOKING ARTICLE**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days. This patent is subject to a terminal disclaimer.

(21) Appl. No.: **15/286,087**

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(63) Continuation of application No. 14/527,287, filed on Oct. 29, 2014, which is a continuation of application (Continued)

(51) **Int. Cl.**
A24F 1/00 (2006.01)
A24F 47/00 (2006.01)
(Continued)

(52) **U.S. CL.**
CPC **A24F 47/008** (2013.01); **A24B 13/02** (2013.01); **A24B 15/12** (2013.01); **A24B 15/167** (2016.11);
(Continued)

(58) **Field of Classification Search**
None
See application file for complete search history.

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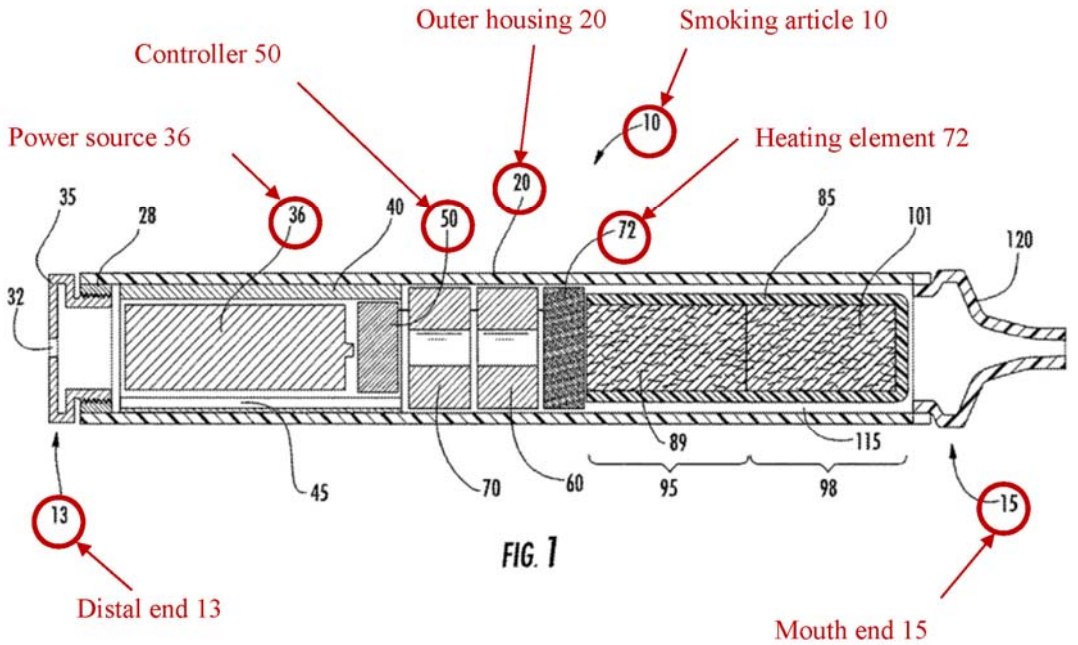
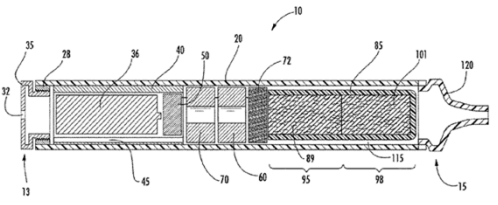
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(57) **ABSTRACT**

A smoking article may include a cigarette incorporated within an electrically powered aerosol generating device that acts as a holder for that cigarette. The smoking article possesses at least one form of tobacco. The smoking article also possesses a mouth-end piece that is used by the smoker to inhale components of tobacco that are generated by the action of heat upon components of the cigarette. A representative smoking article possesses an outer housing incorporating a source of electrical power (e.g., a battery), a sensing mechanism for powering the device at least during periods of draw, and a heating device (e.g., at least one electrical resistance heating element) for forming a thermally generated aerosol that incorporates components of tobacco. During use, the cigarette is positioned within the (Continued)



Ex. 1001 ("123 patent"), Fig. 1

Claims 1 and 15: "wicked into contact"

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31 switching of the current actuation mechanism 510 to an "on" position, the timing mechanism operates for a selected period of time (e.g., 1 minute, 2 minutes, 4 minutes, or the like). In the event that the remaining portion of the circuit is reactivated within the selected period of time, the timing mechanism 520 is reset and begins operating again. In the event of the occurrence a certain period of inactivity or non-use, the timing mechanism then can act to turn the circuit "off," until reactivation of the cycle.

During operation of the circuit, current passes through the first resistance heating element 70 and the third resistance heating element 300, and as such, those resistance heating elements produce heat. Control of the temperatures generated by each resistance heating element is provided by control mechanisms 530, 540, respectively.

A puff control mechanism 550, such as a suitable air flow sensing switch, acts to complete the circuit that provides current to the second resistance heating element 72. That is, during periods of draw, the circuit that provides current through the second resistance heating element is closed, and hence that heating element produces heat. A predetermined quantity of heat can be produced by current controlled by a timer (e.g., a fixed pulse set at about 0.5 second to about 2 seconds in duration). Alternatively, a series of "on/off" types of pulses can be provided during draw periods. When draw is complete, that circuit is broken. A control mechanism 560, such as a timer, acts to provide for control of the current passing through the circuit, and hence the amount of heat generated by heating element. For example, for longer puff periods, current supplied to the heating element, and hence power for aerosol generation, can be provided by a controlled sequential "on" and "off" signal provided by the timer. Typically, the timed period for current flow ranges from about 0.1 second to about 1 second, and about 0.2 second to about 0.6 second generally can be employed; while the "off" period for between periods of periodic current flow often can range from about 0.1 second to about 0.6 second.

Referring to FIG. 5, there is shown a diagram of another embodiment of an electronic circuit 500 that can be incorporated within a smoking article of the present invention. It is again noted that the control circuitry for the smoking articles of the invention can be assembled as discrete electronic components or as an integrated microprocessor device. The representative circuit includes a power source 36, an actuation mechanism 510, and at least one resistance heating element; and for the embodiment shown, a first resistance heating element 70, a second resistance heating element 72, and a third resistance heating element 300. Such a circuit that incorporates three resistance heating elements can be incorporated within the type of smoking article described previously with reference to FIG. 3. Again, simply removing the third heating element 300 could produce a circuit useful in other smoking article embodiments set forth herein.

The circuit preferably incorporates a timing mechanism 520. Such a timing mechanism can be programmed to provide for a controlled period of operation. For example, after the circuit has been activated by activity resulting in the switching of the current actuation mechanism 510 to an "on" position, the timing mechanism operates for a selected period of time. In the event that the remaining portion of the circuit is activated, the timing mechanism is reset and begins operating again. In the event of the occurrence a certain period of inactivity or non-use, the timing mechanism then can act to turn the circuit "off."

32 During operation, current passes through the first resistance heating element 70 and the third resistance heating element 300, and as such, those resistance heating elements produce heat. Control of the temperatures generated by each resistance heating element is provided by control mechanisms 530, 540, respectively.

A puff control mechanism 590 acts to complete the circuit that provides current to the second resistance heating element 72. That is, during periods of draw, the circuit that provides current through the second resistance heating element is closed, and hence that heating element produces heat. When draw is complete, that circuit is broken. In the embodiment shown, the puff control mechanism 590 is provided by a pressure sensor 570 and a threshold detector 580 (e.g., a Schmitt trigger), which can provide for control of the current passing through the second resistance heating element 72, and hence power for aerosol generation, can be provided for longer periods of time. As another example, for deeper or more rigorous puffs, a sensing of stronger draw can be used to provide for greater current flow to the appropriate resistance heating element, and hence provide for a correspondingly greater aerosol generation. Alternatively, a separate switch (not shown) can be selected by the smoker to provide control of current to at least one of the resistance heating elements; and as such, during periods of draw (e.g., whether or not the draw or puff is intense, long, short, deep, shallow, large in volume, small in volume, or the like) the conditions associated with heat generation for aerosol formation are controlled, and hence, consistent aerosol formation can be provided during each puff.

Many modifications and other embodiments of the invention will come to mind to one skilled in the art to which this invention pertains having the benefit of the teachings presented in the foregoing description; and it will be apparent to those skilled in the art that variations and modifications of the present invention can be made without departing from the scope or spirit of the invention. Therefore, it is to be understood that the invention is not to be limited to the specific embodiments disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for purposes of limitation.

What is claimed is:
1. An electrically-powered, aerosol-generating smoking article comprising:
an electrical power source within a tubular outer housing having a mouth-end and an end distal to the mouth-end; at least one electrical resistance heater powered by said electrical power source;
a puff-actuated controller within the tubular outer housing and adapted for regulating current flow through the electrical resistance heater during draw, the controller comprising a sensor adapted for sensing draw on the smoking article by a user; and
a rod-shaped carrier device engaged with the mouth-end of the tubular outer housing and comprising a cartridge providing a liquid storage compartment containing a mixture comprising a tobacco extract and an aerosol-forming material absorbed within an absorbent fibrous material, the cartridge having a generally tubular shape and adapted for airflow therethrough;

What is claimed is:

- 1. An electrically-powered, aerosol-generating smoking article comprising:
an electrical power source within a tubular outer housing having a mouth-end and an end distal to the mouth-end; at least one electrical resistance heater powered by said electrical power source;
a puff-actuated controller within the tubular outer housing and adapted for regulating current flow through the electrical resistance heater during draw, the controller comprising a sensor adapted for sensing draw on the smoking article by a user; and
a rod-shaped carrier device engaged with the mouth-end of the tubular outer housing and comprising a cartridge providing a liquid storage compartment containing a mixture comprising a tobacco extract and an aerosol-forming material absorbed within an absorbent fibrous material, the cartridge having a generally tubular shape and adapted for airflow therethrough;

wherein the rod-shaped carrier device is operatively positioned such that, during draw, the mixture comprising the tobacco extract and the aerosol-forming material can be wicked into contact with the electrical resistance heater and volatilized to produce a visible mainstream aerosol incorporating tobacco components or tobacco-derived components that can be drawn into the mouth of the user of the smoking article.

“Wicking into contact” is the transport mechanism

Typically, the second resistance element 72 can be formed from relatively high surface area absorbent or wicking-type materials, such as graphite yarn, high surface area metallic mesh or screen, or the like. Resistance elements of such type are useful for supporting or holding sufficient aerosol-forming material for aerosol generation, as well as for wicking additional aerosol-forming material for aerosol generation during subsequent puffs. Alternatively, the second resistance element 72 can be employed in close proximity to the first resistance element such that aerosol-forming material can be wicked or otherwise transferred so as to contact the second resistance element or contact an area in close proximity to the second resistance element (e.g., a region that is exposed to a heat produced by the second resistance element). Representative types of resistance heat-

'123 patent at 21:31-45

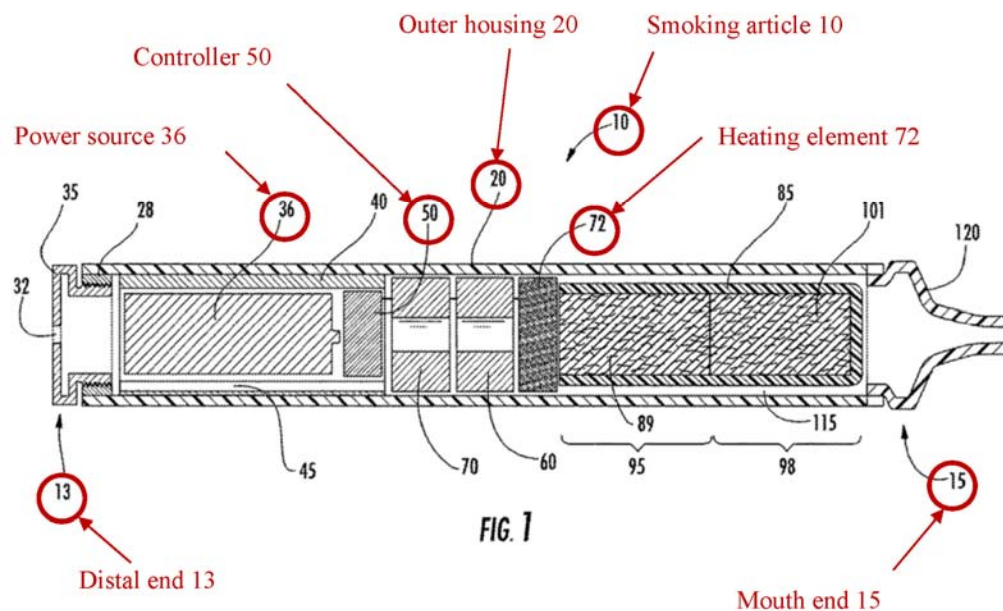


FIG. 1

'123 patent, Fig. 1

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