AN ELECTRICALLY HEATED SMOKING SYSTEM WITH INTERNAL OR EXTERNAL HEATER

The present invention relates to an electrically heated smoking system including a heater for heating an aerosol-forming substrate.

EP-A-0 358 002 discloses a smoking system comprising a cigarette with a resistance heating element for heating tobacco material in the cigarette. The cigarette has an electrical connection plug for connection to a reusable, hand held controller. The hand held controller includes a battery and a current control circuit which controls the supply of power to the resistance heating element in the cigarette.

One problem of such a proposed smoking system is that tobacco smoke tends to condense on the internal walls of the system. This is undesirable because condensation build up on the internal walls of the system can lead to reduced performance.

Accordingly, it is advantageous to provide an electrically heated smoking system which, in use, minimises the risk of smoke or aerosol condensation on its internal walls.

According to one aspect of the invention, there is provided an electrically heated smoking system for receiving an aerosol-forming substrate, the system comprising a heater for heating the substrate to form the aerosol, the heater comprising a heating element, wherein the electrically heated smoking system and the heating element are arranged such that, when the aerosol-forming substrate is received in the electrically heated smoking system, the heating element extends a distance only partially along the length of the aerosol forming-substrate, and the heating element is positioned towards the downstream end of the aerosol-forming substrate, wherein the ratio of the distance that the heating element extends along the aerosol-forming substrate, to the length of the aerosol-forming substrate, is between 0.35 and 0.6.

~~According to another aspect of the invention, there is provided~~ Also disclosed is an electrically heated smoking system for receiving an aerosol-forming substrate, the system comprising a heater for heating the substrate to form the aerosol, the heater comprising a heating element, wherein the electrically heated smoking system and the heating element are arranged such that, when the aerosol-forming substrate is received in the electrically heated smoking system, the heating element extends a distance only partially along the length of the aerosol forming-substrate.

~~According to a further aspect of the invention, there~~There is ~~provided~~further disclosed an electrically heated smoking system for receiving an aerosol-forming substrate, the system comprising a heater for heating the substrate to form the aerosol, the heater comprising a heating element, wherein the electrically heated smoking system and the heating element are arranged such that, when the aerosol-forming substrate is received in the electrically heated smoking system, the heating element is positioned towards the downstream end of the aerosol-forming substrate.

Positioning the heating element such that it extends only partially along the aerosol-forming

the aerosol-forming substrate by a distance *e* between approximately 2 mm and approximately 6 mm. Even more preferably, the upstream end of the heating element is downstream of the upstream end of the aerosol-forming substrate by a distance *e* of approximately 4 mm.

The non-heated portion of the aerosol-forming substrate located at the upstream end, that is, between the upstream end of the aerosol-forming substrate and the upstream end of the heating element, provides an efficient filtration zone. This minimises the risk of aerosol leaving the upstream end of the aerosol forming substrate in the electrically heated smoking system. This also minimises the risk of condensation of aerosol inside the electrically heated smoking system, which minimises the number of cleaning operations required throughout the smoking system's lifetime. In addition, the non-heated upstream portion of the aerosol-forming substrate acts as a slow-release aerosol reservoir which may be accessible by thermal conduction through the substrate throughout the smoking experience.

~~Preferably~~According to the above aspect of the invention, the ratio of the distance *w*, that the heating element extends along the aerosol-forming substrate, to the length *l* of the aerosol-forming substrate, $\frac{w}{l}$ is between approximately 0.35 and approximately 0.6. Even more preferably, the ratio $\frac{w}{l}$ is approximately 0.5.

The ratio of $\frac{w}{l}$ of between approximately 0.35 and approximately 0.6 has the advantage that it maximises the volume of aerosol delivered to the user, whilst minimising the amount of aerosol leaving the upstream portion of the aerosol forming substrate. This minimises the risk of condensation of the aerosol in the smoking system. Further, this ratio also has the advantage that it minimises heat loss through non-tobacco materials. This means that the smoking system requires less energy.

Even more preferably, the ratio of the distance that the heating element extends along the aerosol-forming substrate to the length of the aerosol-forming substrate is approximately 0.5. A ratio of approximately 0.5 (for an aerosol forming substrate such as a tobacco plug of either 10 or 12 mm) offers the best balance in terms of aerosol deliveries, minimisation of the risk of aerosol leaving the upstream end of the aerosol forming substrate and aerosol temperature.

In one embodiment of the electrically heated smoking system, the heater further comprises a second heating element arranged, when the aerosol-forming substrate is received in the electrically heated smoking system: to extend a distance *y* only partially along the length *l* of the aerosol-forming substrate; and to be upstream of the first heating element. The first heating element, the second heating element or both heating elements may extend substantially partially or fully around the circumference of the aerosol forming substrate.