

EXHIBIT 5

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'545 Patent.” (*Id.*) But such statement ascribes too much credit to the '545 Patent and too little credit to the Spray Atomizer family.

(i) The Alleged Technical Value Of The '545 Patent Is Primarily Attributable To The Prior Art

175. The '545 Patent provides almost no technical value over what was already well understood in the art as explained in paragraphs 47-60, and 83-246 of my Opening Invalidity Report. The '545 Patent cites another Philip Morris Patent, U.S. Patent No. 6,040,560 to Fleischhauer, which issued more than two years prior to the filing of the '545 Patent. Fleischhauer describes using pulse width modulation (“PWM”) in an electronic cigarette to provide puffs with consistent taste and delivery to the user. (Fleischhauer at 3:5-24; 13:34-44.) Fleischhauer describes numerous benefits of using pulse width modulation in electronic cigarettes and includes identical Figures as the '545 Patent including an identical schematic, block-diagram for the control circuit. *Compare* '545 Patent Figs. 1-3 with Fleischhauer Figures 2, 3, and 7.

176. Fleischhauer states that the “batteries 35a are sized to provide sufficient power for the heaters,” that “[a]lternative sources of power are suitable,” and in “the preferred embodiment, the power source comprises four nickel-cadmium battery cells connected in series with a total, non-loaded voltage in the range of approximately 4.8 to 5.6 volts.” (Fleischhauer at 5:22-29.) The only difference between Fleischhauer and the '545 Patent is that Fleischhauer does not explicitly mention lithium ion batteries. Rather, Fleischhauer incorporates by reference U.S. Pat. No. 5,144,962 that “describes several types of power sources useful in connection with the smoking system of the present invention” (*Id.* at 5:32-38), which included “rechargeable lithium manganese dioxide” batteries. ('962 Patent at 9:62-65.) The technology described by the '545 Patent was well known in the prior art.

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177. Even though the advantages of PWM were well known in the art, as evidenced by Fleischhauer’s explicit disclosure, Mr. McAlexander improperly ascribes the benefits of pulse width modulation to the ’545 Patent. Mr. McAlexander states that “by using the invention of the ’545 Patent, however, lithium ion batteries are made viable in electrical resistance smoking systems because they ‘can be used safely and effectively.’” (McAlexander Report at ¶ 66.) He alleges that “[a]bsent the claimed invention, using lithium ion batteries in systems requiring such high discharge rates (such as e-cigarette devices) would require drawing current that” would “risk that the battery could become hot, catch fire, or explode.” (*Id.*) But, it is the technology of PWM generally that allows for high initial discharge rates and then to scale back the delivered power such that the battery is prevented from overheating. As described in Fleischhauer, the control circuit delivers varying amounts of power to the heater over multiple phases. (Fleischhauer at 13:15-23.) Fleischhauer describes how the “first phase of the power cycle [is] dedicated to the rapid achievement of the desired operating temperature of the heater” and the second phase “avoid[s] peaks in heater temperature and avoiding run-away pyrolysis.” (*Id.*) This technology of avoiding peaks in heater temperature and avoiding run-away pyrolysis of the tobacco also avoids runaway temperatures of the battery.

178. Second, Mr. McAlexander alleges that because lithium ion batteries have higher voltages, the ’545 Patent “enables [the] electrical[] heating elements ‘to become hot in a very short period of time.’” (McAlexander Report at ¶ 67.) But, the technology described in Fleischhauer already provided a first power phase “to promote a quick climb in heater temperature” and a second power phase that “sustain[ed] an elevated heater temperature.” (Fleischhauer at 19:60-67.) Moreover it would be a simple and predicable design choice to add

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additional batteries in series to increase the voltage output from the batteries if a higher discharge rate was deemed necessary.

179. Third, Mr. McAlexander alleges that the technology of the '545 Patent “enables the overall device to be more compact and smaller,” because lithium ion batteries have higher voltages. (McAlexander Report at ¶ 68.) This would be true if the inventors of the '545 Patent had invented lithium ion batteries. But they did not. In fact, as recognized in U.S. Patent No. 5,144,962 (“'962 Patent”)—the patent that the '545 Patent incorporates by reference—rechargeable lithium batteries were already being used in electronic smoking articles. ('962 Patent at 12:2-3.) Any benefit of the smaller form factor was a predictable result of substituting one known battery technology for another.

180. Fourth, Mr. McAlexander alleges that the controller in the '545 Patent “deliver[s] modulated pulses of electrical energy” to “prevent[] the power from being inconsistent, based on battery voltage, and thus ensures receipt by the user of a consistent aerosol.” (McAlexander Report at ¶ 69.) This is pulse width modulation that is fully disclosed by Fleischhauer. Fleischhauer teaches “deliver[ing] a consistent smoking experience,” by “adjust[ing] the duty cycles of each phase as the batteries progress through their discharged cycles so as to maintain the predetermined total energy application.” (Fleischhauer at 15:40-56.) Again, this alleged benefit is not attributable to the '545 Patent.

181. Fifth, Mr. McAlexander alleges “consumption of the battery voltage and power can be varied through time, which provides the user with the ability to regulate the battery consumption and, thus, provide a quick and intense heat.” (McAlexander Report at ¶ 70.) As previously discussed, varying power over time, first with an initial high power and second with a

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