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**Datasheet for the decision
of 16 November 2023**

Case Number: T 1530/21 - 3.2.01

Application Number: 12888511.8

Publication Number: 2921064

IPC: A24F47/00

Language of the proceedings: EN

Title of invention:

INTELLIGENT CONTROLLER AND METHOD FOR ELECTRONIC CIGARETTE

Patent Proprietor:

Joyetech (Changzhou) Electronics Co., Ltd.

Opponents:

Adamson Jones IP Limited
Hoffmann Eitle
KELTIE LLP

Headword:

Relevant legal provisions:

EPC Art. 54, 56
RPBA 2020 Art. 13(2)

Keyword:

Novelty - (yes)

Inventive step - (no)

Amendment after summons - exceptional circumstances (no)

Decisions cited:

J 0014/19

Catchword:



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Case Number: T 1530/21 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 16 November 2023

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
1 July 2021 concerning maintenance of the
European Patent No. 2921064 in amended form.**

Composition of the Board:

Chairwoman A. Jimenez
Members: S. Mangin
 V. Vinci

Summary of Facts and Submissions

- I. The appeals were filed by the appellants 1 and 2 (opponents 1 and 3 respectively) against the interlocutory decision of the opposition division finding that, on the basis of the auxiliary request 1, the patent in suit (hereinafter "the patent") met the requirements of the EPC.
- II. The opposition division held that the first auxiliary request:
- (a) did not extend beyond the content of the application as originally filed,
 - (b) the invention according to auxiliary request 1 was disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art,
 - (c) the subject-matter of claims 1 and 10 was novel over D1 (WO 2011/137453) and D5 (ProVape, "ProVari Owner's Manual" 12 November 2011), and
 - (d) the subject-matter of claims 1 and 10 involved an inventive step starting inter alia from D1 in combination with common general knowledge or D5.
- III. Oral proceedings were held before the Board on 16 November 2023.
- IV. The appellants 1 and 2 (opponents 1 and 3 respectively) requested that the appealed decision be set aside, and the patent be revoked.

The respondent (patent proprietor) requested that the appeals of the appellants (opponents 1 and 3) be dismissed and that the patent be maintained on the basis of auxiliary request 1 (patent as maintained by

the opposition division) or, in the alternative, that the patent be maintained on the basis of one of the auxiliary requests 2, 3 and 4.

Auxiliary request 2 filed with the statement of ground of appeal corresponded to auxiliary request 2 filed on 11 May 2020 in opposition procedure and auxiliary requests 3 and 4 were filed with letter of 27 September 2023.

Opponent 2 did not make any submissions and was not present at the oral proceedings as announced with letter of 20 October 2023.

V. Independent product claim 1 of auxiliary request 1 reads as follows:

1. An electronic cigarette, comprising:
 - 1.1 an intelligent controller comprising
 - 1.2 a switch module (10),
 - 1.3 a voltage acquisition module (20),
 - 1.4 a control module (30),
 - 1.5 a display module (40), and
 - 1.6 a battery;
 - 1.2.1 wherein the switch module (10) is configured to send a high voltage signal to activate the intelligent controller;
 - 1.3.1 wherein the voltage acquisition module (20) is coupled to a heating wire (120) and configured to acquire a terminal voltage of the heating wire (120);
 - 1.4.1 wherein the control module (30) is coupled to the switch module (10) and the voltage acquisition module (20), respectively, and
 - 1.4.2 is configured to, after receiving the high voltage signal from the switch module (10), send a control signal to the voltage acquisition module (20)**

to make the voltage acquisition module (20) acquire a terminal voltage of the heating wire (120),
1.4.3 detect whether the heating wire (120) is in a short-circuit condition, an open-circuit condition, or a normal condition based on a type of the acquired signal from the voltage acquisition module (20), and
1.4.4 output a detection result;
1.5.1 wherein the display module (40) is electrically connected to an output of the control module (30) and
1.5.2 is configured to digitally display whether the heating wire (120) is in a short-circuit condition, an open-circuit condition, or a normal condition, such that a user can directly observe a condition of the heating wire (120); and
1.6.1 wherein the battery is electrically connected to the switch module (10), the voltage acquisition module (20), the control module (30), and the display module (40), respectively, and
1.6.2 is configured to supply working voltage power to the switch module (10), the voltage acquisition module (20), the control module (30), and the display module (40), respectively.

Independent method claim 10 of auxiliary request 1 reads as follows:

A method for intelligently controlling an electronic cigarette, comprising:

step S1, sending, by a switch module (10), a high voltage signal of startup to a control module (30);
step S2, receiving, by the control module (30), the high voltage signal of startup from the switch module (10), sending a control signal to a voltage acquisition module (20) to make the voltage acquisition module (20) acquire a terminal voltage of a heating wire (120) of an atomizer, detecting whether the heating wire (120)

is in a short-circuit condition, an open-circuit condition, or a normal condition, according to a type of the acquired signal from the voltage acquisition module (20), and outputting a detection result; and step S3, digitally displaying, by a display module (40), an output signal from the control module (30) to show whether the heating wire (120) is in a short-circuit condition, an open-circuit condition, or a normal condition, such that a user directly observes the condition of the heating wire (120).

- VI. Independent product claim 1 of auxiliary request 2 corresponds to claim 1 of the main request with the electronic cigarette additionally comprising:
"an atomizer comprising a heating wire (120)"
"a cartridge"
and the following amended features:
1.1 "an intelligent controller connected to the atomizer", and
1.3.1 "wherein the voltage acquisition module (20) is coupled to the heating wire (120) of the atomizer and configured to acquire a terminal voltage of the heating wire (120)".

Independent method claim 10 of auxiliary request 2 is identical to claim 10 of auxiliary request 1.

- VII. Independent product claim 1 of auxiliary request 3 is a combination of claims 1, 5 and 6 of auxiliary request 2.

Independent method claim 5 of auxiliary request 3 is a combination of claims 10, 11 and 12 of auxiliary request 2.

VIII. Independent product claim 1 of auxiliary request 4 is a combination of claims 1, 5, 6 and 7 of auxiliary request 2.

The method claims are deleted.

IX. In the present decision, reference is made to the following further document:

EV2: print-out from the store website page showing a list of cartridges / atomizers that were available from the manufacturer of the device D5, with an archive date of 10 November 2011 from the following link: <https://web.archive.org/web/20111112094548/http://www.provape.com:80/ecig-accessories-s/20.htm>

Reasons for the Decision

1. Auxiliary request 1 - Novelty over D1

As concluded by the opposition division, the subject-matter of claim 1 differs from D1 in that D1 does not teach features 1.4.2, 1.4.3 and 1.5.2. These findings were not contested by the respondent (proprietor) but were contested by the appellants (opponents) who argued that document D1 anticipated all the features of claim 1.

1.1 Regarding feature 1.4.2

[The control module]

"is configured to, after receiving the high voltage signal from the switch module (10), send a control signal to the voltage acquisition module (20) to make

the voltage acquisition module (20) acquire a terminal voltage of the heating wire (120)".

- 1.1.1 The appellants argued that claim 1 required only that the control signal was sent "after" receipt of the high voltage signal. The claim did not express any kind of a causal link between the receipt of the high voltage signal and the sending of the control signal.

The term "control signal" in claim 1 was any signal which caused a voltage to be acquired. It did not require that the voltage only be measured at discrete times or sampled at regular intervals. It required only that some kind of signal was sent, which resulted in voltage monitoring or measurement to begin. In electronic devices, particularly in control electronics, processes did not take place spontaneously with no prompting. As a result, it was implicit from D1 that in order for e.g. the monitoring processes described in paragraph [0060] to take place, some kind of control signal had to be sent initially. Even though no such signal was explicitly disclosed in D1, the fact that the monitoring took place at all was an implicit disclosure that some kind of signal was sent which instructed the measurement to be obtained. Without such a signal, the measurement simply could not take place.

Furthermore, they argued that even if D1 continuously monitored the voltage, which for the avoidance of doubt they did not consider to be the case (and in this regard, reference was made to the final sentence of paragraph [0061]), it was noted that even in the simplistic case of switching the device of D1 on and off, the criteria of claim 1 would be met. When the device was switched on, the controller circuit 170 caused the voltage to be measured via voltage sensor

176 (and the current to be read by the current sensor 178) and identified the measured resistance of the heater 146.

Finally, in paragraph [0060], D1 implicitly disclosed to the skilled person that voltage and current sensors were used to determine resistance of the heater 146.

- 1.1.2 The respondent (proprietor) argued that D1 did not teach that the controller 170 or sensor 132 sent a control signal to the voltage sensor 176 to cause the voltage sensor 176 measure the internal voltage of the heater 146. Monitoring the resistance or temperature did not necessarily require the controller 170 or sensor 132 to cause the voltage sensor 176 to measure the internal voltage of the heater 146. For example, the voltage sensor 176 could also send an unsolicited measurement to the controller 170 or sensor 132.

Furthermore document D1 did not teach how the controller 170 measured the resistance of the heater 146 to adjust heating parameters. It was not clearly and unambiguously disclosed that the controller 170/sensor 132 monitored internal voltage of the voltage sensor 176 for determining the resistance of the heater 146. It was likewise possible that the controller 170/sensor 132 monitored the temperature by means of a temperature sensor to determine the resistance or use a lookup-table to map a measured current or temperature to a resistance value.

- 1.1.3 The Board does not find an explicit disclosure of the control module being "configured to, after receiving the high voltage signal from the switch module, send a control signal to the voltage acquisition module to

make the voltage acquisition module acquire a terminal voltage of the heating wire".

In particular, as stated by the respondent (patent proprietor), there is no direct and unambiguous disclosure of how the resistance of the heating wire is measured. Although, D1 discloses a voltage sensor and a current sensor (see in particular figure 1B and paragraph [0060]), other measuring methods are technically possible like measuring the temperature via a temperature sensor to determine the heater resistance. Without a direct and unambiguous disclosure of the use of the voltage sensor to determine the resistance, it cannot be concluded that feature 1.4.2 is anticipated by the teaching of D1.

1.2 Regarding features 1.4.3 and 1.5.2

[The control module is configured to]

1.4.3: *"detect whether the heating wire (120) is in a short-circuit condition, an open-circuit condition, or a normal condition based on a type of the acquired signal from the voltage acquisition module (20)", and*
[The display module]

1.5.2: *"is configured to digitally display whether the heating wire (120) is in a short-circuit condition, an open-circuit condition, or a normal condition, such that a user can directly observe a condition of the heating wire (120)"*

1.2.1 The appellants (opponents) argued that the inclusion of the expression "or" in the claim left open the interpretation that, essentially, there were three embodiments in which the claimed electronic cigarette is capable of a) detecting whether the heating wire was in a short-circuit condition in a first embodiment, b) detecting whether the heating wire is in an open-circuit condition in a second embodiment, and c)

detecting whether the heating wire was in a normal condition in a third embodiment. The claimed electronic cigarette did not have to detect and display all three conditions. Such an interpretation was consistent with the established case law, namely that it was not a technically illogical or insensible interpretation, and not an undue narrowing of the terms used in the claim. The appellants also referred to paragraphs [0003], [0005] and [0007] of the patent to support their interpretation.

D1 disclosed the ability to determine whether the heater 146 was malfunctioning (see paragraph [0060]) and implicitly the ability to determine whether the heater 146 was not malfunctioning, i.e., normal. Therefore, D1 was capable of determining whether the heater 146 was in a normal condition.

The same was true for feature 1.5.2, albeit in respect of displaying the normal condition. D1 disclosed at paragraph [0056] that "the LED unit 134 may provide a visual indication when the ESD 100 is operating", and that when "the heater 146 is malfunctioning the LED unit 134 may blink in a different pattern". Hence, when it was determined that the heater 146 was in a normal condition, the LED unit 134 provided a visual indication to the user.

- 1.2.2 The respondent (proprietor) argued that feature 1.4.3 required that the control module (30) could detect each of the three conditions, a short-circuit condition, an open-circuit condition, or a normal condition so that a corresponding indication could be provided on the display as per feature 1.5.2. Document D1 did not disclose that the voltage sensor 176 returned a signal to the sensor 132/controller

circuit 170 that allowed the sensor 132/controller circuit 170 to detect which one of the three conditions existed. Document D1 only taught that sensor 132/controller circuit 170 detected overheating and/or malfunctioning of the heater 146, but there was no teaching that the sensor 132/controller circuit 170 was capable of distinguishing "a short-circuit condition, an open-circuit condition, or a normal condition" based on any signal provided from the voltage sensor 176. In contrast to feature 1.5.2, document D1 did not teach any display means being adapted to indicate which one out of the three conditions determined by the control module (30) existed. Document D1 only taught in paragraph [0056] that the LED unit 134 could be used to generate different visual indications for different "events", such as low battery charge level, heater malfunctioning, etc.

- 1.2.3 The Board judges that features 1.4.3 and 1.5.2, requiring the detection and the display of whether the heating wire is in one of the three conditions: a short-circuit condition, an open-circuit condition and a normal condition, means that the electronic cigarette is capable of detecting and displaying all three conditions depending on the condition of the heating wire as it is the case for the electronic cigarette disclosed in the patent (reference is made in particular to paragraph [0032]). The interpretation made by the appellants is too broad in view of the wording of claim 1 and the disclosure of the invention in the patent as a whole. The language used in paragraphs [0003], [0005] and [0007], referring to the background and the summary of the invention uses the same language or similar language as in claim 1. However, once the skilled person turns to the detailed description of the implementation of the invention,

there is no doubt that the electronic cigarette is to be able to detect and display all three conditions defined in features 1.4.3 and 1.5.2.

Features 1.4.3 and 1.5.2 are not disclosed in D1. Document D1 teaches that sensor 132/controller circuit 170 detects overheating and/or malfunctioning of the heater 146. However, there is no teaching that the sensor 132/controller circuit 170 is capable of detecting and displaying a short-circuit condition and an open-circuit condition.

2. Inventive step starting from D1 in combination with D5.

The subject-matter of claim 1 does not involve an inventive step starting from D1 in combination with D5.

As stated above, the subject-matter of claim 1 differs from D1 in that document D1 does not teach features 1.4.2, 1.4.3 and 1.5.2.

2.1 The respondent (patent proprietor) defined the objective technical problem as providing the user with an electronic cigarette as disclosed in document D1 with a more detailed feedback of a malfunction of the electronic cigarette.

According to the respondent (patent proprietor), the skilled person would not have arrived at the claimed matter of independent claim 1 when starting from document D1 for the following reasons:

2.1.1 The combination of D1 with D5 was based on insight. There was no incentive for the skilled person to implement the detection and the display of the short-circuit and the open-circuit conditions of the atomizer

of D5 into document D1. There was in particular no incentive for the skilled person to use the elements of the circuit in figure 1 of document D1 to measure a resistance of the atomizer/heater based on the acquired terminal voltage. Furthermore D5 was a user manual which did not provide the skilled person with sufficient details as regard to the implementation.

- 2.1.2 D5 did not teach the determination and the display of:
- i- an open circuit condition of the heating wire of the atomizer, and
 - ii- a short circuit condition of the heating wire of the atomizer.

Therefore even if the skilled person would combine the teaching of D1 with the teaching of D5, they would not arrive at the subject-matter of claim 1.

- 2.1.3 i. Page 13 of document D5 did not teach how the absence of the atomizer was determined, e.g. whether the same or a different "mechanism" was used to determine the absence of an atomizer and to determine if an atomizer had a reading higher than 9.9 Ohms. Accordingly, the display of "OP" in the display window 7 did in fact not inform the user on an "open-circuit condition" but indicated either a missing atomizer or an atomizer that had a reading of 9.9 ohms or higher. The user was unable to distinguish the exact error caused from the display "OP" and would have to investigate the exact error caused manually.

The respondent (patent proprietor) noted that document D5 did not use the term "open-circuit" anywhere in the entire document. The skilled person would understand an atomizer to read "open" (page 13) or "open atomizer" (page 16, in connection with error code E7) not to impose or be equivalent to the determination of

whether the heating wire of the atomizer was in an "open-circuit" condition.

It seemed also illogical that "open atomizer" yields an "open circuit" in the atomizer, because the error code E7 (page 16) indicated "Voltage output detected when there should be none", i.e. indicate some power being output, which contradicts there being an "open circuit" within the meaning of the patent.

The skilled person would not understand that the display of "OP" in document D5 yielded an open circuit condition, as the threshold of 9.9 ohms was too low. A resistance of several mega-ohms was expected.

Considering that the normal resistance of an atomizer for use in the electronic cigarette was within the range of 3 ohms, it was not credible that a person skilled in the art would consider a resistance of 9.9 ohms to constitute an "open circuit" as it still meant a significant amount of current flowing through the atomizer (i.e., approx. 33% of the normal current flowing when the atomizer had its normal resistance of 3 ohm). The skilled person would not characterise such amounts of current as a close to "zero current" that would be equivalent to the open circuit.

- 2.1.4 ii. Page 16 of document D5, "E1 - Short Circuit / Shorted Atomizer", did not impose the determination of a short circuit condition of the heating wire of the atomizer. The teaching of document D5 on page 16 stating that "*if this error appears, remove the atomizer and replace with a different one or lower your voltage settings*" clearly and unambiguously taught the skilled person that a current flowing through the atomizer for a given voltage setting was measured. For example, when the resistance of the atomizer was 3 ohms, and the voltage was set to the maximum voltage of

6 V, the maximum current drawn by the atomizer in normal operation (not considering any changes to the resistance due to heating of the atomizer) was 2 A ($I=V/R$). This meant that the electronic cigarette would need to detect a current value of (substantially) more than 2 A to conclude that the resistance of the atomizer approached zero, i.e. an infinite current. The statement that the voltage setting could be lowered to overcome the error yields that the current threshold for detecting the error E1 must be rather low, as a reduction of the voltage to the minimum voltage of 3.3V (see page 9 of document D5) could be suitable for driving the current below the threshold triggering the error E1.

Hence, the error code E1 was in fact not due to the electronic cigarette determining a short circuit of the heating wire in the atomizer within the common meaning of the term "short circuit" as used in the claim language, as otherwise the recommendation on how to react to this error code would not make any sense. The error code E1 factually indicated that the resistance of the atomizer's heating element and the voltage setting were inappropriate for operation of the electronic cigarette (i.e. too low resistance of the atomizer for the voltage setting).

Therefore, the user could not tell from the display of the error code E1 whether the atomizer had an internal short circuit or whether the voltage setting was just too high for the resistance of the atomizer.

- 2.2 The appellants (opponents) argued that a partial problem solution approach was appropriate as the purpose of sending a control signal to the voltage acquisition module was to cause the voltage acquisition module to make a measurement. Its purpose had nothing

to do with the presentation of error conditions on the display.

- 2.2.1 The objective technical problem which feature 1.4.2 solved was how to enable an electronic cigarette such as that disclosed in D1 to select when a voltage measurement took place.

In the field of control electronics, the use of control signals, activation signals, actuation signals, and the like, was ubiquitous. The sending of electronic signals which told various components what to do and when was the foundation of any electronic control system. As a result, the use of a control signal fell well within the bounds of the skilled person's common general knowledge. In seeking to solve the technical problem, the skilled person would immediately know that a control signal could be used in order to enable the electronic cigarette to instruct the voltage sensor 176 to take a reading. As a result, the incorporation of feature 1.4.2 into the device of D1 represented an obvious modification within the meaning of Article 56 EPC.

Furthermore, D1 disclosed at paragraph [0062] that the "voltage sensor 178 may read the internal voltage (i.e. HEATER VOLTAGE) of the heater 146", and paragraph [0060] further confirmed that the integrated sensor 132 / controller circuit 170 may firstly measure a resistance of the heater 146 and secondly monitor whether or not there was a malfunction of the heater 146. From these paragraphs, it was clear that the integrated sensor 132 and/or controller circuit 170 used a resistance measurement to determine whether the heater 146 was malfunctioning, and furthermore, that this resistance measurement was based on measuring the

internal voltage and internal current of the heater 146 (via the voltage sensor 176 and current sensor 178). Even if it could be considered that D1 did not explicitly disclose using the voltage and current measurements to obtain a resistance value (which surely is implied), D1 was nonetheless provided with the means capable of calculating the resistance of the heater 146 via a voltage and current measurement, and thus the skilled person would, even as a matter of design choice, consider utilising the voltage and current measurements that D1 obtains for this purpose.

- 2.2.2 The objective technical problem associated to features 1.4.3 and 1.5.2 was how to provide a user of an electronic cigarette as disclosed in document D1 with more detailed feedback of a malfunction of the electronic cigarette. The respondent (patent proprietor) agreed to this formulation of the problem.

The skilled person was tasked with the provision of providing more detailed feedback about malfunctioning electronic cigarette. It was therefore natural that they would turn to another document relating to an electronic cigarette, in this case D5.

The skilled person was well-aware that a short-circuit condition was an example of a malfunction, which was made all the more evident from the fact that on page 16 of D5, it is referred to as an "error". A missing atomizer is also evidently a malfunction, since it renders the electronic cigarette unusable.

From D5, the skilled person was clearly taught about at least two examples of malfunctions including a short-circuit condition and an open-circuit condition that were communicated to the user using respective error codes on the LED display ("E1" and "OP", respectively).

The device of D1 already included the hardware required to make the requisite measurements to detect the short-circuit and open-circuit conditions. It would therefore be straightforward to modify the device of D1 to incorporate the detection and display of short-circuit and open-circuit conditions.

Regarding the "open-circuit condition", the skilled person understands from the top box on page 13 of D5 that it is possible to detect the absence of an atomizer as a result of a high resistance measurement and that if the resistance is greater than 9.9Ω , the resistance is too high, and therefore should not be used with the ProVari device.

If an atomizer was coupled in which the heating wire was in an open-circuit condition, then it was clear that D5 displayed "OP" on the display to inform the user of this condition. While D5 may display the error code "OP" additionally when an atomizer is not coupled, as per the disclosure of page 13, this does not diminish the fact that "OP" will be displayed in the event there is an open-circuit condition associated with an installed atomizer. The appellants (opponents) noted that the patent itself was unable to distinguish between an open circuit caused, e.g., by a break in a wire connecting to the heating wire, versus an open circuit caused by the absence of the heating wire. In a practical system, to determine whether a measured resistance represented an open-circuit condition, the measured resistance would be compared to a threshold resistance which was set at a suitably high level compared to what one would expect the measured values of the resistances to be. In D5, the value of 9.9 ohms disclosed at page 13 is a value that is seemingly selected for the practical purpose of acting as a resistance that is sufficiently high enough to indicate

the presence of an open-circuit condition compared to resistance values that would typically be expected in a normally functioning electronic cigarette.

An atomizer having a measured resistance of over 9.9 ohms coupled to the ProVari device of D5 would, in theory, not represent an open-circuit condition of the heating element, despite displaying "OP" on the display of the ProVari device. However, the resistance of atomizers for the ProVari were between 1.8 and 3.2 Ohms. The value of 9.9 ohms mentioned at page 13 of D5 can only logically and technically be interpreted as a threshold for determining an open-circuit condition.

Regarding the "short-circuit" condition of the atomizer, page 16 of D5 clearly disclosed the ability to detect and display when the atomizer (and thus the heater) of D5 was in a short-circuit condition such that a user could directly observe a short-circuit condition of the atomizer, with the display of the error "E1".

- 2.3 The Board agrees with the appellants (opponents) that it is appropriate to use partial problems in the present case as there are no synergy between:
- on the one hand features 1.4.3 and 1.5.2 associated with the technical problem of providing the user of the electronic cigarette of D1 with a more detailed feedback of a malfunction of the electronic cigarette; and
 - on the other hand feature 1.4.2 associated with the problem of enabling an electronic cigarette such as that disclosed in D1 to select when a voltage measurement takes place.

- 2.3.1 The electronic cigarette of D5 detects and displays the three conditions defined in features 1.4.3 and 1.5.2. The electronic cigarette of D5 will display:
- "**OP**" when a heating wire in an **open-circuit** condition is inserted in the electronic cigarette of D5,
 - "**E1**", when a heating wire in a **short-circuit** condition is inserted into the electronic cigarette of D5, and
 - the **value of the resistance** when a heating wire in a **normal condition** is inserted.

While "OP" will also be displayed when no atomizer is present, the electronic cigarette of D5 will still detect when a heating wire is in a short-circuit condition. As noted by the appellants (opponents), this situation is similar to the electronic cigarette of the patent which cannot distinguish between a heating wire which is in an open-circuit condition and the absence of a heating wire (see figure 3 of the patent). Furthermore, the display of "OP" when the resistance of the atomizer is above 9,9 ohms, does not diminish the fact that the electronic cigarette of D5 detects and displays "OP" when the heating wire is in an "open-circuit" condition. Claim 1 is not limited to displaying an open-circuit condition, a short-circuit condition and a normal condition, more conditions could be displayed. But in any event, the Board concurs with the appellants (opponents) that when the electronic cigarette displays "OP" when the resistance is above 9,9 Ohms in D5 means in practical terms that the atomizer is in an open-circuit condition. While the Board agrees with the respondent (patent proprietor) that theoretically an open circuit is equivalent to an infinite resistance and that practically a threshold has to be selected above which the atomizer is considered in an open-circuit

condition, the Board is of the opinion that the threshold value of 9,9 ohms in the electronic cigarette of D5 is technically sensible and appropriate. Indeed in these electronic cigarettes, atomizers having a resistance between 1,8 and 3,2 ohms are to be inserted. A threshold which is more than 3 times the highest resistance to be used with the ProVape, ProVari, of D5 for the open-circuit condition is high enough to make the distinction between a "normal" condition and an "open-circuit" condition. The respondent alleged that the resistance increased with temperature, such that the atomizer having a resistance between 1,8 and 3,2 ohms could reach 9,9 ohms when heated. However, they did not provide any evidence.

D5 discloses explicitly the error code "E1" in case of "short Circuit/ Shorted Atomizer". The Board notes the direct and unambiguous disclosure in D5 that an atomizer in a short circuit would be detected and an error E1 would be displayed. Should the display of E1 be due to the voltage settings being too high as alleged by the respondent (proprietor), it does not diminish the fact that the error E1 will be displayed when the atomizer is in a "short-circuit" condition.

Therefore, starting from D1, the skilled person wanting to provide more detailed feedback of a malfunction of the electronic cigarette, would consider the errors unambiguously disclosed in D5 including the open-circuit and the short-circuit conditions.

- 2.3.2 In D1, the electronic circuit having a voltage and a current sensor capable of measuring the voltage and the current intensity at the heating wire, the skilled person will be able to implement the detection of an "open-circuit" and a "short-circuit" condition based on

the voltage measurement used in D1 without any extensive changes to the electronic cigarette of D1. It is indeed a straightforward implementation that does not require any additional electrical components. The other known methods for measuring the atomizer's resistance envisaged by the respondent (proprietor) are more complex, requiring for example a temperature sensor and then correlating the temperature to the specific heater used.

Finally, the purpose of sending a control signal to the voltage acquisition module is to cause the voltage acquisition module to make a measurement. This is a standard way of proceeding in the field of control electronics. While there is no explicit disclosure in D1 and D5, this is a standard procedure, which the skilled person would implement.

3. Auxiliary request 2 - Inventive step

Claim 1 of auxiliary request 2 recites that the electronic cigarette, comprises "an atomizer comprising a heating wire (120);" and "a cartridge" and defines that the "intelligent controller [is] connected to the atomizer".

The parties referred to their submissions made for auxiliary request 1.

The Board concludes that for the same reasons as for auxiliary request 1, the subject-matter of claim 1 of auxiliary request 2 does not involve an inventive step in view of D1 in combination with D5. The added features to claim 1 are present in the electronic cigarette of D1.

4. Admissibility of auxiliary requests 3 and 4 - Article 13(2) RPBA 2020.

The Board considers that no exceptional circumstances justified taking into account auxiliary requests 3 and 4 filed with letter of 27 September 2023 in the appeal proceedings pursuant to Article 13(2) RPBA.

- 4.1 The respondent (proprietor) argued that auxiliary requests 3 and 4 were to be admitted into the procedure since they were faced with new arguments of the Board as regards inventive step in section 6.1.1 of the preliminary opinion. Unlike the appellants (opponents), the Board considered document EV2 to show the common general knowledge of a person skilled in the art proving that "that the resistance of the heater is actually generally below 5 Ohms" and the Board's preliminary conclusion is based on document EV2 in interpreting document D5.

Furthermore, the respondent (patent proprietor) referred to J14/19, in particular point 1.8 which stated that a new combination of factual elements (e.g. the choice of a different citation or a different passage of a citation as the starting point for the assessment of inventive step) and a new combination of factual and legal elements (e.g. the reference to a passage already discussed in a different legal context) constituted a change in the submissions of the appeal.

The respondent (proprietor) argued that if the Board were to rely for their decision on arguments that were first brought forward by the appellants (opponents) during the oral proceedings, it represented exceptional

circumstances that justified the admissibility of auxiliary requests 3 and 4.

The respondent (patent proprietor) finally noted that independent claims 1 and 5 of auxiliary request 3 were combination of claims present in auxiliary request 2 and that auxiliary request 4 only comprised an independent claim 1 which was also a combination of claims of auxiliary request 2. This meant that the appellants (opponents) could have envisaged the amendments, with which they were familiar. Furthermore these amendments overcame all the issues raised and did not give rise to any new objections, contributing thereby to the procedural economy.

- 4.2 The appellants (opponents) argued that auxiliary requests 3 and 4 represented an amendment to the respondent's appeal case made after the notification of a summons to oral proceedings and after the communication of the Board under Article 15(1) RPBA 2020. There were no exceptional circumstances for admitting auxiliary requests 3 and 4. The objection of lack of inventive step starting from D1 in combination with D5 and the issue of the disclosure of the "open-circuit" and "the short-circuit" condition in D5 were raised at the outset of the opposition proceeding with the appellants' notice of opposition.

The appellants (opponents) further argued that the negative preliminary opinion of the Board did not constitute exceptional circumstances for filing auxiliary requests 3 and 4. These requests should have been filed at the latest with their reply to the statement of grounds of appeal.

Furthermore document EV2 was actually not relevant and did not need to be admitted in the proceedings since the respondent did not dispute its content, in particular that the atomizers/cartomizers designated by the manufacturer for use with the ProVari device of document D5 had a resistance below 9.9 ohms.

The appellants (opponents) finally noted that independent claims 1 and 5 of auxiliary request 3 were diverging. Claim 1 specified the intelligent controller and the display module, while claim 5 specified the USB interface.

- 4.3 The Board does not agree that the respondent (patent proprietor) was faced with new arguments as a result of the Board's interpretation of EV2 in the communication. The appellant 2 (opponent 3) submitted EV2 with their statement of grounds of appeal. However, the fact that the atomizer's resistance used in the electronic cigarette ProVape D5 (ProVari) was around 3 ohms, i.e. under 9,9 ohms was not contested by the respondent (patent proprietor). Reference is made to point 2.1.3 d) on page 8 of the letter dated 27 September 2023. Therefore, EV2 did not require to be admitted in the appeal proceedings.

In any case, the Board agrees with the parties that the information provided in EV2 and in particular the atomizer's resistance disclosed are specific to the ProVape of D5 (ProVari).

As argued by the appellants (opponents), the objection of lack of inventive step starting from D1 in combination with D5 and the issue of the disclosure of the "open-circuit" and "the short-circuit" condition in D5 were raised at the outset of the opposition

proceeding with the appellants' notice of opposition. This issue was also considered in the first-instance decision, albeit with a different conclusion. Auxiliary requests 3 and 4 could then have already been filed during the first-instance proceedings and should have been submitted at the latest with the reply to the statement of grounds of appeal together with the other auxiliary requests. Contrary to the respondent (patent proprietor)'s allegation referring to the decision J14/19, the appellants (opponents) refined their existing line of arguments during appeal proceedings and neither the appellants (opponents) nor the Board relied on new facts in the appeal proceedings.

Finally as the appellants (opponents) noted, the independent claims 1 and 5 of auxiliary request 3 are not commensurate, increasing thereby the complexity of the analysis of this request. In particular the assessment of each of the independent claims of auxiliary request 3 increases the complexity of this request which runs counter to the principle of procedural economy.

Order

For these reasons it is decided that:

The decision under appeal is set aside.

The patent is revoked.

The Registrar:

The Chairwoman:



A. Voyé

A. Jimenez

Decision electronically authenticated