Intellectual Property Office

BL O/622/19

15 October 2019

PATENTS ACT 1977

APPLICANT	Nicoventures Holdings Limited
ISSUE	Whether GB1821033.6 complies with Sections 1(1)(b) and 3 of the Patents Act 1977
HEARING OFFICER	Stephen Brown

DECISION

Introduction

1 Patent Application GB1821033.6 was published on 27th March 2019 as GB2566858. It is a Divisional application that takes its priority date of 29th July 2014 from the earlier application GB1413432.4 (GB 2528711).

2 After several rounds of correspondence, the applicant and the examiner are unable to agree whether the application makes the required inventive step or not. The matter thus came before me at a hearing on 17th July 2019.

3 The applicant was represented by Simon Davies of D. Young & Co., via video conference. I would like to thank Mr Davies for his skeleton arguments and I am grateful for his understanding during the hearing which was interrupted by a fire alarm at the IPO. At the hearing I was assisted by Nigel Hanley. The Examiner, Owen Cundy, also attended.

Section 20 – Compliance Date

4 The compliance date for this application was 31st July 2019. I agreed that given that it was unlikely that I would issue my decision immediately after the hearing that I would exercise my discretion to allow the applicant further extensions as required.

The Application

5 The application is for a rechargeable e-cigarette. It concerns limiting the charging time of the battery of the e-cigarette to a predetermined time period in the range of 1-2 hours, such that the battery is fully charged but not over-charged.

6 The most recent claims were filed on 20th May 2019. There is one independent claim, claim 1, which reads:

A rechargeable e-cigarette comprising:

A battery:

A connector which is electrically connectable to an external battery pack: and

A recharging mechanism for re-charging the battery using this external battery pack when the connector is electrically connected to the external battery pack, the recharging mechanism comprising

A charge controller for controlling electrical power flow from the external battery pack to the battery, and a timer wherein:

The timer is configured to start timing when electrical power starts flowing from the external battery pack to the battery and to prevent electrical power flow from the external battery pack to the battery after a predetermined time period has elapsed, wherein the predetermined time period is in the range of 1 to 2 hours and is set so the battery can be charged to its full capacity but avoiding overcharging of the battery.

7 There are two further claims both dependent on claim 1. The first ascribes a temperature cut off function to the charge controller so that charging is stopped if the temperature of the battery is outside of the range 0°C to 60°C. The second specifies that the charge controller prevents charging if the electricity exceeds a predetermined voltage or current threshold. The examiner has maintained throughout that claim 1 does not have an inventive step over the prior art.

The Law

8 Section 1(1) of the Act sets out what is required of a patentable invention:

1(1) A patent may be granted only for an invention in respect of which the following conditions are satisfied, that is to say-

(a) The invention is new;

(b) it involves an inventive step;

……

and references in this Act to a patentable invention shall be construed accordingly.

9 Section 2 of the Act sets out what 'new' means as follows:

2(1) An invention shall be taken to be new if it does not form part of the state of the art.

2(2) The state of the art in the case of an invention shall be taken to comprise all matter (whether a product, a process, information about either, or anything else) which has at any time before the priority date of that invention been made available to the public (whether in the United Kingdom or elsewhere) by written or oral description, by use or in any other way

2(3) The state of the Art in the case on an invention to which an application for a patent or a patent relates shall be taken also to comprise matter contained in an application for another patent which was published on or after the priority date of that invention, if the following conditions are satisfied, that is to say:-

(a) That matter was contained in the application for that other patent both as filed and as published; and

(b) The priority date of that matter is earlier than that of the invention.

10 Section 3 of the Act states that:

An invention shall be taken to involve an inventive step if it is not obvious to a person skilled in the art, having regard to any matter which forms part of the state of the art by virtue only of section 2(2) above (and disregarding section 2(3) above).

11 In addition to statute, the courts have long used the so called *Windsurfing* test to assess issues of inventive step. This test was reformulated by the Court of Appeal in *Pozzoli*[1]. Paragraph 23 of this decision lays out the test as:

(1) (a) Identify the notional "person skilled in the art"

(b) Identify the relevant common general knowledge of that person;

(2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it;

(3) Identify what, if any, differences exist between the matter cited as forming part of the "state of the art" and the inventive concept of the claim or the claim as construed;

(4) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?

[1] Pozzoli Spa v BDMO SA & Anor [2007] EWCA Civ 588

Applying the Pozzoli test

Step 1: Who is the Skilled Person and what is their common general knowledge?

12 Mr Davies argued that the skilled person is a manufacturer of e-cigarettes and would know how they work. They would be well aware of the need to charge the battery in such a device but it would be wrong to suggest that their skill went beyond the use of off the shelf components. Indeed, I note that page 16, lines 10-11, of the description discusses examples of suitable off the shelf components that may be used as part of the claimed invention.

13 Alternatively, the examiner has argued that the skilled person is a designer of E-Cigarettes who has access to a person with knowledge in the field of battery charging, in line with the reasoning in *Tetra Molectric*[2].

14 In the circumstances of this particular case, I do not think that the two views differ significantly. To a great extent they are the same person. What I think is more determinative is what their general knowledge is considered to be. In general, the skilled person needs to know how to design e-cigarettes, including how to suitably recharge their batteries. They will be aware that it takes an amount of time to charge a battery and that it is undesirable to overcharge one.

15 The specification makes reference to a specific "off the shelf" chip, BQ 24040, which may be used to provide the tip charge PCB (1002, Fig 10) or the over-current protection PCB (1000, Fig 10). In response, the examiner has cited a number of documents disclosing this chip, or other similar ones, in addition to a number of datasheets detailing the functions of such chips. He has argued that these are examples of the common general knowledge of the skilled person.

16 Unsurprisingly, Mr Davies disagreed and suggested that, at best, these documents are the state of the art and not common general knowledge. In doing he so he referred explicitly to *Raychem Corp's Patents*[3]. He made the point that these documents are very specific knowledge and cannot be considered to be "at the elbow" of the skilled person. On this point I agree. Thus, I will return to them under step 3, below.

Step 2: Construe the Claim and Identify the Inventive Concept

17 The claim itself presents little difficulty in construction. The key part of the claim is the final clause which states that "the predetermined time period is in the range of 1 to 2 hours and is set so the battery can be charged to its full capacity but avoid overcharging of the battery".

18 Mr Davies pointed out that there is a clear link between the choice of time period and the battery being used. As discussed in the specification, page 15, line 11, to page

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[2] *Tetra Molectric Ltd v Japan Imports Ltd [1976] RPC 547*

[3] *Raychem Corp's Patents [1998] RPC 31*

16, line 15, the intention is to avoid overcharging once the battery has reached full capacity. The inventor has realised that a period of time of between 1 and 2 hours is appropriate for the battery being used in the current invention hence the specified range. When this time is reached the charging is “cut off”. The claim also specifies that the timer is located within the e-cigarette itself and thus not, for example, in the external power source.

19 I identify the inventive concept to be an e-cigarette with a rechargeable battery wherein a timer located within the e-cigarette will “cut off” power after a predetermined time, in the range of 1 to 2 hours, to ensure that the battery is fully charged but not overcharged.

Step 3a: What is the state of the Art?

20 The Examiner cited a total of seven documents, the first of which was WO2014/075369 attributed to JOYETECH. Helpfully, he has identified EP2921064 as a family member which is in English. The examiner has specifically referred to paragraph 0038 of this latter document.

21 JOYETECH is an e-cigarette that has a battery that is charged using a USB interface. As part of the arrangements set out in Fig.1 of the document, a charging management module is located between the device control module and the USB interface. This charging management module may be a BQ 24040 chip. Pin 1 of the chip is connected to the output of the USB interface, pin 10 to the battery and pin 8 to the control module. There is no mention, as far as I can tell, of any timer function.

22 The examiner found two Texas Instruments fact sheets relating to the BQ2404x chip set (D3 and D7 as referred to by the examiner). Between them these documents disclose that pin 4 of the chip may be used to activate a fixed timer in order to provide a “fixed 10 hour safety charger” function. I note that JOYETECH is silent about the use of pin 4 despite explicitly mentioning three other pins.

23 The examiner also cited a paper from ‘Microchip Technology’ (D4) which appears to be an overview of the considerations to be made when charging lithium ion batteries in devices. The most pertinent part is, I believe, the refence on the final page to charge termination methods. According to this paper there are two, an active one based on the state of the battery and a second one based on a redundant timer. However, the paper mentions no particular time period.

24 Finally, the examiner cited an ‘Analog Devices’ factsheet (D5) on the ADP2291 which is a device used to charge a single cell lithium-Ion battery. The key features of this device appear to relate to the charging cycle used and its dependence on the current state of the battery. Reference is made to a timer but it appears to be in connection with the charging modes rather than a safety cut-off timer. I am content to take all of the above documents as the state of the art.

Step 3b: What is the Difference between the inventive concept and the State of the Art?

25 From the above documents I conclude that it is known to have an e-cigarette with a rechargeable battery. It is also known to terminate the charging of such batteries either in response to the state of the battery or after a set time via the use of a timer. Further, it is known for an e-cigarette to contain a chip that contains a “fixed 10 hour safety charger” timer function though actual use of that feature is not explicitly disclosed.

26 What is not present in the state of the art, as identified above, is the detail that a functioning “cut off” timer is located within the e-cigarette itself. Nor can I see any disclosure that the predetermined time can be in the range of 1 to 2 hours in order to ensure that the battery is fully charged but not overcharged.

Step 4: Would these differences be obvious to the skilled person?

27 On balance, I think that it might well be obvious to the skilled person that a functioning “cut off” timer could be located within an e-cigarette. JOYETECH discloses the presence of a BQ24040 chip as a suitable component within an e-cigarette and that chip does include just such a timer function.

28 However, as Mr Davies was keen to point out at the hearing, I learn nothing from JOYETECH beyond that this chip is a suitable component to use as a charging controller. Even if I conclude it would be obvious that pin 4 might be used that would only result in a fixed 10 hour timer, not one in the specified range, nor one chosen such that the given battery is fully charged but not overcharged.

29 At first sight, it may appear easy to argue that changing such a timer is also an obvious step. Especially, so that a given battery is charged for just the right amount of time. However, I fear that this risks depending on hindsight. The most I believe I can safely conclude, based on the documents cited above, is that it may be obvious to have a fixed 10 hour timer, as a ‘safety net’ cut-off so that an e-cigarette battery will not charge forever. I do not think that it would be obvious to also adjust that time to perfectly suit the battery in use. That to my mind is a step too far starting from the state of the art identified above.

30 Another way of looking at this is to consider what problem the current inventor has sought to solve. In my view, it is to ensure that the battery of an e-cigarette is not overcharged. The chosen solution is to limit the charging period based on the particular battery in use using a timer located within the e-cigarette. I do not believe that the uninventive skilled person could start at the state of the art identified above and arrive at this solution.

31 Were the identified state of the art to include the use of battery specific timers in other fields of battery use then my conclusion might well be different, but it does not. As far as the state of the art identified above discloses timers, they are of a long fixed length which is unrelated to the battery being used. On this basis, I conclude that the claims involve the required inventive step.

Decision

32 I have decided that the claims involve the required inventive step and I therefore remit this application to the examiner for further processing.

Stephen Brown

Deputy Director, acting for the Comptroller