



PATENTS ACT 1977

APPLICANT Lenovo (Singapore) Pte. Ltd.

ISSUE Whether application GB1522321.7 complies with
 section 1(2) of the Patents Act 1977

HEARING OFFICER Ben Buchanan

DECISION

Background

- 1 This decision relates to the issue of whether patent application GB1522321.7 (“the application”) meets the requirements of section 1(2) of the Patents Act 1977 (“the Act”).
- 2 The application was filed on 17th December 2015 claiming a priority date of 23rd December 2014 from US patent application 14580679. Despite several rounds of amendment, the applicant has been unable to convince the examiner that the application is not excluded under section 1(2)(c) of the Act, specifically whether the claims define a program for a computer *as such*. The applicant requested a hearing, which took place on 28th November 2019 by telephone. Mr Thomas Leffers of Schweiger and Partners represented the applicant. I was assisted by Mr Jason Scott and the examiner Mr Alan Phipps also attended.
- 3 I would like to thank the examiner for providing a clear and comprehensive summary of the events, correspondence and legal provisions relating to this application in his letter dated 9th October 2019. The specification including the claims, the objections raised by the examiner and the applicant’s previous arguments and observations can all be viewed at the IPO’s online file inspection service IPSUM:

<https://www.ipo.gov.uk/p-ipsium.htm>
- 4 The claims under consideration are those filed on 25th March 2019. The examiner confirmed in his letter dated 9th October 2019 that the only issue for decision is patentability under section 1(2). The application is otherwise in order. I noted at the hearing that the extended compliance period for the application would expire on 23rd December 2019. I explained that I would do my best to issue a decision before then but that I thought it unlikely. In the event that I was unable to meet this timescale I suggested that the applicant should request a further discretionary extension to the compliance period and I note that this was done on 17th December. As I indicated at

the time, I am pleased to exercise Comptroller's discretion to extend the period to 23rd February 2020.

The invention

- 5 The invention lies in processing handwriting strokes to determine candidate input words, spell-checking these and then presenting the results to a user based on combined weighted scores of both the candidate and spell-check processes and providing the top-ranked result as an input to a user application on the device. In other words, the invention determines what a user most likely meant to write by combining analysed input stroke data with a range of predetermined possible intended outputs. This differs from previous systems because the analyses are combined and ranked based on combined confidence scores to improve their reliability (i.e. to more closely match what was intended).

The law

- 6 The relevant law is defined in section 1(2) of the Act and can be viewed online at the IPO's website: <https://www.gov.uk/guidance/the-patent-act-1977>
- 7 The Manual of Patent Practice explains the IPO's practice under the Act and makes helpful references to relevant case law. The Manual can be viewed online at the IPO's website: <https://www.gov.uk/guidance/manual-of-patent-practice-mopp>
- 8 In particular, sections 1.18-1.25.1 and 1.35-1.39.2 are helpful which relate to the *Aerotel/Macrossan*¹ approach to assessing excluded matter and the *AT&T/CVON*² signposts as amended in *HTC v Apple*³ which provide guidance in considering whether a computer program provides a technical contribution.
- 9 There is no dispute concerning the relevant law and its applicability to the facts of this case and I am grateful to Mr Leffers for confirming this position at the hearing.

The Claims

- 10 The claims define a method of converting handwriting strokes into text input for a computer-implemented "user application" (claim 1), an electronic device programmed to carry out the method (claim 7) and a storage device storing executable code for the method (claim 10). Independent claims 1, 7 & 10 define the same inventive concept. As such the claims will stand or fall together and the analysis below applies to all three independent claims:

- 11 Claim 1:

A method, comprising:
receiving, in an overlay handwriting application, one
or more handwriting strokes;
processing the one or more handwriting strokes to

¹ *Aerotel Ltd v Telco Holdings Ltd (and others) and Macrossan's Application* [2006] EWCA Civ 1371

² *AT&T Knowledge Ventures LP and CVON Innovations Limited v Comptroller General of Patents* [2009] EWHC 343

³ *HTC v Apple* [2013] EWCA Civ 451

obtain a plurality of candidate machine input words;
generating, using a spell check application, a list
comprising at least one spell check word for each of the
plurality of candidate machine input words;
ranking the list comprising at least one spell check
word generated by the spell check application according to a
combination of a candidate machine input score and a spell
check confidence score, wherein the spell check confidence
score is based on a number of appearances of a spell check
word in the list;
providing, on a display device, the list comprising at
least one spell check word generated by the spell check
application; and
providing the highest-ranked spell check word from the
list comprising at least one spell check word generated by
the spell check application to a user application as text
input.

12 Claim 7:

An electronic device, comprising:
an input and display device;
a processor; and
a memory device that stores instructions executable by
the processor to:
receive, in an overlay handwriting application, one or
more handwriting strokes;
process the one or more handwriting strokes to obtain a
plurality of candidate machine input words;
generate, using a spell check application, a list
comprising at least one spell check word for each of the
plurality of candidate machine input words;
rank the list comprising at least one spell check word
generated by the spell check application according to a
combination of a candidate machine input score and a spell
check confidence score, wherein the spell check confidence
score is based on a number of appearances of a spell check
word in the list;
provide, on the display device, the list comprising at
least one spell check word generated by the spell check
application; and
provide the highest-ranked spell check word from the
list comprising at least one spell check word generated by
the spell check application to a user application as text
input.

13 Claim 10:

A product, comprising:
a storage device having code stored therewith, the code
being executable by a processor of an electronic device and
comprising:
code that receives, in an overlay handwriting

application, one or more handwriting strokes;
code that processes the one or more handwriting strokes to obtain a plurality of candidate machine input words;
code that generates, using a spell check application, a list comprising at least one spell check word for each of the plurality of candidate machine input words;
code that ranks the list comprising at least one spell check word generated by the spell check application according to a combination of a candidate machine input score and a spell check confidence score, wherein the spell check confidence score is based on a number of appearances of a spell check word in the list;
code that provides, on a display device, the list comprising at least one spell check word generated by the spell check application; and
code that provides the highest-ranked spell check word from the list comprising at least one spell check word generated by the spell check application to a user application as text input.

Argument and analysis

14 I will follow the *Aerotel/Macrossan* four step test approach.

Step 1: Properly construe the claims

15 The examiner believes that the claims are clear and present no difficulties in construing them. Mr Leffers broadly agreed with the examiner's construction but pointed out that the latest claims also include the step of providing the input text to a user application. For the avoidance of doubt I have construed the "overlay handwriting application" as the computer program which receives the *handwritten input* from a user. I have construed the "user application" as any software application which uses *text input* and to which the processed text input is provided by the invention. On this basis I agree that the claims are clear as they stand.

16 I would add that paragraphs [0001], [0002] and [0003] of the description of the application are helpful, for example in clarifying that an "overlay" is a defined portion of a touch-sensitive input device, such as a touch screen display, specifically to detect stroke input locations representative of handwriting using a finger or pen/stylus. The stroke input locations are processed in order to disambiguate whether the user intended, for example, "v" or "u". This handwriting recognition step is an essential feature of the invention but the invention is only concerned with it as far as handwriting strokes are processed to obtain a plurality of candidate machine input words. The claims do not define how the processing works e.g. the steps of optical character recognition (OCR); rather they define how the OCR'd candidate machine input words are subsequently processed according to the invention.

Step 2: Identify the actual or alleged contribution

17 The examiner stated that he considered the handwriting recognition component (producing candidate machine input words) to be conventional and the contribution to lie entirely in the downstream processing. His view of the contribution based on

what he considered the application had added to the sum of human knowledge was: *“receiving handwriting data, processing this to provide candidate machine input words, supplying these to a spell-checker which provides a list of spell-check words for each of the machine input words, ranks the list using both candidate machine input scores and spell-check confidence scores, and displaying this list to the user with the best word highlighted in some way”*.

- 18 Mr Leffers argued that the contribution should be wider to encompass handwriting recognition. To support this, he outlined the general problem to be solved as how to improve a handwriting recognition “engine”. This would mean providing handwriting recognition means which would be easy to implement, safe, and provide more accurate results compared to conventional systems. A secondary line of reasoning further explained that because the actual stroke recognition is not improved (as he openly acknowledged), the invention should be seen in the context of devices with pre-bought and installed handwriting recognition input devices. The problem faced by the user here is with pre-fixed hardware and how to improve the output thereof which is provided as text input to a user application.
- 19 I am therefore faced with the dilemma of how broadly to formulate the contribution. Do I favour the examiner’s narrower approach, or the applicant’s broader interpretation? Does it include the conventional steps of firstly receiving handwriting strokes as user input and processing the data to generate candidate input words and lastly presenting a particular word as text input to a user application?
- 20 Paragraph 43 in *Aerotel/Macrossan* provides some guidance in this regard:
- “43. The second step – identify the contribution - is said to be more problematical. How do you assess the contribution? Mr Birss submits the test is workable – it is an exercise in judgment probably involving the problem said to be solved, how the invention works, what its advantages are. What has the inventor really added to human knowledge perhaps best sums up the exercise. The formulation involves looking at substance not form – which is surely what the legislator intended.”*
- 21 Referring to what has been added to human knowledge, Jacob LJ emphasises that the starting point for assessment is the claims. It may be helpful to consider what makes the invention novel; however, it is then necessary to place that in its proper context and ensure that the effects of the invention are taken into account. It is not correct to eliminate everything in the claim that is known to arrive at that which is unknown, and then to conclude that the unknown part must be the contribution; i.e., as the Court of Appeal in *Genentech*⁴ put it, it is not the case that “an invention is unpatentable if the inventiveness was contributed only by matters excluded under section 1(2)”. This approach – which is sometimes referred to as “Falconer reasoning”, from its originator; or, less formally, “salami-slicing” – was expressly rejected by the Court of Appeal in that decision. In *Lantana*⁵ at paragraph 64, Kitchin LJ set out the importance of considering the proper context of an invention when assessing the contribution, accepting “[a] submission that it is the claim as a whole which must be considered when assessing the contribution which the invention has

⁴ *Genentech* [1989] RPC 205

⁵ *Lantana v Comptroller-General of Patents* [2014] EWCA Civ 1463

made, and that it is not permissible simply to cut the claim into pieces and then consider those pieces separately and without regard to the way they interact with each other”. However, at paragraph 65, Kitchin LJ qualified this by observing: “[n]evertheless, I also have no doubt that, approached in this way, it is the actual contribution to the art which the invention has made which must be considered.”

- 22 I am minded to acknowledge that the invention, as the claims define, provides an improved text input to a (user) software application, based on user-input handwriting strokes. This reflects the problem to be solved set out in paragraph [0017] of the description. Importantly the processing, generating, ranking and providing steps are carried out substantially at the same time as the user-input handwriting strokes are received. A ranked list of spell-check words is presented to a user and a highest-ranked word is provided as text input to an application. If the highest-ranked word is not what the user intended, the user can select an alternative word from the list substantially at the time the user is using the device. This feedback enables the user to use the input device more effectively. I note that claim 7 explicitly defines the input device and display, although it is by implication in that claim that the input device is used for providing handwriting input.
- 23 Mr Leffers also addressed how the invention works and its advantages. He explained that the processing means to provide a candidate machine input word and the spell-checker are integrated. This means the text input is selected from a pre-spellchecked list. This differs from the prior practice of a candidate word being selected then spell-checked as confirmation.
- 24 I did query Mr Leffers at the hearing as to whether the improvement is *better handwriting recognition*. His response was that the invention offers advantages when a better OCR means is not available and then explained that the problem is improving performance in the context of pre-fixed hardware – as he put it, how to provide an improved handwriting recognition engine. On reflection I think another way of looking at the problem is to say that not everybody has neat handwriting. I can foresee that improved stroke detection (better pixel or edge-detection etc. as the examiner exemplified in the hearing) wouldn’t necessarily improve the determination of what a user intended based on what they wrote. Refined detection of poorly formed scribbles using a better OCR means wouldn’t necessarily disambiguate what a user actually meant to provide as input. However, I can see that how the invention works addresses that very problem. Mr Leffers suggested the overall advantage is a more reliable, more accurate, safer handwriting recognition engine.
- 25 Both arguments have their merits, however I find the applicant’s argument more persuasive and warrants a nose-to-tail assessment of the claim to include input and output. I have therefore modified the examiner’s contribution: *Receiving handwriting strokes and processing these to provide candidate machine input words, supplying these to a spell-checker which provides a list of spell-check words for each of the machine input words, ranking the list using both candidate machine input scores and spell-check confidence scores and displaying this list to the user with the best word highlighted in some way, and providing the highest-ranking word as input to a user application.*

- 26 In deciding to identify the contribution broadly I should say that I have paid close attention to the Hearing Officer's reasoning in *Landmark Graphics*⁶. This decision was not discussed at the hearing, but it considers in detail the breadth of both the contribution and the exclusions. In paragraph 27 it concludes that when assessing the contribution for the purposes of section 1(2), one can take a step back from the actual advance and simply identify the field of endeavour...a forensic analysis of the difference between the invention and the prior art might not be necessary when it is clear that the invention is limited to a very specific task or application that is not itself excluded. If that field of endeavour is a technical one then, according to *Halliburton*⁷, there is a reasonable chance of it being a patentable invention under section 1(2).
- 27 On the face of it I am satisfied that the specific task of disambiguating user input, or stepping back, of user interaction whilst controlling a computer, is a technical field of endeavour and so I have formulated the contribution broadly to include the user handwriting input and application text input. I will now consider whether the contribution nonetheless constitutes no more than a program for a computer as such.

Steps 3 & 4: *Ask whether it falls solely within the excluded matter; Check whether the actual or alleged contribution is actually technical in nature*

- 28 In correspondence, the applicant and examiner had made reference to the signposts from *AT&T/CVON* as modified by *HTC v Apple*. At the hearing Mr Leffers accepted that signposts (i) – (iii) provided little succour for his cause and sought to argue that the contribution was technical based on signposts (iv) and (v).
- 29 Regarding signpost (iv), he asserted that the computer became a better computer. Essentially, an “improved handwriting recognition engine” meant that input to the computer was better and therefore a more reliable computer resulted.
- 30 In terms of the fifth signpost, whether a technical problem is solved rather than circumvented, he stressed that combining the processing which produces the candidate machine input word with the spell-checker solved the problem of determining what a user intended, without improved OCR, rather than merely circumventing the problem (which could not necessarily be solved with improved OCR anyway).
- 31 I questioned Mr Leffers as to whether how to provide an improved handwriting recognition engine really is a technical problem. In response, he pointed out that information handling devices are becoming smaller and more portable which often precludes the use of keyboards and mice. Providing different mechanisms for input, for example speech-recognition and handwriting input is therefore a technical problem. Such mechanisms must be reliable and safe. Being able to more accurately recognise the input is therefore a technical solution.
- 32 Whilst this is an interesting point it feels somewhat tangential to the problem at hand. The problem at hand is how to better determine intended text input using an overlay

⁶ Landmark Graphics Corporation BL O/112/18

⁷ *Halliburton Energy Services, Inc. v Smith International (North Sea) Ltd & Ors* [2005] EWHC 1623 (Pat) (21 July 2005)

handwriting application on a computing device. The constraints existent on such a device, at least as far as the application is concerned, are limited to generic touch-sensitive input devices (e.g. a touch screen display). The question is whether the problem is technical and whether it is solved.

- 33 On the one hand, there is no doubt that the invention, whilst essentially including conventional hardware, is implemented by a program for a computer. On the other hand, the field of endeavour is technical. Does the contribution provide a relevant technical effect? Considering signposts (iv) and (v) leads me to agree that user interaction with the computer is improved; in that sense the invention provides a “better computer” and signpost (iv) is met. The problem of improving a handwriting engine without improved OCR is solved. Is it a technical problem? In as much as disambiguating user input and consequently improving the accuracy and reliability of input to a user application is technical, yes.
- 34 I have to confess to some discomfort as to whether using combined ranked and scored machine input and spell-check confidence criteria really is “technical in nature”. My discomfort is eased somewhat because to identify the contribution as such would, I believe, fall into the trap of “Falconer reasoning”. The actual contribution is broader. I have considered the general field of endeavour to be technical; I have consequently formulated the contribution broadly and I have, on balance, concluded signposts (iv) and (v) indicate the affirmative. I have to say that I have done so on the basis, as set out above, that the applicant has made a reasonable case that their invention is patentable, rather than having expelled any doubt altogether. This, too, was considered by the Hearing Officer in *Landmark Graphics* (paragraph 17).
- 35 In considering all the arguments, I have returned to *HTC v Apple* for further guidance in understanding the purpose of signposts (iv) and (v). The first patent in that case is concerned with input and manipulation of data from a touch screen. Paragraphs 56-58 are particularly pertinent to what is happening in the present case. In *HTC v Apple* the input hardware itself was not novel, just as the input device and OCR here is not novel. Rather the technical nature lay in the clever way in which input data could be manipulated to provide an improved application programming interface (API) for programmers. The problem which it addressed - how to deal with the input from a multi-touch device - was essentially technical. I find this helpful guidance when considering how to deal with the input from another form of touch device (i.e. using an overlay handwriting application).
- 36 Kitchin LJ’s comments at paragraph 58 are worth repeating:
- ...a practical benefit of the invention is that it presents a new and improved interface to application programmers, including third party programmers, and makes it easier for them to write application software for the multi-touch device. The device is, in a real practical sense, an improved device. This is not because it now runs different application programs but because it is, as a device, easier for programmers to use. Once again, this emphasises the technical nature of the invention.*
- 37 This, in essence, is the argument put forward by Mr Leffers. Processing of the data received from a standard piece of input hardware makes that input data more

reliable, thereby giving rise to a more effective computer. I note that in *HTC v Apple* the benefit was to the software developer and the cost and complexity of software, whereas at present the advantage is to the user and the accuracy and reliability of input data. Nonetheless, the result is the same; an improved user input device.

- 38 It should probably be said that in *HTC v Apple* the Court paid attention to the fact that the invention was implemented in the application programming interface (API). What I am not sure about is where the present invention is implemented within the relevant device. It is not clear to me from the claims or the description whether the handwriting recognition engine is implemented in the touch-sensitive device driver within the system layer (for example the operating system), or via an API. Mr Leffers did emphasise that the invention is implemented on a single processor as defined in claim 7. I would assume that in order to provide an up to date spell-checker appropriate for the system locale there must be some interaction between the invention, the operating system (i.e. the touch-sensitive device driver) and local libraries (e.g. a dictionary) via APIs. I think, in fact, it does not matter because the contribution applies to all software (user) applications which use the input text and is thus consistent with the reasoning of the Court in *HTC v Apple*, from paragraph 57:

This is a method which concerns the basic internal operation of the device and applies irrespective of the particular application for which the device is being used and the application software which it is running for that purpose.

- 39 Where the present application differs to that considered in *HTC v Apple* is in providing an improved *user* interface as opposed to *programming* interface (API). However, user interaction and control of computers per se is not excluded and I am comfortable that disambiguating user input and providing improved input data to the computer is technical. After all, that is what the multi-touch interface of *HTC v Apple* is used for in operation.
- 40 Having carefully considered the arguments both on file and put forward in the hearing by Mr Leffers, on balance I agree with the applicant. The contribution is technical in nature and the invention is therefore not excluded as a program for a computer as such.

Conclusion

- 41 I find that the claimed invention provides a technical contribution and does not define subject matter excluded from patentability by section 1(2). Consequently I remit the application to the examiner for final preparations to ensure compliance with section 18(3) and grant.

Appeal

- 42 Any appeal must be lodged within 28 days after the date of this decision.

Ben Buchanan
Deputy Director, acting for the Comptroller