Intellectual Property Office

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PATENTS ACT 1977

APPLICANT	Michael Oluwaseun Bamidele
ISSUE	Whether patent application GB1616870.0 meets the requirements of the Act
HEARING OFFICER	H Jones

DECISION

Introduction

1 The application was filed by Mr Bamidele in October 2016. It describes the technical field of the invention as being the use of functional magnetic resonance imaging technology to determine the racial biases of individuals. The application cites the work of Elizabeth Phelps and colleagues at New York University, who discovered a correlation between activity in the anterior cingulate cortex (ACC) and amygdala regions of the brains of individuals when presented with images of black and white faces. The application says that the significance of this work is that brain activity can help ascertain racial biases in all races.

2 Functional magnetic resonance imaging (fMRI) is described in the application as a technique for measuring brain activity by detecting changes in blood oxygenation and flow that occur in response to neural activity. In his letters to the examiner dated 23 January and 18 April 2022, Mr Bamidele states that fMRI is well known in the public domain. At the filing date of the application, it was well known that magnetic resonance imaging (MRI) involves exposing a subject to an extremely strong magnetic field in order to align protons within the water nuclei of the subject's tissue, then disrupting the alignment through the use of radiofrequency energy and measuring the emitted energy when the protons return to their resting alignment. As Mr Bamidele states in his application, functional MRI is the application of MRI technology to measure changes in blood flow caused by neural activity.

The invention

3 The original description explained that the invention adopts a new and unique alternative to fMRI technology to create test results. It describes the invention as a portable monitoring system made up of three parts, namely a testing device, a head-mounted device and a portable monitoring device. The testing device and portable monitoring device can be computers, and all three devices can communicate with each other wirelessly. The testing device is used to present visual or auditory test information to an individual. The head-mounted device comprises receptors/sensors physically touching the human head directly facing the ACC and amygdala regions of an individual's brain. The individual would wear the head-mounted device, be subject to the visual and auditory test from the testing device, and signals from the

receptor/sensors would be transmitted wirelessly to the portable monitoring device. The portable monitoring device would present the measurements is the form of graphs, text, reports, and brain scans, which could be used to make an informed decision about the racial bias of the individual under test. The original claims were broadly consistent with this description of the invention, however, claim 1 made reference to the portable monitoring system adopting "functional magnetic resonance imaging following a number of visual and auditory tests".

4 Mr Bamidele amended the description and claims in response to objections raised by the examiner (amendments filed 19 April 2022). The current form of the description says that the invention adopts a new and unique application of fMRI technology to create test results – this differs from his original description of the invention as adopting a new and unique alternative to such technology. There is also an amended set of claims, with claim 1 and claims 3-12 making no reference to fMRI technology, while claim 2 defines a portable monitoring system adopting fMRI. What Mr Bamidele appears to have done is to split the features of original claim 1 into the current claims 1 and 2, and then renumbered the remaining ten claims (claims 3-12). Claims 1 and 2 are set out below:

> 1. A Portable Monitoring System consisting of a wireless head mounted device, wireless portable monitoring device and wireless testing device for monitoring significant activity in the ACC (anterior cingulate cortex) and Amygdala regions of the brain of the test subject.
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> 2. A Portable Monitoring System adopting functional magnetic resonance imaging following a number of visual and auditory tests (test procedures) executed by the testing device to ascertain the racial biases of individuals or other applications, stimulation input being received by receptors on the head mounted device and being wirelessly transmitted to the portable monitoring device where such stimulation input is converted to test results; such test results corresponding to the test procedures executed at the testing device and such test results taking the form of graphs, brain scans, summary reports and text information.

Issues for decision

5 It is usually the case in applications coming to a hearing that there is a single issue of contention between the applicant and examiner that the hearing officer is required to decide. In this case there are many issues of contention, relating to most (if not all) of the conditions and requirements of the Act that need to be satisfied before a patent may be granted. The examiner considers that the application fails to meet the requirements for sufficiency, inventive step and patentability at the very least. In his pre-hearing report dated 25 May 2022, he says that he can see nothing in the application that is disclosed clearly or completely enough to be performed by a person skilled in the art and that he has deferred completion of the originally truncated search and further examination. The examiner invited Mr Bamidele to present his further arguments to a hearing officer before a decision on whether the application should be refused. Mr Bamidele replied with a request for a decision based on the documents on file.

6 I shall address the objections set out in the detailed examination report dated 25 May 2022 to the extent necessary to resolve the question of whether the application meets the requirements and conditions for grant of a patent.

Sufficiency – section 14(3)

7 The examiner argues that the application does not disclose the facets of the invention related to fMRI clearly or completely enough for a team of skilled persons to be able to make the invention set out in claim 2. The examiner suggests that the reference to fMRI in the context of a portable monitoring system requires the applicant to provide more detail about how this can be achieved given that MRI scanning systems need very strong magnets that are not known for their portability. By way of example, he refers to comments found in US 2001/0282232 (PRADEEP) which suggests the possible use of fMRI instead of EEG in a headset for measuring neural activity and that fMRI systems "are not yet portable but may become portable at some point" (para [0058]). Mr Bamidele's response is to say that fMRI is well known and that the application of such technology to the wireless head-mounted device does not require extensive research – "it will only require proportional scaling of existing technology to achieve the desired wireless head mounted device".

8 I agree with the examiner that a skilled person would require far more detail than is contained in the application in order to realise a portable fMRI system envisaged by claim 2. The task of scaling existing technology to achieve a reasonably portable system, let alone a head-mounted system, would be extremely challenging without further teaching. Mr Bamidele's suggestion that it would be straightforward is fanciful: it may well be an aim of a skilled person to reduce the size, improve the efficiency, lower the manufacturing cost, etc., of devices and systems across all fields of technology, but achieving such aims invariably requires a great deal of effort, ingenuity and good fortune. I consider that Mr Bamidele's application fails to disclose a portable fMRI system in sufficient detail for it to be performed by a person skilled in the art, so fails to satisfy the requirement of section 14(3).

9 Claim 2 is specifically directed to an fMRI system, but the remaining claims are silent as to the particular method used in generating test results. The amended description states that the invention adopts a new and unique application of fMRI technology to create test results. Claims 3, 6, 7 and 8 all refer to this phrase "test results", which must therefore be read and understood in the context of the supporting description, i.e. they define a portable monitoring system (and the various devices within such a system) that adopt fMRI technology to create test results. As I have already found for claim 2, there is insufficient information about the head-mounted (or even a portable) fMRI system in the application to allow a skilled person to perform the invention set out in these claims.

Clarity – section 14(3)

10 Claim 1 defines a portable monitoring system consisting of a wireless head-mounted device, a wireless portable monitoring device and a wireless testing device for monitoring activity in the ACC and amygdala regions of the brain of the test subject. There is no reference to fMRI in the claim, however, we are told in the amended description that the invention relies on such imaging, i.e. it is no longer described as an alternative to fMRI as in the original description. The head-mounted device is described as having receptors physically touching the parts of the human head directly facing the ACC and amygdala regions of the subject's brain, and that these receptors contain sensors for sensing brain activity in those regions. These sensors are said to facilitate the creation of brain maps for the regions emitting the significant brain activity. Sensor data sent wirelessly from the head-mounted device is received by the portable monitoring device and converted into test results.

11 On the one hand we are told that the test results are created by fMRI but then on the other we are told that the results are created from sensor data positioned adjacent the individual's head. This is confusing, and I consider it would create sufficient uncertainty in the mind of the skilled person that it would not be possible to determine whether the invention had been performed or not. The specification does not disclose the invention of claim 1 in a clear enough manner for it to be performed by a person skilled in the art. All claims dependant on claim 1 are therefore equally unclear.

Examiner's other objections

12 The examiner has raised further objections under section 1(1)(b) (obviousness) and section 1(2) (excluded inventions), which I consider to be justified based on a cursory review. There is also a question in my mind whether the specification discloses matter extending beyond that disclosed in the application as filed. However, given my findings above in respect of the requirements of section 14(3), I do not consider it necessary to make a definitive finding with respect to these further requirements in order to resolve the question of whether the application meets the requirements for grant. In my view, it very clearly does not.

Conclusion

13 The specification does not disclose the invention in a manner which is clear enough or complete enough for it to be performed by a person skilled in the art, as is required by section 14(3) of the Act. I therefore refuse the application under section 18(3).

Appeal

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

Huw Jones
Deputy Director, acting for the Comptroller