PATENT COOPERATION TREATY

INTERNATIONAL SEARCHING AUTHORITY

To:
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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) 26 October 2017 (26.10.2017)

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/KR2017/007827

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International Patent Classification (IPC) or both national classification and IPC
G06F 21/32(2013.01)i, G06F 21/45(2013.01)i

Applicant
SAMSUNG ELECTRONICS CO., LTD.

1. This opinion contains indications relating to the following items:

☒ Box No. I  Basis of the opinion
☐ Box No. II  Priority
☐ Box No. III  Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐ Box No. IV  Lack of unity of invention
☒ Box No. V  Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
☐ Box No. VI  Certain documents cited
☐ Box No. VII  Certain defects in the international application
☒ Box No. VIII  Certain observations on the international application

2. FURTHER ACTION
If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

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Date of completion of this opinion
26 October 2017 (26.10.2017)

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Form PCT/ISA/237 (cover sheet) (January 2015)
Box No. 1  Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:

☒ the international application in the language in which it was filed

☐ a translation of the international application into ________________ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

2. ☐ This opinion has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))

3. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established on the basis of a sequence listing:
   a. ☐ forming part of the international application as filed:
      ☐ in the form of an Annex C/ST.25 text file.
      ☐ on paper or in the form of an image file.
   
   b. ☐ furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:
      ☐ in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
      ☐ on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:
1. Statement

| Novelty (N) | Claims | YES |
| Inventive step (IS) | Claims | NONE | NO |
| Industrial applicability (IA) | Claims | 1-21 | YES |

2. Citations and explanations:

Reference is made to the following documents:

2.1 Novelty and Inventive Step

2.1.1 Claims 1-7

2.1.1.1 Claim 1

D1, which is considered to be the closest prior art to the subject matter of claim 1, discloses a method comprising the steps of: irradiating a laser beam to a finger pad; focusing light reflected from a blood vessel layer under skin onto an image sensor plane as laser speckles by using an optical system; determining an amount representing a rate of time variation of the amount of received light at each pixel point in the laser speckles; setting a numerical value concerned as a two-dimensional map to achieve a bloodstream map of the finger pad; and comparing a fingerprint pattern appearing as the bloodstream map with pre-registered personal data for identification (see claim 6 in D1).

Claim 1 differs from D1 in the step of determining at least a first physiological biomarker of blood flow. However, this feature is merely a variation of the feature of D1 that comprises the step of determining a time variation of average bloodstream (see claim 6 in D1).

Accordingly, claim 1 would have been obvious over D1. Therefore, claim 1 is novel under PCT Article 33(2), but lacks an inventive step under PCT Article 33(3).
The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

The expression 'the at least the first physiological biomarker' used in claims 3, 10, 17 is unclear, thereby rendering the definition of the subject matter of said claims unclear (PCT Article 6).

(Note: Referring to the description, it seems to be a typo for 'at least the first physiological biomarker'.)
In case the space in any of the preceding boxes is not sufficient.
Continuation of : Box No. V

2.1.1.2 Claims 2, 5-7

Claims 2, 5-7 are dependent on claim 1.

The additional feature of claim 2 is merely a variation of the feature of D1 that comprises the step of determining the time variation of the average bloodstream (see claim 6 in D1).

The additional features of claims 5-7 can be easily derived from the feature of D1 considering that a waveform, an amplitude, a period or the like of a variation of the bloodstream may be used as a reference for comparison and identification (see paragraph [0039] and figures 1-2 in D1).

Accordingly, claims 2, 5-7 would have been obvious over D1. Therefore, claims 2, 5-7 are novel under PCT Article 33(2), but lack an inventive step under PCT Article 33(3).

2.1.1.3 Claims 3-4

Claims 3-4 are directly or indirectly dependent on claim 1.

The additional features of claims 3-4 differ from D1 in a second sensor, wherein second sensor data is received simultaneously with first sensor data. However, these features are merely variations of the feature of D2 in analogous art that comprises the steps of imaging, on an image sensor as a laser speckle using an optical system, light reflected from retinal blood vessels of an ocular fundus and a blood vessel layer in ocular fundus internal tissue; obtaining an ocular fundus blood flow map; and comparison-checking the blood flow map against pre-registered personal data (see claim 9 in D2).

Accordingly, it would have been obvious to a person skilled in the art to combine D1 and D2, thereby arriving at the claims. Therefore, claims 3-4 are novel under PCT Article 33(2), but lack an inventive step under PCT Article 33(3).
In case the space in any of the preceding boxes is not sufficient.
Continuation of: Previous Page

2.1.2 Claims 8-14

2.1.2.1 Claims 8-9, 12-14

The subject matter of claims 8-9, 12-14 relates to a user device. The features of claims 8-9, 12-14 are substantially the same as those of claims 1-2, 5-7, respectively. Accordingly, claims 8-9, 12-14 would have been obvious over D1. Therefore, claims 8-9, 12-14 are novel under PCT Article 33(2), but lack an inventive step under PCT Article 33(3).

2.1.2.2 Claims 10-11

The subject matter of claims 10-11 relates to a user device. The features of claims 10-11 are substantially the same as those of claims 3-4, respectively. Accordingly, claims 10-11 would have been obvious over a combination of D1 and D2. Therefore, claims 10-11 are novel under PCT Article 33(2), but lack an inventive step under PCT Article 33(3).

2.1.3 Claims 15-21

2.1.3.1 Claims 15-16, 19-21

The subject matter of claims 15-16, 19-21 relates to a computer program product. The features of claims 15-16, 19-21 are substantially the same as those of claims 1-2, 5-7, respectively. Accordingly, claims 15-16, 19-21 would have been obvious over D1. Therefore, claims 15-16, 19-21 are novel under PCT Article 33(2), but lack an inventive step under PCT Article 33(3).

2.1.3.2 Claims 17-18

The subject matter of claims 17-18 relates to a computer program product. The features of claims 17-18 are substantially the same as those of claims 3-4, respectively. Accordingly, claims 17-18 would have been obvious over a combination of D1 and D2. Therefore, claims 17-18 are novel under PCT Article 33(2), but lack an inventive step under PCT Article 33(3).

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2.2 Industrial Applicability

Claims 1-21 are industrially applicable under PCT Article 33(4).