

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

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

To:

see form PCT/ISA/220

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2020/030257

International filing date (day/month/year)
28.04.2020

Priority date (day/month/year)
30.04.2019

International Patent Classification (IPC) or both national classification and IPC
INV. G06F21/55 G06F21/85 H04L29/06

Applicant
CYLANCE INC.

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 usually 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.

Name and mailing address of the ISA:



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Date of completion of this opinion

see form PCT/ISA/210

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Box No. I Basis of the 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:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	<u>1-15</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-15</u>
Industrial applicability (IA)	Yes: Claims	<u>1-15</u>
	No: Claims	

2. Citations and explanations

see separate sheet

1 **Re Item V**

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1.1 Reference is made to the following documents:

Reference is made to the following documents:

- D1 US 2018/270195 A1 (BATHURST DONALD [US] ET AL) 20 September 2018 (2018-09-20)
- D2 US 2007/178914 A1 (MONTENEGRO GABRIEL E [US]) 2 August 2007 (2007-08-02)
- D3 WO 2018/104929 A1 (ARILOU INFORMATION SECURITY TECH LTD [IL]) 14 June 2018 (2018-06-14)
- D4 EP 2 690 827 A2 (BROADCOM CORP [US]) 29 January 2014 (2014-01-29)
- D5 RYAN M GERDES ET AL: "Physical-Layer Identification of Wired Ethernet Devices",
IEEE TRANSACTIONS ON INFORMATION FORENSICS AND SECURITY, IEEE, PISCATAWAY, NJ, US,
vol. 7, no. 4, 1 August 2012 (2012-08-01), pages 1339-1353,
XP011450898,
ISSN: 1556-6013, DOI: 10.1109/TIFS.2012.2197746

1.2 The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of claim 9 is not new.

D1 discloses *a system (security module 150, fig. 3) comprising: a transceiver (transceiver 312 or 316, fig. 3) configured to receive data from a communications bus and generate a plurality of electrical signals representing the data; a fingerprint module (AD sampler 320, fig. 3, for obtaining high-resolution fingerprint of ECUs, see §36) coupled to the transceiver, the fingerprint module configured to receive the plurality of electrical signals and generate a real-time fingerprint of components coupled to the communications bus (see fig.2, showing that the security module interfaces to multiple ECUs and §36 disclosing that a fingerprint is obtained for one or more ECUs); and*

a memory device coupled to the fingerprint module, the memory device configured to store a baseline fingerprint of the components coupled to the communications bus for comparison with the real-time fingerprint (see §§40-42, disclosing that a fingerprint is obtained in imprint mode and stored in memory 306. This fingerprint constitutes the baseline for comparison with a fingerprint taking during the monitoring mode).

- 1.3 The aforementioned reasoning applies correspondingly to independent claim 12, noting that D1, fig. 1 discloses a network comprising several security modules with their respective fingerprinting means constituting a first and second abnormality detection system as claimed. Claim 12 therefore also lacks novelty.
- 1.4 The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of claim 1 is not new.

*D2 discloses A method for implementation by one or more data processors forming one or more computing devices, the method comprising:
concurrently receiving a plurality of electrical signals from a transceiver over a time period, wherein the time period is partitioned into a plurality of sampling windows; (see §§§107-110, in particular §110 indicating that different signals may be received by one transceiver, wherein the signals are sampled over a time period as pictured in fig.3 and detailed in §107)
sequentially selecting an electrical signal of the plurality of electrical signals; (since fingerprints are obtained for each signal, they are sequentially selected)
iteratively capturing, for the sequentially selected electrical signal, a temporal snapshot of said electrical signal over a sampling window of the plurality of sampling windows;
repeating the iteratively capturing for remaining sampling windows of the plurality of sampling windows; (see fig.3 representing a single captured signals and multiple samples thereof that can be said to be iteratively captured) and
temporally concatenating each captured temporal snapshot over the time period according to its respective temporal position of the time period to generate a real-time fingerprint (see page 134, lines 3-6).*

*D3 also discloses A method for implementation by one or more data processors forming one or more computing devices (see p.1, lines 7-11;p.94, lines 9-p.97,l. 18), the method comprising:
concurrently receiving a plurality of electrical signals from a transceiver over a time period, wherein the time period is partitioned into a plurality of sampling windows; (see p.120, line 30 - p.122, line 17)*

sequentially selecting an electrical signal of the plurality of electrical signals; (sample and hold circuit, see p.122, line 12)
iteratively capturing, for the sequentially selected electrical signal, a temporal snapshot of said electrical signal over a sampling window of the plurality of sampling windows;
repeating the iteratively capturing for remaining sampling windows of the plurality of sampling windows; (see fig. 15 and p.127, lines 15-p.129, line 14 : the signal is iteratively sampled into multiple samples that are stored) and temporally concatenating each captured temporal snapshot over the time period according to its respective temporal position of the time period to generate a real-time fingerprint (see fig. 15 aggregator 152a and p.127, lines 15-p.129, line 27, noting in particular that p.129, lines 23-27 makes clear that multiple signals are aggregated whereby these signals may be rising or falling single edges. As this aggregated signal is used for comparison, see fig. 15 step 155 to ascertain whether the signal is suspect, it constitutes a real-time fingerprint as claimed.).

- 1.5 Dependent claims 2-15 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, see documents D1-D3, the passages thereof cited in the ISR and the following observations : D3, fig 5 and D2, §6 discloses setting up firewall/blocking rules depending on a transmitters fingerprint set (claims 2-3,5-6,7) and D3 and fig. 15 and D2, §122 disclose notifying the user (claim 4); D1, §41 also discloses blocking signals identified not to be conform to a stored fingerprint (claims 2-3,5-6,7); D1 §42 discloses issuing a user alert (claim 4) D1 concerns fingerprinting of signals obtained from a CAN bus connecting a security module to Electronic Control Units. D3 is particularly pertinent to claim 14 as it is adapted to fingerprint Ethernet devices, see p.123, lines 8-12, including gigabit Ethernet.