

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**
(PCT Rule 43*bis*.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/EP2018/071021

International filing date (day/month/year)
02.08.2018

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07.08.2017

International Patent Classification (IPC) or both national classification and IPC
INV. G05D1/00

Applicant
NOKIA SOLUTIONS AND NETWORKS OY

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 43*bis*.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 66.1*bis*(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. IV Lack of unity of invention

1. In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has, within the applicable time limit:
- paid additional fees
 - paid additional fees under protest and, where applicable, the protest fee
 - paid additional fees under protest but the applicable protest fee was not paid
 - not paid additional fees
2. This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- complied with
 - not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- all parts.
 - the parts relating to claims Nos.

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	<u>4-17, 20, 22</u>
	No: Claims	<u>1-3, 18, 19, 21</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-22</u>
Industrial applicability (IA)	Yes: Claims	<u>1-22</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

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:

see separate sheet

Reference is made to the following documents; the numbering will be adhered to in the rest of the procedure.

- D1 WO 2013/059513 A1 (RECONROBOTICS INC [US]; JANNSEN MICHAEL D [US]) 25 April 2013 (2013-04-25)
- D2 US 2016/155339 A1 (SAAD EMAD W [US] ET AL) 2 June 2016 (2016-06-02)
- D3 US 2013/289858 A1 (MANGIAT ALAIN ANTHONY [US] ET AL) 31 October 2013 (2013-10-31)
- D4 US 2002/196787 A1 (RAJAN GOVINDA NALLAPPA [NL] ET AL) 26 December 2002 (2002-12-26)
- D5 US 2016/381596 A1 (HU FEI [US] ET AL) 29 December 2016 (2016-12-29)
- D6 WO 2009/146199 A2 (DEKA PRODUCTS LP [US]; US FOUNDATION FOR INSPIRATION [US]; BEAVIS RUSS) 3 December 2009 (2009-12-03)

Ad Item IV

Rule 13.1 PCT

Non-unity

- 1 The set of claims can be split among two different groups. For each of those groups, the problem to be solved is indicated hereunder.

Group 1: claims 1-7, 18, 19 and 21

problem to be solved: controlling different types of unmanned vehicles.

Group 2: claims 8-17, 20 and 22

problem to be solved: saving processing energy of an unmanned vehicle.

- 2 Common features

The common features between **each of the claims of group 1** and **each of the claims of group 2** are either

"a method comprising receiving by an apparatus a first mission control message for sending to a first unmanned vehicle" or

the combination of features of **independent claim 1**.

However, those both combinations of features are known from the prior art (see reasoning under point 5.2).

Therefore **no** common features of **the claims of one group** and the **claims of another group** represents a single inventive general concept.

- 3 It appears that there exists no corresponding technical effect between the groups. Therefore, neither the objective problems corresponding to the claimed subject-matters nor their solutions, which are defined by the special technical features, link one invention to one other so as to form a single general inventive concept.
- 4 Therefore, the present application therefore does not meet the requirements of **Rule 13.1 PCT**.

Ad Item V

Group 1

Independent claims 1, 19 and 21

- 5 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of **independent claims 1, 19 and 21** is not new in the sense of Article 33(2) PCT.
 - 5.1 **D1** is considered as the closest prior art regarding the subject-matter of **independent claim 1**.
 - 5.2 **D1** discloses a method comprising:
 - a) receiving, by an apparatus, a first mission control message for sending to a first unmanned vehicle (**Fig. 2; p. 8, l. 5-6, p. 9, l. 22-23**);
 - b) selecting, by the apparatus, a first control protocol from at least two control protocols (**Fig. 2: the protocol used between "Robot 1" and "Robot Control Radio"; p. 9, l. 23-29**)
 - c) for sending the first mission control message to the first unmanned vehicle (**p. 9, l. 23-29**)

d) in dependence on a determined capability of the first unmanned vehicle (*p. 9, l. 23 - p. 10, l. 3 : it has been determined in both cases which control protocol a robot is capable of*); and

e) sending, by the apparatus, the first mission control message to the first unmanned vehicle using the selected control protocol (*p. 9, l. 23-29*).

5.3 Thus, the combination of features of **independent claim 1** is already disclosed in **D1**.

Therefore, the subject-matter of **independent claim 1** is **not new** in view of **D1**.

5.4 **D2** ([0015], [0071]-[0073], claim 13) is also novelty-destroying regarding the subject-matter of **independent claim 1**.

5.5 The previous objections apply, mutatis mutandis, to the subject-matter of **claims 19** and **21**.

Therefore, the subject-matter of **claims 19** and **21** is **not new** in view of each of **D1** and **D2**.

Dependent claims 2-7

6 **Dependent claims 2-7** do **not** appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT with respect to **novelty** and/or **inventive step**.

6.1 The combination of the characteristics of **independent claim 1** and the additional characteristics of **claims 2 and 3** is disclosed in **D1** (Fig. 2; p. 9, l. 23 - p. 10, l. 3) and in **D2** ([0071]-[0073]).

Therefore, the subject-matter of **claims 2 and 3** is **not new** in view of each of **D1** and **D2**.

6.2 In **claims 4-7**, a slight constructional change is suggested which comes within the scope of the customary practice followed by persons skilled in the art.

Therefore, the subject-matter of **claim 4-7** does not involve an inventive step, in view of each of **D1** and **D2**, combined with the knowledge of **the skilled person**.

Group 2

Independent claims 20 and 22

- 7 Notwithstanding the clarity objection under point 14, the present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of **independent claim 22** does not involve an inventive step in the sense of Article 33(3) PCT.
- 7.1 **D4** is considered as the closest prior art regarding the subject-matter of **independent claim 22**.
- 7.2 **D4** discloses a computer program comprising computer executable instructions, which when executed by a computer, cause the computer to perform (*implicit, see steps hereunder*)
- a) to receive at least first and second mission control messages **1i, 1j, 1k** for sending to a network node (**[0014]**);
 - b) to determine whether or not the at least first and second of mission control messages are a type of message that can be concatenated into a single packet (**Fig. 4; [0015]**);
 - c) when it is determined that the at least first and second mission control messages are a type of message that can be concatenated into a single packet, to concatenate said at least first and second mission control messages into at least one packet (**Fig. 4; [0015]**); and
 - d) to transmit the at least one packet to a network node (**Fig. 4, step 430**) from which the subject-matter of **independent claim 22** differs only in that
 - e) the network node is an unmanned vehicle.
- 7.3 However, the use of unmanned vehicles as part of a network is widely known in the present technical field (see for example **D1** and **D5**). The skilled person would therefore consider using the method of **D4** in such network, thereby realising the method of **independent claim 22**.
- For that reason, the subject-matter of **independent claim 22** lacks an inventive step, in view of **D4** combined with the knowledge of the skilled person.
- 7.4 The previous objection applies, mutatis mutandis, to the subject-matter of **independent claim 20**.
- Therefore, the subject-matter of **independent claim 20** lacks an inventive step, in view of **D4** combined with the knowledge of the skilled person.

Dependent claims 8-17

8 **Dependent claims 8-17** do **not** appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT with respect to **inventive step**.

8.1 The subject-matter of **claims 8** and **16** lacks an inventive step, in view of **D1** combined with **D4** (following a similar reasoning as under point 7).

8.2 The combination of the characteristics a) - d) of **claim 8** and the additional characteristics of **claims 9-12** and **14** is disclosed in **D4** (Fig. 2, 4, [0015], [0016]: it is implicit that multiple packets can be created because there is a maximum packet size).

Following a similar reasoning as under previous point, the subject-matter of **claims 9-12** and **14** lacks an inventive step, in view of **D1** combined with **D4**.

8.3 In **claims 13, 15 and 17**, a slight constructional change is suggested which comes within the scope of the customary practice followed by persons skilled in the art.

Therefore, the subject-matter of **claims 13, 15 and 17** lacks an inventive step, in view of **D1** combined with **D4**.

Ad Item VII

9 The independent claims are not properly cast in the **two part form**, with those features which in combination are disclosed by **D1** (respectively **D4**) being placed in the preamble (Rule 6.3(b) PCT).

10 The features of claims are not provided with **reference signs** placed in parentheses (Rule 6.2(b) PCT).

11 The provisions of Rule 5.1(a)(iii) PCT require that the description shall disclose how the invention can be understood as the solution to a technical problem; indeed, the inventive step may be considered as a step from the **technical problem** to its **solution**; the Applicant is therefore invited to mention the document **D1** (respectively **D4**) in the description, to briefly discuss the relevant background art disclosed therein and to identify the technical problem to be solved.

12 If, therefore, the requirements of the above rule are neither satisfied by the original description, nor, after request, by the amendment, it will emerge that an invention within the meaning of Article 33 PCT does not exist.

- 13 **D3, D5** and **D6** are cited as relevant background art that might be of relevance later in the procedure.

Ad Item VIII

- 14 The application does not meet the requirements of Article 6 PCT, because **claims 8, 18, 20** and **22** are not clear. The reasons are the following.

- 14.1 The expression

 "the first unmanned vehicle" of **claims 8, 20** and **22**

 lacks an antecedent basis in each of those claims.

- 14.2 It is unclear what the expression

 "first and second volumes of the first unmanned vehicle" in **claim 18**

 represents. In the technical field of unmanned vehicles, the expressions "first volume(s)" and/or "second volume(s)" of a vehicle do not have a widely recognised meaning.