

# 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/RO2015/000002

International filing date (day/month/year)  
22.01.2015

Priority date (day/month/year)  
23.01.2014

International Patent Classification (IPC) or both national classification and IPC  
INV. G01V5/00

Applicant  
TUDOR MIRCEA

**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:



European Patent Office  
P.B. 5818 Patentlaan 2  
NL-2280 HV Rijswijk - Pays Bas  
Tel. +31 70 340 - 2040  
Fax: +31 70 340 - 3016


Date of completion of this opinion

see form  
PCT/ISA/210

Authorized Officer

Van Ouytsel, Krist'l

Telephone No. +31 70 340-0



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**Box No. I Basis of the opinion**

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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:

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**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

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The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

the entire international application

claims Nos. 10-12

because:

the said international application, or the said claims Nos. relate to the following subject matter which does not require an international search (*specify*):

the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed (*specify*):

no international search report has been established for the whole application or for said claims Nos. 10-12

a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.

furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.

pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13ter.1(a) or (b).

See Supplemental Box for further details

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**Box No. IV Lack of unity of invention**

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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. 1-9, 13, 14

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**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**

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1. Statement

Novelty (N)	Yes: Claims	<u>1-9, 13, 14</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>1-9</u>
	No: Claims	<u>13, 14</u>
Industrial applicability (IA)	Yes: Claims	<u>1-9, 13, 14</u>
	No: Claims	

2. Citations and explanations

**see separate sheet**

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**Box No. VIII Certain observations on the international application**

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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**

- D1 CN 103 529 480 A (UNIV TSINGHUA; NUCTECH CO LTD) 22 January 2014 (2014-01-22)
- D2 WO 2006/036076 A1 (S C MB TELECOM LTD S R L [RO]; TUDOR MIRCEA [RO]; SIMA CONSTANTIN [RO]) 6 April 2006 (2006-04-06)
- D3 US 2007/237294 A1 (HOFF PAUL W [US] ET AL) 11 October 2007 (2007-10-11)
- D4 US 2011/103548 A1 (BENDAHAN JOSEPH [US]) 5 May 2011 (2011-05-05)
- D5 WO 2005/084351 A2 (VARIAN MED SYS TECH INC [US]; CLAYTON JAMES E [US]; BJORKHOLM PAUL [US]) 15 September 2005 (2005-09-15)
- D6 US 2011/026673 A1 (MASTRONARDI RICHARD [US] ET AL) 3 February 2011 (2011-02-03)

#### **Item IV**

##### Non-unity

This Authority considers that the application does not meet the requirements of unity of invention and that there are 2 inventions covered by the claims indicated as follows:

Invention 1: claims: 1-9, 13, 14

mobile scanner unit and method for non-intrusive inspection of an aircraft, wherein an aircraft is towed passed two scanning frames for inspection in two directions, using two radiation sources and two detector arrays in different locations;

Invention 2: claims: 10-12

modular detector line for placing at ground level and configured to discharge load of an aircraft to the housing.

The reasons for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows:

Two prior art documents have been identified: D1 (CN103529480) and D3 (US2007/0237294). D1 discloses a slidable source or multiple sources on top of a frame and a detector line in the floor to inspect an aircraft. D3 discloses two gamma

ray sources irradiating a container truck from the top and from a side and two detector arrays one on or below ground opposite the top source and one on a side opposite the side source.

It follows that the following technical features of claims 1 and 10 make a contribution over the prior art and can be considered as a special technical feature within the meaning of Rule 13.2 PCT:

Claim 1: mobile scanner unit and control centre having a mechanical boom system with a source and hinged boom system with detector array and a relocatable radiation source for scanning from two directions;

claim 10: structure of the detector array housing to discharge load supplied by an aircraft.

The problem solved by these special technical features can therefore be construed as:

Invention 1: how to provide an accurate scan of the entire aircraft;

Invention 2: how to prevent damage to the housing of the detector line on the ground.

Also, examining the possible correspondence by technical effect, one finds that the technical effect of the first invention is to provide accurate scanning of all parts of an aircraft at high throughput;

and that the technical effect of the second invention is to provide a robust housing for a detector.

This appears to show lack of corresponding technical effect as well. Consequently, neither the objective problem underlying the subjects of the claimed inventions, nor their solutions defined by the special technical features allow for a relationship to be established between the said inventions, which involves a single general inventive concept.

In conclusion, the groups of claims are not linked by common or corresponding special technical features and define 2 different inventions not linked by a single general inventive concept.

The application, hence does not meet the requirements of unity of invention as defined in Rules 13.1 and 13.2 PCT.

## **Item V**

1. Independent system claim 1 is neither known from, nor rendered obvious by, the available prior art.

1.1 Document D1 (fig.s 2-4) e.g. discloses a scanning housing with one slidable penetrating radiation source or a plurality of radiation sources on the roof thereof and a corresponding detector line in a trench in the floor. An aircraft moves through the scanning system.

Document D1, however does not mention nor hint at scanning from two directions and does not disclose scanning from the side, nor the tugging device or a system of booms and mobile scanner unit and center.

The skilled man would be required to take a large number of steps to add a second scanning system to that of D1 and would have to replace the fixed frame system with a mobile scanning unit with extendable booms to solve the problem of mobility and scanning from different directions in order to provide more accurate inspection of the whole of the aircraft.

This is considered to require an inventive step and therefore not obvious in the light of the cited and consulted prior art.

1.2 Document D3 (fig.6, par.s [91-94]) discloses two orthogonal gamma or x-ray scanning systems comprising two fixed sources on a fixed portal, one detector array mounted on one side of the portal and one detector array mounted in the ground.

The skilled man would not immediately be led to replace the portal with a mobile scanning unit with a structure of two booms with a source and detector and one relocatable source and a tugging device as claimed in claim 1.

Claim 1 is thus considered to be novel and inventive and fulfills the requirements of Art.s 33(1-4) PCT.

1.3 Dependent system claims 2-9, therefore are also seen to fulfill the requirements of Art.s 33(1-4) PCT.

## 2. Claim 13

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 13 and 14 does not involve an inventive step in the sense of Article 33(3) PCT.

2.1 Document D1 (fig.s 2-4) discloses a method for nonintrusive inspection of an aircraft,

positioning, moving through two scanning frames (116,1161,1162,1163), analysing and displaying data (111,112) from at least two perspectives.

The subject-matter differs from this known prior art scanning method in that a mobile tugging device is connected to and disconnected from the aircraft to position it.



Simply manoeuvring the plane or using a tugging device is of course known in the field and practised on a daily basis at airports; connecting and disconnecting a tugging device can therefore not be seen to bear any inventive measure.

The claim further differs in that the positioning is synchronized with the start of radiation sources and the transmission of the signals from the detector array and in the stopping criteria of the scanning method.

These steps are of course well known in the art. See e.g. document D2 (fig.s 1-3,8,10,11) which discloses an autonomous mobile scanning unit with remote control outside a perimeter area and the stopping scanning criteria of step d) (i-iii) (p.2, lines 19-41). A speed and steering control unit (10) is also disclosed (p.6, lines 36-41) so that step d) iv) is also seen to obvious.

It is remarked that the skilled man would immediately combine these two documents and use the mobile system of D2 also for inspection of aircrafts, since the perimeter control method is, in essence, not limited in size.

2.2 The automated control of dependent method claim 14 is also known from D2 (p. 2, lines 19-41).

### **Item VIII**

3. The application does not meet the requirements of Article 6 PCT, because claim 1 is not clear.

#### 3.1 Claim 1

In particular, the wording "the boom is positioned on top of the inspected aircraft" leads to believe that the boom is in contact with the aircraft.

The applicant is requested to verify whether this is meant.

#### 3.2 Claims 10 and 13

The independent claims refer to features, e.g. "**The** modular detector line", "**the** mobile tugging device", not claimed before in the claim, only in claim 1.

#### 3.3 Claim 13

Method claim 13 is not entirely in line with system claim 1. The location of the sources and detectors could be next to each other and therefore does not preclude scanning from two different perspectives alongside of each other, whereas it is clear from claim 1 that one scan is vertical and the other from a side. Claim 13, therefore, seems to imply a wider scope.

The position of the sources and detectors is deemed to be essential to the invention.