

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

# PCT

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

To:

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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/EP2018/067570

International filing date (day/month/year)  
29.06.2018

Priority date (day/month/year)  
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International Patent Classification (IPC) or both national classification and IPC  
INV. B64C39/02 B64D47/08 ADD. F16M11/20 G05D1/00 B64C25/02 B64C25/32

Applicant  
SWARM SYSTEMS LIMITED

**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:



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0  
Fax: +49 89 2399 - 4465


Date of completion of this opinion

see form PCT/ISA/210

Authorized Officer

Lambert, Brice

Telephone No. +49 89 2399-0



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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. 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>10, 11, 13</u>
	No: Claims	<u>1-9, 12, 14-19</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-19</u>
Industrial applicability (IA)	Yes: Claims	<u>1-19</u>
	No: Claims	

2. Citations and explanations

see separate sheet

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**Box No. VII Certain defects in the international application**

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

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

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:

D1 WO 2010/058195 A1 (BAE SYSTEMS PLC [GB]; SALKELD GEOFFREY [GB]) 27 May 2010 (2010-05-27)

D2 CN 106 697 275 A (XU ZHIYONG) 24 May 2017 (2017-05-24)

D3 US 2017/166326 A1 (APKARIAN JACOB [CA]) 15 June 2017 (2017-06-15)

D4 WO 2017/042354 A1 (ECOLE POLYTECHNIQUE FED DE LAUSANNE [CH]) 16 March 2017 (2017-03-16)

D5 WO 2012/130856 A1 (INST SUPERIEUR DE L AERONAUTIQUE ET DE L ESPACE [FR]; MOSCHETTA JEAN-M) 4 October 2012 (2012-10-04)

1.2 The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of claim 1 is not new.

D1 discloses (pages 3, 13 and 14, Fig. 1):

A hovering air vehicle (HAV) (10) comprising a main body (12, 14) with a plurality of actuators (18) each with a rotor (20), at least one payload unit (30) on a gimbal (tilt motor (26) swivels the arm (28)), the main body is connected by a rotating element (page 14, second paragraph, the support structure (32) is connected to the base of the body (14) via ball bearings) to an undercarriage (32), the HAV is operable when perched such that when at least one of the rotors is spun up, the main body of the HAV pans (page 13, second paragraph).

1.3 The subject-matter of independent claim 1 is as well not new over the disclosure of documents:

1.3.1 D2 (paragraphs 23-30, Fig. 1) which discloses a HAV with a main body (1), multiple rotors (4), a rotating camera (17) and an undercarriage (wheels (10)) that permits the HAV to rotate about its vertical axis when on ground by controlling the multiple rotors (4),

- 1.3.2 D3 (paragraphs 29-57, Fig. 1, 5 and 10) which discloses a HAV (100) with a main body (104), multiple rotors (118), a camera (114) on a gimbal (Fig. 10) and an undercarriage (108) in form of a sphere that permits the HAV to rotate about its vertical axis when on ground by controlling the multiple rotors (118), and
- 1.3.3 D4 (pages 7-12, Fig. 1-6) which discloses a HAV (1500) with a main body (104), multiple rotors (1502), a payload (1504) on a gimbal (1510) and an undercarriage (1508) in form of a sphere that permits the HAV to rotate about its vertical axis when on ground by controlling the multiple rotors (1502).
- 1.4 The subject-matter of independent claim 1 does not involve an inventive step over the disclosure of document D5 (page 5, line 20 - page 10, line 10, Fig. 1-9) which discloses a drone (16) with a main body (40), rotors (23, 24), a camera in the fuselage (17) and an undercarriage (39) that permits the drone to roll on the ground and by controlling the rotors to act on the yaw axis to engage a panning motion of the camera. The feature according to which the camera is installed via a gimbal on the fuselage is well known and merely one of several straightforward possibilities which the skilled person would select, depending on the circumstances, without exercising inventive skill.
- 1.5 Dependent claims 2-19 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:
- 1.5.1 Claim 2: D1, page 14, second paragraph, the support structure (32) is connected to the base of the body (14) via ball bearings
- 1.5.2 Claim 3: D3, paragraph 54, Fig. 5, brakes (2641, 2642, 2643, 2644)
- 1.5.3 Claims 4-8: D1, pages 6-8, UAV control unit (24). D2, Fig. 3. D3, controller (260)
- 1.5.4 Claim 9: D1, Fig. 1
- 1.5.5 Claims 10 and 11: The feature related to which type of payload is installed on the vehicle is merely one of several straightforward possibilities which the skilled person would select, depending on the circumstances, without exercising inventive skill.
- 1.5.6 Claim 12: D1, Fig. 1, UAV (10) is a vertical take-off and landing device. D2, Fig. 1. D3, Fig. 1.

- 1.5.7 Claim 13: The features related to the weight of the vehicle is a design wish which the skilled person would select, depending on the circumstances, without exercising inventive skill.
- 1.5.8 Claim 14: D1, page 13, second paragraph, the pan function is provided by the yaw control of the UAV (10) which can rotate 360 degrees about its vertical axis.
- 1.5.9 Claims 15 and 16: The vehicles disclosed in D1-D5 have an efficient panning motion with respect to visual/audio signature and quality of the captured image. See as well objection in paragraph 3.4 below.
- 1.5.10 Claim 17: D3, paragraphs 52 and 53, Fig. 5 and 10, controller (260) controls the movement of both the undercarriage (108) and the camera orientation on sensor assembly (112)
- 1.5.11 Claim 18: D1, Fig. 1. D2, Fig. 1.
- 1.5.12 Claim 19: D1, page 6, last sentence of second paragraph.

**2 Re Item VII**

**Certain defects in the international application**

- 2.1 Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).
- 2.2 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
- 2.3 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in D1-D3 is not mentioned in the description, nor are these documents identified therein.

**3 Re Item VIII**

**Certain observations on the international application**

- 3.1 It is not clear in claim 1 if the payload with the gimbal is only part of the HAV or if the payload unit is attached to the main body via the gimbal.
- 3.2 The use of the relative term "simple" in claim 4 does not provide any limitation to the subject-matter of said claim.

- 3.3 The axes introduced in claim 9 are not defined (e.g. axis of symmetry, axis of rotation ...) and the term "upwards" does not permit to determine the relationship between those axes.
- 3.4 Claims 15 and 16 attempt to define the subject-matter in terms of the result to be achieved, which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result. In addition, the use of relative terms "low" and "minimal" do not provide any limitation to the subject-matter of said claims.