

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference SCJ-021.25	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2010/051779	International filing date (<i>day/month/year</i>) 07 OCTOBER 2010 (07.10.2010)	(Earliest) Priority Date (<i>day/month/year</i>) 09 OCTOBER 2009 (09.10.2009)
Applicant SKYCROSS, INC. et al		

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out 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))

- b. This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).
c. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. **Certain claims were found unsearchable** (See Box No. II)

3. **Unity of invention is lacking** (See Box No. III)

4. With regard to the **title**,

- the text is approved as submitted by the applicant.
 the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- the text is approved as submitted by the applicant.
 the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 1A
 as suggested by the applicant.
 as selected by this Authority, because the applicant failed to suggest a figure.
 as selected by this Authority, because this figure better characterizes the invention.
b. none of the figure is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/051779**A. CLASSIFICATION OF SUBJECT MATTER***H01Q 1/52(2006.01)i, H01Q 1/48(2006.01)i*

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H01Q 1/52; H01Q 9/16; H01Q 21/12; H01Q 1/38; H01Q 13/10; H01Q 9/04

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: antenna, pcb, board, multi, ground, counterpoise, isolation

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 2007-0139276 A1 (SVIGELJ, JOHN A. et al.) 21 June 2007 See the abstract; figures 1-3; paragraphs 18-34; and claims 1-18	1, 3, 4, 12, 14, 15 2, 5-11, 13, 16-27
X A	US 2008-0012778 A1 (MITSUI, TSUTOMU et al.) 17 January 2008 See the abstract; figures 1-8; paragraphs 21-52; and claims 1-18	1, 3, 4, 12, 14, 15 2, 5-11, 13, 16-27
A	US 2009-0153423 A1 (DINALLO, CARLO et al.) 18 June 2009 See the abstract; figures 2-9; paragraphs 21-56; and claims 1-15	1-27
A	US 2008-0252538 A1 (YING, ZHINONG) 16 October 2008 See the abstract; figures 2-7; paragraphs 39-60; and claims 1-15	1-27

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

03 JUNE 2011 (03.06.2011)

Date of mailing of the international search report

10 JUNE 2011 (10.06.2011)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 189 Cheongsu-ro,
Seo-gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

Kim Jeong Seok

Telephone No. 82-42-481-8481



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2010/051779

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007-0139276 A1	21.06.2007	EP 1969672 A2	17.09.2008
		KR 10-2008-0081174 A	08.09.2008
		US 7498987 B2	03.03.2009
		WO 2007-076215 A2	05.07.2007
		WO 2007-076215 A3	09.10.2008
		WO 2007-076215 A3	05.07.2007
US 2008-0012778 A1	17.01.2008	JP 2008-022123 A	31.01.2008
		KR 10-0837408 B1	12.06.2008
		US 7683841 B2	23.03.2010
US 2009-0153423 A1	18.06.2009	WO 2009-076261 A1	18.06.2009
US 2008-0252538 A1	16.10.2008	AT 405967 T	15.09.2008
		CN 101116221 A0	30.01.2008
		DE 602004016012 D1	02.10.2008
		EP 1670093 A1	14.06.2006
		EP 1670093 B1	20.08.2008
		US 7808437 B2	05.10.2010
		WO 2006-061352 A1	15.06.2006

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
VALLABH RAJESH

FOLEY HOAG LLP 155 SEAPORT BOULEVARD
BOSTON MA 02210-2600 USA

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year) **10 JUNE 2011 (10.06.2011)**

Applicant's or agent's file reference
SCJ-021.25

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date (day/month/year)	Priority date(day/month/year)
PCT/US2010/051779	07 OCTOBER 2010 (07.10.2010)	09 OCTOBER 2009 (09.10.2009)

International Patent Classification (IPC) or both national classification and IPC

H01Q 1/52(2006.01)i, H01Q 1/48(2006.01)i

Applicant

SKYCROSS, INC. et al

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 or 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.

3. For further details, see notes to Form PCT/ISA/220.

<p>Name and mailing address of the ISA/KR Korean Intellectual Property Office Government Complex-Daejeon, 189 Cheongs-ro, Seo-gu, Daejeon 302- 701, Republic of Korea Facsimile No. 82-42-472-7140</p>	<p>Date of completion of this opinion 03 JUNE 2011 (03.06.2011)</p>	<p>Authorized officer Kim Jeong Seok Telephone No.82-42-481-8481</p> 
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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2010/051779

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 43*bis*.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. a sequence listing filed or furnished

- on paper
- in electronic form

b. time of filing or furnishing

- contained in the international application as filed.
- filed together with the international application in electronic form.
- furnished subsequently to this Authority for the purposes of search.

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 in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2010/051779

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

I. Statement

Novelty (N)	Claims	<u>1-27</u>	YES
	Claims	<u>NONE</u>	NO
Inventive step (IS)	Claims	<u>2,5-11,13,16-27</u>	YES
	Claims	<u>1,3-4,12,14-15</u>	NO
Industrial applicability (IA)	Claims	<u>1-27</u>	YES
	Claims	<u>NONE</u>	NO

2. Citations and explanations :

1. Prior Art

Reference is made to the following documents:

D1 : US 2007-0139276 A1 (SVIGELJ, JOHN A. et al.) 21 June 2007

D2 : US 2008-0012778 A1 (MITSUI, TSUTOMU et al.) 17 January 2008

D1 discloses a small antenna comprising: a first antenna element, a second antenna element, a ground plane and a dielectric substrate.

D2 discloses an antenna device comprising: a circuit board, a first antenna element, a second antenna element and a feeding terminal.

2. Novelty and Inventive Step (PCT Articles 33(2) and 33(3))

2.1. Claims 1-15

Document D1 is regarded as the closest prior art to the subject matter of claim 1. A printed circuit board, a first antenna, a second antenna and a ground plane of claim 1 correspond respectively to the dielectric substrate, the first antenna element, the second antenna element and the ground plane of D1. D1 does not disclose that the second antenna is configured to minimize coupling to the ground plane to increase isolation between the first antenna and the second antenna. However, D1 discloses the isolation between the first antenna element and the second antenna element, a person skilled in the art would easily conceive the idea of minimizing the coupling to the ground plane to increase the isolation between antenna elements. Therefore, the subject matter of claim 1 cannot be considered as involving an inventive step under PCT Article 33(3).

Claims 3, 4, 12, 14, 15 are dependent on claim 1 of the present application. The additional features of claims 3, 4, 12, 14, 15 can be anticipated by document D1 or come within the scope of the customary practice followed by a person skilled in the art. Therefore, the subject matter of claims 3, 4, 12, 14, 15 cannot be considered as involving an inventive step under PCT Article 33(3).

Claims 2, 5-11, 13 are dependent on claim 1 of the present application. None of D1 and D2 disclose the additional features of claims 2, 5-11, 13. Accordingly, it would not have been obvious to a person skilled in the art to apply the knowledge of these documents individually or in combination in order to create the antenna system of claims 2, 5-11, 13. Therefore, the subject matter of claims 2, 5-11, 13 is considered to be novel and to involve an inventive step under PCT Article 33(2) and (3).

(Continued on the Supplemental Box.)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2010/051779

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of :

(Box No. V)

2.2. Claims 16-27

Document D1 is regarded as the closest prior art to the subject matter of claim 16. However, None of D1-D2 disclose the antenna system of claim 16. Accordingly, it would not have been obvious to a person skilled in the art to apply the knowledge of these documents individually or in combination in order to create the antenna system of claim 16. Therefore, the subject matter of claim 16 is considered to be novel and to involve an inventive step under PCT Article 33(2) and (3).

Claims 17-27 are dependent on claim 16 of the present application. Therefore, Claims 17-27 are considered to be novel and to involve an inventive step, because the subject matter of claim 16 is considered to be novel and to involve an inventive step under PCT Article 33(2) and (3).

3. Industrial Applicability (PCT Article 33(4))

Claims 1-27 are industrially applicable under PCT Article 33(4).