

PW 8023650

THE UNITED STATES OF AMERICA

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UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

November 21, 2019

THIS IS TO CERTIFY THAT ANNEXED IS A TRUE COPY FROM THE
RECORDS OF THIS OFFICE OF THE FILE WRAPPER AND CONTENTS
OF:

APPLICATION NUMBER: 14/310,307

FILING DATE: June 20, 2014

By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office



M. TARVER
Certifying Officer

**UTILITY PATENT APPLICATION TRANSMITTAL
(Small Entity)**

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.

16869.16

Total Pages in this Submission

4

COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, VA 22313-1450

Transmitted herewith for filing under 35 U.S.C. 111 (a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

MICRO UNMANNED AERIAL VEHICLE AND METHOD OF CONTROL THEREFOR

and invented by:

Ivan Reedman and Barry Davies

If a CONTINUATION APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.:

Which is a:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

Which is a:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

Enclosed are:

Application Elements

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having 30 pages and including the following:
 - a. ☒ Descriptive Title of the Invention
 - b. ☒ Cross References to Related Applications *(if applicable)*
 - c. ☐ Statement Regarding Federally-sponsored Research/Development *(if applicable)*
 - d. ☐ Reference to Sequence Listing, a Table, or a Computer Program Listing Appendix
 - e. ☒ Background of the Invention
 - f. ☒ Brief Summary of the Invention
 - g. ☒ Brief Description of the Drawings *(if filed)*
 - h. ☒ Detailed Description
 - i. ☒ Claim(s) as Classified Below
 - j. ☒ Abstract of the Disclosure

UTILITY PATENT APPLICATION TRANSMITTAL
(Small Entity)

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4

Application Elements (Continued)

3. ☒ Drawing(s) (when necessary as prescribed by 35 USC 113)
- a. ☒ Formal Number of Sheets 3
- b. ☐ Informal Number of Sheets
4. ☐ Oath or Declaration
- a. ☐ Newly executed (*original or copy*) ☐ Unexecuted
- b. ☐ Copy from a prior application (37CFR 1.63(d) (*for continuation/divisional application only*))
- c. ☐ With Power of Attorney ☐ Without Power of Attorney
- d. ☐ DELETION OF INVENTOR(S)
Signed statement attached deleting inventor(s) named in the prior application,
see 37 C.F.R. 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation By Reference (*usable if Box 4b is checked*)
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
6. ☐ CD ROM or CD-R in duplicate, large table or Computer Program (Appendix)
7. ☒ Application Data Sheet (See 37 CFR 1.76)
8. ☐ Nucleotide and/or Amino Acid Sequence Submission (*if applicable, all must be included*)
- a. ☐ Computer Readable Form (CRF)
- b. ☐ Specification Sequence Listing on:
- i. ☐ CD-ROM or CD-R (2 copies); or
- ii. ☐ Paper
- c. ☐ Statement(s) Verifying Identical Paper and Computer Readable Copy

Accompanying Application Parts

9. ☐ Assignment Papers (*cover sheet & document(s)*)
10. ☐ 37 CFR 3.73(B) Statement (*when there is an assignee*)
11. ☐ English Translation Document (*if applicable*)
12. ☒ Information Disclosure Statement/PTO-1449 ☐ Copies of IDS Citations
13. ☐ Preliminary Amendment
14. ☐ Return Receipt Postcard (*MPEP 503*) (*Should be specifically itemized*)
15. ☐ Certified Copy of Priority Document(s) (*if foreign priority is claimed*)
16. ☐ Certificate of Mailing
- ☒ Via E-File ☐ Express Mail (*Specify Label No.*):

UTILITY PATENT APPLICATION TRANSMITTAL
(Small Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.

16869.16

Total Pages in this Submission

4

Accompanying Application Parts (Continued)

17. ☐ Additional Enclosures *(please identify below)*:

Request That Application Not Be Published Pursuant To 35 U.S.C. 122(b)(2)

18. ☐ Pursuant to 35 U.S.C. 122(b)(2), Applicant hereby requests that this patent application not be published pursuant to 35 U.S.C. 122(b)(1). Applicant hereby certifies that the invention disclosed in this application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication of applications 18 months after filing of the application.

Warning

An applicant who makes a request not to publish, but who subsequently files in a foreign country or under a multilateral international agreement specified in 35 U.S.C. 122(b)(2)(B)(i), must notify the Director of such filing not later than 45 days after the date of the filing of such foreign or international application. A failure of the applicant to provide such notice within the prescribed period shall result in the application being regarded as abandoned, unless it is shown to the satisfaction of the Director that the delay in submitting the notice was unintentional.

**UTILITY PATENT APPLICATION TRANSMITTAL
(Small Entity)**

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.

16869.16

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4

CLAIMS AS FILED					
For	#Filed	#Allowed	#Extra	Rate	Fee
Total Claims	11	-20	0	\$40.00	\$0.00
Indep. Claims	2	-3	0	\$210.00	\$0.00
Multiple Dependent Claims (check if applicable)					\$0.00
Total # of Pages in Specification	32	Total # of Drawing Sheets	3		
Total # of Sheets	35	Application Size Fee			\$0.00
Small Entity Basic Fee					\$70.00
Small Entity Search Fee					\$300.00
Small Entity Examination Fee					\$360.00
OTHER FEE (specify purpose)		Late filing of Declaration, Processing fee and Request for Track 1 Exam			\$2,140.00
TOTAL FILING FEE					\$2,870.00

- ☐ A check in the amount of \$_____ to cover the filing fee is enclosed.
- ☒ The Director is hereby authorized to charge and credit Deposit Account No. 23-3178 as described below.
- ☒ Charge the amount of \$_____ as filing fee.
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- ☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
- ☒ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).
- ☒ Payment by credit card.
- WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

/JOHN C. STRINGHAM, 40831/

Signature

Dated: June 20, 2014

Customer Number: 22913

John C. Stringham
Reg. No. 40,831
WORKMAN | NYDEGGER
Attorneys for Applicant

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International Bureau



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PCT

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(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant and

(72) Inventor: **PASHKO-PASCHENKO, Dimitri** [US/US];
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(74) Agent: **BONAR, Laurence, C.**; 917 Logan Street, Port Townsend, WA 98368-2337 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,

Declaration under Rule 4.17:

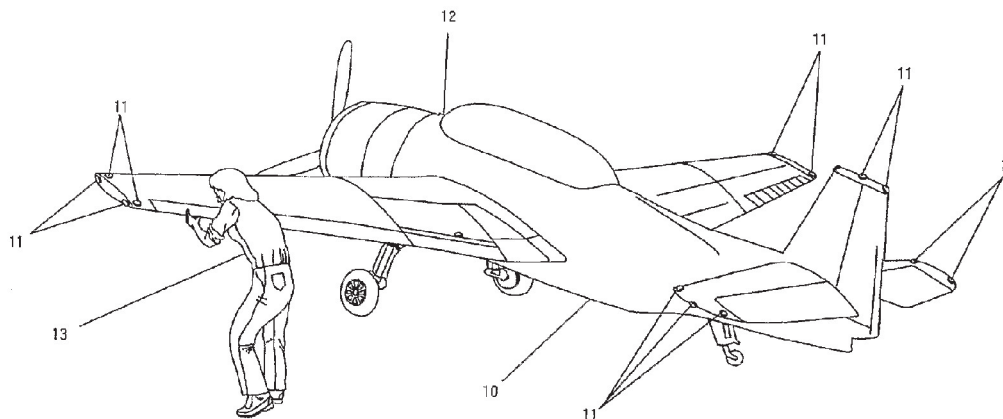
— as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: OBJECT PROXIMITY WARNING SYSTEM



(57) Abstract: A system and method are provided to detect an impending contact or collision between a subject vehicle, which may be an aircraft, a watercraft or a load-handling vehicle, and stationary objects or other vehicles in the vicinity of the subject vehicle, comprising distance or motion-detecting sensors mounted at positions on the subject vehicle at risk of such collision or contact, and alerting means, responsive to said sensors, to notify the operator of the subject vehicle and/or the operators of such other vehicles in the vicinity of the subject vehicle of the risk of a collision. Preferred embodiments comprise alerting means which indicate to the operator of the subject vehicle which, if any, sensors detect an object closer to the subject vehicle than a predetermined distance of safe approach.

WO 2006/138387 A2

(12) 特許協力条約に基づいて公開された国際出願

(19) 世界知的所有権機関
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(43) 国際公開日
2010年12月2日(02.12.2010)



PCT



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- (25) 国際出願の言語: 日本語
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US61/217,047 2009年5月26日(26.05.2009) US
- (71) 出願人(米国を除く全ての指定国について): 国立大学法人 千葉大学(NATIONAL UNIVERSITY CORPORATION CHIBA UNIVERSITY) [JP/JP]; 〒2638522 千葉県千葉市稲毛区弥生町1番33号 Chiba (JP).
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Daisuke) [JP/JP]; 〒2638522 千葉県千葉市稲毛区弥生町1番33号 国立大学法人千葉大学大学院工学研究科人工システム科学専攻機械系コース内 Chiba (JP).

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(81) 指定国(表示のない限り、全ての種類の国内保護が可能): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

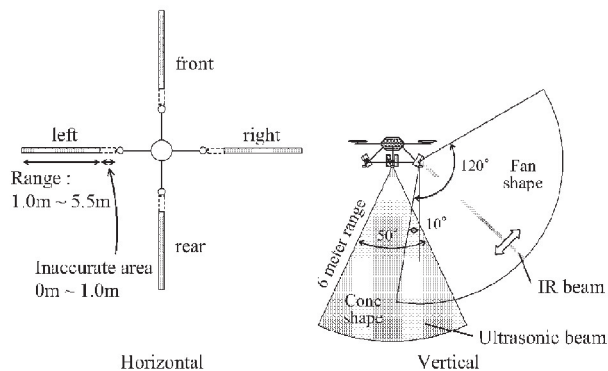
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[続葉有]

(54) Title: MOBILE BODY CONTROL DEVICE AND MOBILE BODY IN WHICH MOBILE BODY CONTROL DEVICE IS MOUNTED

(54) 発明の名称: 移動体制御装置及び移動体制御装置を搭載した移動体

[図3]



(57) 要約:

(57) Abstract: Disclosed is a mobile body control device for detecting an object or the like present around the mobile body and detecting the distance to the object and the outline of the object in order that the mobile body can avoid an obstacle and can land on a flat location without using any GPS device. The mobile body control device is mounted to a mobile body and used. The mobile body control device comprises an ultrasonic sensor unit for measuring the distance to a peripheral object in the vicinity thereof using an ultrasonic wave having a weak directivity and outputting vicinity information which is the result of the measurement and an infrared sensor unit for repetitively transmitting infrared radiation from the infrared sensor by vibration into a prescribed scope viewed from the mobile body, determining the outline of an object within the prescribed scope, measuring the distance to the outline, and outputting outline information which is the result of the measurement.

[続葉有]

WO 2010/137596 A1

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		MICRO UNMANNED AERIAL VEHICLE AND METHOD OF CONTROL THEREOF		
First Named Inventor/Applicant Name:		Ivan Reedman		
Filer:		John C. Stringham/Rachelle Turner		
Attorney Docket Number:		16869.16		
Filed as Small Entity				
Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	70	70
Utility Search Fee	2111	1	300	300
Utility Examination Fee	2311	1	360	360
Request for Prioritized Examination	2817	1	2000	2000
Pages:				
Claims:				
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Publ. Fee- Early, Voluntary, or Normal	1504	1	0	0
PROCESSING FEE, EXCEPT PROV. APPLS.	2830	1	70	70
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				2800

Electronic Acknowledgement Receipt

EFS ID:	19365599
Application Number:	14310307
International Application Number:	
Confirmation Number:	5765
Title of Invention:	MICRO UNMANNED AERIAL VEHICLE AND METHOD OF CONTROL THEREOF
First Named Inventor/Applicant Name:	Ivan Reedman
Customer Number:	22913
Filer:	John C. Stringham/Rachelle Turner
Filer Authorized By:	John C. Stringham
Attorney Docket Number:	16869.16
Receipt Date:	20-JUN-2014
Filing Date:	
Time Stamp:	14:20:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$2800
RAM confirmation Number	615
Deposit Account	233178
Authorized User	ADAMS, SHEREE

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	TrackOne Request	16869_16_Req_Track1.pdf	130612	no	1
			4f90fddceb7d3aed09d9af9f1dc954ae0cef62e6		
Warnings:					
Information:					
2	Drawings-only black and white line drawings	16869_16_US_dwgs.pdf	77792	no	3
			25db63ca76369a5dfcb31bfe7cb4936c94ce6104		
Warnings:					
Information:					
3	Application Data Sheet	16869_16_ADS.pdf	1561546	no	8
			17df7da00b15f025bb9625c4d04ffd7dbab0ad3		
Warnings:					
Information:					
4	Information Disclosure Statement (IDS) Form (SB08)	16869_16_IDS.pdf	612621	no	4
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Information:					
5	Foreign Reference	0522_001.pdf	47926	no	1
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Information:					
8		16869_16_applic.pdf	167997	yes	32
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	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	27	
	Claims		28	31	
	Abstract		32	32	
Warnings:					
Information:					
9	Transmittal of New Application	16869_16_Trans.pdf	169072	no	4
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Warnings:					
Information:					
10	Foreign Reference	WO2006138387_1.pdf	100782	no	1
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Information:					
Total Files Size (in bytes):			3416381		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

**CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION
UNDER 37 CFR 1.102(e)** (Page 1 of 1)

First Named Inventor:	Ivan Reedman	Nonprovisional Application Number (if known):	
Title of Invention:	MICRO UNMANNED AERIAL VEHICLE AND METHOD OF CONTROL THEREFOR		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently \$0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.
2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.
3. The applicable box is checked below:

I. ☒ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

- i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.
---OR---
(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.
- ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, or the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

- i. A request for continued examination has been filed with, or prior to, this form.
- ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
- iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
- iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
- v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature <u>/John C. Stringham, 40831/</u>	Date <u>2014-06-20</u>
Name (Print/Typed) <u>John C. Stringham</u>	Practitioner Registration Number <u>40831</u>
Note: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.*	
<input type="checkbox"/> *Total of <u>1</u> forms are submitted.	

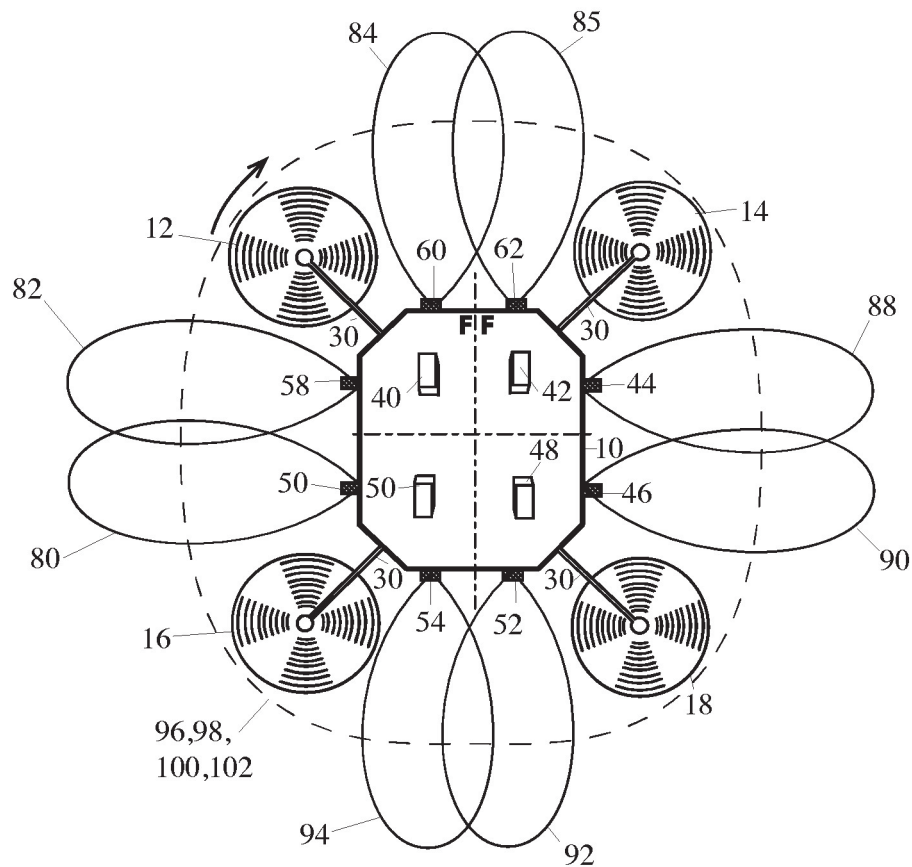


FIG. 1

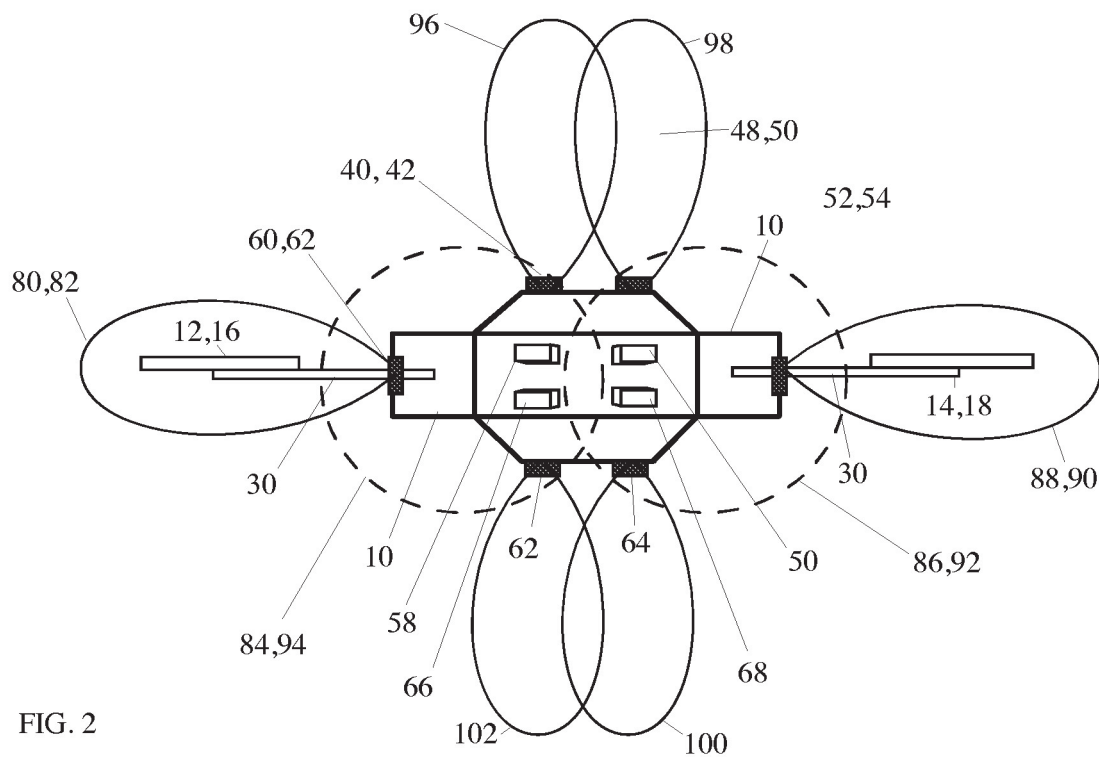


FIG. 2

300

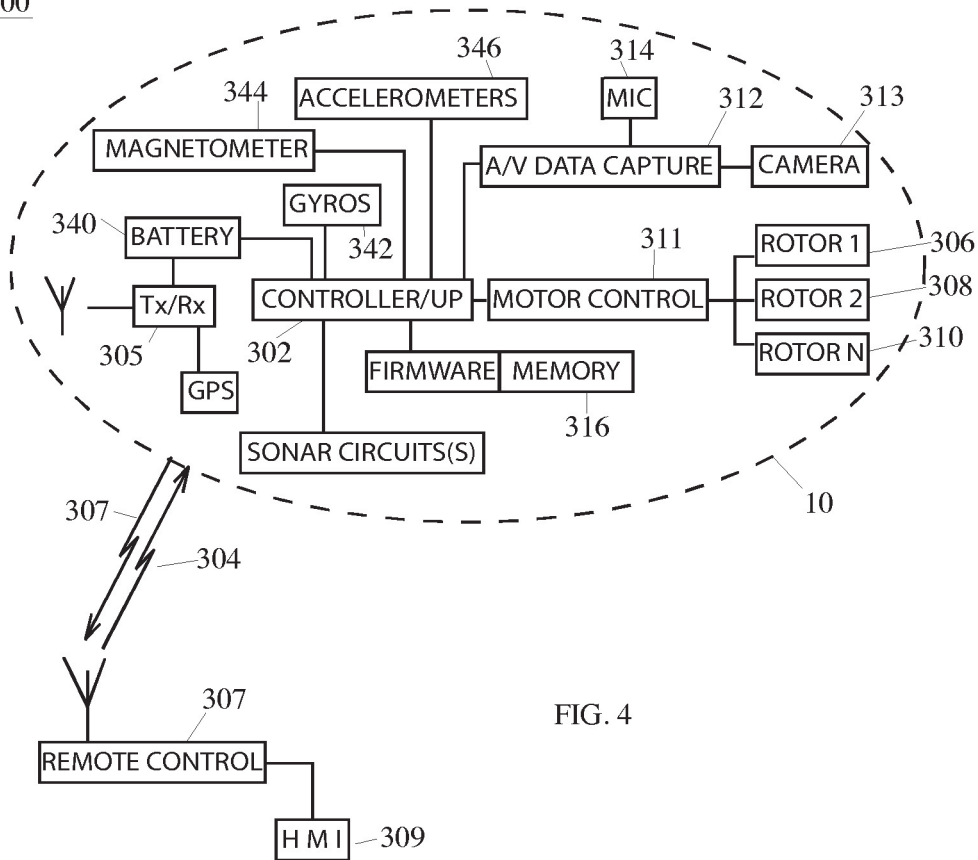


FIG. 4

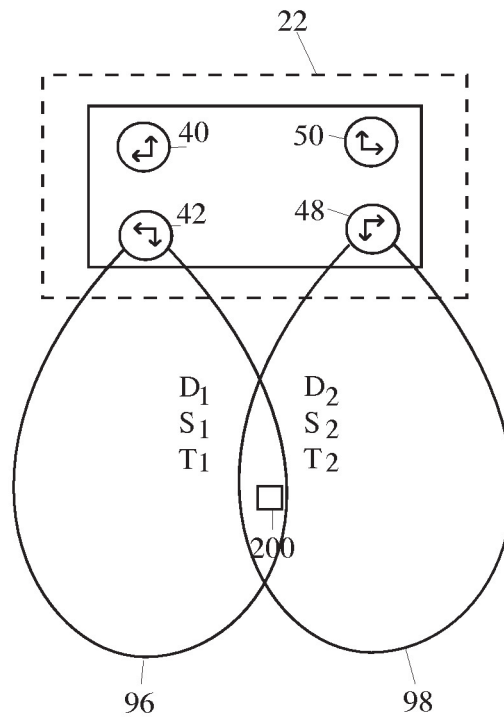


FIG. 3



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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	16869.16
		Application Number	
Title of Invention	MICRO UNMANNED AERIAL VEHICLE AND METHOD OF CONTROL THEREFOR		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2

<input type="checkbox"/>	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--------------------------	---

Inventor Information:

Inventor 1					Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Ivan		Reedman			
Residence Information (Select One) <input type="radio"/> US Residency <input checked="" type="radio"/> Non US Residency <input type="radio"/> Active US Military Service						
City	South Glamorgan	Country of Residence i	GB			
Mailing Address of Inventor:						
Address 1		Clydesmuir Road, Cardiff				
Address 2						
City	South Glamorgan	State/Province				
Postal Code	CF24 2QS	Country i	GB			
Inventor 2					Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Barry		Davies			
Residence Information (Select One) <input type="radio"/> US Residency <input checked="" type="radio"/> Non US Residency <input type="radio"/> Active US Military Service						
City	South Glamorgan	Country of Residence i	GB			
Mailing Address of Inventor:						
Address 1		Brook House Lodge, Began Road, Cardiff				
Address 2						
City	South Glamorgan	State/Province				
Postal Code	CF3 6CJ	Country i	GB			
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.						
Add						

Correspondence Information:

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	16869.16
		Application Number	
Title of Invention	MICRO UNMANNED AERIAL VEHICLE AND METHOD OF CONTROL THEREFOR		

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ An Address is being provided for the correspondence information of this application.

Customer Number	22913		
Email Address	docketing@wnlaw.com	<input type="button" value="Add Email"/>	<input type="button" value="Remove Email"/>

Application Information:

Title of the Invention	MICRO UNMANNED AERIAL VEHICLE AND METHOD OF CONTROL THEREFOR		
Attorney Docket Number	16869.16	Small Entity Status Claimed	<input checked="" type="checkbox"/>
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	3	Suggested Figure for Publication (if any)	

Filing By Reference :

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	<input checked="" type="radio"/> Customer Number	<input type="radio"/> US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)
Customer Number	22913		

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	16869.16
		Application Number	
Title of Invention	MICRO UNMANNED AERIAL VEHICLE AND METHOD OF CONTROL THEREFOR		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the application number blank.

Prior Application Status		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove			
Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ^j (if applicable)
PCT/GB2013/052745	GB	2013-10-22	
Remove			
Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ^j (if applicable)
1218963.5	GB	2012-10-22	
Additional Foreign Priority Data may be generated within this form by selecting the Add button.			Add

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	16869.16
		Application Number	
Title of Invention	MICRO UNMANNED AERIAL VEHICLE AND METHOD OF CONTROL THEREFOR		

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

<p>This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.</p> <p><input type="checkbox"/> NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.</p>
--

Authorization to Permit Access:

<input checked="" type="checkbox"/> Authorization to Permit Access to the Instant Application by the Participating Offices
<p>If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.</p> <p>In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.</p> <p>In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.</p>

Applicant Information:

<p>Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.</p>
--

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	16869.16
	Application Number	
Title of Invention	MICRO UNMANNED AERIAL VEHICLE AND METHOD OF CONTROL THEREFOR	

Applicant 1				Remove	
<p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p>					
Clear					
<input type="radio"/> Assignee		<input type="radio"/> Legal Representative under 35 U.S.C. 117		<input type="radio"/> Joint Inventor	
<input checked="" type="radio"/> Person to whom the inventor is obligated to assign.			<input type="radio"/> Person who shows sufficient proprietary interest		
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:					
Name of the Deceased or Legally Incapacitated Inventor : <input type="text"/>					
If the Applicant is an Organization check here. <input checked="" type="checkbox"/>					
Organization Name		BCB INTERNATIONAL LTD.			
Mailing Address Information:					
Address 1		Clydesmuir Road, Cardiff			
Address 2					
City		South Glamorgan	State/Province		
Country ⁱ	GB	Postal Code		CF24 2QS	
Phone Number			Fax Number		
Email Address					

Additional Applicant Data may be generated within this form by selecting the Add button.

[Add](#)

Applicant 2				Remove	
<p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p>					
Clear					
<input type="radio"/> Assignee		<input type="radio"/> Legal Representative under 35 U.S.C. 117		<input type="radio"/> Joint Inventor	
<input checked="" type="radio"/> Person to whom the inventor is obligated to assign.			<input type="radio"/> Person who shows sufficient proprietary interest		
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:					
Name of the Deceased or Legally Incapacitated Inventor : <input type="text"/>					

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	16869.16
		Application Number	
Title of Invention	MICRO UNMANNED AERIAL VEHICLE AND METHOD OF CONTROL THEREFOR		

If the Applicant is an Organization check here. <input checked="" type="checkbox"/>			
Organization Name	TORQUING GROUP LTD.		
Mailing Address Information:			
Address 1	Williamston House, 7 Goat Street, Haverfordwest		
Address 2			
City	Pembrokeshire	State/Province	
Country ⁱ	GB	Postal Code	SA16 1PX
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button. Add			

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.				
Assignee 1				
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
Remove				
If the Assignee or Non-Applicant Assignee is an Organization check here. <input type="checkbox"/>				
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information For Assignee including Non-Applicant Assignee:				
Address 1				
Address 2				
City		State/Province		
Country ⁱ		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add				

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	16869.16
		Application Number	
Title of Invention	MICRO UNMANNED AERIAL VEHICLE AND METHOD OF CONTROL THEREFOR		

Signature:

Remove

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications

Signature	/John C. Stringham, 40831/			Date (YYYY-MM-DD)	2014-06-20
First Name	John C.	Last Name	Stringham	Registration Number	40831
Additional Signature may be generated within this form by selecting the Add button.					Add

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number			
	Filing Date		2014-06-20	
	First Named Inventor	Ivan Reedman		
	Art Unit			
	Examiner Name			
	Attorney Docket Number	16869.16		

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6804607		2004-10-12	Wood	

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	1					

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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ² j	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	201727964U	CN		2011-02-02	Univ Central South Forestry		<input type="checkbox"/>
	2	2006138387	WO		2006-12-28	Pashko-Paschenko, Dimitri		<input type="checkbox"/>
	3	2010137596	WO		2010-02-12	Univ Chiba Nat Univ Corp et al.		<input type="checkbox"/>

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		
Filing Date		2014-06-20
First Named Inventor	Ivan Reedman	
Art Unit		
Examiner Name		
Attorney Docket Number	16869.16	

If you wish to add additional Foreign Patent Document citation information please click the Add button **Add**

NON-PATENT LITERATURE DOCUMENTS			Remove
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1	EUROPEAN PATENT OFFICE, Search Report, Application No. GB1218963.5, Date of Search March 23, 2013	<input type="checkbox"/>

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EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	2014-06-20
First Named Inventor	Ivan Reedman
Art Unit	
Examiner Name	
Attorney Docket Number	16869.16

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/John C. Stringham, 40831/	Date (YYYY-MM-DD)	2014-06-20
Name/Print	John C. Stringham	Registration Number	40831

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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- PN - CN201727964U U 20110202
- TI - Toy helicopter with collision prevention function
- AB - The utility model discloses a toy helicopter with a collision prevention function, which is characterized by comprising a microprocessor, a wireless receiver, an executing mechanism and six ultrasonic sensors respectively installed on the top, at the bottom, in the front, in the rear, on the left and on the right of the toy helicopter. The wireless receiver, the executing mechanism and the ultrasonic sensors are all connected with the microprocessor. The toy helicopter can more effectively prevent collision with an obstacle.
- PA - UNIV CENTRAL SOUTH FORESTRY

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- AN - 2011-D44112 [28]
- TI - Toy helicopter, has six ultrasonic sensors respectively installed on upper, lower, front, back, left and right of helicopter, and wireless receiver, execution mechanism and ultrasonic sensors connected with microprocessor
- AB - NOVELTY :
The helicopter has a microprocessor i.e. digital signal processor, arranged with a wireless receiver, an execution mechanism and six ultrasonic sensors, which are respectively installed on the upper, lower, front, back, left and right of the helicopter. The wireless receiver, the execution mechanism and the ultrasonic sensors are connected with the microprocessor.
- USE :
Toy helicopter.
- ADVANTAGE :
The helicopter with anti-collision function prevents the collision with the barrier effectively.
- DESCRIPTION OF DRAWINGS :
The drawing shows a block diagram of a toy helicopter. '(Drawing includes non-English language text)'
- PN - CN201727964U U 20110202 DW201128
- PA - (UYCS) UNIV CENT SOUTH FORESTRY TECHNOLOGY



(12) 实用新型专利

(10) 授权公告号 CN 201727964 U

(45) 授权公告日 2011.02.02

(21) 申请号 201020247281.8

(22) 申请日 2010.07.04

(73) 专利权人 中南林业科技大学

地址 410004 湖南省长沙市天心区韶山南路
498 号

(72) 发明人 贺超英

(51) Int. Cl.

A63H 27/133(2006.01)

(ESM) 同样的发明创造已同日申请发明专利

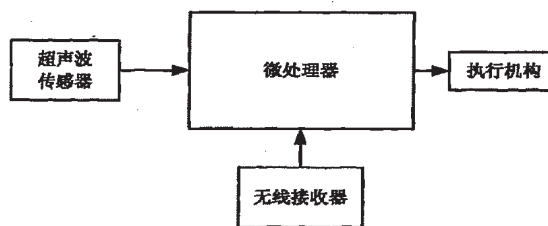
权利要求书 1 页 说明书 2 页 附图 1 页

(54) 实用新型名称

具有防撞功能的玩具直升机

(57) 摘要

本实用新型公开了一种具有防撞功能的玩具直升机,其特征在于,包括微处理器、无线接收器、执行机构以及分别安装于玩具直升机上、下、前、后、左和右的 6 个超声波传感器,所述的无线接收器、执行机构和超声波传感器均与微处理器连接。该具有防撞功能的玩具直升机能更有效避免与障碍物发生碰撞。



1. 一种具有防撞功能的玩具直升机,其特征在于,包括微处理器、无线接收器、执行机构以及分别安装于玩具直升机上、下、前、后、左和右的 6 个超声波传感器,所述的无线接收器、执行机构和超声波传感器均与微处理器连接。

2. 根据权利要求 1 所述的具有防撞功能的玩具直升机,其特征在于,所述的微处理器为数字信号处理器。

具有防撞功能的玩具直升机

技术领域

[0001] 本实用新型涉及一种具有防撞功能的玩具直升机。

背景技术

[0002] 现有的玩具直升机没有保护装置,而且,由于机翼高速旋转,一旦碰到障碍物就会受到严重的损坏,因此,为了小朋友们能更多的享受玩具直升机带来的乐趣,有必要设计一种新型的玩具直升机。

实用新型内容

[0003] 本实用新型要解决技术问题是提供一种具有防撞功能的玩具直升机,该具有防撞功能的玩具直升机能有效避免与障碍物发生碰撞。

[0004] 本实用新型为解决上述技术问题所采用的技术方案是:

[0005] 一种具有防撞功能的玩具直升机,其特征在于,包括微处理器、无线接收器、执行机构以及分别安装于玩具直升机上、下、前、后、左和右的6个超声波传感器,所述的无线接收器、执行机构和超声波传感器均与微处理器连接。

[0006] 所述的微处理器为数字信号处理器(DSP)。

[0007] 本实用新型的有益效果:

[0008] 本实用新型的具有防撞功能的玩具直升机,由于在空间的6个方向上都设有检测障碍物的超声波传感器,可以在直升机飞行过程中实时检测各方向障碍物的情况,及时驱动执行机构作出避障反应,因此,本实用新型的具有防撞功能的玩具直升机能有效避免撞击带来的损坏。

附图说明

[0009] 图1为本实用新型的结构框图。

具体实施方式

[0010] 下面结合附图和具体实施例对本实用新型作进一步说明。

[0011] 实施例1:

[0012] 如图1所示,一种具有防撞功能的玩具直升机,其特征在于,包括微处理器、无线接收器、执行机构以及分别安装于玩具直升机上、下、前、后、左和右的6个超声波传感器,所述的无线接收器、执行机构和超声波传感器均与微处理器连接。所述的微处理器为数字信号处理器(DSP)。

[0013] 工作过程描述:假设玩具直升机的微处理器通过前向的超声波传感器探测到前方有障碍物,则实时监控该障碍物的距离,如果距离在设定值(如3米)以内,则响应中断,使得前向的运动指令不能被执行,只能执行转弯或后退或悬停的命令,由此避免玩具直升机与该前向的障碍物撞击。对于其他方向出现的障碍物,也做相似的处理,下降降落时的情况

除外。这样,各个方向的障碍物都能有效的自动避免,避免了玩具直升机受到撞击损害。

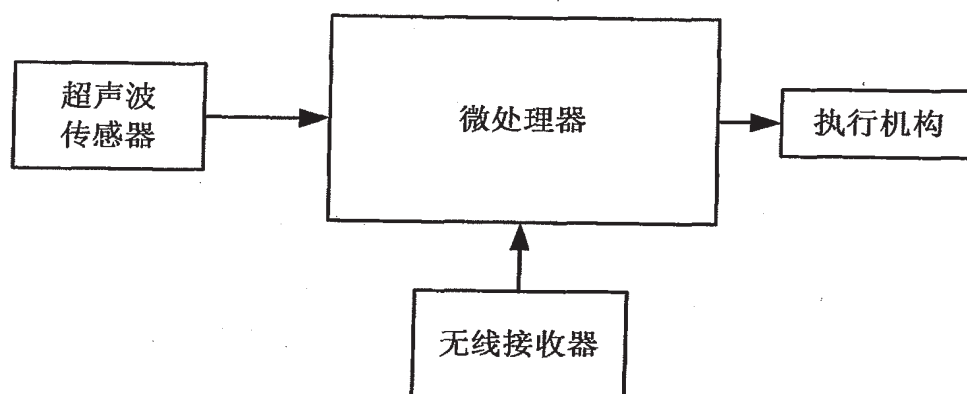
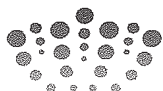


图 1



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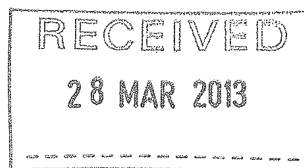
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Your Reference: BCB-P3628GB
Application No: GB1218963.5

25 March 2013

Dear Sirs

Patents Act 1977: Search Report under Section 17(5)



I enclose two copies of my search report and a copy of the citations.

Other search results

If you have applied to another patent office for a patent for this invention you will be receiving from them the results of their search. If you decide to proceed with the present application you are asked to provide a copy of any such official search report or details of any documents cited and category assigned in the report. You may file such information electronically using the online patent filing services detailed in www.ipo.gov.uk/p-apply-online

Cut-off date This request applies to search reports that you have received before the date when you send a response to our first examination report under section 18(3) or section 18(4); if you make no response to an initial section 18(4) report the cut-off date is two months after the date of that report. Tell us about a search report sooner rather than later if that would allow it to be considered during our first examination.

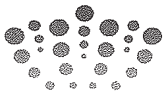
Exceptions You do not have to supply details of a search report that (1) shows a nil response, or (2) has been published by WIPO or EPO, or (3) you have already supplied to us on a previous GB application.

Publication

I estimate that, provided you have met all the formal requirements, preparations for publication of your application will be completed soon after **18 March 2014**. At this time you will receive a letter confirming the exact date when the preparations for publication will be

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completed. This letter will also tell you the publication number and date of publication of your application. However, it should not be relied upon as a reminder if you are intending to withdraw your application before publication.

On the date of publication details of your application, including your name and address, will be entered in the Register of Patents and will become publicly available, including on our website. Some documents and correspondence from your application file will also be made publicly available on our website at www.ipo.gov.uk/p-ipsum.

Withdrawal

If you wish to withdraw your application to prevent publication you must withdraw it before the preparations for publication are complete. One way that you can withdraw your application is by emailing withdraw@ipo.gov.uk. Further details on withdrawal are available from www.ipo.gov.uk/p-withdraw. **WARNING** – once preparations for publication are complete it will NOT be possible to prevent publication.

Amendment

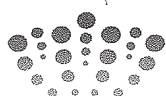
If you wish to file amended claims for inclusion with the published application you must do so before the preparations for publication are completed.

Correspondence

If you write to the Office less than 3 weeks before 18 March 2014 please mark your letter prominently: **"URGENT - PUBLICATION IMMINENT"**.

Yours faithfully


Mr Tyrone Moore
Examiner



Application No: GB1218963.5

Examiner: Mr Tyrone Moore

Claims searched: 1-12

Date of search: 23 March 2013

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1, 8	CN 201727964 U (UNIV CENTRAL SOUTH FORESTRY) See whole document. A remote controlled aircraft with multiple ultrasonic sensors positioned around the aircraft for use in an anti-collision system.
A	-	WO 2006/138387 A2 (PASHKO-PASCHENKO DIMITRI) See whole document. An example of an aircraft with collision avoidance.
A	-	US 6804607 B1 (WOOD DEREK) See whole document. An example of an aircraft with collision avoidance and a safety envelope, item 44, fig.3.
A	-	WO 2010/137596 A1 (UNIV CHIBA NAT UNIV CORP et al.) See EPODOC abstract and figures. An example of an aircraft with object detection and avoidance using an ultrasonic sensor unit.

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

Worldwide search of patent documents classified in the following areas of the IPC

B64C; G01S; G05D

The following online and other databases have been used in the preparation of this search report

EPODOC; WPI; XFULL designating all states.

International Classification:

Subclass	Subgroup	Valid From
G05D	0001/03	01/01/2006
G01S	0015/93	01/01/2006

UNITED STATES PATENT APPLICATION

of

BCB INTERNATIONAL LTD.

And

TORQUING GROUP LTD.

for

**MICRO UNMANNED AERIAL VEHICLE AND
METHOD OF CONTROL THEREOF**

MICRO UNMANNED AERIAL VEHICLE AND METHOD OF CONTROL THEREFOR

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to, and the benefit of, PCT Application Serial No. PCT/GB2013/052745, filed on October 22, 2013, and entitled “MICRO UNMANNED AERIAL VEHICLE AND METHOD OF CONROL THEREFOR”, which also claims priority to and the benefit of Great Britain Patent Application No. 1218963.5, entitled "MICRO UNMANNED AERIAL VEHICLE AND METHOD OF CONROL THEREFOR", filed on October 22, 2012. All of the aforementioned applications are incorporated by reference herein in their entirety.

BACKGROUND TO THE INVENTION

[0002] The present invention relates, in general, to a unmanned aerial vehicle (UAV) and is particularly, but not exclusively, applicable to a flight control system for a micro or nano UAV that is tasked with reconnaissance and covert data gathering for risk assessment. More particularly, the present invention relates to control of a UAV using a locally generated sonar bubble.

SUMMARY OF THE PRIOR ART

[0003] In the design of military or surveillance UAV systems, it is necessary for the flight-control system to be responsive, robust and lightweight. Particularly, the agile manoeuvring of a UAV relies upon accurate operational regulation of its individual motors that collectively control 3-dimensional movement of the UAV device in space and real time. Indeed, fine manoeuvring control is required to permit secure and safe reconnoitre into buildings, with current line-of-sight systems entirely failing to mitigate anything that is not seen by the remote handler or which is only seen at a point that is too late to calculate a new flight path given current flight control settings, such as speed or altitude. In fact, even a camera-based UAV system, transmission path delay or multi-path interference experienced in radio frequency (RF) operation may present sufficient delay to jeopardize or compromise the remote UAV drone. Indeed, current line-of-sight systems require direct active control.

[0004] Micro UAV technology is particularly interesting from the perspective of inspection and reconnaissance since the small size unit can be manoeuvred, under remote control, into small or dangerous areas to determine and relay images of a threat or risk. The drone footprint for a micro UAV is usually in the region of a metre in size and often significantly smaller, with a weight in the range of less than a few hundred grams. This small size places considerable constraints on payload and motor size, with the motor technology relying on battery cells (such as lithium ion technology) for power.

[0005] It has been known to make use of inertial navigation or inertial guidance systems in UAV technologies, but principally only in larger scale devices rather than