

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
28 September 2006 (28.09.2006)

PCT

(10) International Publication Number
WO 2006/101470 A3

(51) International Patent Classification:

F41H 5/007 (2006.01) *F41H 11/02* (2006.01)

(21) International Application Number:

PCT/US2005/005589

(22) International Filing Date:

23 February 2005 (23.02.2005)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

10/787,843 26 February 2004 (26.02.2004) US

(71) Applicant (for all designated States except US): **CHANG INDUSTRY, INC.** [US/US]; 1925 McKinley Avenue, Suite F, La Verne, CA 91750 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **CHANG, Yu-Wen** [US/US]; 30136 Avenida DeCalma, Rancho Palos Verdes, CA 90275 (US).

(74) Agents: **LYN, Kevin, R.** et al.; **ALSTON & BIRD LLP**, Bank of America Plaza, 101 South Tryon Street, Suite 4000, Charlotte, NC 28280-4000 (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, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(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, 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).

Published:

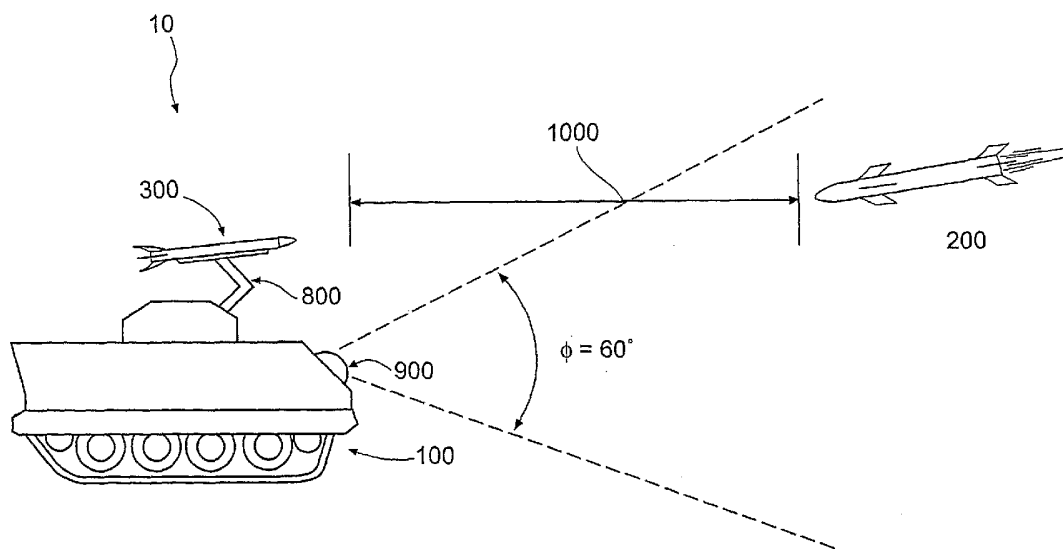
- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:

23 November 2006

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: ACTIVE PROTECTION DEVICE AND ASSOCIATED APPARATUS, SYSTEM, AND METHOD



(57) Abstract: An interceptor device (300) adapted to protect a platform associated therewith against an incoming threat having a trajectory by intercepting the threat in an intercept zone is provided. Such an interceptor device comprises a housing (400) defining an axis and a countermeasure device operably engaged with the housing. At least one detonating charge is housed by the housing and is operably engaged with the countermeasure device. A controller device is in communication with the at least one detonating charge, wherein the controller device is housed by the housing and is configured to direct the at least one detonating charge to deploy the countermeasure device at least partially radially outward with respect to the axis of the housing and in correspondence with the trajectory of the threat to thereby cause the countermeasure to impact the threat in the intercept zone. Associated apparatuses, systems, and methods are also provided.

WO 2006/101470 A3

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US2005/005589

A. CLASSIFICATION OF SUBJECT MATTER
INV. F41H5/007 F41H11/02

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)
F41H F42C

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 23 36 040 A1 (MESSERSCHMITT-BOELKOW-BLOHM GMBH; MESSERSCHMITT-BOELKOW-BLOHM GMBH, 80) 20 January 1977 (1977-01-20) the whole document	1-58
X	US 5 359 934 A (IVANOV ET AL) 1 November 1994 (1994-11-01) column 1, lines 14-42; claims 1-5; figure 1	1-58
X	WO 01/88564 A (DIEHL MUNITIONSSYSTEME GMBH & CO.KG; PAPPERT, GUNNAR; SCHLUETER, KLAUS) 22 November 2001 (2001-11-22) the whole document	1-3, 6-19, 28-58
	----- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in 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 document 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 another 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

5 September 2006

Date of mailing of the international search report

12/09/2006

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Van der Plas, J

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US2005/005589

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/164087 A1 (VIVES MICHEL ET AL) 4 September 2003 (2003-09-04) page 2, lines 43-61; figure 1 -----	1-3,6, 12,16, 22-55,58
P,X	WO 2004/090459 A (SHUMOV, SERHIY OLEKSANDROVYCH; KHYTRYK, VASYL ONYPHRIYOVYCH; MEDVYD, V) 21 October 2004 (2004-10-21) page 2, lines 10-23; figures 1-8 page 3, line 25 - page 4, line 9 page 6, line 4 - page 7, line 9 -----	1-3,6, 12-16, 22,23, 25-37, 40-46, 48-52, 55-58
A	FR 1 605 558 A (COMPAGNIE GENERALE DE SYSTEMES ET DE PROJETS AVANCES) 25 July 1980 (1980-07-25) -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2005/005589

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 2336040	A1	20-01-1977	NONE	
US 5359934	A	01-11-1994	NONE	
WO 0188564	A	22-11-2001	AU 7748901 A CA 2407821 A1 DE 10024320 A1 EP 1282832 A1 JP 2003533705 T NO 20025464 A US 2003117309 A1	26-11-2001 29-10-2002 29-11-2001 12-02-2003 11-11-2003 10-01-2003 26-06-2003
US 2003164087	A1	04-09-2003	DE 60113024 D1 DE 60113024 T2 EP 1192404 A1 FR 2805037 A1 WO 0159396 A1	06-10-2005 14-06-2006 03-04-2002 17-08-2001 16-08-2001
WO 2004090459	A	21-10-2004	EP 1467171 A1 US 2006107829 A1	13-10-2004 25-05-2006
FR 1605558	A	25-07-1980	NONE	