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12/845,386 28 July 2010 (28.07.2010) US
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- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** 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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- Published:**
- with international search report (Art. 21(3))
 - before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))
- (88) **Date of publication of the international search report:**
21 March 2013



WO 2012/128782 A3

(54) **Title:** FLEXIBLE BODY ARMOR VEST WITH BREAST PLATE

(57) **Abstract:** Body armor vests and other articles having combined ballistic performance and overall weight characteristics are described. A representative body armor vest comprises both a rigid breast plate and a flexible fabric adjoining the breast plate. Both components may comprise a plurality of unidirectionally oriented fibrous layers comprising fibers having high tenacity and a high tensile modulus.

A. CLASSIFICATION OF SUBJECT MATTER*A41D 1/04(2006.01)i, A41D 1/00(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)

A41D 1/04; D06M 15/564; F41H 1/02; D06B 3/02; B32B 5/12; B27N 9/00; F41H 5/04

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: body armor vest, rigid breast plate, tenacity, tensile modulus, ballistic performance, flexible fabric, oriented fibrous layer

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2009-108498 A1 (HONEYWELL INTERNATIONAL INC. et al.) 03 September 2009 See claims 1, 11, 12, p. 27, paragraph 1 and p. 31, paragraph 1.	1-4, 9, 10
A	US 2009-0025111 A1 (BHATNAGAR ASHOK et al.) 29 January 2009 See claim 24 and paragraph [0023].	1-4, 9, 10
A	WO 2008-097362 A1 (HONEYWELL INTERNATIONAL INC. et al.) 14 August 2008 See abstract and claims 1, 6.	1-4, 9, 10
A	US 05480706A A (LI; HSIN L. et al.) 02 January 1996 See abstract and claim 1.	1-4, 9, 10

 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

22 JANUARY 2013 (22.01.2013)

Date of mailing of the international search report

23 JANUARY 2013 (23.01.2013)

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORTInternational application No.
PCT/US2011/044629**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: 7
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

Claim 7 is unclear since it refers to a claim which is not searchable due to not being drafted in accordance with the second and third sentences of Rule 6.4(a)

3. Claims Nos.: 5-6,8
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/044629

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2009-108498 A1	03.09.2009	CA 2716885 A1	03.09.2009
		CN 102016151 A	13.04.2011
		EP 2250309 A1	17.11.2010
		IL207693D0	30.12.2010
		JP 2011-523378 A	11.08.2011
		KR 10-2010-0118598 A	05.11.2010
		KR20100118598A	05.11.2010
		MX 2010009298 A	14.09.2010
		TW 200944375 A	01.11.2009
		US 2011-0191928 A1	11.08.2011
		US 7994075 B1	09.08.2011
US 2009-0025111 A1	29.01.2009	AR057779A1	19.12.2007
		AU 2006-338598 A1	30.08.2007
		AU 2006-338598 B2	06.01.2011
		BR P10614963A2	22.06.2010
		CA 2620324 A1	30.08.2007
		CN 101356054 A	28.01.2009
		EP 1917140 A2	07.05.2008
		IL189772D0	07.08.2008
		JP 2009-505865 A	12.02.2009
		JP 2009-505865 T	12.02.2009
		KR 10-2008-0043374 A	16.05.2008
		KR20080043374A	16.05.2008
		MX 2008002711 A	15.04.2008
		RU 2008111143 A	10.10.2009
		RU 2436676 C2	20.12.2011
		US 7687412 B2	30.03.2010
		WO 2007-097780 A2	30.08.2007
WO 2007-097780 A3	30.08.2007		
WO 2007-097780 A3	08.11.2007		
WO 2007-097780 A8	03.07.2008		
WO 2007-097780 A9	02.10.2008		
WO 2008-097362 A1	14.08.2008	None	
US 05480706A A	02.01.1996	US 05480706A A	02.01.1996