Title (en)
HYBRID PROTECTIVE COMPOSITE

Title (de)
HYBRIDES SCHUTZKOMPOSIT

Title (fr)
COMPOSITE HYBRIDE PROTECTEUR

Publication
EP 1141649 B2 20111123 (EN)

Application
EP 99942041 A 19990810

Priority
• US 9917937 W 19990810
• US 21736098 A 19981221

Abstract (en)
[origin: WO0037876A1] A composite is disclosed which is resistant to knife and ice pick stab penetration and is made from a plurality of layers (12) of woven polybenzoxazole or polybenzothiazole fibers, a plurality of ballistic layers (16), and a plurality of tightly-woven penetration resistant layers (14). Said layers may comprise para-aramid fibers or polyethylene fibers.

IPC 8 full level
F41H 1/02 (2006.01); **F41H 5/04** (2006.01); **B32B 5/26** (2006.01); **B32B 27/00** (2006.01); **B32B 27/34** (2006.01)

CPC (source: EP KR)
F41H 5/04 (2013.01 - KR); **F41H 5/0485** (2013.01 - EP)

Citation (opposition)
Opponent :
• JP H0972697 A 19970318 - TOYO BOSEKI
• WO 9805917 A1 19980212 - SECOND CHANCE BODY ARMOR INC [US]
• WO 9632621 A2 19961017 - DU PONT [US]
• "Conversion of Yarn to Fabric (Second Edition)", WEAVING, pages 140 - 143
• "Wellington Sears Handbook of Industrial Textiles", pages 625,626 - 820
• "Manmade Fiber and Textile Dictionary", pages 36
• "All-Fiber System Meets Needs of Fabric Engineering", 246,248 AND 250, pages 113-115 - 243-244
• "Structural Mechanics of Fibers,Yarns, and Fabrics", pages 330-335
• "Wellington Sear Handbook of Industrial Textiles", pages 555,559 - 563
• "Table showing fabric tightness factor calculation as compared to optically measured fabric tightness factor"
• "Table comparing fabric tightness factor calculations using D1,D7 and D8 equations to calculate yarn diameter"
• "Pictures of "Kevlar correctional"under the electron microscope"
• "Picture of"Style 331" under the electron microscope"

Cited by
WO2008016362A3

Designated contracting state (EPC)
DE FR GB IT NL

DOCDB simple family (publication)
WO 0037876 A1 20000629; AU 5550599 A 20000712; AU 755697 B2 20021219; BR 9917018 A 20050412; BR 9917018 B1 20101019; CA 2346980 A1 20000629; CA 2346980 C 20040511; CN 1118677 C 20030820; CN 1331794 A 20020116; DE 69927712 D1 20051117; DE 69927712 T2 20060706; DE 69927712 T3 20120516; DE 69939883 D1 20081218; EP 1141649 A1 20011010; EP 1141649 B1 20051012; EP 1141649 B2 20111123; EP 1496331 A1 20050112; EP 1496331 B1 20081105; HK 1040279 A1 20020531; IL 142522 A0 20020310; JP 2002533651 A 20021008; JP 3794924 B2 20060712; KR 100471335 B1 20050221; KR 20010089661 A 20011008; RU 2217682 C2 20031127; TW I227197 B 20050201

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US 9917937 W 19990810; AU 5550599 A 19990810; BR 9917018 A 19990810; CA 2346980 A 19990810; CN 99814833 A 19990810; DE 69927712 T 19990810; DE 69939883 T 19990810; EP 04024471 A 19990810; EP 99942041 A 19990810; HK 02101608 A 20020301; IL 14252299 A 19990810; JP 2000589891 A 19990810; KR 20017007805 A 20010620; RU 2001120340 A 19990810; TW 88112622 A 19990726