

Title (en)
HELMET WITH A PROTECTIVE LINER

Title (de)
HELM MIT SCHUTZAUSKLEIDUNG

Title (fr)
CASQUE AVEC DOUBLURE DE PROTECTION

Publication
EP 3422887 B1 20201118 (EN)

Application
EP 17760965 A 20170303

Priority
• US 201662303884 P 20160304
• US 2017020830 W 20170303

Abstract (en)
[origin: WO2017152151A1] Embodiments herein employ a novel strategy based on a floating cellular liner that acts as a torsional suspension system to dampen rotational acceleration, such as head acceleration in a helmet, in response to an oblique impact. Specifically, the torsional suspension consists of an anisotropic cellular liner that is at least partially recessed inside a more rigid adjacent shell, relative to which the cellular liner can simultaneously undergo translation and in-plane compression.

IPC 8 full level
A42B 3/12 (2006.01); **A42B 3/06** (2006.01)

CPC (source: EP)
A42B 3/064 (2013.01); **A42B 3/124** (2013.01)

Citation (opposition)
Opponent : Studio Torta Spa
• US 2015047110 A1 20150219 - CHILSON JAMES A [US]
• US 2006059605 A1 20060323 - FERRARA VINCENT R [US]
• US 2004117896 A1 20040624 - MADEY STEVEN M [US], et al
• DE 29917109 U1 20000127 - SCHUBERTH WERK KG [DE]
• US 2014013492 A1 20140116 - BOTTLANG MICHAEL [US], et al
• US 2012060251 A1 20120315 - SCHIMPF OLIVER [DE]
• WO 2014171889 A1 20141023 - MIPS AB [SE]
• GB 2518668 A 20150401 - DESIGN BLUE LTD [GB]
• EP 1942759 B1 20110907 - LLOYD SCOTLAND LTD [GB]
• HAKMI R: "Honeycomb Structure", WIKIPEDIA, 20 January 2016 (2016-01-20), pages 1 - 7, XP055927054, Retrieved from the Internet <URL:https://en.wikipedia.org/w/index.php?title=Honeycomb_structure&oldid=700800749> [retrieved on 20220601]
• ATLI BILIM: "Effect of geometric parameters on the in-plane crushing behavior of honeycombs and honeycombs with facesheets", THESIS, 1 January 2009 (2009-01-01), pages 1 - 194, XP055927058
• ANONYMOUS: "Auxetics", WIKIPEDIA, 3 March 2016 (2016-03-03), pages 1 - 4, XP055927233, Retrieved from the Internet <URL:https://en.wikipedia.org/w/index.php?title=Auxetics&oldid=707998388> [retrieved on 20220601]
• ZHANG J., ASHBY M. F.: "The out-of-plane properties of honeycombs", INT. J. MECH. SCI., vol. 34, no. 6, 1 January 1992 (1992-01-01), pages 475 - 489, XP055927247

Cited by
WO2021122546A1; EP3838042A1; EP3838043A1; WO2021122564A1; EP4082372A1; EP3785558A1; US2023011532A1; WO2022229874A1; WO2022229875A1; WO2022229876A1

Designated contracting state (EPC)
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)
WO 2017152151 A1 20170908; AU 2017228415 A1 20181011; AU 2017228415 B2 20191121; CN 109068783 A 20181221; CN 109068783 B 20221021; EP 3422887 A1 20190109; EP 3422887 A4 20200115; EP 3422887 B1 20201118

DOCDB simple family (application)
US 2017020830 W 20170303; AU 2017228415 A 20170303; CN 201780027218 A 20170303; EP 17760965 A 20170303