

Title (en)  
Safety document and/or document of value containing an electromechanical converter

Title (de)  
Sicherheits- und/oder Wertdokument enthaltend einen elektromechanischen Wandler

Title (fr)  
Document de sécurité et/ou de valeur contenant un convertisseur électromécanique

Publication  
**EP 2455228 A1 20120523 (DE)**

Application  
**EP 10191715 A 20101118**

Priority  
EP 10191715 A 20101118

Abstract (en)  
The document has an electromechanical converter including electrodes and a layer containing inorganic piezoelectric material arranged between the electrodes. The material is selected from a group including piezoelectric crystal, piezoelectric ceramics or material for piezoelectric thin layer based on barium titanate, lead zirconate titanate or silica. The converter is present between thermoplastic resin layers. An intermediate layer made of adhesive is present between the converter and the resin layers. The converter activates organic and polymer LED structures for lighting purposes. The electrodes are made of material selected from a group consisting of metals, metal alloys, conductive oligomer or polymer, conductive oxide and/or polymers filled with conductive fillers. The thermoplastic resin layers are formed as Teslin(RTM: Synthetic material). An independent claim is also included for a method for manufacturing a safety- and/or value document.

Abstract (de)  
Die vorliegende Erfindung betrifft ein Sicherheits- und/oder Wertdokument mit einem elektromechanischen Wandler als neuartigem Sicherheitselement, ein Verfahren zu dessen Herstellung sowie die Verwendung eines solchen elektromechanischen Wandlers als Sicherheitselement in Sicherheits- und/oder Wertdokumenten.

IPC 8 full level  
**B42D 15/00** (2006.01); **B42D 15/10** (2006.01)

CPC (source: EP US)  
**B42D 25/23** (2014.10 - EP US); **B42D 25/36** (2014.10 - EP); **B42D 25/373** (2014.10 - EP US); **B42D 25/47** (2014.10 - EP US)

Citation (applicant)  
• US 2004263028 A1 20041230 - PEI QIBING [US], et al  
• EP 2182559 A1 20100505 - BAYER MATERIALSCIENCE AG [DE]  
• WO 2004050766 A1 20040617 - DSM IP ASSETS BV [NL], et al  
• WO 2004050767 A1 20040617 - DSM IP ASSETS BV [NL], et al  
• DE 19522397 A1 19970102 - MERCK PATENT GMBH [DE]  
• US 6693657 B2 20040217 - CARROLL JR JAMES B [US], et al  
• WO 2006042714 A1 20060427 - TICONA GMBH [DE], et al  
• DE 2407674 A1 19741010 - TOKYO KOSEI KAKEN CO  
• DE 2407776 A1 19750904 - LICENTIA GMBH  
• DE 2715932 A1 19781019 - BAYER AG  
• DE 1900270 A1 19691106 - RHODIACETA  
• US 3692744 A 19720919 - RICH RENE, et al  
• DE 102007054046 A1 20090618 - BAYER MATERIALSCIENCE AG [DE]  
• WO 2010091796 A1 20100819 - BAYER MATERIALSCIENCE AG [DE], et al  
• SCHNELL: "Polymer Reviews", vol. 9, 1964, INTERSCIENCE PUBLISHERS, article "Chemistry and Physics of Polycarbonates"  
• D. FREITAG; U. GRIGO; P. R. MÜLLER; H. NOUVERTNE; BAYER AG: "Encyclopedia of Polymer Science and Engineering", vol. 11, 1988, article "Polycarbonates", pages: 648 - 718  
• DRES. U. GRIGO; K. KIRCHNER; P. R. MÜLLER; BECKER; BRAUN: "Kunststoff-Handbuch, Band 3/1, Polycarbonate, Polyacetale, Polyester, Celluloseester", vol. 3-1, 1992, CARL HANSER VERLAG MÜNCHEN, article "Polycarbonate", pages: 117 - 299

Citation (search report)  
• [XYI] JP 2004078731 A 20040311 - FUJITSU LTD  
• [Y] DE 102007048102 A1 20090409 - KURZ LEONHARD FA [DE], et al

Cited by  
WO2018054765A1

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

Designated extension state (EPC)  
BA ME

DOCDB simple family (publication)  
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