Title (en)
Flat hairspring for a clock balance wheel and balance wheel -hairspring assembly

Title (de)
Flache Spirale für Unruh einer Uhr und gesamte Spiral-Unruh-Einheit

Title (fr)
Spiral plat pour balancier d'horlogerie et ensemble balancier-spiral

Publication
EP 2299336 A3 20171011 (FR)

Application
EP 10405172 A 20100916

Priority
• CH 14542009 A 20090921
• CH 3192010 A 20100309

Abstract (en)
[origin: EP2299336A2] The hairspring has a wound strip shaped to ensure a concentric development of hairspring and a zero force on pivots and on a fixing point during rotation of less than 360 degrees of inner end relative to outer end in directions from a rest position, where the hairspring is formed from fragile and crystalline materials and silicon. Stiffness of the strip gradually decreases beyond 360 degrees from a point located between the lower end and a turn and from another point located between the outer end and a last turn, where the lowest stiffness is situated in a median part of the strip.

IPC 8 full level
G04B 17/06 (2006.01); **G04B 17/20** (2006.01)

CPC (source: EP US)
G04B 17/066 (2013.01 - EP US); **G04B 17/20** (2013.01 - EP US)

Citation (search report)
• [AD] EP 1593004 A2 20051109 - ETA SA MFT HORLOGERE SUISSE [CH]
• [AD] US 209642 A 18781105
• [A] CA 910060 A 19720919 - TIMEX CORP

Cited by
EP4372479A1; CN104813241A; CH706087A1; EP3159749A1; EP3159748A1; RU2707823C2; EP3159750A1; EP3159747A1; CN106990699A; EP2687917A3; RU2714953C2; EP3214506A1; RU2726019C2; US10564605B2; EP2908183A1; CN104849995A; WO2013034962A1; WO2014203085A1; WO2016192957A1; US9239569B2; US10012954B2; US10474104B2; FR3088396A1; WO2017163148A1; US10018964B2; US11249440B2; EP4293428A1; WO2023242746A1; WO2023242756A1; TWI738673B; TWI721025B; EP3913441A1; EP2407831A1; US8562206B2; US9134701B2

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 SE SI SK SM TR

Designated extension state (EPC)
BA ME RS

DOCDB simple family (publication)
EP 2299336 A2 20110323; **EP 2299336 A3 20171011**; **EP 2299336 B1 20190424**; CH 701846 A1 20110331; CH 701846 B1 20140715; CH 701846 B8 20150615; CN 102023558 A 20110420; CN 102023558 B 20140820; JP 2011064687 A 20110331; JP 5496034 B2 20140521; US 2011069591 A1 20110324; US 8348497 B2 20130108

DOCDB simple family (application)
EP 10405172 A 20100916; CH 3192010 A 20100309; CN 201010520935 A 20100920; JP 2010209805 A 20100917; US 88354010 A 20100916