

Title (en)  
Balance-spring resonator spiral and its method of fabrication

Title (de)  
Spiralfeder der Resonatorunruh und Fabrikationsmethode

Title (fr)  
Spiral de résonateur balancier-spiral

Publication  
**EP 1655642 A3 20060927 (FR)**

Application  
**EP 06003086 A 20040202**

Priority  
• EP 04707219 A 20040202  
• EP 03075362 A 20030206  
• EP 06003086 A 20040202

Abstract (en)  
[origin: EP1445670A1] The spring (10) has windings that are made of a single band extending from an inside curve (11) to an outside curve (14). The inside curve is extended by a self blocking washer (17) that allows the spring to be fixed on axis (9) of a balance-wheel. A rectangular section having a non-uniform thickness (e) is presented between an attachment to a center and an attachment to outside. An independent claim is also included for a method of manufacturing a hair-spring from a board in an amorphous or crystalline material.

IPC 8 full level  
**G04B 17/34** (2006.01); **G04B 17/06** (2006.01); **G04D 3/00** (2006.01)

CPC (source: EP KR US)  
**G04B 17/066** (2013.01 - EP KR US); **G04B 17/34** (2013.01 - US); **G04B 17/345** (2013.01 - EP KR US); **G04D 3/0041** (2013.01 - EP KR US); **G04D 3/0069** (2013.01 - EP KR US)

Citation (search report)  
• [XAY] US 3430435 A 19690304 - DUMONT MARCEL  
• [YA] DE 7112818 U 19730419  
• [Y] EP 0732635 A1 19960918 - SUISSE ELECTRONIQUE MICROTECH [CH]  
• [A] FR 2386850 A1 19781103 - FAR FAB ASSORTIMENTS REUNIES [CH]

Cited by  
EP2104007A1; EP4224257A1; WO2009115463A1; EP1921516A1; CN105299113A; EP1921518A1; EP1921517A1; EP2390732A1; CN102906646A; EP2322996A1; CN103930837A; WO2009115470A1; WO2011147782A1; WO2013045706A3; WO2008135817A3; US7438465B2; US7572050B2; US8636403B2; US9342053B2; EP2104008A1; US8523426B2; EP2400351A1; US8439557B2; US7575369B2; WO2014146842A1; DE212014000091U1; EP2104006A1; US9459589B2; WO2013045706A2; US8491182B2; US9411314B2; EP2105807A1; US8296953B2; US8622611B2; EP2104005A1; EP2485095A1; EP2595005A1; WO2013072158A1; US8550699B2; DE212012000207U1; EP3181939B1; EP3181940B1; EP3181938B1

Designated contracting state (EPC)  
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR

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**EP 1445670 A1 20040811**; AT E486304 T1 20101115; CN 100435044 C 20081119; CN 1745341 A 20060308; DE 602004023518 D1 20091119; DE 602004029762 D1 20101209; EP 1593004 A2 20051109; EP 1593004 B1 20101027; EP 1655642 A2 20060510; EP 1655642 A3 20060927; EP 1655642 B1 20091007; EP 2175328 A2 20100414; EP 2175328 A3 20110330; EP 2175328 B1 20140730; HK 1084737 A1 20060804; JP 2006516718 A 20060706; JP 2013015534 A 20130124; JP 5122073 B2 20130116; JP 5389999 B2 20140115; KR 20050098881 A 20051012; TW 200426547 A 20041201; US 10444706 B2 20191015; US 2006055097 A1 20060316; US 2015277382 A1 20151001; US 2019107809 A1 20190411; WO 2004070476 A2 20040819; WO 2004070476 A3 20041223

DOCDB simple family (application)  
**EP 03075362 A 20030206**; AT 04707219 T 20040202; CN 200480003387 A 20040202; DE 602004023518 T 20040202; DE 602004029762 T 20040202; EP 04707219 A 20040202; EP 06003086 A 20040202; EP 10151818 A 20040202; EP 2004000931 W 20040202; HK 06104914 A 20060425; JP 2005518308 A 20040202; JP 2012202260 A 20120914; KR 20057014243 A 20050803; TW 93102542 A 20040204; US 201514681535 A 20150408; US 201816210811 A 20181205; US 54464405 A 20050805