

Title (en)

Thermally compensated balance-hairspring resonator

Title (de)

Spiralfeder-Unruh-Resonator mit Thermokompensation

Title (fr)

Résonateur balancier-spiral thermocompensé

Publication

**EP 1519250 A1 20050330 (FR)**

Application

**EP 03021787 A 20030926**

Priority

EP 03021787 A 20030926

Abstract (en)

The resonator has an elastic spiral with coils and formed from a quartz mono crystal, and a balancer with a moment of inertia. The spiral is engraved in a precut plate (3) such that the height of the coils forms an angle with a cryptographic axis, after rotating around an x-axis, to adapt the thermal property of the spiral to that of the balancer. An independent claim is also included for a method of manufacturing a resonator.

Abstract (fr)

Le spiral est structuré par photolithographie et gravure dans une lame préalablement découpée dans un monocristal de quartz de sorte que la hauteur h des spires forment avec l'axe cristallographique z un angle  $\theta$  permettant d'adapter le comportement thermique du spiral à celui du balancier en réduisant ainsi l'écart de marche du aux variations de température. <IMAGE>

IPC 1-7

**G04B 17/06**

IPC 8 full level

**G04B 17/06** (2006.01); **G04B 17/22** (2006.01); **G04B 18/04** (2006.01)

CPC (source: EP KR US)

**G04B 17/222** (2013.01 - EP KR US); **G04B 18/04** (2013.01 - KR)

Citation (applicant)

EP 0732635 A1 19960918 - SUISSE ELECTRONIQUE MICROTECH [CH]

Citation (search report)

- [XAY] EP 0732635 A1 19960918 - SUISSE ELECTRONIQUE MICROTECH [CH]
- [Y] EP 1302821 A2 20030416 - FRANCK MULLER WATCHLAND SA [CH]
- [A] US 2003011119 A1 20030116 - IMAI MASATO [JP]

Cited by

EP2703909A1; JP2009517637A; EP2703910A3; EP3056948A1; WO2012127035A1; EP1791039A1; WO2007059876A2; US7753581B2; JP2008501967A; EP2703910A2; US9030920B2; US9903049B2

Designated contracting state (EPC)

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