

Title (en)
Paired balance wheel - hairspring resonator

Title (de)
Gepaarter Unruh-Spiralfeder-Resonator

Title (fr)
Résonateur balancier - spiral appairé

Publication
EP 2703910 B1 20190508 (FR)

Application
EP 13179958 A 20130809

Priority
• EP 12182973 A 20120904
• EP 13179958 A 20130809

Abstract (en)
[origin: EP2703909A1] The resonator (1) has a balance spring (5) formed in a single crystal quartz with three crystallographic axes, where the first and second axes are electrical axis and mechanical axis, respectively. The thermal expansion coefficient of a balance (3) lies between + 6 part per million degree Celsius -1 and + 9.9 part per million degree Celsius -1. Cut angle ranging between - 5 degree and + 5 degree is formed between the balance spring and the third axis of the single crystal quartz such that the resonator is less sensitive to temperature variation. A portion of the balance is made of titanium, platinum or durimphy.

IPC 8 full level
G04B 17/06 (2006.01)

CPC (source: CH EP RU US)
G04B 17/063 (2013.01 - EP US); **G04B 17/066** (2013.01 - EP US); **G04B 17/20** (2013.01 - CH); **G04C 3/04** (2013.01 - US);
G04B 17/22 (2013.01 - RU)

Citation (examination)
US 2010034057 A1 20100211 - LEVINGSTON GIDEON [FR]

Designated contracting state (EPC)
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DOCDB simple family (publication)
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EP 2703910 B1 20190508; JP 2014052374 A 20140320; JP 6328392 B2 20180523; RU 2013140777 A 20150310; RU 2643195 C2 20180131;
US 2014064044 A1 20140306; US 9030920 B2 20150512

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