

Title (en)
TIMEPIECE OSCILLATOR

Title (de)
OSZILLATOR FÜR UHR

Title (fr)
OSCILLATEUR HORLOGER

Publication
EP 3584640 B1 20230111 (FR)

Application
EP 19183765 A 20160613

Priority
• EP 19183765 A 20160613
• EP 16174244 A 20160613

Abstract (en)
[origin: US2017357213A1] A timepiece shaft (1), especially a balance shaft (1), comprising a first functional portion (2a; 2b) including at least one part (221a, 221b) of a pivot-shank (22a; 22b) and/or at least one part (211a, 211b) of a pivot (21a, 21b), the first functional portion being made of ceramic and a first outer diameter (D1) of the first functional portion being less than 0.5 mm, or less than 0.4 mm, or less than 0.2 mm, or less than 0.1 mm

IPC 8 full level
G04B 13/02 (2006.01); **G04B 1/16** (2006.01); **G04B 15/14** (2006.01)

CPC (source: CH CN EP US)
G04B 1/16 (2013.01 - CN EP US); **G04B 13/02** (2013.01 - EP US); **G04B 13/022** (2013.01 - US); **G04B 13/026** (2024.01 - CH CN);
G04B 15/14 (2013.01 - CN EP US); **G04B 17/063** (2013.01 - CH CN US); **G04B 17/32** (2013.01 - CH CN); **G04B 17/34** (2013.01 - CN US);
G04B 31/00 (2013.01 - CH CN); **G04B 31/06** (2013.01 - US)

Citation (opposition)
Opponent : ICB SA
• JP 5135528 B2 20130206
• JP 3055407 B2 20000626
• EP 2142965 B1 20101110 - ETA SA MFT HORLOGERE SUISSE [CH]
• WO 2015185423 A2 20151210 - NIVAROX SA [CH]
• EP 2757424 A1 20140723 - OMEGA SA [CH]
• GB 655161 A 19510711 - LINDE AIR PROD CO
• GB 2416408 B 20060607 - LEVINGSTON GIDEON [FR]
• EP 2727880 A1 20140507 - GFD GES FUER DIAMANTPRODUKTE MBH [DE], et al
• EP 2735540 A1 20140528 - DIAMAZE MICROTECHNOLOGY S A [CH], et al
• CH 702431 B1 20150529 - SUISSE ELECTRONIQUE MICROTECH [CH]
• CH 269552 A 19500715 - LINDE AIR PROD CO [US]
• US 6755566 B2 20040629 - DAMASKO KONRAD [DE]
• 1 January 1993, EDITIONS SCRIPTAR S.A., LA CONVERSION/SUISSE , article DANIELS GEORGE: "La montre : Principes et méthodes de fabrication. Passage", pages: 80 - 81, XP055791472
• NARDIN M, BOOLSKY R.: "Nouveaux pivotages de balanciers", 06 CONGRÈS INTL. DE CHRONO, 1 January 1959 (1959-01-01), pages 695 - 700, XP055791478
• WILLIAM D. CALLISTER, DAVID G. RETHWISCH: "Materials science and engineering an introduction (8th Edition)", 1 January 2011, JOHN WILEY & SONS, ISBN: 0-470-50586-9, article WILLIAM D. CALLISTER JR., DAVID G. RETHWISCH: "Chapter 12 - Structures and Properties of Ceramics", pages: 451 - 500, XP009553972

Designated contracting state (EPC)
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DOCDB simple family (publication)
EP 3258325 A1 20171220; **EP 3258325 B1 20191030**; CH 712552 A2 20171215; CH 712552 B1 20211215; CN 107490950 A 20171219; CN 107490950 B 20210507; CN 113110010 A 20210713; EP 3584640 A1 20191225; EP 3584640 B1 20230111; EP 4177677 A1 20230510; JP 2018028529 A 20180222; JP 2023011848 A 20230124; JP 7214335 B2 20230130; US 11982977 B2 20240514; US 2017357213 A1 20171214; US 2022373977 A1 20221124

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