

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Gopalakrishnan
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AND SCORING

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**PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT
NO. 10,595,731 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42**

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EXHIBITS

- APPLE-1001 U.S. Pat. No. 10,595,731 to Gopalakrishnan (“the ’731 patent”)
- APPLE-1002 Excerpts from the Prosecution History of the ’731 patent (“the Prosecution History”)
- APPLE-1003 Declaration of Dr. Bernard A. Chaitman
- APPLE-1004 PCT Patent Publication WO2012/140559 (“Shmueli”)
- APPLE-1005 U.S. Patent Publication 2014/0275840 (“Osorio”)
- APPLE-1006 Li Q, Clifford GD, “Signal quality and data fusion for false alarm reduction in the intensive care unit,” J Electrocardiol. 2012 Nov-Dec; 45(6):596-603 (“Li-2012”)
- APPLE-1007 U.S. Patent Publication 2008/0004904 (“Tran”)
- APPLE-1008 U.S. Patent Publication 2014/0107493 (“Yuen”)
- APPLE-1009 U.S. Patent Publication 2015/0119725 (“Martin”)
- APPLE-1010 U.S. Provisional Application No. 61/794,540 (“OP”)
- APPLE-1011 Lee J, Reyes BA, McManus DD, Mathias O, Chon KH. Atrial fibrillation detection using a smart phone. International Journal of Bioelectromagnetism, Vol. 15, No. 1, pp. 26 - 29, 2013 (“Lee 2013”)
- APPLE-1012 Tsipouras MG, Fotiadis DI. Automatic arrhythmia detection based on time and time-frequency analysis of heart rate variability. Comput Methods Programs Biomed. 2004 May; 74(2):95-108 (“Tsipouras 2004”)
- APPLE-1013 Lu S, Zhao H, Ju K, Shin K, Lee M, Shelley K, Chon KH. Can photoplethysmography variability serve as an alternative

approach to obtain heart rate variability information? J Clin Monit Comput. 2008 Feb; 22(1):23-9 (“Lu 2008”)

- APPLE-1014 Selvaraj N, Jaryal A, Santhosh J, Deepak KK, Anand S. Assessment of heart rate variability derived from finger-tip photoplethysmography as compared to electrocardiography. J Med Eng Technol. 2008 Nov-Dec; 32(6):479-84 (“Selvaraj 2008”)
- APPLE-1015 Lu G, Yang F, Taylor JA, Stein JF. A comparison of photoplethysmography and ECG recording to analyse heart rate variability in healthy subjects. J Med Eng Technol. 2009; 33(8):634-41 (“Lu 2009”)
- APPLE-1016 Suzuki T, Kameyama K, Tamura T. Development of the irregular pulse detection method in daily life using wearable photoplethysmographic sensor. Annu Int Conf IEEE Eng Med Biol Soc. 2009; 2009:6080-3 (“Suzuki 2009”)
- APPLE-1017 Reed MJ, Robertson CE, Addison PS. Heart rate variability measurements and the prediction of ventricular arrhythmias. QJM. 2005 Feb; 98(2):87-95 (“Reed 2005”)
- APPLE-1018 Schäfer A, Vagedes J. How accurate is pulse rate variability as an estimate of heart rate variability? A review on studies comparing photoplethysmographic technology with an electrocardiogram. Int J Cardiol. 2013 Jun 5; 166(1):15-29 (“Schafer 2013”)
- APPLE-1019 K. Douglas Wilkinson, “The Clinical Use of the Sphygmomanometer,” The British Medical Journal, 1189-90 (Dec. 27, 1924) (“Wilkinson”)
- APPLE-1020 U.S. Pat. No. 6,095,984 (“Amano”)
- APPLE-1021 B.K. Bootsma et. al, “Analysis of R-R intervals in patients with atrial fibrillation at rest and during exercise.” Circulation 1970; 41:783-794

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