

Title (en)
METHOD FOR DETECTING A BEARING FAULT IN A ROTATING SYSTEM AND MONITORING SYSTEM IMPLEMENTING THIS METHOD

Title (de)
VERFAHREN ZUR ERKENNUNG EINES LAGERFEHLERS IN EINEM DREHSYSTEM UND ÜBERWACHUNGSSYSTEM ZUR DURCHFÜHRUNG
DIESES VERFAHRENS

Title (fr)
PROCÉDÉ DE DÉTECTION D'UN DÉFAUT DE ROULEMENT D'UN SYSTÈME ROTATIF ET SYSTÈME DE SURVEILLANCE METTANT EN
OEUVRE CE PROCÉDÉ

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Application
EP 22769764 A 20220809

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Abstract (en)
[origin: WO2023017226A1] According to one aspect, the invention relates to a method (100) for detecting a fault in a bearing of a rotating system, which comprises the following steps: a) acquiring (110) a position signal of the bearing ($0[n]$), a vibration signal of the bearing ($x[n]$) and a theoretical characteristic vector of the bearing ($V_{the} = [BPFO_{the}, BPFi_{the}, BSF_{the}, FTF_{the}, SRF]$); b) determining (120) a deterministic portion of the vibration signal and eliminating said deterministic portion to obtain a residual signal ($r[n]$) as a function of the position signal; c) calculating (130), from the theoretical characteristic vector, lower bounds ($V_{Low} = [BPFOLow, BPFiLOW, BSFLow, FTFLOW, SRF]$) and upper bounds ($V_{Hi} = [BPFOHi, BPFiHi, BSFHi, FTFHi, SRF]$) of fault frequencies; d) calculating (140), from the vibration signal, a spectral coherence and the square of the amplitude of the spectral coherence ($\Gamma^2_{r(fast)}(\alpha, f_k)$); e) calculating (150), from the square of the amplitude of the spectral coherence and the lower and upper bounds of the fault frequencies, an actual characteristic vector of the bearing ($V_{act} = [BPFO_{act}, BPFi_{act}, BSF_{act}, FTF_{act}, SRF]$); f) determining (160) a spectral cyclic contrast of the fault ($EBPFo(f_k)$, $EBPFI(f_k)$, $EBSF(f_k)$, $EFTF(f_k)$); g) precisely identifying (170) signatures of interest by calculating a weighted and integrated cyclic coherence associated with the fault ($JBPFo(\alpha)$, $JBPFI(\alpha)$, $JBSF(\alpha)$, $JFTF(\alpha)$); h) determining (180) diagnostic indicators that can be easily interpreted by an operator.

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