

Title (en)  
APPARATUS AND METHOD FOR NON-INVASIVE, PASSIVE FETAL HEART MONITORING

Title (de)  
VORRICHTUNG UND VERFAHREN ZUR NICHTINVASIVEN, PASSIVEN BEOBACHTUNG EINES FATALEN HERZENS

Title (fr)  
APPAREIL ET PROCEDE PASSIFS ET NON INVASIFS POUR SURVEILLER LA FREQUENCE CARDIAQUE FOETALE

Publication  
**EP 1168961 A4 20030502 (EN)**

Application  
**EP 00916231 A 20000310**

Priority  
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• US 12444799 P 19990315

Abstract (en)  
[origin: WO0054650A2] An apparatus and method for fetal heart and maternal heart and uterine monitoring is provided which acquire biopotential waveforms indicative of the mother's heart beat from sensors located at or near the mother's chest, and waveforms indicative of the combined maternal and fetal heart beats from abdominal sensors located on the mother's abdomen, lower back, or both. The signals from the abdominal sensors are divided into a plurality of channels. An adaptive signal processing filter (ASPF) algorithm or other suitable algorithm is then used to cancel the estimated maternal waveform from each channel derived from the abdominal sensors. The system then selects from the resulting waveforms at least one waveform to serve as the reference fetal waveform. The reference waveform is then processed against the other abdominal waveforms preferably using the ASPF algorithm again to form an enhanced fetal signal that is a representation of the fetus's biopotential electrocardiogram (EKGf). The EKGf can subsequently be used to measure fetal heart rate and other biophysical profile parameters. Surface electromyogram (EMG) signals allow for concurrent monitoring of uterine contractions and afford improved cancellation of motion artifacts.  
[origin: WO0054650A2] An apparatus, a method for fetal heart, maternal heart, and uterine monitoring is provided which acquire bio-potential wave forms indicative of the mother's heart beat from sensors (10) located at or near the mother's chest; wave forms indicative of the combined maternal, and fetal heartbeats from the abdominal sensors located on the mother's abdomen, lower back, or both. The signals from the abdominal sensors are divided into a plurality of channels. An adaptive signal processing filter (ASPF) algorithm or suitable algorithm is then used to cancel the estimated maternal waveform from each channel derived from the abdominal sensors. The system then selects from the resulting wave forms at least one wave form to serve as the reference fetal wave form. The reference wave form is then processed against the other abdominal wave forms preferably using the ASPF algorithm again to form an enhanced fetal signal that is a representation of the fetus's bio-potential electrocardiogram (EKG). The EKG can subsequently be used to measure fetal heart rate, and other biophysical profile parameters. Surface electromyogram (EMG) signals allow for concurrent monitoring of uterine contractions, and afford improved cancellation of motion artifacts.

IPC 1-7  
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IPC 8 full level  
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Citation (search report)  
• [A] US 4945917 A 19900807 - AKSELROD SOLANGE [IL], et al  
• [A] US 5372139 A 19941213 - HOLLS WILLIAM M [US], et al  
• [X] ALPAR H ET AL: "On-line Monitoring Of Fetal ECG", ENGINEERING IN MEDICINE AND BIOLOGY SOCIETY, 1990., PROCEEDINGS OF THE TWELFTH ANNUAL INTERNATIONAL CONFERENCE OF THE IEEE PHILADELPHIA, PA, USA 1-4 NOV. 1990, NEW YORK, NY, USA, IEEE, US, 1 November 1990 (1990-11-01), pages 1224 - 1225, XP010036208, ISBN: 0-87942-559-8

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