(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :08/10/2026

(21) Application No.202631120748 A

(43) Publication Date : 16/10/2026

(54) Title of the invention : Wearable multi-modal physiological monitoring system for real-time assessment of ventilatory threshold and motor-unit recruitment during dynamic exercise

(51) International classification	:A61B 5/00, A61B 5/11, A61B 5/113, A61B 5/08, A61B 5/0205
(31) Priority Document No	:NA
(32) Priority Date	:NA
(33) Name of priority country	:NA
(86) International Application No Filing Date	: :01/01/1900
(87) International Publication No	: NA
(61) Patent of Addition to Application Number Filing Date	:NA :NA
(62) Divisional to Application Number Filing Date	:NA :NA

(71)**Name of Applicant :**
1)Swami Vivekananda University
Address of Applicant :Swami Vivekananda University, Telinipara, Barasat - Barrackpore Rd, Bara Kanthalia, Kolkata, WestBengal – 700121, India. West Bengal India
(72)**Name of Inventor :**
1)Dr. Priya Nandy

(57) Abstract :
A wearable multi-modal physiological monitoring system is disclosed for real-time assessment of ventilatory threshold behaviour and motor-unit recruitment during dynamic exercise. A peripheral sensing unit uses dry-contact surface electromyography electrodes, a tri-axial inertial measurement unit, an analog front end, and a data converter to obtain motion-referenced muscle signals. A thoracic hub supported by an elastic chest strap uses a piezoelectric strain sensor and an acoustic contact respiratory sensor to obtain respiratory-mechanics signals. An embedded microcontroller suppresses motion artifact from the muscle signal, derives median-frequency and mean-frequency trends and a muscle-fatigue index, determines respiratory rate from the thoracic signals, and temporally aligns the neuromuscular and respiratory metrics. A ventilatory-threshold marker is identified from a correlated respiratory breakpoint and sustained muscle-frequency decline. Processed metrics are transmitted through a low-energy wireless interface to a remote display.

No. of Pages : 26 No. of Claims : 6