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(57) Abstract :

An energy harvesting shoes is comprising, triboelectric nanogenerators 101 (TENGs) generates electricity from user movement, and flexible solar panels 102 captures sunlight, a learning wheel support 107 deploys skating wheels, a horizontally oriented L-shaped hydraulic piston 107a with an Omni-directional wheel 107b to assist novice skaters, a slope braking module 103 includes an AI-powered camera 103a and a motorized rubber friction block 103b to respond autonomously to downhill terrain, a mobility assistance module 104 features a telescopic rod electromagnetically coupled to one shoe, an AI and machine learning (ML) module manages energy from TENGs and solar panels 102 and supplies it to an integrated USB port 105, a holographic projector 106 for navigation guidance and avoiding obstacles, speaker for prompting or alerting the user with audio messages, and microphone for receiving verbal commands or confirmations from the user for shoes activation or control.

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