**Ergonomically designed combat boot**

**Problem Identified:**

Military recruits walk about 11 km per day thus absorbs about 351000 N impact force during carrying of 4.2 kg rifle in hand that is transmitted to the joints of lower extremities with increased risk of foot injuries. The existing heavy weight boot without impact force absorbing insocks also poses possibility of injuries during military activities over long duration. In addition, the burden/weight of existing boots increases the energy expenditure.

**Innovative approach to solve the problem:**

Light weight boot is constructed on ergonomic principles with improved functional features for different terrains, impact force absorbing insocks, and, shock absorption ability. It improves balance and stability during walking uphill and in real terrain conditions either with or without load. It reduces transfer of impact force to the lower extremities and minimizes risk of falls and overuse injuries. Reduction in energy expenditure delays onset of fatigue and enhances walking efficiency and mobility.

**Potential benefits of the new invention:**

1. Ergonomically designed for better fit, comfort, safety and suability.
2. Besides military personnel, construction workers, recreational mountaineers and trekkers will also be benefited considering its utility over multiple terrains.
3. Ergonomic combat boot weighs less than 1.5 kg., has antistatic, antiskid, anti-penetration, oil/acid resistant properties.
4. The present invention introduces a textile anti-penetration insole by replacing the traditional steel-plate anti-penetration midsole.
5. The advanced sole system comprises of outsole, midsole, anti-perforation insole, visco-elastic insock, together constituting an efficient impact shock absorbing bed.
6. The advanced outsole architecture is impregnated with five different varieties of cleats which offer stronger grip and better slip resistance.
7. The Speed shoe lacing technique with zip, heavy duty eyelets and closed type hook allow faster mode of wearing which is significantly contributing to the wearing time economy.
8. The inner lining is highly breathable which permits the passage of air and sweat generated during vigorous activities. This will reduce the chances of harmful microbial growth.
9. The PU foam sandwiched between the outer and inner provides sufficient cushioning and comfort.
10. The outer part of leather and nylon textile has water repellent property.
11. Advanced leather at the vamp and nylon outer at the upper ankle provide adequate flexibility at the ankle and toes of the feet.

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