PES's MODERN COLLEGE OF ENGINEERING
Department of Mechanical Engineering
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"DESIGN AND DEVELOPMENT OF FLOATING BACKPACK"

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Abstract: **The purpose of this project is to design and development of floating bag. Our project proposes to design a backpack that permits the load to move relative to the wearer during walking and running so that the large movements between the load and the wearer of the backpack reduce the fluctuations of vertical motion of the load with respect to ground. Because the hip (and thus the pack body) goes up a down a good deal during walking, a large relative movement between the wearer and the load reduces the absolute excursion of the load. The suspended-load backpack includes a suspension system having a first portion connected to shoulder straps directly or through an interface and a second portion connected to the pack body and a compliant mechanism that permits the second portion of the suspension system and the pack body to move up and down relative to the first portion of the suspension system in accordance with a gait of the wearer of the backpack.**

Introduction

- In army, load carriage is an unavoidable part of field operations which is the reason why soldiers often make use of a military backpack.
- Soldiers usually carry loads weighting more than 30% of their body weight.
- When the soldier carries a certain weight, his energy expenditure increases, which causes a reduction in performance.

Aim:

To develop a floating bag ,which will reduce injury.

Objectives:

i. To develop a load carriage system that reduce shock

ii. To reduces its vertical displacement and moment

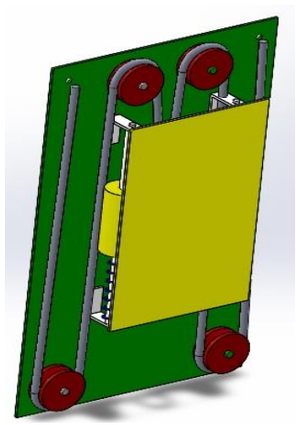
iii. To eliminate injuries, which are caused because of carrying heavy load

Results

Field Trials is an integral part of a project. It not only gives the idea of the working condition of the project, but we also come to know about the problems in the model.

1. FAST RUNNING BY 3 INDIVIDUALS AND THEIR EXPERIENCE WITH VARING WEIGHT
2. JUMPING WITH THE BACKPACK
3. FIELDCRAFT MOVEMENTS

Prototype Model Layout and Photograph



Conclusions

1. By using this mechanism we can reduce dynamic forces which act on body during running and walking.
2. This mechanism reduces chances of injury from to much strain on back, neck and knees.
3. It helps in long marches with less stress on body

References

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2. ENERGY COST AND MECHANICAL WORK OF WALKING DURING LOAD CARRIAGE IN SOLDIERS. GRENIER JG, PEYROT N, CASTELLS J, OULLION R, MESSONNIER L, MORIN JB.MED SCI SPORTS EXERC. 2012 JUN;44(6):1131-40. DOI: 10.1249/MSS.0B013E3182456057.PMID: 22215177