

SMART FRUIT HARVESTING BASKET

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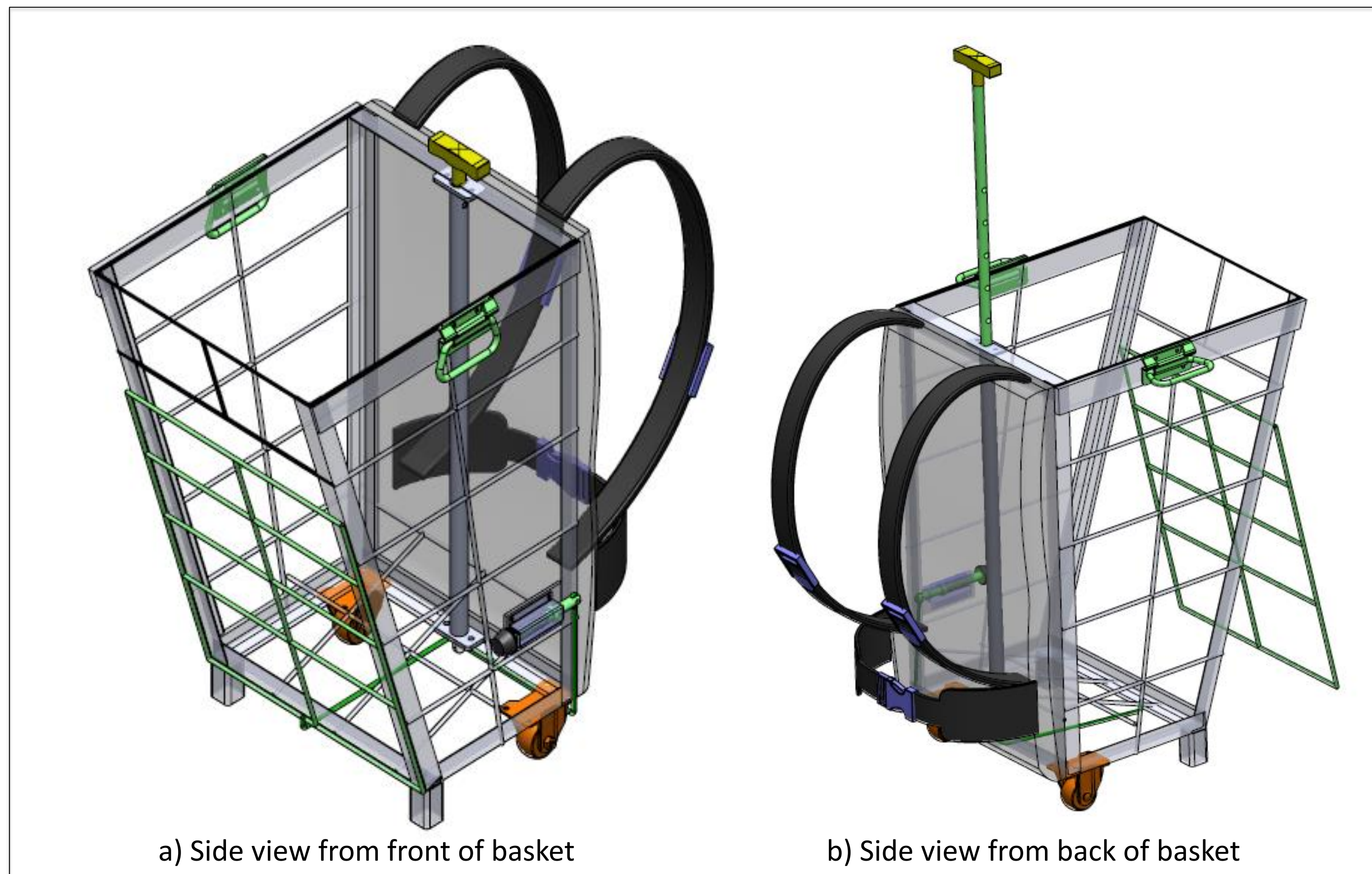


Figure 1: ISO view of invention

INTRODUCTION OF TECHNOLOGY

Pineapple harvesting contributes to musculoskeletal diseases (MSD) among this agricultural sector. In Malaysia, pineapples are harvested manually using rattan baskets and workers carry cumulatively 500-600 kg of fruits per day. Workers need to bend excessively and are exposed to contact stress. This invention was developed to improve MSD in the long run, specifically reduce discomfort and physiological workload of harvesters.

INVENTION

This invention relates to an improved design of a basket which can be held on shoulders by workers and can be used to collect and transfer heavy units preferably fruits more preferably bigger fruits such as pineapples. For ease of the worker, the basket is provided in:

- A rigid frame of rectangular trapezoid shaped basket with an open top for harvesting of produce
- A door opening connected to the front side of the basket for unloading the basket
- A latch spring mechanical mechanism attached to a hook connected to the door opening
- A pair of adjustable shoulder harness and waist strap attached at rear of the basket
- A back pad and wheels so that the basket can be easily dragged when required.

ADVANTAGES

- Reduces physiological work load; mean energy expenditure and mean heart rate reduced
 - Excessive load carrying is reduced as design is 30% smaller from existing basket; productivity is maintained
- Reduced level of discomfort; even distribution of weight at shoulder, lessen awkward movement, eliminate excessive bending
- Reduced contact stress; placement of padding on the back, adjustable harness as shoulder straps and waist strap

Constrain in work process & ill-health effects due to use of existing harvesting basket

Industry started in 1921; peat soil, soft structure, wheelbarrow not suitable



1) Solid Rattan basket, home-made straps, discomfort at shoulder, uneven weight distribution on shoulder and back



3) To unload fruits, workers bend excessively > 60° (exceed 45°, NIOSH recommendations)



2) 50 kg-70 kg, in 1 day, cumulative weight between 500-600 kg
* ILO Maximum Weight Convention, 1967 (No. 127), stated maximum weight is 55 kg

Figure 2: Problems associated with harvesting using existing basket

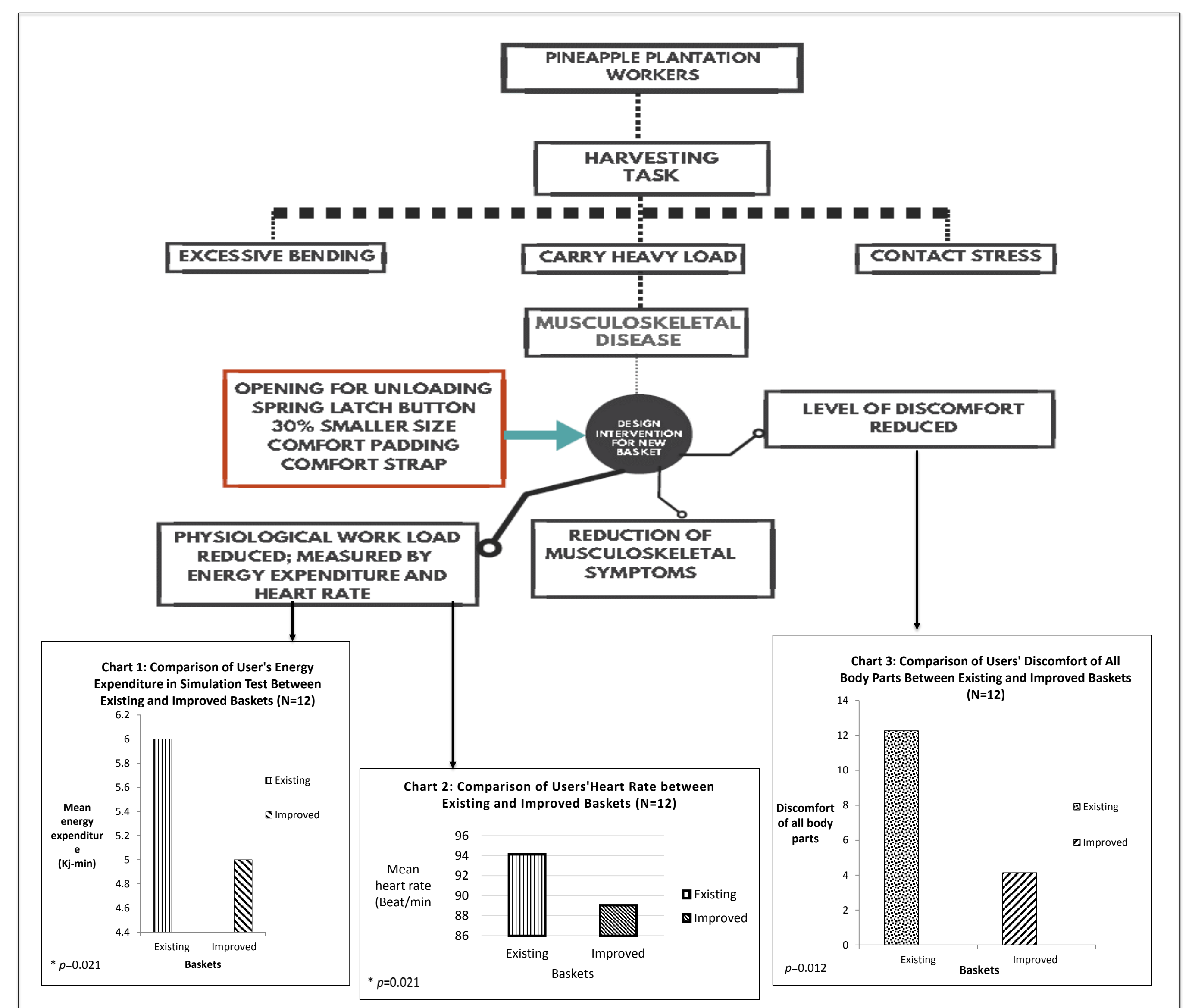


Figure 3: Laboratory simulation test results between existing and improved baskets

MARKET POTENTIAL

There are 3,062 pineapple estates in Malaysia (2012) and 16,850 acre of plantations (2010), producing 416,00 tonne metric fruits. Malaysia is 9th world exporter. Pineapples grow best on peat soil (like in Malaysia) which requires manual handling tools. Globally, Costa Rica, Thailand and Philippines, Indonesia, Kenya, Brazil, Ivory Coast, South Africa, India, Taiwan and Australia are also pineapple producers. Some of these countries still uses manual tool.

SOCIAL BENEFIT

Invention will enable workers to perform tasks in safe and healthy manner as required by the Occupational Safety and Health Act 1994. Other benefits includes:

- Increased productivity and reduce costs of operation from sickness absences related musculoskeletal symptoms and disease
- Protect workers' wellbeing in the long run.



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