

Why chaiwala ?

Considering the intensity of work and erratic working hours that form the tenor of the job, the chaiwala community is grappling with musculoskeletal as well as muscular problems that get accredited by virtue of the awkward sustained postures.

They have to constantly switch between different postures as new customers come and go rapidly. Slacking off might lead to a wage cut. This constant action will lead to back problems which is why we selected chaiwalas as area of research and intervention.

What is chai bag ?

Chai bag is an accessory that aims to improve the physical ergonomics of "chaiwalas at railway stations". The design focuses on enhancing the experience related to the existing tea canister rather than changing the canister itself.



Location

Pune railway station



The body posture is analyzed using the REBA method by articular angles measurement, observing the force load and movements' repetitiveness and the postural changes' frequency. The neck, trunk, upper and lower arms, legs and wrists' postures are assembled into ranges. Each positional range, corresponding to the anatomical areas assessed, is related to a score corresponding to the values that get increasingly higher as the distance from the segment's neutral position increases. The act of pouring, serving and carrying the canister is recorded and observed using photography.

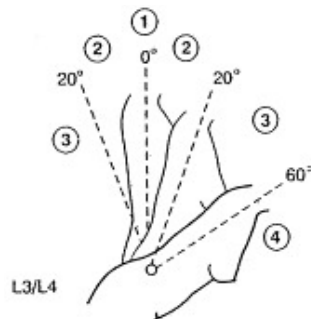


Fig. 1 Posture while carrying

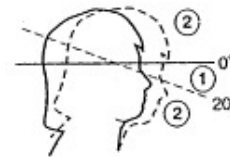


Fig. 2 Posture while pouring

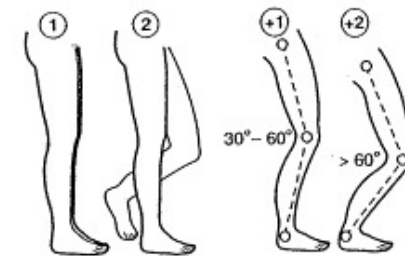
Trunk score =3



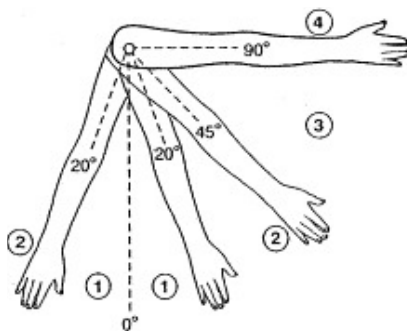
Neck score = 3



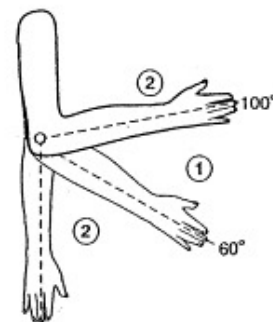
Leg score = 2



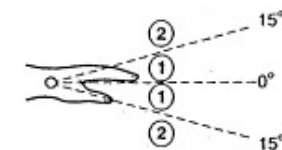
Upper arm score = 2



Lower arm score = 2



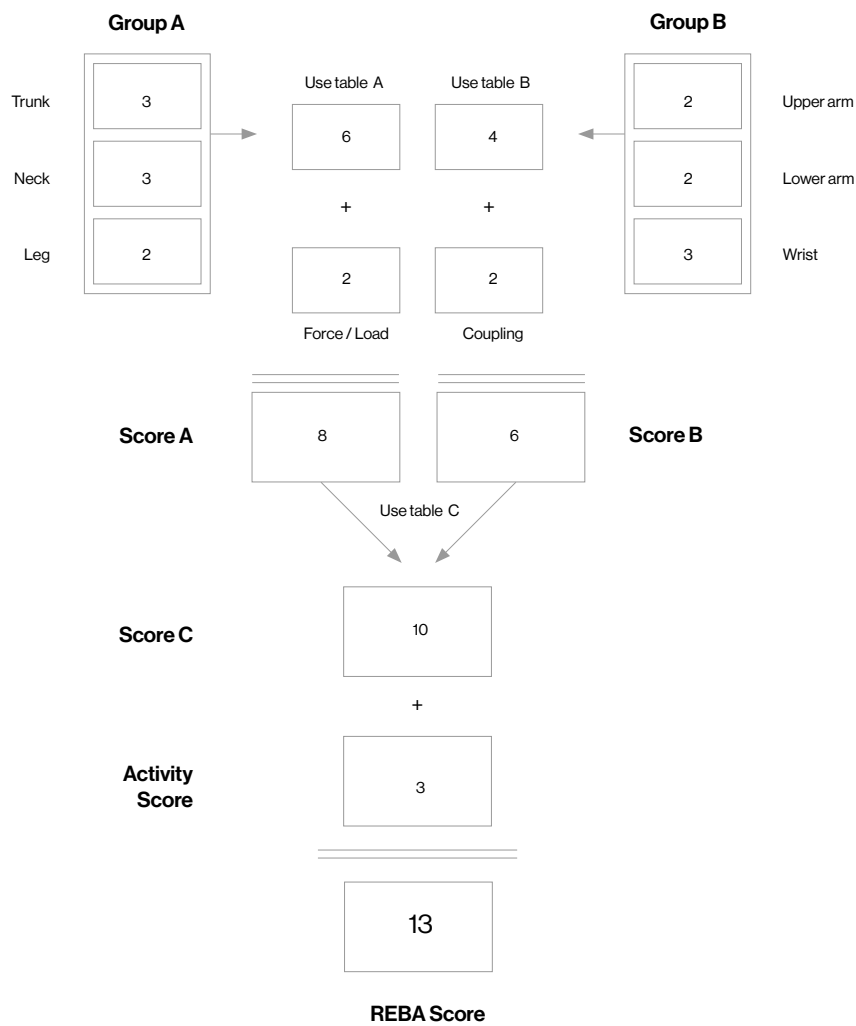
Wrist score = 3



REBA score assessment of chaiwala

Using the process Fig.1 and Fig.2 is scored and the final REBA score is 13. This is categorized as a very high-risk level, with immediate action needed to control the risks. One immediate control measure is to distribute the load across the hip, shoulder and back to facilitate his actions.

The risk assessment contains other factors such as the chaiwala's size, the surrounding environment, other manual handling operations' frequency, the available resources and equipment and the chaiwala's ability to identify when a task is beyond his ability and ask for help.



REBA action levels

Action level	REBA score	Risk level	Risk level
0	1	Negligible	None necessary
1	2-3	Low	None necessary
2	4-7	Medium	Necessary
3	8-10	High	Necessary soon
4	11-15	Very high	Necessary now

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Problem identification

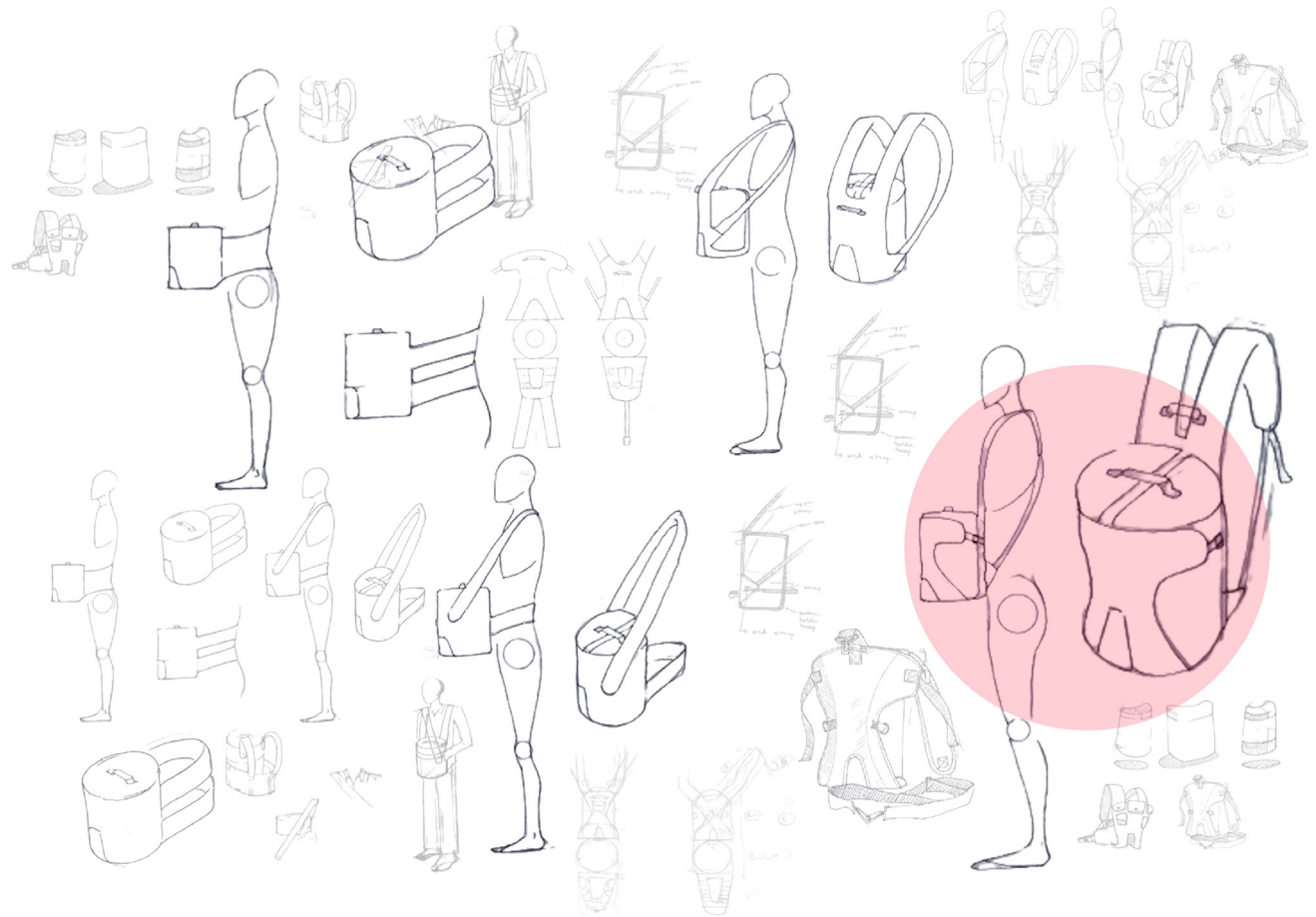
1. One of the hand is engaged all the time because of the cups/money.
2. The canister has a steel handle which hurts him.
3. Bad posture while pouring out tea.
4. Difficulty while returning change of money.
5. The canister sometimes slips off his legs while pouring the tea.

Design brief

To design a tangible product which improves the physical ergonomics of a "chaiwala at railway stations".

There have been no attempts made to improve the experience related to the existing Tea Canister rather there have been attempts to change the Canister itself.

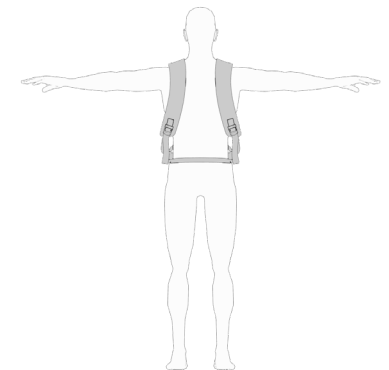
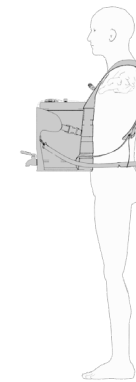
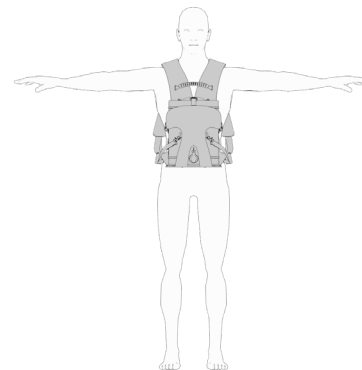
Brainstorming



New Ergonomic Posture

Design solution and it's possible application

Our current design solution helps these chaiwala as it improves their posture. Most of these men are already familiar with this placement of bags which will make it easier for them to adapt to it. In terms of application, the vendors could use this to carry any cylindrical container rather than carrying it on their shoulders or in their hands.



How does it help?

With the three-point pressure method (distributing the load across the hip, shoulder and back), pressure on the

lower back can be reduced, thus keeping tea vendors from developing the wrong posture.

Design solution

1. Improves posture
2. Vertical and horizontal stability
3. Free movement
4. Quicker and easier serving
5. Air ventilation

Design Intervention



Head over extension

- Shoulder & neck pain
- Headache

Anterior pelvic tilt

- Lower back pain
- Pressure on spine

Before Intervention



Neutral spine

- Shoulder & neck relax
- Healthy spine

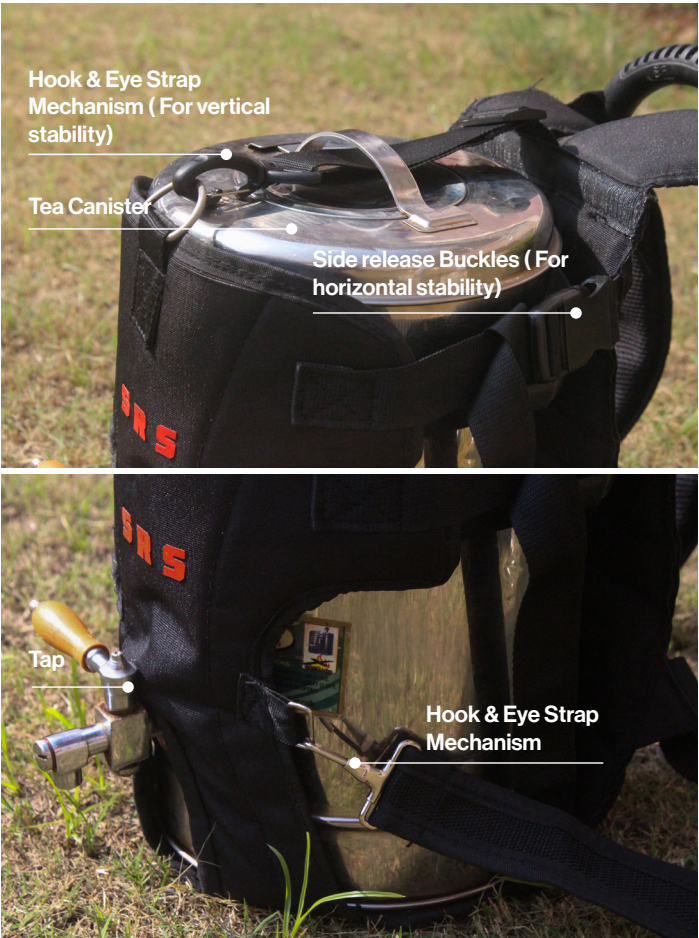
Three point pressure

- Distributes the load evenly
- Makes easier to pour without bending.

After Intervention

Prototyping

Material	Fabric (cotton canvas, polyester pack cloth, cordura, nylon), foam, buckle, straps
Weight the bag can carry	The bag houses a 5 liter canister
Dimension	D9 in x H11 in
Water capacity	12L, 25L
Weight of the ring	2.5 kg



How to use

Breakdown in six

“After our intervention we were able to reduced the REBA (Rapid Entire Body Assessment) score by more than half (13 to 6).”







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