

Design & Fabrication of Chair-less Chair

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Abstract – This project main aim is to reduce the human efforts for the arrangement of the sitting. It's an innovative concept of chair-less chair. By using this chair, you will be able to sit anywhere without using the stool and chairs. This chair is not like the others chair, it's been hidden in your leg, it's magically appears when you need. In any industry on the assembly line, you have to stand for hours, and you get very less time for the relaxation, for this short duration you can't arrange the chairs or stool. And generally, industry not provide the chairs. So, to overcome this problem, this innovation of Chair-less chair have a good idea.

Keywords – Belt, Damper,

1. INTRODCUTION

This chai-less chair project is inspired to create new invention in the advance world. If you are working in factory, warehouse or restaurant kitchen, you have to stand while working, at relaxation time you search for the stool or chair, to avoid, this innovation it is a very good idea. This chair not cover any space, and hidden behind your leg. This Chair-less Chair is developed by the Company CEO Keith Gunura in 2009. It is wear as the exoskeleton on the back of the legs, its lets you walk or even run as needed, but it has a supporting structure when you go into a sitting position.



2. MATERIAL USED

2.1 Mild Steel

Mild steel has carbon content from 0.15%-0.30%. They are easily weldable thus can be hardened only. They are similar to wrought iron in properties. Both ultimate and tensile and compressive strength of these steel increases with increasing carbon content. They can be easily gas welded or electric or arc welded. With increase in the carbon percentage weld ability decreases.

Because of the above properties we select this material for our project.

We use this metal in our project as the main metal to support all the mechanisms.

2.2 Galvanized Iron

Galvanizing protects the underlying iron or steel in the following ways:

The zinc coating, when intact, prevents corrosive substances from reaching the underlying steel or iron.

The zinc protects iron by corroding first for better results, application of chromates over zinc in also seen as an industrial trend.

In this project we used this metal in the base support.

Table - 1 Material Specification

Sr. No.	PARTICULAR	MAT.	QTY.
1	Cylinder 25 Bore 250 Stroke	STD	2
2	PAD (Leg Holder)	G.I.	2
3	Belt	NY	4
4	Shoe	Leather	2
5	Pivot Joint	MS	4
6	Shoe Holder	MS	2
7	Adjustable Support	MS	2
8	Block Nut	MS	2
9	Paint	STD	1

3. METHODOLOGY

To support human lower body part which is an exoskeleton especially worker need to stand more than 5 hours per day, methodology of this work is concentrated on the need to developed the simple chair.

When a worker wants to seat, pushing a button, by which at the desired angle the frame locks. Through the frame to the floor or the heels, the weight of the body is transferred. To hold the limbs tightly a rubber band will be used, in order to fix the position to the exoskeleton.

This product worn on the legs, which allows the user to walk or run when no activated. When the device is activated it uses a variable damper to engage and hold person's body weight, relieving the stress on leg muscles and joints. The wearer just need to move into the desired pose, this activates the device.

A belt secures the wearable to the hips and its straps wrap around the thigh. The stress on the leg muscles and joints is relieved. This device is totally controlled by a mechatronic system.

Here the two link simple mechanism is used. The link lengths of the lower limb are derived, based on the anthropometric study. The link dimensions are derived using the standard design procedure.



4. APPLICATION

1. This chair-less chair would be helpful to hunters, farmers, surgeons etc. i.e. anyone who needs to stand for long hours at stretch.
2. For the elder people as they need rest a while after walking some distance.
3. It is useful for the handicapped persons also.



5. ADVANTAGES

1. It's automatic
2. It gives maximum comfort to the wearer.
3. Power less
4. Weight is light
5. It is Portable.
6. Compact in Size

6. CONCLUSION

The design of this mechanism or device is specially designed for the workers who worked in the assembly line for long time and the people who have the knee problem in sitting. The people who are suffering from the spinal cord diseases or back pain, this device is too much beneficial for them. This device reduces the fatigue of the body and increase the person's workability in the company.

7. REFERENCE

1. https://www.google.co.in/url?q=https://sapetti.com/cha irlesschair&sa=U&ved=2ahUKEwi8maWA0s3hAhX_8HMB HXIsDz8QFjAQegQIBhAB&usg=AOvVaw1DQN-OKWZvgplticcG7bUv
2. <https://www.google.co.in/url?q=https://futurism.com/t he-chairless-chair-allows-you-to-sit-anywhere&sa=U&ved=2ahUKEwjVwoSf0c3hAhWD7nMBH VwMDTUQFjANegQIBBAB&usg=AOvVaw35WwI5KN79MFt fG1Yufdef>

3.<https://www.google.co.in/url?q=https://www.dezeen.com/2017/07/06/chairless-chair-designed-provide-support-active-factoryworkers/&sa=U&ved=2ahUKEwjVwoSf0c3hAhWD7nMBHVwMDTUQFjAJegQIBRAB&usg=AOvVaw2AlFZntfCPPMp3sugeJc-z>

4.https://www.google.co.in/url?q=http://ripublication.com/ijtam17/ijtamv12n4_03.pdf&sa=U&ved=2ahUKEwjM2a7s0M3hAhWc63MBHZBUAIsQFjAJegQIBBAB&usg=AOvVaw2SV7J6DsT7yS2edHwJhWEK

5.https://www.google.co.in/url?q=https://journalnx.com/papers/20150742-chairless-chair%2520.pdf&sa=U&ved=2ahUKEwiAs6yqzM3hAhVE63MBHbpaCsAQFjAJegQIAhAB&usg=AOvVaw0q_DBJDQKytqt2dvsSGDNd

6.<https://www.google.co.in/url?q=https://www.ijraset.com/files/serve.php%3FFID%3D8176&sa=U&ved=2ahUKEwiAs6yqzM3hAhVE63MBHbpaCsAQFjADegQICBAB&usg=AOvVaw3aZfkyUUnmTWbqhm-Dp6ka>