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Chairless Chair

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Abstract: It's an innovative and forward-thinking concept, the ability to sit anywhere and everywhere with the aid of a chairless chair. It's like a chair that isn't there, but magically appears whenever you need it. It's called the chairless chair and you wear it on your legs like exoskeleton , when it's not activated , you can walk normally or even run. Like a chair that is now there.
Standing for hours or end causes a lot of distress to lower limbs, but most works get very few breaks and chairs are rarely provided , because they take up too much space. So the best idea was to strap an unobtrusive chair directly to yourself. So it was decided to have this innovative concept in reality, to help workers who work for hours on production line in standing position and tired
Index Words: Chairless Chair, Exoskeleton, Ergonomics.

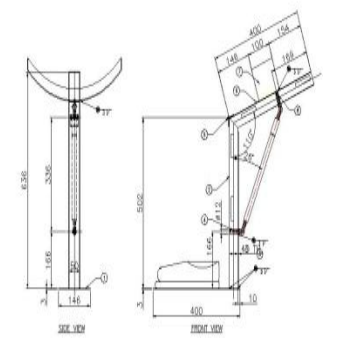
I. INTRODUCTION

It's an innovative and forward-thinking concept the ability to sit anywhere and every-where with the aid of a chairless chair. The concept was first conceived two years ago by Keith Gunura, co-founder and CEO of noonee, and since then the company has de-veloped its Chairless Chair and entered talks with a number of leading manufacturers. Designed for static and dynamic industrial market applications, the Chairless Chair aims to increase user's health, comfort, and productivity. It's like a chair that isn't there, but magically appears whenever you need it. It's called the Chairless Chair and you wear it on your legs like an exoskeleton: when it's not activated, you can walk normally or even run. Like a chair that is now there.Standing for hours on end causes a lot of distress to lower limbs, but most workers get very few breaks and chairs are rarely provided, because they take up too much space. So we thought that the best idea was to strap an unobtrusive chair directly to you.

The device never touches the ground, which makes it easier to wear, a belt secures it to the hips and it has straps that wrap around the thighs. A variable damper engages and supports the bodyweight, which is directed towards the heels of the shoes. These are specially designed and part of the mechanism, but an alternate version works with any footwear and touches the ground only when in a stationary position.The 'chairless chair', which Audi has further developed together with a Swiss start up company, is an exoskeleton that is worn on the back of the legs. It is fastened with belts to the hips, knees and ankles. Two leather covered surfaces support the buttocks and thighs while two struts made of carbon fiber reinforced plastic (CFRP) adapt to the contours of the leg.

II. LITERATURE REVIEW

The Chairless Chair then locks into that configuration, directing their weight down to the heels of their shoes, to which it is attached it also attaches to the thighs via straps, and to the waist using a belt. There are as many different types of chairs as there are types of people. It is an object that is available to most everyone. In its different embodiments it can be humble or regal, made of traditional wood or high-tech polymers, simple in con-cept or highly charged with meaning. Fundamentally, the requirements for a chair are few. It is essentially a horizontal surface at a logical distance from the ground meant to support the human body while sitting. A vertical surface is provided for back support.



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III. EXPERIMENTAL SETUP

Fig - Experimental Set up of Chairless Chair

A. Links

Mild Steel links selected as per the ergonomics guidelines such that the links between the waists to knee is of 380 mm and the knee to ankle is 420 mm which is most common for Indian people. The Mild Steel square bar available in the market of mostly two size of thickness one is 1 mm and another is 3 mm thick. So as per market availability and safety we select the Mild Steel links of cross section = 30*30*1 .Square hollow section of Mild Steel is selected, as sectional modulus of Square section is more shown in

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figure 3.7 . Sectional Area is related to strength in bending so square hollow section is selected, as strength in bending will be more which our requirement is.

Fig. Mild Steel Link

General purpose steel bars for machining, suitable for lightly stressed components including studs ,bolts, gears, shafts, link ,rounds ,clips etc. Often specified where weldability is requirement can be case harden to improve wear resistance .Available in bright rounds, squares and flats , and hot rolled round.mild steel is readily available in abundant quantity and is less costly, it has good resistance to dust, fumes, it has rugged construction

B. Shoe Link

Shoe Link is used for attachment of our shoes with chairless chair. It facilitated for easily walking along with chairless chair. It is fixed with the help of nut bolt with lower link.

3.2 Shoe Link

C. Stopper

It is the most important part of our project. This Part gives stability to whole project. It is made up of mild steel.

Fig 3.3 Stopper

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D. Tie Belt

Belt is used for strapping of exoskeleton to human body. Belt will be taken as standard material available in market to wrap the model as waist and thigh

E. Software

The computer system consists of the software. The software used for plotting is " CATIA Software And Software ".

IV. CONCLUSION

In this project design and fabrication of chairless chair has been done. The main goal of our project was to give the comfort to workers, who work on production line for hours. Also to make the model at least cost, that has been achieved. The work started with designing of model and procurement of required material. ANSYS Software used for analysis. Finally fabricated Chairless Chair at workshop. The model is working satisfac-torily. This concept was new and the data available was also limited. There are some future modifications possible.

V. ACKNOWLEDGEMENT

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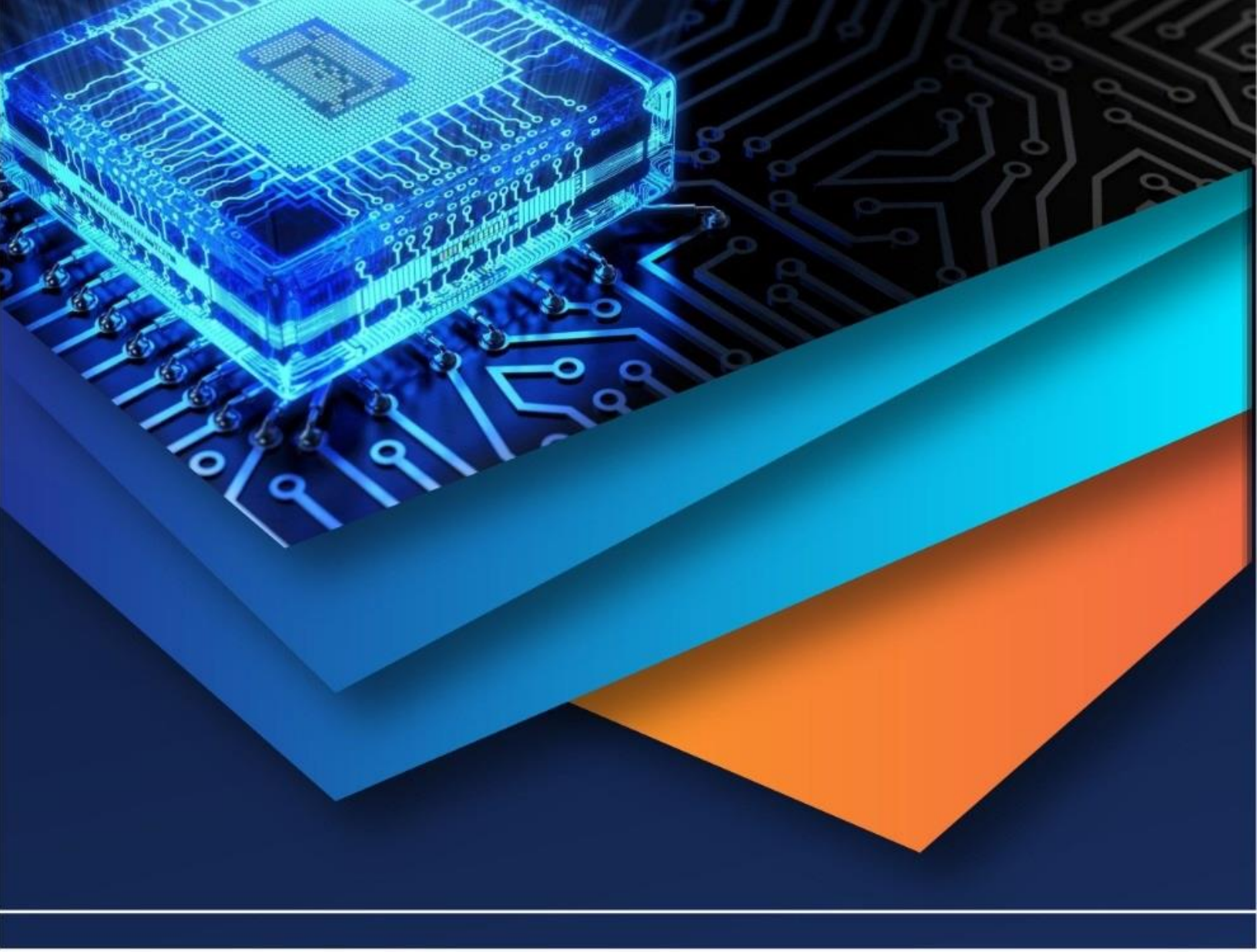

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