

REDESIGN AND MODIFICATION OF EXISTING EARTH AUGER

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ABSTRACT

The Project aims Redesign and development of earth auger which would be modification to overcome all the shortcomings of the existing earth auger. The project will be useful to provide a solution for low cost and comparatively safe auger which can be completely used by one person. This project will provide farmers with a cheap and safe alternative to use for plantation or other purposes. This project will help understand the shortcomings of manual and power operated earth augers and provide possible solutions. Hence, this project will reduce the chances of auger related injuries and also increase the stability and usability of the same. This project will help farmers to use earth auger comfortably and work will be done smoothly and efficiently.

Keyword : - Earth Auger, Drilling, Agriculture

1. Introduction

Agriculture plays a pivotal role in Indian economy. Small scale farming which is the subject of this paper is important for increasing the productivity in agriculture and food security. It may be noted that Indian agriculture is home to small and marginal farmers[80 percent] , Agriculture census shows that in India there are about 121 million farmers, about 99 million are small farmers. Study says that agricultural work related accidents are currently higher than injuries in any other industry all over the world. To overcome all the issues related auger like accidents, to ensure productivity and compatibility we redesigned the earth auger. The principle of Auger drilling machine which is employed in pile foundation during construction. The machine is formed automatic by employing a D.C motor which is an influence source for digging the soil. The motor can be rotated both in clockwise and anticlockwise directions. This makes the auger to drill hole in the soil return back to its original position. This machine is meant for a preliminary aim of avoiding the utilization of shovels & levers in plantation of saplings thereby enhancing the plantation process by making it facile.

The conventional earth auger does not have any frame around the body. We have provided a frame around the body which will not only provide strength to the model but also will make it easy to operate even by a single operator. The frame will also reduce the vibrations that are produced while the working of the auger.

2. Future scope

Based on the outcomes from the research work the following suggestions were given for future development.

1. The vibration can be further minimized by using absorber material on handle.

2. The different drill bits and their operational difficulty can be studied on the same set up.
3. The trolley wheels can be replaced with tyre wheels solution to the vibration and cantilever support.
4. Complete automation of earth auger can be achieved in future using various technologies.
5. Lighter materials can be used to further reduce the weight of earth auger.
6. Various attachments for auger drill can be studied for different types of soil.

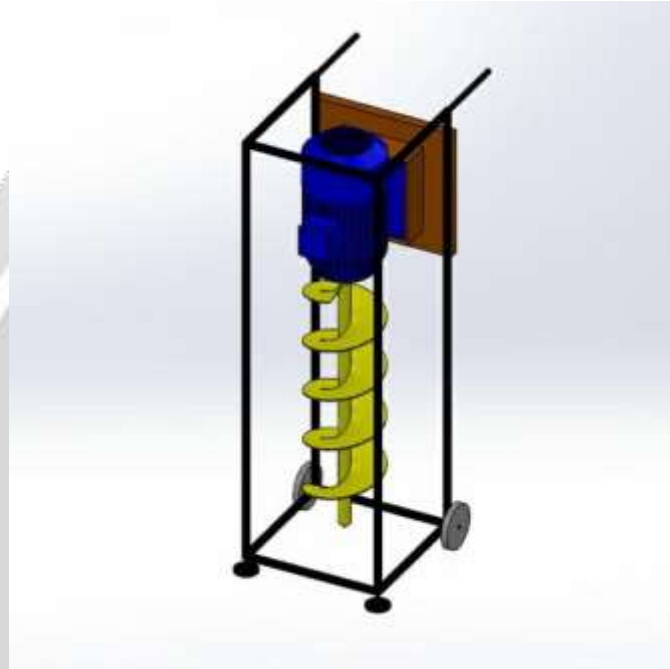


Fig -1: Earth Auger Solidworks design

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3. Algorithm

- 1) Ensure that the auger is having sufficient amount of fuel.
- 2) According to the required depth and radius of the hole, select the necessary drill bit and attach to the auger.
- 3) Take the auger to the desired place with the use of wheels attached to the auger.
- 4) Make sure that the auger is placed at a sturdy location and lock the wheels of the auger.
- 5) Start the engine and wait till the drill bit rotate at a uniform speed.
- 6) Rotate the slider rail handle in a clockwise direction to provide positive feed to the drill.
- 7) Rotate the handle at a slow and constant speed to provide uniform feed.
- 8) After the desired depth is reached, rotate the handle in anticlockwise direction to lift the drill nit up to its initial position.

- 9) Switch off the engine and wait until the drill stops rotating.
- 10) Unlock the wheels and move the auger to the next drilling location.

4. CONCLUSION

We studied and analysed problems in existing earth auger. To overcome all the issues related with it we redesigned earth auger. Our designed model are feasible to operate and transport, have greater stability due to supporting frame and wheels provided. This model have made for security and safety purpose which will reduce agricultural accident during drilling operation. It requires less man power and it can solve the labour problems which is the need of today's farming industry. New modified model are more efficient and comfortable to operator.

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