

AUTOMATIC SCREW JACK
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Keywords: Screw, Thread

ABSTRACT

Now a day with the increasing levels of technology, the efforts being put to produce any kind of work has been continuously decreasing. The efforts required in achieving the desired output can be effectively and economically decreased by the implementation of better designs. Power screws are used to convert rotary motion into translator motion. A screw jack is an example of a power screw in which a small force is applied in a horizontal plane is used to raise or lower a large load. The principle on which it works is similar to that of an inclined plane. The mechanical advantage of a screw jack is that the ratio of the load applied to the effort applied. The screw jack is operated by turning a lead screw. The height of the jack is adjusted by turning a lead screw and its adjustment can be done either manually or by integrating an electric motor. In this project, an electric motor will be integrated with the screw jack and the electricity needed for the operation is taken from the battery of the vehicle and thereby the mechanical advantage will be increased

INTRODUCTION

The motorized screw jack has been developed to cater to the needs of small and medium automobile garages, which are normally man powered with minimum skilled labor. In most of the garages the vehicles are lifted by using screw jack. This needs high man power and skilled labour. In order to avoid all such disadvantages, the motorized jack has been designed in such a way that it can be used to lift the vehicle very smoothly without any impact force. The operation is made simple so that even unskilled labour can use it with ease. The d.c motor is coupled with the screw jack by gear arrangement. The screw jack shafts rotation depends upon the rotation of D.C motor. This is a simple type of automation project. The operation remains to be an essential part of the system although with changing demands on physical input, the degree of mechanization is increased.

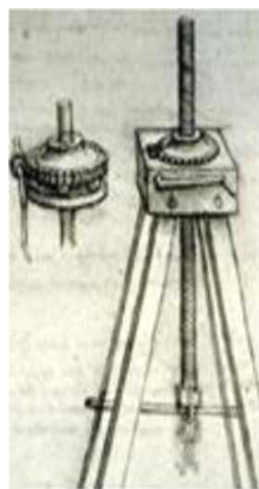


Fig 1 : automatic screw jack

MATERIALS AND METHODS

A scissor jack is operated simply by turning a small crank that is inserted into one end of the scissor jack. This crank is usually "Z" shaped. The end fits into a ring hole mounted on the end of the screw, which is the object of force on the scissor jack. When this crank is turned, the screw turns, and this raises the jack. The screw acts like a gear mechanism. It has teeth (the screw thread), which turn and move the two arms, producing work. Just by turning this screw thread, the scissor jack can lift a vehicle that is several thousand pounds



International Journal OF Engineering Sciences & Management Research

CONCLUSION

Screw Jacks are the ideal product to push, pull, lift, lower and position loads of anything from a couple of kilograms to hundreds of tonnes. The need has long existed for an improved portable jack for automotive vehicles. It is highly desirable that a jack become available that can be operated alternatively from inside the vehicle or from a location of safety off the road on which the vehicle is located. Such a jack should desirably be light enough and be compact enough so that it can be stored in an automobile trunk, can be lifted up and carried by most adults to its position of use, and yet be capable of lifting a wheel of a 4,000-5,000 pound vehicle off the ground. Further, it should be stable and easily controllable by a switch so that jacking can be done from a position of safety. It should be easily movable either to a position underneath the axle of the vehicle or some other reinforced support surface designed to be engaged by a jack.

ACKNOWLEDGEMENTS

We are profoundly grateful to Prof. Mr. Gade Sir (PROJECT COORDINATOR) for his expert guidance and continuous encouragement throughout to see that this project rights its target since its commencement to its completion. We would like to express deepest appreciation towards Prof. KOHINKAR Sir (HOD, Mech. Dept), whose invaluable guidance supported us in completing this project. At last we must express our sincere heartfelt gratitude to all the staff members of Mechanical Department who helped us directly or indirectly during this course of work.

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