

A Review of Design & Development of Two Wheeler Lifting Mechanism

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Abstract

Now a days 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 be decreased by the implementation of better designs. These Power screws are used to converting rotary motion into translatory motion. A screw jack is an example of a power screw in which a small force 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 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 moving a lead screw and this adjustment can be done either manually or by integrating an electric motor.

Keywords: Lifting, Lever etc.

I. PROBLEM STATEMENT

In present days the two wheeler mechanic are not using lifting platform due to its heavy cost and their maintenance. Because of continuously bending of mechanic body during the repair and maintenance of two wheeler there are many health related problems are arising, also more stress and efforts are required.



A. Limiting Deflection in Scissor Lift:

Selecting lift with design capacity greater than required for the application; most scissor lift design for duty at higher capacities will experience less stress in all structural components as well as lower system pressures, at lower, working capacities. Reduced stresses and pressure always result in reduced deflection. Avoid transfer of load within the first 20% of lift travel: To minimize stress and deflection, at transfer elevations, it is critical to design the conveyor or transfer system to ensure that these elevations are above the scissor lift's "critical zone" of the first 20% of the lift available travel. Transfer load over fixed end of the lift platform: First if possible, load should not be transfer over the sides of a raised scissor lift is much more difficult to control deflection when the load is not shared equally between the two scissor legs pairs.

B. Available Scissor Lift:

- 1) Hydraulic lifting platform.
- 2) Electric lifting platform.

3) Pneumatic system / airbag.

C. Design & Development of Scissor Lift:

1) Specification

These machines are small enough to operate manually and motorized.

1) Function: for lifting the two wheeler with motorized.

a) Specification:

1) Type : Motorized operated

2) Power:- Screw jack and scissor lift concept

3) Overall dimensions (Tentative): 3feet x 1.5 feet x 2feet height. approx.

4) Job capacity- up to 80 kg

5) General Information :

The machine consists of a mechanism, the platform and screw and scissor mechanism.

2) Design of experiment set up

In this section all design concepts developed will be discussed and based on evaluation criteria and process developed followed by a design.

D. Concept Selection

The design was selected from an already made product in the market with modification in various parts and section to further enhance the functionality of the design.

1) Lift Frame

Ascissor lift design was chosen because of its ergonomics as compared to other heavy lifting devices in the market. Scissor lift frame are very sturdy and strong with increase structural integrity.

2) Screw selection

The horizontal spindle screw selection was selected from a variety of screw application, because of its important to the scissor lift, and after much consideration a final decision would be a square thread.

3) Bearing selection

These bearing is to reduce the effort required to turn the screw spindle, knowing that since the device is to be operated manually, it would not be an easy task turning the spindle to either raise or lower load on the platform. Both bearing will be attached to one end of the spindle, while the other end will be attached to a handle.

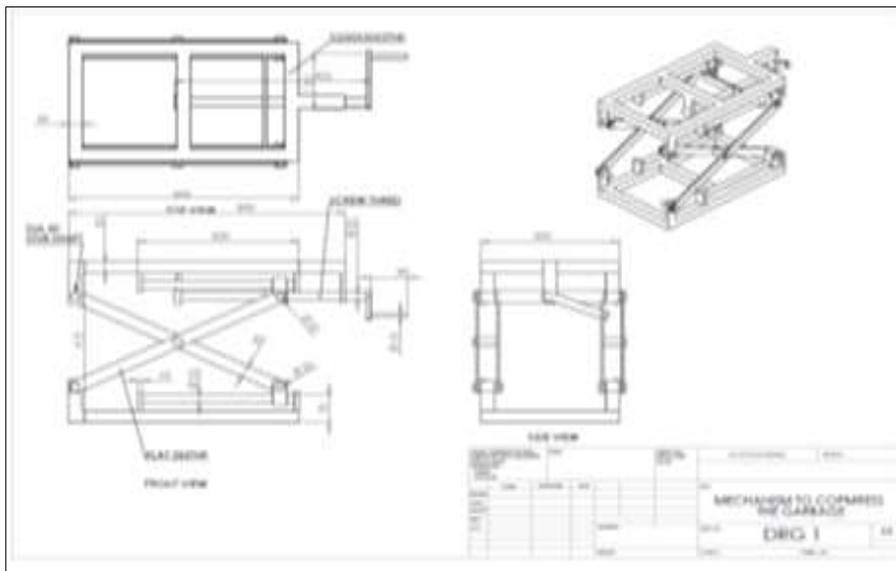
4) Locking wheel

A wheel is attached to the device to enable it to be movable from one place to the other, but a locking device would also be mounted for safety. With much attention on the above mentioned design considerations, the optimum aim is the manufacturability, functionality and the economic availability of the design, in general its ergonomic advantages.

5) Frame

The frame is made up of the scissor arms which are acting as the support to the entire structure. A tablebed platform will be at the top of the scissor link arm. Also a same bed will be at the bottom of the frame to accommodate the scissor link mechanism when fully collapsed.

Proposed mechanism:-



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