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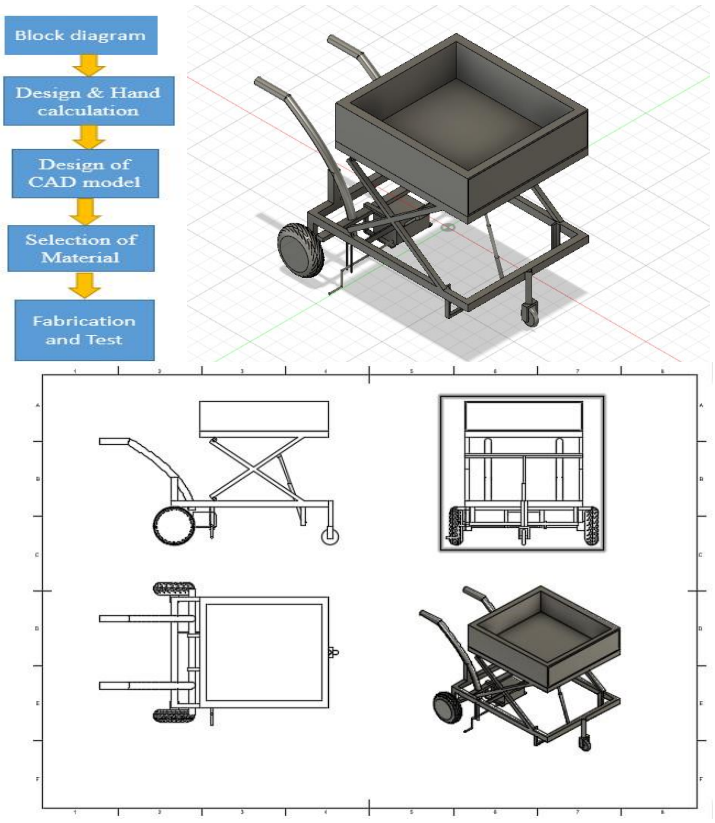
SYNOPSIS

1.	**Reference no: 46S_BE_2140**
2.	**Project Title: "MANUAL OPERATED MULTI-PURPOSE POWER TROLLEY"**
3.	**Name of the college: VIVEKANANDA COLLEGE OF ENGINEERING AND TECHNOLOGY, PUTTUR**
4.	**Department: Mechanical Engineering**
5.	**Name of project guide:** **1. Dr. MANUJESH B J**
6.	**Name of the Team Members:** **1. ABHISHEK** (4VP19ME001) **2. SATHMANI** (4VP19ME035) **3. SHAMANTH G** (4VP19ME036) **4. SHARATH KUMAR K** (4VP19ME037)
7.	**Team Leader of the Project:** **1. SATHMANI**
8.	**Keywords:** **Multi-purpose trolley, Creativity Techniques, Lift and Tilt, Innovation**
9.	**Introduction:** As we know most of India's population depends on Agriculture. And Farmer is the backbone of our country. In our area areca nut, coconut is the major crop. One of the major problems associated with agriculture is the lack of labors. Due to this many young farmers are will quit farming and migrate to cities. During harvesting of areca nut, areca nut is to be transported from plantation to the place of storage. Since lack of labors, farmers will be facing difficulties. Many mini trolleys are available in market, but those trolleys will no satisfy required condition and cannot be 100 % efficient. In order to solve these problems, we have developed a design and fabrication of multi-purpose power trolley. We can find some trolley in market where it has some of the disadvantages. In this we have used two-wheeler engine which has more power

	compared to other trolley. We have designed it in a condition so that it can easily move in the middle of plantation. It also has gear system, by which it can get more power. It also has good mileage it will give up to 35 km / litter of petrol. We introducing new tilting mechanism in this trolley it is reduce the man power and good benefit of farmer. It can travel in muddy, intricate places. This trolley is mainly focused on low cost, easy to operate. This trolley is design for different application like agriculture, Transport, Industry.
10.	**Objectives of the project:** As we find different problem in Agriculture filed, transport, construction, so we study different literature review, according to give the object for our project. Also, by using existing components in feasible area. By using modern technology, efficient and light weight. ❖ To Design, Develop and fabricate a trolley adopting innovation to serve multi purposes. ❖ To assist in lifting domestic and industrial loads. ❖ To adopt & adjust suitably to meet wide range of applications. ❖ To ease the farming activity and enable ladies and old aged people to effectively use the machine.
11.	**Methodology:** 

Materials selection:

MATERIAL	ALLOWABLE STRESS MN/m^2	BHN
CAST IRON GRADE 20	47.1	200
MILD STEEL	210	300

WORKING PRINCIPLE:

Working principle of trolley is simple. Manually operated multi-purpose power trolley is constructed as shown in the fig. Initially we have to load the trolley and move to the place of destination. And then we have to unlock the back door of tray. And then we have lifted the scissor arm in the help of hydraulic jack up to unloading High. After lift the scissor arm, with help of yoke disconnect the bucket lock then unloading the material. After unloading the bucket, we have to apply downward pressure to bucket then bucket will be comes down and settle on the upward chassis of trolley. Then we release the scissor arm to initial position with the help of hydraulic jack. The process is repeated for next loading and unloading. Since we used the engine, the braking system, and gear system of bike.

12. **Result:**

- The results can be discussed as the design process is completed.
- Farmers and industrial people can have a better and simple mechanism which is less energy for loading and unloading objective without any labor.
- It is better than existing model because of its loading and unloading performance.
- We design the trolley up to 100 to 200 kg after completion of project trolley is capable of lift and tilting the object up to 150kg.
- This machine lifts up to 3ft to 4ft for load carrying vehicle it adopts and adjusts different application.

Design & Hand Calculation

Capacity of Bucket, Volume = L*B*H

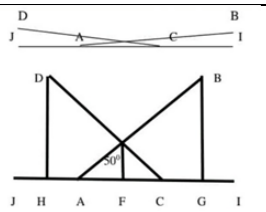
V = 1219.2*762*152.4

V = 141,584,232.96mm^3

V = 0.142m^3

Volume = 0.142*1000

Capacity of bucket= 142kg



Scissor Calculation

AB = CD = 1200mm BG=DH=900mm

Sinθ = BG/AB

θ = 48.59° =50°

AE= 300mm

AE*sin50= EF

EF= 230mm

JI= 1200mm

13. **Conclusion:**

- Hydraulic scissor lift is designed for high load resistance. Although there is serval machine available for agriculture, most of the trolley is applicable only for one application.
- The existing model is costly compare to new model.
- The old machine is required labor but our new innovation is easily operated by old age people and women by using less effort.
- Our machine is capable for industry, transport, construction, agriculture etc.
- For the given dimensions the scissor lift can lift a load in the range of 150 kg up to the height of 915 mm.

14. **Scope for future work:**

- Lifting system of trolley can be changed by replacing jack system with hydraulic system, which will be very easy to lift but cost of the dumper increases.
- In this trolley we have only one door in the tray, we can give extra two doors on the sides of tray by which it is easy to load and unload.
- In this trolley there is no any seat arrangement we walking with trolley, in future we decide to make a seat arrangement.
- In future we automatically control the trolley in IoT based mechanism.