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Solar Powered Driven Multipurpose Agricultural Machine

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Abstract: *The main aim of the project is to develop utile agricultural vehicle supported with solar power-driven, for playing major agricultural operations like plowing, seeding, harvest home etc. The modification includes fabricating a vehicle that is compatible, compact in size and economical with cost not exceeding Rs 20000/- per unit. The project is a few machine types that makes cultivation abundant less complicated. The look of the chassis of the vehicle is formed in such the way that it's appropriate for the operations.*

Keywords: *Utile, Compact style, Non- typical Energy, Ploughing, Seeding.*

I. INTRODUCTION

Agriculture is the practice of rearing animals, growing plants and fungi to sustain human life and is the core of development of human life. The study of agriculture is thought as agriculture science. The history of agriculture dates back thousands of years, and its development has been driven and outlined by greatly totally different climates, cultures, and technologies. Trendy scientific agriculture, plants breeding, agrochemicals like pesticides and fertilizers, and technological developments have in several cases sharply inflated yields from cultivation, however at identical time have caused widespread ecological harm. Agricultural food production and water management square measure progressively turning into international problems. Mechanized agriculture is that the method of victimization agriculture machinery to mechanize the work of agriculture, greatly increasing hired hand productivity in modern world, and power-driven machinery has replaced several farm jobs at one time allotted by labour or by operating animals like oxen, horses and mules. The complete history of agriculture contains several samples of the utilization of tools, like hoe and therefore the plough. However, the continuing integration of machines since the economic revolution has allowed farming to become abundant less labour intensive current mechanized agriculture includes the utilization of tractors, truck, mix harvesters, multitudinous varieties of farm implements, airplanes and helicopters, and different vehicles. Mechanization was one in every of the massive factors liable for urbanization and industrial economies. Besides up production potency, mechanization encourages giant scale production and generally will improve the standard farm turn out on the opposite hand it will displace unskilled farm labour and may cause environmental degradation particularly if it's applied shortsightedly instead of holistically.

II. DESIGN ANALYSIS

A. Basic Conception of Design

Concept to style a project for small and medium scale of farmers and in one machine multi functions may be performed in value {low-cost} cost as compared to different agriculture machine. Mechanism of the machine ought to be terribly straightforward in order that it does not need a talented person to control and it may be simply in husbandry and small- scale farming.

B. Chassis/Frame Design

The selection of the material and fabric for the vehicle is that the initial and most vital issue for automotive style. There's sort of materials which will be utilized in automotive body and chassis. the fabric for the frame and chassis is steel. The most factors for choosing material specially for body is wide verity of characteristics like thermal, chemical and mechanical and sturdiness. Within the frame solely the most supporting structures like engine of the vehicle, the harvester and plowing tool square measure mounted. It can bear and sustain all types of load i.e. both static and dynamic load of vehicle. The look is formed such that it is appropriate supporting all the operations. The frame is formed for a compact size vehicle.

C. Construction Details

Utile farming machine contains the following components- (1) Chassis frame (2) 12V Battery (3) Switch (4) Accelerator (5) Lever (6) Cultivating tool (7) Hub Motor Wheel (8) Shank (9) Handle

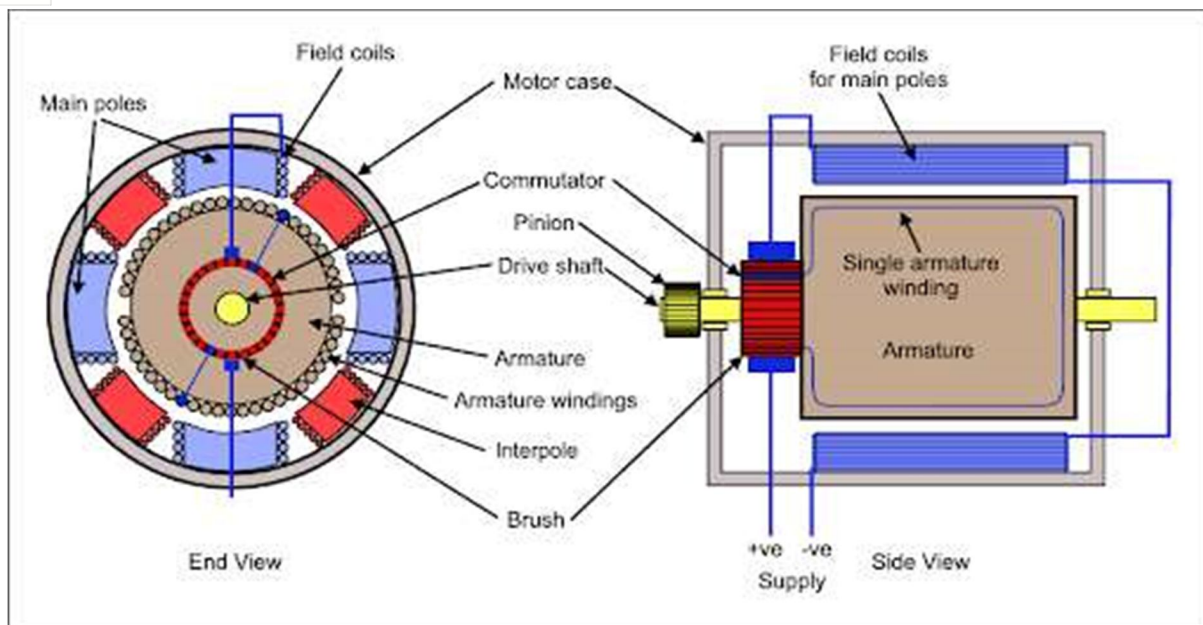


Fig.1

D. Electric Hub Motor Mechanism

Hub motor magnetic attraction fields square measure provided to the stationary windings of the motor. The outer a part of the motor follows, or tries to follow, those fields, turning the hooked-up wheel. during a brushed motor, energy is transferred by brushes contacting the rod of the motor. Energy is transferred to a brushless motor electronically, without any physical contact between stationary and moving parts. Although brushless motor technology is expensive, but a lot more economical and longer-lasting than brushed motor systems.

A hub motor usually is intended in one in every of 3 configurations. Thought-about least sensible is associate axial-flux motor, wherever the stator coil windings square measure usually sandwiched between sets of magnets. The opposite 2 configurations square measure each radial style with the motor magnets secure to the rotor; in one, the inner rotation motor, the rotor sits within the stator coil, as during a typical motor. Within the different, the outer-rotation motor, the rotor sits outside the stator coil and rotates around it. The appliance of hub motors in conveyance uses continues to be evolving, and neither configuration has become customary.



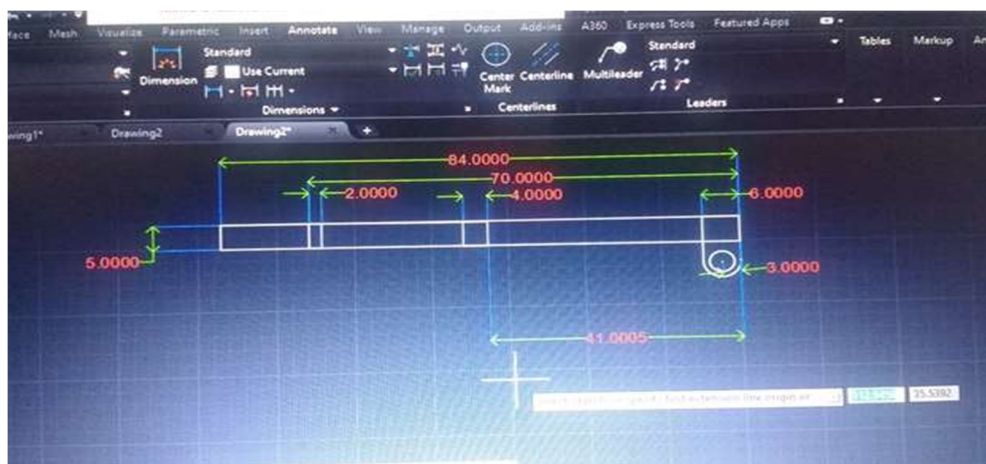
Fig. 2 Electric Hub Motor



Fig.3 Controller

III. DESIGNED MODELS OF AGRICULTURAL MACHINE

For planning and analysis of components, there are square measure several computer code obtainable within the market. a number of those square measure PTC Creo, CATIA, Auto CAD, ANSYS, Hyper-mesh and discoverer etc. From on top of computer code, motorcar CAD and ANSYS had chosen during this work for style and analysis of Agriculture Machine and figures given below square measure the designed Agriculture machine.



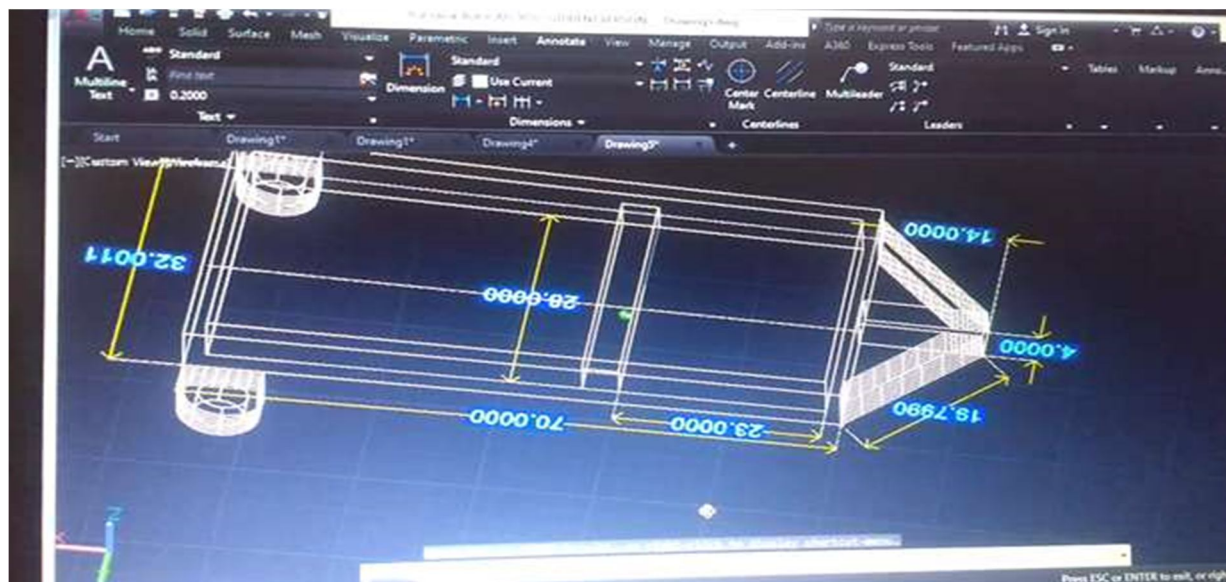
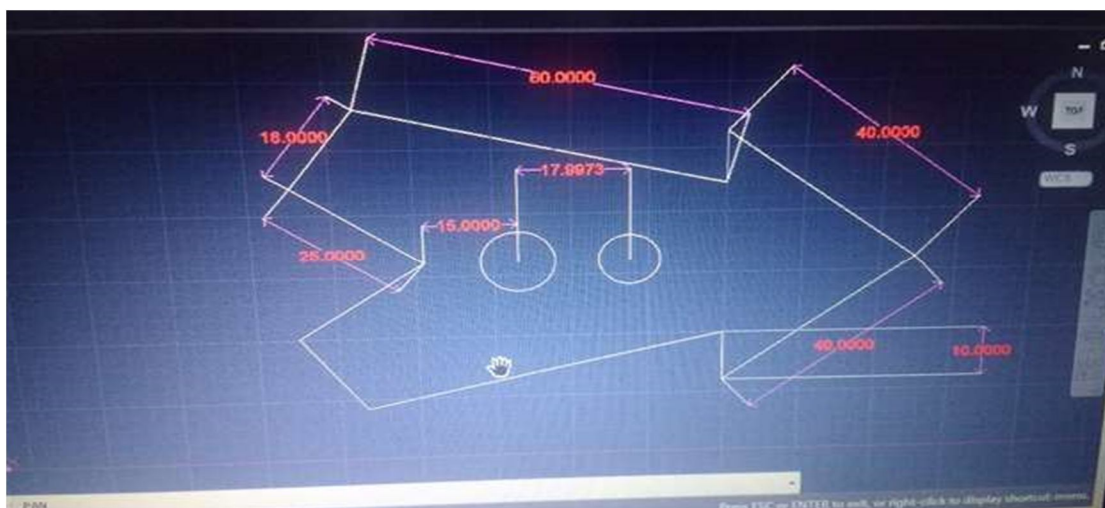
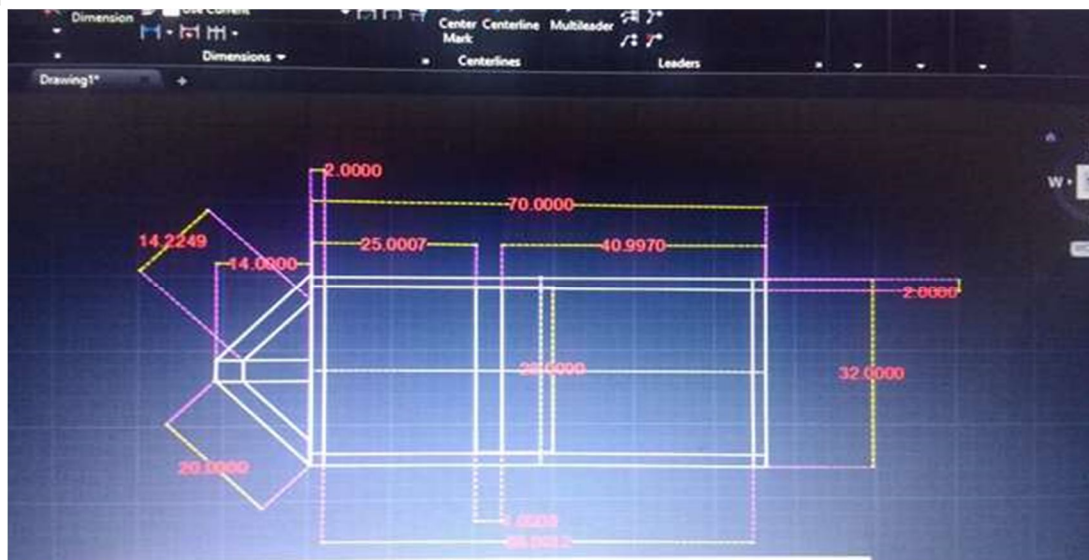
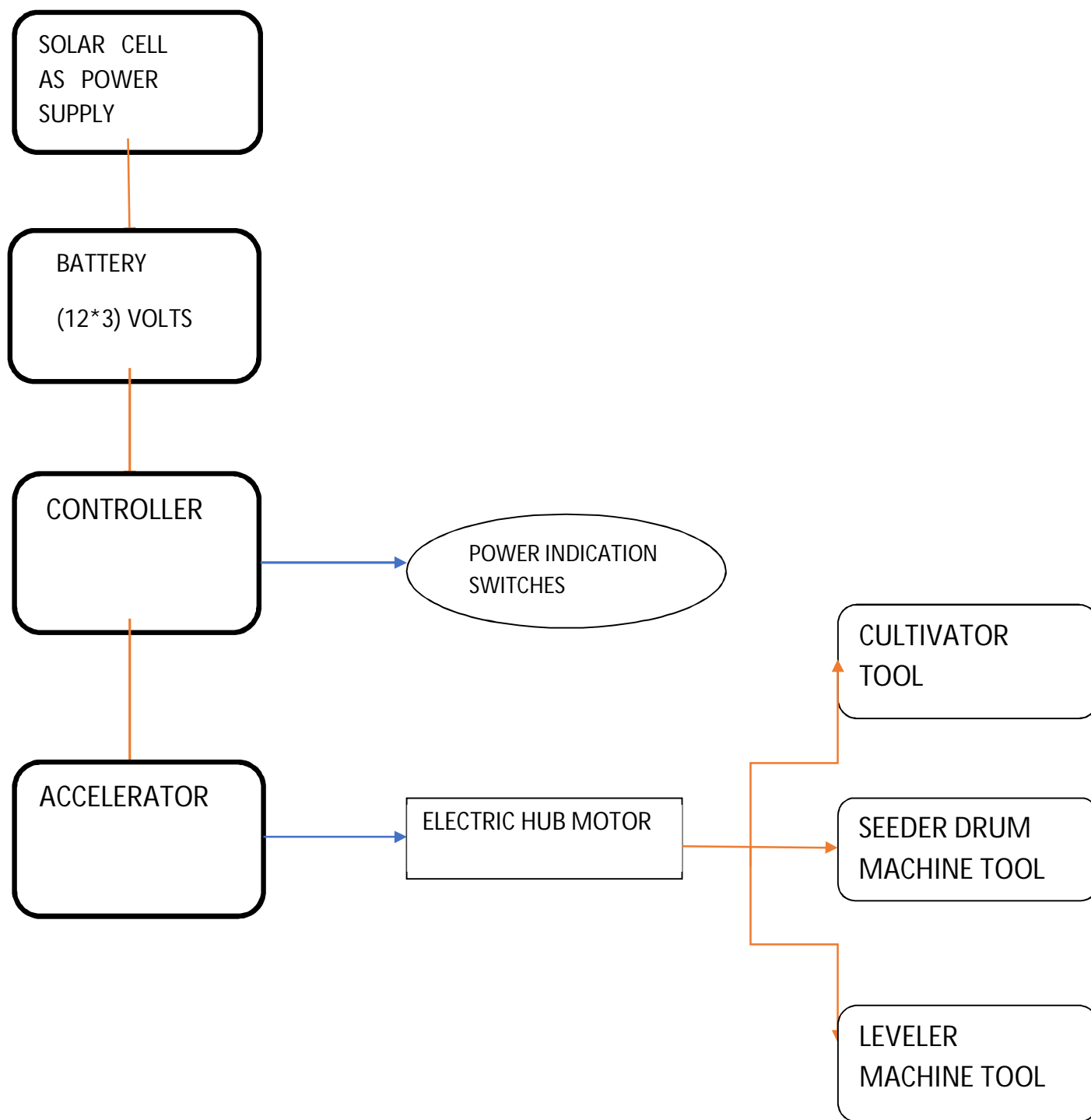


Fig. 4 four structural designs

IV. FLOW CHART OF OPERATING MECHANISM-



V. TOOLS AND THEIR RELEVANCE: -

A. Plowing Tool Concept

The plowing tool is intended within the approach that it wouldn't break because of the abrupt encounter of rocks and roots gift within the soil. The limitations within the current tool has been removed and modified. The designed new tool is quite sturdy and has better strength with reasonable cost and may be utilized in all types of geographical regions.

B. Design of the Planned Tool

The lifetime of the tool is inflated by substitution of the sole and the tip of the tool. The sharpness of the tool is remains constant for considerably longer amount of your time. The potency and therefore the effectiveness of the tool is magnified. The breakage of the tool is reduced by exploitation of high-speed steel within the tip. We are going to use HSS (i.e. High-Speed Steel) for plough tool to maintain most of the durability of the tool.

VI. RESULT AND DISCUSSIONS

Mainly, our multipurpose Solar-Powered agricultural machine is used for ploughing, seeding and harvesting like processes. Also, it can be used for removal of weeds which are the unwanted plants that grows in our fields. We are focusing on the Non- conventional sources of energy that's why we are using solar energy with the help of solar panel.

Our main aim is to manage the cost efficiency along with maintaining the feasibility and quality of the product and equipment. Also, we are aiming to maintain the compactness and compatibility of design.

Hence, this automation will help small-scale farmers in lowering the cost of equipment, reduces labour costs and reduces time-consumption in certain operations. The machine needed less man power and fewer time compared to ancient methodology. Solar operated agricultural multipurpose machines are currently used in all the developing agricultural application.

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