



DESIGN AND DEVELOPMENT OF MOTORIZED SHAPING MACHINE

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ABSTRACT

Most of the industries are having a various types of reciprocating machines for performing machine operation on small size of work. Usually shaper, broaching machine and planner are used for machining a small area of work with less quantity. These machines are used for machining very small area of plain surface, vertical surface, angular surface, grooving etc. It removes the materials from job only at forward stroke. So it takes more machining time to complete the product. In order to overcome this problem, a small dual shaper machine is developed for machining two work pieces at a same time. In this machine, it has both the direction of ram movement and it removes a material from two work pieces simultaneously. So, the machining time will be reduced and the production rate will be increased.

1.1 Introduction

In general, the shaper can produce any surface composed of straight line elements. Modern shapers can generate contoured surface. The main purpose of shaping machine is to machine plain horizontal surface. It is possible to form vertical and angular surfaces also. With proper tools and accessories even irregular surfaces can be formed. As per the of motion of the shaper they are

- Crank type
- Geared type
- Hydraulic type

By moving the work piece across the path of the reciprocating tool a flat surfaces is generated regardless of the shape of the tool. With the special tools, attachments and devices for holding the work, a shaper can also be used to cut external and internal keyways, gears, racks, dovetails, T-slots and other miscellaneous shapes. Shaping is essentially an inefficient method of metal removal but the simplicity of the process coupled with short set up time and cheap tooling makes it extremely useful for the single job.

The most common type of horizontal shapers is the production push cut shaper. This type of shaper consists of a frame or column supported on a base, a reciprocating ram and work table. The frame houses the drive mechanism of the shaper. The tool slide swivel base is held on the circular seat on the ram and is graduated to indicate the angle of swivel. The apron consisting of the clapper box the clapper block and the tool post is clamped on the vertical slide by a screw. It can be swiveled about the apron swivel in by releasing the clamping screw. The clapper blocks which carries the tool post is connected to the clapper box means of a hinged pin. The researchers suggested that a shaping machine for dividing a deformable mass, such as a meat product, into separately shaped portions comprises a stock container, at least two piston-cylinder units for alternately feeding in the mass from the stock container to a shaping plate provided with shaped recesses, and also means for removing the shaped portions from the shaping plate [1].

Some authors suggested that twin mounted double sided reciprocating shaping mechanism is provided which is formed in the shape of an acute isosceles triangle whereby the bottom is opened to the ground and each cutting mechanism is bent or deformed along the longitudinal axis to form to conical shape when rotated about the center axis of the isosceles triangle. The twin mounted double sided reciprocating shaping mechanism is adapted to be used for cutting and shaping and forming trees, bushes and the like in the contour of a cone [2].

The invention relates to a machine for cutting down and shaping trees, designed to cut down, strip and truncate trees, consisting of a support and cutting down-stripping-truncating equipment likely to be adapted to a self-propelling device, said equipment carrying a movable framework on which the cutting-truncating and stripping elements are positioned, a machine wherein the components there of are substantially secured along a one and same axis, the stripping element carrying at least two blades is explained in [3]. This invention relates to improvements in machines for building pneumatic tires [4]. It includes features which are beneficial in the building of almost any standard type of pneumatic tire, although it is most particularly suited to the fabrication of radial ply tires. In the manufacture of radial ply tires, comprised of single or multiple plies composed of wire and/or textile, it is conventional practice to wind the rubberized ply or plies on a revolving cylindrical tire building drum with the wires or cords forming high angles.

Some authors suggested that multi-touch capacitive touch sensor panel can be created using a substrate with column and row traces formed on either side of the substrate. To shield the column (sense) traces from the effects of capacitive coupling from a modulated Come layer in an adjacent liquid crystal display (LCD) or any source of capacitive coupling, the row traces can be widened to shield the column traces, and the row traces can be placed closer to the LCD [5]. Tire shaping machine invention relates to improvements in

machines for building pneumatic tires [6]. It includes features which are beneficial in the building of almost any standard type of pneumatic tire, although it is most particularly suited to the fabrication of radial ply tires.

In the manufacture of radial ply tires, comprised of single or multiple plies composed of wire and/or textile, it is conventional practice to wind the rubberized ply or plies on a revolving cylindrical tire building drum with the wires or cords forming high angles (in the neighborhood of 90) to a plane that is perpendicular to the finished tire axis. The opposite ends of the ply or plies are each then folded around a rubberized bead wire, and sidewall and under breaker stock are added. The semi-completed carcass is then removed from the tire building drum and placed on a shaping machine (or, alternatively, the carcass may have originally been built on a shaping machine drum), wherein a low angle wire breaker strip (or circumferential restraining ply) and a tread slab are added thereto, and the tire is brought to its ultimate shape is explained in [7]. The application of the breaker strip or strips to the semi-completed tire carcass is a critical step in the fabrication of a tire. It requires that the circumference of the tire carcass be extended to the precise diameter at which this component is to be added is explained in [8]. Normally in the manufacturing industry the shaping machine is used to manufacture a component, the time consumption is more, if single tool is used to manufacture the component. In order to reduce the time taken to produce a component, a new type of shaper machine was developed. In this new type of machine two shaping tools are used. Therefore two work pieces can be machined at the same time. In dual side shaper machine the machining time will be less when to normal shaper. The power consumption is same in both the shaper machine, and the speed of the ram will be controlled.

Objective of the project

- ❖ To understand the basic principal of the our project
- ❖ Describe the construction and working of various parts of our project
- ❖ Development of the working model of the our project
- ❖ To reduce time spent and work load

Problem Definition

- ❖ The shaper machine can be made for both side feed action even without changing the motor specifics.
- ❖ The shaper can be modified for saving time for same size of the workpieces.

Literature Review

R M Lathe et.al, Scrutinized that regular machining process devours high point in time and expands the work cost, to beat these issues and challenges he utilized robotized electric compressed air gadgets and PLCs in the shaping machine. He created electro pneumatic circuit for performing forming tasks, which makes the activity self-loader by utilizing a solitary point cutting device. Robotization of the machines are made with the assistance of pneumatic gadget, sensors, mechatronics and PLCs and so forth.

M.V.N Srujan Manohar et al, Studied that pneumatic shaper is utilized for high creation of programmed gear cutting with auto ordering work piece. A little wrench gear structure has been in this way contrived to show the apparatus cutting connections in molding machines.

Anand Shukla et al., Investigated that improving of the reducing power and force utilization of the designer machine by shifting various parameters during cutting activity utilizing PC interface. He built up a technique to discover cutting power and force required by the device to perform forming procedure on work piece.

Dharwa et al, Investigated that vitality is the most indispensable viewpoint in the improvement of current innovative human advancement. The regular vitality sources are in effect scant, so elective vitality sources are discovered which must be modest, effectively accessible and must fulfill the specialized necessities. Force required for accelerating is well underneath the limit of a normal solid individual.

R.Maguteeswaran et al examined that the different machining process in assembling businesses are done by independent machining machine. It need more room for necessity and time with high costs. Yet, the creation of multi activity machine, which includes three tasks in a solitary machine. The activities are in particular penetrating, opening and forming

Devanand R.Tayade et al investigated that assessment of cutting and symmetrical parameter represents one of the most significant components for quality and profitability which assume huge job in the present assembling market. From clients see point quality is significant on the grounds that the degree of nature of the secured thing (or item) impacts the level of fulfillment of the purchasers during utilization of the acquired products.

Edward W Miller invented his machine Double-acting gear shaping machine US 2638036 A To provide a plurality of cutters in combination with means for reciprocating them so arranged and operated that cuts are made throughout the axial length of the work gear in each stroke in both directions of reciprocation; to provide in combination with the foregoing, means by which either spur or helical gears may be cut; to combine with reciprocating opposed cutters new and improved means for causing the inactive cutter to be backed off or withdrawn from the work throughout its return stroke and at the same time to hold the active cutter in advanced cutting position; to apply the foregoing principles to a single cutter adapted to generate teeth in a gear adjacent to a shoulder which protrudes beyond the circumference of the gear; to provide a double acting single cutter for operation by the same means and to the same effect as two opposed cutters;

and to accomplish the same objects by cutters of both rack tooth character having one or a plurality of teeth and circular cutters having teeth arranged similarly to spur or helical gear teeth. Other objects subsidiary and related to the foregoing appear in the following description of illustrative embodiments of the invention, as do also the principles and particulars in which the invention consists.

Design consideration of the project

Project design may be defined as the iterative decision making activity to create a plan or plans by which the available resources are converted, preferably optimally, into systems, processes or devices to perform the desired functions and to meet human needs. In fact project design has been defined in many ways but the simplest ways to define project design as

“An iterative decision making process to conceive and implement optimum systems to solve society’s problems and needs.”

Project design is practical in nature and must be concerned with physical reliability, or economic and financial feasibility. Design is essentially a decision-making process. If we have a problem, we need to design a solution. In other words, to design is to formulate a plan to satisfy a particular need and to create something with a physical reality.

Basic concept of project design:

Decision making comes in every stage of design. Consider two cars of different makes. They may both be reasonable cars and serve the same purpose but the designs are different. The designers consider different factors and come to certain conclusions leading to an optimum design. Market survey gives an indication of what people want. Existing norms play an important role. Once a critical decision is made, the rest of the design features follow. For example, once we decide the engine capacity, the shape and size, then the subsequent course of the design would follow. A bad decision leads to a bad design and a bad product.

Design may be for different products and with the present specialization and knowledge bank, we have a long list of design disciplines e.g. ship design, building design, process design, bridge design, clothing or fashion design and so

Advantages of the project

Advantages of the project as per following like as:

- No conventional grid electricity required
- Long operating life
- Highly reliable and durable
- Easy to operate and maintain
- Eco-friendly

Disadvantages of the project

Dis-advantages of the project as per following like as:

- High installation cost
- Operating speed is low
- Maintenance cost high
- Operating cost is high
- Skilled operator required

Application of the project

Our projects should use for following various applications like as:

1. Very simple to operate for
2. Low speed
3. Bidirectional (Two side)
4. Timing control, sound indication and more...

Project Flow Chart

From the flow chart, this project started with the objective of the project. The objective of the project must follow the title. The objective must fulfill the title then follow up with design review about folding table and then study a lot of investigation about folding table. This is including study about several of stage, type of stage, types of material which suitable to make a stage. These tasks have been done through study on internet, books and others resources. After all information had been collected and gathered, the project continued with the design process. All the knowledge and lessons had been applied to make a suitable design for the project. After several design sketched, design consideration have been made and one of the design have been chosen by using Pugh's concept selection.

The solid modeling and engineering drawing by using solid works software the fabrication process progress use drawing as a reference. The process consist fabrication to all parts that have been designed by the dimension using various type of manufacturing process. The manufacturing process includes welding, drilling, bending, cutting and etc. During the fabrication process, if there have error occur, such as fabrication error, so the process need to modification the process need to go back to the previous step and the process flow again, until no error occur the process can be continued smoothly until the final product finished. Then, the draft report need to be submitted to the supervisor for double checking if there had an error.

Proposed Work:

No	Activity	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb
1.	Allotment of Guide	✓							
2.	Project survey.	✓	✓						
3.	Project and idea Screening.			✓					
4.	Material selection				✓				
5.	Design				✓	✓			
6.	Manufacturing						✓	✓	
7.	Testing							✓	✓

Conclusion

A dual side shaper is designed and fabricated. This dual side shaper machine is used to manufacture components similar to a standard shaper machine. However, the machining time required for this dual shaper is less as compared to the normal shaper. Hence, the production rate is increased in the dual side shaper machine when compared to the normal shaper. The designed dual shaper has been used for only trial production. In the future it would be used for commercial production in industries

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