

Review of Design and Development of Precision Sheet Metal Pulley

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ABSTRACT

A Pulley is one of the oldest devices ever made, it is simply a part that either allows a rope to move in two directions very smoothly, or can be used in multiples to ease lifting loads, for instance someone with a set of pulleys can lift a large weight with only a fraction of the actual weight needed based on the actual number of pulley wheels used. A pulley on a car, is slightly different, it is commonly used to transmit power from one point on the engine to another, as it is lighter and quieter than using a chain or a pile of gears. Basically a belt either lined with teeth or simply a v shape is placed over the center of the pulley and tightened, the friction of the belt due to its tightness transmits the turning force (torque) from one pulley to another, therefore moving the power from one pulley to another.

Keyword: - Power, Sheet Metal, Torque, Dynamic Loads

1. INTRODUCTION

In this, basically pulley is manufacture by using sheet metal forming process. This will be overcoming the disadvantage of Casting Pulley. By using Sheet metal forming process complex pulley can be produced cheaply and quickly. Also it is Easy to manufacture parts which are sufficiently strong against dynamic loads and have sufficient accuracy. Sheet metal process has been forced to prevent products with high quality and short delivery times as a result of the globalization of markets. Such process reduces the cost and production time and production quality improved.

Sheet metal forming is a very important manufacturing method. The complex parts can be produced cheaply and quickly. Also, it is strong against dynamic loads and have sufficient accuracy for general manufacturing. Therefore, this manufacturing method is preferably used in almost every mass-produced product. However, nowadays, sheet easy to manufacture parts which are sufficiently metal sectors have been forced to present products with high quality and short delivery times as a result of the globalization of markets [4].

Sheet metal forming is a significant manufacturing process for producing a large variety of automotive parts and aerospace parts as well as consumer products. The sheet metal operations such as shearing, blanking, piercing, notching, trimming and nibbling. The sheet metal processes are bending, embossing, coining, spinning, stretch forming and deep drawing [3].

Metal spinning is a term used to describe the forming of metal into seamless, axisymmetric shapes by a combination of rotational motion and force. Metal spinning is one of the oldest methods of chip less forming, but over the years, this process has lost ground to other forming process such as deep drawing and ironing. However, due to the inherent advantages and flexibility of the process such as simple tooling and low forming loads, plus the rapid emerging trend in modern industries towards near net shape manufacturing of thin sectioned lightweight parts, Spinning has undergone a renaissance in recent years and has developed into a versatile process for producing Lightweight components [2].

2. LITRATURE REVIEW

D. R. Patil et al. [1] It is concluded that this method can be applied to the deep drawing of the complex automobile parts. In this case, the edge of blank takes the shape of the target contour within a few iterations, which shows that the roll-back method is an effective and convenient method for an optimum blank shape design. This method can be applied to various sheet metal components as the edge of blank takes the shape of the target contour within a few iterations, which shows roll back method is an effective and convenient method for an optimum blank shape design.

Pratik Pawar et al. [2] In this paper, the principles and developments of spinning operation on traditional lathe machine have been reviewed. It can be seen that although spinning can be a very complicated process in terms of deformation characteristics, they have a great potential in the development, for the manufacture of complex shapes which are being required in increasing numbers by global manufacturing industries. The metal spinning parameter is directly affected to the work piece surface finish, tool life, work piece failure, wrinkling failure. Using these design parameters we have to reduce the defect & failure occurs in metal spinning operation performed on general lathe. By using spinning attachment to traditional lathe machine instead of spinning machine cost of product is minimized.

Dr. R. Uday Kumar et al. [3] In this paper, the process of spinning, an object with surface of revolution is produced from a sheet metal. The blank is held against a form die which is rotated and the sheet metal blank is laid over this die, using a specially shaped tool or roller. If a simultaneous thinning of the sheet metal takes place during the operation, the process then is called shear spinning. A theoretical study is made on forming processes particularly in spinning and deep drawing. According to the literature survey a lot of research is still require to completely understand the technology of metal spinning, calculation of the forces based on plasticity theory have been attempted but have not yet brought satisfactory results. In the situation the spinning process is very similar to deep drawing. The spinning process also enables components to be produced with both improve mechanical properties and almost 2 to 2.5 times their values in the raw material condition as well as with high dimensional accuracies and surface finishes. Such components mostly find application in the air craft and missile industries which require a high strength to low weight ratio for their components. In this paper studied to present the available literature on this subject the present state of art of deep drawing and spinning process in its industrial applications. It will be guidance for the practical production engineers engaged in this spinning area. This paper also contains the comparative study of spinning and deep drawing process.

M K Chudasama et al. [4] In manufacturing, sheet metal industries has major role to play for cost effective solution. Pulley used for power transmission in automobile cooling application is a sheet metal product. An attempt has been made here to shorten the delivery time by developing a Knowledge-Based System (KBS) for sheet metal product. Different customers have different dimensional specification for the said pulley. Also frequent design changes make it difficult for the manufacturer to develop process plan, production schedules and in turn reduce delivery time. Some decision support system requires helping in development of process plan as well as for production scheduling. KBS is developed here keeping these requirements in mind. Data related to process sequence to produce the part has been gathered and stored in required format. An inference engine is developed to get the process sequence for the production of the pulley.

Mr. Mayur Tapase et al. [5] Metal spinning is one of the oldest methods of chip-less formation. Spinning have gradually matured as metal forming process for the production of engineering component in small to medium batch quantities. Spinning being utilized increasingly due to great flexibility for producing complicated parts never to net shape and reduce weight and cost. In this paper classification, types of spinning, spinning terminology, design parameter and its consideration are introduced.

3. METHODOLOGY

Following process, used for producing sheet metal pulley. Initial Raw Material in coil form.

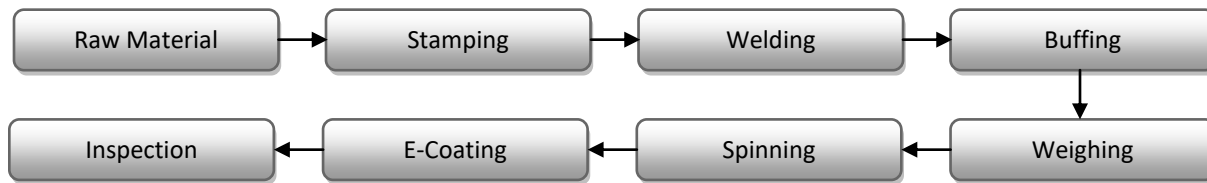


Fig-1: Sheet metal Pulley Process Flow

4. CONCLUSIONS

From this above research paper concluded that Spinning process is the best method for, producing the groove on sheet metal pulley. By using sheet metal it Produces Simple or Complex shapes easily & it improve RPM & load carrying capacity & also it reduces the weight & cost of pulley.

5. REFERENCES

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