



A Review Paper on Development for Drilling and Riveting Operation

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ABSTRACT: The growth of Indian producing sector depends mostly on its productivity & quality. Productivity may be improved by reducing the entire machining time, combining the operations etc. just in case of production wherever style of jobs is a smaller amount and amount to be created is big, it's terribly essential to supply the task at a quicker rate. this can be unfeasible if we feature out the assembly by victimization general purpose machines. the simplest thanks to improve the productivity together with quality is by use of special purpose machine. This paper show the approach of development of SPM for drilling and interesting operation. The construct of SPM is that the plate having completely different size and thickness area unit drill on drilling spindle 1st so riveted on orbital interesting spindle. each the operation performs on same machine having 2 separate spindles. This machine is containing automation by victimization gas system.

Keywords- Productivity, SPM for drilling and riveting operation, pneumatic system.

I. INTRODUCTION

The present work relates to drilling and interesting machines, and additional significantly to a comparatively compact sort of device that is quickly moveable and operates mechanically to clamp a piece piece, drill a hole in that, insert and hold a rivet within the hole, and squeeze the rivet.

In developing world, activity drilling and fascinating operations at the same time on an equivalent machine was a much bigger downside for producing company and workshop holders, individual drilling and fascinating machines were exist within the market, however they weren't helpful for workshop holders, little businessman and entrepreneurs to shop for one by one attributable to terribly high value. In recent past year a lot of stress was given to style and development of existing machines.

In this regard makes an attempt had been created to develop a machine which will perform drilling and gripping operations at the same time on constant machine. there have been such a big amount of machines had been developed as moveable drilling, orbital machine, hand gripping and versatile automatic gripping.

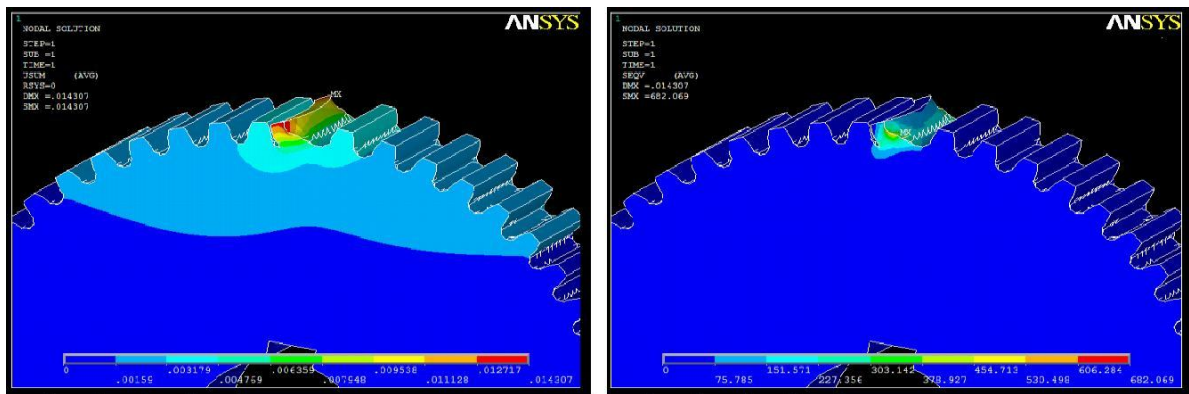
This machine thought provided most compact, economical and moveable style that was terribly simple to handle and easy operating by one person. The machine accommodates single section induction motor transmit power to drive mechanism by pulleys through V-belt and a gas cylinder that drive the method unit. throughout field testing it had been ascertained that each one the instrumentation were operative satisfactorily and will be employed in industries and workshops.

II. DESIGN & MANUFACTURING OF MULTI SPINDLE DRILLING HEAD (MSDH)

A. M. Takale was centered on "Design & producing of multi spindle drilling head (msdh) for its cycle time optimization", This paper deals with style and development of multispindle drilling head for cycle time optimisation of the element. Their makes an attempt got to improve the productivity by reducing the overall machining time and mixing the operations. they need style the main parts of multispindle drilling head like main spindle gear and main spindle and calculate the strain analysis. By exploitation multispindle drilling head productivity can increase. as a result of with the current method one hole produces at a time needs four minutes for every element (because tool amendment takes place for drilling 5mm hole (for M6x1 tap)). i.e. 12-15 components area unit made throughout one hour, however by exploitation multispindle drilling head cycle time just about takes place one minute.

III. STRUCTURE ANALYSES

Stress analysis is carried out on major components of multispindle drilling head like main spindle gear and main spindle. In the analysis shown below, tangential and radial force is considered. Analysis software ANSYS 12 is used to verify the maximum stresses induced in the main spindle gear and main spindle [5], The deflection and stress analysis of main spindle gear having material En24 (40Ni2Cr1Mo28) ($S_y = 1300 \text{ N/mm}^2$) [6], is as follows

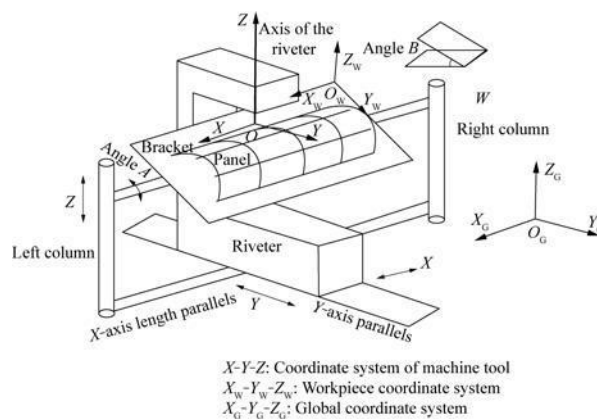


From displacement analysis and stress analysis it is clear that design is safe. Because induced stress (682.069 N/mm²) is less than the yield stress ($S_{yt} = 1300$ N/mm²) of the material

IV. Multi-objective optimization method for automatic drilling and riveting sequence planning

Multi-objective improvement model of automatic drilling and fascinating sequence designing is made by expressing the potency and accuracy of fascinating as functions of the points coordinates with multiple degrees of freedom. the value of your time and therefore the exactitude of automatic drilling and fascinating area unit delineate by suggests that of the points coordinates. Pareto dominance is incorporated into the projected ACO to search out out the non-dominated sequences. Multi-objective improvement model of automatic drilling and fascinating sequence designing might take error transfer into consideration. Error transfer throughout the fascinating method might influence the exactitude of automatic drilling and fascinating.

The automatic drilling and riveting system is automatic equipment with multiple degrees of freedom. Usually, the system mainly includes an automatic riv-eter, pairs of parallels, a bracket system, two columns and a working platform. Fig.1 shows an overview of the system where $X_G-Y_G-Z_G$ is the global coordinate system, $X-Y-Z$ the coordinate system of machine tool, $X_W-Y_W-Z_W$ the coordinate system for defining the work piece which is fixed to the bracket. The riveter can move along the X - axis and Y -axis parallels. The bracket moves along two Z -axis columns, and changes angle A by making the bracket rotate around the X direction while angle B by moving different displacements of the bracket's two ends (there are telescopic devices at the two ends of the bracket). The automatic drilling and riveting process is described as follows.



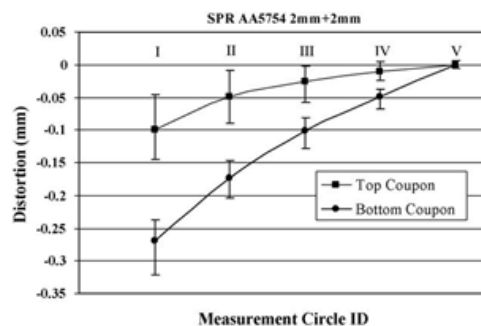
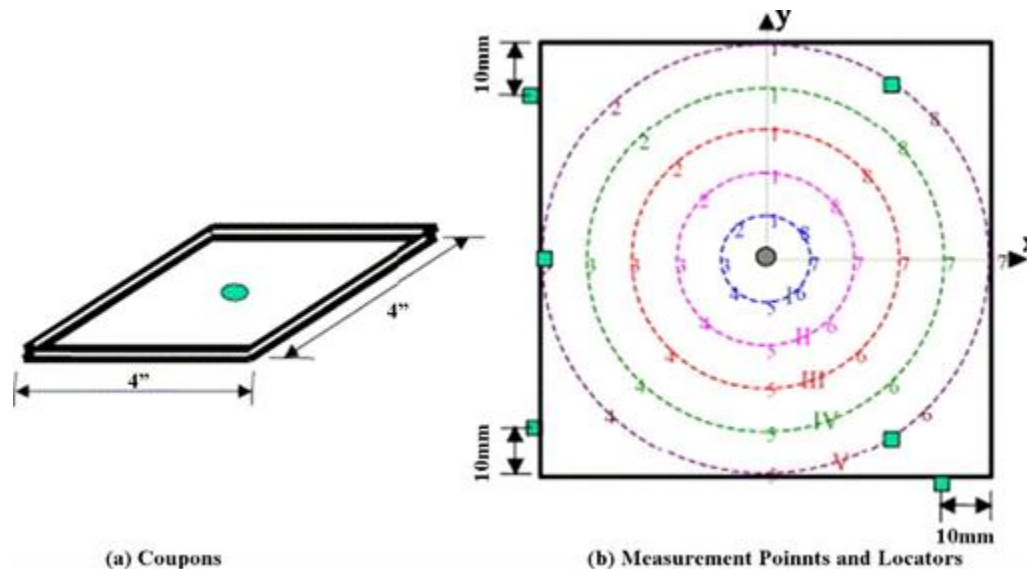
Firstly, the riveter moves along the X -axis and Y -axis parallels to the position of a riveting point. Then adjust the point's normal vector to coincide with the axis of the riveter's tool by the adjustment of angle A and angle B . After that, the riveter begins to drill and rivet till all the points are processed. Without loss of generality, here we define some assumptions in order to build the model more reasonably and easily

V. SELF-PIERCE RIVETING FOR SHEET MATERIALS

We discuss on mechanics on joint formation ,types of SPR joints like strength, corrosion properties and free vibration properties. The prediction of joint distortion once SPR is employed to form structures and therefore the price effects of the technique area unit introduced. Prediction of distortion caused by the assembly method and therefore the price effectiveness of the technique are introduced. The results of atomic number 26 analysis, for distinguishing the variables touching SPR joint characteristics area unit reviewed.

As stated earlier, the SPR process has the disadvantage of needing high forming forces, typically around 10 times higher than those used for spot welding (Westgate et al., 2001). This large force can cause severe joint distortion and this will affect the dimensional quality of the assembly. By using experimental data and FE analysis results, Cai et al. (2005) showed that SPR joint distortion was much larger (about two to four times the magnitude) than that from RSW. Fig. 6 shows the coupon tests and Fig. shows the tests results separately.

It was suggested that distortion caused by the SPR process needs to be addressed at the design stage, if accurate global assembly predictions are to be achieved. To include the local SPR effect, a new algorithm, representing the SPR distortion was developed and this can be incorporated into special FE analysis codes (elastic assembly variation simulation) to efficiently predict body assembly dimensions where spot joining processes are involved



VI. LITRETURE REVIEW

P.O. Boucharda, this pamphlet was printed on “Numerical modeling of self-pierce interesting from interesting method modeling all the way down to structural analysis” centered on the numerical modeling of the SPR method. that they had used the finite component package to allows the model for giant deformation of elastic–plastic materials for second and 3D configurations. A Lemaitre coupled harm model had been enforced to agitate harm throughout the method and fracture was sculptural mistreatment the “kill element” technique. that they had conjointly check the influence of the transfer of vital mechanical fields, like residual stresses or harm, on the ultimate mechanical strength of the riveted specimen.

A.S. Aditya Polapragada, printed the paper on gas machine feed punching and riveter in (IJERT). during this paper they'd style and fabricate the unit and expressed the importance of the gas press tool had a plus of operating in low, even a pressure of vi bar was enough for operational the unit. The die employed in this was fastened specified the die of needed form can be used in step with the need. this allows them to use completely different sort punch dies leading to a large vary of product.

A.M. Takale is focused on "design and manufacture of multi spindle drill head (msdh) for its cycle time optimization," This paper focuses on the design and development of more spindle drill head for cycle time optimization of the component. Their efforts to improve productivity by reducing the overall processing time and the combination of the operations. They design the main components of spindle drill head as main spindle gear and main spindle and calculate the stress analysis. By using spindle productivity drill head will increase. For the current process a hole

produces at a time takes 4 minutes for each component (for tool change occurs for drilling 5mm hole (for M6x1 tap)). ie 12-15 parts produced for an hour, but using spindle drill head cycle time about takes place 1 minute.

Prof. P.R. Sawant had been revealed a paper on "Design and development of spm-a case study in Multi drilling and sound machine", This paper discuss the case study and comparison of productivity of element victimisation typical radial drilling machine and special purpose machine (SPM) for drilling and sound operation.

India's manufacturing sector growth largely depends on its productivity and quality. Productivity, production efficiency, which is the main cause of the operations / activities of the organization are carried out depends on many factors. The total machining time and reduces productivity, operations, etc., in cases where the act of combining mass production of low diversity and are produced in large quantity can be improved, it is very essential to produce jobs at a rapid rate. If this is possible, we must carry out the production of general-purpose machine. Production rate (productivity) is the best way to improve the quality along with the special purpose machines is used. Utility and performance of the existing radial drilling machine will be increased in the design and development of the multispindle drilling head attachment. Along with the development of the industry as a case study in this paper under consideration deals with similar work undertaken

In order to model surface roughness, many strategies had been employed in previous analysis. A project to use multiple heads to form contour drills and angular holes was preoccupied by A.S.Udgave, (2008). Multiple-spindle drilling machines area unit used for production, an excellent time saver wherever several items of jobs having several holes area unit to be trained. Multi-spindle head machines area unit employed in mechanical trade so as to extend the productivity of machining systems. This machine has 2 spindles driven by one motor and every one the spindles area unit fed in to the work piece at the same time. Feeding motions area unit obtained either by raising the work table or by lowering the drills head. because the name indicates multiple spindle drilling machines have 2 spindles driven by one power head, and these 2 spindles holding the drill bits area unit fed into the work piece at the same time. The spindles area unit thus made that their centre distance may be adjusted in any position inside the drill head looking on the duty demand. The positions of these parallel shafts holding the drills area unit adjusted relying upon the locations of the holes to be created on the duty.

Hazim El-Mounayri, Zakir Dugla, and Haiyan Deng (2009) developed a model in finish edge by victimization gear wheel. From the studies, knowledge collected from CNC cutting experiments victimization style of Experiments approach. Then the information obtained were used for standardisation and validation. The inputs to the model include Feed, Speed and Depth of cut. The model is valid through a comparison of the experimental values with their expected counterparts. a decent agreement is found from this analysis. The proved technique opens the door for a brand new, straightforward and economical approach so as to model surface roughness, many ways had been employed in previous analysis. A project to use multiple heads to form contour drills and angular holes was obsessed by A.S.Udgave, (2008). Multiple-spindle drilling machines area unit used for production, a good time saver wherever several items of jobs having several holes area unit to be trained. Multi-spindle head machines area unit employed in mechanical trade so as to extend the productivity of machining systems. This machine has 2 spindles driven by one motor and every one the spindles area unit fed in to the work piece at the same time. Feeding motions area unit obtained either by raising the work table or by lowering the drills head. because the name indicates multiple spindle drilling machines have 2 spindles driven by one power head, and these 2 spindles holding the drill bits area unit fed into the work piece at the same time. The spindles area unit therefore made that their centre distance may be adjusted in any position at intervals the drill head counting on the work demand.

In their analysis, roughness of machined surface was assumed to be generated by the relative motion between tool and work piece and therefore the geometric factors of a tool. an easy linear model was developed to predict drill head rotation. Surface roughness was foreseen from the displacement signal of spindle motion. Prediction model had prediction accuracy of regarding ninety fifth. supported the literature review, the foremost parameters that wide thought-about once work the operation of a machine ar feed rate, spindle speed and depth of cut. Most of the researches didn't think about the uncontrolled parameters, like tool pure mathematics, tool wear, chip loads, and chip formations, or the fabric properties of each tool and work piece.

VII. CONCLUSION

The growth of Indian industries is looking on productivity. During this paper for rising productivity study some paper associated with automation and mix operation. This paper provides the knowledge of SPM for drilling and engrossing. the most conception of this project work is to style & developed a special purpose machine, which may be used for drilling and engrossing the work piece having completely different thickness and material on constant machine.

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