

DESIGN & MANUFACTURING OF PIPE CHAMFRING MACHIN.

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Abstract - Generally, for welding operations in maintenance and manufacturing we use chamfering machines but still we are using manually operated chamfering machines and for every operation we must do all the setups by human interference. This manual interference is more time consuming and have more chances of physical injuries to the human working nearby to it. The main aim of this paper to study all the possible solutions for converting manual operated chamfering machines to automated chamfering machine, increase productivity of them and reduces human interference while operating of the machines. In this paper various previously used method of operation of chamfering machine are discussed. Analysis has is done considering various previously used techniques and find out one new method that will be helpful for the operation of chamfering machine by using hydraulic systems. In this project we are going to manufacture the portable chamfering machine which can go in variable pipe diameter .

Keywords - Chamfering machines

1.Introduction

The Industrialization is moving towards automation and in this era of automation where it is broadly defined as replacement of manual effort by mechanical power in all applications of manufacturing. Chamfering is one of the major operations in manufacturing of pipes. In manufacturing industry there are many small scale and medium scale industries are there who performs this operation and as per the requirement or customer. For many industrial applications round pipe welding is required to be chamfered using different machines. This operation for mass production consumes time and manpower of the industry. To reduce the time consumption and energy consumption of worker we have designed and developed round pipe chamfer machine.

1. Problem definition

The pipe having thickness more than 2 mm cannot be directly welded. Before welding of pipe, the edges of pipe need to be chamfered otherwise welding will be done only on the surface of pipe and pipe will not take the extra load.

The current tempering operation in industry is done by using surface grinder operated manually. The manual operation requires more time and chamfering done is not uniform because of human error. The manual operation of chamfering has the chances of accident causes due to human error and process require more time compared to machine operation. Every time pipe cannot be taken to chamfering machine so the requirement here is to make the portable chamfering machine which can be fitted inside the pipe and can be taken to any size of pipe easily manual.

2. Objective

- It should have free moving parts, maintenance free, high reliability
- It should be easily controllable
- It should be intrinsically safe
- It should be made at possible low cost
- It should be compact and lightweight requires less space.
- It cost should be initially low and its working expenses are also less.
- Its maintenance should be simple, and no skilled labors should require.
- The machine shall be made of light weight material suitable for working in all weather in India.
- The outer surface of the machine shall be well finished, smooth and free from any unwanted projected part.
- The outer surface shall be free from surface defect like holes, sharp edges, cracks etc.
- Each set of the machine shall comprise of the chamfering machine with surface grinder. where it is broadly defined as

replacement of manual

3. Methodology

The machine which we are making will be suitable for the pipe range from 300mm to 600mm diameter, further the size of pipe diameter can be increased by using extra attachment in the machine link legs. The main part of machine is the central shaft which can be rotated by using handle given on the one end of the machine. When the main shaft is rotated the linkage mechanism will be tightly fitted inside pipe by using screw mechanism as the middle pipe is rotated the leg of machine will go out word and will apply the pressure inside pipe and machine will get fixed inside pipe. When the machine is rigidly fixed inside pipe, on the handle side one more mechanism is installed on which grinder can be fitted. The surface grinder will apply the force by using spring mechanism the grinder can be tilted at various angle required for chamfering operation.

The operator just needs to lift the machine by hand and put inside the pipe after putting machine inside pipe operator will rotate the handle and machine will be rigidly fitted inside pipe, after fitting the machine the spring pressure will be applied on grinder wheel and grinding operation can be done once the surface of pipe is uniformly. The grinder will be tilted on various angle so that chamfering at different angle can be achieved when the chamfering is successfully done the operator will lose the main shaft and take out the complete assembly from the pipe and welding will be done on the pipe edges.

Design Approach

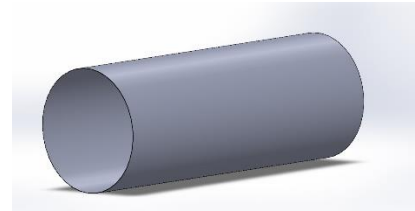
The project design consist of mainly two parts, first part is the mounting of machine which will be spring loaded and should be able to set itself in variable pipe diameter and second part is mounting and developing the rotating mechanism for surface grinder so that chambering in various angle should be possible. The machine is mathematically designed for a safe design and CAD model is develop for easy manufacturing.

Design Components

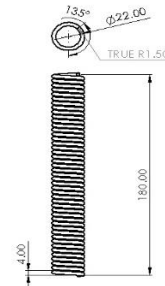
- Pipe work piece
- Spring
- Hand Grinder
- Small arm
- Sleeve

- Bush & Links
- Machin assembly
- Final Assembly

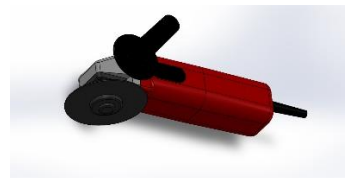
1. Pipe work piece



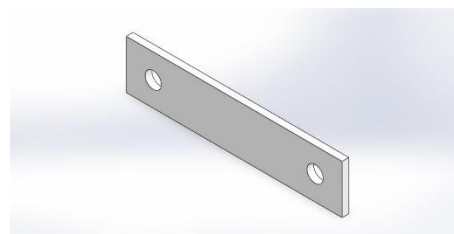
2 .Spring



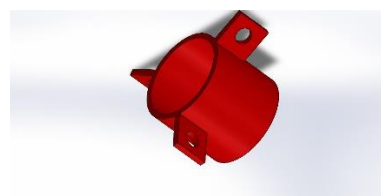
3 .Hand Grinder



4.Small Arm



5.Sleeve.



6. Bush & Links



7. Machin Assembly



8. Final Assembly



1. LITERATURE REVIEW

All Modern-day manufacturing is a demanding environment with a constant need for process improvement. As automation becomes more advanced, there are fewer jobs that must be completed by a human. The workforce is highly skilled, so replacing mundane tasks with automation allow the skilled workers to focus on the difficult jobs. One such task is grinding a chamfer onto every leading edge of different diameter pipe. The purpose of this project is to design an automatic chamfer

grinding system. To ensure maximum design potential, an entire semester was spent planning and designing the system. This has carried over into the current semester, and several techniques are being used, the largest of which is 3D computer aided design using Solid works. Once a design is finalized, and college approval obtained, the building process will begin. Concurrent with assembly will be component testing, to confirm that the chosen components will perform as required. By the completion of this semester, a finished device will be given to Company or college to be put into their everyday operations.

➤ Future Scope

1. The chamfering machine can be redesigned as per there requirements of an industrial component.
2. This specification chiefly covers the technical provisions having no connections with necessary contractual provisions.

CONCLUSION

The conceptual design of double pipe chamfer machine is prepared or designed in Solid works software and analysis in same software. This project can conclude that the operations performing on this machine will overcome the disadvantage of conventional machine and will provide us high-rate manufacturing with less time consumption and less consumption of manpower. After completion of document for this same it is concluded that manufacturing of the machine will be done for various pipe diameter and can be successfully used in many constructions site repairing work and pipe manufacturing industries

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