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DESIGN AND FABRICATION OF COOLANT SYSTEM FOR LATHE MACHINE

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ABSTRACT:

Lathe machines are used widely in all mechanical industries and workshops to carry out various operations on the mechanical parts. Turning, drilling, and cutting are very common operations performed on the mechanical parts. Mechanical part design needs precision of work as the dimensions of the part should be very accurate to fit in to the bigger machines. The main problem while working on lathe machine is the heat developed as the operations carried out are on the metallic parts. Due to continuous friction of the parts huge amount of heat is produces. Also the motors connected to the lathe undergoes huge load as there is huge requirement of torque. Hence the heat produced need to be addressed. We have designed a system for cooling for cooling of lathe machine.

KEYWORDS: Lathe, Motors, Heat Produced, Cooling, Cooling System for Lathe, etc.

INTRODUCTION:

Cooling is very important aspect of any machine. Lathe machines deals with the processing of mechanical parts. These parts are made up of metallic material and have good mechanical strength. The lathe machine is used to convert a piece of metal to the final part with considerations of dimensions and other mechanical properties.

Heat produced in lathe machine is huge and it is produced in various parts of the machine. Lathe machine are used for performing the operations like turning, drilling, trimming and shaping the mechanical parts. These machines if cooled properly results in saving of money with improvement in the life of various parts. Authors have developed a unique system for cooling of lathe. The system is capable to cool multiple machines at a time. This machine found suitable for the mechanical workshops and the industries where there are multiple lathes working continuously to carry out production of various mechanical parts.

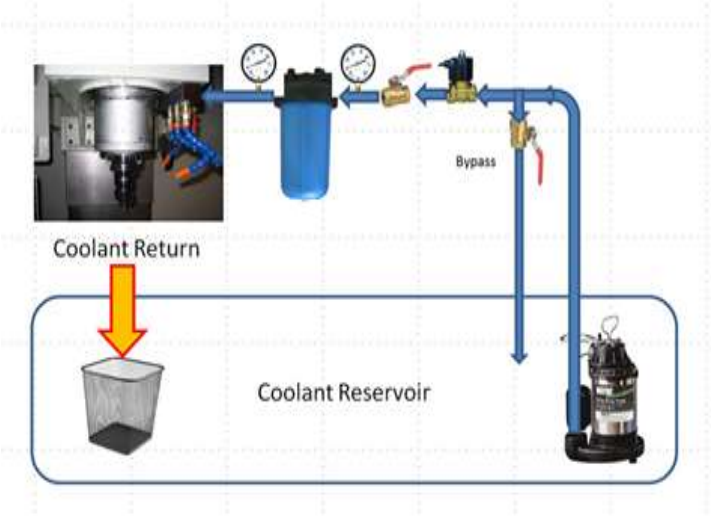

Fig.1: Coolant Provider System for Single Lathe

Regenerative circuit is used here to design the system of cooling. The system is used to cool multiple machines at a time. It reduced the cost of individual cooling arrangement to be provided for each lathe machine.

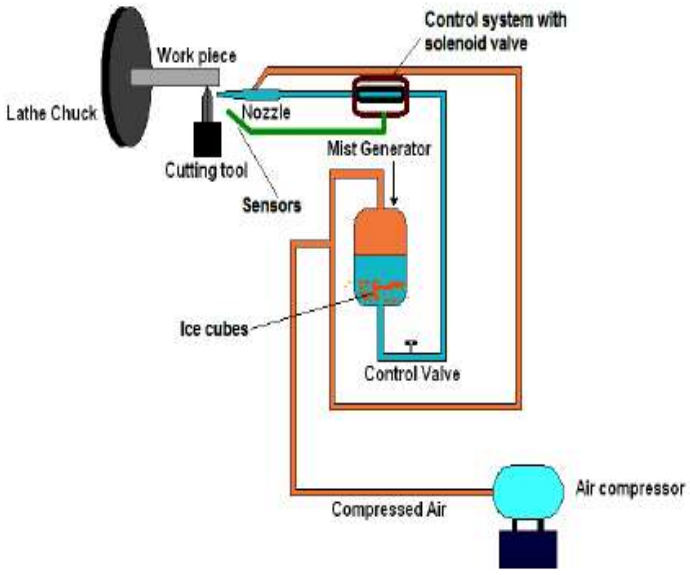

Fig.2: Mist Coolant System for Lathe Machine

For production drilling have used kerosene mixed with motor oil. The kerosene boils and evaporates at the cutting-edge cooling where it is most important. This can be a Smokey way to drill and can be a fire hazard

OBJECTIVES OF WORK:

The work is carried out to fulfill following objectives:

- Designing cooling machines to cool multiple lathe machines at a time.
- Reducing cost of cooling system for lathe.
- Improving performance of present cooling systems of lathe machines.

SYSTEM REQUIREMENT:

Table.1: Specifications of main components

Sr. No.	Component Details	Specifications Component
1	Pump	0.5 HP, 230V, 1Phae, 1500 RPM.
2	Coolant System	3/2 Directional Control Valve
3	Stirrer Mechanism	Radial Flow Type, 100-150V
4	Tank	Stainless Steel, 50 Litres

SYSTEM DESIGN:

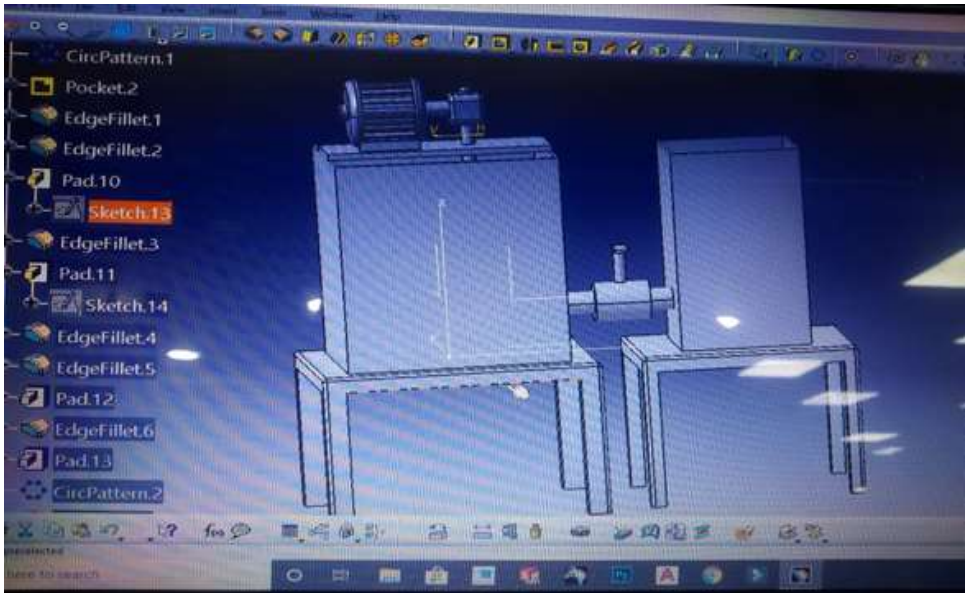

Fig. 3: Coolant System Layout on AutoCAD

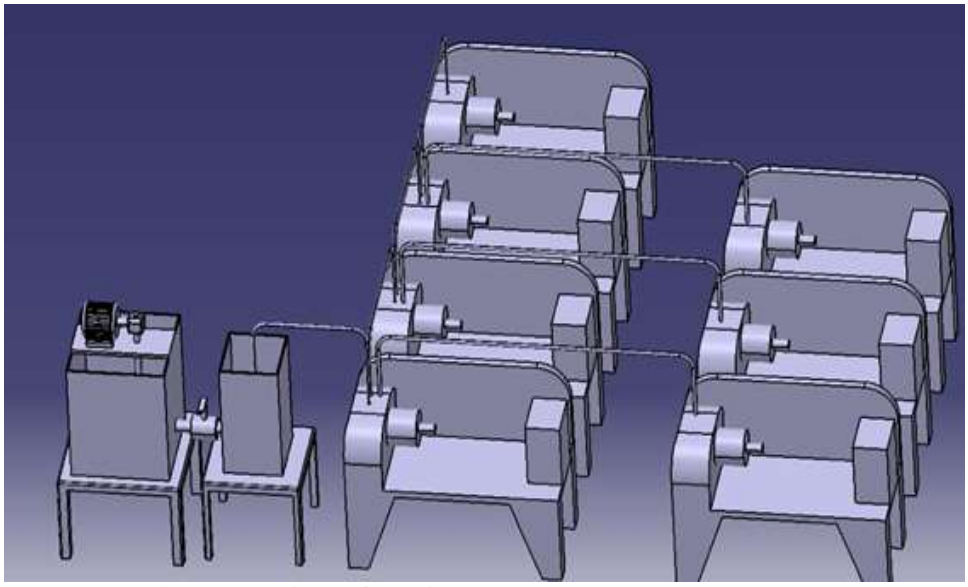

Fig.4: Top view of Coolant System Layout on AutoCAD

Authors have developed the CAD model for the cooling system of lathe machine. The hardware f the same system is to be developed as a part of undergraduate project of the students.

CONCLUSION:

Lathe machines are one of the most popular and multipurpose machines in production of mechanical parts. Lathe machines are used in various operations of mechanical parts such as turning, drilling. These machines experiences huge load when the mechanical part is processed. The heat produced in these machines is huge and there is need of system of cooling for such machines. Present cooling systems are provided separately to each lathe. It increases the cost of installation, cooling, and electricity for each cooling system. Authors have developed a unique system for cooling of multiple lathe machines from one system. This system is suitable for the workshops where there is more than one lathe machine functioning continuously.

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