

DESIGN AND FABRICATION OF OIL BURR SEPARATOR

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Abstract

Metals such as Fe, Al, etc. are widely used in manufacturing to produce almost all kinds of industrial and consumer products. Each year, a huge amount of metal chip solid waste is generated from the manufacturing industry. These manufacturing chips, mixed with cutting fluid, are difficult to recycle. Current manufacturing companies either landfill these wastes or pay a third party to haul them away, causing both environmental and economic issues. As widely recognized recycling these metal chip wastes could enhance the economic profit and reduce the environmental impact of manufacturing. Because these metal chips are a mixture of different materials.

Keywords: *Cylindrical Container, Centrifugal Action, Cutting Oil, Machining Burr with Oil, Oil Recovery*

1.INTRODUCTION

The world is knocking the door of 21st century. Rapid industrialization has made our country as the 10th most industrial country in the world. India is ranking 3rd in world in respect of technological talent and the manpower. Rapid industrialization played a crucial role to improve our economy. There are lots of good outcomes but it also created plenty number of problems. "Pollution problem" is versatile one. Pollution has created lot of problem in industries. Sugar factories, Automobile industries, are captured by pollution. Water pollution is a big problem which is unavoidable. The processed water at factory has created pollution. The factory requires huge amount of water daily and the processed water has to be wasted to the river. The processed water contains low PH Value, which in turn makes the land salty. It can't be used for agriculture. The oil and grease contents in water effect on the land as well as on human beings. Due to chemicals present in water, the water lives are on the edge of destroying. Oil separator is mechanical equipment, which is used in the environment pollution control from oil spillage. Oil separator helps in removing the oily effluent from the waste water. By removing

the oil from waste water, it becomes free of oil pollution. Oil separator can remove even a thin floating film of oil from the water.

2. PROBLEM STATEMENT

Problem definition is most important step in any problem solving is said that very probably defined problem is half way towards the solution of problem hence systematic methodological approach of problem definition is adopted. Many industries consist of machining process like honing, broaching etc. In this process high rate of burr is removed which contains high amount of cutting oil . Now a days burr which contain cutting oil is disposed without separating cutting oil. Hence it needs to separate cutting oil from the burr. Oil contain in burr is intrinsic problem hence separation of oil from burr system is statistically impossible to clean whole oil content from burr by this method of centrifugation whole oil contain in burr is separated.

3. OBJECTIVES

1. The design and optimization of centrifugal oil separator base on basic laws of physics such as centrifugation.
2. To study various machining processes.
3. To study various types of cutting oil used in machining process.
4. To develop experimental setup for removal of cutting oil from burr.
5. Testing of setup and modification in it, if necessary.

4. METHODOLOGY

1. Literature Survey For: i) Machining Process ii) Cutting Oil iii) Coolants
2. Designing of various components used in setup.
3. Fabrication of experimental setup.
4. Performance evaluation experimental setup
5. Finally results will be summarized.

Cutting Fluid Use for Metal Working:

Type of product is not mixed with water, but is applied directly. Neat cutting oils are primarily used when good lubricating properties are required, such as in deep-hole drilling, threading and reaming. Cutting oils have different viscosities, base oils and additives depending on the processes and which metals are being machined. Mineral oils, synthetic oils, white oils and esters are used as base oils. „Fatty oils“ are also often added (such as vegetable oils, animal oils or esters) to protect against wear. EP additives are also sometimes used (e.g. sulphur, phosphorus or chlorine).

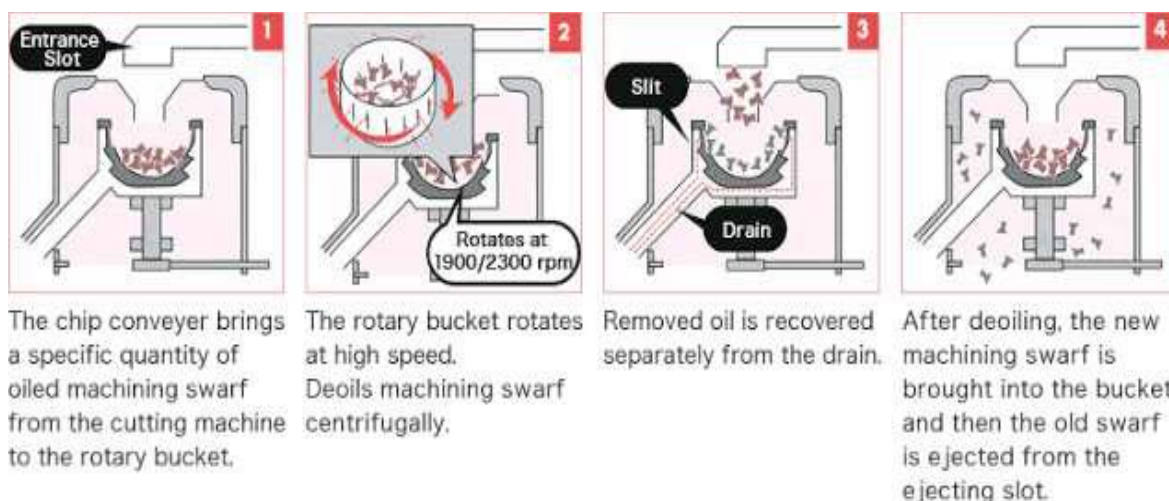
5. PRINCIPLE AND WORKING OF OIL SEPARATOR

5.1 Principle

Centrifugal oil burr separator works on the principle of basic laws of physics such as centrifugal motion . It causes a centrifugal motion due to rotation of shaft with the help of belt and pulley arrangement and the power is supplied from the motor due to which the bucket carrying net spins at high rpm.

5.2 Working

Oil Recovery Centrifuge works on principle of centrifugal separation. Rotor bucket made of perforated mild steel is driven by motor. Burr from which oil is to be recovered are loaded in the rotor bucket. Centrifugal force created in the rotor separates oil from surface of burr. Collected oil is depleted out by opening valve located at the base of unit. Fig.-: Setup of oil separator Centrifuge is used in conjunction with positive filters to remove extraneous oil and small fines from metal working cutting oil. The fluid mix feeds into a centrifugal open type net, which rotate at a high rpm. Centrifugal force pushes the swarf to the outside of the bucket. The cutting oil from the net spilt into bucket and then its filtered



6. ADVANTAGES AND APPLICATION

6.1. Advantages

1. Complete Oil Recovery.
2. Reduced Oil Consumption.
3. Substantial savings on cost of oil.
4. Reduced pollution and environmental impact.
5. Improved Product Finish

6.2 Applications

1. Gear Manufacturing
2. Fastener Manufacturing
3. Spring Manufacturing
4. Gun Drilling

6. Conclusion

The main aim of project to save money &eco-friendly. The new system is economical and user friendly than previous system. Easy to operate, smooth running, higher oil removal rate, economical, the new system flexible in operation.

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