PLASTIC MOULDING

Plastic moulding is a process of forcing melted plastic into a mould cavity or die. Once the plastic has cooled the part can be ejected. Injection moulding is best suited for producing articles made of Thermoplastic materials. It can be performed with a host of materials mainly including metals, glasses, elastomers, confections, and most commonly thermoplastic and Thermosetting polymers. The material for the part is fed into a heated barrel, mixed, and forced into a mould cavity, where it cools and hardens to the configuration of the cavity.

TOOLS REQUIRED:

1. Raw Material
2. Plastic moulding machine
3. Die or Mould cavity.

USE:

Plastic injection moulding is generally used for producing

- Plastic injection moulding
- Rubber injection moulding
- Metal injection moulding.

This process is used to create many things such as cups, containers, tools, mechanical parts (like gears).

It is the most common modern method of manufacturing parts. It is ideal for producing high volumes of the same object.

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1. RAW MATERIALS :

These are the substances used to make the aimed object. Generally plastic or polymer pellets are used as raw materials. They fill up the mould cavity and attain its shape on cooling. Some common type of raw materials include, Polypropylene, Acrylonitrile Butadine Styrene, Polyamide, High Density Polyethylene, Polycarbonate, and ABS+PC blend etcetera.

RAW MATERIALS

2. PLASTIC MOULDING MACHINE:

It is a simple vertical machine that consists of a Barrel, Plunger, Band Heaters along with energy regulators, Rack and Pinion system for injecting the material by the plunger, a torpedo and a nozzel. The clamping is done manually on the working table, where the machine is fitted. The capacity for heating of the machine is available from 0.5oz to 2oz. Once heating is achieved production starts manually.

The quality of the product completely depend upon the skillness of the operator. The heating set point is achieved by heat and trial method. Although temperature controller is fitted on the machine but the set point is completely dependend on the quality of the product produced by the operator. The cycle time is completely variable and it depends on the competence of the operator.

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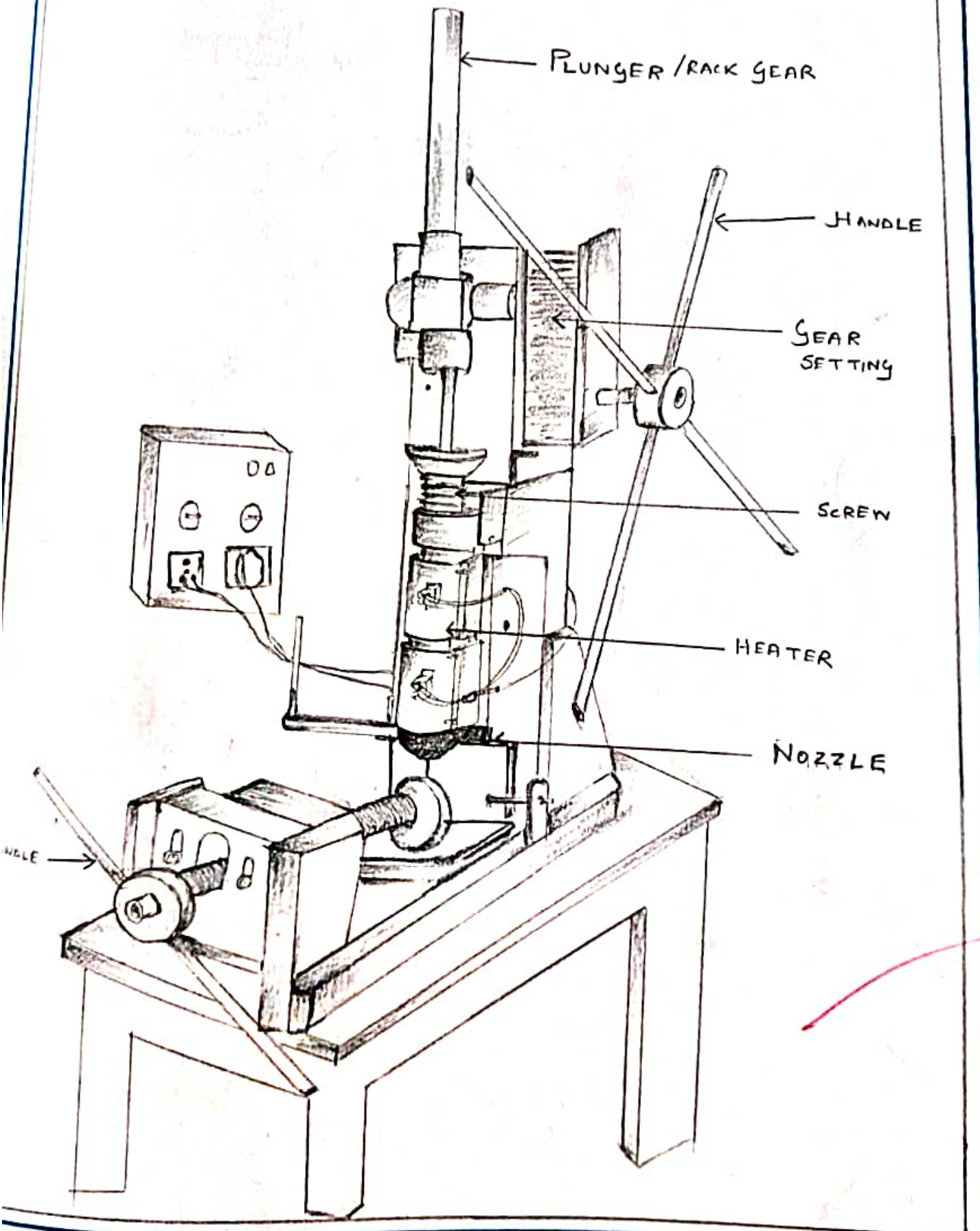
PLASTIC MOULDING MACHINE



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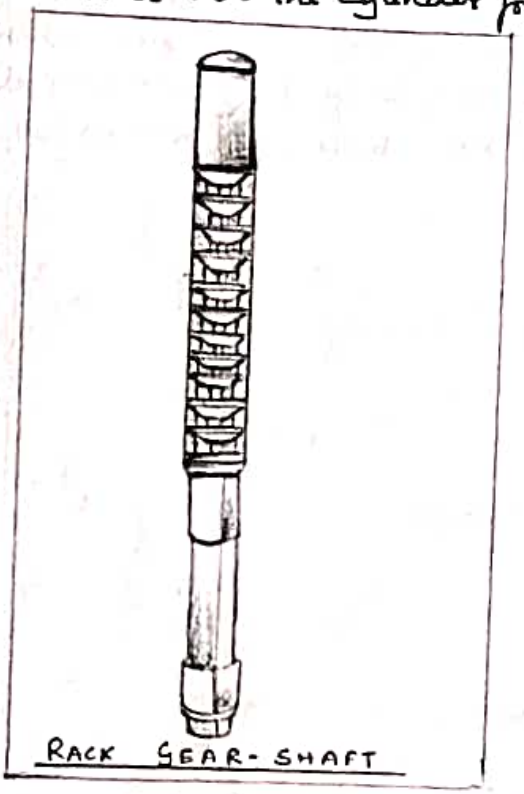
PARTS OF THE MACHINE :

1. RACK GEAR-SHAFT :

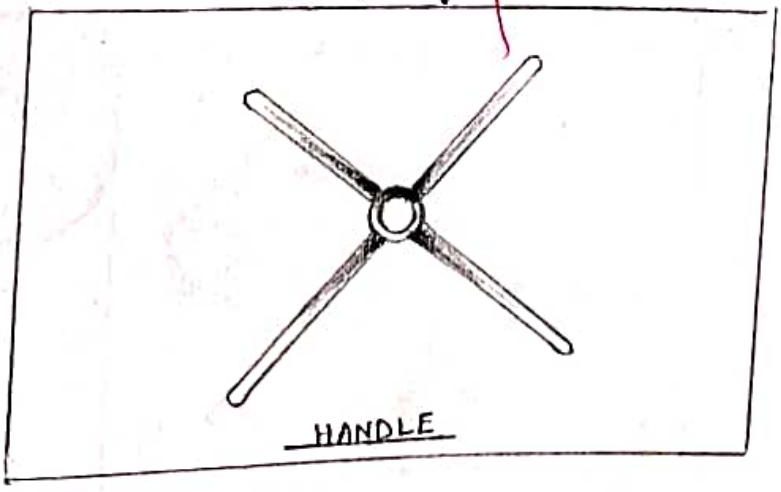
It is a long metal rod like structure that is used for plunging the raw material into the cylinder for heating purpose.



RACK GEAR-SHAFT

2. HANDLE :

It is used for moving the plunger in and out of the cylinder in vertical direction and for fixing the die in horizontal direction.



HANDLE

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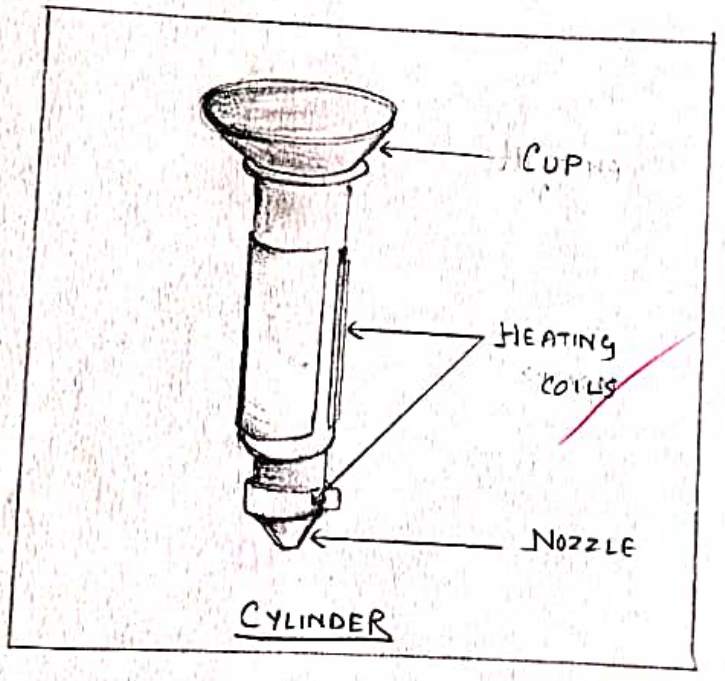
3. CYLINDER :

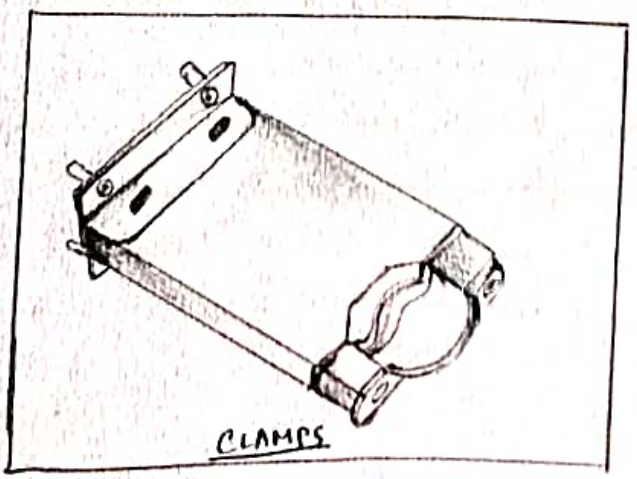
It is made up of mild steel. On the lower part of the cylinder a nozzle is fitted.

It has two heating coils which are electric heating instruments. A cup or holder is fitted at the top of the cylinder through which raw materials are poured. The molten material or plastic is ejected into the die from the nozzle hole when the plunger applies force on the material. Electrical supply is given to the coil so the plastic material goes to molten stage and turns jelly like.



4. CLAMPS :

Clamps are used to attach the cylinder with the frame



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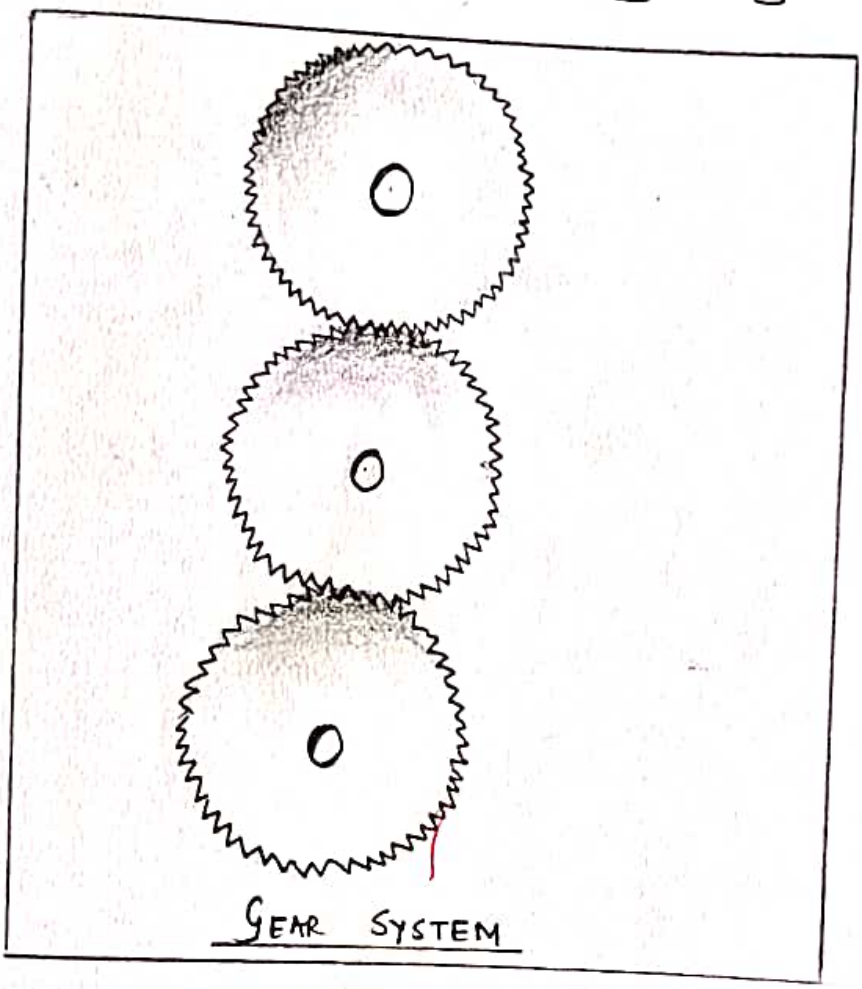
5. GEAR SYSTEM:

There are three gears which work simultaneously for moving the plunger in and out of the cylinder.



GEAR SYSTEM

3. INJECTION MOULD DIE:

Injection mould dies are cavities of required shape or component. This die has an opening for molten raw material to enter. When injection is done the die set is removed by tidying the screw that is the clamping arrangement. The clamping unit is what that holds the die under pressure during the process of injection moulding.

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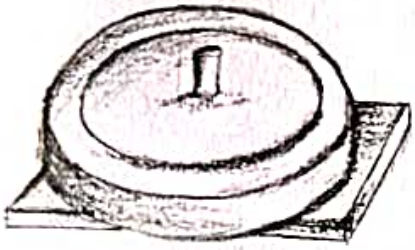
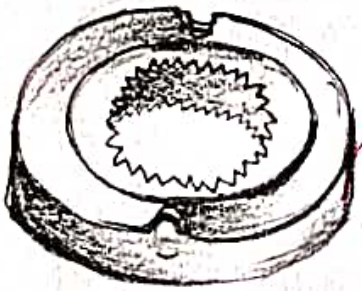
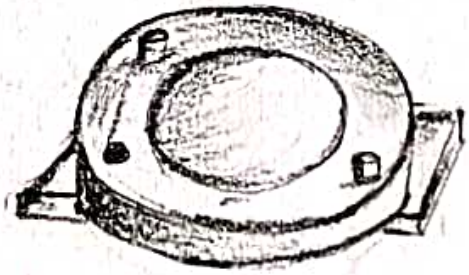






INJECTION MOULDING DIE

INSTITUTE OF ENGINEERING & MANAGEMENT

NAME OF THE STUDENT : SAMAYITA KALI

SEMESTER : 1ST SEMESTER

ROLL NO. : 10

ASSIGNMENT ON DEPARTMENT : MECHANICAL WORKSHOP

DATE OF EXPERIMENT / PROJECT : 16/10/19

DATE OF SUBMISSION : 22/10/19

TITLE : PLASTIC MOULDING SHOP JOB REPORT

OBJECT : To carefully note down the procedure
the process of making an object of plastic mou

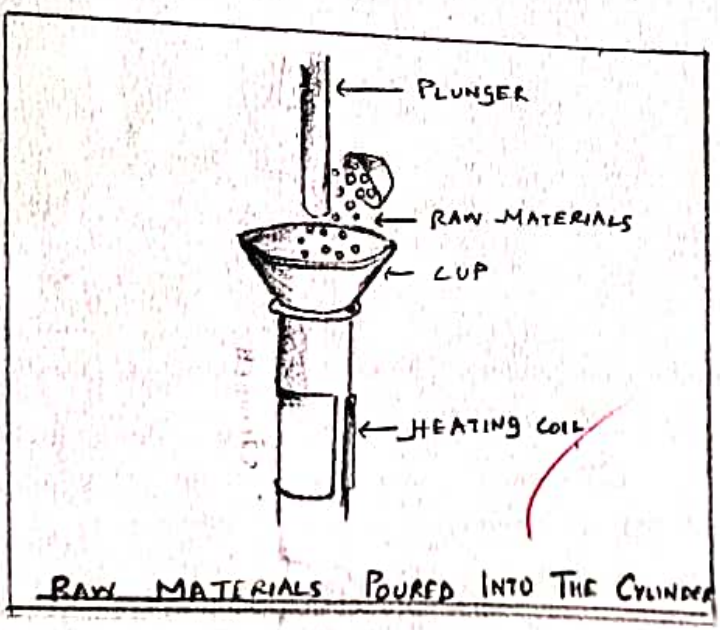
JOB REPORT

The main part of the job report includes the working of the plastic moulding machine.

PROCEDURE :

① PREPARATION OF MOULD :

At the beginning of the procedure, the plunger is raised up from the cylinder with the help of the handle and the raw materials is poured into the cup of the cylinder. The injection process starts as the plunger moves from upward to downward using the three gear system and thus pushing the raw material into the heating chamber.



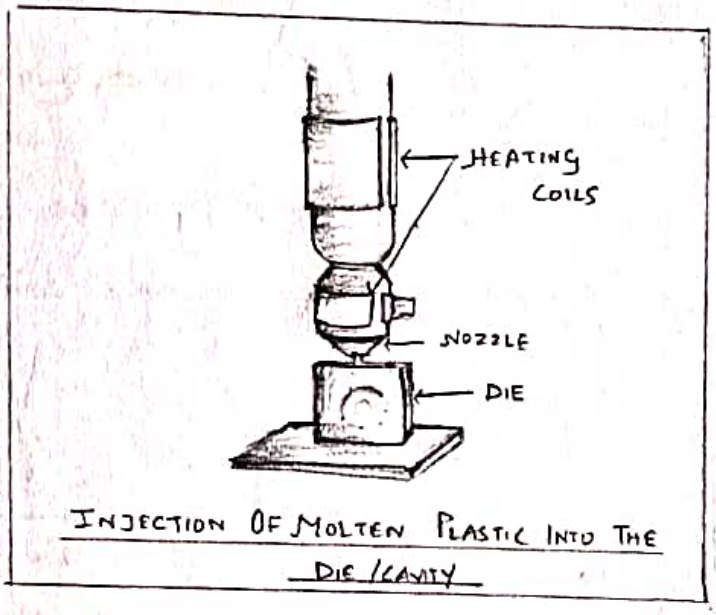
RAW MATERIALS POURED INTO THE CYLINDER

② CLAMPING OF THE DIE :

The clamp is what that actually holds the die in place securely when melted plastic is being injected into the cavity. It is held under pressure while the mould cools down and attains the shape of the die completely.

③ Injection Of Plastic :

After the raw material is pushed into the heating part of the cylinder it takes about fourty five (45) minutes for the raw material to melt and turn jelly like. This molten material is pushed inside the nozzle. Further this molten plastic is pushed into the die assembly to gather the required shape.



Injection Of Molten Plastic Into The Die/Cavity

④ Cooling The Mould :

Moulds are typically Air or water cooled. Sometimes small holes are bored into the mould that allow a cooling liquid (such as water) to be circulated. Injection mould cooling consumes about 85% of the cycle time for the entire process.

⑤ Unloading Or Demoulding :

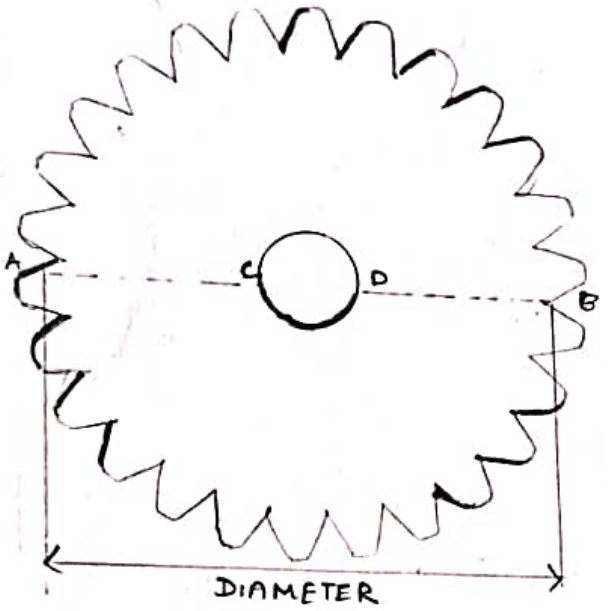
After solidification, the clamp holding the two halves of the mould together closed is opened allowing the part to be removed. The injection moulding proces can then be repeated.

PRECAUTIONS :

1. Never reach over or under machine guards
2. Do not touch the body of the cylinder when the machine is on
3. Donot toucch the die when the melted plastic is poured or was just poured
4. Never use bare hands on the mould before it is cooled
5. Donot disturb the plastic mould before cooling
6. Donot apply to much pressure on the handles, it may damage the machine.
7. Never use steel tools on the mould cores or cavities.
8. The machine should be always shut off after use.

ADVANTAGES :

1. The procss allows fast production
2. Provides design flexibility
3. Multiple materials can be used at the same time
4. Can be used to produce very small parts
5. Leaves behind little post - production scrap
6. Good product consistency and dimensional control
7. Reduces requirements for finishing.



All dimensions are in cm.

GIVEN OBSERVATION	RECORDED OBSERVATION
AB = 7 cm CD = 1.3 cm Thickness = 1.6 cm	AB = 7cm CD = 1.3cm Thickness = 1.6cm

16/10/19

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