



Manufacturing of Auto-Feed Hydraulic Cutting Machine

SHAIKH ARSHAD (13ME44)

SYED ADNAN (13ME41)

WASIULLAH (13ME62)

UNDER GUIDANCE OF

PROF. ATUL MESHAM

TABLE OF CONTENT

- ▶ INTRODUCTION
- ▶ PROBLEM DEFINATION
- ▶ OBJECTIVE
- ▶ LITERATURE
- ▶ DESIGN CALCULATION
- ▶ MARKET SURVEY
- ▶ FABRICATION
- ▶ ASSEMBLY
- ▶ WORKING
- ▶ TESTING
- ▶ CONCLUSION
- ▶ FUTURE SCOPE

INTRODUCTION

- ▶ Make a cost efficient hydraulic cutting machine
- ▶ Increase the speed of cutting of sheet metal process
- ▶ Decrease man power by making it automatic
- ▶ Make sure safety of operator

Problem Defination

To make a cost effective & efficient, Auto-Feed Hydraulic cutting
Machine for Small scale industries to cut sheet metal of various
thicknesses

Objective

- ▶ Low cost Machine
- ▶ Suitable for small scale industries
- ▶ Fully Automatic

Literature

Four types of cutting machines

1. Rack and Pinion operated
2. Spring operated
3. Pneumatic operated
4. Hydraulic Operated

- ▶ All three are non efficient not capable for cutting more thick sheet metal but hydraulic is made for large thick materials.
- ▶ Hydraulic cutting has high efficient and heavy duty

Methodology



Followed below methodology for completion of our project on time

- Literature Survey
- Design Calculation
- Market Survey
- Procurement of components
- Fabrication
- Assembly
- Testing

Design Calculation

Sheet metal Material	Mild Steel
Thickness	3 mm
Length of cut	140 mm
Tensile Strength	130

Force Require to cut = (length of cut) * (thickness) * (Shear stress)

$$\text{Force} = 10 * 3 * 125$$

$$\text{Force} = \mathbf{3750 \text{ N}}$$

$$\text{Available Force} = \left(\frac{\pi d^2}{4} \right) * (\text{Pressure})$$

$$\text{Available Force} = \left(\frac{\pi 55^2}{4} \right) * 2$$

$$\text{Available Force} = \mathbf{4751.9 \text{ N}}$$

Since our available force is greater than force req.

Hence our **Cylinder design is safe**

MARKET SURVEY

Available Hydraulic Machines

Hydraulic Cutting Machine



We Master Export Keeping in mind the precised needs and necessities of our customers, we have come up with a vast collection of Hydraulic Cutting Machine. Offered hydraulic **more..**

Rs 1.25 Lakh/Unit(s)

Master Exports, India 
Flyover End, Ludhiana
 **08079464364**

[Send Enquiry](#)

Hydraulic Sheet Cutting Machine



Shearing are available in capacities (size) of 4 feet / 5 / 6 / 8 / 10 / 12 feet & 13 feet length thickness of machine is 0. 100 mm up to 16 mm capacity, rolling key clutch, spring loaded **more..**

Rs 5 Lakh/Unit

Vivek Machine Tools 
Raj Nagar, Rajkot
 **08079447408**

[Send Enquiry](#)




Hydraulic Cutting Machine



Our rich industry experience enables us to manufacture and supply impeccable quality Hydraulic Cutting Machine that comes with inner-inclined structure to make it easy for **more..**

Rs 5 Lakh/pcs

Parrytech Hydraulics 
Mundka, New Delhi
 **08048602344**

[Send Enquiry](#)

► Courtesy :- India Mart website

MARKET SURVEY T

- ▶ Visited 3 industries and got cost of components
- ▶ Visited small scale industries to know their requirements
- ▶ Visited various shops for basic components

FABRICATION

UPPER BODY



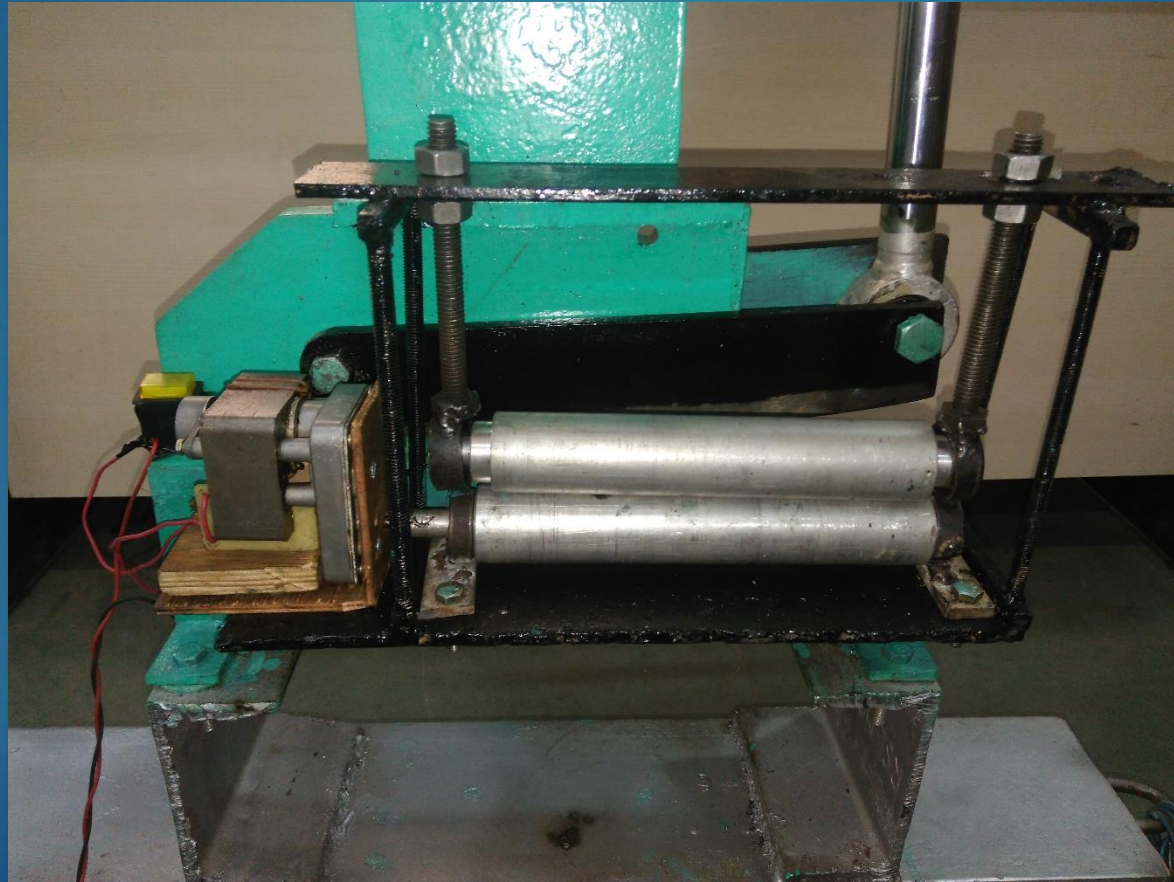
TROLLEY



GRINDING AND SURFACE FINISHING



FEEDING SYSTEM



LENGTH MEASUREMENT SYSTEM

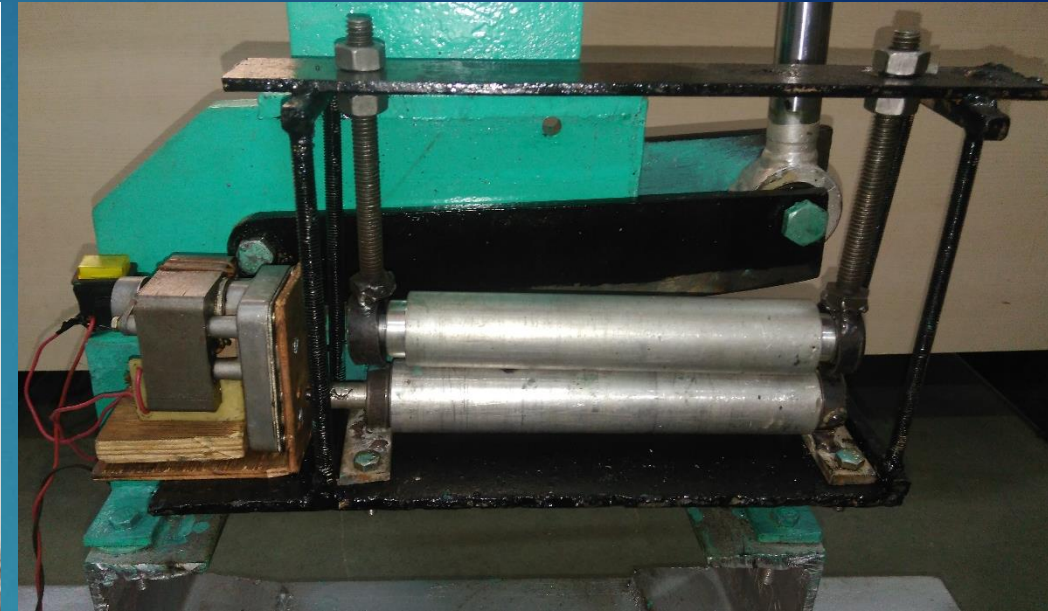


POWER PACK

- ▶ It is present in mechatronics lab



WORKING OF CUTTING MACHINE



MACHINE SPECIFICATION

- ▶ Operating Pressure = 20 bar
- ▶ Motor speed = 1440 rpm
- ▶ Motor Capacity = 2 HP
- ▶ Gear Pump Capacity = 9 litres / min
- ▶ Feeding speed = 120 rpm



TESTING

LEAKAGE PROBLEM

- ▶ While testing, leakage problem occurred



TESTING



SHEET METAL TESTED

At 20 bar pressure

- ▶ 3 mm Mild Steel (2 cut of 22mm length sheet metal in 10 sec)
- ▶ 2 mm Galvanised Iron
- ▶ 2mm Stainless steel

Greater thickness can be cut if pressure is increased

CONCLUSION

- ▶ Eliminated one labor required for cutting process
- ▶ Tremendous reduction of human efforts
- ▶ Semi- Automatic machine
- ▶ Increase in production rate

Future scope

- ▶ It can be made fully automatic by adding arduino circuit and sensors.
- ▶ Thickness of sheet metal can be increased by increasing pressure
- ▶ Speed of cutting increase if discharge of pump increased
- ▶ Cutting capacity can be increased by increasing bore of cylinder
- ▶ Line detecting sensor will terminate cutting if hand comes while cutting

THANK YOU
FOR
BEING GOOD AUDIENCE

