DESIGN AND FABRICATION OF U-CLOTHSPIN ASSEMBLY MACHINE

A project report submitted for the partial fulfillment of the requirement for the Degree of

Bachelor of Engineering

In

Mechanical Engineering

Faculty of Engineering and Technology

Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur

Submitted By

MR. APURVA RANGARI	**(124)**	**MR. KALPESH RAWALE**	**(163)**
MR. BIPIN GUPTA	**(129)**	**MR. ROHAN GHATOLE**	**(175)**
MR. NINAD KUMRE	**(159)**	**MR. RUPESH WAGHMARE**	**(178)**

Under the Guidance of

Dr. A. V. VANALKAR

PROFESSOR

DEPARTMENT OF MECHANICAL ENGINEERING

K. D. K. COLLEGE OF ENGINEERING, NAGPUR.

2018-2019

KARMAVIR DADASAHEB KANNAMWAR

COLLEGE OF ENGINEERING, NAGPUR

DEPARTMENT OF MECHANICAL ENGINEERING

SESSION 2018 - 2019

CERTIFICATE

Certified that the project titled **Design and Fabrication of U-clothspin assembly Machine** is a bonafide work done under my guidance by VIII semester students of this institute and is submitted to **Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur** for the partial fulfillment of the requirements for the award of degree of Bachelor of Engineering in **MECHANICAL ENGINEERING.**

MR. APURVA RANGARI	**(124)**	**MR. KALPESH RAWALE**	**(163)**
MR. BIPIN GUPTA	**(129)**	**MR. ROHAN GHATOLE**	**(175)**
MR. NINAD KUMRE	**(159)**	**MR. RUPESH WAGHMARE**	**(178)**

DR. A.V. VANALKAR — Project Guide

DR. C.C. HANDA — Professor & Head

DR. D.P. Singh

Principal

K. D. K. C. E., Nagpur

ACKNOWLEDGEMENT

With profound feeling of immense gratitude and affection, we would like to thank our guide **Dr. A.V. Vanalkar, Deptt. of Mechanical Engineering** for his continuous support, motivation, enthusiasm and guidance. His encouragement, supervision with constructive criticism and confidence enabled us to complete this project.

We also wish to extend our reverences to **Prof. C.C. Handa, Head of Mechanical Engineering** for providing necessary facilities to complete our project.

We express our admirations for P**rof. A. M. Badar, Vice principal**, for his valuable advice and support throughout this venture.

We also put forth our deepest sense of gratitude towards **Dr. D.P. Singh, Principa**l for constant motivation and providing necessary infrastructure.

Finally, a special thank to all the faculty members of the department for their cooperation throughout the project work.

PROJECTEES

Apurva Rangari (124)

Bipin Gupta (129)

Ninad Kumre (159)

Kalpesh Rawale (163)

Rohan Ghatole (175)

Rupesh Waghmare (178)

K. D. K. COLLEGE OF ENGINEERING, NAGPUR

DEPARTMENT OF MECHANICAL ENGINEERING

Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur

Session 2018 – 2019

DECLARATION

The dissertation titled **DESIGN AND FABRICATION OF U-CLOTHSPIN ASSEMBLY MACHINE** is our own work carried out under the guidance of Prof. **Dr. A. V. VANALKAR**, Department of Mechanical Engineering at K.D.K.C.E, Nagpur. As far as our knowledge, this work in the same form or any other form is not submitted by us or anyone else for award of any degree.

PROJECTEES

APURVA RANGARI (124)

BIPIN GUPTA (129)

NINAD KUMRE (159)

KALPESH RAWALE (163)

ROHAN GHATOLE (175)

RUPESH WAGHMARE (178)

CONTENTS

ABSTRACT

The first design that resembles the modern clothespin was patented in 1853 by David M. Smith, a prolific Vermont inventor. Clothespin assembling machines are used for assembling clip and spring to one final clothespin.Today, many clothes-pegs (also clothespins) are manufactured very cheaply by creating two interlocking plastic or wooden prongs, in between which is often wedged a small spring. This design was invented by David M. Smith of Springfield, Vermont, in 1853. By a lever action, when the two prongs are pinched at the top of the peg, the prongs open up, and when released, the spring draws the two prongs shut, creating the action necessary for gripping. Smith was also known for being an excellent violin player. It was one of his hobbies. He used to think clearly whenever playing violin, thinking about every day problems. That was how he came up with the idea to invent a clothespin. Clothespins were further enhanced by the invention of stainless steel clothespins that do not rust or decay with outdoor use. Rather than using a torsion spring that often twists, causing the clothespin to fall apart, they rely on a strong, trapped, compression spring that results in a stronger grip. The company, which had discontinued its line of wooden clothespins, diversified into plastics, including plastic clothespins, which constituted only a small part of overall production. However, the National Clothespin Company finally ceased production of clothespins, the last American-manufactured clothespin coming off the production line in 2009, amid a certain amount of media attention and regret.

LIST OF FIGURES

LIST OF IMAGES

1. INTRODUCTION

1.1 CLOTHESPIN

Clothespin are used for drying garments simply hung over a line. Over the years it has been subject to many redesigns and changes in manufacturing techniques but the principle remains the same. Washed, wet clothes are held in place on a piece of cord strung between two objects and the clothes allowed to dry in the free air. The clothes peg holds the garments firmly but should not damage them. Some of the early clothes pegs were made from a split piece of wood with a piece of wire or metal wrapped around the top of the split. This wire would stop the stick splitting completely.

If the task is performed manually it will take 7-8 sec and if it is done automatically it takes less time.The design by Smith was improved by Solon E. Moore in 1887. He added what he called a "coiled fulcrum" made from a single wire, this was the spring that held the wooden pieces together, acted as a spring forcing them to shut, and as a fulcrum on which the two halves could rock, eliminating the need for a separate component, and reducing manufacturing costs. This became the first successful spring-actuated clothespin, being manufactured and sold in huge quantities all across the United States. The state of Vermont, and its capital of Montpelier, in particular, quickly became what The New York Times has called "The Silicon Valley of Clothespin Manufacturing", the United States Clothespin Company opening in 1887 to manufacture Moore's improved design. Vermonter Stephen Thomas, a Medal of Honor recipient in the Civil War served as company president, and the company enjoyed a significant level of success, in spite of the competitors that rapidly sprang up in Waterbury and other places. Most significant was in 1909, when Allan Moore, one of the U.S.C. Co. employees, devised a way in which clothespins could be manufactured more cheaply, by eliminating one of the coils in the "spring fulcrum". He left the company, and with a loan from a local entrepreneur opened a competing factory, literally across the street from the U.S.C. Co. building. The new National Clothespin Company rapidly overtook the U.S.C. Co., consuming 500,000 board-feet of lumber at the height of production. After WWI, cheap imports from Europe

began to flood the market, in spite of repeated calls for protective tariffs by Vermont, and the state industry went into decline; in 1920, it cost 58 cents to manufacture one gross of clothespins in Vermont, while imported Swedish clothespins were sold for 48 cents a gross. The situation worsened after WWII, and the introduction of the electric clothes dryer diminished demand for clothes pins, further damaging the industry; the U.S.C. Co. was forced to close its doors before the end of the 1940s. However, the National Clothespin Company, who had previously moved from its original location across the street, and had been sold to a new owner, managed to stay in business by virtue of a contract with the F.W. Woolworths department store chain. In this fashion, they managed to hang on through the following decades, in spite of a disastrous fire in 1978. The profit margin was eaten into further by the increasing volume cheap Chinese imports; the familiar pleas for protective tariffs were continued, but to no result.

Objectives:-

1. To provide small scale industries with a better option for production of u clothespin.
2. To minimize tne level of dependence on worker with automation.
3. To understand machine design and experimentation of u clothespin assembly machine.
4. To fulfill the need of new and young entrepreneurs seeking opportunities in this field.

1.2 SYSTEM COMPONENT

The clothes pin assembly machine is constructed using following components.

LIST OF COMPONENTS

- Pneumatic cylinder
- Air compressor
- Sensors
- Air pipes
- Atmega 16 microprocessor
- Servomotor
- Acrylic disc
- Solenoid valve

1. Pneumatic Cylinder

Fig.1.1 Pneumatic Cylinder

Pneumatic cylinder(s) (sometimes known as air cylinders) are mechanical devices which use the power of compressed gas to produce a force in a reciprocating linear motion.

Engineers sometimes prefer to use pneumatics because they are quieter, cleaner, and do not require large amounts of space for fluid storage.

Because the operating fluid is a gas, leakage from a pneumatic cylinder will not drip out and contaminate the surroundings, making pneumatics more desirable where cleanliness is a requirement

General

Once actuated, compressed air enters into the tube at one end of the piston and imparts force on the piston. Consequently, the piston becomes displaced.

Compressibility of gases

One major issue engineers come across working with pneumatic cylinders has to do with the compressibility of a gas. Many studies have been completed on how the precision of a

pneumatic cylinder can be affected as the load acting on the cylinder tries to further compress the gas used. Under a vertical load, a case where the cylinder takes on the full load, the precision of the cylinder is affected the most. A study at the National Cheng Kung University in Taiwan, concluded that the accuracy is about ± 30 nm, which is still within a satisfactory range but shows that the compressibility of air has an effect on the system.

Types

Although pneumatic cylinders will vary in appearance, size and function, they generally fall into one of the specific categories shown below. However, there are also numerous other types of pneumatic cylinder available, many of which are designed to fulfill specific and specialized functions.

Single-acting cylinders

Single-acting cylinders (SAC) use the pressure imparted by compressed air to create a driving force in one direction (usually out), and a spring to return to the "home" position. More often than not, this type of cylinder has limited extension due to the space the compressed spring takes up. Another downside to SACs is that part of the force produced by the cylinder is lost as it tries to push against the spring.

Double-acting cylinders

Double-acting cylinders (DAC) use the force of air to move in both extend and retract strokes. They have two ports to allow air in, one for outstroke and one for instroke. Stroke length for this design is not limited, however, the piston rod is more vulnerable to buckling and bending. Additional calculations should be performed

2. Air Compressor

Fig 1.2 . Air Compressor

An air compressor is a device that converts power (using an electric motor, diesel or gasoline engine, etc.) into potential energy stored in pressurized air (i.e.,compressed air). By one of several methods, an air compressor forces more and more air into a storage tank, increasing the pressure. When tank pressure reaches its engineered upper limit the air compressor shuts off. The compressed air, then, is held in the tank until called into use.[1] The energy contained in the compressed air can be used for a variety of applications, utilizing the kinetic energy of the air as it is released and the tank depressurizes. When tank pressure reaches its lower limit, the air compressor turns on again and re-pressurizes the tank. An air compressor must be differentiated from pump because it works for any gas/air and pump work on liquid

Classification :-

Compressors can be classified according to the pressure delivered:

They can also be classified according to the design and principle of operation:

Displacement type

There are numerous methods of air compression, divided into either positive-displacement or roto-dynamic types.

Positive displacement

Positive-displacement compressors work by forcing air into a chamber whose volume is decreased to compress the air. Once the maximum pressure is reached, a port or valve

opens and air is discharged into the outlet system from the compression chamber. Common types of positive displacement compressors are

Dynamic displacement

Dynamic displacement air compressors include centrifugal compressors and axial compressors. In these types, a rotating component imparts its kinetic energy to the air which is eventually converted into pressure energy. These use centrifugal force generated by a spinning impeller to accelerate and then decelerate captured air, which pressurizes it.

Cooling

Due to adiabatic heating, air compressors require some method of disposing of waste heat. Generally this is some form of air- or water-cooling, although some (particularly rotary type) compressors may be cooled by oil (that is then in turn air- or water-cooled). The atmospheric changes are also considered during cooling of compressors.

Applications

Air compressors have many uses, including: supplying high-pressure clean air to fill gas cylinders, supplying moderate-pressure clean air to a submerged surface supplied diver, supplying moderate-pressure clean air for driving some office and school building pneumatic HVAC control system valves, supplying a large amount of moderate-pressure air to power pneumatic tools, such as jackhammers, filling high pressure air tanks (HPA), for filling tires, and to produce large volumes of moderate-pressure air for large-scale industrial processes (such as oxidation for petroleum coking or cement plant bag house purge systems).

3. Sensors

Fig 1.3 Photo Sensors

A sensor is a device that detects and responds to some type of input from the physical environment. The specific input could be light, heat, motion, moisture, pressure, or any one of a great number of other environmental phenomena. The output is generally a signal that is converted to human-readable display at the sensor location or transmitted electronically over a network for reading or further processing.

Classification of measurement errors

A good sensor obeys the following rules::

Most sensors have a linear transfer function. The sensitivity is then defined as the ratio between the output signal and measured property. For example, if a sensor measures temperature and has a voltage output, the sensitivity is a constant with the units [V/K]. The sensitivity is the slope of the transfer function. Converting the sensor's electrical output (for example V) to the measured units (for example K) requires dividing the electrical output by the slope (or multiplying by its reciprocal). In addition, an offset is frequently added or subtracted. For example, -40 must be added to the output if 0 V output corresponds to -40 C input.

4. Air Pipes

Fig 1.4 Air Pipes

In common usage the words pipe and tube are usually interchangeable, but in industry and engineering, the terms are uniquely defined. Depending on the applicable standard to which it is manufactured, pipe is generally specified by a nominal diameter with a constant outside diameter (OD) and a schedule that defines the thickness. Tube is most often specified by the OD and wall thickness, but may be specified by any two of OD, inside diameter (ID), and wall thickness

5. Atmega 16 microprocessor

Fig 1.5 Atmega 16 microprocessor

ATmega16 is an 8-bit high performance microcontroller of Atmel's Mega AVR family with low power consumption. Atmega16 is based on enhanced RISC (Reduced Instruction Set Computing, Know more about RISC and CISC Architecture) architecture with 131 powerful instructions. Most of the instructions execute in one machine cycle. Atmega16 can work on a maximum frequency of 16MHz.

ATmega16 has 16 KB programmable flash memory, static RAM of 1 KB and EEPROM of 512 Bytes. The endurance cycle of flash memory and EEPROM is 10,000 and 100,000, respectively.

ATmega16 is a 40 pin microcontroller. There are 32 I/O (input/output) lines which are divided into four 8-bit ports designated as PORTA, PORTB, PORTC and PORTD.

ATmega16 has various in-built peripherals like USART, ADC, Analog Comparator, SPI, JTAG etc. Each I/O pin has an alternative task related to in-built peripherals. The following table shows the pin description of ATmega16.

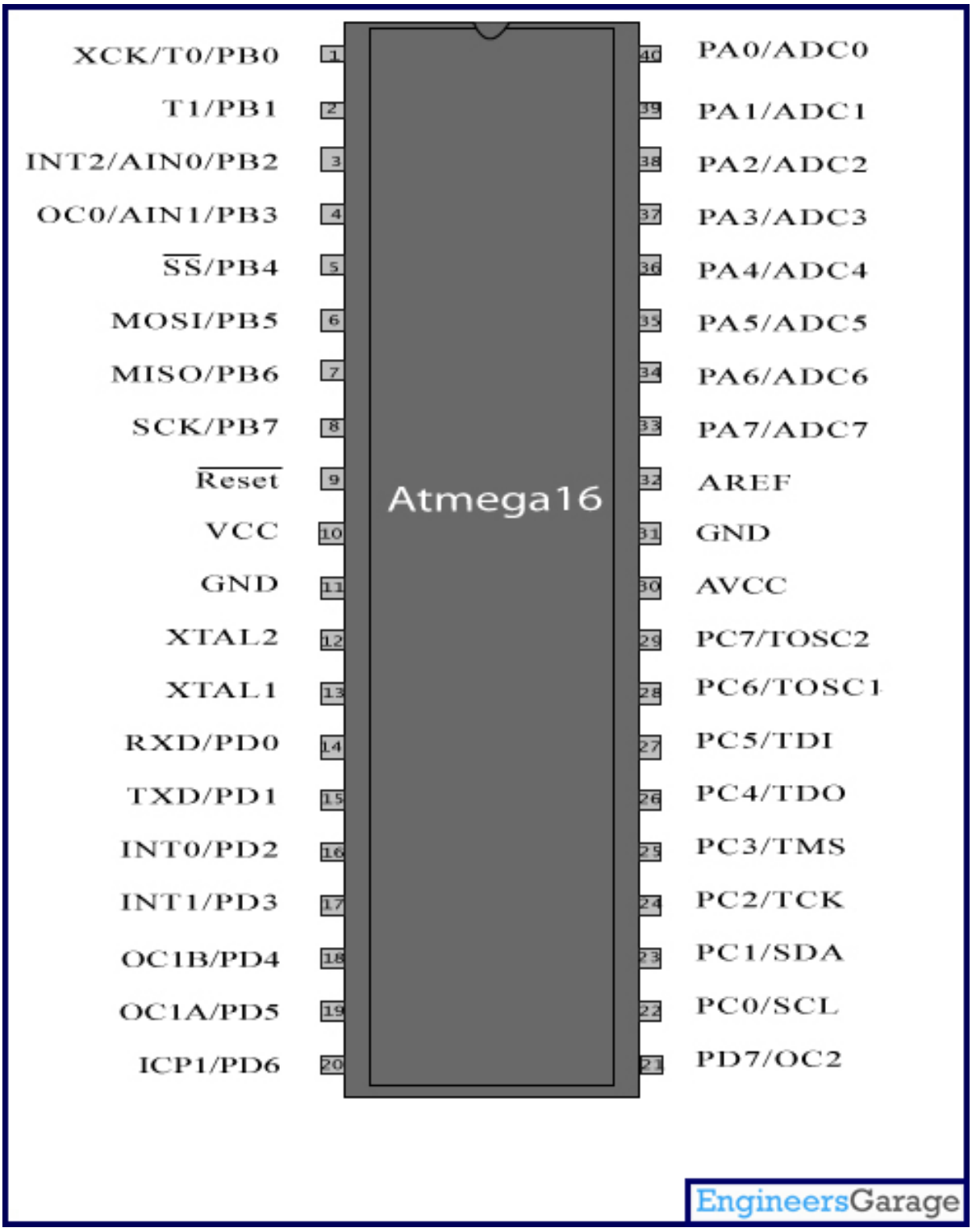


Fig 1.6 Atmega 16 microprocessor Pin Configuration

Pin Description:

Pin No.	Pin name	Description	Alternate Function
1	(XCK/T0) PB0	I/O PORTB, Pin 0	T0: Timer0 External Counter Input. XCK : USART External Clock I/O
2	(T1) PB1	I/O PORTB, Pin 1	T1:Timer1 External Counter Input
3	(INT2/AIN0) PB2	I/O PORTB, Pin 2	AIN0: Analog Comparator Positive I/P INT2: External Interrupt 2 Input
4	(OC0/AIN1) PB3	I/O PORTB, Pin 3	AIN1: Analog Comparator Negative I/P OC0 : Timer0 Output Compare Match Output
5	(SS) PB4	I/O PORTB, Pin 4	In System Programmer (ISP) Serial Peripheral Interface (SPI)
6	(MOSI) PB5	I/O PORTB, Pin 5	
7	(MISO) PB6	I/O PORTB, Pin 6	
8	(SCK) PB7	I/O PORTB, Pin 7	
9	RESET	Reset Pin, Active Low Reset	
10	Vcc	Vcc = +5V	
11	GND	GROUND	
12	XTAL2	Output to Inverting Oscillator Amplifier	
13	XTAL1	Input to Inverting Oscillator Amplifier	
14	(RXD) PD0	I/O PORTD, Pin 0	USART Serial Communication Interface
15	(TXD) PD1	I/O PORTD, Pin 1	
16	(INT0) PD2	I/O PORTD, Pin 2	External Interrupt INT0
17	(INT1) PD3	I/O PORTD, Pin 3	External Interrupt INT1
18	(OC1B) PD4	I/O PORTD, Pin 4	PWM Channel Outputs
19	(OC1A) PD5	I/O PORTD, Pin 5	
20	(ICP) PD6	I/O PORTD, Pin 6	Timer/Counter1 Input Capture Pin
21	PD7 (OC2)	I/O PORTD, Pin 7	Timer/Counter2 Output Compare Match Output
22	PC0 (SCL)	I/O PORTC, Pin 0	TWI Interface
23	PC1 (SDA)	I/O PORTC, Pin 1	

24	PC2 (TCK)	I/O PORTC, Pin 2	JTAG Interface
25	PC3 (TMS)	I/O PORTC, Pin 3	
26	PC4 (TDO)	I/O PORTC, Pin 4	
27	PC5 (TDI)	I/O PORTC, Pin 5	
28	PC6 (TOSC1)	I/O PORTC, Pin 6	Timer Oscillator Pin 1
29	PC7 (TOSC2)	I/O PORTC, Pin 7	Timer Oscillator Pin 2
30	AVcc	Voltage Supply = Vcc for ADC	
31	GND	GROUND	
32	AREF	Analog Reference Pin for ADC	
33	PA7 (ADC7)	I/O PORTA, Pin 7	ADC Channel 7
34	PA6 (ADC6)	I/O PORTA, Pin 6	ADC Channel 6
35	PA5 (ADC5)	I/O PORTA, Pin 5	ADC Channel 5
36	PA4 (ADC4)	I/O PORTA, Pin 4	ADC Channel 4
37	PA3 (ADC3)	I/O PORTA, Pin 3	ADC Channel 3
38	PA2 (ADC2)	I/O PORTA, Pin 2	ADC Channel 2
39	PA1 (ADC1)	I/O PORTA, Pin 1	ADC Channel 1
40	PA0 (ADC0)	I/O PORTA, Pin 0	ADC Channel 0

6. TowerPro MG996R Servo

Fig 1.7 TowerPro MG996R Servo

This High-Torque MG996R Digital Servo features metal gearing resulting in extra high 10kg stalling torque in a tiny package. The MG996R is essentially an upgraded version of the famous MG995 servo, and features upgraded shock-proofing and a redesigned PCB and IC control system that make it much more accurate than its predecessor. The gearing and motor have also been upgraded to improve dead bandwidth and centering. The unit comes complete with 30cm wire and 3 pin 'S' type female header connector that fits most receivers, including Futaba, JR, GWS, Cirrus, Blue Bird, Blue Arrow, Corona, Berg, Spektrum and Hitecately 120 degrees (60 in each direction). You can use any servo code, hardware or library to control these servos, so it's great for beginners who want to make stuff move without building a motor controller with feedback & gear box, especially since it will fit in small places.

The MG996R Metal Gear Servo also comes with a selection of arms and hardware to get you set up nice and fast .

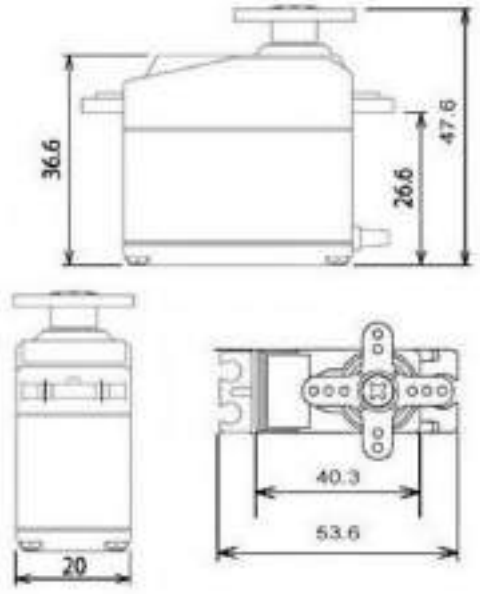


Fig 1.8 TowerPro MG996R Servo 2-D View

Specifications

•Weight: 55 g

•Dimension: 40.7 x 19.7 x 42.9 mm approx.

•Stall torque: 9.4 kgf·cm (4.8 V), 11 kgf·cm (6 V)

•Operating speed: 0.17 s/60º (4.8 V), 0.14 s/60º (6 V)

•Operating voltage: 4.8 V a 7.2 V

•Running Current: 500 mA –900 mA

•Stall Current 2.5 A (6V)

•Dead band width: 5 µs

•Stable and shock proof double ball bearing design

•Temperature range: 0 ºC –4.8 V a 7.2 V–900 mA (6V) double ball bearing design55 ºC

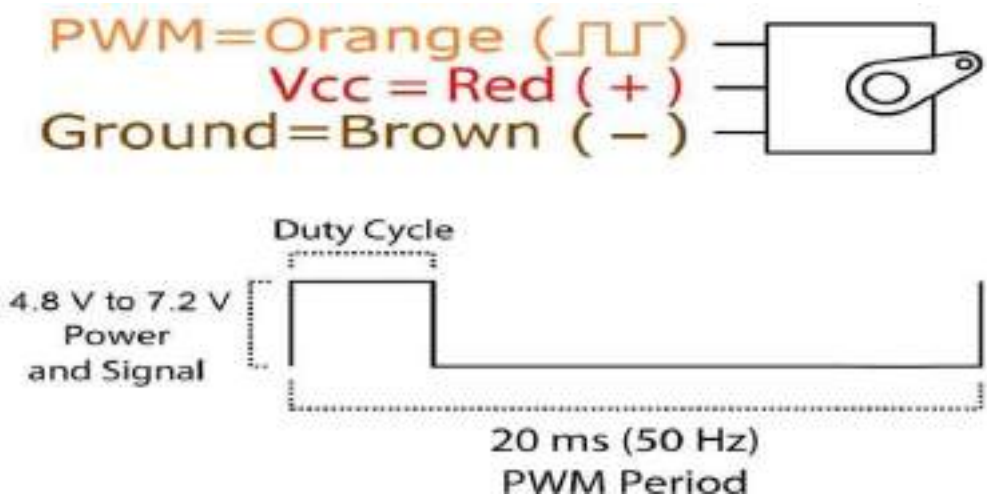


Fig 1.9 Duty Cycle

7. Acrylic Disc

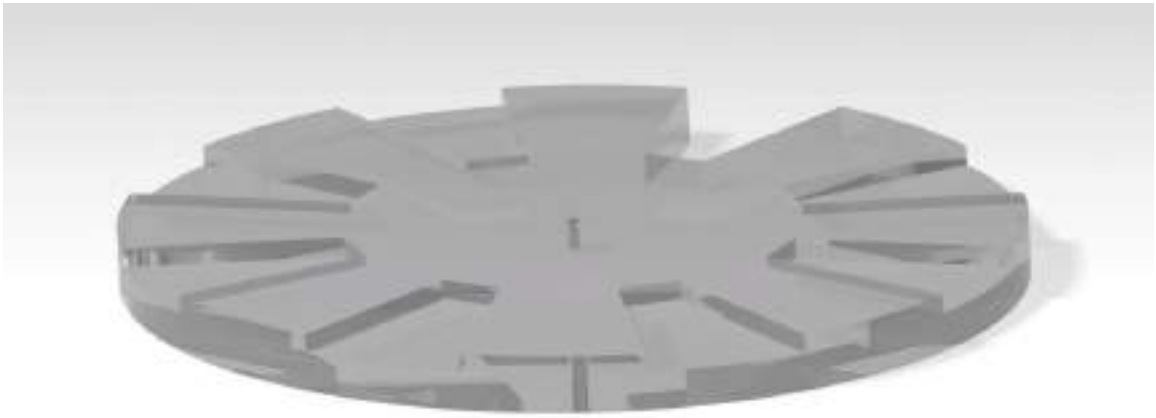


Fig 1.10 Acrylic disc

Acrylic fibers are synthetic fibers made from a polymer (polyacrylonitrile) with an average molecular weight of ~100,000, about 1900 monomer units. For a fiber to be called "acrylic" in the US, the polymer must contain at least 85% acrylonitrile monomer. Typical comonomers are vinyl acetate or methyl acrylate. DuPont created the first acrylic fibers in 1941 and trademarked them under the name Orlon. It was first developed in the mid-1940s but was not produced in large quantities until the 1950s. Strong and warm, acrylic fiber is often used for sweaters and tracksuits and as linings for boots and gloves, as well as in furnishing fabrics and carpets. It is manufactured as a filament, then cut into short staple lengths similar to wool hairs, and spun into yarn. Modacrylic is a modified acrylic fiber that contains at least 35% and at most 85% acrylonitrile monomer. The comonomers vinyl chloride, vinylidene chloride or vinyl bromide used in modacrylic give the fiber flame retardant properties. End-uses of modacrylic include faux fur, wigs, hair extensions and protective clothing.

Production

The polymer is formed by free-radical polymerization in aqueous suspension. The fiber is produced by dissolving the polymer in a solvent such as N,N-dimethylformamide (DMF) or aqueous sodium thiocyanate, metering it through a multi-hole spinnerette and coagulating the resultant filaments in an aqueous solution of the same solvent (wet spinning) or evaporating the solvent in a stream of heated inert gas (dry spinning). Washing, stretching, drying and crimping complete the processing. Acrylic fibers are produced in a range of deniers, usually from 0.9 to 15, as cut staple or as a 500,000 to 1 million filament tow. End uses include sweaters, hats, hand-knitting yarns, socks, rugs, awnings, boat covers, and upholstery; the fiber is also used as "PAN" precursor for carbon fiber. Production of acrylic fibers is centered in the Far East, Turkey, India, Mexico, and South America, though a number of European producers still continue to operate, including Dralon and Fisipe. US producers have ended production (except for specialty uses such as in friction materials, gaskets, specialty papers, conductive, and stucco), though acrylic tow and staple are still spun into yarns in the USA. Former U.S. brands of acrylic included Acrilan (Monsanto), and Creslan (American Cyanamid). Other brand names that are still in use include Dralon (Dralon GmbH) and Drytex (Sudamericana de Fibras, S.A.). In the late 1950's Courtaulds Ltd began investigating the production of an acrylic fibre later to be called "courtelle" by a process of solvent polymerisation. Methyl acrylate (6%) and acrylonitrile were polymerised in a 50% solution of sodium thiocyanate to produce a dope ready for spinning into a waterbath to produce "courtelle" fibre in various grades of denier. The sodium thiocyanate solution was reconcentrated and re used. The reaction was a continuous process with about 5% of reactants being recycled. This recycling process resulted in the build up of pollutants in the process as did the recycling of the solvent. A great deal of research in the Chemical engineering laboratory in Lockhurst Lane, Coventry, and on the pre production pilot plant at Little Heath overcame the recycling problems and resulted in the process becoming a commercial success at a new production plant in Grimsby.

8. Solenoid Valve

A Solenoid valve is used wherever fluid flow has to be controlled automatically. They are being used to an increasing degree in the most varied types of plants and equipment. The variety of different designs which are available enables a valve to be selected to specifically suit the application in question.

There are 5 main parameters to consider when selecting a valve:

- Cv
- media compatibility
- pressure
- temperature
- process fitting

Solenoid valve is a control units which, when electrically energized or de-energized, either shut off or allow fluid flow. The actuator takes the form of an electromagnet. When energized, a magnetic field builds up which pulls a plunger or pivoted armature against the action of a spring. When de-energized, the plunger or pivoted armature is returned to its original position by the spring action.

To the mode of actuation, a distinction is made between direct- valves, internally piloted valves, and externally piloted valves. A further distinguishing feature is the number of port connections or the number of flow paths ("ways").

Direct-acting solenoid valve

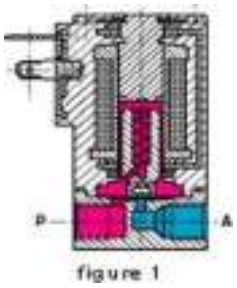


Fig 1.11 Direct-acting solenoid valve

With a direct-acting solenoid valve, the seat seal is attached to the solenoid core. In the de-energized condition, a seat orifice is closed, which opens when the valve is energized.

Direct-acting 2-way solenoid valve

Tubes and pipes for hydraulic applications are internally oiled before the system is commissioned. Usually steel piping is painted outside. Where flare and other couplings are used, the paint is removed under the nut, and is a location where corrosion can begin. For this reason, in marine applications most piping is stainless steel.

Two-way solenoid operated valves are shut-off valves with one inlet port and one outlet port (Fig. 1). In the de-energized condition, the core spring, assisted by the fluid pressure, holds the valve seal on the valve seat to shut off the flow. When energized, the core and seal are pulled into the solenoid coil and the valve opens. The electro-magnetic force is greater than the combined spring force and the static and dynamic pressure forces of the medium.

.

1.2 CAD MODEL

CAD is a software application which uses the computer technology in the process of design and design-documentation.

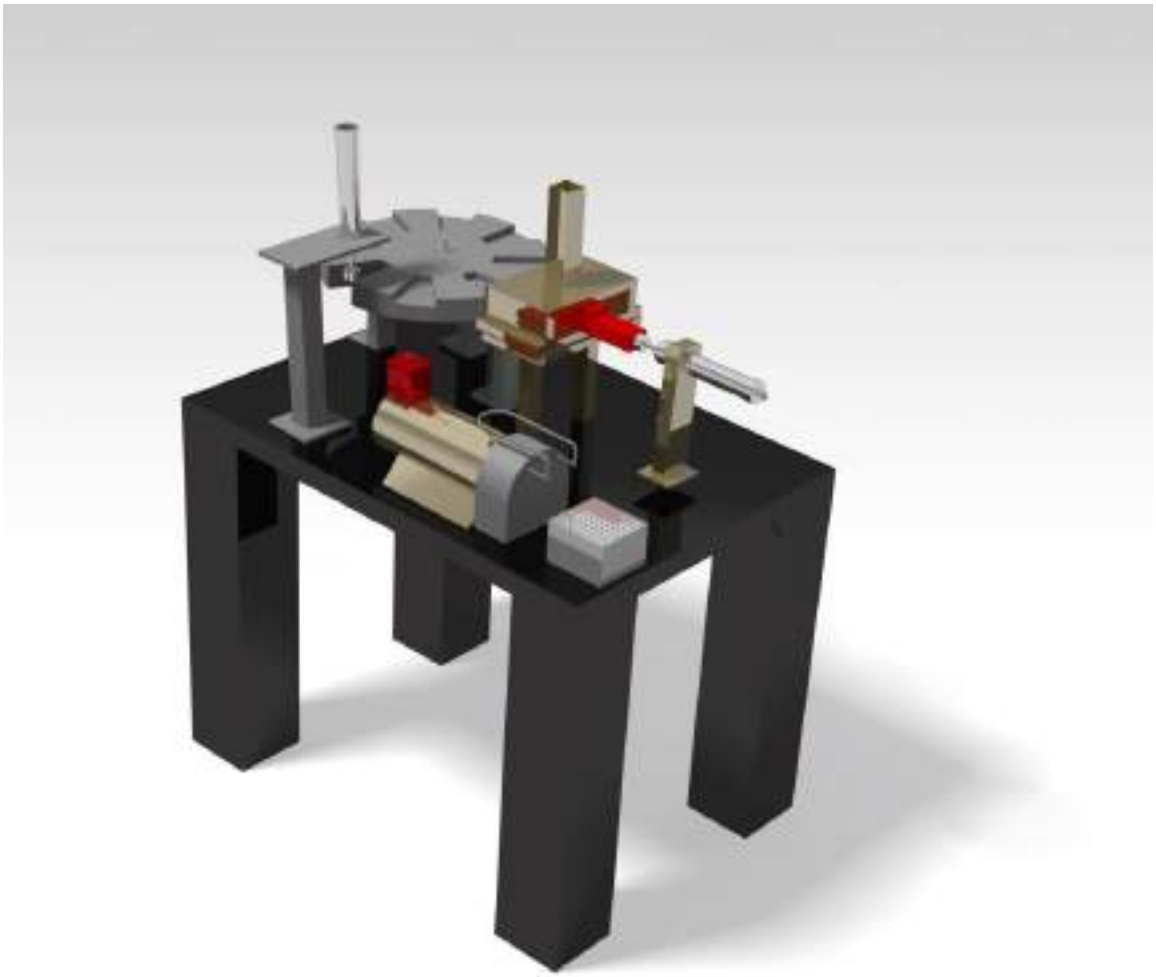


FIG 1.14 CAD MODEL OF U CLOTHS PEG MACHINE

3D MODEL OF U CLOTHESPIN ASSEMBLY MACHINE

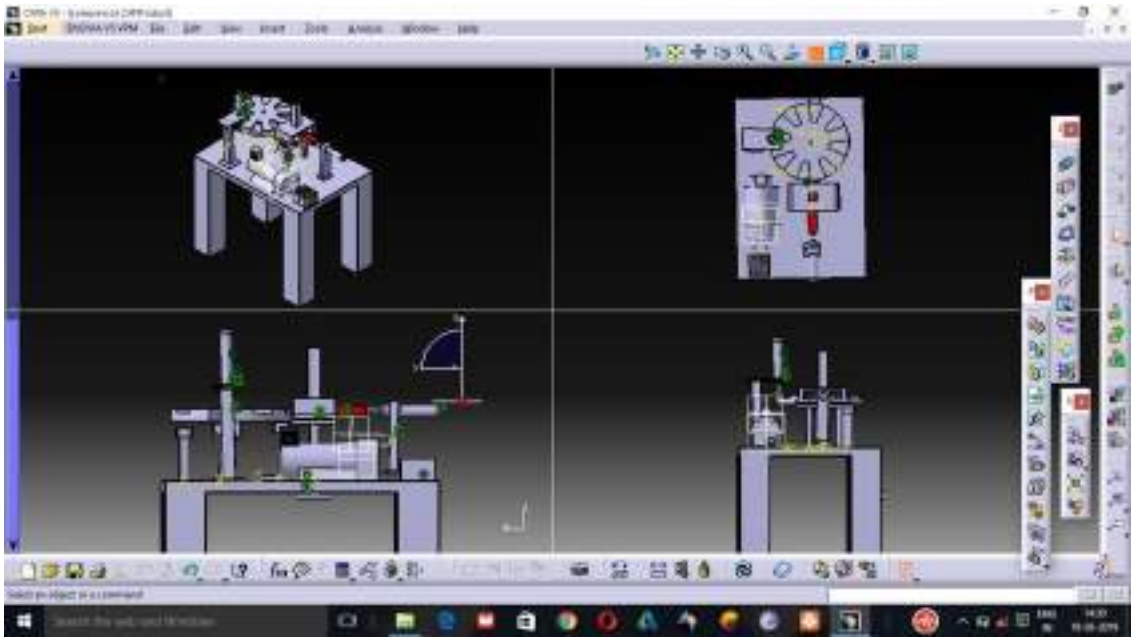


Fig 1.15 Multi view of u clothespin assembly machine

Basically, CAD software is used to design curves and figures in two-dimensional (2D) space, curves, surfaces and solids in three-dimensional (3D) objects. CAD software enables the user to produce better streamlining design, drafting, and documentation and facilitate manufacturing process. It provides output in the form of electronic files and allows the users to get printing copy.

Here we have used CATIA V5 software for analytical modelling. This software is often used in construction, manufacturing and other industries because it can bring economy to the processes by providing convenience in conveying information in technical and engineering drawings. Examples of information which can be conveyed are materials, processes, dimensions and tolerance. The software helps to produce drafting and design for all types of buildings such as residential houses, hospitals and factories. Besides, the software is also used throughout the engineering process to produce conceptual design and layout for the products and define the strength and dynamic analysis of manufacturing components.

2. LITERATURE REVIEW

2.1 A Review Article on Acrylic PMMA –

Published by - Eshwar Pawar 1(PRMIT&R, MECHANICAL/ SGBAU, INDIA)

Acrylic is a material that surely has varied applications in the future with the advancements in technology and research it surely can make a great contribution for the useful purpose in environment. Technology and research are effectively being re-engineered. Although the material is available with us for a very long time but its effective utilization in various engineering applications is seemed to be lacking and hence the purpose of this research paper is to make everyone aware of its characteristics and future scope. It can be a part of any developing country like India to achieve excellent performance. Some standards and improvement has to be done for developing more ways to increase the impact strength and durability of the material, which is suitable for Indian conditions so that the importance and utilization of this material can be made much faster. This is the time to seriously think of other useful alternatives to help meet the demands of the future generation.

2.2 An Overview of ATmega AVR MicrocontrollersUsed in Scientific Research and Industrial Applications

Published by - Wojciech Kunikowski, Ernest Czerwiński, Paweł Olejnik, Jan Awrejcewicz

As it was presented on the basis of many examples, the ATmega family microcontrollers proved to found many practical applications, both in scientific research and industrial use. Atmel microprocessors are ordered in a wide variety of package styles, they have low power consumption over a wide operation voltage range and allow excellent code density. Embedded AD/DA converters, better support for communication proto-cols and more flexible programming have proved to be more efficient in many cases of real applications comparing to even a small PLC controllers. The second part of the article has shown in

details that the ATmega644PA is capable of control-ling even complex multidimensional dynamical systems, and has enough processing power for conducting numerical calculations. In both tests of usability some satisfactory results have been achieved.

2.3 THE INDUSTRY'S VIEW ON AUTOMATION IN MANUFACTURING

Published by - Frohm, J.1 Lindström, V.2 Winroth, M.2 and Stahre, J.1

The purpose of automated systems is to perform functions more efficiently, more reliably, and more accurately than human operators. Also, expectations are that automated systems can perform functions and tasks at a lower cost than human operators. Thereby there are few arguments that can be put against the efficiency, reliability, and accuracy of automated systems. With higher reliability, it could be argued that a system would be a safer system as well.

2.4 REVIEW ON PNEUMATIC PUNCHING MACHINE AND MODIFICATION IN PUNCH TOOL TO REDUCE PUNCHING FORCE REQUIREMENT

Published by - P.Goyal, G.Srivastava, R.Singh, N.Singh

Pneumatically operated punching machine is suitable for small scale and

medium size industries. Based on the shear provided on the punch face the punching force reduction

of 25% to 60% thereby increasing tool life and reducing tool machining cost. Therefore with this

force reduction we are able to easily punch sheets of thickness upto 2.25 mm for plastic sheet having

tensile strength 90 N/mm2 and upto 1.5 mm of aluminium sheet having tensile strength 180 N/mm2.

2.5 Improvement of a Servo Motor Design Including Optimization and Cost Analysis

Published by - Damir Žarko, Drago Ban, Davor Goriþki

This paper presents an approach to improvement of the design of a servo motor based on the finite-element analysis, the optimization of the motor parameters and the cost analysis. A very good agreement between measured and calculated torque for the same rms current was achieved which confirms the reliability of the FE model of the motor. Three different motor designs are obtained using optimization and are compared to the existing design in terms of performance and the manufacturing

cost. A single motor design which received the highest grade is recommended as the best design improvement.

Compared to the old motor design the new redesigned motor has the following properties:

1. Lower heating (around 40%) of the motor for the same torque due to smaller number of turns per coil,
2. Smaller moment of inertia (around 17.8 %) and smaller total mass,
3. Lower manufacturing cost.

2.6 Study about SMPS Design and Reduction of Common Mode Noises

Published by - Ayhan ÖZDEMIR1, Zekiye ERDEM2, Irfan YAZICI3

This study consists of design and real time application of the filter to reduce common mode noise of SMPS. Common mode and EMI noises are two main problems that should be filtered on the input in SMPS's, but they also affect SMPS output because of the high switching. It is particularly inevitable to use filters for applications such as performing measurements on the output which are extremely sensitive to noise.

In this study, conventional noise reduction methods like EMI filters or Kelvin connection are used but their capability to reduce output noise was so limited. Therefore in this study a common mode noise filter is designed and realized in real time which reduces common mode noise on SMPS outputs. It is observed through the real-time application that designed filter significantly damp the common mode noise. Thus, this study brings a solution for the reduction of common mode noise that significantly affects measurement and system performance.

3. PROBLEM IDENTIFICATION AND FORMULATION

3.1 PROBLEM IDENTIFICATION

In old days the clothes peg were assembled manually, which caused wastage of time and effort for assembling pin one at a time and this process is totally dependent on manual operator his skills, his competence and his motivation to do the work

The current machines which are available for clothes peg assembly and automatic and are very costly which costs around 4-5 lakhs .Which is very costly for a young entrepreneur to afford who can only afford only upto 2-3 lakhs which make it very inconvenient for a young or new entrepreneur to buy the machine

3.2 PROBLEM FORMULATION

The purpose of this project is to make a machine which is light in weight and fully automatic which can perform all the tasks for which it is made.

In this project we made a machine which costs around just 20,000 in which all the operations are automatically performed.

In our machine where 2 or 3 workers were required for clothes peg assembly, we replaced this by only a single worker who can assemble two parts of the clothes peg in die and magazine.

As this machine is very cheaper as compared to other machines which is in market available.

This makes it quite easy for a small entrepreneur to buy the machine who is setting up his /her startup.

Our main focus is on small entrepreneurs to provide their needs for manufacturing unit.

4. EXPERIMENTAL SETUP

4.1 EXPERIMENTAL SETUP - CONSTRUCTION, WORKING, OBJECTIVES

4.1.1 CONSTRUCTION

4.1.1.1 DESIGN AND MODELING OF THE PARTS FOR PROPOSED SET UP

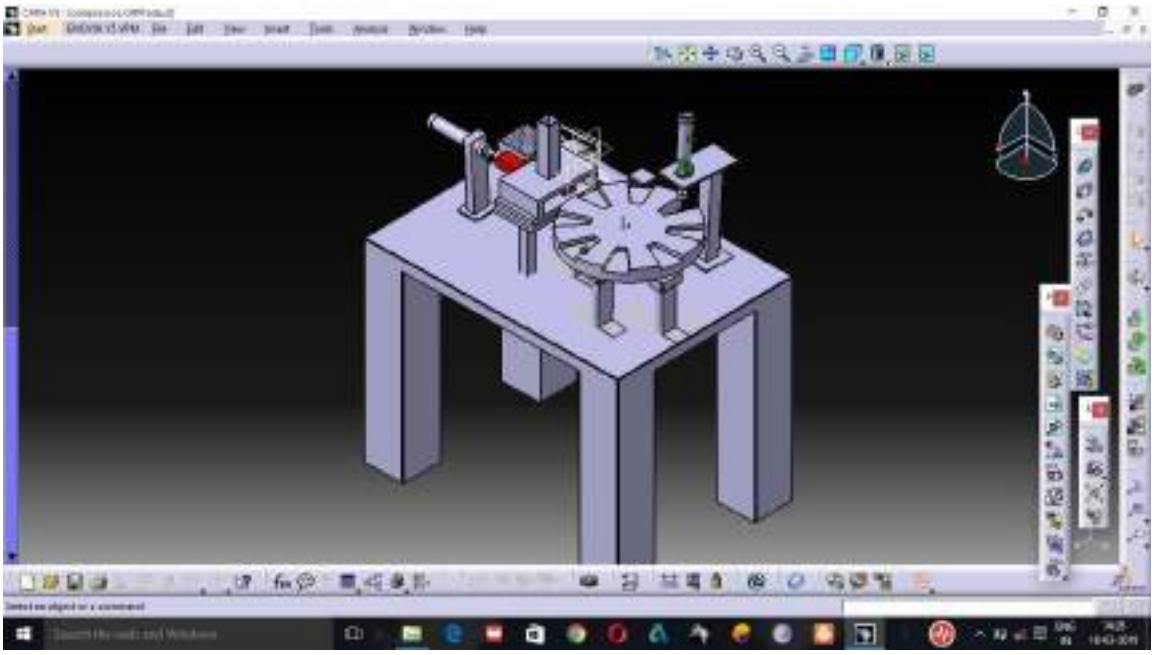


Image.4.1 Model

The following parts have been modeled to fulfill the assembly and manufacturing requirements of the setup.

4.1.1.2 SUPPORT STRUCTURE

FIG 4.2 SUPPORT STRUCTURE

The support structure used here is a wooden plank. The wooden plank is supported by the four iron legs. This assembly takes up the entire load of the machine. The machine is used for light operation therefore no heavy material is required to support it.it then houses the compressor , discs, pneumatic actuators.

4.1.1.3 DISCS

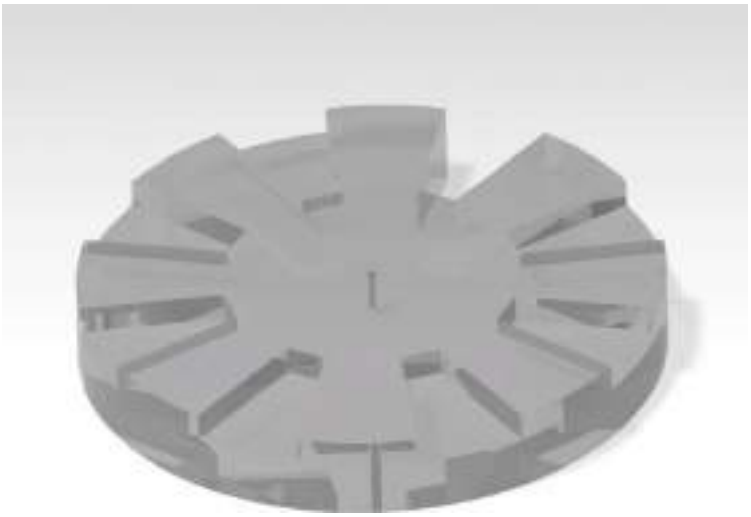
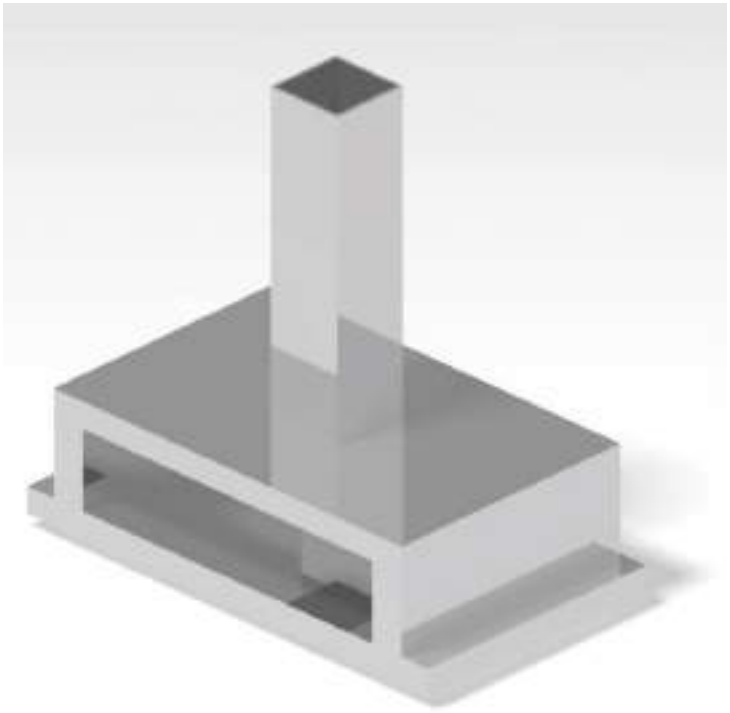


Fig 4.3 DISCS

The discs are made up of acrylic which is alight weight material. Here we have made use of three discs mounted coincentrically. The first two disc are fixed while the third disc which is mounted on the top is free to move.the discs are having a diameter of 280 mm and width of 10 mm.the top disc consists of eight slots. The pin fits I sidw the slot. The disc is rotated by a servomotor.

4.1.1.4 U SPRING HANGAR



4.4 SPRING HANGAR

U spring hangar acts as a storage for u springs. It is avertical section which basically houses a specially shaped spring holder. Kit is made up of hard plastic . the u spring is inserted by hand vertically.all the pins stack up and are punched once in a stroke.

4.1.1.5 PLUNGER

Plunger is use for inserting the pin inside the clip

Fig 4.5 PLUNGER

4.1.1.6 SENSORS AND MICROCONTROLLER

Sensors and microcontrollers are responsible for the entire functioning of the machine. A photo sensor is used for sensing the position of the disc. It sends feedback signal to the microcontroller. ATMega16 micro-controller is used for programming of the machine. The programming language is Embedded C. upon receiving the signals from the sensor ,The microcontroller provides control signal to the compressor which is regulated by switch mode power supply (SMPS).

Fig 4.6 PHOTO SENSOR

FIG 4.7 MICRO CONTROLLER

4.1.2 WORKING OF MACHINE

The entire working of the machine is dependent on the sensor. The sensor used here is photo sensor. Depending upon the position of the slotted disc, it generates a 0 or a 1 signal. This signal is then transferred to a microcontroller. There microcontroller used here is AtMega16 microcontroller. The programming language is Embedded C. The microcontroller upon receiving the signal from sensor generates an actuating signal which is to be fed to the pneumatic actuators. The pneumatic actuators are actually by using a compressor. The control signal from microcontroller triggers the plunger to move forward, thereby producing a punching stroke and at the same time the second pneumatic actuators moved from top to bottom to eject out the assembled clip from the slotted disc and the operation is repeated as the servomotor changes the position of the disc.

5. MATERIALS

5.1 VARIOUS MATERIALS USED AND THEIR DETAILS

1. STAINLESS STEEL

Stainless steel Composition-

Ni	**12.00**
Cr	**17.00**
Mo	**2.50**
Fe	**Balance**
Si	**1.00**
Mn	**2.00**
C	**0.080**
P	**0.045**
S	**0.030**

Properties of Stainless Steel -

1) Stainless steels are most notable for their corrosion resistance, which increases with increasing chromium content. Additions of molybdenum increase corrosion resistance in reducing acids and against pitting attack in chloride solutions.

2) Additions of molybdenum increase corrosion resistance in reducing acids and against pitting attack in chloride solutions.

3) Corrosion resistance

- Stainless steels do not suffer uniform corrosion, like carbon steel, when exposed to wet environments. Unprotected carbon steel rustsreadily when exposed to the combination of air and moisture.

- The resulting iron oxide surface layer (the rust) is porous and fragile. Since iron oxide occupies a larger volume than the original steel this layer expands and tends to flake and fall away exposing the underlying steel to further attack.

4).Uniform corrosion

- Uniform corrosion takes place in very aggressive environments, typically chemical production or use, pulp and paper industries, etc.
- The whole surface of the steel is attacked and the corrosion is expressed as corrosion rate in mm/year (usually less than 0.1mm/year is acceptable for such cases) Corrosion tables provide guidelines.
- This is typically the case when stainless steels are exposed to acidic or basic solutions. Whether a stainless steel corrodes depends on the kind and concentration of acid or base, and the solution temperature.

4) Acids

- Acidic solutions can be categorized into two general categories, reducing acids such as hydrochloric acid and dilute sulfuric acid, and oxidizing acids such as nitric acid and concentrated sulfuric acid.
- Increasing chromium and molybdenum contents provide increasing resistance to reducing acids, while increasing chromium and silicon contents provide increasing resistance to oxidizing acids.
- Sulfuric acid is one of the largest tonnage industrial chemical manufactured. At room temperature Type 304 is only resistant to 3% acid while Type 316 is resistant to 3% acid up to 50 °C and 20% acid at room temperature.
- Concentrated sulfuric acid possesses oxidizing characteristics like nitric acid and thus silicon bearing stainless steels also find application.

5) Bases

6) Organics

- All grades resist damage from aldehydes and amines, though in the latter case Type 316 is preferable to 304; cellulose acetate will damage 304 unless the temperature is kept low. Fats and fatty acids only affect Type 304 at temperatures above 150 °C (302 °F), and Type 316 above 260 °C (500 °F), while Type 317 is unaffected at all temperatures.
- Type 316L is required for processing of urea

2) POLYETHYLENE TERAPHTHALATE

Composiion

1. **Ethylene glycol**
2. **Dimethyl terephthalate(DMT)/ Terephthalic acid.**

Production of Dimethyl terephthalate process (DMT)

The reactions are idealized as follows:

First step

$$C6H4(CO2CH3)2 + 2\ HOCH2CH2OH \rightarrow C6H4(CO2CH2CH2OH)2 + 2\ CH3OH$$

Second step

$$n\ C6H4(CO2CH2CH2OH)2 \rightarrow [(CO)C6H4(CO2CH2CH2O)]n + n\ HOCH2CH2OH$$

Production of Terephthalic acid

The reactions are idealized as follows:

$$n\ C_6H_4(CO_2H)_2 + n\ HOCH_2CH_2OH \rightarrow [(CO)C_6H_4(CO_2CH_2CH_2O)]_n + 2n\ H_2O$$

Properties of Polyethylene terephthalate

Chemical Properties

- Excellent resistance to alcohols, aliphatic hydrocarbons, oils, greases and diluted acids
- Moderate resistance to diluted alkalis, aromatic & halogenated hydrocarbons

3. Acrylic

Most acrylics are polymers of methyl methacrylate (PMMA). Acrylic can be optically clear or cloudy, as in the case of impact modified acrylics.

ADVANTAGES:

- Excellent optical clarity
- Excellent weatherability and resistance to sunlight
- Rigid, with good impact strength
- Excellent dimensional stability and low mould shrinkage
- Stretch forming increases bi-axial toughness

DISADVANTAGES AND LIMITATIONS:

- Poor solvent resistance; attacked especially by ketones, esters, chlorocarbons and aromatic hydrocarbons, freons
- Subject to stress cracking
- Combustible
- Continuous service temperature limited to about 200 F degrees
- Flexible grades unavailable

PROPERTIES OF MATERIAL:

- **Transparency**

Acrylic plastic is extremely transparent and transmits 92 percent of white light. This is equal to the transparency of the finest optical glass.

- **Impact Resistance**

Acrylic sheets (Plexiglas) have six to 17 times the impact resistance of ordinary glass, depending on the specific preparation. Plexiglas also breaks into relatively dull pieces compared to glass.

- **Weather Resistance**

Acrylic plastic is highly resistant to variations in temperature and humidity, making it useful in outdoor applications.

- **Chemical Resistance**

Acrylic plastic is highly resistant to inorganic acids and bases but can be dissolved by organic substances, especially petroleum products.

- **Combustibility**

Acrylic plastic is combustible and will self-ignite at approximately 860 degrees Fahrenheit. It will burn with an open flame at about 560 degrees Fahrenheit.

6. DESIGN CONSIDERATION

Plastic Clip: Clip is made of Polyethylene terephthalate (sometimes written poly(ethylene terephthalate)), commonly abbreviated **PET**, **PETE**, or the obsolete PETP or PET-P, is the most common thermoplasticpolymer resin of the polyester family and is used in fibres for clothing, containers for liquids and foods, thermoforming for manufacturing, and in combination with glass fibre for engineering resins.

Steel springs: The spring is made up of stainless steel . In metallurgy, stainless steel,also known as inox steel or inox from French *inoxydable* (inoxidizable), is a steelalloy, with highest percentage contents of iron, chromium, and nickel, with a minimum of 10.5% chromium content by mass and a maximum of 1.2% carbon by mass

6.1 PRODUCT DESCRIPTION:

Design for checking the failure of clip during assembly of U- spring.

- Plastic used (clip) – Polyethylene Terepthalate
- Ultimate strength - S_{UT} = 8.7 to 20×10^3 Psi i.e. 60 to 140 Mpa
- Factor of safety – FOS = 2 (for use with ordinary material where loading and environment conditions are less severe).

$$\sigma_{allowable} = \frac{S_{UT}}{FOS}$$

$$\sigma_{allowable} = \frac{140}{2} = 70 \text{ Mpa (Max)}$$

$$\sigma_{allowable} = \frac{60}{2} = 30 \text{ Mpa (Min)}$$

- Diameter of plunger = 15mm
- Area of plunger = $\frac{\pi}{4}d^2 = \frac{\pi}{4}\times 15^2 = 176.714\ mm^2$
- Pressure acting on the plunger = 4.5 Psi = 0.03 Mpa

Force = pressure × area

= 0.03 × 176.714

=5.3014 N

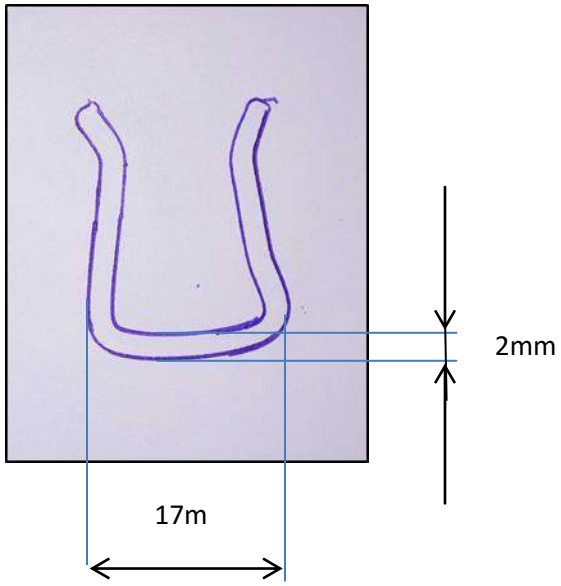


IMAGE 6.1 U SPRING OF CLOTHESPIN

- Desired failure – Failure in crushing
- Crushing area - A_{CR} = 17 × 2 = 34 mm^2

$$\sigma_{CR} = \frac{F}{A_{CR}}$$

$$= \frac{5.3014}{34}$$

= 0.1559 Mpa

Hence, σ_{design} = σ_{CR} = 0.1559 Mpa

σ_{design} = 0.1559Mpa < $\sigma_{allowable}$ = 30 Mpa (Min).

Therefore , the design is safe.

PROGRAMMING LANGUAGE :

```
#include <util/delay.h>


#include <avr/io.h>
#include<compat/deprecated.h>
#include<tecxtra.h>

void init_servo_driver(void)
{
   TCCR1B = 0x00; //stop timer
   DDRD = 0xFF; //set pins for output
   TCNT1H = 0xB1;  //setup
   TCNT1L = 0xE1;
   //ICR1 = 1000; // used for TOP, makes for 50 hz
   TCCR1A = 0xA2;
   //OCR1A = 52;
   TCCR1B = 0x1A; //start timer
}
main()
{
//DDRA= 0b00000000;
//PORTA=0b11111111;

DDRA &= ~(1<<PA0);
PORTA |= (1<<PA0);
DDRC=0b11111111;
PORTC=0b11111111;
DDRD=0b11111111;
PORTD=0b00000000;

ICR1= 0;
PORTC=0b11111111;
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
    _delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
```

```
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
char rec;
while(1)
{



init_servo_driver();
//ICR1 = 4000; // used for TOP, makes for 50 hz
//OCR1A = 500;
  if((PINA & (1<<PA0)))
  {
   PORTC=0b00000000;
   ICR1=0;
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
PORTC=0b11111111;
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
   _delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);

ICR1=8000;
OCR1A=1875;
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
_delay_ms(2000);
//_delay_ms(2000);
```

```
      // ICR1=0;

   }
   else
   {
    //PORTC=0b11111111;
ICR1=8000;
OCR1A=2275;
_delay_ms(200);
//_delay_ms(2000);
      // ICR1=0;

   }



}

}
```

7. COST ESTIMATION

Sr.no	Name of components	Quantity	Cost per unit	Total cost (Rs)
1	Compressor	1	1480	1480
2	Pneumatic cylinder	2	900	1800
3	Acrylic disc	3	700	2100
4	Servo motor Mg945	1	350	350
5	1/2 Dcv	1	750	750
6	Direct acting solenoid	1	350	350
7	fabrication	1	2000	2000
8	Pneumatic pipe	1	450	450
9	SMPS	1	500	500
10	Wire	1	150	150
11	Relay	1	400	400
12	Micro controller	1	600	600
13	Photo sensor	1	1250	1250
			Total cost	12180 Rs

8. Results and Conclusion

For manual operation

Sr no	Cloths pin number (A)	Time Taken for U-Pin (sec)
1	A1	10
2	A2	11
3	A3	14
4	A4	8
5	A5	10
6	A6	12
7	A7	9
8	A8	14
	Total time taken	1 minutes 28 sec /88 sec

For automatic Operation

Sr no	Cloths pin number (A)	Time Taken for U-Pin (sec)
1	A1	10
2	A2	10
3	A3	10
4	A4	10
5	A5	10
6	A6	10
7	A7	10
8	A8	10
	Total time taken	1 minutes 20 sec /80 sec

8.2 Conclusion

Hence , we have successfully carried out all the required calculation for the design of u clothespin assembly machine. At the same time we have tried to use modern techniques wherever necessary. For purpose of analytical modelling the use of CATIA V5 software has been done. While working on the project we came to know about various complexities related to the machine. All such complexities were deeply studied and a possible solution for those was successfully implemented. Working in a group together, we came to know about various aspects of team management and spirit of working together as a unit. The project is industry oriented and it has expanded our horizon regarding various industrial processes and machinery. The project was completed on time and it is serving the purpose.

9. FUTURE SCOPE AND ADVANCEMENT

- In this project currently the number of pins are 8 which can be increased by increasing the size of the rotating disc, the maximum number of pins can be increased up to 32 pins at a single cycle.
- The efficiency of machine can be increased by using stepper motor instead servo motor for faster rotating speed and faster assembly of pins accurately.
- Currently in our project we are using manual feed of pin feeding which can be eliminated by using staplers concept which is similar to magazine in a stapler or gun , in which pins are joined together horizontally.
- As we know this is the age of automation this machine can perform very well with the use of automaton. Automation not only will increase the efficiency and accuracy but also reduce direct costs such and labor costs increasing the profit for the firm.

10. Project Model

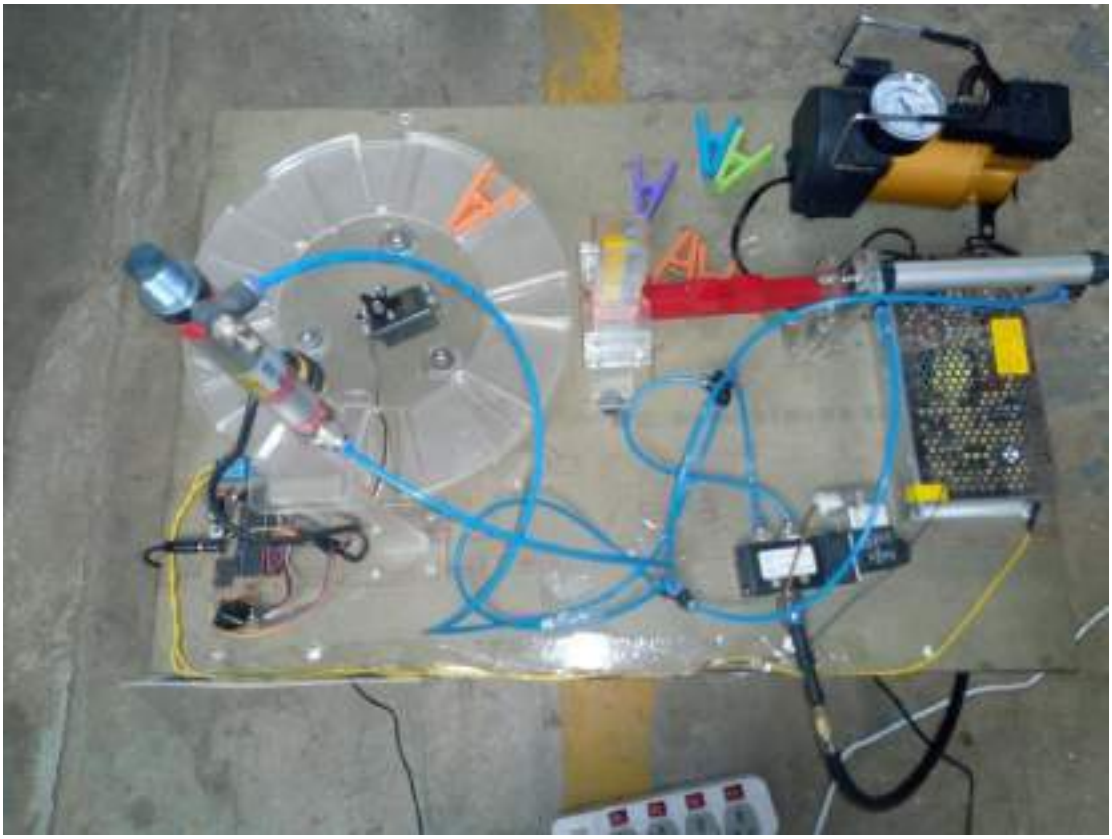


Image 9.1 Project model

REFRENCES

- IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) e-ISSN: 2278-1684,p-ISSN: 2320-334X, Volume 13, Issue 2 Ver. I (Mar. - Apr. 2016), PP 01-04 www.iosrjournals.org

- Frohm, J.1 Lindström, V.2 Winroth, M.2 and Stahre, J.1
  Division of Production Systems, Chalmers University of Technology, SE- 412 96 Gothenburg, Sweden
  Department of Industrial Engineering and Management, School of Engineering, Jönköping University, SE-551 11 Jönköping, Sweden
  An Overview of ATmega AVR MicrocontrollersUsed in Scientific Research and Industrial Applications

- Wojciech Kunikowski, Ernest Czerwiński, Paweł Olejnik, Jan Awrejcewicz
  Department of Automation, Biomechanics and Mechatronics, Lodz University of Technology, 90–924 Łódź, 1/15

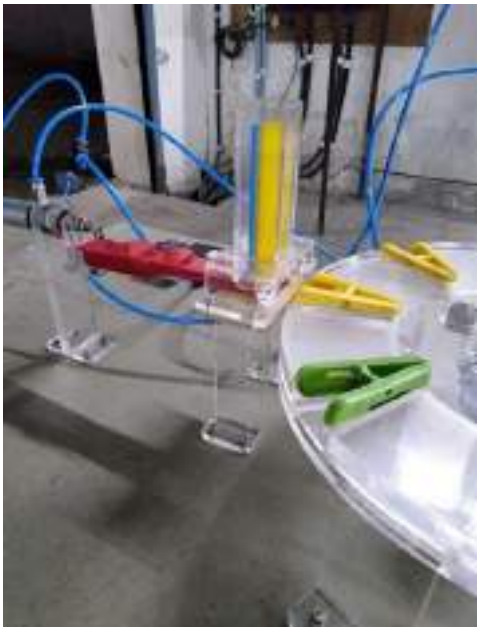
- https://www.makeitfrom.com/material-properties/Polyethylene-Terephthalate-PET-PETE

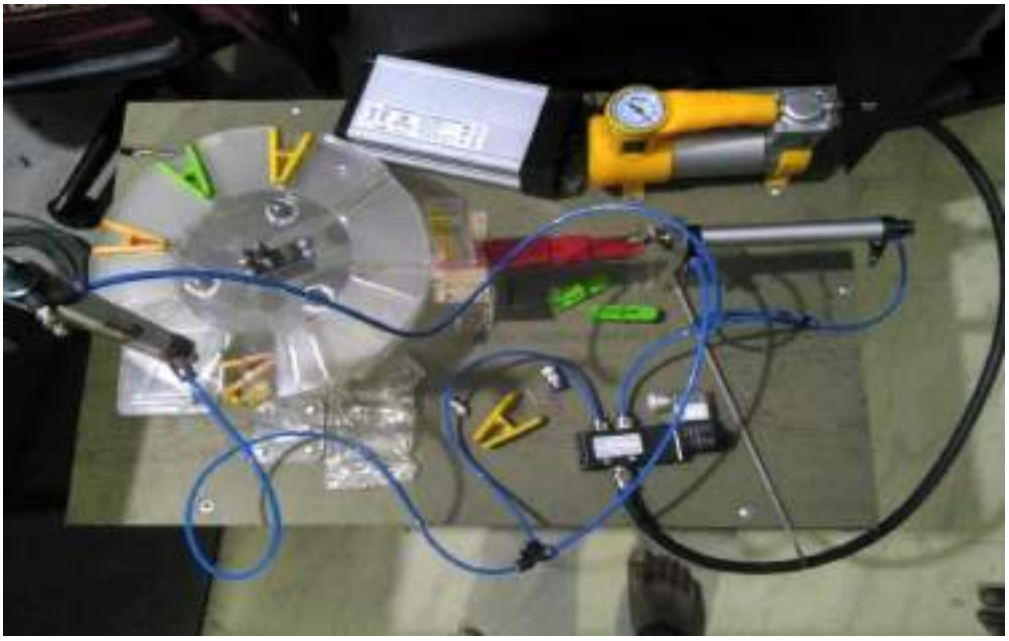
- Theory of Machines By R S Khurmi - S. Chand

- The Design of Machine Elements by V.B.Bhandari

APPENDICES

Various views of project photos





List of Publications

1. APURVA Rangari; Ninad Kumre; Rohan Ghatole; Dr. A. V. Vanalkar, "Design and Development of U-clothspin Assembly Machine", KDKCE'S International Conference on emerging trends in Mechanical Engineering.
2. Bipin Gupta; Kalpesh Rawale; Rupesh Waghmare; Dr. A. V. Vanalkar, "Fabrication of U-clothspin Assembly Machine", KDKCE'S International Conference on emerging trends in Mechanical Engineering.

Acceptance of paper for International Conference eTime 2019

1 message

eTime2019 <etime2019@kdkce.edu.in> Mon, 18 Mar, 2019 at 3:00 PM
Reply-to: etime2019@kdkce.edu.in
To: gajalabam001@gmail.com

Dear Author,
In view of NBA committee visit to our college, International Conference e-TIME 2019 is postponed to 5-6th April,2019.
Revised schedule is as follows:
Please visit website https://edk-etime.finalassapp.com/ **for all details.**

Last date of Abstract submission	15th March,2019
Notification of Acceptance via Email	20th March,2019
Full paper submission	24th March,2019
Last date of Registration	28th March,2019
Conference Date	5 &6th April,2019

Congratulations, your abstract entitled " **FABRICATION OF U-CLOTHESPIN ASSEMBLY MACHINE** " has been successfully reviewed and revised as per the requirements of reviewers and has been accepted for Conference E-TIME 2019 and publication in UGC Approved journal.

Your Paper ID:- M0080

Finalized Review Report by Editor

Originality: 69%(Turnitin)

Paper Relevance: Fair

Format of Paper: Fair

Topic Contribution: Fair

Final Decision: Accept.

Submit your full length paper in prescribed template on the website.

Acceptance of paper for International Conference eTime 2019

1 message

eTime2019 <etime2019@kdkce.edu.in> Mon, Mar 18, 2019 at 4:41 PM
Reply-to: etime2019@kdkce.edu.in
To: apurvasajank28@gmail.com

Dear Author,
In view of NBA committee visit to our college, International Conference e-TIME 2019 is postponed to 5-6th April,2019.
Revised schedule is as follows:
Please visit website https://edk-etime.finalassapp.com/ **for all details.**

Last date of Abstract submission	15th March,2019
Notification of Acceptance via Email	20th March,2019
Full paper submission	24th March,2019
Last date of Registration	28th March,2019
Conference Date	5 &6th April,2019

Congratulations, your abstract entitled " **DESIGN AND DEVELOPMENT OF U-CLOTHESPIN ASSEMBLY MACHINE** " has been successfully reviewed and revised as per the requirements of reviewers and has been accepted for Conference E-TIME 2019 and publication in UGC Approved journal.

Your Paper ID:- M0081

Finalized Review Report by Editor

Originality: 69% (Turnitin)

Paper Relevance: Fair

Format of Paper: Fair

Topic Contribution: Fair

Final Decision: Accept.

Submit your full length paper in prescribed template on the website.