1. MECHANICAL FORKLIFT USING REDUCTION GEAR MECHANISM

ABSTRACT

The main objective in the project which we are going to implement the reduction gear mechanism to lift up the object with lower speed .The forklift is operated by using motorized screw jack. To lower the speed and increase the torque we are using cluster gear mechanism.Now a days there are several types of fork lifts are used to handling heavy materials like containers, trolley. Some of the types available in market are hand pallet truck, walkie low lift truck, etc... In this project we are implementing mechanical fork lift. The concept behind this is motorized screw jack, for this we are manufacturing two motorized screw jack for two forks because not to complex in the manufacturing and to assemble. In here we are introducing reduction gear mechanism to reduce the speed from motor to screw jack for the reduction gear mechanism cluster gears are being used.our project is preferable to be used in small scale industries as it is not possible to use hydraulic forklift which has high investment cost.The advantage of this project is there is no leakage of fluids which takes place in hydraulic and pneumatic systems

WORKING PRINCIPLE

Working Principle

The mechanical forklift consists of a set of metallic forks which is manufactured from mild steel. The forks have their movement in only one direction i.e, translation along Y-Axis, thereby enabling the load to be lifted in vertical direction. The mechanical forklift consists of a metallic frame on which various components are mounted to perform the lifting operation. The forklift consists of eight main components namely AC motor, screwjack, cluster gears, forklift forks, mounting shafts, frame, wheels. The components are assembled in such a way that there is a continuous contact or meshing between the gears and they don't get locked up during the operation.

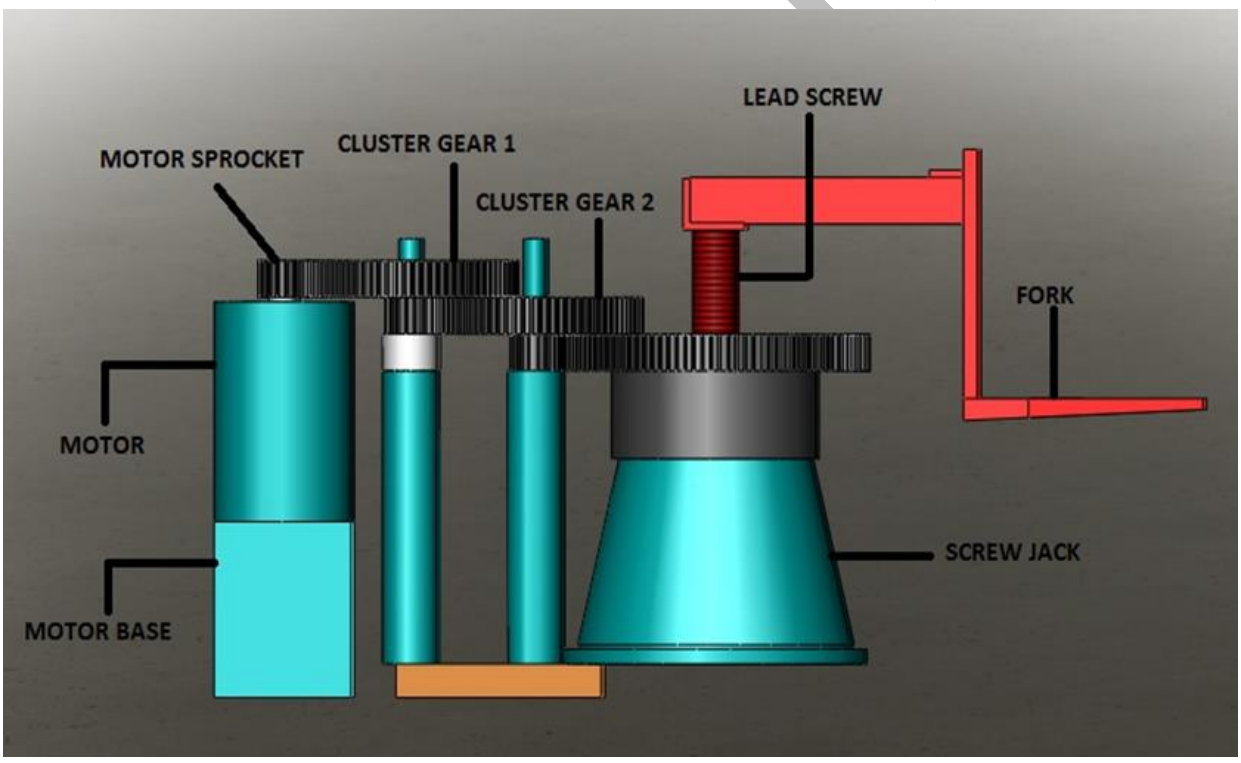


Fig 6.1 construction view

As it can be seen from the above diagram the AC motor is first placed on the frame and clamped is such a way that there is no vibration. The cluster gears are mounted

on the shafts. The shafts are mounted on the frame with help of a C-channel, and the centre distance is adjusted accordingly. Finally the jack gear is connected with the bottom of the cluster gear 2. This is screwed to the screwjack so that it forms a fixed link without any movement.

The forks are welded together so that it dose not moves individually. The wheels are attached to the base of the frame for easy movement. The motor's are connected together with help of a motor controller to provide the movement in forward or reverse direction according to the needs of the user.

When the motor is switched on the power is transmitted from the motor sprocket to the two sets of cluster gears(1 & 2), in this way the speed of the motor is reduced. The output from the cluster gears is then given to the jack gear on to which the fork is attached, to perform the lifting operation. The motor is controlled with a controller for the forward and reverse movement of the motor. Thus the fork is lifted upward or downward and thus the load.

APPLICATIONS AND ADVANTAGES

APPLICATIONS

- Industrial applications
- Used by small scale industries

ADVANTAGES

- Rigid
- On/off control
- Mechanical advantage
- Self-locking
- Low maintenance and overall cost
- Simple in manufacturing and construction
- Used in all working environment

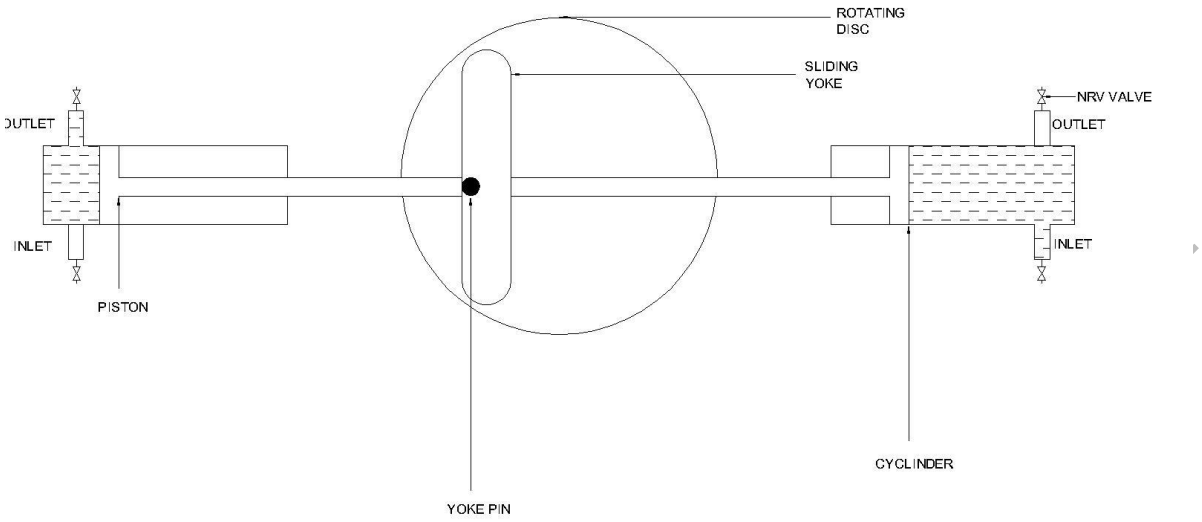
DISADVANTAGES

- Height limitations
- Efficiency is low

2. DOUBLE WATER PUMPING SYSTEM USING SCOTCH YOKE MECHANISM

ABSTRACT

The aim of the paper is to design and develop a Double water pumping system using scotch yoke mechanism. The reciprocating motion of the plunger is utilized for the pumping action. The plunger is reciprocated with the help of a cam plate. By this action the water is pumped with very high pressure and to various heads. This can be utilized for various applications like lubrication in machines and water pumping in agriculture field. The cam plate gets the drive from the motor for its rotation and converts that rotary motion to useful dual side reciprocating motion. The motor is powered with the aid of electric power. Thus the water is pumped from source to various heads.



WORKING PRINCIPLE

- The experimental setup consists of water pump whose pumping shaft is connected to the yoke plate of the scotch yoke mechanism the rotating disk consists of the yoke supporting pin is inserted into the yoke plate for controlling the translation motion.
- The rotation of the plate is carried out with the help of motor. When the motor is turned on then it rotates the plate attached with it and this rotation is converted into linear motion by means of yoke plate, this linear motion to

reciprocate the piston and pump the water and transmitted to the required designation.

ADVANTAGES

- It is easy to suck the water with the minimum effort.
- Less cost.
- Simple in design.
- It draws water faster than normal hand pumps.
- Less time consumption operation.

DISADVANTAGE

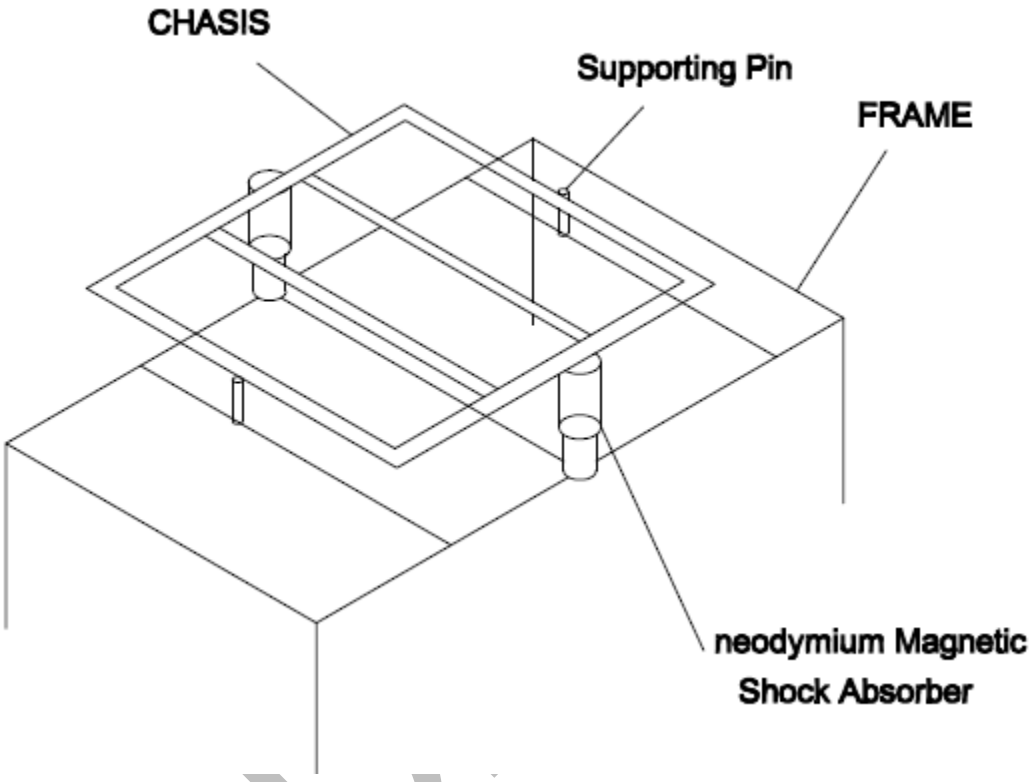
- Leakage may be a problem if the parts are not properly machined.
- High precision work is needed.

3. Vehicle Stablisation using Neodymium Magnetic suspension

Abstract

This project is based on suspension system of an four wheeler. This report gives information about magnetic suspension system. The aim of this project is to study and investigate the response of system, when it is subjected to road surface irregularities with the hope that it would help automobile industry. This project presents design, construction and working of magnetic suspension system. This system uses electromagnets (Neodymium magnet) as passive dampers, which is used to reduce displacement and acceleration of sprung mass in order to improve ride comfort while in turning. By using this type of absorber we can absorb the more number of shocks and variations are absorbed with the more accuracy. This type of Suspension has no problem of leakage of oil like hydraulic shock absorber. Also this has less maintenance than other types of shock absorber that we can made this type of shock absorber for the efficient work of vehicle and for reducing the maintained cost of vehicle.

LAYOUT



Working Principle

Magnetic Shock Absorber which is mainly based on the principle of magnetic property like when the same poles of two magnets come in contact with each other then they are repulsed from each other. This unit is mounted in vehicle such as other type of shock absorber. The working of this absorber is very simple. Two magnets are mounted in this way that one

is mounted below and other is on upper side. Poles of these magnets are same at inner side so that they are repulsed from each other and space is made between them due to this. When the vehicle is running on the bump or the muddy road then the space between two magnets is reduced and then shocks and variations present in the vehicle absorbed by repulsion property of the magnet. By using this type of absorber we can absorb the more number of shocks and variations are absorbed with the more accuracy. This shock absorber has no problem of leakage of oil like hydraulic shock absorber. Also this has less maintenance than other types of shock absorber. So that we can made this type of shock absorber for the efficient work of vehicle and for reducing the maintained cost of vehicle.

4. DESIGN AND FABRICATION OF PNEUMATIC FOUR WHEEL JACK

ABSTRACT

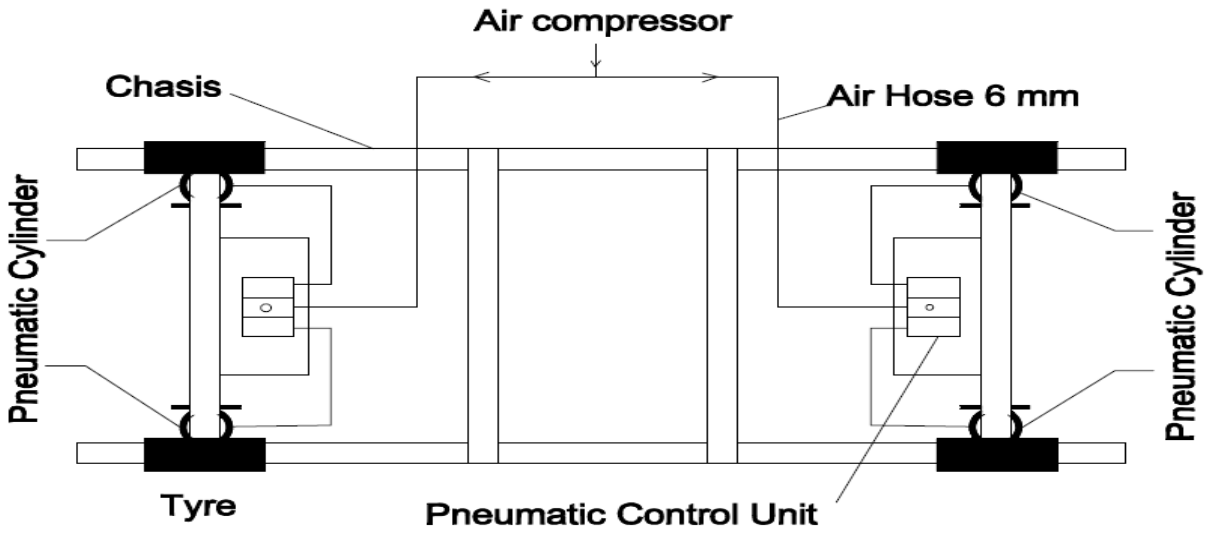
In this project title of “Design and Fabrication of PNEUMATIC FOUR WHEEL JACK” we are using compressed air to lift the vehicle for changing the tyre and any chassis repair work.

The air source is taken from the engine compressor easy to operate.

No need to carry the jack with us. The pneumatic jack is fitted in the vehicle itself. It can be operated be operated manually by the driver itself.

WORKING PRINCIPLE

The working medium adopted is compressed air. The compressed air is transmitted through tubes to pneumatic cylinder where power is converted into reciprocating motion. The reciprocating motion is obtained by using an electrically controlled solenoid valve. The input to the solenoid valve is given through the control unit. The reciprocating motion transmitted to the jack through the piston which moves on the cylinder. The jack is placed under the vehicle chassis, where the vehicle to be lifted. The vehicle can be lifted when the solenoid valve is switched. The vehicle over the jack gets the reciprocating motion through the piston which is connected to the jack. Thus using a pneumatic jack the vehicle can be lifted with ease in operation



ADVANTAGES

- Reduced manpower
- Reliable & flexible
- Good performance
- Less expensive
- Easy to operate
- Easy to maintain
- Can be implemented in all four wheelers

DISADVANTAGES

- Initial cost is high.
- High maintenance cost

5. DESIGN & FABRICATION OF ACCELERATION CONTROLLING SYSTEM IN TRAFFIC.

SYNOPSIS

As for Indian road transport scenario is concerned, accidents are becoming a day to day cause an attempt has been made in this project to reduce such mishaps. In our project a high speed indication is given and automatic braking is applied by cutting off the fuel supply to the engine when the setup speed is exceeded.

In our project, we have used solenoid valve and a operational amplifier circuit using LM324IC. The alternations to be made to implement this project in the vehicles are also discussed. The FM transmitter and receiver circuit is used for this project. The FM receiver circuit is fitted in the vehicle. The FM transmitter is fixed in the colleges/school, hospitals and wherever you want the accident prevention.

INTRODUCTION

In this fast moving world accidents are becoming proportional to high speed. In this project we are dealing with the speed limit taking into consideration, the wheel speed. A speed limit, the electronic gets closed. This makes the solenoid valve to close, which is placed before the carburetor. The fuel supply is cutoff due to the action of solenoid valve that in turn decreases the speed. As soon as speed decreases the op-amp circuit disables the supply to the solenoid valve, which makes it to open and allows the fuel flow in a regular manner to the engine.

NECESSITY OF USING AUTOMATIC BREAKING SYSTEM

The rider while in action may drive in different speeds depending on his needs and his substance of mind. This may lead to negligence of visual indication of the speed that he is driving which in many incidents have proven to be a disaster.

In our AUTOMATIC BREAKING SYSTEM the audible alarm is given to the rider against the high speed stop that he is brought to his senses from the deviation, the AUTOMATIC BREAKING SYSTEM enables the control limit and brings the vehicle to the safety limit.

- To prevent high speed in automobiles,
- To reduce the accidents caused be over speed,
- To provide smooth/steady drive throughout the ride,
- To provide additional brake in addition to the conventional breaking system,
- To reduce the fuel intake of the Engine,
- To reduce the deviation of the rider by the usage of alarm facility.

ADVANTAGES

- ✓ To provide automatic braking system.
- ✓ To provide hazard free atmosphere.
- ✓ To provide smooth ride for the motorist.
- ✓ To provide mind free ride for the motorist.
- ✓ To provide the nation with a accident free roads.

DISADVANTAGES

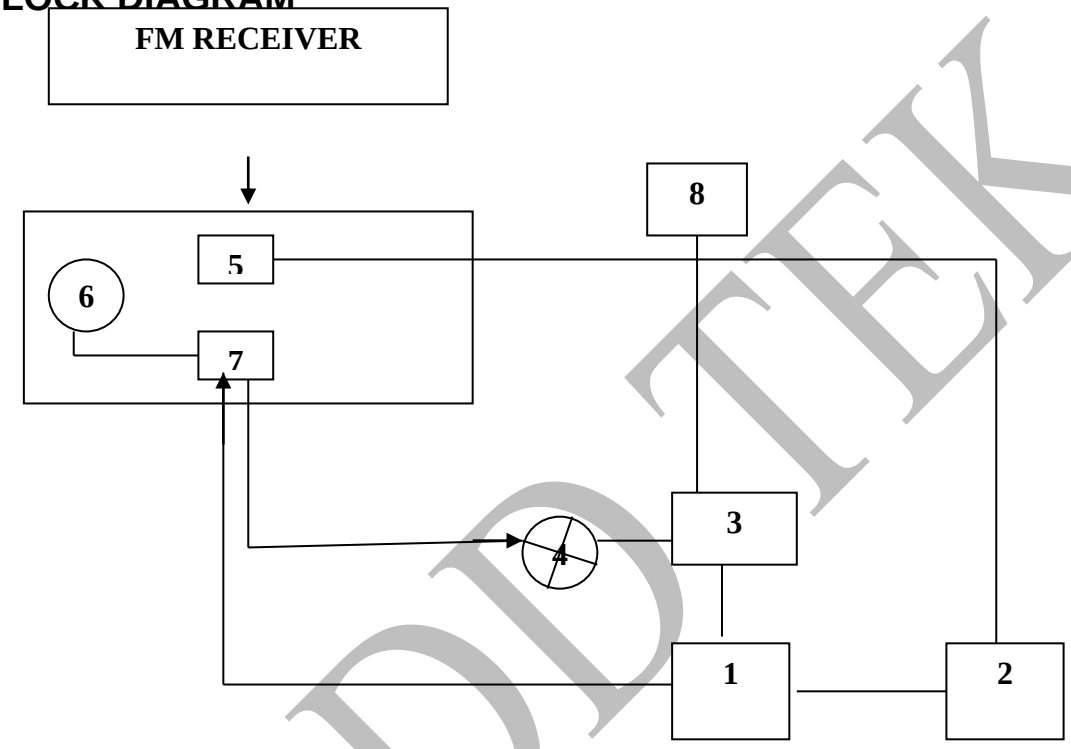
- Additional cost is required for vehicle automation

APPLICATIONS

- ✓ Automatic braking system can be used in both light moving vehicles such as two wheelers as well as in heavy moving vehicles such as buses and trucks e.t.c

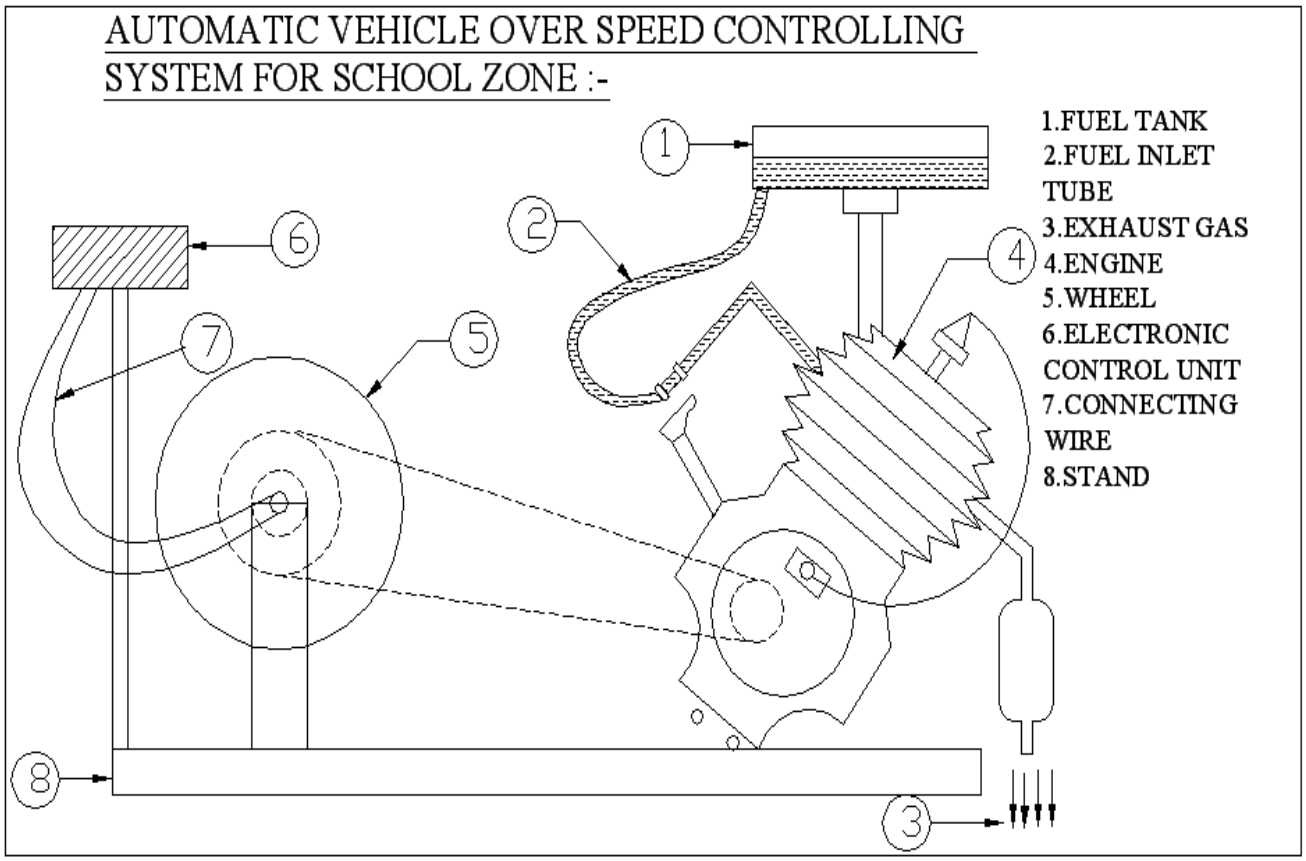
- ✓ Automatic breaking system is flexible enough to be used in any type of breaking system such as mechanical, hydraulic, vacuum and air brakes.
- ✓ Automatic breaking system can be implemented in institutional vehicles, taxis, driving school vehicles, etc.

BLOCK DIAGRAM



1. ENGINE
2. WHEEL
3. CARBURETTOR
4. SOLENOID VALVE
5. SPEEDO METER
6. INDICATION LIGHT
7. CIRCUIT
8. FUEL TANK

AUTOMATIC VEHICLE OVER SPEED CONTROLLING SYSTEM FOR SCHOOL ZONE :-



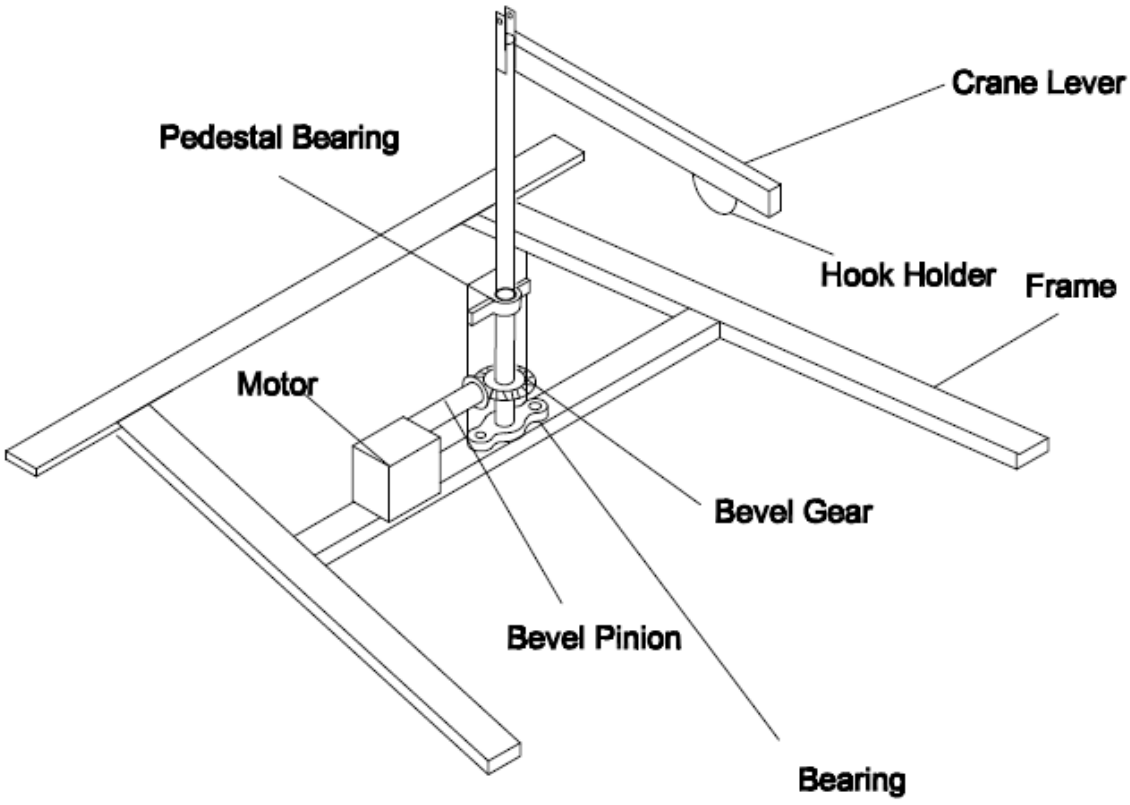
6.Design And Fabrication Of Pneumatic Crane With 360º Rotation Using Motor

ABSTRACT

This project work deals with the project of "DESIGN AND FABRICATION OF PNEUMATIC CRANE WITH 360^{O} Rotation using motor". The pneumatic system has gained a large amount in last few decades. This importance is due to its accuracy and cost. This convenience in operating the pneumatic system has made as to design and fabrication this unit as our project. This unit as we hope that it can be operated easily with semi skilled operators. The pneumatic crane has an advantage of working in low pressure of 6 bar is enough for operating the unit. The pressurized air passing through tubes to the cylinder forces the piston out whose power through the linkage is transmitted. Pneumatic hand crane for work support was developed to reduce the work load of the operator using Pneumatic cylinders with air compressor. These pneumatic cylinders are being operated using directional control valves. It has a pivot joint for lifting arm and a crane hook with a connecting chain. A rope is being connected from the pivot of the arm to the lifting area to arrest the vibrations produced during lifting of weights. These cranes are easily portable with movable and rotatable using Motor and wheels on the bottom of the fixture. Also, it minimizes the usage of pulleys and ropes, which causes damage due to failure of ropes

during weight lifting in industries.Where pneumatic power is used as a power assistant.

DRAWING



Pneumatic Crane with 360 ° rotation

- **The Pneumatic cylinder is connected between the fixed frame and the lifting arm. A supporting frame is connected from the main frame to the fixed frame. At the end of the lifting arm, a crane hook is connected with a chain to lift up the weights. These frames along with lifting arm are seated** in main frame

with portable wheels on the bottom. During weight lifting in industries, the lifting arm may produce vibrations due to overweight. In order to arrest those vibrations produced, a string wire is being connected from the pivot of the lifting arm to the end of the lifting area with a stand When the Pneumatic cylinders are being pressurized by the air compressor, air enters at a high pressure in to the cylinder which in turn it expands to lift the arm. Thus the weight is being lifted by the arm and it is shifted to the required place with portable wheels on the cranes. The usages of these portable pneumatic cranes in industries are very much important to reduce the work power of men and machines. Also, it saves time to rotate and rest the work with 360^{O} using Gear mechanism powered by MOTOR.

ADVANTAGES

- Low operating cost.
- Easily portable and adaptable.
- Reduces accidents.
- To reduce the work load.
- Less complications
- Cost of pneumatic cylinder is comparatively low.

DISADVANTAGE

- Quick movement or Displacement causes the damage.
- Usage of Air compressor.

- High maintenance.
- Entire system goes down if air supply shuts down

APPLICATIONS

- It can be installed in all machine shops
- Can be used in tool room
- These pneumatic cranes are used in
- Small scale industries to lift weight up to 0.5-1tonne.
- Construction work.
- Stores

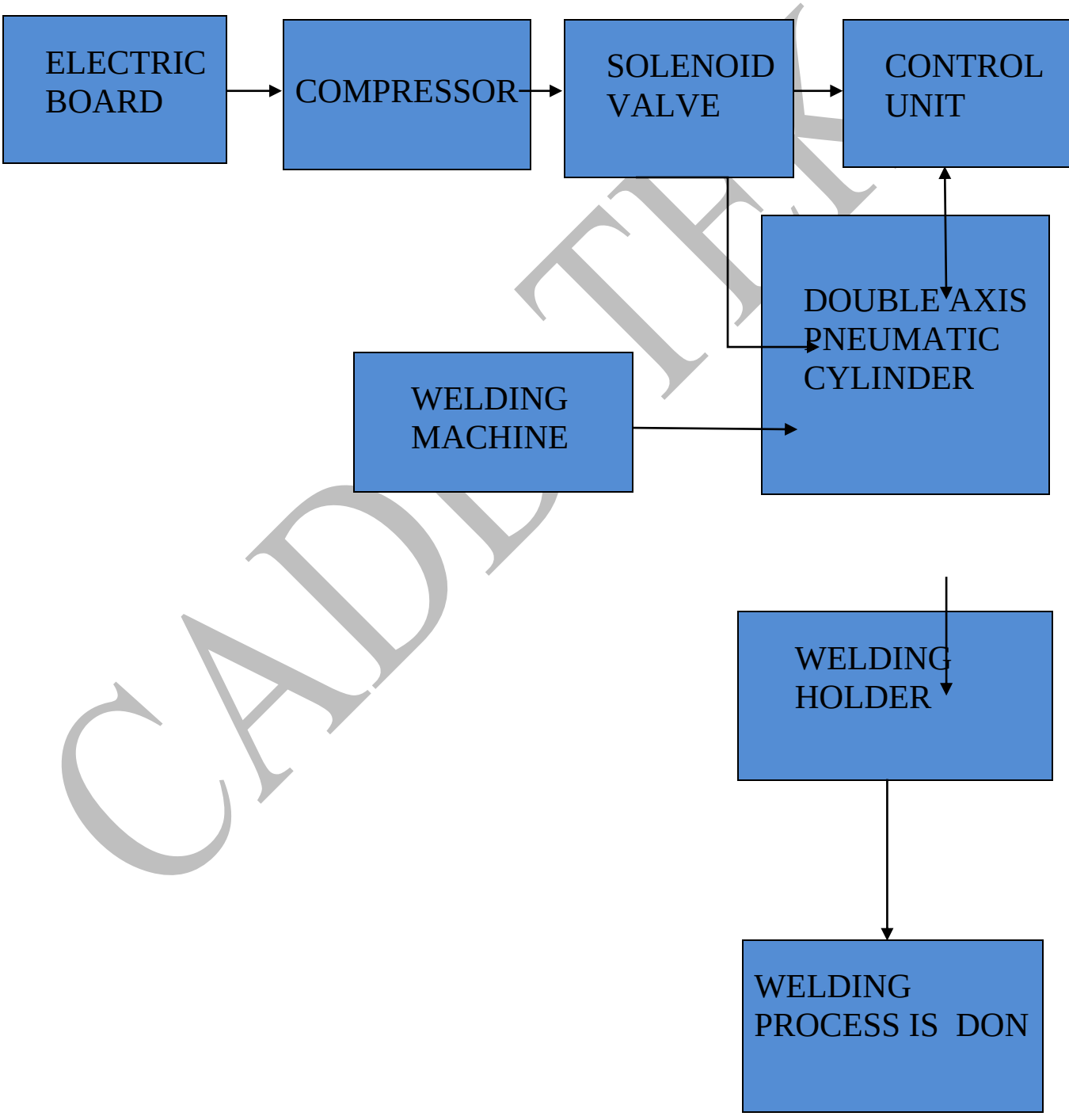
7.Design & fabrication of automatic double axis welding machine.

ABSTRACT

The technology of pneumatics has gained tremendous importance in the field of workplace rationalization and automation from old-fashioned timber works and coal mines to modern machine shops and space robots. Certain characteristics of compressed air have made this medium quite suitable for used in modern manufacturing and production industries. It is therefore important that technicians and engineers should have a good knowledge of pneumatic system, air operated valves and accessories. A pneumatic system consists of a compressor plant, pipe lines, control valves, drive members and related auxiliary appliances. The air is compressed in an air compressor and from the compressor plant the flow medium is transmitted to the pneumatic cylinder through a well laid pipe line system. To maintain optimum efficiency of pneumatic system, it is of vital importance that pressure drop between generation and consumption of compressed air is kept very low.

In our project "**AUTOMATIC DOUBLE AXIS WELDING MACHINE**" is beings with an introduction to welding the various components automatically. Three-pneumatic cylinder and solenoid valve are provided. One cylinder is for the up and down movement, another one for arm lifting and one for the rotary motion.

BLOCK DIAGRAM OF WELDING MACHINE



ADVANTAGES

- Small in size.
- Working Speed High.
- Due to portable ability it is easily handled.

DISADVANTAGES

- Not so effective for very hard materials.
- While working, the compressed air produces noise therefore a silencer may be used.
- Cost is High

APPLICATION

- Automobile industry
- Automobile manufacturing
- Metal working
- Fabrication
- Industrial application

8.SOLAR POWERED WATER LIFTER FROM RIVER - GIANT WHEEL METHOD

SYNOPSIS

Here is an easy way to lift the water using solar power. The diagrammatical representation for the solar powered water lifter from river - giant wheel method is shown below. It consists of solar panel, worm gear arrangement, DC motor, scoops and a collecting tray. The main purpose of this machine is to save time. By using this machine large amount of water can be lifted from rivers easily and also quickly. The power for the motor is given from the solar panel.

WORKING PRINCIPLE

Solar panel consists of number of silicon cells, when sun light falls on this panel it generates the voltage signals, these voltage signals are given to charging circuit. Depending on the panel board size the generated voltage amount is increased. Here the worm gear and motor arrangement is used to control the rotation of the scoops. The motor gets supply from the solar panel. These scoops are arranged as it can touch the water surface on a giant wheel. Below these scoops arrangement there is a tank which contains water (consider as a river). A tray and a collecting tray are arranged as shown in the diagram.

When the motor rotates the scoops also starts rotating due the gear arrangement. So when the scoops rotate it reaches the water surface, when scoops leave the water surface it carries water in it as the angle of the scoops is placed in such a manner. After scoop reaches the upper area the water spills in a tray due to gravitational force as the arrangement of the scoop is made so. The spilled water then reaches a collecting tray which is connected to the required place.

ADVANTAGES

- Time consumption
- No man power is required
- Compact

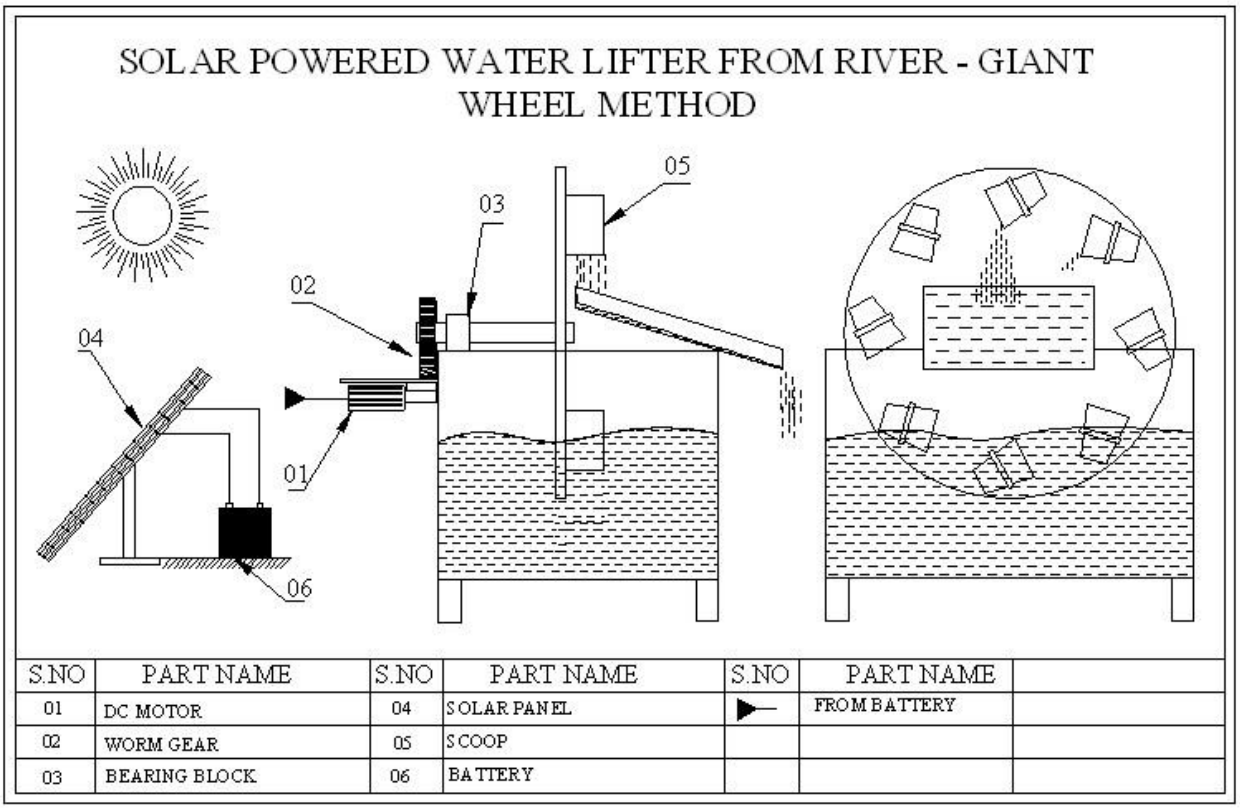
DISADVANTAGES

- Collecting trays should be changed frequently
- Not portable

APPLICATION

This project is very useful in the agricultural application to lift water from river.

DRAWING FOR SOLAR POWERED WATER LIFTING SYSTEM



S.NO	PART NAME	S.NO	PART NAME	S.NO	PART NAME	
01	DC MOTOR	04	SOLAR PANEL	▶—	FROM BATTERY	
02	WORM GEAR	05	SCOOP			
03	BEARING BLOCK	06	BATTERY			

9.ADVANCED TWO-DIMENSIONAL SPRAY PAINTER WITH SCISSOR LIFT MECHANISM

ABSTRACT:

Painting is the operation of adding paint, pigment of colour to a surface. This is done to protect the surface as well as to have good aesthetics. One type of painting used is spray painting. It is used to produce a uniform coating and an excellent finish. But this can also be a tedious task and also the spray is hazardous.

So the use of advanced robots is needed for spray painting applications. This is because the robot can do the operation precisely and also it eliminated danger to human health.

This project proposes the idea of using a double scissor lift arrangement to lift the paint sprayer in the vertical axis and a lead screw drive to move it in a horizontal axis. The scissor lift is used because it can be used to achieve a good height and also it is easily portable. The control can be easily done using simple electrical circuits.

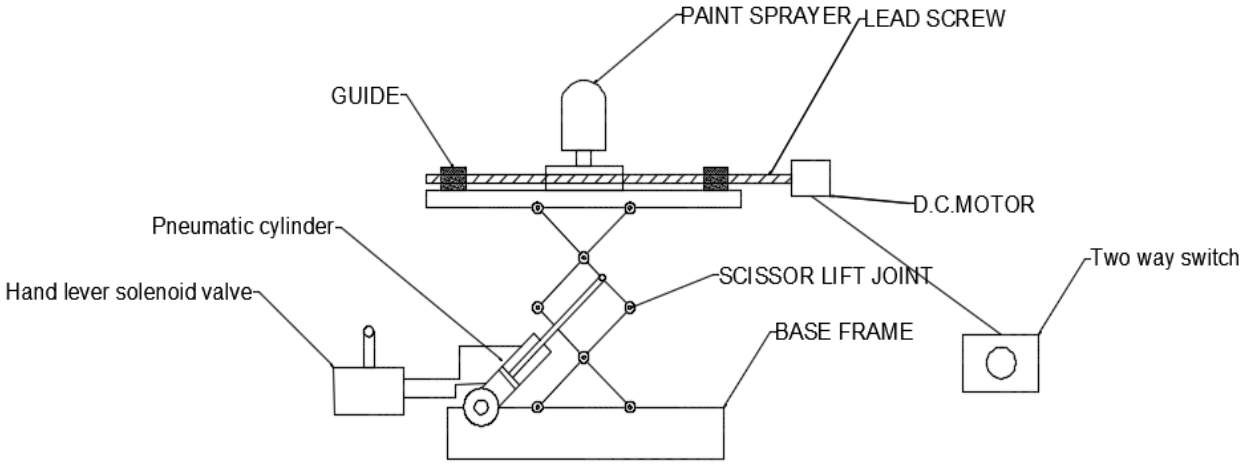
WORKING PRINCIPLE:

This machine contains for one dc motor drive and one pneumatic drive; dc motor has an attached on using horizontal motion in paint sprayer, then pneumatic cylinder can be used for vertical motion in scissor lift on table,

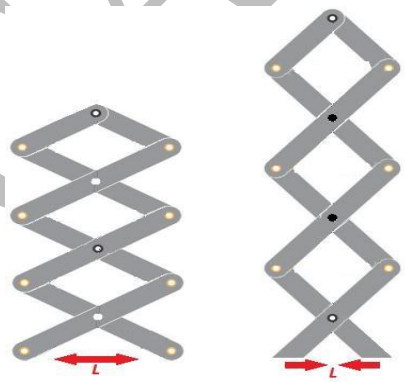
which is pneumatic cylinder actuation on double acting motion meanwhile it has operated in attached on hand lever solenoid valve.

The dc motor can be operated in attached two-way switch, which acting on forward and backward motion actuation system. It is direct connection on dc battery.

LAYOUT:



Scissor-lift mechanism:



Thus the vertical motion is accomplished by the scissor lift mechanism.

Advantage

- It is easy to operate
- The painting is done easily and takes lesser time
- The application of paint on the surface is uniform.
- It is economical
- It also eliminates the possible hazards due to the exposure to the paint spray.

Application:

- It can be used to speed and uniform painting applications.
- It can be used handling hazardous paint pigments.
- It can be used for painting outer walls of buildings, as it can easily reach the height, which is tough for a human.

10.DESIGN AND FABRICATION OF ADVANCED MOTORIZED WATER PUMP USING SCOTCH YOKE MECHANISM

ABSTRACT

The aim of the paper is to design and develop a water pumping system using scotch yoke mechanism. The reciprocating motion of the plunger is utilized for the pumping action. The plunger is reciprocated with the help of a cam plate. By this action the water is pumped with very high pressure and to various heads. This can be utilized for various applications like lubrication in machines and water pumping in agriculture field. The cam plate gets the drive from the motor for its rotation and converts that rotary motion to useful dual side reciprocating motion. The motor is powered with the aid of electric power. Thus the water is pumped from source to various heads.

INTRODUCTION

Every one of us will need of some kind of water source for drinking, bathing, washing clothes, preparing food and for irrigation. We may get the water from various sources like, lake, river, ponds, open well, bore well. So we have to pump the water from the source and use the water for the various purposes. Pumps operate by some mechanism (typically reciprocating or rotary), and consume energy to perform mechanical work by moving the fluid.

Pumps operate via many energy sources, including manual operation, electricity, engines, or wind power which usually come in many sizes that vary from microscopic for use in medical applications to large industrial pumps.

Generally, these mechanical pumps have numerous applications such as pumping water from wells, filtering of dust in the aquarium, filtering the ponds and aeration, also used in car industry for water-cooling and fuel injection, and finally in the energy industry for pumping oil and natural gas or for operating cooling towers. This Scotch yoke mechanism could be used for conversion between rotational motion and linear reciprocating motion. In general, this linear motion can take place in various forms depending on the shape of the slot, but mostly the basic yoke with a constant rotation speed produces a linear motion that is simple harmonic in nature.

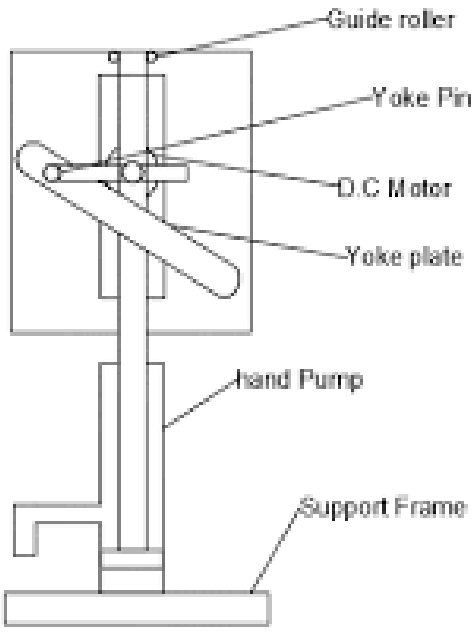
WORKING PRINCIPLE:

The experimental setup consists of water pump whose pumping shaft is connected to the yoke plate of the scotch yoke mechanism the rotating disk consists of the yoke supporting pin is inserted into the yoke plate for controlling the translation motion.

The rotation of the plate is carried out with the help of motor. When the motor is turned on then it rotates the plate attached with it and this rotation is converted into translation by means of yoke plate, this translation motion

activates the piston of the pump to take to and fro motion, the water is sucked and transmitted to the required designation.

LAYOUT:



ADVANTAGES:

- Less cost.
- Simple in design.
- It draws water faster than normal hand pumps.
- Less time consumption operation.

APPLICATIONS:

- It is used in rural areas.
- As the installation cost of hand water pump with hand lever is low it is useful for poor people.
- It can be installed in all the public places.

11. DESIGN & FABRICATION OF 4 BAR MECHANISM MULTI OPERATIONAL MACHINE FOR INDUSTRIES.

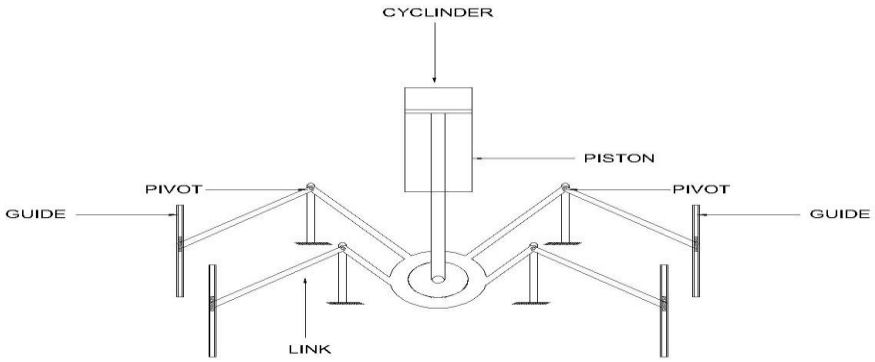
ABSTRACT

The growth of Indian manufacturing sector depends largely on its productivity & quality. Productivity depends upon many factors, one of the major factors being manufacturing efficiency with which the operation /activities are carried out in the organization. Productivity can be improved by reducing the total machining time, combining the operations etc. In case of mass production where variety of jobs is less and quantity to be produced is huge, it is very essential to produce the job at a faster rate. This is not possible if we carry out the production by using general purpose machines. The best way to improve the production rate (productivity) along with quality is by use of special purpose machine. Usefulness and performance of the existing radial drilling machine will be increased by designing of multispindle operational machine

This paper deals with design and development of multispindle operation head for cycle time optimization of the component. The report presented here gives detailed overview of making of the Special purpose machine. This report touches to numerous aspects of engineering, which has been covered in the curriculum of UG and PG programs of Mechanical engineering. The report is compiled with a simple and easy to follow approach for building up of a machine. It consist of design of gear, shaft, bearing, etc.

SYNOPSIS

Multi-operation machine as a research area is motivated by questions that arise in industrial manufacturing, production planning, and computer control. Consider a large automotive garage with specialized shops. A industrial may require the following work, hammering, riveting punching and forging. These four tasks may be carried out in any order. However, since hammering, and punching are in different buildings, it is impossible to perform two tasks for a industrial simultaneously. When there are many industrial requiring services at the four shops, it is desirable to construct a service schedule that takes the least amount of total time



multi operational machine using 4 link mechanism

ADVANTAGES

1. High torque output with a small cylinder size
2. Fewer moving parts
3. Smoother operation

Application

1.

12. FABRICATION OF PNEUMATIC OPERATED POTATO CHIPS MAKING MACHINE

SYNOPSIS

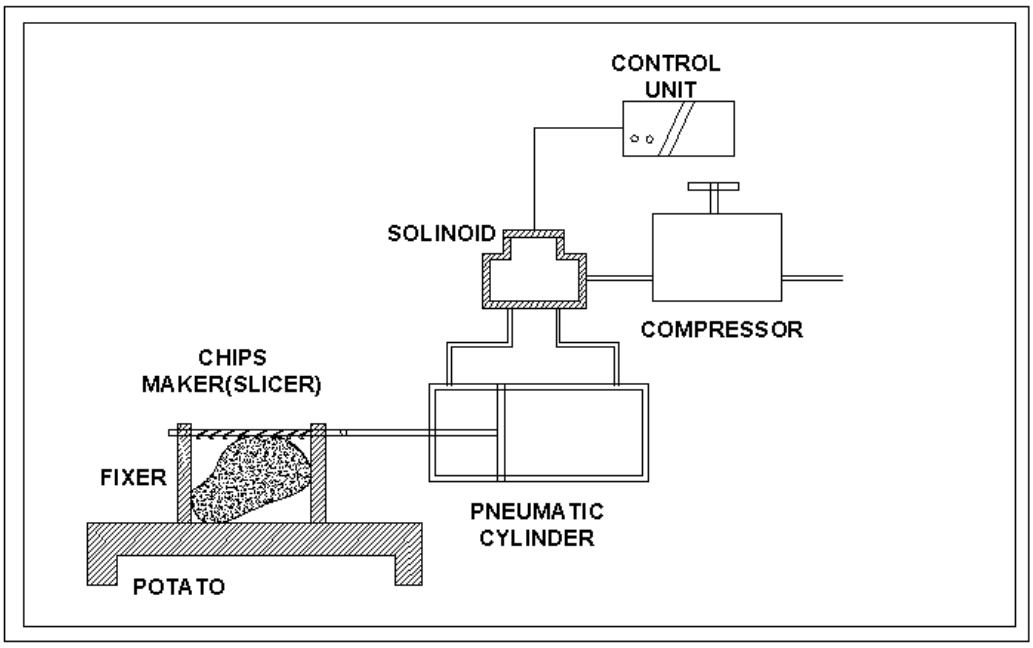
The main aim of the project is to reduce the man power, time consumption during the potato chips processing and other food processing in hotels. The power source is considered to be pneumatic power due to its availability, quick response. This arrangement consists of compressor, control unit, solenoid valve and pneumatic cylinder.

Initially compressor supplies the air at certain pressure to the solenoid valve. This solenoid valve is used to control the direction of flow of air to the pneumatic cylinder. This pneumatic cylinder actuates the piston due to high pressure of air. At the end of the piston rod potato cutting knife is fitted. So the reciprocating motion of piston gives cutting action on the potato which are placed on the table. Then the flow direction is reversed by the solenoid valve. So this will actuate the piston rod to retard position. Now the solenoid valve changes the direction of flow of air to the pneumatic cylinder. This process is carried continuously.

In this project, number of potato can be cut into the pieces with specified sequence of period. This automatic process requires less man power to place

the potato on the cutting table. This type of system is very useful in bulk processing in the fast food hotels

DRAWING FOR PNEUMATIC POTATO CHIPS MACKING MACHINE:



ADVANTAGES:

1. No man power required
2. Consumes less time
3. Bulk production
4. Low maintenance
5. Quick response

APPLICATION:

1. Applicable in hotel

13. DESIGN & FABRICATION OF PNEUMATIC CRANE

ABSTRACT

Simulation of the PNEUMATIC CRANE for work support was developed to reduce the work load of the operator using Pneumatic cylinders with air compressor. These pneumatic cylinders are being operated using directional control valves. It has a pivot joint for lifting arm and a crane hook with a connecting chain. A rope is being connected from the pivot of the arm to the lifting area to arrest the vibrations produced during lifting of weights. These cranes are easily portable with movable wheels on the bottom of the fixture. Also, it minimizes the usage of motors, pulleys and ropes, which causes damage due to failure of ropes during weight lifting in industries.

INTRODUCTION

Production sites feature increasing numbers of lines producing multiple type, small/lot products, lines using cell production, etc., and manual operation personnel to cope with diversifying consumer needs. These increase the physical burden on personnel, cutting work efficiency. Complicated by a dropping birthrate, an aging society, a

shrinking work force, and an aging artisan pool, the issue arises of how to lighten the physical burden on personnel. An attractive answer is the use of power assist systems that make it easier to move heavy objects. Proposed power-assist systems have included exoskeletons and arms patterned after the Extender of Examples of production line models include Skill Assist. This enables personnel to demonstrate skills and variable impedance control. To evaluate the performance of power-assist systems in the design stage, it is important to simulate systems including the human element, but few reports have discussed simulation including the human element. The work-support pneumatic power-assist system reducing operating force on personnel by using a pneumatic cylinder and arm we propose introduces design methodology. We start by simulating dynamics to evaluate device performance and to verify feasibility. Because the power assist system operates passively in response to operator instruction, we used control that includes the human element in a numerical model. To evaluate power-assist system performance, we compared it with measured of operating force and acceleration.

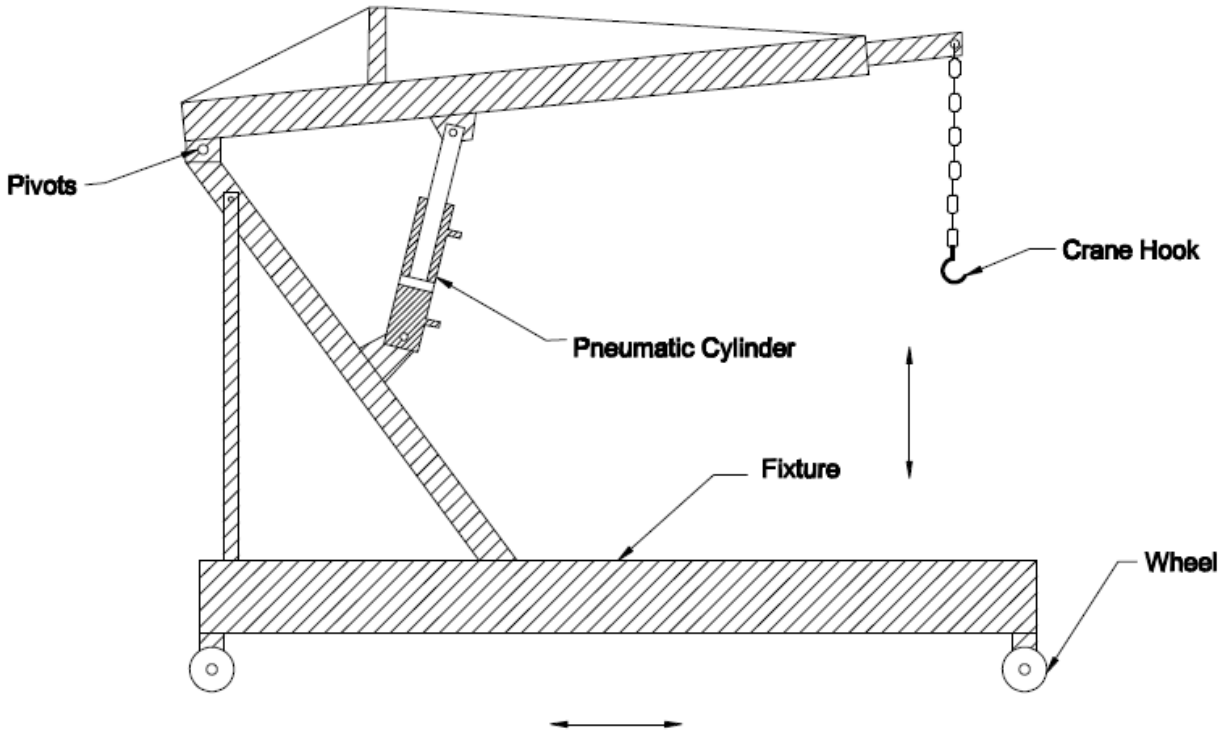
We designed an inverse dynamics model of a power assist system, in which identification was based on measured operating force and system operation displacement. Power-assist system simulation treated the inverse dynamics model as a model acquired in the human brain. This method lacked generality, being applicable only to simulating existing power-assist systems; however, so we set out to construct highly generalizable simulation by modeling human learning and using it to acquire an inverse dynamics model of the power-assist system. To evaluate power-assist performance during design, highly generalizable dynamic simulation must not depend on individual system elements such as actuator features, the arm, or the load mass. We used an inverse system enabling learning using a neural network – a human model flexibly adapted and not controlled by the environment

The major components of the project are follows:

- Main Frame
- Pneumatic cylinder
- Wheel arrangement

- Air compressor

Layout



WORKING OPERATION

The components used for this project are

- Frame
- Pneumatic cylinder with connecting pipes
- Wheel arrangement
- Air compressor
- Pivot joints
- Crane hook with chain connected.

The Pneumatic cylinder is connected between the fixed frame and the lifting arm. A supporting frame is connected from the main

frame to the fixed frame. At the end of the lifting arm, a crane hook is connected with a chain to lift up the weights. These frames along with lifting arm are seated in main frame with portable wheels on the bottom. During weight lifting in industries, the lifting arm may produce vibrations due to over weight. In order to arrest those vibrations produced, a string wire is being connected from the pivot of the lifting arm to the end of the lifting area with a stand.

When the Pneumatic cylinders are being pressurized by the air compressor, air enters at a high pressure in to the cylinder which in turn it expands to lift the arm. Thus the weight is being lifted by the arm and it is shifted to the required place with portable wheels on the cranes. The usages of these portable pneumatic cranes in industries are very much important to reduce the work power of men and machines. Also, it saves time and avoids accidents during lifting of weights. In ordinary cranes, rope drives are used with pulleys and motors to lift the weight which is not so safer since the ropes can break due to regular usage and also due to wear and tear.

ADVANTAGES

- Low operating cost.
- Easily portable and adaptable.
- Reduces accidents.
- To reduce the work load.
- Less complications
- Cost of pneumatic cylinder is comparatively low.

DISADVANTAGES

- Quick movement or Displacement causes the damage.
- Usage of Air compressor.
- High maintenance.
- Entire system goes down if air supply shuts down.

APPLICATIONS

These pneumatic cranes are used in

- Small scale industries to lift weight up to 0.5-1tonne.
- Construction work.
- Stores

14. Design & Fabrication of multipurpose operational machine for DTP using scotch yoke mechanism

SYNOPSIS

Design and fabrication of multipurpose operation for dtp as a research area is motivated by questions that arise in DTP centre. Consider a for DTP(Desk Top Publishing) with specialized shops. A DTP may require the following work, staple, punching, spiral, punch and cutting. These four tasks may be carried out in any order. however, since cutting and punching are in different rooms , it is impossible to perform two tasks for a DTP centre's simultaneously. When there are many DTP centre requiring these services at the four rooms, it is desirable to construct a service schedule that takes the least amount of total time.

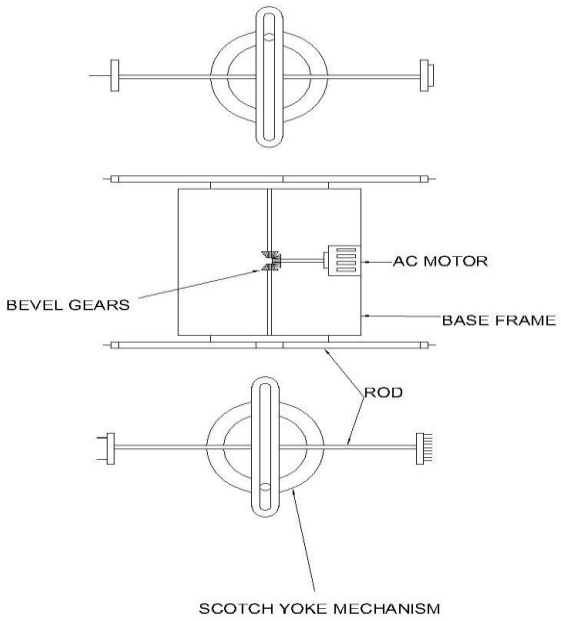
INTRODUCTION

Road vehicles can expend a significant amount of energy in undesirable vertical motions that are induced by road bumps, and much of that is dissipated in conventional shock absorbers as they dampen the vertical motions. A conventional automotive shock absorber dampens suspension movement to produce a controlled action that keeps the tire firmly on the road. This is done

by converting the kinetic energy into heat energy, which is then absorbed by the shock's oil.

The Power-Generating Shock Absorber (PGSA) converts this kinetic energy into electricity instead of heat through the use of a Linear Motion Electromagnetic System (LMES). The LMES uses a dense permanent magnet stack embedded in the main piston, a switchable series of stator coil windings, a rectifier, and an electronic control system to manage the varying electrical output and dampening load. The bottom shaft of the PGSA mounts to the moving suspension member and forces the magnet stack to reciprocate within the annular array of stator windings, producing alternating current electricity. That electricity is then converted into direct current through a full-wave rectifier and stored in the vehicle's batteries. The electricity generated by each PGSA can then be combined with electricity from other power generation systems (e.g. regenerative braking) and stored in the vehicle's batteries.

Layout



MULTIOPERATIONAL MCHINE USING SCOTCH YOKE MECHANISM

ADVANTAGES

1 High torque output with a small cylinder size

2 Fewer moving parts

3 Smoother operation

4 Higher percentage of the time spent at top dead center (dwell) improving theoretical engine efficiency of constant volume combustion cycles though actual gains have not been demonstrated
In an engine, elimination of joint typically served by a wrist pin, and near elimination of piston .

DISADVANTAGES

1. Rapid wear of the slot in the yoke caused by sliding friction and high contact pressures.

2. Increased heat loss during combustion due to extended dwell at top dead center offsets any constant volume combustion improvements in real engines

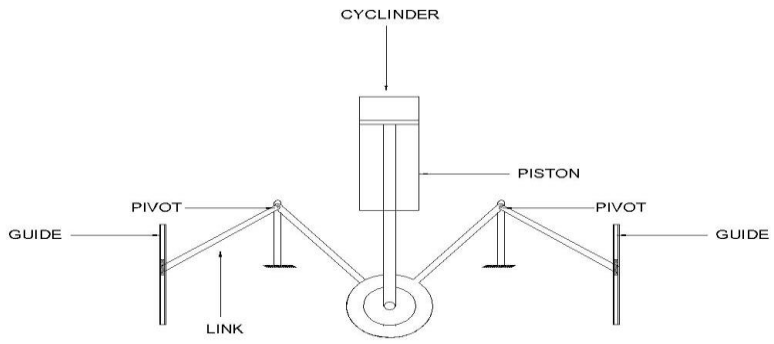
3. Lesser percentage of the time spent at bottom dead center reducing blow down time for two stroke engines, when compared with a conventional piston and crankshaft mechanism.

15. Design & fabrication of multi operational machines for DTP centre using link mechanism.

Introduction

Multi-operation machine as a research area is motivated by questions that arise in dtp.. Consider for dtp with specialized shops. A for dtp may require the following work, cutting and punching . These four tasks may be carried out in any order.however, since cutting, and punching are in different rooms, itis impossible to perform two tasks for a industrial simultaneously. When there are many dtp requiring services at the two rooms, , it is desirable to construct a service schedule that takes the least amount of total time

Layout



multi operational machine using 2 link mechanism

ADVANTAGES

- Low operating cost.
- Easily portable and adaptable.
- To reduce the work load.

16. DESIGN AND FABRICATION RAW ROTI MAKING MACHINE

SYNOPSIS

Flat breads are very popular especially in those parts of the world where bread constitutes a major source of dietary protein and calories. There are several forms of flat bread, and the variation is mainly in terms of ingredient, technology, and quality. Several modifications in the formulations have been made in the recent past in order to improve the quality and delicacy of these food products. With urbanization and industrialization, the demand for ready to eat and easy to carry products resembling flat bread in appearance, but having desirable qualities of bread offers one exciting possibility to this effect. In India, wheat is one of the daily staples, consumed in the form of different flat breads such as Chapati, Parotha, Phulka, Puri and Tandoori Roti.

Different wheat varieties have been used for the production of flat breads. In recent years, many researchers have tried to improve ingredient level, baking properties, organoleptic characteristics, nutritional value and extension of the shelf life of flat bread. They are usually produced from a simple recipe consistingof flour, salt and water in varying proportions, however, sometimes the manufactures also use optional ingredients like yeast fat, skim milk powder and certain additives like emulsifiers, hydrocolloids, enzymes and preservatives for quality improvement and shelf life enhancementIndex

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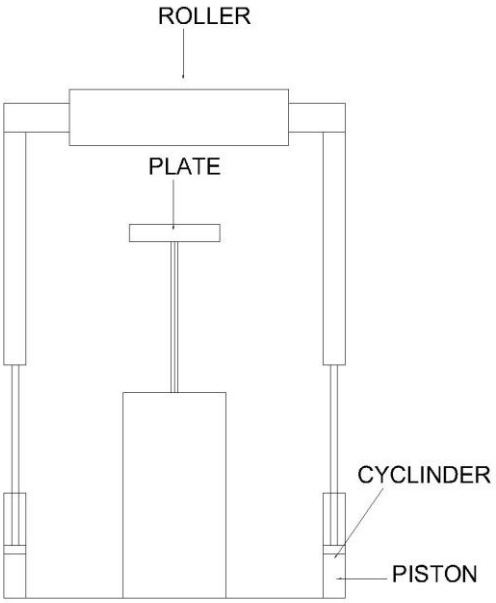


RAW ROTI MAKING MACHINE

ADVANTAGES

Here are some of the advantages of the machine that will surely compel you to buy the product.

* Quick and easy to make chapatti

* Suitable for large scale production

* Reduce the manpower

* Compact design and thus easily fit in the kitchen

* Highly efficient as compared to the traditional ways of making of chapatti

* Energy-efficient

* Robust structure as the body of the machine is made up of stainless steel

* Hygienic process

* Easy to clean parts like oven, hopper, rollers, and belts

* Require less monitoring

* Easy to maintain

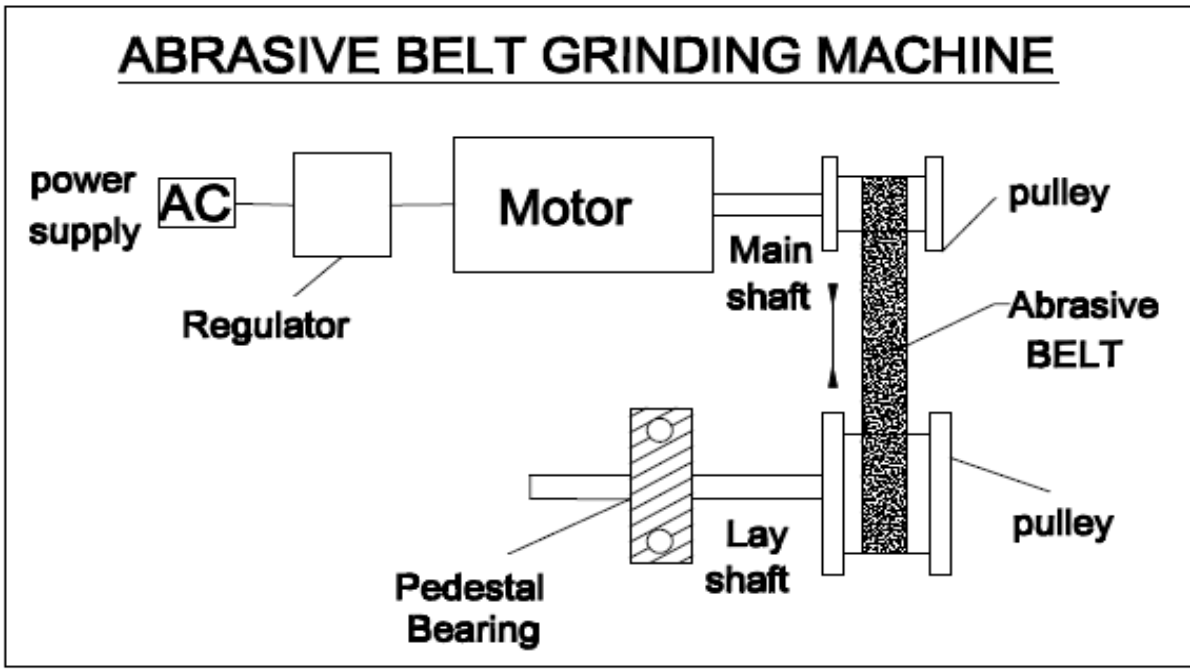
17. Design and fabrication of abrasive belt grinding wheel.

SYNOPSIS

The Machine we designed and fabricated is used for grinding any shape of object like Circular, Rectangular, and Polygon. In our project the work abrasive belt is used to grinding the material. The abrasive belt is rotated by the single phase induction motor. Hence our project namely abrasive belt grinder is a Special type of Machine. According to the type of material to be grind, the grinding tool can be changed.

This project gives details of grinding various shapes and sizes of components. This machine can be widely applied in almost all type of industries. By varying the pulley sizes I can get a high end speed of over 10,000 rpm if needed. The only change I would make is to have a totally enclosed motor to keep out the grit.

Layout



APPLICATIONS

- Grinding outside the job in any size of body can be done.
- As the feed is given automatic, 0.8 micron finish may be achieved.
- By changing the grades of abrasive belt grinding it can be used to grind the carbon steel, Alloy steel and stainless steel etc.

ADVANTAGES:

- The machine is compact and rigid in size.
- Maintenance is less.
- It can be used on any place of small grinding application

- By varying the pulley diameter the speed of the abrasive belt to be changed.

DISADVANTAGES :

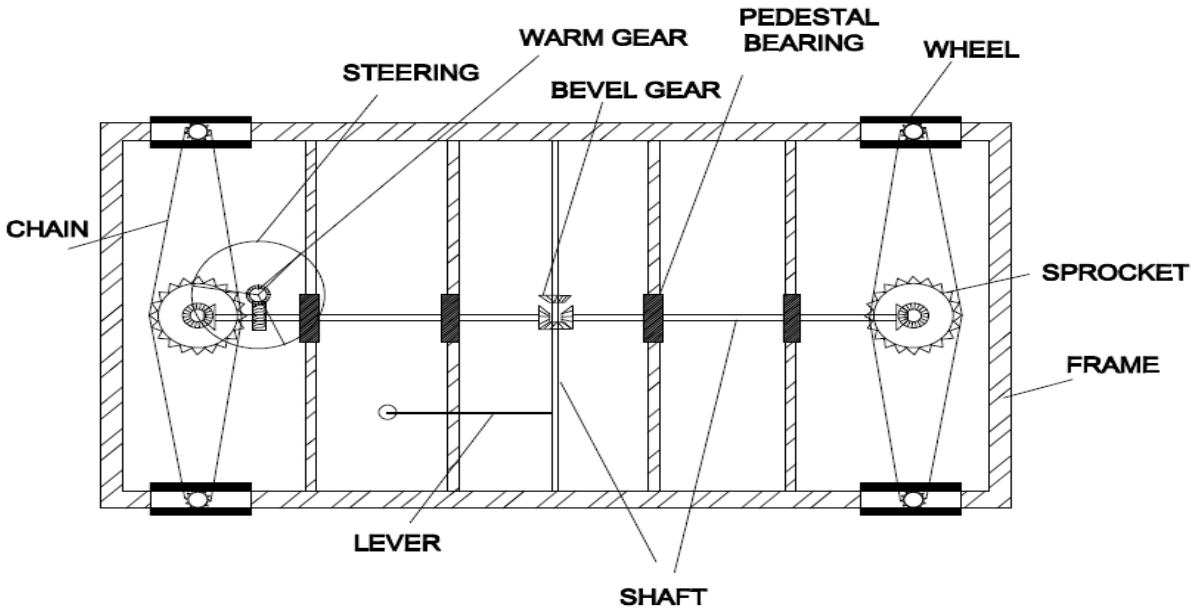
- The abrasive belt should be changeable one for different material. This process takes more time.

18. FABRICATION OF FOUR MODE OPERATIONS FOR AUTOMOBILE STEERING

SYNOPSIS

Here we have fabricated the four wheels steering with four mode operation. The main aim of this project is to steer the vehicle according to the requirement. The four wheel steering is more required in critical roads and in desert roads. In this project we implement four steering modes in a single vehicle and the modes can be changed as needed. In this project we implement four steering modes in a single vehicle and the modes can be changed as needed. We are controlled the four mode steering in chain drive and also find the vehicle aligned as soon as possible.

Layout



ADVANTAGES

- Easy Maintenance
- Mode Change Is Easy
- Implementation Is Easy
- Reduced Manpower
- High Turning Radius
- Can Be Implemented In All Four Wheelers
- Easy To Park The Vehicle

DISADVANTAGES

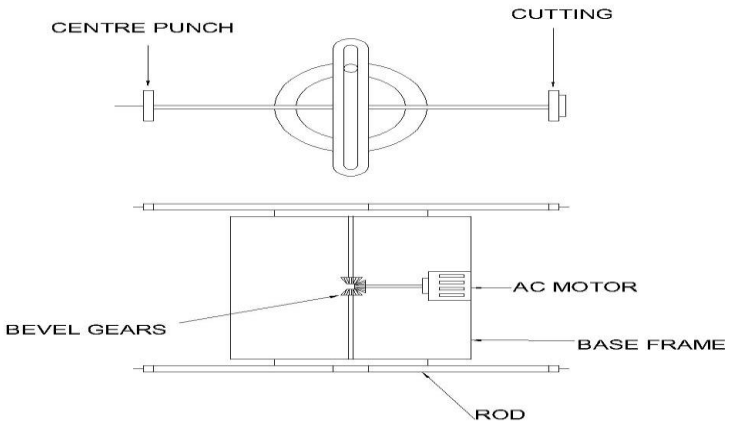
- It is applicable for all four wheeled vehicles.
- Used for easy parking in four wheelers
- Large farm vehicles and trucks etc.

19. Design & fabrication of two operational machine for industries using scotch yoke mechanism

SYNOPSIS

Multi-operation machine as a research area is motivated by questions that arise in industrial manufacturing, production planning, and computer control. Consider a large automotive garage with specialized shops. A industrial may require the following work, **CUTTING** and punching . These four tasks may be carried out in any order.however, since **CUTTING** and punching are in different buildings, itis impossible to perform two tasks for a industrial simultaneously. When there are many industrial requiring services at the two shops, it is desirable to construct a service schedule that takesthe least amount of total time

Layout



ADVANTAGES

1 High torque output with a small cylinder size

2 Fewer moving parts

3 Smoother operation

4 Higher percentage of the time spent at top dead center (dwell) improving theoretical engine efficiency of constant volume combustion cycles though actual gains have not been demonstrated
In an engine, elimination of joint typically served by a wrist pin, and near elimination of piston .

DISADVANTAGES

1 Rapid wear of the slot in the yoke caused by sliding friction and high contact pressures.

2 Increased heat loss during combustion due to extended dwell at top dead center offsets any constant volume combustion improvements in real engines

3 Lesser percentage of the time spent at bottom dead center reducing blow down time for two stroke engines, when compared with a conventional piston and crankshaft mechanism.

20. DESIGN AND FABRICATION OF A SELF-CLOSING SAVONIUS WIND TURBIN

SYNOPSIS

Mechanism is similar to that of a porter governor with a weight attached to the central axis. Arms are attached to the blades and connects them to the central load

Centrifugal force pushes the turbine blades outwards at higher wind speeds thus reducing the rotational speed of turbine.Limits the speed of rotation of the turbine as the wind speed reaches dangerous limits.

Low start up speed: generates power at low wind speeds

Constant power output: even at high wind speeds as it always faces into the wind.

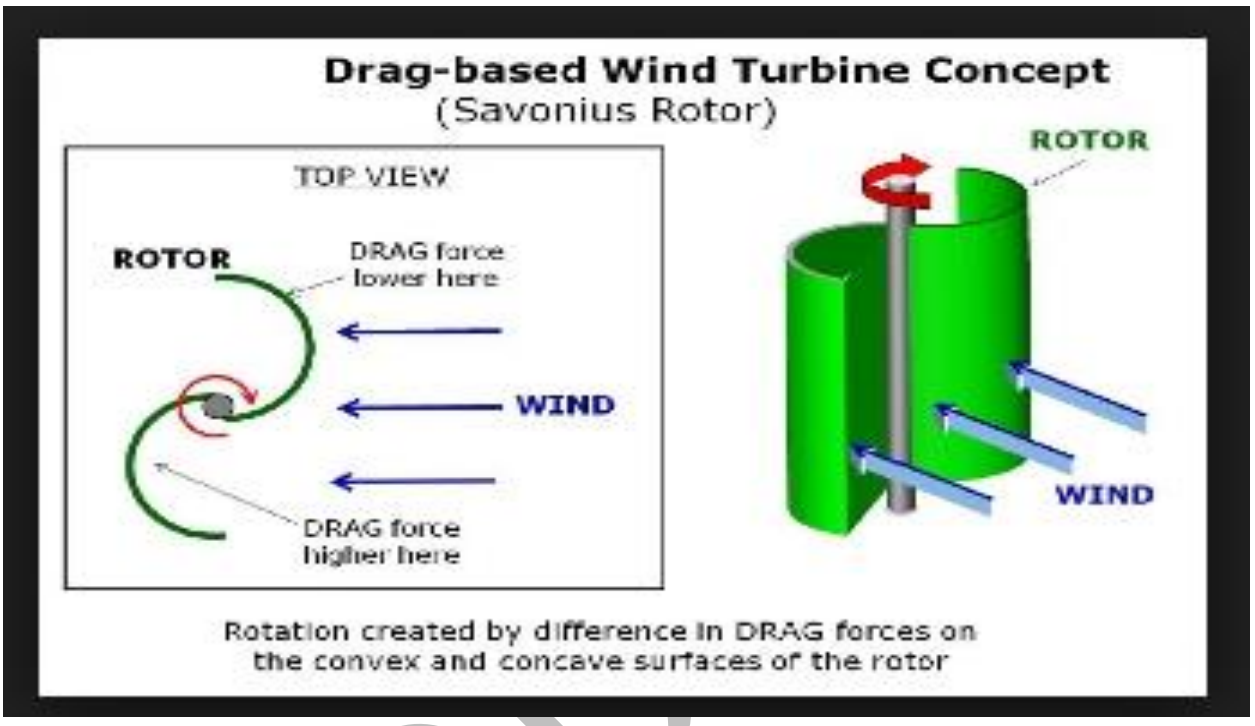
Independent: as there is no electronic steering system, no power supply is needed, making it suitable for installation in **remote areas**. (Other turbine systems need up to 80% of their power to operate their electronics.)

Durable: no gearbox means easy maintenance and no expensive parts.

Easy to maintain: even by semi-skilled engineers.

Virtually silent: as the blades work with the wind, rather than cut through it.

Layout



ADVANTAGES

- Low production cost as compared to horizontal axis wind turbine
- Easy installation as compared to other wind turbine
- Easy to transport from one place to other
- Low maintenance cost
- They can be install in urban area
- Low risk for human and birds because blades moves at relatively low speed

DISADVANTAGES

- As only one blade of wind turbine work at a time so efficiency is very low
- They need a initial push to start, this action use few of its own produce electricity
- They have relative high vibration because the air flow near the ground creates turbulent flow
- They create noise pollution

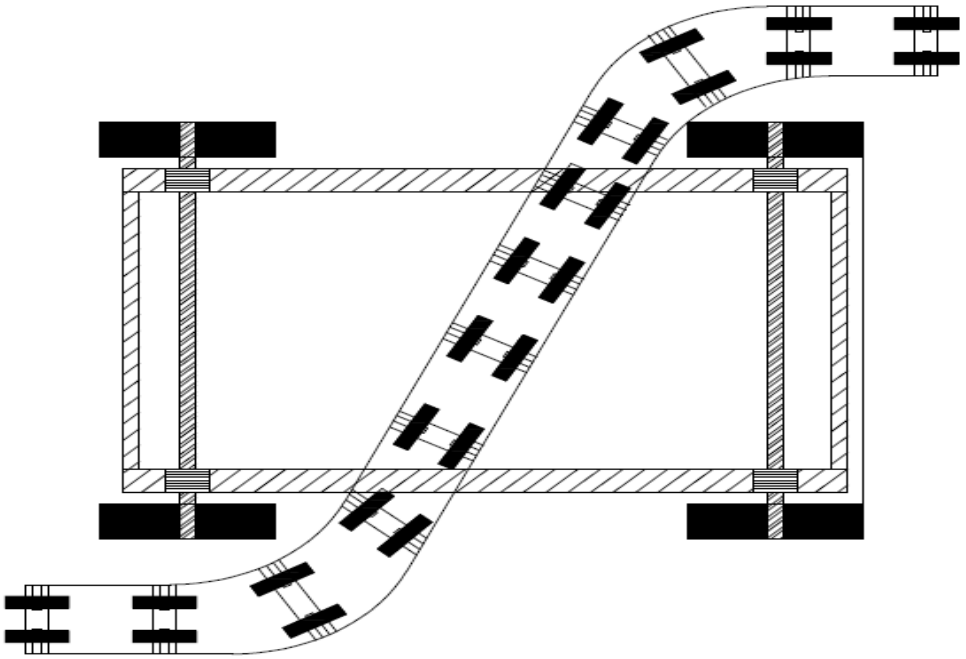
21. Design and fabrication of movable road barrier vehicle

SYNOPSIS

The objective of the project is to design and Fabricate a **MOVABLE ROAD BARRIER VEHICLE** with the intention of suitable operations in metro Politian such as Traffic tidal. The maximum weight that can be carried is calculated and provided with the barrier for safe operation. Moveable Barrier conveyor system used to carry the barrier for Temporary (Construction) installations.

The system allows better phasing of road works and more intensive construction as a result of more construction space being available, thus improving productivity and better utilization of manpower and plant

Layout



ADVANTAGES

- Increases work area for contractor
- Barrier can change lanes several times per day
- Construction or permanent applications
- Very low barrier deflection
- Allows increased traffic flows during peak periods, increased work area during off peak periods

DISADVANTAGES

- Cost will be more for the vehicle manufacturing
- Complicated design

DESIGN AND FABRICATION OF PNEUMATICALLY OPERATED VEHICLE

ABSTRACT

The “DESIGN AND FABRICATION OF PNEUMATICALLY OPERATED VEHICLE” is an eco-friendly vehicle which operates with compressed air. A pneumatically operated vehicle uses the expansion of compressed air to drive the pistons. A pneumatically operated vehicle is a pneumatic actuator that creates useful work by expanding compressed air. The pneumatic actuator link with scotch yoke mechanism. This mechanism gives the rotary motion from linear motion. There is no mixing of fuel with air as there is no combustion.

A pneumatically operated vehicle makes use of Compressed Air Technology for its operation. When this compressed air expands, the energy is released to do work. So this energy in compressed air can also be utilized to displace a piston.

The Pneumatic Actuator Is Operated by Solenoid Valve With Timer

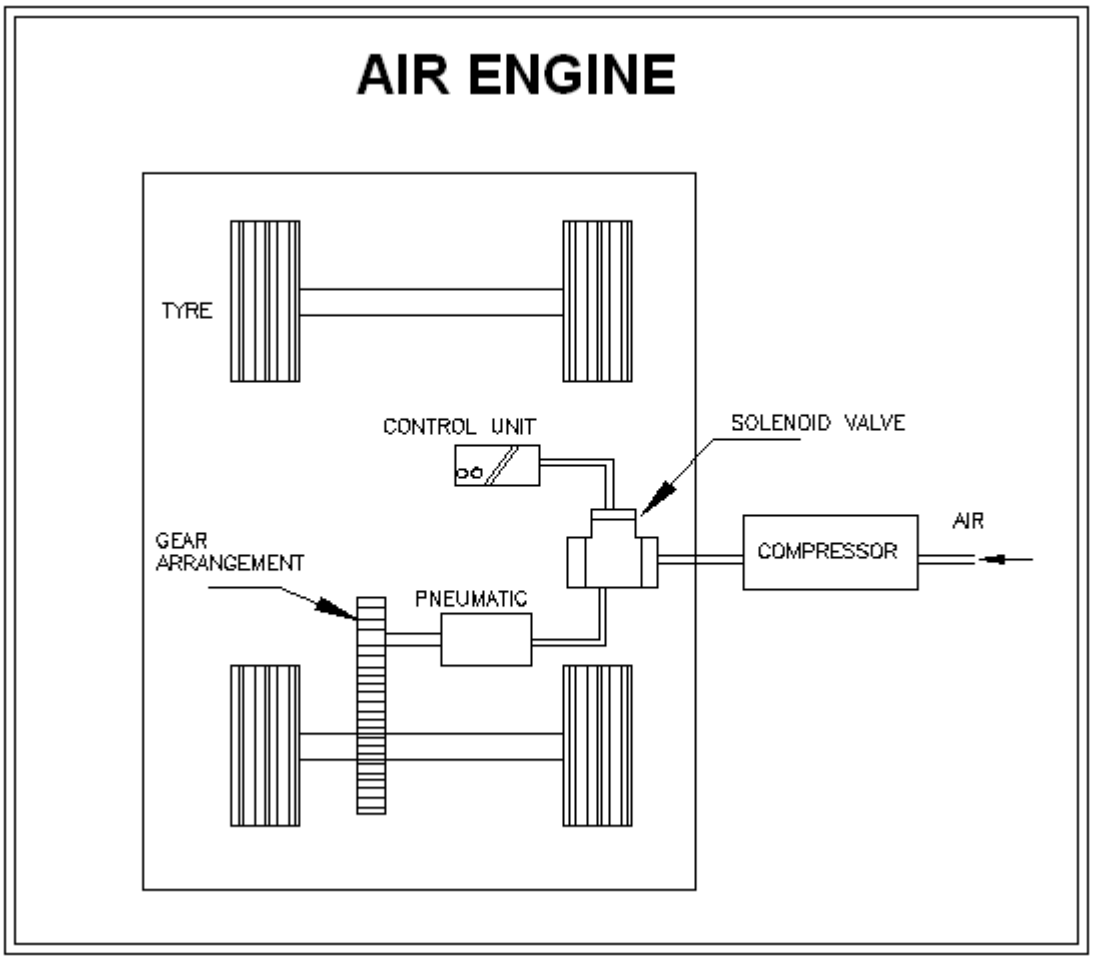
THE COMPONENTS

The major components of our Air Driven vehicle consist of

1. THE PNEUMATIC CYLINDER
2. SCOTCH YOKE MECHANISM
3. THE SOLENOID VALVE

4. THE VALVE ACTUATION SYSTEM
5. THE PIPE SYSTEM
6. FIXTURE

Layout



Advantage

- less costly and more effective
- Simple in construction. The engine can be massively reduced in size
- Easy to maintain and repair.
- No fire hazard problem due to over loading. Air, on its own, is non-flammable.

- Low manufacture and maintenance costs
- Comparatively the operation cost is less.
- Light in weight and easy to handle. The engine runs on cold or warm air, so can be made of lower strength light weight material such as aluminium, plastic, low friction teflon or a combination
- Lighter vehicles cause less damage to roads
- The price of filling air tanks is significantly cheaper than petrol, diesel or biofuel. If electricity is cheap, then compressing air will also be relatively cheap
- Quick response is achieved.

Disadvantage

- Both maintenance and repair of this jack shall be carried out by qualified persons who on base of their education and experience have enough knowledge in jacks and associated equipment

APPLICATIONS

- Used in all four wheelers
- In service stations
- Industries applications

22. PNEUMATICALLY OPERATED HYDRAULIC AND PNEUMATIC BRAKING SYSTEM IN AUTOMOTIVE

SYNOPSIS

The aim is to design and develop a control system based an fully mechanically dual (hydraulic and pneumatic) braking system in single liver is called "PNEUMATICALLY OPERATED HYDRAULIC AND PNEUMATIC BRAKING SYSTEM IN AUTOMOTIVE" The main aim of this project to reduce the work loads to the driver so that to minimize the accident.

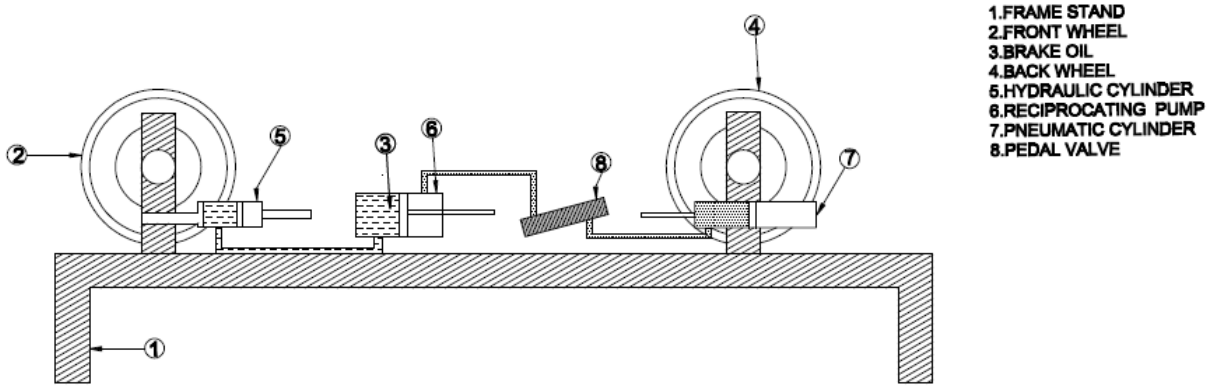
INTRODUCTION

A brake is a mechanical device which inhibits motion. Most commonly brakes use friction to convert kinetic energy into heat, though other methods of energy conversion may be employed. For example regenerative braking converts much of the energy to electrical energy, which may be stored for later use. Other methods convert kinetic energy into potential energy in such stored forms as pressurized air or pressurized oil. Eddy current brakes use magnetic fields to convert kinetic energy into electric current in the brake disc, fin, or rail, which is converted into heat. Still other braking methods even transform kinetic energy into different forms, for example by transferring the energy to a rotating flywheel.

Brakes are generally applied to rotating axles or wheels, but may also take other forms such as the surface of a moving fluid (flaps deployed into water or air). Some vehicles use a combination of braking mechanisms, such as drag racing cars with both wheel brakes and a parachute, or airplanes with both wheel brakes and drag flaps raised into the air during landing.

Since kinetic energy increases quadratically with velocity ($K = mv^2/2$), an object moving at 10 m/s has 100 times as much energy as one of the same mass moving at 1 m/s, and consequently the theoretical braking distance, when braking at the traction limit, is 100 times as long. In practice, fast vehicles usually have significant air drag, and energy lost to air drag rises quickly with speed. Since,In this project we using Hydraulic and Pneumatic braking system .The hydraulic brake is an arrangement of braking mechanism which uses brake fluid, typically containing ethylene glycol, to transfer pressure from the controlling mechanism to the braking mechanism Air brakes or more formally a compressed air brake system is a type of frictionbrake for vehicles in which compressed air pressing on a piston is used to apply the pressure to the brake pad needed to stop the vehicle. Air brakes are used in large heavy vehicles, particularly those having multiple trailers which must be linked into the brake system, such as trucks, buses, trailers, and semi-trailers in addition to their use in railroad trains.

Layout



ADVANTAGES

- This system used in heavy vehicles because they are more powerful than hydraulic or mechanical brakes.
- Simplifies the chassis design.
- The compressed air is used for purposes like tyre inflation; for horn, windscreen wiper etc.

DISADVANTAGES

- If there is any leakage in passage the entire system will be fail.
- Therefore sealing of air is very difficult.

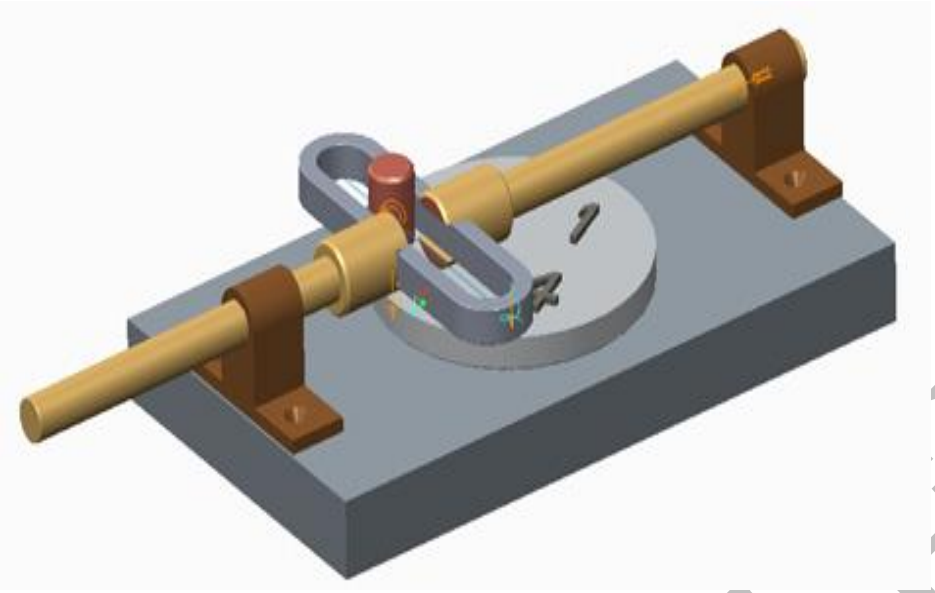
23. DESIGN AND FABRICATION OF DOUBLE SIDE POWER HACK SAW USING SCOTCH YOKE MECHANISM

ABSTRACT

Aim of this project " **DESIGN AND FABRICATION OF DOUBLE SIDE POWER HACK SAW USING SCOTCH YOKE MECHANISM"**to cut the material in double side by using scotch yoke Mechanism. The Scotch and yoke (also known as slotted link mechanism) is a reciprocating motion mechanism, converting the linear motion of a slider into rotational motion, or vice versa. The piston or other reciprocating part is directly coupled to a sliding yoke with a slot that engages a pin on the rotating part. The location of the piston versus time is a sine wave of constant amplitude and constant frequency given a constant rotational speed. The scotch and yoke mechanism is connected to power hacksaw machine.

SCOTCH YOKE

The Scotch yoke (also known as slotted link mechanism) is a motion mechanism, converting the linear motion of a slider into rotational motion, or vice versa. The piston or other reciprocating part is directly coupled to a sliding yoke with a slot that engages a pin on the rotating part. The location of the piston versus time is a sine wave of constant amplitude, and constant frequency given a constant rotational speed.



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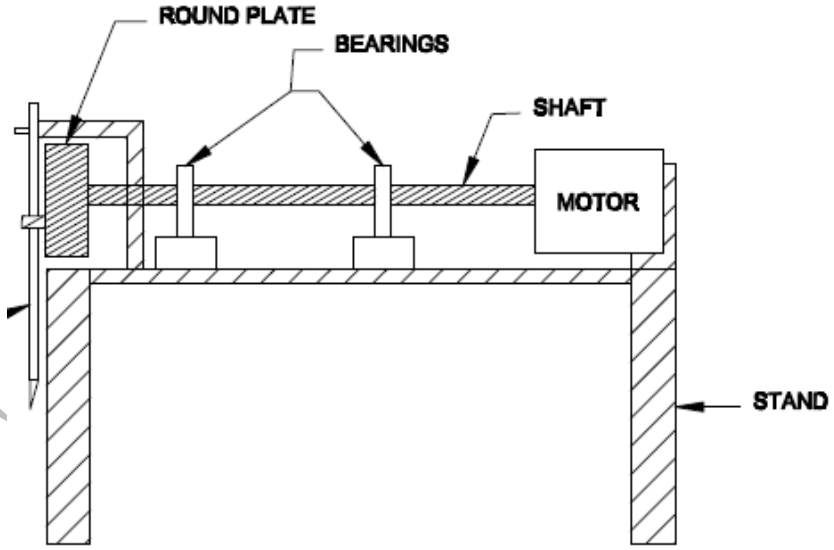


WORKING PRINCIPLE

The above figure shows the top view of the Scotch Yoke mechanism. The rotary motion is transmitted from the motor to the disc through a flexible

coupling and Plummer block. The pin is welded to the disc. The slot is fitted over the pin with a small gap to prevent friction.

Therefore when the disc rotates, the pin also rotates along with it and traces the path along the inside of the slot. This causes the slot to reciprocate in the horizontal direction. Thus the rotary motion is converted to reciprocation motion.

ADVANTAGES

- Greatly reduces the man hours spent as once switched on, no supervision is required.
- Scotch Yoke mechanism has lesser moving parts and hence provides a smoother operation.
- Lower maintenance.

DISADVANTAGES

- More expensive than conventional rack and pinion arrangement.
- Occupies more space.

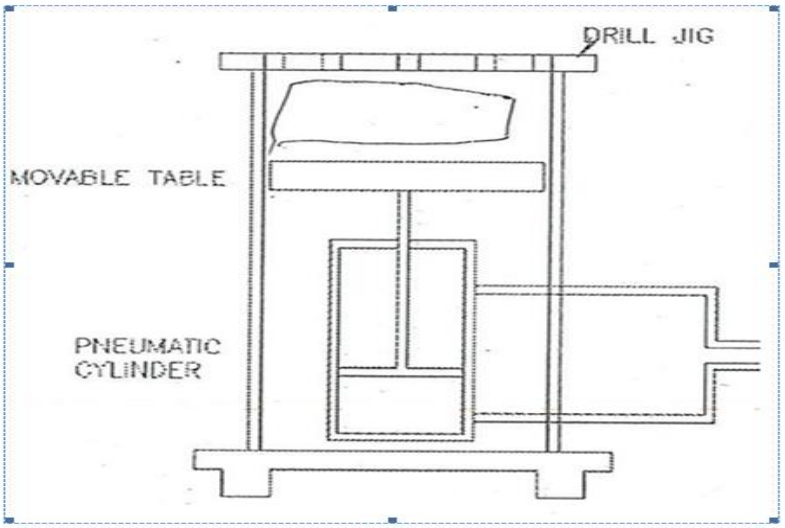
24. PNEUMATIC DRILL JIG

SYNOPSIS

This project work deals with the Design And Fabrication Of Pneumatic Drill Jig. This Pneumatic Drill Jig shows reduction in the labor time, machining time, etc. This type of Jig is used for mass production for motor cover, bearing cap and other mechanical and automobile equipment's. This pneumatic drill jig is provided with pneumatic clamping arrangement. This type of clamping arrangement saves the setting time, marking time, punching time etc. When compressed air is taken from a convenient medium to provide pope clamping force and good gripping to the component.

As the quantity to produce is large the proposed pneumatic drill jig fulfills the mass production requirement in the shop. Clamping can be done by releasing the pressured air using valves.

Layout:



ADVANTAGES

- The use of air cylinder reduces operator effort
- Operator effort was reduced considerably and the job made much easier and faster
- Air clamping device is quicker in action more constant in climbing proper and more convenient than hand operator clamps and save human energy
- Increase the versatility of machining performed
- Reduced waste motion which cause fatigue to worker
- Considerable savings in time are possible from the use of air clamps

DISADVANTAGES

- High precision work is needed.
- It requires surface plate for aligning the workpiece with the jig and for clamping
- Need separate compressor.

25. PNEUMATIC RAMMING MACHINE FOR FOUNDRY WORK

SYNOPSIS

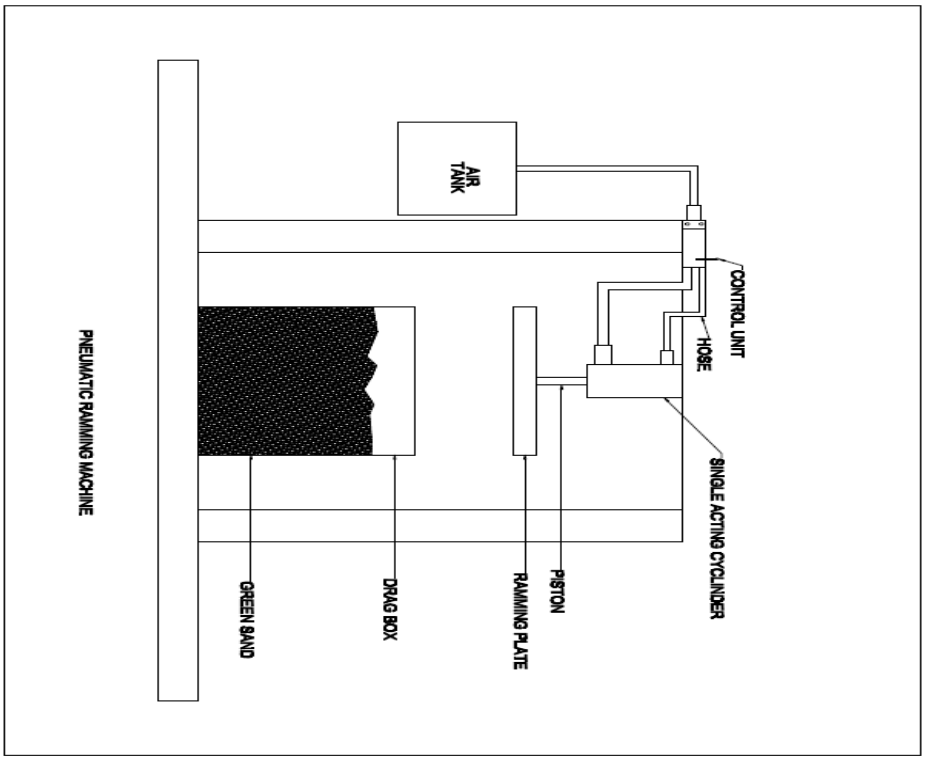
In our project we use compressed air for ramming the green sand in drag and cope box. a single acting pneumatic cylinder is connected to a control switch. Air sourced is take from a compressor. A plate is fixed at the end of cylinder piston rod. the compressed air enters the control switch. The control switch allow the air in to the single acting cylinder the plate fixed on the piston rod ram the sand by to and for motion.

INTRODUCTION

The pneumatic rammer is used for ramming the sand uniformly around the pattern. It can be used even in small scale industries. To

operate this rammer an air compressor is needed. A butt which is attached to the bottom of the piston rod does the operation of ramming. The pressure developed inside the cylinder reciprocates the piston and hence the butt. This rammer is handled by an operator just by moving it over the moulding sand. The butt rams the sand at places moved and the sand is uniformly rammed. This rammer reduces the ramming time and labor. Due to this the cost is reduced considerably. So this machine finds application in foundries.

Layout :



ADVANTAGES

- Uniform ramming is obtained.
- Manual ramming is not necessary.
- Ramming time is less.

Disadvanage:

- The rammer can be handled by an operator without feeling uneasiness.
- No separate skill is required to operate this rammer.

Application

- The operation is quick and hence it is a time saving one. The operation is easy and consumes less cost. Due to the above reasons it finds its extensive application in manufacturing industries.
- It has an extensive application in both large scale and small scale industries because of its economy and easy handling.

26. DESIGN AND FABRICATION PEDAL OPERATED OF PUMP

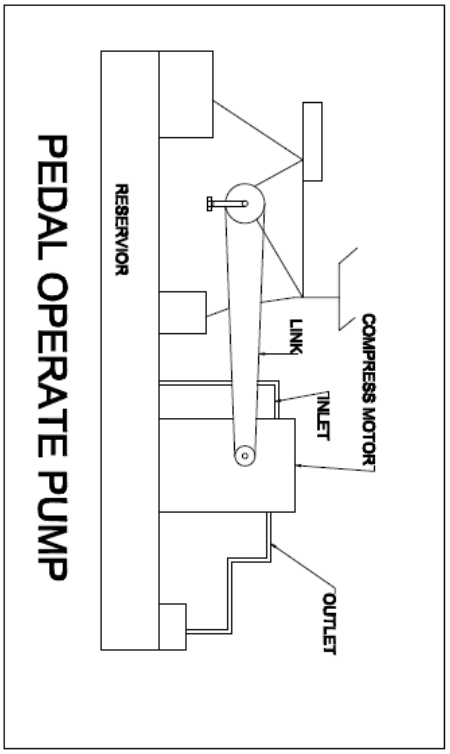
SYNOPSIS

The existing pump designs are basically the same, in the mode of operation with slight variations in the materials of construction. The major problems associated with these pumps are the high level of fatigue and low pump efficiency, and also there are the continuous pumping action will not occur during pumping. These problems have motivated the design and fabrication of a manually operated hand pump that made by a single stage air compressor to ease the operation and at the same time increase the pump efficiency. From the test results, it follows that for the same input, speed and the static water level same interval of time the pump with air compressor discharges more water than that of ordinary hand pump. This shows more ease of operation of the pump and pump efficiency.

Introduction

The first idea for powering the pump would be a stationary bicycle. Pedal power is simple, efficient, and practical. Its most familiar use is the bicycle for personal or cargo transportation. But pedals can also power small stationary machines. Since the system is to remain human powered and large amounts of power are required, having the operator use their stronger leg muscles was intuitive. A stationary pedal driven device seemed to agree with most of the design considerations related to the power source. Initially our design settled on using a pedaling system to harness the human input energy. We decided to go with this style of power procurement because a person can sustain large power expenditures more readily

Layout:



ADVANTAGES

- Water delivered at both the piston movement towards BDC to TDC& TDC to BDC. (continuous stroke will be occur)
- The pumping motion should be rotational
- Due to the rotational movement of the pedal with pumping is easy.
- The water delivered should be high compared with the simple hand pump.

27. DESIGN AND FABRICATION OF WORK HOLDING DEVICE USING COMPRESSED AIR FOR DRILLING MACHINE

SYNOPSIS

Work holding and releasing is the most essential act to carry out machining. These are commonly used in the machine shop.to operate the machine vices by compressed air. Normally machine vices are operated by rotating the screw threaded shaft by lever. In this system compressed air is used to operate the machine vice. The movable jaw was moved by compressed air and the work was hold.To hold the job in proper position. To release the job quickly. To hold the job rigidly.To prevent vibration of the job while the machining is carried out.

Introduction :

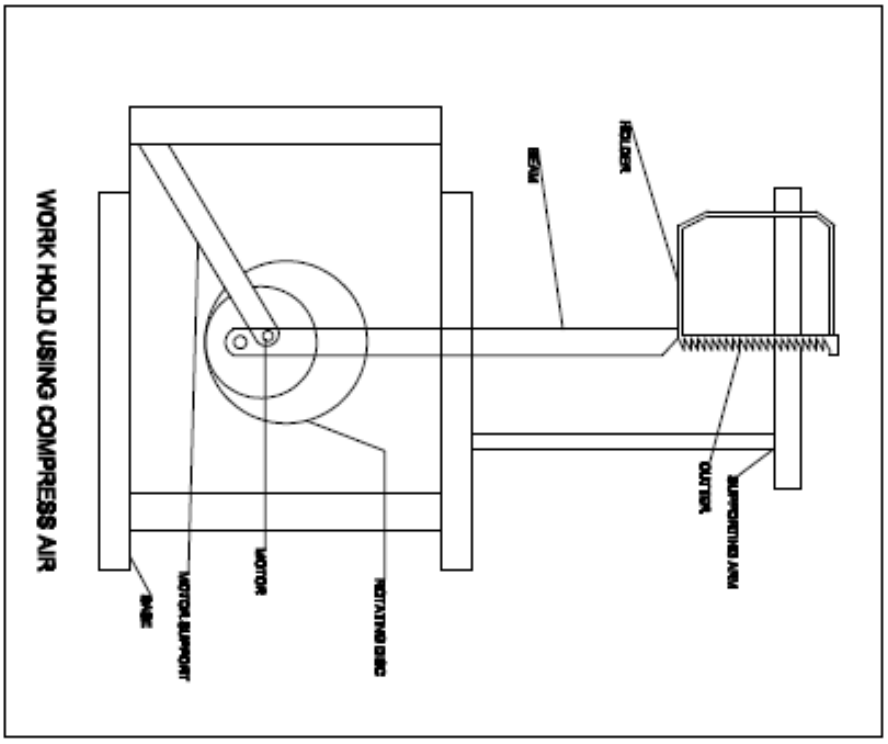
Our project is based on the need for the work holding devices. This design and fabrication which will enable the operation like drilling, reaming, tapping process easier. Our project is mainly composed of design and fabrication of the “PNEUMATIC DRILLJIG” which cover the absolute design

to the specified dimensions of the work piece. This box jig is economical means to produce This pneumatic drill jig is provided with pneumatic clamping arrangement. This type of clamping arrangement saves the setting time, marking time, punching time etc. when compressed air is taken from a convenient medium to provide pope clamping force and good gripping to the component. As the quantity to produce is large the proposed pneumatic drill jig fulfils the mass production requirement in the shop. Clamping can be done by releasing the pressured air using valves.

The component is placed in between the Jig plate and the locator, which is on the piston rod. When the valve is opened, the compressed air from the compressor will enter into the cylinder through a hole at the bottom of the cylinder. The piston inside the cylinder is made to push in the upward direction. When the piston moves the locator clamps the component rigidly. Now the component is ready for drilling operation

When the two-way valve is closed the piston will return to bottom position to release the clamps. When we close the valve, the piston will come in very high force in downward direction. So these are chances for the damage of piston. To avoid this, we are using FLOW CONTROL VALVE to control the flow of piston.

Layout :



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ADVANTAGES

- Idle time of the machine is reduced.
- When compared with the mechanical vices, it consumes less time for clamping and unclamping the job.
- It reduces the manual labour
- Hence, production rate is higher In this mechanism there is no backlash

DISADVANTAGES

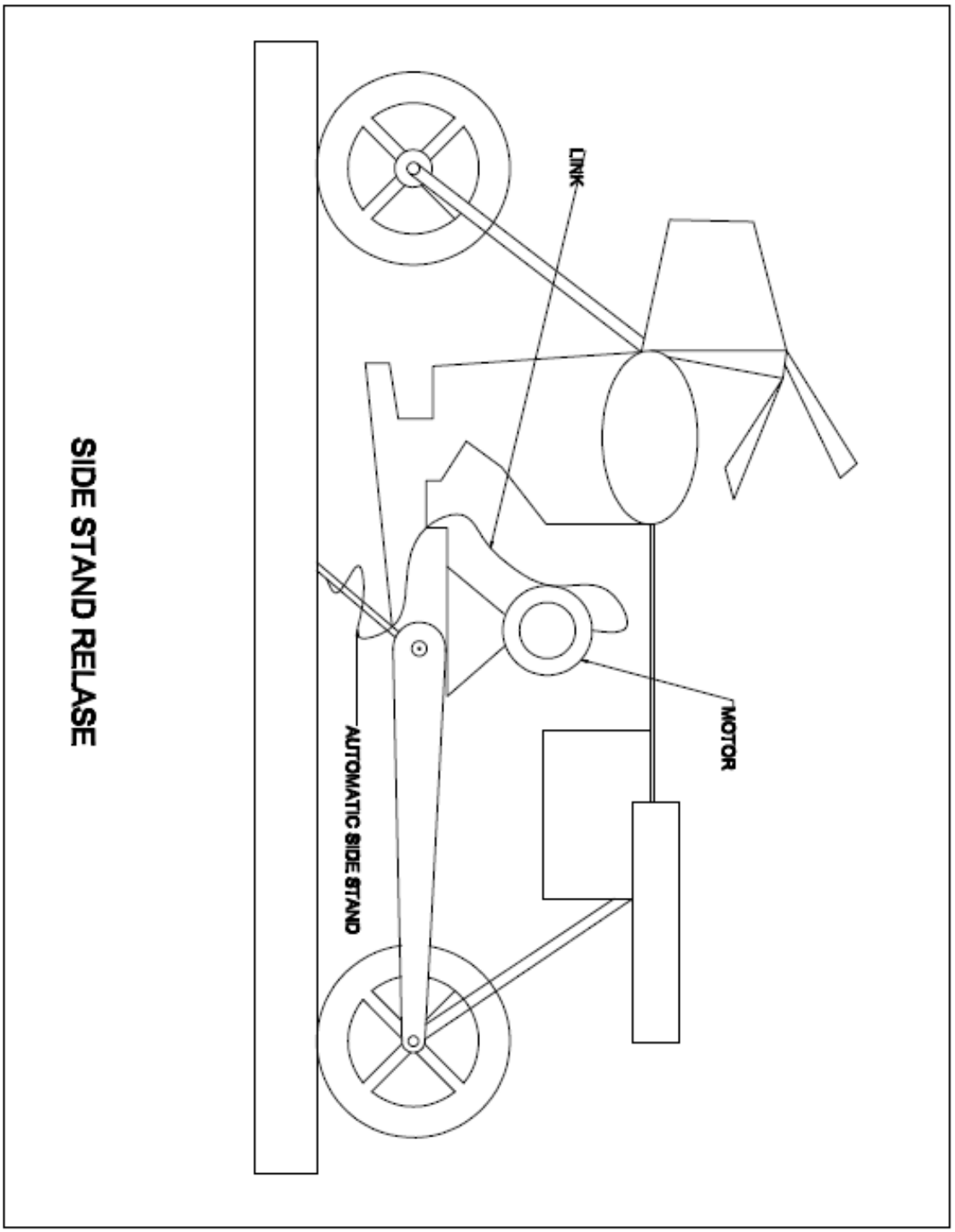
- It is only used for small size components.
- Forces causing deflection may come from handling

28. AUTOMATIC SIDE STAND RELEASE IN TWO WHEELER

SYNOPSIS

Side stand in two wheeler support the entire weight of the vehicle when it is parked. They are perfect on quick stop when one need to leave the vehicle for a short while. They are provide with a spring that pulls it back into position to ensure extra safety. Some time may forget to release the side stand. This will tend to unwanted danger and lack of concentration while driving. Nowadays sensors are used for ensure that the stand. Is in released conditioner not by indicating it using small light in dash board. There is also a possibility to forget see the light. This project concentrates on to completely reduce the possibility of driving two wheeler without releasing the side stand. This may suitable for all kind of two wheelers. In this project we used a electric motor to release the side stand .when the key is ON the motor rotates and release the side stand automatically

Layout :



ADVANTAGES

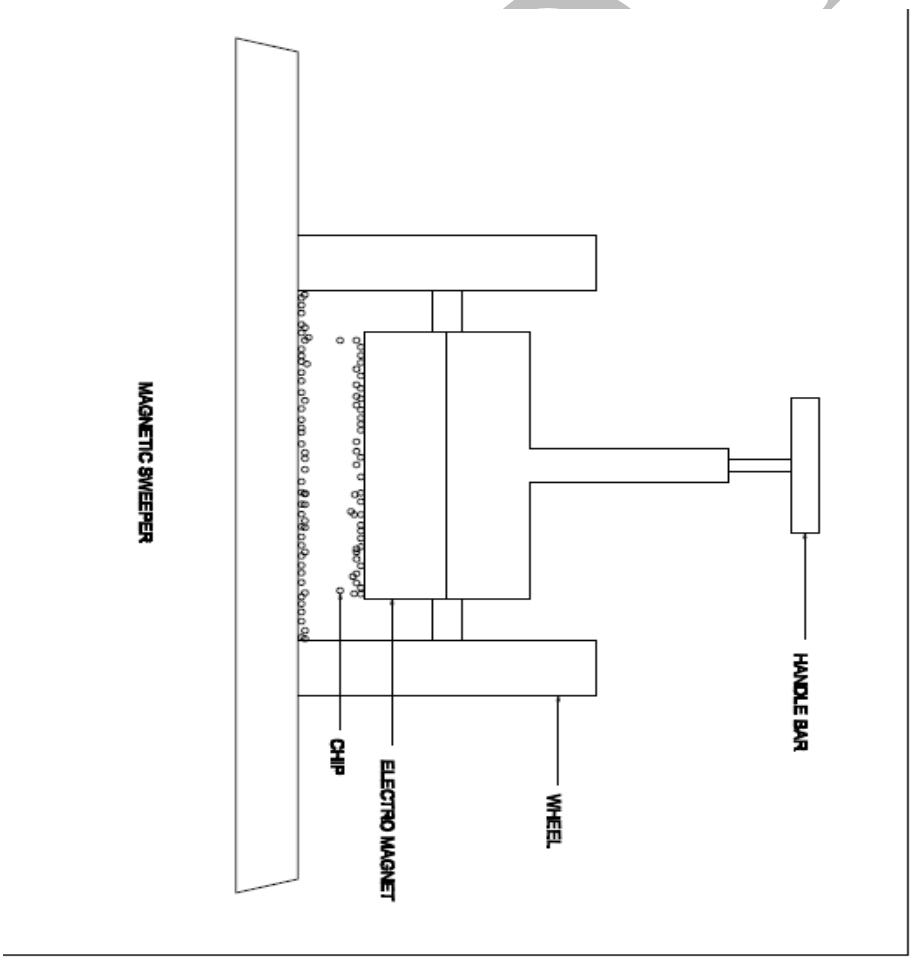
- Side stand safety system can be avoiding accident easily.
- The system is important to vehicle safety.
- Initial cost very less.
- Maintenance cost very less.
- Moving part less.so wears less.
- High effectiveness.
- Drive handling easy.
- Less space required.
- Very smooth.

29. DESIGN OF MAGNET SWEEPER

SYNOPSIS:

In industrial workshop, the unwanted material like chips are curl will be spread over on the floor. The very small size chips are very complicated to clean away. The magnet sweeper will be helping us to remove such type of chips. Magnet sweeper may be operated either using permanent magnet or electrically engaging magnet coil. This is simple construction and portable for usage.

Layout :



ADVANTAGES:

- Minute chips can be easily removed
- Safe floor workshop
- By using electro magnet chips can be easily removed
- Low cost

30.Design & fabrication of automobile reverse locking system using ratchet and pawl mechanism.

ABSTRACT

Automobiles are now becoming the most essential part of our day-to-day life. This is the golden age for automobile companies, since they are attaining their peak selling rates in this 21st century. However with the increased production they are facing lots of problems like traffic, fuel efficiency, blends, exhaust gas analysis, etc., among them providing a proper reverse system in an automobile is a major issue for them. With increased parking difficulties and heavy traffic problems, equipping the reverse system with more facilities is their major objective. In addition to that gliding of vehicles in gradients and mountain roads occurs often due to driver's a prosemia.

In this project, we made a simple and economical solution to the above mentioned problem. We used Ratchet and Pawl mechanism as our major capital and fabricated an equipment which can be attached to any automobile that it prevents unwanted reverse motion when it is at rest or in motion. The attachment is to be welded with the wheel

rim and the pawl with a retraction spring or a lever mechanism is fabricated with the frame. Due to cost factors a small prototype of this project was done. Here we did a model with two metal wheels connected with a shaft. A rectangular frame is welded with the shaft and a lever attachment is provided in it to engage and disengage the pawl. The ratchet is welded with one of the wheels.

Introduction :

Ratchet and pawl mechanism is used in many applications effectively where the one side power transmission is required for example in (i) Giant wheel- It is the large wheel used in the amusement parks to rotate along the horizontal axis to rotate in one direction while carrying the number of passengers. (ii)Clocks- where the hands rotate in clockwise directions only.(iii) Baffle gates- in the entrances of many buildings which rotates about vertical axis in one direction.(iv) Shaping Machines – in the crank and slotted arm.

In the hill station, the most common problem to the drivers isto park their cars in the slope and to start up the car. While waiting in the traffic , the cars have to move on step by step very slowly, this situation is a difficult one for the drivers to make their car not to roll

back in the slope. So the mechanism has to be developed to stop the vehicle from rolling back and it should not stop the vehicle in accelerating forwards. This function can be achieved by using the ratchet and pawl mechanism.

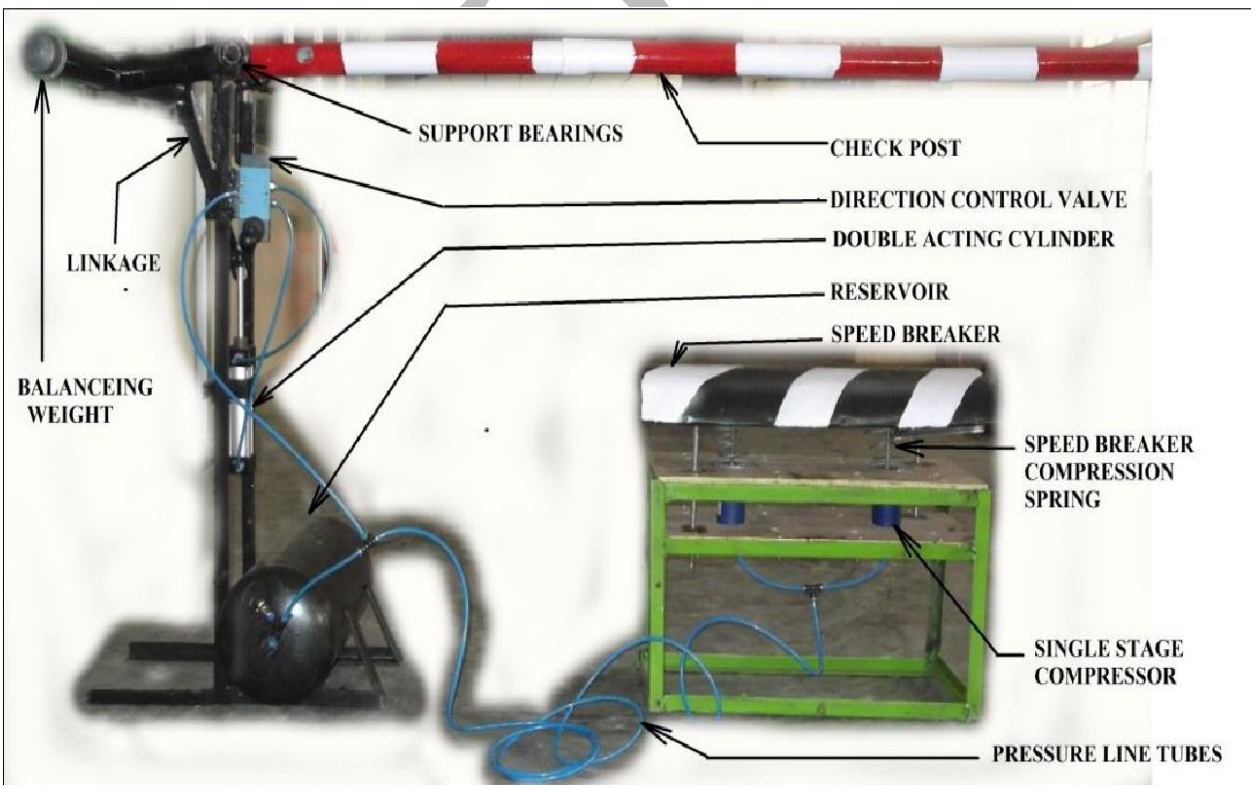
The ratchet and pawl has to be designed and has to be fit in the front drive shaft in case of the front drive vehicles. The Maruti Swift Dzire car is considered and the ratchet and pawl has to be designed for it. In order to design for the worst case the road maximum slope is considered- Zoji pass Road Kashmir which has 21.80 o with gradient

31. DESING AND fabrication OF TRAFFIC CONTROL UNIT USING SPEED BRAKER PNEUMATIC SYSTEM

- We are trying to introduce a new pneumatic power generation by actuation of mechanism which is used in road speed breaker at the time of the depression of the speed breaker the air is compressed in a pneumatic actuator ,to get the kinetic energy to actuate the traffic control system.

  . the main objective of the project is to control the road traffic ,without using electrical energy from the main source

DIAGRAM:



ADVANTAGES;

- It is used in roads of toll gates
- It is used in shopping malls
- It is used in industries of entry and exit gates.