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A

PROJECT REPORT

ON

"SCREEN CLEANING AND WATER FILTERATION"

FOR THE DIPLOMA IN MECHANICAL ENGINEERING

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This is to certify that Project Report Titled

"SCREEN CLEANING AND WATER FILTERATION"

Has been submitted by following students in final year Mechanical Engineering for the partial fulfilment of "**Diploma in Mechanical Engineering"** of MSBTE Mumbai is record of their own work carried out by them during academic session 2017-2018.

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PROJECT APPROVAL SHEET

We have done the appropriate work for the award of Diploma in Mechanical Engineering of Maharashtra State Board of Techanical Education to Shreeyash Polytechnic Aurangabad.

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INDEX

LIST OF FIGURES

LIST OF TABLE

ABSTRACT

To achieve the aim of production a functional and efficiency production system is necessary. We used available local material and tool from a industry scrap yard. This objective of this thesis work is to work to reduce waste of material during production process. This designed attachment consist of simple parts such as pipes, pipe fittings, nozzle, pump, motor, valve, crank rod, M.S. plate, nut & bolts. The wastage of material can be prevented by certain arrangement of pump with pipe & nozzle fitting. Our aim is to increase productivity and avoid man power on screen cleaning platform by specific attachment which can be operate automatically

1. INTRODUCTION

1.1 Introduction

In particular, the use of cleaning is need for improve efficiency of their product. It is suitable due to the less cost of system used. However, the screen cleaning is a very challenging task due to the comparatively high man power is required for cleaning purpose. In general, it is necessary to avoid the wastage of pulp material. For that purpose we introducing a cleaning mechanism that involves high pressure water jet nozzle and high pressure pump etc. are used. A cleaning process involves moving nozzle series which is fitted on the M.S. pipe to the correct cleaning of roller screen. Prior to cleaning, a hand operated pressure regulator is used to control the flow rate or discharge of working fluid (water). In addition the pressure regulator assures that the cleaning is kept stable throughout the particular time period. A self-moving mechanism is normally used to clean the roller screen continuously.

A water filtration system involves the two stages namely as cake filtration and vibrator net are used. From that system about 80-85% of pulp is removed from the water. After filtration remaining of 10-15% of contaminants are present in black water. So, for those remaining contaminants we use vibrator roller bar for filtration of black water. In general, it is necessary to remove the remaining contaminants for improving the water clarity and maintain its PH level. Because of that filtered water is used to screen cleaning system.

Pressing the sheet removes the water by force. Once the water is forced from the sheet, a special kind of felt, which is not to be confused with the traditional one, is used to collect the water. Whereas, when making paper by hand, a blotter sheet is used instead. An industrial cleaning system consists of mechanical linkages to perform the specific functions related to the cleaning and filtration.

1. The mechanical linkages consist of single crank mechanism.
2. Different types of joints in the linkages, it provides the relative movements between the links of the mechanism.

An industrial cleaning and filtration is general purpose mechanism that possesses certain technical features.

1. the most apparent technical feature of an industrial screen cleaning is its mechanisms arrangement.

2. Screen cleaning and filtration system are typically used as substitutes for human workers in these tasks.

3. Screen cleaning and filtration system can perform a fix features such as cleaning and filtering of water as well as the cleaning.

Fig.1.1 Screen Cleaning Manually

1.2 Necessity:

In production process, the material wastage is common problem in the various process industries. For reducing or removing this thing the changes is required. So, we are study the all process in details. In that we studied, at the time of giving surface finishing to the soft board the cotton 10 mm thick screen is passes through the surface of board. Then, every 30 minutes the screen cleaning is required. When they do not clean the screen timely, the small fibre bagasse particles are collected on the surface of screen, and they causes the wastage of material.

For changes of this problem or prevention of material wastage, we suggest automation system for screen cleaning during process. They cleaning screen keep gap of thirty minutes, so in the automation process screen is cleaned continuously by using mechanism. In this mechanism, we use single crank mechanism, Divergent type nozzles, DC motor & balanced type vane pump, etc. components. The five divergent nozzles are mounted on the M.S. pipe & this pipe is connected to single crank of mechanism and this mechanism is connected to the electric motor. This system is mounted on front face of the screen.

When the screen is passes through the surface of soft boards the mechanism works automatically, at this time the when pump starts and provides pressurised black water to system and this water is passes from nozzle for high velocity of water for covering of more surface of screen during cleaning. After cleaning of this screen this water is collected in a temporary storage and passes to the filtration system for removing fibre particles from the water. This process is continuously worked during process. So, for reducing of material wastage the automation system is necessary. By using this system the productivity of the industry is increased.

1.3 Objectives:

In the industry based projects the main problem is the wastage of material during production.

a) To reduce wastage of material during process, or in production.

b) Increasing productivity of the board in industry.

c) Reducing the labour cost & make industry in automation.

d) Increasing efficiency of the production process.

e) Reduce efforts of workers during screen cleaning.

2. LITERATURE SURVEY

Global production of wood pulp in 2006 was 175 million tons (160 million tonnes). In the previous year, 63 million tons (57 million tonnes) of market pulp (not made into paper in the same facility) was sold, with Canada being the largest source at 21 % of the total, followed by the United States at 16 %. The wood fibre sources required for pulping are "45% sawmill residue, 21% logs and chips, and 34% recycled paper" (Canada, 2014). Chemical pulp made up 93 % of market pulp. The timber resources used to make wood pulp are referred to as pulpwood. Wood pulp comes from softwood trees such as spruce, pine, fir, larch and hemlock, and hardwoods such as eucalyptus, aspen and birch. A pulp mill is a manufacturing facility that converts wood chips or other plant fibre source into a thick fibre board which can be shipped to a paper mill for further processing. Pulp can be manufactured using mechanical, semi-chemical or fully chemical methods (Kraft and sulphite processes). The finished product may be either bleached or non-bleached, depending on the customer requirements.

Bagasse is the fibrous matter that remains after sugarcane or sorghum stalks are crushed to extract their juice. It is dry pulpy residue left after the extraction of juice from sugar cane. Bagasse is used as a biofuel and in the manufacture of pulp and building materials. Agave bagasse is a similar material that consists of the tissue of the blue agave after extraction of the sap. Bagasse is commonly used as a substitute for wood in many tropical and subtropical countries for the production of pulp, paper and board, such as India, China, Colombia, Iran, Thailand, and Argentina. It produces pulp with physical properties that are well suited for generic printing and writing papers as well as tissue products but it is also widely used for boxes and newspaper production.

It can also be used for making boards resembling plywood or particle board, called Bagasse board and Zenith board, and is considered a good substitute for plywood. It has wide usage for making partitions and furniture. A nozzle is a device designed to control the direction or characteristics of a fluid flow (especially to increase velocity) as it exits (or enters) an enclosed chamber or pipe. A nozzle is often a pipe or tube of varying cross sectional area and it can be used to direct or modify the flow of a fluid (liquid or gas). Nozzles are frequently used to control the rate of flow, speed, direction, mass, shape, and/or the pressure of the stream that emerges from them. In a nozzle, the velocity of fluid increases at the expense of its pressure energy.

Frequently, the goal of a nozzle is to increase the kinetic energy of the flowing medium at the expense of its pressure and internal energy. Nozzles can be described as convergent (narrowing down from a wide diameter to a smaller diameter in the direction of the flow) or divergent (expanding from a smaller diameter to a larger one). A de Laval nozzle has a convergent section followed by a divergent section and is often called a convergent-divergent nozzle.

Convergent nozzles accelerate subsonic fluids. If the nozzle pressure ratio is high enough, then the flow will reach sonic velocity at the narrowest point (i.e. the nozzle throat). In this situation, the nozzle is said to be choked. Some mills pre-treat wood chips or other plant material like straw with sodium carbonate, sodium hydroxide, sodium sulphite, and other chemical prior to refining with equipment similar to a mechanical mill. The conditions of the chemical treatment are much less vigorous (lower temperature, shorter time, less extreme pH) than in a chemical pulping process, since the goal is to make the fibres easier to refine, not to remove lignin as in a fully chemical process. Pulps made using these hybrid processes are known as chemi-thermo mechanical pulps (CTMP). Sometimes a CTMP mill is located on the same site as a Kraft mill so that the effluent from the CTMP mill can be treated in the Kraft recovery process to regenerate the inorganic pulping chemicals.

3. SYSTEM DESIGN

Industrial screen cleaning mechanisms comes in a variety of shapes and sizes. They are capable to clean the continuous moving roller screen by using the filtered black water.

3.1 Classification based on physical configurations.

Following basic configurations are identified with most of the commercially available industrial systems.

a) Horizontal sliding configuration:

A system which is constructed around this configuration consists of the orthogonal slides, as shown in fig. The sliding is parallel to the screen of the system. By appropriate movement of the slide, the system is capable of moving in within the dimensional workspace.

b) Vertical rotary configuration:

In this configuration, the crank is a vertically rotates by the prime movers such as motor. This system permits to the link to slides at an angle by the motion of the crank. This is illustrated schematically in the figure.

c) Cartesian configuration:

A system which is constructed around this configuration consists of two orthogonal slides as shown in figure, the two slides are parallel to the X and Z axis of the Cartesian coordinate system. By appropriate movements of these slides, the system is capable of moving its pipe at any position with two dimensional rectangular workspace.

3.2 Difference between old and automated screen cleaning system

Table No. 3.1 Difference between old & automated system

Parameters	Old System	Automated System
Working speed	In this system the cleaning speed is slow.	In this system the cleaning speed is high.
Cleaning volume	It covers less volume of screen during cleaning.	It covers more volume of screen during cleaning as compared to old system.
Efficiency	Efficiency of this system is less as compared to automated system	Efficiency of this system is more as compared to old system.
Material wastage	In this system wastage of material is more.	In this system material wastage rate is less as compared to old system.

3.3 Technical features of the system

The technical features of the system determine its efficiency and effectiveness at performing a given task. The following are some of the most important among these technical features.

3.3.a) Degree of freedom (D.O.F.):

Each joint in the degree of freedom. DOF can be a slider and rotary type. The system has a two degree of freedom. One of them is allow to in horizontal direction, and other is rotates in vertical direction.

3.3.b) Work volume/ Workspace:

The crank system tends to have a fixed and limited geometry. The work envelope is the boundary of position in a space that the system cans rich. For a horizontal the workspace might be a rectangle, for a cleaning of the screen.

3.3.c) Electric drive system:

An electric system provides for the crank with less speed. Accordingly, electric drive systems are adopted for the smoother and slow speed change. However, the system supported by the electric drive is more accurate and better repeatability, and are cleaner simpler to use.

3.4. Working principle

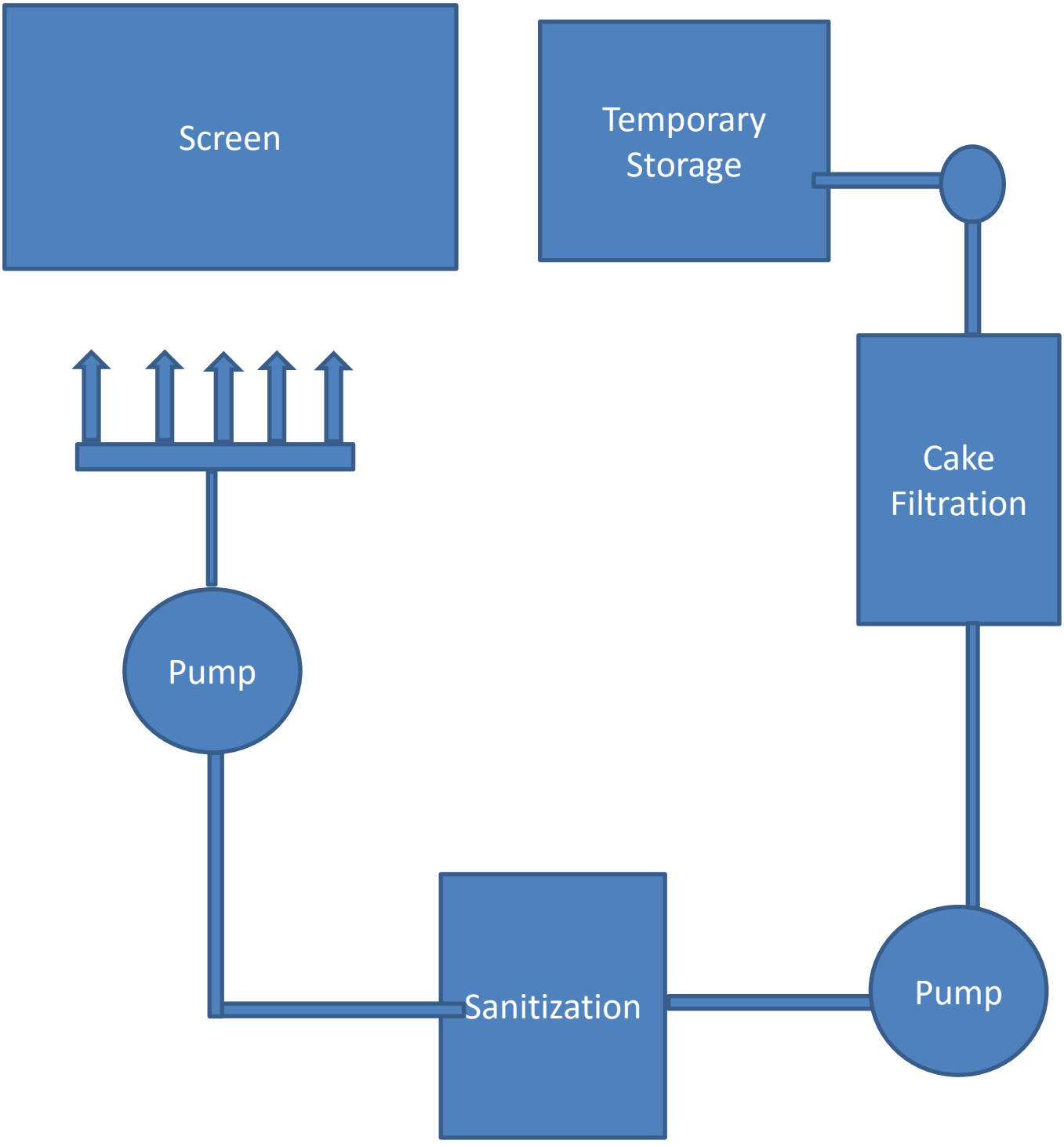

Fig.3.1 Layout of screen cleaning system

From the various types configuration we are using horizontal sliding type with three degree of freedom and that are follows:

3.4.a) Horizontal sliding configuration:

A system which is constructed around this configuration consists of the orthogonal slides, as shown in fig. The sliding is parallel to the screen of the system. By appropriate movement of the slide, the system is capable of moving in within the dimensional workspace.

3.4.b) Vertical rotary configuration:

In this configuration, the crank is a vertically rotates by the prime movers such as motor. This system permits to the link to slides at an angle by the motion of the crank. This is illustrated schematically in the figure.

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A system which is constructed around this configuration consists of two orthogonal slides as shown in figure, the two slides are parallel to the X and Z axis of the Cartesian coordinate system. By appropriate movements of these slides, the system is capable of moving its pipe at any position with two dimensional rectangular workspace.

3.5. List of the component

a) AC Motor

b) Crank

c) Pipes

d) Nut Bolt

e) Nozzles

f) Links

3.5. a) Ac motor:

An AC motor is an electric motor driven by an alternating current (AC). The AC motor commonly consists of two basic parts, an outside stator having coils supplied with alternating current to produce a rotating magnetic field, and an inside rotor attached to the output shaft producing a second rotating magnetic field. The rotor magnetic field may be produced by permanent magnets, reluctance saliency, or DC or AC electrical windings.

Less common, AC linear motors operate on similar principles as rotating motors but have their stationary and moving parts arranged in a straight line configuration, producing linear motion instead of rotation. The two main types of AC motors are induction motors and synchronous motors. The induction motor (or asynchronous motor) always relies on a small difference in speed between the stator rotating magnetic field and the rotor shaft speed called slip to induce rotor current in the rotor AC winding. As a result, the induction motor cannot

produce torque near synchronous speed where induction (or slip) is irrelevant or ceases to exist. In contrast, the synchronous motor does not rely on slip-induction for operation and uses either permanent magnets, salient poles (having projecting magnetic poles), or an independently excited rotor winding. The synchronous motor produces its rated torque at exactly synchronous speed. The brushless wound-rotor doubly fed synchronous motor system has an independently excited rotor winding that does not rely on the principles of slip-induction of current. The brushless wound-rotor doubly fed motor is a synchronous motor that can function exactly at the supply frequency or sub to super multiple of the supply frequency. Other types of motors include eddy current motors, and AC and DC mechanically commutated machines in which speed is dependent on voltage and winding connection.

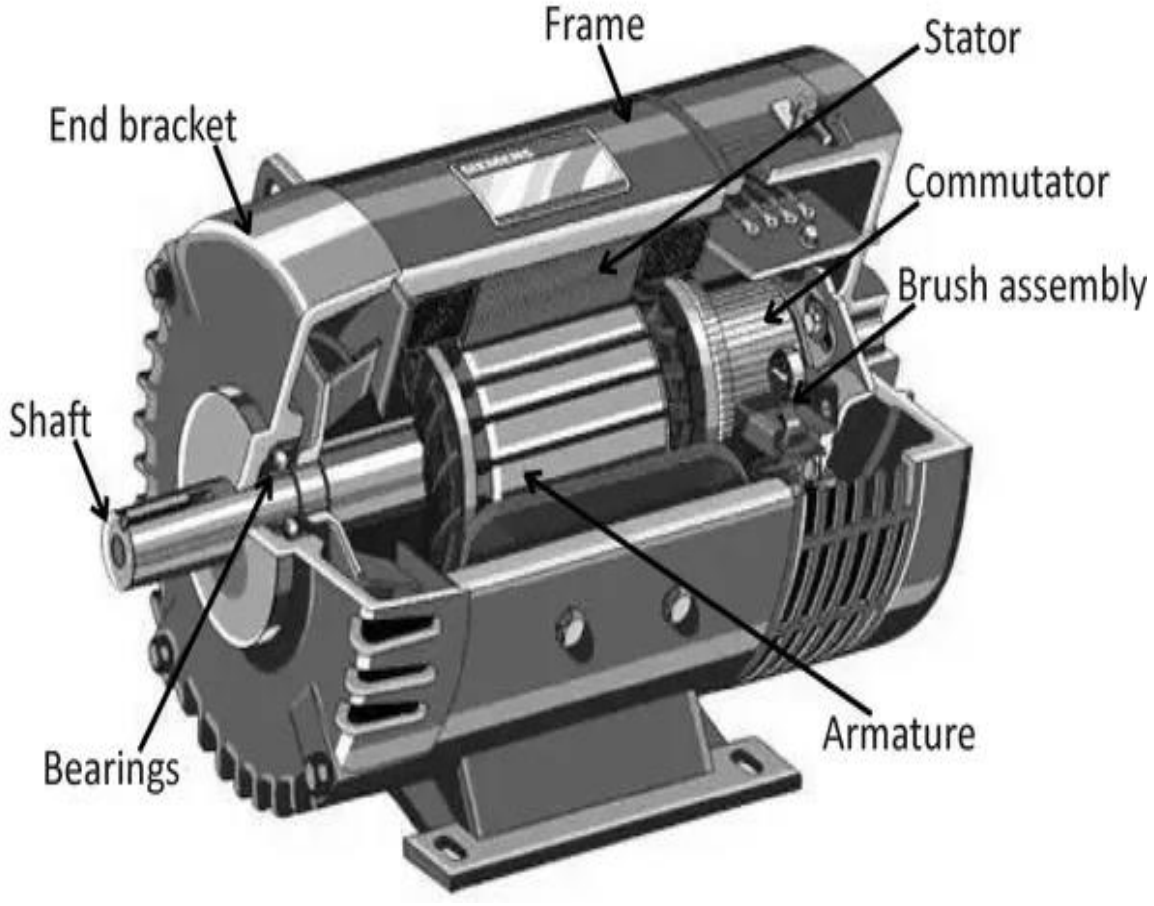

Fig.3.2 AC Motor

3.5.b) Crank:

A crank is an arm attached at a right angle to a rotating shaft by which reciprocating motion is imparted to or received from the shaft. It is used to convert circular motion into reciprocating motion, or vice versa. Attached to the end of the crank by a pivot is a rod, usually called a connecting rod. A crank is an arm attached at a right angle to a rotating shaft by which reciprocating motion is imparted to or received from the shaft. It is used to convert circular motion into reciprocating motion, or vice versa. Attached to the end of the crank by a pivot is a rod, usually called a connecting rod.

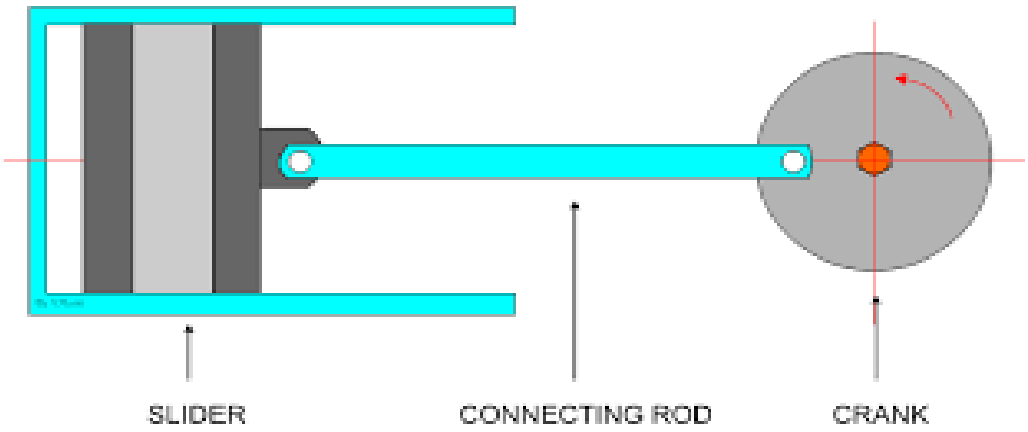

Fig.3.3 Crank

Reciprocating motion, also called reciprocation, is a repetitive up-and-down or back-and-forth linear motion. It is found in a wide range of mechanisms, including reciprocating engines and pumps. The two opposite motions that comprise a single reciprocation cycle are called strokes. A crank can be used to convert circular motion into reciprocating motion, or conversely turn reciprocating motion into circular motion.

For example, inside an internal combustion engine (a type of reciprocating engine), the expansion of burning fuel in the cylinders periodically pushes the piston down, which, through the connecting rod, turns the crankshaft. The continuing rotation of the crankshaft drives the piston back up, ready for the next cycle. The piston moves in a reciprocating motion, which is converted into circular motion of the crankshaft, which ultimately propels the vehicle or does other useful work. Reciprocating motion is close to, but different from, sinusoidal simple harmonic motion. The point on the crankshaft which connects to the connecting rod rotates smoothly at a constant velocity in a circle. Thus, the horizontal displacement, of that point, is indeed exactly sinusoidal by definition. However, during the cycle, the angle of the connecting rod changes continuously. So, the horizontal displacement of the "far" end of the connecting rod (i.e., connected to the piston) differs from sinusoidal.

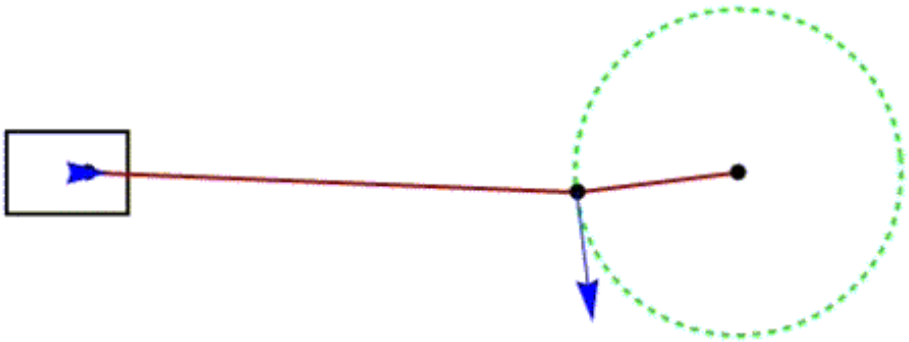

Fig.3.4 Single crank mechanism conversion of reciprocating motion to rotary motion.

3.5.c) Pipes:

A fitting is used in pipe systems to connect straight pipe or tubing sections, adapt to different sizes or shapes and for other purposes, such as regulating (or measuring) fluid flow. "Plumbing" is generally used to describe the conveyance of water, gas, or liquid waste in domestic or commercial environments; "piping" is often used to describe the high-performance (high-pressure, high-flow, high-temperature or hazardous-material) conveyance of fluids in specialized applications. "Tubing" is sometimes used for lighter-weight piping, especially that flexible enough to be supplied in coiled form. Fittings (especially uncommon types) require money, time, materials and tools to install, and are an important part of piping and plumbing systems. Valves are technically fittings, but are usually discussed separately.

An elbow is installed between two lengths of pipe (or tubing) to allow a change of direction, usually a 90° or 45° angle; 22.5° elbows are also available. The ends may be machined for butt welding, threaded (usually female), or socketed. When the ends differ in size, it is known as a reducing (or reducer) elbow.

A 90º elbow, also known as a "90 bend", "90 ell" or "quarter bend", attaches readily to plastic, copper, cast iron, steel, and lead, and is attached to rubber with stainless-steel clamps. Other available materials include silicone, rubber compounds, galvanized steel, and nylon. It is primarily used to connect hoses to valves, water pumps and deck drains. A 45º elbow, also known as a "45 bend" or "45 ell", is commonly used in water-supply facilities, food, chemical and electronic industrial pipeline networks, air-conditioning pipelines, agriculture and garden production, and solar-energy facility piping. Elbows are also

categorized by length. The radius of curvature of a long-radius (LR) elbow is 1.5 times the pipe diameter, but a short-radius (SR) elbow has a radius equal to the pipe diameter. Short elbows, widely available, are typically used in pressurized systems, and in physically tight locations.

Long elbows are used in low-pressure gravity-fed systems and other applications where low turbulence and minimum deposition of entrained solids are of concern. They are available in acrylonitrile butadiene styrene (ABS plastic), polyvinyl chloride (PVC), chlorinated polyvinyl chloride (CPVC), and copper, and are used in DWV systems, sewage, and central vacuum systems.

Fig.3.5 Pipes

3.5.d) Nut and Bolts:

A nut is a type of fastener with a threaded hole. Nuts are almost always used in conjunction with a mating bolt to fasten multiple parts together. The two partners are kept together by a combination of their threads' friction (with slight elastic deformation), a slight stretching of the bolt, and compression of the parts to be held together. In applications where vibration or rotation may work a nut loose, various locking mechanisms may be employed: lock washers, jam nuts, specialist adhesive thread-locking fluid such as Loctite, safety pins (split pins) or lock wire in conjunction with castellated nuts, nylon inserts (nylon nut), or slightly oval-shaped threads.

Square nuts, as well as bolt heads, were the first shape made and used to be the most common largely because they were much easier to manufacture, especially by hand. While rare today due to the reasons stated below for the preference of hexagonal nuts, they are occasionally used in some situations when a maximum amount of torque and grip is needed for a given size: the greater length of each side allows a spanner to be applied with a larger surface area and more leverage at the nut. The most common shape today is hexagonal, for similar reasons as the bolt head: six sides give a good granularity of angles for a tool to approach from (good in tight spots), but more (and smaller) corners would be vulnerable to being rounded off. It takes only one sixth of a rotation to obtain the next side of the hexagon and grip is optimal. However, polygons with more than six sides do not give the requisite grip and polygons with fewer than six sides take more time to be given a complete rotation. Other specialized shapes exist for certain needs, such as wing nuts for finger adjustment and captive nuts (e.g. cage nuts) for inaccessible areas.

A wide variety of nuts exists, from household hardware versions to specialized industry-specific designs that are engineered to meet various technical standards. Fasteners used in automotive, engineering, and industrial applications usually need to be tightened to a specific torque setting, using a torque wrench. Nuts are graded with strength ratings compatible with their respective bolts; for example, an ISO property class 10 nut will be able to support the bolt proof strength load of an ISO property class 10.9 bolts without stripping. Likewise, SAE class 5 nuts can support the proof load of an SAE class 5 bolt, and so on.

In the tension joint, the bolt and clamped components of the joint are designed to transfer an applied tension load through the joint by way of the clamped components by the design of a proper balance of joint and bolt stiffness. The joint should be designed such that the clamp load is never overcome by the external tension forces acting to separate the joint. If the external tension forces overcome the clamp load (bolt preload) the clamped joint components will separate, allowing relative motion of the components.

The second type of bolted joint transfers the applied load in shear of the bolt shank and relies on the shear strength of the bolt. Tension loads on such a joint are only incidental. A preload is still applied but consideration of joint flexibility is not as critical as in the case where loads are transmitted through the joint in tension. Other such shear joints do not employ a preload on the bolt as they are designed to allow rotation of the joint about the bolt, but use other methods of maintaining bolt/joint integrity. Joints that allow rotation include clevis linkages, and rely on a locking mechanism (like lock washers, thread adhesives, and lock nuts).

Fig.3.6 Nut & Bolt

3.5.e) Nozzles:

A nozzle is a device designed to control the direction or characteristics of a fluid flow (especially to increase velocity) as it exits an enclosed chamber or pipe. A nozzle is often a pipe or tube of varying cross sectional area and it can be used to direct or modify the flow of a fluid liquid. Nozzles are frequently used to control the rate of flow, speed, direction, mass, shape, or the pressure of the stream that emerges from them. In a nozzle, the velocity of fluid increases at the expense of its pressure energy. Nozzles can be described as divergent (expanding from a smaller diameter to a larger one). A diversion has a divergent section and is often called a divergent.

Convergent nozzles accelerate subsonic fluids. If the nozzle pressure ratio is high enough, then the flow will reach sonic velocity at the narrowest point (i.e. the nozzle throat). In this situation, the nozzle is said to be choked. Increasing the nozzle pressure ratio further

will not increase the throat Mach number above one. Downstream (i.e. external to the nozzle) the flow is free to expand to supersonic velocities; however, Mach 1 can be a very high speed for a hot gas because the speed of sound varies as the square root of absolute temperature. This fact is used extensively in rocketry where hypersonic flows are required and where propellant mixtures are deliberately chosen to further increase the sonic speed.

Divergent nozzles slow fluids if the flow is subsonic, but they accelerate sonic or supersonic fluids. Convergent-divergent nozzles can therefore accelerate fluids that have choked in the convergent section to supersonic speeds. This CD process is more efficient than allowing a convergent nozzle to expand supersonically externally. The shape of the divergent section also ensures that the direction of the escaping gases is directly backwards, as any sideways component would not contribute to thrust.

Fig.3.7 Nozzle

3.5. f) Linkages:

A mechanical linkage is an assembly of bodies connected to manage forces and movement. The movement of a body, or link, is studied using geometry so the link is considered to be rigid. The connections between links are modelled as providing ideal movement, pure rotation or sliding for example, and are called joints. A linkage modelled as a network of rigid links and ideal joints is called a kinematic chain. Linkages may be constructed from open chains, closed chains, or a combination of open and closed chains. Each link in a chain is connected by a joint to one or more other links. Thus, a kinematic chain can be modelled as a graph in which the links are paths and the joints are vertices, which is called a linkage graph.

The deployable mirror linkage is constructed from a series of rhombus or scissor linkages. An extended scissor lift the movement of an ideal joint is generally associated with

a subgroup of the group of Euclidean displacements. The number of parameters in the subgroup is called the degrees of freedom (DOF) of the joint. Mechanical linkages are usually designed to transform a given input force and movement into a desired output force and movement. The ratio of the output force to the input force is known as the mechanical advantage of the linkage, while the ratio of the input speed to the output speed is known as the speed ratio. The speed ratio and mechanical advantage are defined so they yield the same number in an ideal linkage. A kinematic chain, in which one link is fixed or stationary, is called a mechanism, and a linkage designed to be stationary is called a structure.

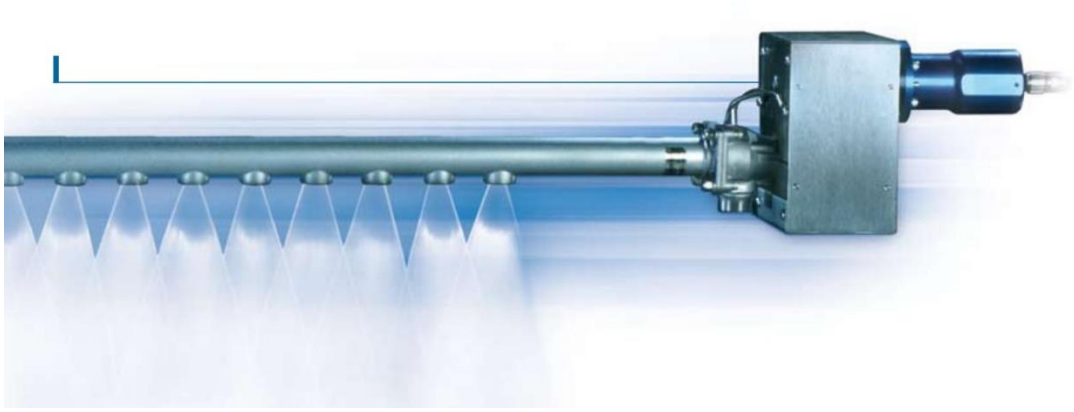

Fig.3.8 Linkage

3.6. List of material:

Table No. 3.2 List of Material

SR.NO.	DESCRIPTION	QUANTITY
1	MOTOR	1
2	PUMP	2
3	M.S.PIPES	10
4	NOZZLES	5
5	CRANK ROD	1
6	M.S.PLATE	1
7	NUT & BOLT	5
8	PIPE FITTINGS	6
9	VALVE	2

3.7 cost of parts

Table No 3.3 Cost of Material

SR. NO.	PART NAME	QUANTITY	COST
1	MOTOR	1	5000
2	PUMP	2	54000
3	PIPES	10	600
4	NOZZLES	5	1750
5	CRANK ROD	1	250
6	M.S.PLATE	1	450
7	NUT & BOLT	5	60
8	PIPE FITTINGS	6	600
9	VALVE	2	250
TOTAL			62960

3.8 Advantages:

a) Quality:

Industrial automated system has the capacity to practically improve product quality. Applications are performed with precision and high repeatability every time. This level of consistency can be hard to achieve any other way.

b) Production:

With automated systems, throughout speeds increase, which directly impacts production. Because an automated system has the ability to work at a constant speed without pausing for breaks, it has the potential to produce more than human worker.

c) Safety:

Automated systems increase workplace safety as compared to old system. Workers are moved to supervisory roles where they no longer have to perform dangerous applications in hazardous settings.

d) Savings:

Improve worker safety leads to financial savings. There are decreases material removal rate. Decrease labour cost and maintenance cost. Improves productivity of the industry.

3.9 Disadvantages:

a) Expensive:

Initial investment to integrated automated systems into your business is significant, especially when business owners are limiting their purchases to new automated equipment. The cost of automation should be calculated in light of a business greater financial budget.

b) Safety:

This system may protect workers from any accidents, but in meantime, their very presence can create other safety problems. Because when sometimes high pressure water can leak they harmful to other workers, so safety precaution is must.

4. WATER FILTRATION

4.1 Filtration:-

Filtration is one of the effective ways of purifying black water and when using right multimedia filters its effective in ridding water of compounds. This method use physical and chemical process to purify water and make it safe for cleaning consumption. Filtration eliminates both large compound and small, dangerous contamination that cause damage to nozzle outlet with a quick and simple filtration process. This is one of the effective black water purification methods that utilized for removal of unwanted compound material from water.

Filtration includes different types of filtration methods, but in our system while removing the solid pulp from black water or the water which is going to be used for screen cleaning purpose. This pulp is removed with the help of filtration net or any other filtration material such as coal, sand, etc. but in our filtration project 200*mesh filtration net is used.

Fig.4.1 Vibrator net

4.2. Working:

This process involves filtering the hard water and removing all the contaminants that may be in the water. In this case, water to be softened will pass through various types of equipment for removing the chemical elements that are logged in the hard water. Besides from softening the water, the method will also reduce the concentration of the minerals. It is very common for homeowners to fit the equipment in the houses so that they can treat all the water they get. It is because of this reason that Bio Tech Water Researchers have come up with a solution for water filtration. However, it must be noted that water filters cannot get rid of all the contaminants in the water but it will remove some contaminants. Strainers generally consist of a simple thin physical barrier made from metal or plastic. In water treatment they tend to be used at the inlet to the treatment system to exclude large objects (e.g. leaves, fish, and coarse detritus). These may be manually or mechanically scraped bar screens. The spacing between the bars ranges from 1 to 10 cm. Intake screens can have much smaller spacing created by closely spaced plates or even fine metal fabric. The latter are usually intended to remove fine silt and especially algae and are referred to as micro strainers.

Filters, as commonly understood in water treatment generally consist of a medium within which it is intended most of the particles in the water will be captured. Such filters might be manufactured as disposable cartridge filters, which can be suitable for domestic (i.e. point-of-use treatment) and small-scale industrial applications. Larger forms of cartridge filters exist which can be cleaned. One version filtration in which a porous support surface is given a sacrificial coating of diatomaceous earth, or other suitable material, each time the filter has been cleaned. Additionally, a small amount of the diatomaceous earth is applied continuously during filtration. However, in most cases, filters used in municipal water treatment contain sand or another appropriate granular material (e.g. anthracite, crushed glass or other ceramic material, or another relatively inert mineral) as the filter medium. Filtration using such filters is often referred to as in-depth granular media filtration.

Granular media filters are used in either of two distinct ways which are commonly called slow-sand filtration and rapid gravity or pressure filtration. When the filters are used as the final means of particle removal from the water, then the filters may need to be preceded by another stage of solid-liquid separation (clarification) such as sedimentation (Sedimentation Processes), dissolved-air flotation (Flotation Processes) or possibly a preliminary stage of filtration. Other processes take place in vessels similar to those used for granular media filtration and in some respects the processes do have similarities with filtration but filtration is not their sole or primary purpose. Therefore, such processes are not

considered further in this article. Examples include vessels filled with granular activated carbon for removal of dissolved organic substances, and vessels filled with ion exchange resin for removal of inorganic and organic ions. There are applications of filters that whilst filtration (removal of particles) does take place a secondary process is intended to also occur, e.g. iron and manganese removal, and arsenic removal.

5. CONCLUSION

5.1. Conclusion:

From the above discussion, it can be concluded that an Automation system can helps to improve efficiency or Productivity of the process. This system can helps to improve rate of less material wastage during working. We have used convergent-divergent nozzle for high pressure of water during cleaning. This high pressure water can be used for cleaning of cotton polythene screen which is used for giving flatness to the board. For using this system efficiency of production of board is increased and reduced the labour cost of eight workers. Applications are performed with precision and high repeatability every time. This level of consistency can be hard to achieve any other way.

5.2. Future scope:

Automation is a technology with a future, and is a technology for the future. If present trends continue, and if some of the laboratory research currently underway is ultimately converted into practicable technology. Getting from the present future will require much work in mechanical engineering, electrical engineering, industrial engineering, Automation technology, material technology, manufacturing system engineering, and other engineering fields. A combination of economic and technical factors will determine how the future applications will be introduced. Although there is significant development in the science of automation, still its usage is limited due to high cost of production, less availability of resources. If we can overcome these limitations, more benefits can be gained from automation.

We can theorize a likely profile of the future automation based on the various research activities that are currently being performed. The features and capability of the future robot will include the following point.

5.2. a) Future Manufacturing Applications:

The present biggest application areas for industrial automation are in the motor drives systems, conveyor system, and material handling systems. In the screen cleaning system the automation is possible by electric motor drive to control cleaning of screen time to time. Control of this system is connected to an electric system or PLC for better performance.

A cleaning process involves moving nozzle series which is fitted on the M.S. pipe to the correct cleaning of roller screen. Prior to cleaning, a hand operated pressure regulator is used to co. However, the screen cleaning is a very challenging task due to the comparatively high man power is required for cleaning purpose. In general, it is necessary to avoid the wastage of pulp material. For that purpose we introducing a cleaning mechanism that involves high

pressure water jet nozzle and high pressure pump etc. are used. Control the flow rate or discharge of working fluid (water). In addition the pressure regulator assures that the cleaning is kept stable throughout the particular time period. A self-moving mechanism is normally used to clean the roller screen continuously.

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