Fabrication of Automatic Feeding & Cutting Mechanism

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Abstract— Now a days there are many efforts being made for taking away the burden on the humans. For this purpose there are many efforts going on for the Automization of machines. This paper has taken up the fabrication of "Automatic Feeding and Cutting Mechanism". This machine automatically feeds its stock and performs the cutting operation. It involves simple lever mechanisms. Here the power input for the machine is provided by means of a motor. It involves simple mechanisms which transfers the motion from one form to the other. This mechanism is very useful in making holes on metal sheets in industries, by changing the tool. By using this mechanism for stitching of big bags in agriculture.
Key words: Fabrication of Automatic Feeding Mechanism, Fabrication of Cutting Mechanism

I. INTRODUCTION

Mechanical engineering without production and manufacturing is meaningless and inseparable. Production and manufacturing process deals with conversion of raw materials inputs to finished products as per required dimensions and efficiently using recent technology. Now a day, machines are widely controlled by embedded system. To meet the need of exploding population economic and effective control of machines is necessary. The main theme of our project is used to feed the raw material automatically to the machine and make holes simultaneously with a particular gap. A mechanism is considered to be more general. It is an isolated group of rigid bodies through the study of which we can understand the basic structure of any machine and can design machines that are not in existence. Whenever there is a need for motion accompanied with force, there is a mechanism.

II. MECHANISM

A system that consists of links & joints and converts one form of motion to another form is called as Mechanism.

Mechanism is a combination of rigid bodies which are formed and connected together by links, so that they are moved to perform some functions, such as the crank-connecting rod mechanism of the I.C. engines, mechanisms of automobiles etc. A mechanism is considered to be more general. It is an isolated group of rigid bodies through the study of which one can understand the basic structure of any machine and can design machines that are not in existence. Whenever there is a need for motion accompanied with force, there is a mechanism. A group of rigid bodies connected to each other by rigid kinematic pairs (joints) to transmit force and motion. A machine consists of a number of parts or bodies, the mechanism of the various parts or bodies from which the machine is assembled. This is done by making one of the parts fixed, and the relative motion of other parts is determined with respect to the fixed part..

A. Kinematic Element

Kinematic element is a part of a rigid body which is used to connect it to another rigid body such that the relative motion between the two rigid bodies can occur.

B. Kinematic Pair

Kinematic pairs the joining of two kinematic elements. The types of kinematic pairs and their distribution within the mechanism determine the main characteristics of a mechanism. The relative motion between the kinematic pair is completely or successfully constrained(i.e. in a definite direction).Links are rigid bodies each having hinged holes or slot to be connected together by some means to constitute a mechanism which able to transmit motion or forces to some another locations.

Classification Mechanisms of Kinematic Pairs:

1) Open Kinematic pairs
2) Closed Kinematic Pairs
   – Form Closed Kinematic Pairs
   – Force Closed Kinematic Pairs
3) Higher Kinematic Pairs: Contact along a surface
4) Lower kinematic Pairs: Contact at a point or on a line

C. Kinematic Chain

The kinematic pairs are coupled in such a way that the last link is joined to the first link to transmit definite motion (i.e. completely or successfully constrained motion), it is called 'kinematic chain'. It is a combination of kinematic pairs. For example, the crankshaft of an engine forms a kinematic pair with the bearings which are fixed in a pair, the connecting rod with the crank forms a second kinematic pair, the piston with the connecting rod forms a third pair and the piston with the cylinder forms a fourth pair. The total combination of these is a kinematic chain.

If each link is assumed to form two pairs with two adjacent links, then the relation between the number of pairs (p) forming a kinematic chain and the number of links (l) may be expressed in the form of equation:

$$l = 2p - 4$$

Another relation between the number of links (l) and number of joint (j) which constitute a kinematic chain is given by the expression:

$$j = \frac{3}{2}l - 2$$

The above equations are applicable to kinematic chains then L.H.S. >R.H.S. for two equations, therefore it is not a kinematic chain and hence no relative motion is possible. Such type of chain is called 'locked chain' and forms a rigid frame or structure which is used in bridges and trusses.

If L.H.S. = R.H.S for two equations, therefore it is a ‘kinematic chain of one degree of freedom’ and it may be called as a ‘constrained kinematic chain’, and it is the basis of all machines.

If L.H.S. < R.H.S. for two equations, therefore it is not a kinematic chain. Such a type of chain is called ‘unconstrained chain’.

D. Types of joints

- Binary joint: When two links are joined at the same connection, the joint is known as ‘binary joint’.
- Ternary joint: When three links are joined at the same connection, the joint is known as ‘ternary joint’.
- Quaternary joint: When four links are joined at same connection, the joint is known as ‘quaternary joint’.

A mechanism with four links is known as ‘simple mechanism’, and the mechanism with more than four links is known as ‘compound mechanism’. When a mechanism is required to transmit power or to do some particular type of work, it then becomes a ‘machine’.

E. Number of degrees of freedom

In general, a mechanism with l number of links connected by j number of binary joints or lower pairs, then the number of degrees of freedom of a mechanism is given by:

$$n = 3(l - 1)\text{-}2j\text{-}h$$

III. OBJECTIVE

Now a day, machines are widely controlled by embedded system. To meet the need of exploding population economic and effective control of machines is necessary.

The main theme is used to feed the raw material automatically to the machine and make holes simultaneously with a particular gap. To decrease the mistakes made by human.

- To increase the accuracy.

IV. COMPONENTS

The main components used to the automatic feeding and cutting mechanism are:

1) Links
2) Joints
3) Fixing table
4) Crank
5) Bearings and Bush
6) Belt and Pulley
7) Motor
8) Frame
9) Cutting Tool
10) Feeding Tool

A. Links

Each part of a machine, which moves relative to some other part, is known as a kinematic link (simply link). A link may consist of several parts which are rigidly fastened together, so that they do not move relative to one another.

What is the link made up of?

1) Wood

Wood possesses several properties. Wood is a hard, fibrous structural tissue found in the stems and roots of trees and other woody plants. It has been used for thousands of years for both fuel and as a construction material. It is an organic material, a natural composite of cellulose fibers (which are strong in tension) embedded in a matrix of lignin which resists compression. Wood is sometimes defined as only the secondary xylem in the stems of trees ,or it is defined more broadly to include the same type of tissue elsewhere such as in the roots of trees or shrubs.

Fig. 1: Wood

Wood is also used in many engineering applications. Engineered wood products, glued building products "engineered” for application-specific performance requirements, are often used in construction and industrial applications. Glued engineered wood products are manufactured by bonding together wood strands, veneers, lumber or other forms of wood fiber with glue to form a larger, more efficient composite structural unit. Wood is an important material which has always been used to make many of the things around us.

B. Joints

They is used to join the two or more links together.

There are three types of joints usually found in a chain:

- Binary joint: When two links are joined at the same connection, the joint is known as ‘binary joint’
- Ternary joint: When three links are joined at the same connection, the joint is known as ‘ternary joint’.
- Quaternary joint: When four links are joined at same connection, the joint is known as ‘quaternary joint’.

A mechanism with four links is known as ‘simple mechanism’, and the mechanism with more than four links is known as ‘compound mechanism’. When a mechanism is required to transmit power or to do some particular type of work, it then becomes a ‘machine’. Component used as joint is ‘Bolt & Nuts’. This machine requires us bolts and nuts, joints Bolts are used to join pieces together either permanently or temporarily.

Many steel structures, including buildings, are simply bolted together. For example, the Eiffel Tower in Paris was originally a temporary structure and after twenty years it was to be dismantled. For this reason most of the steel components were bolted together. Nuts and bolts come in many different types and sizes.

Fig. 2: Fasteners

A fastener made by screwing a nut into a threaded bolt.

C. Fixing Table

The frame material is plywood. Plywood is a sheet material manufactured from thin layers or "plies" of wood veneer that are glued together with adjacent layer shaving their wood grain rotated up to 90 degrees to one another. It is an wood from the family of manufactured boards which density fibre board and particle board (chipboard includes medium).

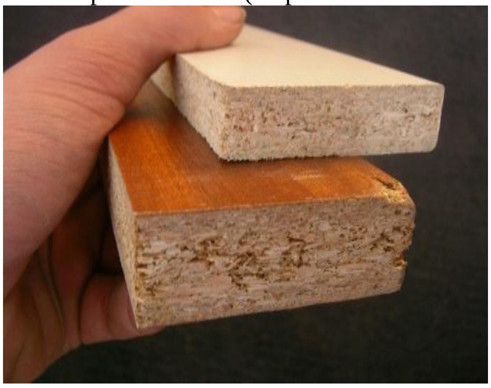

Fig. 3: Wood Pieces

All plywoods bind resin and wood fiber sheets (cellulose cells are long, strong and thin to form a composite material. This alternation of the grain is called cross-graining and has several important benefits: it reduces the tendency of wood to split when nailed at the edges; it reduces expansion and shrinkage, providing improved dimensional stability; and it makes the strength of the panel consistent across all directions.

D. Crank

A crank is an arm attached at right angles 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. The arm may be a bent portion of the shaft, or a separate arm or disk attached to it. Attached to the end of the crank by a pivot is a rod, usually called a connecting rod. The end of the rod attached to the crank moves in a circular motion, while the other end is usually constrained to move in a linear sliding motion.

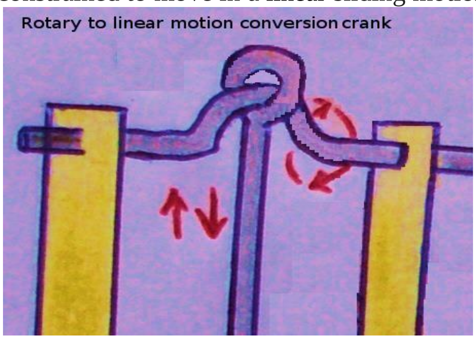

Fig. 4: Rotary to Linear motion

The term often refers to a human-powered crank which is used to manually turn an axle, as in a bicycle crank set or a brace and bit drill. In this case a person's arm or leg serves as the connecting rod, applying reciprocating force to the crank. There is usually a bar perpendicular to the other end of the arm, often with a freely rotatable handle or pedal attached .Reciprocating motion, also called reciprocation, is a repetitive up-and-down or back-and-forth linear motion. 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.

E. Bearings and Bush

A bearing is a machine element that constrains relative motion and reduces friction between moving parts to only the desired motion. The design of the bearing may, for example, provide for free linear movement of the moving part or for free rotation around a fixed axis; or, it may prevent a motion by controlling the vectors of normal forces that bear on the moving parts. Many bearings also facilitate the desired motion as much as possible, such as by minimizing friction.

Bearings are classified broadly according to the type of operation, the motions allowed, or to the directions of the loads (forces) applied to the parts.

Fig. 5: Bearing

The term "bearing" is derived from the verb "to bear"; a bearing being a machine element that allows one part to bear (i.e., to support) another.

The simplest bearings are bearing surfaces, cut or formed into a part, with varying degrees of control over the form, size, roughness and location of the surface. Other bearings are separate devices installed into a machine or machine part. The most sophisticated bearings for the most demanding applications are very precise devices; their manufacture requires some of the highest standards of current technology. A plain bearing (in railroading sometimes called a solid bearing) is the simplest type of bearing, comprising just a bearing surface and no rolling elements. Therefore the journal (i.e., the part of the shaft in contact with the bearing) slides over the bearing surface. The simplest example of a plain bearing is a shaft rotating in a hole. A simple linear bearing can be a pair of flat surfaces designed to allow motion.

They are also compact and lightweight, and they have a high load-carrying capacity.

1) Bushing

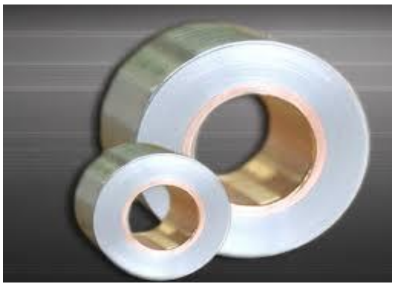

Fig. 6: Bushing

A bushing, also known as a bush, is an independent plain bearing that is inserted into a housing to provide a bearing surface for rotary applications; this is the most common form of a plain bearing. Common designs include solid (sleeve and flanged), split, and clenched bushings. A sleeve, split, or clenched bushing is only a "sleeve" of material with an inner diameter (ID), outer diameter (OD), and length. The difference between the three types is that a solid sleeved bushing is solid all the way around, a split bushing has a cut along its length, and a clenched bearing is similar to a split bushing but with a clench across the cut. A flanged bushing is a sleeve bushing with a flange at one end extending radially outward from the outer diameter. The flange is used to positively locate the bushing when it is installed or to provide a thrust bearing surface.

F. Belt and Pulley

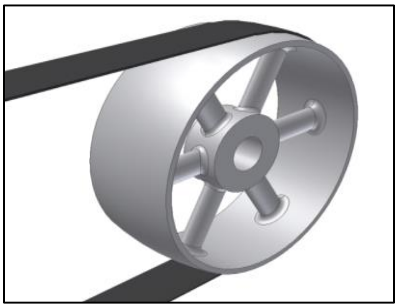

Fig. 7: Belt

It is for transmission of motion. A belt is a loop of flexible material used to mechanically link two or more rotating shafts, most often parallel. Belts may be used as a source of motion, to transmit power efficiently, or to track relative movement. Belts are looped over pulleys and may have a twist between the pulleys, and the shafts need not be parallel. In a two pulley system, the belt can either drive the pulleys normally in one direction (the same if on parallel shafts), or the belt may be crossed, so that the direction of the driven shaft is reversed (the opposite direction to the driver if on parallel shafts). As a source of motion, a conveyor belt is one application where the belt is adapted to continuously carry a load between two points.

1) Power Transmission in Belts

Belts are the cheapest utility for power transmission between shafts that may not be axially aligned. Power transmission is achieved by specially designed belts and pulleys. The demands on a belt drive transmission system are large and this has led to many variations on the theme. They run smoothly and with little noise, and cushion motor and bearings against load changes, albeit with less strength than gears or chains. However, improvements in belt engineering allow use of belts in systems that only formerly allowed chains or gears. Power transmitted between a belt and a pulley is expressed as the product of difference of tension and belt velocity:

$$P = (T_1 - T_2)v$$

Where, T_1 and T_2 are tensions in the tight side and slack side of the belt respectively.

They are related as:

$$\frac{T_1}{T_2} = e^{\mu\alpha}$$

Where, μ is the coefficient of friction, and α is the angle subtended by contact surface at the centre of the pulley.

2) Pulley

A pulley is a wheel on an axle that is designed to support movement and change of direction of a cable or belt along its circumference .Pulleys are used in a variety of ways to lift loads, apply forces, and to transmit power. In nautical contexts, the assembly of wheel, axle, and supporting shell is referred to as a "block". A pulley is also called a sheave or drums and may have a groove between two flanges around its circumference. The drive element of a pulley system can bea rope, cable, belt, or chain that runs over the pulley inside the groove. Hero of Alexandria identified the pulley as one of six simple machines used to lift weights. Pulleys are assembled to form a block and tackle in order to provide mechanical advantage to apply large forces. Pulleys are also assembled as part of belt and chain drives in order to transmit power from one rotating shaft to another.

G. 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 stationary 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 commonly, linear AC 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.

Fig. 8: Motor

1) Operating Principle

AC motors operate with two rotating (or moving) magnetic fields on the rotor and stator respectively. Pulling or pushing the poles of the two magnetic fields along, the speed of the stator rotating magnetic field (Ws) and the speed of the rotor rotating magnetic field .(which is relative to the speed of the mechanical shaft (Wm), must maintain synchronism for average torque production by satisfying the synchronous speed relation (i.e., ±Ws ±Wr = Wm). Otherwise, asynchronously rotating magnetic fields would produce pulsating or non-average torque.

H. Cutting Tool

In the machining, a cutting tool (or cutter) is any tool that is used to remove material from the workpiece by means of shear deformation. Cutting may be accomplished by single-point or multipoint tools. Single-point tools are used in turning, shaping, planning and similar operations, and remove material by means of one cutting edge. Milling and drilling tools are often multipoint tools. Grinding tools are also multipoint tools. Each grain of abrasive functions as a microscopic single-point cutting edge (although of high negative rake angle), and shears a tiny chip. Cutting tools must be made of a material harder than the material which is to be cut, and the tool must be able to withstand the heat generated in the metal-cutting process. Also, the tool must have a specific geometry, with clearance angles designed so that the cutting edge can contact the workpiece without the rest of the tool dragging on the workpiece surface. The angle of the cutting face is also important, as is the flute width, number of flutes or teeth, and margin size. In order to have a long working life, all of the above must be optimized, plus the speeds and feeds at which the tool is run. Cutting tool materials can be divided into two main categories: stable and unstable.

Unstable materials (usually steels) are substances that start at a relatively low hardness point and are then heat treated to promote the growth of hard particles (usually carbides) inside the original matrix, which increases the overall hardness of the material at the expense of some its original toughness. Since heat is the mechanism to alter the structure of the substance and at the same time the cutting action produces a lot of heat, such substances is inherently unstable under machining conditions. Stable materials (usually tungsten carbide) are substances that remain relatively stable .under the heat produced by most machining conditions, as they don't attain their hardness through heat. They wear down due to abrasion, but generally don't change their properties much during use.

I. Feeding Tool

1) Rubber pad as a feeding tool

Using design principles inspired by the nanoscopic hairs on the gecko, UC Berkeley researchers and colleagues have created a novel microfiber array which has very high friction but is not ``sticky". Usual high friction materials, such as soft rubbers or polymers, are tacky, and would be uncomfortable on shoe soles (think gum stuck to the bottom of one's shoe). The high friction micro fiber array works by. The microfibers are made from a rigid plastic which is 100 to 1000 times harder than rubber, and can resist high temperatures without softening. The microfiber array has friction which is 10 to 30 times greater than the friction of the starting plastic. This novel material could potentially replace soft rubber on surfaces which need high friction like shoes, tires, or sport gloves.Friction is the force that resists sliding between two surfaces. High friction materials can prevent sliding under high loads or steep inclines. Such materials are typically soft and can achieve intimate contact with an opposing surface. A typical high friction material is rubber, which is used in a variety of applications such as shoes and tires.

2) Frame

Frame is used to fix the link (made with wood) to the fixing table. Material used for the frame is iron. The iron frame is drilled with 4.5mm diameter tool. To this frame the required fixed link is bolted and this arrangement is fixed to the fixing table by the use of 8mm bolts.

a) Working

The working principle of an automatic feeding mechanism is to convert rotary motion to linear motion it works with the help of an AC Motor 0.5hp single phase which runs with speed of 1500rpm generating 240volts power. The motor weighs about 1kg.

Links are screwed with 8mm iron bolts and nuts. The feeding operation is runned with the feeding tool fixed to one end of the links which moves horizontally. The cutting tool is fixed to another end of the link which moves vertically. This results in making holes for thin and light metal forms.

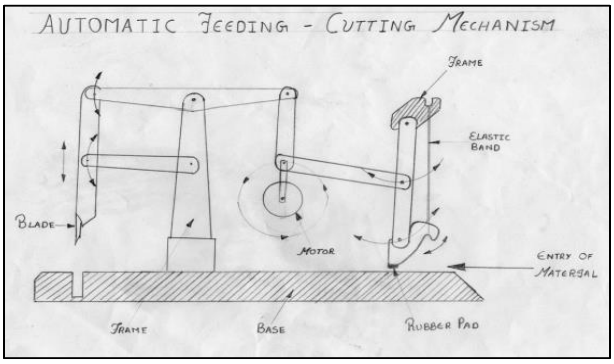

Fig. 9: Automatic Feeding

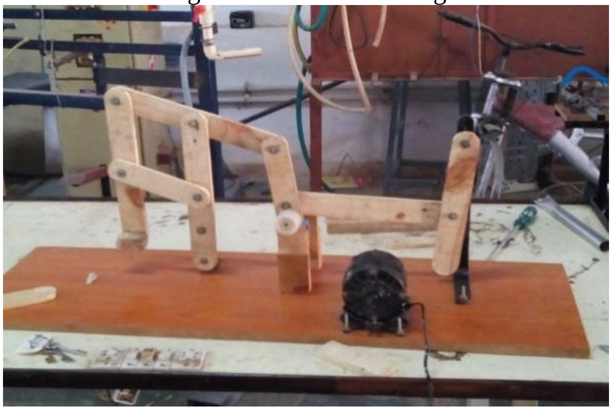

Fig. 10: Automatic Feeding & Cutting

V. SPECIFICATIONS: AC MOTOR

- Weight: 1kg
- Hp: 0.5
- Rpm: 1500
- Power: single phase
- Volts: 240
- Pulley diameter: 22mm
- No carbons
- No condensers
- Material used for links: Mango tree wood
- Material used for base: ply wood
- Bolts: 3/16 bolts of lengths 2inches, 1.5inch
- Washer: 4mm diameter
- Bush: steel bush of outer diameter 17mm and inner diameter 8mm
- Tool bit: 4.5
- Supports: steel bars

A. Calculations of links, joints, kinematic pairs:

We have 6 rigid links, 7 joints and 5 kinematic pairs

By fixing all the links we get successfully constrained motion

All the pairs in the mechanism are turning pairs only, so they have surface contact only, so they are all lower pairs.

It is a self-closed pair because all the pairs are connected in such a way that only required kind of relative motion takes place.

As the number of links is more than 4 it is known as compound mechanism.

In this mechanism we have 5 binary joints and one ternary joint.

We know that 1ternary joint is equal to 2binary joints Links l =6
Joints j=7 (5binary joints +1 ternary joint)
Pairs p=5

According to the relation to number of links to number of joints and pairs

l = 2p – 4
6 = 2(5) – 4
6 = 10 – 4
6 = 6
LHS = RHS
And $j = \frac{3}{2}l - 1$
7 = 1.5(6) – 2
LHS = RHS
7 = 9 – 2

B. Degrees of Freedom

The number of degrees of freedom of a system is the number of independent variables that must be specified to define completely the condition of the system. A body is said to be movable if the number of degrees of freedom is one or greater, it is otherwise locked If the number of degrees of freedom is equal to unity the chain is said to be constrained

According to Kutzbach equation

$$n = 3(l - 1) - 2j - h$$

Where n = number of degrees of freedom
l = number of links = 6
j = number of joints = 7
h = number of higher pairs = 0
n = 3 (6 – 1) -2(7) – 0
n = 1

According to Grubler's criteria

$$3l - 2j - 4 = 0$$
$$3(6) - 2(7) - 4 = 0$$
$$0 = 0$$

Therefore our mechanism satisfies Grubler`s criteria.

C. Speed calculations of the motor

According to the given specifications of the motor it runs at a speed of 1500 rpm which is not ideal to work with the machine so it has to be reduced by any means.

The speed of motor can be controlled by means of gears or pulleys, in this machine we are controlling the speed of the machine by using pulleys of larger diameter.

We know that speed is inversely proportional to the diameter of the pulley.

We require speed upto 900 rpm
N1 = 1500 rpm
N2 = 900 rpm
D1 =22 mm
D2 =?
N1/N2 =D1/D2
1500/900 = 22/D2
D2 =36.6667

Therefore the diameter of the second pulley is to be 37 mm to get the required speed for the ideal working of the machine.

D. Fabrication Processes

Different fabrication processes used in the construction of automatic feeding and cutting mechanism are hacksaw cutting, drilling, welding.

1) Hacksaw Cutting

A hacksaw is a fine-toothed saw, originally and principally for cutting metal. They can also cut various other materials, such as plastic and wood; for example, plumbers and electricians often cut plastic pipe and plastic conduit with them. There are hand saw versions and powered versions (power hacksaws). Most hacksaws are hand saws with a C-shaped frame that holds a blade under tension. Such hacksaws have a handle, usually a pistol grip, with pins for attaching a narrow disposable blade. The frames may also be adjustable to accommodate blades of different sizes. A screw or other mechanism is used to put the thin blade under tension. Panel hacksaws, forgo the frame and instead have a sheet metal body; they can cut into a sheet metal panel further than a frame would allow. These saws are no longer commonly available but hacksaw blade holders enable standard hacksaw blades to be used similarly to a Keyhole saw or Pad saw. Power tools including Nibblers, Jigsaws and Angle Grinders fitted with metal cutting blades and discs are now used for longer cuts in sheet metals.

On hacksaws, as with most frame saws, the blade can be mounted with the teeth facing toward or away from the handle, resulting in cutting action on either the push or pull stroke. In normal use, cutting vertically downwards with work held in a bench vice, hacksaw blades should be set to be facing forwards. Some frame saws, including Fret Saws and Piercing Saws, have their blades set to be facing the handle because they are used to cut by being pulled down against a horizontal surface.

Hacksaws are used to cut wood which are used as links and iron pieces which are used as fixtures.

E. Welding

Arc welding is a type of welding that uses a welding power supply to create an electric arc between an electrode and the base material to melt the metals at the welding point. They can use either direct (DC) or alternating (AC) current, and consumable or non-consumable electrodes. The welding region is usually protected by some type of shielding gas, vapour, or slag. Arc welding processes may be manual, semi-automatic, or fully automated. First developed in the late part of the 19th century, arc welding became commercially important in shipbuilding during the Second World War. Today it remains an important process for the fabrication of steel structures and vehicles.

Fig. 11: Arc welding setup

Fig. 12: Arc Welding

F. Drilling

Fig. 13: Drilling

Drilling is a cutting process that uses a drill bit to cut or enlarge a hole of circular cross-section in solid materials. The drill bit is a rotary cutting tool, often multipoint. The bit is pressed against the workpiece and rotated at rates from hundreds to thousands of revolutions per minute. This forces the cutting edge against the workpiece, cutting off chips (swarf) from the hole as it is drilled.

Exceptionally, specially-shaped bits can cut holes of non-circular cross-section; a square cross-section is possible.

1) Drilling in metal

High speed steel twist bit drilling into aluminium with methylated spirits lubricant.

Under normal usage, swarf is carried up and away from the tip of the drill bit by the fluting of the drill bit. The cutting edges produce more chips which continue the movement of the chips outwards from the hole. This is successful until the chips pack too tightly, either because of deeper than normal holes or insufficient backing off (removing the drill slightly or totally from the hole while drilling). Cutting fluid is sometimes used to ease this problem and to prolong the tool's life by cooling and lubricating the tip and chip flow. Coolant may be introduced via holes through the drill shank, which is common when using a gun drill. When cutting aluminum in particular, cutting fluid helps ensure a smooth and accurate hole while preventing the metal from grabbing the drill bit in the process of drilling the hole. When cutting brass, another soft metal that can grab the drill bit and causes "chatter" the cutting edges of the drill bit, which normally form an acute angle, a face of approx. 1-2 millimeters can be ground on the cutting edge to create an obtuse angle of 91 to 93 degrees. This prevents "chatter" where the drill tears rather than cuts the metal. However, the drill is pushing the metal away. This creates high friction and very hot swarf.

For heavy feeds and comparatively deep holes oil-hole drills can be used, with a lubricant pumped to the drill head through a small hole in the bit and flowing out along the fluting. A conventional drill press arrangement can be used in oil-hole drilling, but it is more commonly seen in automatic drilling machinery in which it is the workpiece that rotates rather than the drill bit.

2) Drilling in wood

Wood being softer than most metals, drilling in wood is considerably easier and faster than drilling in metal. Cutting fluids are not used or needed. The main issue in drilling wood is assuring clean entry and exit holes and preventing burning. Avoiding burning is a question of using sharp bits and the appropriate cutting speed. Drill bits can tear out chips of wood around the top and bottom of the hole and this is undesirable in fine woodworking applications.

The ubiquitous twist drill bits used in metalworking also work well in wood, but they tend to chip wood out at the entry and exit of the hole. In some cases, as in rough holes for carpentry, the quality of the hole does not matter, and a number of bits for fast cutting in wood exist, including spade bits and self-feeding auger bits. Many types of specialised drill bits for boring clean holes in wood have been developed, including brad-point bits, Forstner bits and hole saws. Chipping on exit can be minimized by using a piece of wood as backing behind the work piece, and the same technique is sometimes used to keep the hole entry neat.

Holes are easier to start in wood as the drill bit can be accurately positioned by pushing it into the wood and creating a dimple. The bit will thus have little tendency to wander.

G. Need for Automation

Nowadays almost all the manufacturing process is being atomized in order to deliver the products at a faster rate. The manufacturing operation is being atomized for the following reasons. .

- To achieve mass production
- To reduce man power

1) Advantages

- Proper fixing of motor is needed
- Use the bush for proper joining.

2) Disadvantages

- Here using a tool bit of small diameter, therefore it is suitable to make small holes only.
- It is suitable for sheets of less thickness

3) Precautions

- Check all the joints before going to operate this mechanism. Fix the motor properly.

4) Applications

- It can be used for punching holes on to thin sheet metals.
- It can be used for stitching thick gunny bags in industries.
- It can be used for cutting thin sheets at regular intervals
- To reduce the production cost
- To reduce the production time
- To reduce the material handling

VI. CONCLUSION

Fabrication of this project uses simple ideas and mechanism to achieve a simple set of actions and is intended to initiate the feeding\operator. However these mechanisms are expensive for small scale industries. Major problem encountered is the changing of the feed is not easy. It can produce 30 holes per minute

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