

Manual Road Cleaning Machine

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ABSTRACT:

*Water is the basic need for the existence of life on earth. In spite of 70% water on earth majority of water is not suitable for drinking purpose. There is a huge demand of clean water as it is used for a variety of purpose such as drinking, bathing, cleaning, cooking etc. Impurities present in water can cause serious health issues that can damage the life of human beings. The chief function of the automatic drainage system is to collect, transport, as well as dispose the solid waste in the waste bucket by the help of claws.. Solid waste in drainage water includes empty bottles, polythene bags, papers etc. Impurities in drainage water can lead to blockage of the drainage system. In order to avoid such situation these impurities are needed to be taken out time to time for the continuous flow of drainage water. Drain can be cleaned continuously by the help of model using the drive system to remove the solid waste and threw it into waste bucket. This project is designed with the objective to initiate the efficient working of system. This project automatically cleans the water in the drainage system each time any impurity appears, and claws which are driven by chain sprocket grasp the solid waste and threw it into the waste bucket to avoid blockage. It even reduces the cost of manual labor as well as reduces the threat to human life.***CHAIN**

INTRODUCTION

Automatic Drainage Water Cleaning overcomes all sorts of drainage problems and promotes blockage free drains promoting continuous flow of drain water. In the modern era there have been adequate sewage problems where sewage water needs to be segregated to clean our surrounding environment. The waste and gases produced from the industries are very harmful to human beings and to the environment. Our proposed system is used to clean and control the drainage level using auto mechanism technique.

PROBLEM STATEMENT

In today's era automation plays a very important role in all industrial applications for the proper disposal of sewage from industries and household is still a challenging task. Drain pipes are used for the adequate disposal of waste and unfortunately sometimes there may be a threat to human life during the cleaning of blockage in the drain pipes or it can cause serious health issues because of the pertaining problems like malaria, dengue, etc. In order to overcome this problem as well as to save human life we implement a design Automatic Drainage Cleaning System. We designed our project in order to use it in an efficient way to control the disposal of waste along with regular filtration of drains, removal of solid waste in order to avoid blockage in drains

to promote continuous flow of drainage water which ultimately reduces the threat to human life.

CHAIN DRIVE

Chain drive is a way of transmitting mechanical power from one place to another. It is often used to convey power to the wheels of a vehicle, particularly bicycles and motorcycles. It is also used in a wide variety of machines besides vehicles.

Most often, the power is conveyed by a roller chain, known as the drive chain or transmission chain, passing over a sprocket gear, with the teeth of the gear meshing with the holes in the links of the chain. The gear is turned, and this pulls the chain putting mechanical force into the system. Another type of drive chain is the Morse chain, invented by the Morse Chain Company of Ithaca, New York, USA. This has inverted teeth.

Sometimes the power is output by simply rotating the chain, which can be used to lift or drag objects. In other situations, a second gear is placed and the power is recovered by attaching shafts or hubs to this gear. Though drive chains are often simple oval loops, they can also go around corners by placing more than two gears along the chain; gears that do not put power into the system or transmit it out are generally known as idler-wheels. By varying the diameter of the input and output gears with respect to each other, the gear ratio can be altered, so that, for example, the pedals of a bicycle can spin all the way around more than once for every rotation of the gear that drives the wheels. Automobiles

A chain-drive system uses one or more roller chains to transmit power from a differential to the rear axle. This system allowed for a great deal of vertical axle movement (for example, over bumps), and was simpler to design and build than a rigid driveshaft in a workable suspension. Also, it had less unsprung weight at the rear wheels than the Hotchkiss drive, which would have had the weight of the driveshaft and differential to carry as well. This meant that the vehicle would have a smoother ride. The lighter unsprung mass would allow the suspension to react to bumps more effectively.

Frazer Nash were strong proponents of this system using one chain per gear selected by dog clutches. The Frazer Nash chain drive system, (designed for the GN Cycle car Company by Archibald Frazer-Nash and Henry Ronald Godfrey) was very effective, allowing extremely fast gear selections. The Frazer Nash (or GN) transmission system provided the basis for many "special" racing cars of the 1920s and 1930s, the most famous being Basil Davenport's Spider which held the outright record at the Shelsley Walsh Speed Hill Climb in the 1920s.

Parry-Thomas was killed during a land speed record attempt in his car 'Babs' when the chain final-drive broke,

decapitating him.

The last popular chain drive automobile was the Honda S600 of the 1960s.

Inside motors

Internal combustion engines often use a timing chain to drive the camshaft(s). This is an area in which chain drives frequently compete directly with belt drive systems, particularly when the engine has overhead camshafts, and provides an excellent example of some of the differences and similarities between the two approaches. For this application, chains last longer, but are often harder to replace. Being heavier, the chain robs more power, but is also less likely to fail. The camshaft of a four stroke engine rotates at half crankshaft speed, so the camshaft gear has twice as many teeth as the crankshaft gear. Less common alternatives to chain drives include trains of spur gears or bevel gear and shaft drives.

Transfer cases

'Silent chain' drives inside a 1912 gearbox

Today, inverted tooth drive chains are commonly used in passenger car and light truck transfer cases.

Motorcycles

Chain drive versus belt drive or use of a driveshaft is a fundamental design decision in motorcycle design; nearly all motorcycles use one of these three designs. See Motorcycle construction for more details.

BEARING

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.

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.

By far, the most common bearing is the plain bearing, a bearing which uses surfaces in rubbing contact, often with a lubricant such as oil or graphite. A plain bearing may or may not be a discrete device. It may be nothing more than the bearing surface of a hole with a shaft passing through it, or of a planar surface that bears another (in these cases, not a

discrete device); or it may be a layer of bearing metal either fused to the substrate (semi-discrete) or in the form of a separable sleeve (discrete). With suitable lubrication, plain bearings often give entirely acceptable accuracy, life, and friction at minimal cost. Therefore, they are very widely used.

However, there are many applications where a more suitable bearing can improve efficiency, accuracy, service intervals, reliability, speed of operation, size, weight, and costs of purchasing and operating machinery.

Thus, there are many types of bearings, with varying shape, material, lubrication, principle of operation, and so on.

Principles of operation Animation of ball bearing (without a cage). The inner ring rotates and the outer ring is stationary.

There are at least 6 common principles of operation:

Plain bearing, also known by the specific styles: bushing, journal bearing, sleeve bearing, rifle bearing

Rolling-element bearing such as ball bearings and roller bearings

Jewel bearing, in which the load is carried by rolling the axle slightly off-center

Fluid bearing, in which the load is carried by a gas or liquid

Magnetic bearing, in which the load is carried by a magnetic field

Flexure bearing, in which the motion is supported by a load element which bends.

Motions

Common motions permitted by bearings are:

axial rotation e.g. shaft rotation

linear motion e.g. drawer

spherical rotation e.g. ball and socket joint

hinge motion e.g. door, elbow, knee

Friction

Reducing friction in bearings is often important for efficiency, to reduce wear and to facilitate extended use at high speeds and to avoid overheating and premature failure of the bearing. Essentially, a bearing can reduce friction by virtue of its shape, by its material, or by introducing and containing a fluid between surfaces or by separating the surfaces with an electromagnetic field.

By shape, gains advantage usually by using spheres or rollers, or by forming flexure bearings.

By material, exploits the nature of the bearing material used. (An example would be using plastics that have low surface friction.) By fluid, exploits the low viscosity of a layer of fluid, such as a lubricant or as a pressurized medium to keep the two solid parts from touching, or by reducing the normal force between them. By fields, exploits electromagnetic fields, such as magnetic fields, to keep solid parts from touching. Combinations of these can even be employed within the same bearing. An example of this is where the

cage is made of plastic, and it separates the rollers/balls, which reduce friction by their shape and finish.

Loads

1. Bearings vary greatly over the size and directions of forces that they can support.

2. Forces can be predominately radial, axial (thrust bearings) or bending moments perpendicular to the main axis.

STEEL SQUARE TUBE

1. Square Steel Tube, is a welded structural steel tube with an internal weld seam present. Available in A513 or A500 Grade B depending on its size and wall thickness, Square Steel Tube is widely used in industrial maintenance, agricultural implements, transportation equipment, ornamental, etc.

2. Specifications: ASTM A513, ASTM A500 Grade B

3. Applications: frames, roll cages, truck racks, trailers, railings, etc.

4. Workability: Easy to Weld, Cut, Form and Machine

5. Mechanical Properties: Brinell = 63, Tensile = 58,000 +/-, Yield = 46,000 +/-

6. How is it Measured? Height (A) X Width (B) X Wall Thickness (C) X Length

7. Available Stock Sizes: 1ft, 2ft, 4ft, 6ft, 8ft, 12ft, 24ft or Cut to Size

Mild steel

Mild steel is made of low carbon and iron, with much more of iron than carbon. Mild is the most commonly used construction materials and it is known as mild because of the relatively low carbon content. Mild steel is made of low carbon components of ingot iron. This is a chemically pure type of iron which is heated with coke and gypsum or lime at high temperatures in a blast furnace. The right balance of carbon in the mixture must be attained as too much will make the steel brittle while too little will make it too soft.

Mild steel can be used for a variety of purposes. Some of these items include bolts, nuts, chains, hinges, knives, armour, pipes, and magnets.

You may want to try the links at the American Society for Metals at their website www.asminternational.org or the American Iron and Steel Institute at www.steel.org for a video of Clamp the two pieces of mild steel you're welding together to hold them steady while you weld. 2. Hook up your welding torch. Depending on your model, the torch might need electricity Chain final drive, 1912 illustration

ADVANTAGES:

1. Cost of production is low
2. No need to purchase heavy machinery
3. Reduces threat to human life
4. Manual assistance is not required
5. principle is quiet easy.
6. Compact
7. Portable.

8. Highly Efficient

DISADVANTAGE:

1. Rust
2. Flat solar panel
3. Jerks in chain

APPLICATION

It can be installed for domestic sewage treatment.

It can be used for proper treatment of sewage as well as to avoid blockage of drains.

It is portable and compact in size which initiates easy handling.

Manual assistance is not required.

CONCLUSION

The progress in science & technology is a non-stop process. New things and new technology are being invented. As the technology grows day by day, we can imagine about the future in which thing we may occupy every place.

The proposed system is found to be more compact, user friendly and less complex, which can readily be used in order to perform several tedious and repetitive tasks. Though it is designed keeping in mind about the need for industry, it can extended for other purposes such as commercial & research applications. The feature makes this system is the base for future systems.

The principle of the development of science is that nothing is impossible. So we shall look forward to a bright & sophisticated world.

REFERENCE

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