

Dry And Wet Waste Management System

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Abstract: -- - It is one of the innovative concepts used in several industries, public areas for collecting waste and makes our place neat and clean and Our project titled DRY AND WET WASTE MANAGEMENT SYSTEM will be the first ever idea to be implemented to segregate the waste product of daily households and the proper management of waste in large scale applications. The idea behind this can be implemented at the beginning stage of the of the infrastructure development plan, also after the construction of the buildings and plants. This is an automatically operated, so every persons can able to operate it easily, this process will take a vital role in all regions. By this process waste will be compressed automatically when it reaches a certain level and finally when it is filled we can open the door and remove at the certain place.

I. INTRODUCTION

Waste collection is a part of the process waste management. It is the transfer of solid waste from the point of use and disposal to the point of treatment or landfill. Waste collection also includes the curb side collection of recyclable materials that technically are not waste, as part of a municipal landfill diversion program. Household waste in economically developed countries will generally be left in waste containers or recycling bins prior to collection by a waste collector using a waste collection vehicle.

However, in many developing countries, such as Mexico and Egypt, waste left in bins or bags at the side of the road will not be removed unless residents interact with the waste collectors.

Mexico City residents must haul their trash to a waste collection vehicle which makes frequent stops around each neighborhood. The waste collectors will indicate their readiness by ringing a distinctive bell and possibly shouting. Residents line up and hand their trash container to the waste collector. A tip may be expected in some neighborhoods. Private contracted waste collectors may circulate in the same neighborhoods as many as five times per day, pushing a cart with a waste container, ringing a bell and shouting to announce their presence. These private contractors are not paid a salary, and survive only on the tips they receive. Later, they meet up with a waste collection vehicle to deposit their accumulated waste.

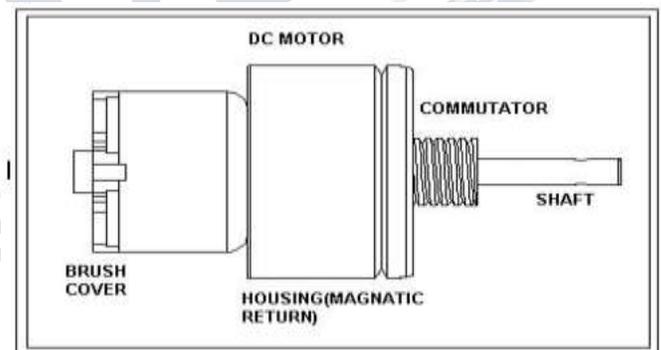
The waste collection vehicle will often take the waste to a transfer station where it will be loaded up into a larger vehicle and sent to either a landfill or alternative waste treatment facility.

Waste collection considerations include type and size of bins, positioning of the bins, and how often bins are to be serviced.

Overfilled bins result in rubbish falling out while being tipped. Hazardous rubbish like empty petrol cans can cause fires igniting other trash when the truck compactor is operating. Bins may be locked or stored in secure areas to avoid having non-paying parties placing rubbish in the bin.

II. DESCRIPTION OF EQUIPMENTS

2.1 MOTOR



PRINCIPLES OF OPERATION

In any electric motor, operation is based on simple electromagnetism. A current-carrying conductor generates a magnetic field; when this is then placed in an external magnetic field, it will experience a force proportional to the current in the conductor, and to the strength of the external magnetic field. As you are well aware of from playing with magnets as a kid, opposite (North and South) polarities attract, while like polarities (North and North, South and South) repel. The internal configuration of a DC motor is designed to harness the magnetic interaction between a current-carrying conductor and an external magnetic field to generate rotational motion.

Let's start by looking at a simple 2-pole DC electric motor (here red represents a magnet or winding with a "North"

polarization, while green represents a magnet or winding with a "South" polarization).

2.2 SCREW CONVEYOR:

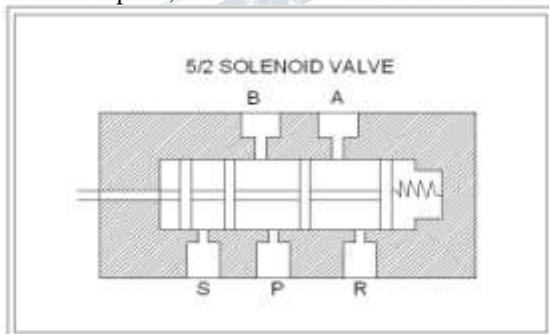
Here the screw conveyor is coupled inside the cylinder. On the screw conveyor shaft we are fixing on the motor to rotate the screw conveyor for moving the material from one place to another. Here the material is pour in side to the funnel which is place on the top of the cylinder and it send through the collecting tray by movement of the rotating of the screw conveyor. This is a simple and fast method.

2.3 PNEUMATIC CYLINDER:

The word 'pneuma' comes from Greek and means wind. The word pneumatics is the study of air movement and its phenomena is derived from the word pneuma. Today pneumatics is mainly understood to means the application of air as a working medium in industry especially the driving and controlling of machines and equipment.

2.4. SOLENOID VALVE:

The directional valve is one of the important parts of a pneumatic system. Commonly known as DCV; this valve is used to control the direction of air flow in the pneumatic system. The directional valve does this by changing the position of its internal movable parts. This valve was selected for speedy operation and to reduce the manual effort and also for the modification of the machine into automatic machine by means of using a solenoid valve. A solenoid is an electrical device that converts electrical energy into straight line motion and force. These are also used to operate a mechanical operation which in turn operates the valve mechanism. Solenoid is one is which the plunger is pulled when the solenoid is energized. The name of the parts of the solenoid should be learned so that they can be recognized when called upon to make repairs, to do service work or to install them.

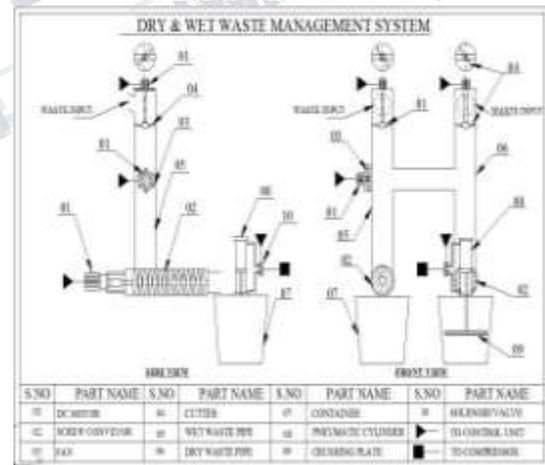


2.5 CONTROL UNIT

In our project the main device is a micro controller. It is used to control the whole unit of this project. The micro controller is connected to the control unit. The control unit is connected with the battery to get the power supply.

Microcontrollers are destined to play an increasingly important role in revolutionizing various industries and influencing our day to day life more strongly than one can imagine. Since its emergence in the early 1980's the microcontroller has been recognized as a general purpose building block for intelligent digital systems. It is finding using diverse area, starting from simple children's toys to highly complex spacecraft. Because of its versatility and many advantages, the application domain has spread in all conceivable directions, making it ubiquitous. As a consequence, it has generate a great deal of interest and enthusiasm among students, teachers and practicing engineers, creating an acute education need for imparting the knowledge of microcontroller based system design and development. It identifies the vital features responsible for their tremendous impact; the acute educational need created by them and provides a glimpse of the major application area.

III. DESIGN AND DRAWING



SQUARE DC MOTOR

CALCULATION:
SPECIFICATION:

(A) Speed N = 30 RPM Voltage V = 12 Volt

Current I = 0.3 A (loading condition) Current I = 0.06 A (No Load Condition) Power $P = V \times I = 12 \times 0.3 = 3.6$ WATT
 $1 \text{ WATT} = 0.00134102 \text{ HP}$

$$3.6 \text{ WATT} = 3.6 \times 0.00134102$$

$$P = 0.0048 \text{ HP}$$

Motor Efficiency = 36%

FORMULAE:

Good science project does not stop with building a motor. It is very important to measure different electrical and mechanical parameters of your motor and calculate unknown values using the following helpful formulas.

This formula could be used in many cases. You may calculate the resistance of your motor by measuring the consumed current and applied voltage. For any given resistance (in the motors it is basically the resistance of the coil) this formula explains that the current can be controlled by applied voltage.

Electrical power of the motor is defined by the following formula:

$$P_{in} = I \times V$$

Where,

P_{in} – input power, measured in watts (W) I – current, measured in amperes
 V – applied voltage, measured in volts (V)

Motors supposed to do some work and two important values define how powerful the motor is. It is motor speed and torque – the turning force of the motor. Output mechanical power of the motor could be calculated by using the following formula

$$P_{out} = T \times \omega$$

Where,

P_{out} – output power, measured in watts (W)
 τ – torque, measured in Newton meters (Nm)
 ω – angular speed, measured in radians per second (rad/s).

Calculate angular speed if you know rotational speed of the motor in rpm:

$$\omega = N \times 2\pi / 60$$

Where,

ω – Angular speed, measured in radians per second (rad/s);

rpm – rotational speed in revolutions per minute;
 π – Mathematical constant pi (3.14).

60 – Number of seconds in a minute.

Efficiency of the motor is calculated as mechanical output power divided by electrical input power:

$$E = P_{out} / P_{in}$$

Therefore

$$P_{out} = P_{in} \times E$$

After substitution we get

$$T \times \omega = I \times V \times E$$

$$T \times N \times 2\pi / 60 = I \times V \times E$$

Connect the motor to the load. Using the motor from generator kit is the best way to do it. Why do you need to connect the motor to the load? Well, if there is no load – there is no torque.

Measure current, voltage and rpm. Now you can calculate the torque for this load at this speed assuming that you know efficiency of the motor.

Motor torque changes with the speed. At no load you have maximum speed and zero torque. Load adds mechanical resistance. The motor starts to consume more current to overcome this resistance and the speed decreases. If you increase the load at some point motor stops (this is called stall). When it occurs the torque is at maximum and it is called stall torque. While it is hard to measure stall torque without special tools you can find this value by plotting speed-torque graph. You need to take at least two measurements with different loads to find the stall torque.

WORKING PRINCIPLE:

In apartments, garbage is thrown in the hopper, wet and dry wastes each respectively. Initially the fan blades will cut the wastes into pieces and send it to the base. In between a blower system is attached, where dry wastes from the wet wastes are separated and blown to the dry waste. Both wastes collected in the screw conveyor which is being operated by the dc motor here the wastes are compressed finely to send to final stage. In dry waste using the pneumatic cylinder, wastes are compressed to reduce the space consumption.

IV. CONCLUSION

This project is made with pre planning, that it provides flexibility in operation.

This innovation has made the more desirable and economical. This project "DRY AND

WET WASTE MANAGEMENT SYSTEM" is designed with the hope that it is very much economical and help full to road construction.

This project helped us to know the periodic steps in completing a project work. Thus we have completed the project successfully.

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