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**MODELING, ANALYSING AND FABRICATION  
OF  
PEBBLE STUFFER**

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**Abstract:** - To reduce the man power and manual stress in the field of bore well industries and to reduce the lead time, this project has been analyzed and fabricated. The aim of the project is to reduce the work of filling pebbles into the borewell by reduced man power (i.e.) automated way. Here a distributor is attached to the mouth of the bore well, which is a rotation enabled machine. And the pebbles are made to flow from the hopper to the distributor via belt conveyor. Through the rotating distributor which is of patterned slots, the pebbles flow in to the bore filter in structural manner. This machine is very compact and weighs less. Without considering the conveyor and hopper, this is portable up to a single man can carry, very simple parts and construction provides an easy way of service and repair. The operation is fully cost efficient both by means of reduction in worker wages as well as machine parts.

**Keyword:** Pebble, Bore well, automated stuffing

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## 1. Introduction

This project is meant for stuffing or filling the bore well pipe filters with pebbles in an easy manner or in a patterned manner. This is mainly designed and fabricated to reduce man power in the bore well department. On present scenario the pebbles are filled in bore well by means of man power. In general for a single bore of normal feet needs one load of pebble this may weigh up to 2-3 tons. Not only man power, each and every person should carry a lot of load.

## 2. Pebble stuffer

Pebble Stuffer is nothing but a small machine which is used to reduce the man power and manual stress in the field of bore well industries and to make work time consumption. We had designed a simple structural mechanism to fill the bore filter with pebbles. In our project we had made a simple conical spreader which makes the pebble flow in a circular manner. A base that rotates according to the flow of pebbles. A conveyor is used to take the pebbles from the hopper to bore.

### **3. DESCRIPTION OF PARTS**

#### **3.1 DISTRIBUTER**

##### **3.1.1 CONE**

A cone shaped distributor is used to spread the pebbles from the conveyor into the bore pipe.

##### **3.1.1 SEPERATOR**

A separator with four number of slots and a separator blade is placed id this separator. The conical distributor is mounted above the separator.

#### **3.2 GEARED DC MOTOR**

##### **3.2.1 DEFENITION**

Geared motor is used to rotate the shaft on which the separator is mounted. Through which the separator rotates to fill the pebbles in the bore structurally.

##### **3.2.2 REQUIREMENT OF MOTOR**

The motor is of 100 rpm and a power of 12v, 3amps is required to operate this motor. And has a pulling power of 5 kg.

#### **3.3 V-BELT**

##### **3.3.1 DESIGNATION**

- Cross- Section symbol - A
- Usual load of drive - 0.75 - 5 Kw
- Min. Pulley pitch diameter - 20 mm
- Nominal top width - 10 mm
- Nominal thickness - 8mm
- Weight per meter - 0.168 Kgf

#### **3.4 SHAFT**

##### **3.4.1 DEFENITION**

Shaft is a rotating machine element which is used to transmit power from one place to another place .the power is delivered to shaft by some tangential force and the resultant torque set up within the shaft permits the power to be transferred to various machines linked up to the shaft

In order to transfer the power from one shaft to another ,the various members such a pulleys, gears, etc .,are mounted on it.

A shaft of 10 inch length is used to rotate the separator and to hold it. The shaft is connected to the geared motor by a v-belt.

##### **3.4.2 REQUIREMENT OF THE SHAFT MATERIAL**

- It should have high strength
- It should have good mach inability
- It should have high wear resistant properties
- It should have good heat treatment properties

#### 4.1 WORKING PRINCIPLE

The pebbles are first filled in the hopper, and then the pebbles are transferred to the conveyor belt through a slot or outlet in the hopper. Then the pebbles are driven to the distributor through the belt conveyor. Then the distributor spreads the pebbles and fills the bore filter in a structural manner.

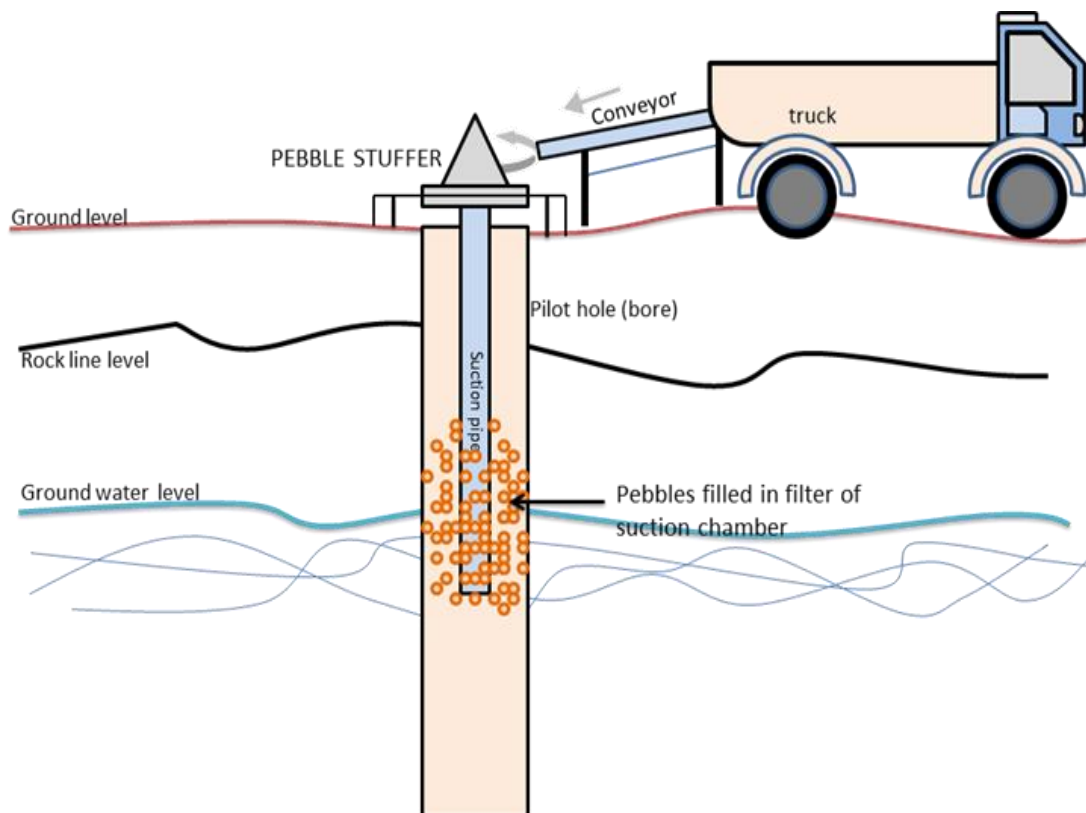
#### 4.2 COMPONENTS USED

The following components are used in the machine.

- Conical distributor
- Separator
- Shaft
- V-belt
- Geared motor

#### 4.3 CONSTRUCTION

- The gear motor and the shaft is placed over a stand and connected by a v-belt.
- Then the separator and the conical distributor are welded together.
- Then the distributor is mounted over the shaft.
- Then at last the set up is placed at the mouth of bore pipe.
- Then the pebbles are made to flow from hopper bore via conveyor.



## 5. FIGURES

### 5.4.1 SEPERATOR

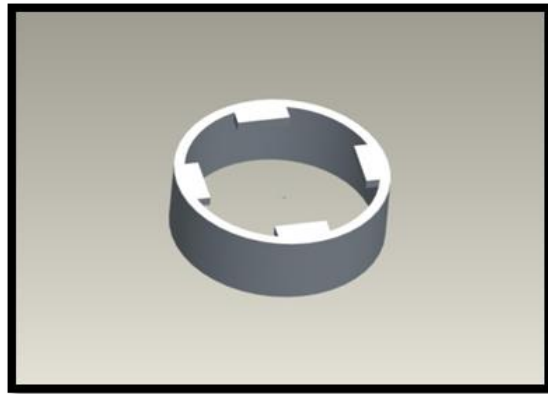


Fig 5.4.1

### 5.4.2 CONICAL SEPERATOR

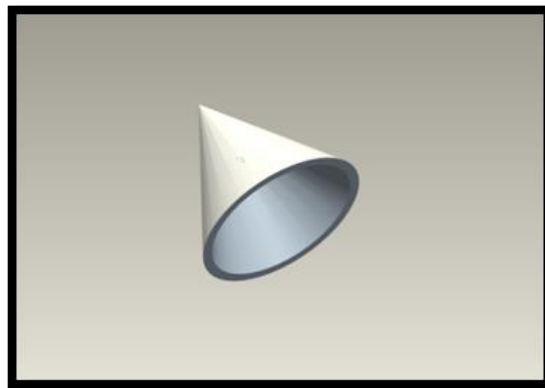


Fig 5.4.2

### 5.4.3 FILTER PIPE

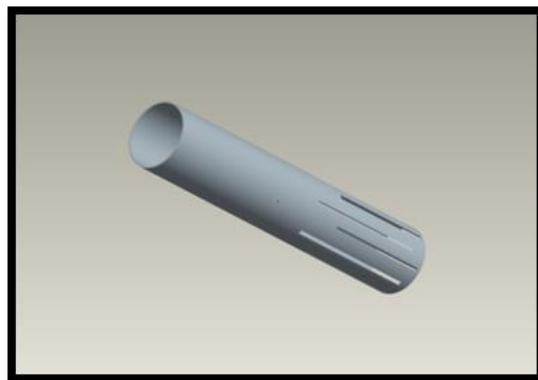


Fig5.4.3

#### 5.4.4 SUCTION PIPE

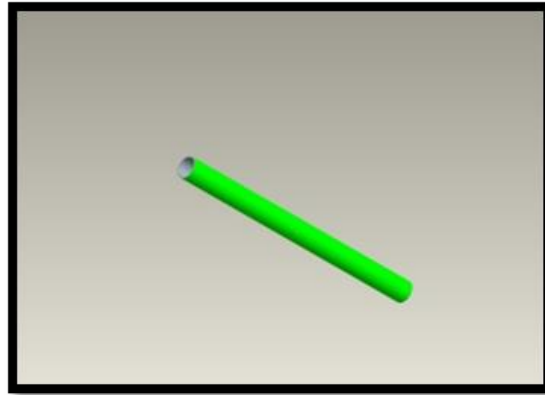


Fig 5.4.4

#### 5.5 ASSEMBLY DIAGRAM

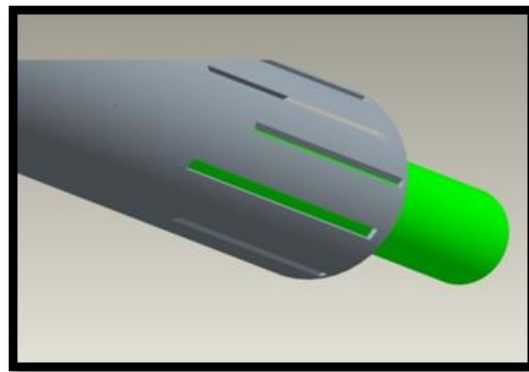


Fig 5.5.2

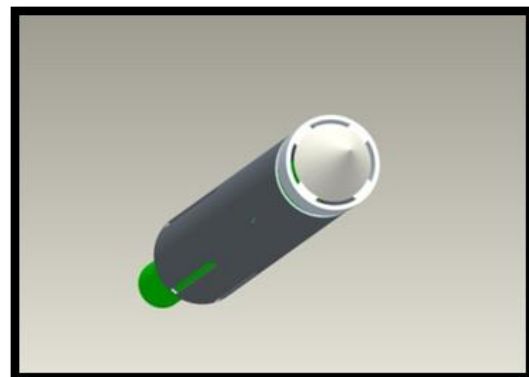
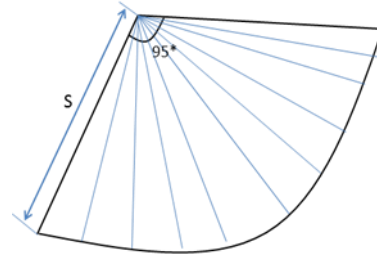
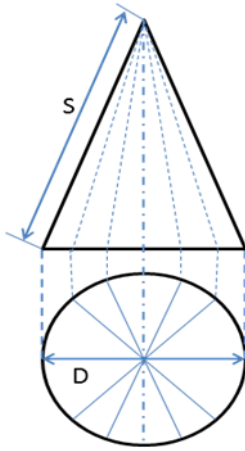


Fig 5.5.3

## 6. EQUATIONS

$$\theta = \frac{180 \times \text{Diameter of the base (D)}}{\text{Slant height (s)}} = \frac{180 \times D}{s} = \frac{180 \times 0.13}{0.25} = 95^\circ$$



## 7. CONCLUSION

This is the new study in the field of bore wells, to reduce the manual work and stress. This study gives a clear view to know about the automation of stuffing pebbles in the sectional area of the bore. Our project can be used as a product in bore well companies, as our project is very compact in size and easy to handle it will make revolution in the field of bore well industries.

## 8. REFERENCES

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