International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 04 Issue: 08 | Aug -2017 www.irjet.net p-ISSN: 2395-0072

DEVICE FOR MANUAL WATER BORING

Albert Francis A[a], Ajith kumar G[b], Ahilesh R.N[c], Abilash Ebenezer G[d]

[A,b,c,d] *UG Students, Department of Mechanical Engineering,*
K.Ramakrishnan College Of Engineering,
Tiruchirappalli,Tamilnadu,India-621112.

Abstract: The effective design of the machine is made conveniently through selected components which reduces the human effort and investment cost. The design of the machine can minimize the time taken and failure of drilling in underground. The selection of low speed high torque diesel engine is the main source of the design. The air compressor and the centrifugal pump is the additional features of the design. The main power shaft is connected to the primary and secondary shafts. The additional components such as wheel, ear and pump shaft is attached with the primary shaft. The most of the transmission done by belt drive. The pulley diameter can be varied depending upon our requirement. The secondary shaft's power is transmitted from horizontal to vertical by using bevel gears. The connecting rod holes are provided for supplying air pressure and water. The external thread of connecting rod is provided for movement in vertical direction. Four pillars are provided in the machine design to reduce the shock of the machine.

Key words: primary and secondary shaft, pump, diesel engine, gear, belt drive.

1. INTRODUCTION

Water is most important to every living species. Now a days water source is reduced due to various causes of pollution. The water is used in various purposes such as drinking, cooking, cleaning and in agriculture field. The water is also needed in manufacturing, production and chemical laboratories. The source of water can be taken from the river, pond and rain water. The agricultural water is mainly dependent on river, rain water and underground water. The underground water is non-polluted source in the world. The surface water's purity is automatically reduced by the mixing of sewage and industrial wastes. The effect of industrial water waste increases soil depletion. The drinking water is purified by various types of desalination techniques. Because the unpurified water is dangerous to health. The contamination of polluted air mixture in atmosphere is the main causes of acid rain. So now a days most of the people are in need to use underground water .The ground water level can be maintained by various awareness programs which are conducted by many of them. Polyethylene bags reduces the underground water level. Because these bags stop the water flow in top of the ground surface, therefore evaporation takes place. The ground water extraction can be done by boring. The size of the diameter of bore is selected by the requirement. The underground boring is not possible by every machines.

2. LITERATURE REVIEW

In our life we are using many machines for human comfortable zone. These machines are to minimize the time taken for the job and reduce the human effort. In Ancient days separate machines are available for underground boring. By the growth of technology three pillars which makes a cone shape setup is used to make boring with the power source of human. The time taken for such bore is maximum and more number of persons are required for completing the boring .The pressure of the tool and rotation is only done through human effort. So it should be reduced, there are many innovators who introduced the machines for preparing the holes and remove the soil by using crane buckets. The demerits of the boring machine is that it takes more space for installation. The initial investment cost is maximum and does not possible for in-between the cultivated lands. Because the wheel thickness is maximum. The advanced machines are working only with the help of pressure. It is suitable for urban area dry surface. But for wet surface agricultural lands it is not possible by that machines. In agricultural lands underground water is available nearly to surface with minimum depth .The selection process of the location for hole making is difficult. The existing high powered machines are required for rocky areas and where water is present in highly deep from surface.

3.EXISTING DESIGN

Fig 3.1 manual operation **Fig 3.2 heavy machines for boring**

4. WORKING

The design of boring machine is totally made with the help of low speed diesel engine. Because the low speed motor can take constant load applied in the bore wells .The diesel engine output is connected to the primary shaft. The drive wheel, suction pump and rope extension are attached with the primary shaft. The wheel drive is to transmit the rotary motion from primary to the secondary shaft. The belt drive and the wheel is placed at three locations near engine output, primary and secondary wheels. The primary shaft wheel is used to receive the power from engine shaft and deliver the power to the secondary shaft. The another wheel is connected to the centrifugal pump. The pump supplies the water from the barrel to the bore holes for soil softening purpose. The intermediate gear is connected to the rope wheel and is rotated automatically with respect to given gear ratio.

In clock wise direction the drill bit is moved downwards automatically by the source of transmitted power. But the lifting purpose of drill bit and connected hole rods is mainly done by the rotating rope wheel. A handle is provided for adjusting the gear mated in the rope wheel lifting. An air compressor is provider at the bottom of the engine and the source of air compressor is the diesel engine. The compressor is used to create the high air pressure through the piston and cylinder arrangement and it is connected through the connecting rod holes. The high velocity of air creates a impact on the soil. The drill bit is connected to the rotating connecting rod. The connecting rod's external thread is provided for the machine. The primary shaft power is transmitted to the secondary shaft with the help of belt drive. The drive wheel is given a ratio to transmit the power from initial to final rotating rod .The equal diameter of the drive wheel can fulfill the complete motion. The secondary shaft uses the bevel gears for transmitting the rotary motion from horizontal secondary shaft to vertical connecting rod movement. The number of connecting rods that we attach can be modified depending upon our height of the requirement. The two holes that are provided for the connecting rod. The one hole is to deliver the air at high pressure and the another one is to deliver the water for softening purpose. The drill bit that we use can be changed to our requirement through the type of soil.

5. DESIGN

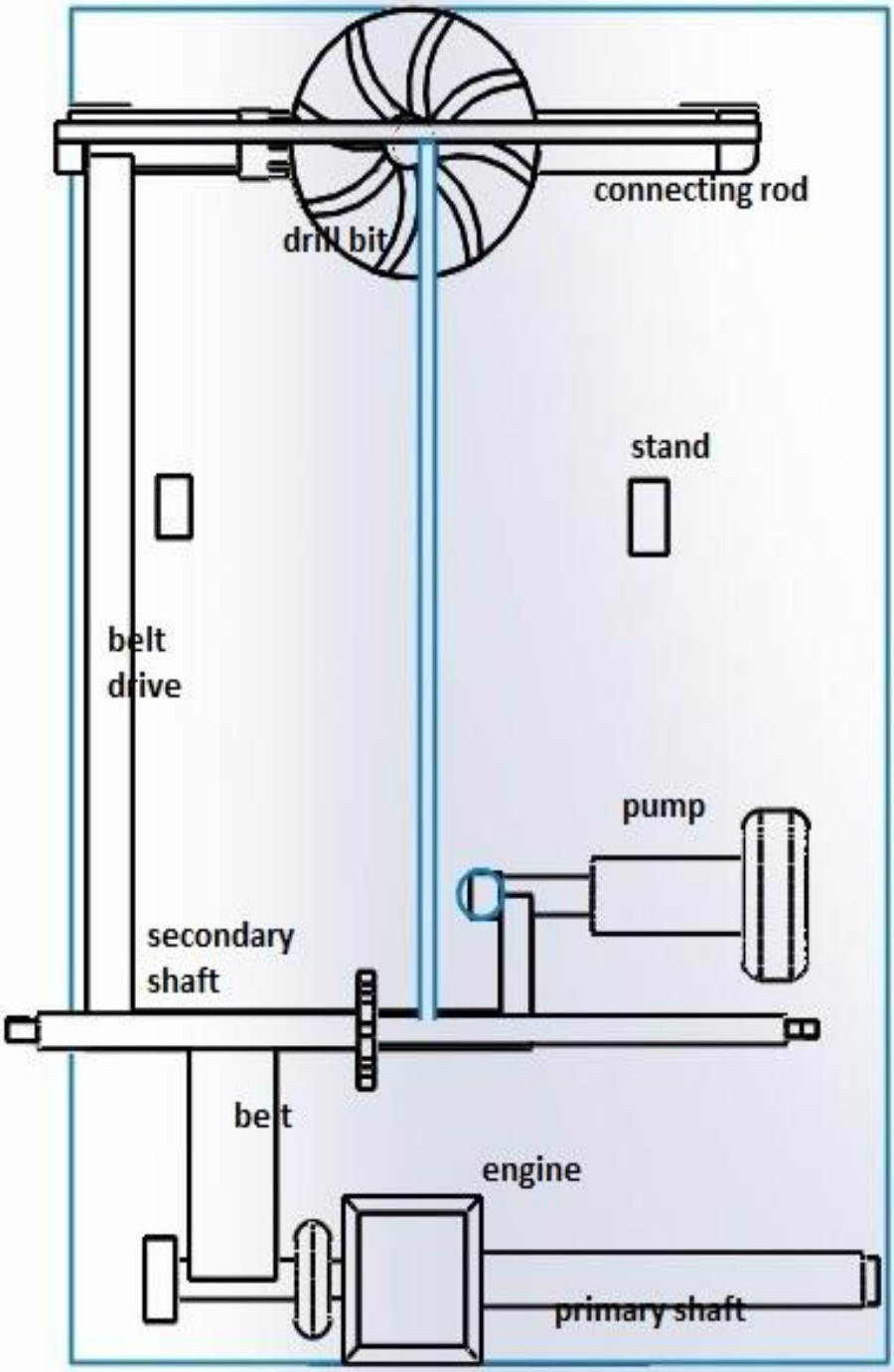

Fig 5.1 top view

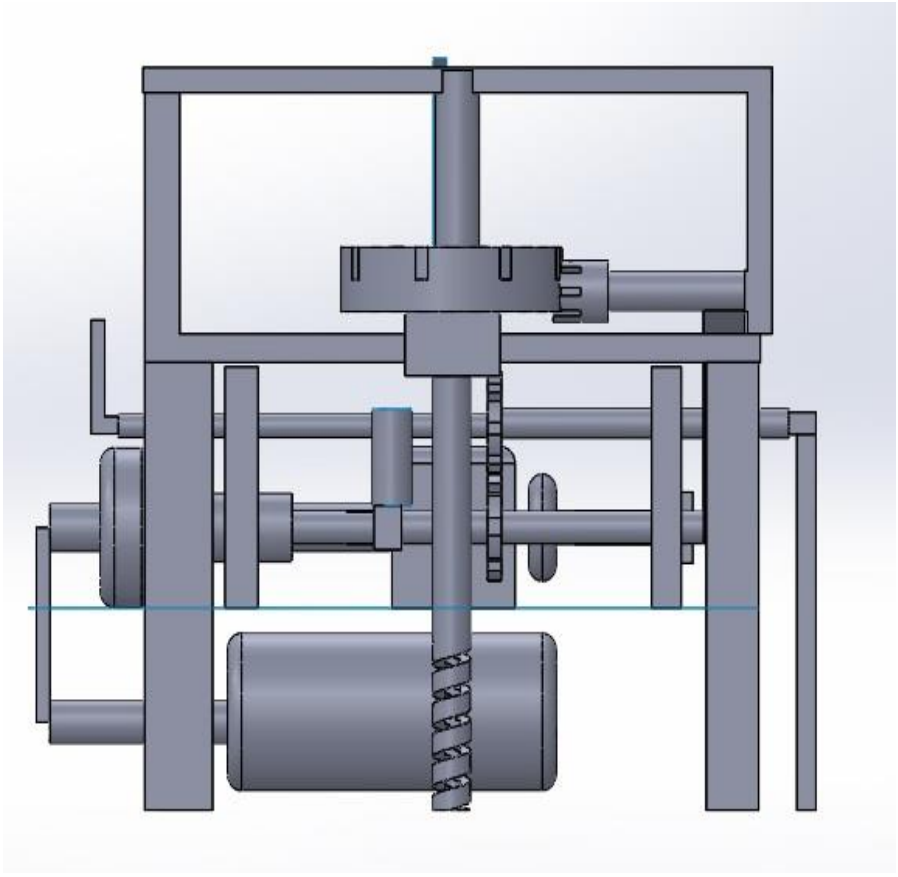

Fig 5.2 side view

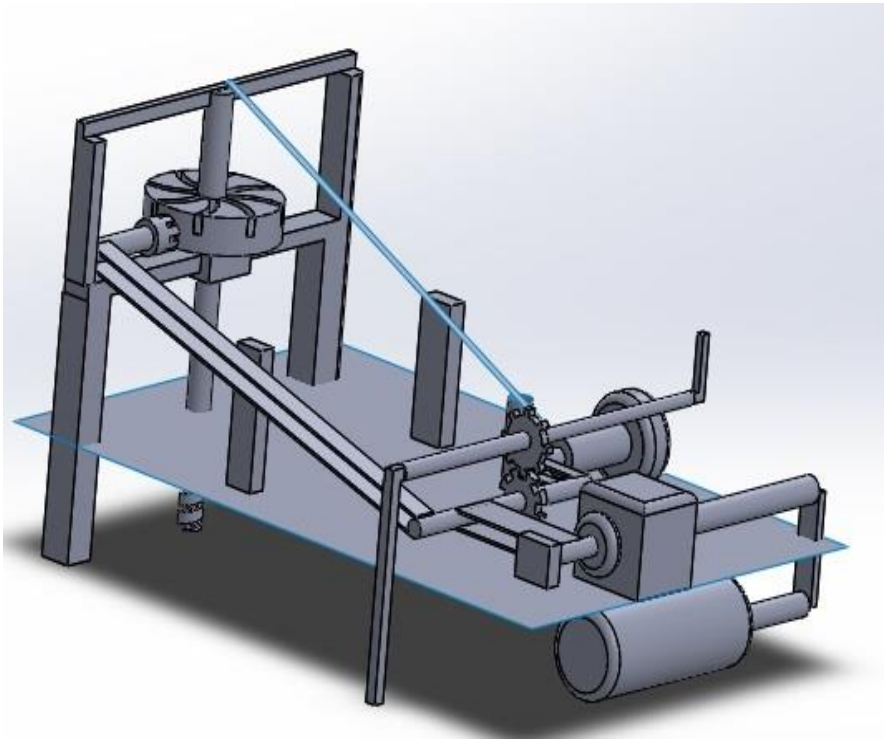

Fig 5.3 isometric view

6. CONCLUSION

The design of boring machine is to minimize the occupying space on the surface. The maintenance cost of the machine is very minimum. The machine also reduces the human effort of applying pressure and the number of man power requirement is minimized. The machine is very useful for underground boring in the field of agriculture. Low cost components are used to reduce the initial investment. The machine is a great alternate for manually operating boring methods. The design is comfortably created in between the similarities of manually operated boring machine and the advanced vehicle operated boring machine. The machine can be used to drill in both dry and wet surfaces.

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