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# Fabrication of wheel trencher attachment for tractor

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## ABSTRACT

In agriculture drip irrigation work, there is a need of small size digging. Nowadays JCB and man power is used for digging process. Using of JCB is more expensive in cost wise and time wise. It is not suitable for small depth and width of digging process in drip irrigation work. Using of man power also more expensive in cost wise and time wise. So we find alternative solution for small size of digging process, this wheel trencher attachment is very helpful to farmers for drip irrigation digging, underground pipeline works and any other small digging process. Man power, time and cost of digging are reduced by using this wheel trencher attachment.

## INTRODUCTION

The design a trenching machine is small in size, Tractor mount trenches can be used in compact spaces. For various gardening process tractor mount trencher are used.A trencher wheel mount in the front portion of tractor the trencher having a boom pivotal up and down and a pair of laterally spaced swivel wheels beneath the trencher supported on arms.A trencher machine for attachment to a tractor movably mounted hydraulically for up and down movement, the trencher having a creep drive for producing a slow forward movement pushing the tractor forward moving direction. A provided for cutting a trench in soil or earth by driving a cutter tube member through the soil and injecting compressed fluid into the tube member along the flow of compressed fluid into the tube member to break up the soil and drive it through the tube member along the flow of compressed fluid. When the neutral/start position and a drive positions to control the direction of the trencher, the control system is configured to allow the power assembly to be started only when the control lever is in a Neutral / start position and prevents starting of the power assembly when the control lever is in other than a neutral/start position. This invention relates generally to a system for providing for manually moving trenchers and other small ground engaging equipment while in operation, trenching is required for the below ground installation of many types of utilities including electrical power, gas, telephone, water and sewer. Control of the position of the boom assembly is also provided in order to control the depth of excavation and to provide a transport mode. The end assembly is arranged between the side walls at free end, this assembly is rotated by supporting of chain tooth assembly. The boom assembly is mounted for movement between a transport position and a digging position.The effective cutting depth is determine by angle of frame carrying chain in horizontal position and hydraulic cylinder is fixed in vertical position. Hydraulic cylinder mounted in sub frame of a body. A roller supporting frame is mounted in body in vertical position and water tank is also mounted in frame itself. A roller frame includes box beam for receive telescopic fashion in beam members.A trench digging attachment mounted on a motor vehicle, said motor vehicle including a rear deck and a drive means driven from the

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engine. A trench digging attachment in which the boom can be moved from side to side of the vehicle which might be desired.

## LITERATURE REVIEW

A trench is a long narrow ditch dug in the ground, Trenching machine are bifurcated depending upon their size and consist of portable, attachment and heavy duty type. These trenchers are comfortable because of their small size and low cost. The cost of the trenching machine has been reduced making it economical for manufacturing.

The result is reduced human effort and reducing time consumption. Such conditions occur on a large scale in India due to the complexity of terrain.

The trencher will be mounted in the trailer place with the connection of the power take off. It has three point pivot used motion of trencher attachment in up and down. The laterally gap trencher wheel in behavior the power transmission rear wheels to front in pivoted arm in connected by gravity of frame is fixed forward the trencher. The trencher and its frame are supported on a wheel means preferably comprising two laterally spaced [1].

A trenching attachment for mounting on a wheeled tractor having an engine, a power take off and a hydraulic system which are both driven by the engine, and a three-point hitch, said attachment comprising a frame with two spaced wheels, the trenching attachment as set forth in claim wherein, the boom has boom locking means directly connected thereto, and to the frame, for providing mechanical locking of the boom in an upright position [2].

Trenches are cut in soil or earth for various purposes. These include, among others, laying underground media such as, drain tile or utility conduits. Drain tile, also known as weeping tile among other names is perforated piping installed underground and often immersed in a bed of stone to transport water as part of an irrigation system.

A neutral/start position and a drive position and thence in another plane to forward or reverse positions to control the direction of the trencher, this method for controlling operation of a hand operated wheeled trencher according to claim further including and wherein said preventing means comprises an interlock movable with said operator controlled handle and having a profiled surface extending across the path of movement of the multi-function lever [4].

It is a manual operating trenching system and used in small ground digging process. The ground drive force is applied to the frame at a point resultant affect the performance of the trencher. The tool is attached in the side frame a body for move from place to place. The mechanism that prevents of travel trencher in a opposite direction of a trenching [5].

The boom assembly is having for digging process of chain and tooth assembly is rotatable. The boom idler and for clamping the side walls of the boom to each other to minimize clearance between boom and boom end idler. A trencher boom assembly adapted to have endless digging chain with the digging elements. The both chain and tooth assembly entrained at one end about a chain drive sprocket [6].

The cutting depth of this type trencher is determined by angle of frame carrying the endless chain relative to the horizontal. In this trencher type frame having a one end and it will mounted in vehicle for the movement in vertical plane parallel to the movement of vehicle [7].

The easy understanding of the trencher interaction through the analyses of the design and mechanics is essential. The force and moment on the cutter is based on the analysis of the mechanics and the individual cutting tool is determined. The roller equipped frame includes a walled structure which serves as a water tank. A hydraulic cylinder is disposed intermediate the tractor hitch bar and the attachment in an inclined manner to bias the attachment downwardly to increase ground pressure [8].

Cutting tool is mainly made by high speed steel and cutting temperature are maintained properly. Heat treatment operations are required from past few years. High speed steels are introduced in Second World War time for defense items and then it will be used for other purposes for high strength was required [9].

## WORKING

The trencher wheel attachment for tractor is used for digging process. From tractor PTO (powers take off) take the power output. Differential is connected in the PTO by using the universal joint. Trencher wheel is fixed in one end of differential and weight is fixed in another side of the differential for balancing of weight [10].The depth of cut, angle, speed and parameters of digging is may vary with respect to the application of working.

## RESULT AND DISCUSSION

We reduce the man power by using the trencher wheel attachment and also reduce the cost of the drip irrigation process. By using this trencher wheel attachment 452 meter will be digged for 1hour for same depth around one foot.

## CALCULATION

- Weight of the wheel - 130kg
- Diameter of the wheel - 2.9m
- Cutting tooth length - 0.9652m
- PTO speed - 1506rpm
- Cutting speed - 452m/hr
- Idle speed - 400rpm
- Cutting speed - 250 to 300rpm
- Breathe of wheel - 0.12m
- Breathe of cutting tool - 0.05m
- Height of cutting tool - 0.076m
- Thickness of cutting tool - 0.01m

## CONCLUSION

We complete our project successfully with above mentioned specification and components. As per our measurement trencher wheel digs 452m/hr. We reduce the human effort in digging process with good performance. This project is very helpful for agricultural drip irrigation process, under water pipeline work, under electric cable line works and it reduce the cost and time of the digging process.

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