HAND HELD TAMPPING DEVICE

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Abstract
A hand held tamping device comprises an engine, an elongated housing, and a connection chamber. The engine is coupled by a clutch to a drive shaft and is capable of rotating the drive shaft. The elongated housing includes a tamping tube to tamp an object. The connection chamber houses the drive shaft and connects the engine and the elongated housing. The drive shaft extends into the elongated housing and is fixedly coupled to an eccentric drive that rotates with the drive shaft and is attached to a connecting rod that is coupled to the eccentric drive at the proximal end of the connecting rod and extends into the tamping tube at the distal end of the connecting rod. The distal end of the connecting rod is fixedly coupled to the tamping tube. The proximal end of the connecting rod rotates with the eccentric drive and the distal end of the connecting rod moves up and down in the elongated housing facilitating the tamping tube moving up and down in the elongated housing as the engine rotates the drive shaft.
HAND HELD TAMPPING DEVICE

FIELD OF THE DISCLOSURE

[0001] The present disclosure relates to tamping devices, or compacting devices, and more particularly, the disclosure relates to a hand held tamping device, especially suitable for tamping the soil around a wooden post that is placed in a hole in the ground.

BACKGROUND OF THE INVENTION

[0002] In building a fence using wooden posts, it is necessary to bore a hole in the ground and place the post in the hole. The hole is then filled with dirt taken from the hole to set the post in a solid position to support the fence. In order to do this it is necessary to tamp or compact the dirt in the hole. This is commonly done by using a stick or by stepping on the dirt and pushing it down into the hole. There is a need for a lightweight portable device that can tamp the dirt in the hole more quickly and more firmly than can be done with a person standing and jumping on the dirt to make it more compact in the hole against the post. A lightweight device needs to be portable as fences are sometimes built in out-of-the-way places. Big machinery is not suitable for tamping the dirt in the hole around the post because of the size of the equipment and the small size of the hole.

SUMMARY OF THE DISCLOSURE

[0003] The invention comprises an engine, an elongated housing, and a connection chamber. The engine is coupled to a drive shaft and is capable of rotating the drive shaft. A centrifugal clutch may be placed between the engine and the drive shaft. The elongated housing houses a tamping tube to facilitate tamping an object, such as dirt. The connection chamber houses the drive shaft and connects the engine and the elongated housing. The drive shaft extends into the elongated housing and is fixedly coupled to an eccentric drive that rotates with the drive shaft. This invention further includes a connecting rod that is fixedly coupled to the eccentric drive at its proximal end and extends into the tamping tube at the distal end of the connecting rod. The distal end of the connecting rod is fixedly coupled to the tamping tube. The proximal end of the connecting rod rotates with the eccentric drive and the distal end of the connecting rod facilitating the tamping tube to move up and down in the elongated housing as the engine rotates the drive shaft.

[0004] Other systems, methods, features, and advantages of the present invention will be or become apparent to one with skill in the art upon examination of the following drawings and detailed description. It is intended that all such additional systems, methods, features, and advantages be included within this description, be within the scope of the present invention, and be protected by the accompanying claims. The objectives set forth above have been obtained by combining a small engine with a drive shaft that has an eccentric plate on the end for rotating a connecting rod with a foot up and down to tamp the soil. The eccentric plate converts a circular motion of the drive shaft from the engine into reciprocating motion to move the foot at the end of a tamping tube up and down to tamp the soil.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] Many aspects of the invention can be better understood with reference to the following drawing. The components in the drawing are not necessarily to scale, emphasis instead being placed upon clearly illustrating the principles of the present invention. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views.

[0006] The FIGURE is a cross-section of the tamping device of this invention.

DETAILED DESCRIPTION

[0007] The disclosed apparatus can be better understood with reference to the FIGURE. The components in the FIGURE are not necessarily to scale. The FIGURE is a partial section view of a hand held tamping device. The hand held tamping device 10 includes an engine 1 that is preferably a 2-cycle internal combustion engine similar to those used in hand held grass or weed string trimmers. The engine could be a 4-cycle internal combustion engine. It could also be an electric engine, with or without a rechargeable battery pack. The engine 1 uses a clutch 3, preferably a centrifugal clutch. A manually operated clutch could also be used. The clutch 3 is placed inside a connection chamber 5 between the engine 1 and an elongated housing 13. The engine 1 is coupled through the clutch 3 to a drive shaft 9 that is housed in the connection chamber 5 and extends into the elongated housing 13. The engine 1 is capable of rotating the drive shaft 9 to tamp or compact dirt. The connection chamber 5 connects the engine 1 and the elongated housing 13 and is displaced between the engine 1 and the elongated housing 13. The drive shaft 9 extends through bearings 7, 11 to keep the drive shaft in the center of the connection chamber 5 and to reduce wear. In short, the bearings 7, 11 prevent the drive shaft 9 from wobbling in the connection chamber 5 as the engine 1 rotates the drive shaft 9.

[0008] The end of the drive shaft 9 that extends into the elongated housing 13 is fixedly coupled to a circular plate (or eccentric drive) 15. A connecting rod 17 is coupled to the outer edge of the circular round plate 15 at its proximal end and extends into the tamping tube 23 at its distal end. The eccentric drive could be a crankshaft similar to the type used on automobile engines. In this case the connecting rod 17 is connected to a crank that is offset from the crankshaft (not shown). The connecting rod may have a forked end for clamping around the crank of the crankshaft. Bearings may be provided between the forked end of the connecting rod and the crank to reduce wear. Any type of mechanism for converting circular motion into reciprocating motion may be used in connection with this tamping device.

[0009] The distal end of the connecting rod 17 is coupled to the tamping tube 23. The proximal end of the connecting rod 17 rotates with the circular plate 15 with the distal end of the connecting rod 17 moving up and down in the elongated housing 13 facilitating the tamping tube 23 to move up and down in the elongated housing 13 as the engine 1 rotates the drive shaft 9. The proximal end of the connecting rod 17 is connected to the circular plate 15 by a bolt, or other means, which allows the proximal end of the connecting rod to rotate freely with the circular plate 15.

[0010] There may be a rod bearing 29 which is attached to the connecting rod 17 to reduce its wear as it rotates about the circular plate 15. In this embodiment a pinhole 31 with a pin or shaft is provided to connect the connecting rod 17 to the circular plate 15. As the drive shaft 9 rotates, the
proximal end of the connecting rod 17 also rotates along with the circular plate 15 and thus, moves the connecting rod 17 up and down to facilitate tamping dirt. A balancing weight 19 may be fixedly coupled to the circular plate 15, preferably across the middle of the circular plate 15 from the connecting rod 17 on the outer edge of the circular plate 15 so the circular plate 15 can be balanced as the circular plate 15 rotates. Other means of balancing an eccentric drive may be used.

[0011] The circular plate 15 is fixedly coupled to a member such as a bar, or a rod 37 that is fixedly coupled to a tamping tube 23. The elongated housing 13 houses the tamping tube 23 which is guided along the inner walls of the elongated housing 13 via guide bushings 25, 27, which are located near the ends of the elongated housing 13. The guide bushings 25, 27 are displaced between the inner walls of the elongated housing 13 and the outer wall of the tamping tube 23. The guide bushings 25, 27 enable the tamping tube 23 to move up and down in the elongated housing 13. A hardened pin 45 at the bottom of the tamping tube 23 keeps a tamping foot 47 aligned with the tamping tube 23. The tamping foot 47 can be of different sizes, depending on the work being done. The foot 47 enables the tamping device to pound an object, such as soil, around the post. Other loose materials such as cement or sani can likewise be tamped.

[0012] The elongated housing 13 can be fixedly coupled with a handle 41. A handle throttle control 21 may be placed on the handle 41 and attached with a throttle cable 43 that is coupled to the engine 1. The throttle control 21 and the throttle cable 43 control the speed of the engine; thus, control the rate of tamping of the soil. The centrifugal clutch 3 only engages when the engine speed is increased. Thus, the tamping is started by opening the throttle of the engine 1 with the throttle control 21. Likewise, the tamping is stopped by closing the throttle with the throttle control 21.

[0013] It should be emphasized that the above-described embodiments of the present invention, particularly, any “preferred” embodiments, are merely possible examples of implementations, merely set forth for a clear understanding of the principles of the invention. Many variations and modifications may be made to the above-described embodiments of the invention without departing substantially from the spirit and principles of the invention. All such modifications and variations are intended to be included herein within the scope of this disclosure and the present invention and protected by the following claims.

1. A hand held tamping device comprising:
   - an engine that is coupled to a drive shaft and is capable of rotating the drive shaft;
   - an elongated housing that includes a tamping tube to facilitate tamping an object;
   - a connection chamber that houses the drive shaft and connects the engine and the elongated housing, wherein the drive shaft extends into the elongated housing;
   - an eccentric drive that is fixedly coupled to the drive shaft and rotates with the drive shaft;
   - a connecting rod that is fixedly coupled to the eccentric drive at the proximal end of the connecting rod and extends into the tamping tube at its distal end, wherein the distal end of the connecting rod is fixedly coupled to the tamping tube, wherein the proximal end of the connecting rod rotates with the eccentric drive and the distal end of the connecting shaft moves up and down in the elongated housing facilitating the tamping tube to move up and down in the elongated housing as the engine rotates the drive shaft.
2. The tamping device of claim 1 in which the drive shaft is connected to the engine by a centrifugal clutch.
3. The tamping device as defined in claim 1, further comprising a balancing weight that balances the forces imposed by the connecting rod on the eccentric drive.
4. The tamping device as defined in claim 1, wherein the connecting rod is coupled to the eccentric drive by way of a securing pin or shaft extending through a hole in the eccentric drive and the proximal end of the connecting rod so it is capable of rotating with the eccentric drive.
5. The tamping device as defined in claim 5, wherein the connecting rod is further coupled to the eccentric drive by the inclusion of a rod bearing between the proximal end of the connecting rod and the pin or shaft.
6. The tamping device as defined in claim 1, further comprising a member that is fixedly coupled to inner walls of the tamping tube and the distal end of the connecting rod is fixedly coupled to the member.
7. The tamping device as defined in claim 1, wherein the distal end of the connecting rod is coupled to the member by way of a rod bearing.
8. The tamping device as defined in claim 1, further comprising a handle that is fixedly coupled to the outer walls of the elongated housing.
9. The tamping device as defined in claim 9, wherein the handle includes a throttle control that controls the speed of the engine.
10. The tamping device as defined in claim 10, further comprising a throttle cable connecting the throttle control to the engine and enabling the throttle control to control the speed of the engine.
11. The tamping device as defined in claim 1, further comprising guide bushings between the inner walls of the elongated housing and the outer wall of the tamping tube, the guide bushings enabling the tamping tube to move up and down in the elongated housing.
12. The tamping device as defined in claim 1, further comprising a tamping foot that is fixedly coupled to the tamping tube and tamps the object as the tamping tube moves up and down in the elongated housing.
13. The tamping device as defined in claim 1, further comprising a tamping foot that is fixedly coupled to the tamping tube and tamps the object as the tamping tube moves up and down in the elongated housing.
14. The tamping device as defined in claim 1 in which the engine is a 2-cycle gasoline engine.
15. The tamping device as defined in claim 1 in which the engine is an electric motor.
16. The tamping device of claim 15 in which the electric motor is powered by a battery pack.
17. The tamping device of claim 15 in which the electric motor is powered by a battery pack.
18. The tamping device of claim 1 in which the eccentric drive comprises a crank that is offset from the drive shaft with the proximal end of connecting rod coupled to the crank.