RAKER ASSEMBLY USED FOR CLEARING DEBRIS IN AREAS SURROUNDING TREES IN A PLANTATION

FIELD OF INVENTION

The present invention relates generally to a raker assembly adapted to be detachably connected to a heavy machinery such as mini tractor and used for clearing debris in areas surrounding trees in a plantation.

BACKGROUND ART

In oil palm plantations, loose material such as leaves, small stones, wood chips and the like material are often collected using a raker.

Once the material has been collected, the operator generally needs to bend over to pick up the raked materials.

The current manual methods of clearing debris surrounding oil palm circle are by manual hand raking which is not only time consuming but also tedious. The process requires the workers to bend down and stand up repeatedly, which cause fatigue and consumes a huge amount of time.

Accordingly, the need exists to mechanize clearing process so as to improve the productivity and work method. It would directly reduce the requirement of labour.

SUMMARY OF INVENTION

Accordingly, the present invention provides a raker assembly adapted to be detachably connected to a heavy machinery such as mini tractor and used for clearing debris in areas surrounding oil palm circle, such as oil palm plantation, wherein the raker assembly includes a raker, a handle connected to a three linkage points, a plurality of tines extending from said handle mounting head wherein ends of each tine distal to said mounting head in each tine, wherein during operation, the raker will be attached to the three linkage point of the mini tractor and it will move around the palm circle in order to clear the debris and each tine moves independent of other tines upon coming into contact with an uneven surface in the plantation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a raker according to the preferred embodiment of the present invention;

FIG. 2 is a front view of the raker of FIG. 1;

FIG. 3 is a rear view of the raker of FIG. 1;

FIG. 4 is a top view of the raker of FIG. 1;

FIG. 5 is a bottom view of the raker of FIG. 1;

FIG. 6 is a right view of the raker of FIG. 1; and

FIG. 7 is a left view of the raker of FIG. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention relates generally to a raker assembly adapted to be detachably connected to a mini tractor and used for clearing debris around the palm circle. In particular, the present invention relates to a raker assembly adapted to be detachably connected to a mini tractor and used for clearing debris around the palm circle in a plantation which is able to effectively rake loose materials and debris from the ground surfaces.

Generally, the invention provides a raker assembly used for clearing debris around the palm circle in a plantation, such as oil palm plantation including a handle connected to a handle mounting head, and a plurality of arms extending from said handle mounting head.

The raker is welded with T-shaped joints attached to the longitudinal bar. Further structure stability may be provided to slide the arms beneath gathered material and support the gathered material as the raker is lifted.

In the preferred embodiment of the present invention, the arms are parallel and preferable the arms are connected by an arm extending from the end of each arm distal to the mounting head to an adjacent arm.

Each frame are welded with longitudinal bars (18) and reinforced by supporting arms, i.e., the handles (12), and connected to the mounting head (14).

The connecting arm may attach toleast one lower support arm to the handle connected to the handle mounting head. The T-shaped joints may be slidingly attached to the mounting head

preferably by a substantially rigid loop provided by T-shaped joints which slidingly engages a fixture on the mounting head. The arms (16) have sufficient flexibility to allow the raker to be used as a rake to gather together loose material and sufficient rigidity to slide beneath the gathered material.

Referring to the accompanying figures, the raker assembly according to the preferred embodiments of the present invention includes a raker (10) and a handle (12) which connected to a handle mounting head (14). Extending from the handle (12) is a plurality of arms (16).

Each of the arms (16) is connected with a longitudinal bar (18) defining a support section connected to the handle (12) that is connected to the mounting head (14) and an elongated base section extending from the support section of the longitudinal bar (18). The arms (16) may be arranged in parallel in a planar configuration to enable the base section of the arms (16) to be positioned beneath and lift the gathered material. Hence, the arms (16) are preferably provided with sufficient rigidity to accomplish the debris clearing function.

Structural strength is obtained by connecting the arms (16) at their distal ends. It is preferable that the raker (10) and the arms (16) are made from a heavy material like iron, stainless steel, titanium and gold to provide sufficient flexibility for the arms (16) to adequately perform a raking function. In the preferred embodiment of the present invention, the raker (10) and the arms (16) are made of materials like galvanized iron, Kevlar iron, high carbon steel iron, cast iron, white iron, grey iron, ductile iron, malleable iron, compacted graphite iron or wrought iron.

In the preferred embodiment of the present invention, the raker (10) consists of 8 sections and each section weighs around 10kg and therefore the total weight will be 80kg. However, it is also possible to have the raker (10) to be around 180 to 280kg so that it can withstand the unpredictable soil conditions at the plantation.

Also, thickness of the raker (10) and arms (16) also play an important role - so that they can withstand the unpredictable surface conditions at the estates. In the preferred embodiment of the present invention, the thickness of the the raker (10) consists of 4 units of tension rods (Y16) which are welded on a 6mm thick plate.

Besides that, in the preferred embodiment of the present invention, the raker (10) has eight sections if the size of the raker (10) is 2.13m (7 feet) long. As the distance between one oil palm

to another is 7.9m (26 feet), the size of the raker (10) can be smaller or bigger than 2.13m (7 feet), according to the user requirement.

Each of the sections is measured at 2.90m (9.5 feet). Therefore, the usual width of the raker (10) will be around 2.13 to 2.43m (7 to 8 feet). Of course, the number of sections can vary and depends on the width or size of the raker (10) as preferred by the manufacturer.

To provide sufficient rigidity for the raker (10) to perform the debris clearing function, each arm (16) illustrated in the preferred embodiment, preferably includes an arm extending from the distal end of each arm (16) to the distal end of an adjacent arm (16). To provide the necessary structural support, the arms (16) are substantially parallel.

As shown in the accompanying Figures, the T-shaped joints (20) may include an upper support arm, at least one lower support arm and a connecting arm. The connecting arm attaches the lower support arm or arms to the mounting head (14). To provide additional flexibility during a raking motion, the T-shaped joints (20) can be slidingly attached to the mounting head (14).

To provide additional structural strength to the T-shaped joints (20), a plurality of lower support arms is provided with the lower support arms extending between the connecting arm and the upper support arm. The provision of the T-shaped joints (20) and a bent profile to the arms (16) enables the raker to have sufficient flexibility to allow it to operate as a rake and sufficient rigidity to enable it to slide beneath and support gathered loose material.

This combination of flexibility and rigidity is further accentuated by the features of the arms (16) and gives additional strength to the arms (16) for raking materials, while retaining sufficient lateral flexibility for by-passing structures. It is preferred that the arms (16) are not joined together at their end in the vicinity of the arms to permit the arms (16) to pass through material such as grass and to enable each of the arms (16) to flex individually when raking loose material.

The handle (12) is preferably of a suitable length to allow the operator to work from an upright position and may be made from any suitable lightweight material such as aluminium tubing or timber. The orientation of the handle to the base section of the arm will depend on the weight of objects which are to be raked. Thus for heavier objects, such as rock, mud, stones etc., the angle of the handle (12) in relation to the base section is decreased so that the handle (12) is lower to the ground to allow an operator to more directly push the raker (10) beneath the materials.

By providing a plurality of arms (16) and the T-shaped joints (20), the raker (10) has sufficient structural strength to slide beneath gathered as well as sufficient flexibility to enable the raker (10) to rake. The construction of the raker (10) is also lightweight placing less physical strain on the user.

During the operation, the raker will be attached to a mini tractor and the operator will move in substantially circular motion around the oil palm circle in order to clear the debris. Each of the arms (16) moves independent of other arms (16) upon coming into contact with an uneven surface in the field to provide a rhythmic movement and this helps the raker (10) to clear the debris in all surfaces condition.

Although, the raker (10) is illustrated above in relation with oil palm plantation, it is understood that the raker (10) can be used to clear debris in areas surrounding other trees like coconut, rubber etc.

CLAIMS

1. A raker assembly adapted to be detachably connected to a heavy machinery, wherein the raker assembly comprises

a raker (10);

a handle (12) connected to a handle mounting head (14);

a plurality of T-shaped joints (20) attached to a longitudinal bar (18) connected to the handle (2); and

a plurality of arms (16) extending from the longitudinal bar (18),

wherein the plurality of arms (16) moves independently of each other arms (16) upon coming into contact with an uneven surface.

2. The raker assembly according to Claim 1 wherein the arms (16) are in planar alignment.

3. The raker assembly according to any one of the preceding claims wherein the arms (16) are substantially parallel.

4. The raker assembly according to any one of the preceding claims wherein the arms (16) further comprises an arm extending from distal ends of each arm (16) which are connected to the distal end of an adjacent arm (16).

5. The raker assembly according to Claim 1 wherein the T-shaped joints (20) includes an upper support arm, at least one lower support arm and a connecting arm, the connecting arm attaching the at least one lower support arm to the handle (12) connected to the handle mounting head (14).

6. A method of operating a raker assembly which is connected to a heavy machinery such as a mini tractor, wherein the raker assembly is adapted to be detachably connected to a heavy machinery, wherein the raker assembly comprises a raker (10), a handle (12) connected to a handle mounting head (14), a plurality of T-shaped joints (20) attached to a longitudinal bar (18) connected to the handle (12) and a plurality of arms (16) extending from the longitudinal bar (18) and wherein the plurality of arms (16) moves independently of each other arms (16) upon coming into contact with an uneven surface comprising

moving the raker (10) in a substantially circular motion around a tree such as an oil palm tree in an oil palm plantation to clear debris in areas surrounding the tree.