Abstract: The non-burnt sugar cane stalk cutting machine that using the agricultural tractor as power plant, by using the agricultural tractor with range from 105 horse-power or more as power plant, by installed the said tractor onto the body of the machine. There is chain that connected from tractor drive axles to the drive wheel of the machine, drives the machine to run at a speed of 10-20 kilometer per hour, and utilizing the tractor's power take off (PTO) to drive hydraulic pump at speed of 540 rpm, to the cutter blades. This machine can be used in harvesting the sugar cane stalk both in upright stalk or laid down stalk. There is a blower that can separate topping and leave residues from cut stalks. The conveyor system is installed in the rear of the machine to convey the cut stalks to the truck that drive along the cutting track of the machine. This machine was design with simple technology, easy and low cost to maintenance, easy to use, and furthermore, the tractor can be moved out to use in other task after the cutting season. Most of the materials and spare parts can manufactured locally, so the price of the machine is much cheaper that the imported one.
NON-BURNT SUGARCANE TRACTOR POWERED BILLET HARVESTOR

Background of the invention

This invention is tractor mounted billet type by using the agricultural tractor as power source. This machine can be used in harvesting sugar cane without prior being burnt. This machine utilized the agricultural tractor with range from 105 horse-powers or more as power source, by installed the said tractor onto the body of the machine. The chain that connected from tractor drive axles to the drive wheel of the machine drives the machine to run at a speed of 10-20 kilometer per hour. The tractor's power take off (PTO) will also be used to drive hydraulic pump at speed of 540 rpm. to the cutter blades. This machine can be used in harvesting the sugar cane stalk both in upright stalk or laid down stalk. There is a blower that can separate topping and leave residues from cut stalks. The conveyor system is installed in the rear of the machine to convey the cut stalks to the truck that drive along the cutting track of the machine. The performance of the machine can be harvested the sugar cane planting field with planting density of 10-15 ton per rai with fuel consumption at 0.8-1.5 litre per ton sugar cane. This machine was design with simple technology, easy and low cost to maintenance, easy to use, and furthermore, the tractor can be moved out to use in other task after the cutting season. Most of the materials and spare parts can manufacture locally. Besides, this machine can be used in the planting field with row space of 1.5 meter.

One of the main purpose of inventing of the Non-burnt Sugar cane tractor mounted billet harvester is to save cost and time in harvesting of sugar cane, replenishment of labors that gradually shortage, cleaner cut stalks, and diminish the burning of sugar cane stalks-that lower the sugar content in stalk as well as the degradation of soil quality.

Field of the Invention

Engineering discipline that concerned with sugar cane tractor mounted to billet harvester by using tractor as a power source.

General Background

Sugar cane is one of the most important plant of the country that being source of raw material to produce sugar. In the past, labour forces were used for sugar cane harvesting. In using the labour force to harvest by cutting stalk in the field, it was necessary to burn out the sugar cane stalk in the field so that the labour can walk through the row of stalk more easily without
hurting from the spine of leaves. In doing this, the cut stalk will be degraded and lower the sugar content. The Non-burnt Sugar cane tractor mounted billet harvester will help solving the said problems of harvesting practices; lower the problems of high labour cost, shortage of labour, and non-burned cut stalk of sugar cane.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

This invention has three main parts:

1. **The tractor installation platform**

   Figure 1 showed the tractor installation platform consisted of:
   - Platform body consisted of square iron tubes that cut into designed length then welded together into shape of the installation platform that the tractor body can be installed onto the upper body of the platform. In the lower part of the platform will be installed the lower stalk cutter, the stalk chopper, and the conveyor. The rear part of the platform will install the drive shaft for hydraulic pump and the blower fan to separate the toppings and leaves away from the cut stalk.
   - The tractor installation platform has two parts:
     - Tractor engine platform mounting in the front.
     - Tractor rear axle mounting in the rear end.

2. **Wheel drive chain of the sugar cane stalk cutter.**

   Figure 2. Showed enlarged view of wheel drive chain of the sugar cane stalk cutting machine comprised of:
   - Drive chain gear using chain no. 120 with 27 teeth welded to flange hub that fixed with rear wheel hub flange of the tractor.
   - Driven chain gear using chain no. 120 with 88 teeth fixed with rear hub flange of the tractor.
   - The rear hub flange will be the main part to have the driven chain gear, rear wheel hub, and rear hub flange.
   - Drive chain no. 120

3. **Drive axle for hydraulic pump and blowing fan to separate the toppings and leaves**
Figure 3 showed the enlarged view of drive axle to drive the hydraulic pump and blower fan to separate the toppings and leaves away from the cut stalk, comprised of:

- Drive axle with safety clutch.
- Reduction gear ratio 1:2
- Four direction gear ratio 1:1
- Blowing fan drive axle
- Blower fan to separate the toppings and leaves away

**Brief description of the drawings:**

Figure 1 showed the tractor installation platform.
Figure 2 showed the wheel drive gear of the machine.
Figure 3 showed the drive shaft for hydraulic pump and the blower fan to separate the toppings and leaves away from the cut stalk.

**Best method of the invention**

Same as described in the detailed description of the preferred embodiment.

**Conclusion of the invention.**

The non-burnt sugar cane tractor mounted billet type by using the agricultural tractor as power source, by using the agricultural tractor with range from 105 horse-power or more as power plant, by installed the said tractor onto the body of the machine, There is chain that connected from tractor drive axles to the drive wheel of the machine, drives the machine to run at a speed of 10-20 kilometer per hour, and utilizing the tractor's power take off (PTO) to drive hydraulic pump at speed of 540 rpm. to the cutter blades. This machine can be used in harvesting the sugar cane stalk both in upright stalk or laid down stalk. There is a blower that can separate topping and leave residues from cut stalks. The conveyor system is installed in the rear of the machine to convey the cut stalks to the truck that drive along the cutting track of the machine. This machine was design with simple technology, easy and low cost to maintenance, easy to use, and furthermore, the tractor can be moved out to use in other task after the cutting season. Most of the materials and spare parts can manufactured locally, so the price of the machine is much cheaper that the imported one.
Claims

1. The sugar cane tractor mounted billet type by using the agricultural tractor as power source comprised of platform body for tractor installation, the wheel drive gear of the machine, the drive shaft for hydraulic pump and the blower fan to separate the toppings and leaves away from the cut stalk which can be use in harvesting of the sugar cane stalk without prior burning of the sugar cane.

2. The platform body for tractor installation comprised of the installation platform that the tractor body can be installed onto the upper body of the platform (1). In the lower part of the platform will be installed the lower stalk cutter (2), the stalk chopper (3), and the conveyor (4). The rear part of the platform will install the drive shaft for hydraulic pump and the blower fan to separate the toppings and leaves away from the cut stalk. The screw separator (5) and the stalk top cutter (6) are installed in the front end.

3. The wheel drive chain of the sugar cane stalk cutter comprised of drive chain gear using chain no. 120 with 27 teeth welded to flange hub that fixed with rear wheel hub flange of the tractor (1). The driven chain gear using chain no.120 with 88 teeth (2) fixed with rear hub flange of the tractor (3). The rear hub flange will be the main part to have the driven chain gear, rear wheel hub (4), and rear hub flange (5). The drive chain no. 120 will transfer power to the drive wheel to drive the machine at speed of 10-20 kilometer per hour.

4. The drive axle to drive the hydraulic pump and blower fan to separate the toppings and leaves away from the cut stalk, comprised of drive axle with safety clutch (1). Which connected to the reduction gear ratio 1:2 (2) transferred power through the four direction gear ratio 1:1 (3) which also connected to the blowing fan drive axle (4) to the blower fan to separate the toppings and leaves away (5). In the right side is connected to hydraulic pump (6) to drive the stalk chopper.
### INTERNATIONAL SEARCH REPORT

**International application No.**

PCT/TH20 10/000008

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#### A. CLASSIFICATION OF SUBJECT MATTER

A01D45/10 (2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

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#### B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A01D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, EPODOC, CNPAT, CNKI, TRACTOR, SEPARAT+, DETACH+ JAN, HYDRAULIC

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#### C. DOCUMENTS CONSIDERED TO BE RELEVANT

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[See patent family annex.]

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**Date of the actual completion of the international search**

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**Date of mailing of the international search report**

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## INTERNATIONAL SEARCH REPORT

Information on patent family members

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