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Innovative technologies for date palm services

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Introduction

The automation of date palm operations services one of the most complex agricultural operations compared to other crops, because the date palm groves of old characterized by intensive plantation and the existence of irrigation canals and inter crops plantation, and operations service relied on manual methods, rising of date palm by (Fround) and using (heme/hip) in offshoots separation and saws or (Alakfah) for pruning. Mechanization operations services suitable for modern orchards with regular plantation spaces. Many attempts to design and manufacture machinery and equipment to automation operation services of date palm, we will review some of them which been designed and tested to facilitate some operations services of date palm trees.

Offshoots separation Tools

Date palm only specie of genus Phoenix propagate by Offshoots which have different names in date palm-growing areas axillary bud. Offshoots grown from Date palm trees continue giving offshoots until 10 years age, and after all buds will be floral buds. The number of offshoots given by the Palm 8-33, this number varied due to cultivar, some cultivars produces small numbers of offshoots like Maktum and Barhi give 8 other cultivars produce high numbers of offshoots like Zahdi give 33. Offshoots separation requires precision and skill, especially cutting connection area with the mother trees which must be done by skilled person using iron tool with sharp end must be consider in separation the cutting of connection area must be sharp free of wounds because this affects the success rate of off shoots after planting (Figure 1).

New Tool for Offshoots separation

New Tool for Offshoots separation has been designing, manufacturing and testing and recorded patent with the number 2975 in 8/10/2001issued by Central Organization for Standardization and Quality Control Cosqc.IQ (Figure 2).

Economic importance

i. Lightweight, carry with one hand only and does not need a muscular effort

ii. working fast and high productivity

iii. Machine Consists of Tank and fan with fins, Microcontroller, and small electric motor, works using two small batteries 3 volts.

iv. Tank easily changing the if large or small powder quantity used because the tank communicates with the fan cover by pulp (age).

v. Amount of powder emerging from the machine controlled easily by microcontroller.

vi. Powder discharge rate 18kg/h and it can pollinate 16Palm /h.

vii. Different sizes can be manufactured

viii. The machine action basis on the centrifugal force

ix. Used for pollination and dusting process of the palm trees.

Components of the machine

Tank(1) : have cylindrical shape designed in different sizes are (235, 562, 1013) cm^3, change due needed to purpose In bottom of Tank there is (tin) or (age) fixed tank on fan cover as shown in above picture. The material of tank is plastic and Table 1 show of the empty machine weight or with for three different sizes listed above.

Fan cover (2): Hollow disk with 8.5cm diameter and a thickness of 3cm open from the front ended with tow V-shaped extension (3) each on length 12cm and width 3cm keeps directing powder abroad and cover fixed with the handle (9) by Join (7) the fan (4) will be inside the cover.

Fan(4): Plastic Disk with 7.5cm diameter supplied by eight straight fins each one length 2cm. Controller (6 which is L-shaped), found in the fan center to move the powder inside the tank and coming to the fan that sits from its position on the rotation axis of the engine (8).

Motor (Engine)(8): located inside the(knob) handle (2) and the number of cycles 2000r/min, works with voltage 3 volt taken from two batteries each one 1.5 volt , the two Linked in a row inside the handle (9).

Knob(handle)(9): The handle (9) have cylindrical shape with cm 2.5diameter and 10cm length, made of plastic, and is fragmented into two parts, the first part contains (engine/motor) and Switch (14) and electrical connection points (11), while the second part is cover (13).

Controller(12): Rubber ring with outer diameter 3.2 cm, and an inner diameter of 1.8 cm and thickness of 3 mm contains a square-shaped slot (hole) with dimensions of 1x0.6cm placed in the bottom of the tank, to control emerging powder quantity by Change the aperture area by hand rotated (Figure 3).

Table 1 Components of machine

1- torque crow-bar	2- Cutter	3- Belt	4- Screw and nut	5- Cutter install Holes	6- Porte	7- Handle

Figure 1 Off shoots separation tools.

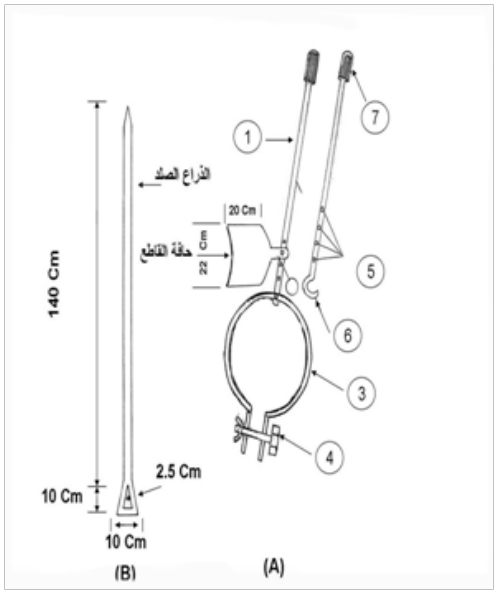

Figure 2 New tool for offshoots separation.

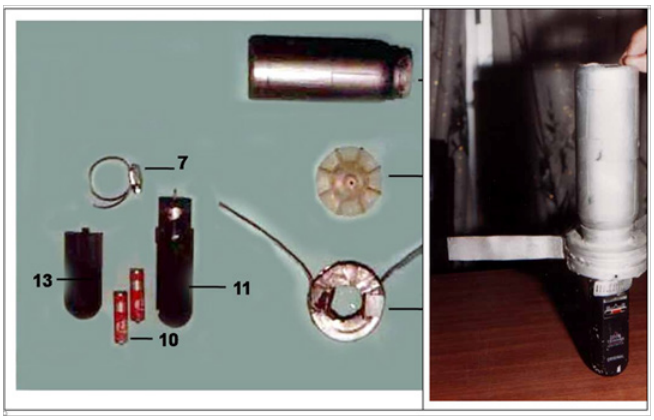

Figure 3 An electric machine for dusting and pollinating date palm trees.

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Conflict of interest

The author declares no conflict of interest.