

Berry Picking at Its Best

Strawberry picking with the
automatic harvesting robot
AGROBOT

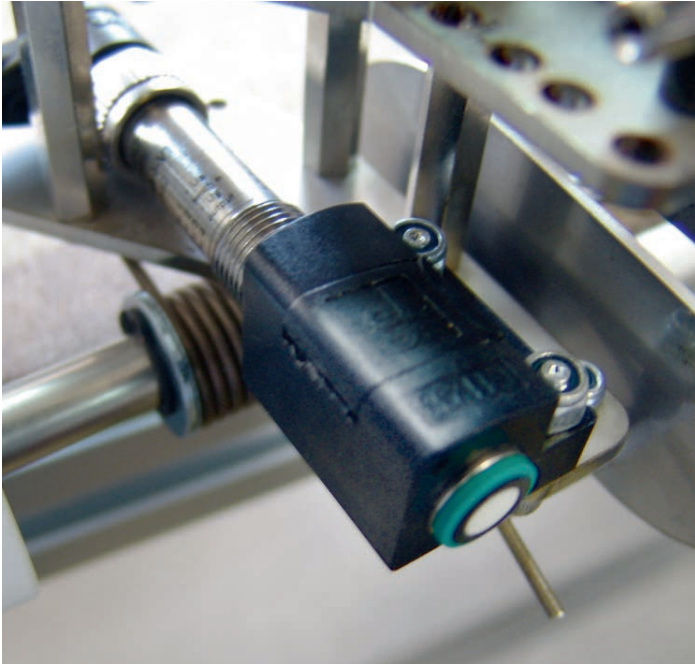


The Application

With their sweet taste, strawberries stand out as one of the world's most popular fruits. Around five million metric tons are harvested every year, and this figure continues to rise. Until very recently, it seemed impossible to automate the painstaking work of picking, so strawberry harvesting remained exclusively manual. Then along came AGROBOT S.L., a manufacturer of innovative agricultural robots based in the Andalusian town of Huelva. With the automatic harvesting robot AGROBOT, a single harvest worker can pick the fruits of an entire strawberry field, all while sitting comfortably. A set of Pepperl+Fuchs sensors helps steer the machine through crop rows, control the robotic arms that pick the berries, and convey the berries to the packaging area.

The Goal

The ripe little fruits have to be harvested undamaged and be automatically conveyed to the upper packaging area of the harvesting machine. There, operators sitting at two ergonomic workstations can immediately select and pack the fruit into trays. Since everything apart from the selecting and packing is done automatically, the harvester must be steered through the fields without damaging the delicate fruits.



Ultrasonic sensors protect the robotic arm from damage by maintaining a safe distance from the bumpy ground.



Each wheel is equipped with an ultrasonic sensor that continuously detects the distance between the wheel and the strawberry field row.

The Solution

In order to protect berries from squeezing or falls, they are cut from their stems by two thin, razor-sharp blades and immediately caught in a tiny basket. The basket then places the fruit on a conveyor belt leading to the packaging area. Robotic arms whose movements are directed by inductive and ultrasonic sensors from Pepperl+Fuchs control the interactions of blades and baskets with the berries. A camera-based vision system analyzes each fruit individually, checking form and color, and then orders the precise cutting movements when a ripe berry is found. A UB400-12GM series ultrasonic sensor scans the distance to the ground, preventing the robotic arms from touching the ground and getting damaged. Additional ultrasonic sensors help steer the harvesting machine automatically. Each wheel is equipped with an ultrasonic sensor, which continuously detects the distance between the wheel and the strawberry field row, keeping the vehicle on track and avoiding damage to the fruit.

The Advantage

The robust ultrasonic sensor technology guarantees a reliable harvesting process in dirty environments and under changing temperatures. Even shocks and vibrations caused by the bumpy ground have no effect on the measuring results. This enables the AGROBOT SW 6010 to move through the fields automatically. Ultrasonic and inductive sensors from Pepperl+Fuchs provide signals for navigation and maneuvering as well as for articulation of the robotic arms doing the actual harvesting.

Watch the AGROBOT SW 6010 working its way through rows of strawberry beds:

AGROBOT SW 6010



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