

ROBOTIC PALLETISING OF ANIMAL BEDDING

Stacking 20 kg bales of straw onto a pallet is a difficult job and loading them to a height of 3.2 metres is arduous to do manually, with significant risk of injury. Even using traditional automation techniques, it is challenging to achieve. Motoman Robotics found the ideal solution to the problem at Sundown Products, a 27-employee animal feed, equine bedding and chicken litter manufacturer near Huntingdon.

A fire in January 2007 destroyed much of the factory, so the company needed to replace its pallet building facility quickly to minimise loss of production. The original automated system had been in place since 1998, when Sundown diversified from nutritionally improved animal feed into the production of bedding. The cell had, however, become unreliable over time.

Commented Sundown's managing director, David Cubitt, "A fast response was needed from the supplier of the new robot to minimise our loss of production. We approached four companies and Motoman was by far the quickest off the mark.

"One of its integrators, RobotSense, took us to see a number of other Motoman palletising robot systems in action before any of the other potential suppliers had even responded."

The new robot was delivered in May 2007 as a turnkey package with gripper and stacking program already written, and immediately started working 24 hours a day.

Mr Cubitt describes the system as "perfectly reliable" and says that the bale stacks are neat and stable, creating a presentable product for his customers.

Waste straw sourced from local farms in Cambridgeshire is shredded and encased in plastic to form 140-litre bales. They emerge from the baling machine, progress up an inclined conveyor and are deposited onto a roller table at the top. To allow the robot to access the bale from this elevated position, it is mounted on a two metre high pedestal.

A specially designed gripper on the robot wrist picks up the bale, swings through 90 degrees and deposits it onto a 1,500 mm x 1,200 mm pallet sitting on a roller conveyor close to floor level. A full layer comprises five bales in a three-cross and two-longitudinal pattern. Seven staggered layers are placed on top of one

another to complete the load, after which it is shrink wrapped ready for delivery to customers throughout the UK.

The robot gripper is designed with an integral second clamp that is able to pick up a new wooden pallet from an adjacent stack. After a full load of 35 bales has been completed and the pallet moves off for shrink wrapping, the clamp fingers swing down automatically and pick up an empty pallet, placing it on the floor-level conveyor ready for the next load to be built. Five pallets per hour can be completed using this automated process.

Three photographs herewith, captioned:



- (i) At Sundown Products, the RobotSense gripper on the Motoman robot picks up each straw bale from a roller table at the top of the conveyor.



- (ii) The pedestal-mounted robot swings through 90 degrees and places the straw bale in a predetermined place on a wooden pallet below, creating a stable stack that is subsequently shrink-wrapped.



- (iii) The gripper has a second set of clamps that lift the next, empty pallet off an adjacent stack and places it on the conveyor ready for the next load of straw bales to be built.

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