



HYQUIA003/1.0

PACKAGING BOTTLENECKS ELIMINATED

Look at any automated production line in the food and pharmaceutical industries and you're likely to find one operation that is still carried out manually: case packing. Robin Maidment of Quin Systems examines the reasons for this, and describes a new system which is finally bringing affordable automation to the case packing process.

Loading finished products, whether they be packets of biscuits or bubble-packed pills, into outer cases suitable for warehousing and shipment looks like a straightforward process, but many factors combine to mean that this is far from true.

For example, different layers of products in the cases often have different orientations and, if the case packer is to handle more than one kind of product, each product will have its own stacking pattern. Non-standard special-offer packs further complicate matters, and the case packer must be easily reprogrammable to handle them.

Then there's operating speed. It's not too difficult to develop a rudimentary case packer that works at around 20 cycles per minute, but this is far too slow for modern production lines. Case packers that can reach 50 cycles per minute are few and far between, and they are costly. Case packers for higher speeds are almost unknown.

more...

High operating speeds give rise to another consideration: the potential for product damage. Unless acceleration and deceleration are well controlled and motion is smooth, there is always a risk that, whatever type of end effector is used, products will be dropped. As well as possibly damaging the product, this also interrupts the packing process.

For these reasons, many companies still resort to manual case packing, even though this is costly and often leads to production bottlenecks, especially when packing staff are absent through holidays and sickness.

Attempts have been made to develop effective automated case packers, many based on robots. Unfortunately, robots are not well suited to this application. They were, in the main, developed for moving large heavy objects over distances of several metres at relatively modest speeds.

Adapting them to a case packer where they are required to move light objects over small distances at high speeds is virtually impossible. It's only necessary to look at the design of most robots to see that their heavy arms, pivoted at the ends, have a high moment of inertia. Rapid, accurate motion is, therefore, out of the question.

Robots are also expensive and they take up a lot of valuable space on the production floor. Some types have even more shortcomings, such as spider-like end-effector suspension systems which prevent them from reaching into deep cases to place products accurately.

It was these considerations that spurred Quin Systems, a company with wide experience of developing innovative motion control solutions, to approach the problem of automated case packing from a new angle. The result is the R-Theta™ Casepacker which features a product pick-up head that moves on slides and tracks, rather than at the end of an arm.

This arrangement minimises inertia, allowing high operating speeds to be achieved, and in conjunction with Quin's specially developed motion control algorithms, it ensures that all movements are smooth, thereby eliminating the risk of product damage, even when working at high speeds.

Quin's new case packer can readily achieve 100 cycles per minute, putting it far ahead of conventional solutions. The design is based on direct drive from two brushless servomotors, an approach which eliminates the backlash and high maintenance requirements associated with gearboxes.

A compact system which is usually mounted above the production line in space which would otherwise be wasted, the new Casepacker is easily scalable, allowing stroke lengths for the motions to be selected to match the exact requirements of individual applications, thereby ensuring optimum performance. Its versatility is further enhanced by the ability to accommodate a variety of end effectors, including vacuum suckers, pneumatic grippers and electromagnetic devices.

The system is supplied pre-programmed, and simply requires the user to enter details of the required movements and end-effector timings via an intuitive touch-screen interface. Programs for multiple products can be created and stored, so that the machine operator can subsequently call them up as required with a single touch of the screen,

Quin's Casepacker has also been designed to allow easy integration with other parts of the production process. It can, for example, be easily interfaced with external product detection sensors, and it has integral networking facilities which allow it to exchange data with any modern automation system.

Much more cost effective than far less capable robot-based systems, R-Theta™ technology provides the basis of the first truly viable automated case packing solution for the food and pharmaceutical industries. Live trials of this innovative system are already underway in several demanding applications, with universally excellent results. Without doubt, therefore, the days of manual case packing are numbered!

=== END ===

(800 words)