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Bosch Rexroth Helps a 326-year-old Tea Company Move at a Modern Pace with VarioFlow plus

Rexroth's VarioFlow plus allows Yamamotoyama to move products horizontally, vertically, on incline or decline, overhead, sub-floor, around obstacles and over long distances.

Challenge:

Allow the Yamamotoyama plant to run multiple flavors simultaneously and quickly without damaging the product and within a confined space

Solution:

A VarioFlow plus conveyor system was designed using a stacked configuration which moved the products smoothly and quickly within a narrow footprint

Results:

- Conveyor system was easily integrated into the electronic control system
- Demonstrable increase in speed of case packing
- Increased production and efficiency in operation
- Energy consumption reduced by 42 percent



Rexroth's VarioFlow plus increases productivity and flexibility to improve Yamamotoyama's ability to produce multiple products.

OLD WORLD TEA MAKER KEEPS UP WITH MODERN MANUFACTURING

Family owned and operated, Yamamotoyama was founded in Tokyo in 1690. Kahei Yamamoto II had a dream of introducing green tea, which at that time was only accessible to the wealthy, not to the general public. He learned that steaming the tea leaves instead of brewing them, which was the accepted method at that time, resulted in a more delicious, sweet tasting tea that retained its nutrients. The tea was an instant sensation, making Yamamotoyama a household name. Since that time the company has expanded its operations around the globe while staying current with modern manufacturing methods. Today, the company remains family owned and continues to specialize in manufacturing green tea and nori seaweed.

EXPANDED PRODUCTION IN US REQUIRES CONVEYOR SYSTEM

Yamamotoyama of America (www.yamamotoyama.com) was seeking to improve its Pomona, CA production operations in order to achieve greater productivity and flexibility in producing multiple products. The facility operates multiple IMA tea bag manufacturing and carton machines, each of which can produce 300 tea bags (which is 18 full cartons of tea bags) per minute. Once cartons are produced, the next step in the process is packing the full tea cartons into

shipper cases, then labeling the cases and palletizing for shipment. As management at Yamamotoyama planned to expand production, they needed to add more automated case packers, which in turn needed to be sourced from the tea cartoning machines. A carton delivery conveyor system from the tea cartoners to the case packers was needed, with the ability to organize multiple flavors to the case packers in the proper grouping of 12 cartons per flavor.

THE FLEXIBILITY OF VARIOFLOW PLUS IS A BIG PLUS FOR TEA-MAKER

VarioFlow plus is a flexible, modular plastic chain conveyor system used for moving high volume packaged goods and other consumer goods, such as packaged foods, pharmaceuticals and healthcare products. It can be used to move products horizontally, vertically, on incline or decline, overhead, sub-floor, around obstacles and over long distances. Workpiece pallets can be used to convey products in applications where positioning or higher precision is needed. VarioFlow plus is simply the quietest, most flexible, energy-efficient and easiest to assemble plastic chain conveyor available. The management at Yamamotoyama were interested in VarioFlow plus because of its smooth running belt, low profile channel, tight radius curve wheel and ability to create a 'stacked' conveyor configuration with vertical curves, which is why they contacted Bosch Rexroth.

MULTIPLE FLAVORS INTO A SINGLE CASE PACKER

According to Mr. Daniel Goldstein, COO of Yamamotoyama of America, “We needed the flexibility to source multiple flavors of tea product from multiple IMA cartoners into a single IMA case packer. We researched Bosch Rexroth products, and selected Bosch Rexroth Corporation due to their quality products.” Each IMA machine can produce just one flavor of tea at any given time, however the Yamamotoyama plant is arranged such that the machines are located in groups, each producing 18 cartons per minute. This meant that the conveyor system had to accommodate this volume of tea cartons per minute, and accurately merge/induct groups of 12 cartons into the case packer, without error. A second requirement was to protect the carton surface. The tea product is packaged in glossy, shelf ready cartons, and the appearance of the carton needed to remain neat and unscratched. Therefore, a smooth surface conveyor belt would be required. The third challenge was one of space. The plant equipment spacing is very compact, with minimal lateral distance between production equipment, so the conveyor system needed a very small footprint.

PROBUILDER CREATES STACKED CONVEYOR CONFIGURATION

TransAutomation Technologies Inc., a Santa Ana CA based member of the Bosch Rexroth ProBuilder network, was asked to complete the design and build of the system. According to Mr. Goldstein, “We needed the system to be locally supported, and were confident in the fact that the system would be built and completely integrated by the local ProBuilder, TransAutomation Technologies.” The mechanical design of the VarioFlow *plus* conveyor needed to be complemented with custom mechanical devices for controlling product groups of cartons, and further integrated with an electronic controls system. Yamamotoyama system receives the output of the IMA cartoners onto individual take-away conveyor runs. The Bosch Rexroth conveyor elevations were varied through the use of vertical inclines and lateral off-sets to achieve a stacked configuration, allowing for a very narrow footprint. At the terminus of the system, the product travels in a vertical incline onto the trunk conveyor through the use of Bosch Rexroth vertical curve declines.



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Once product cartons approach the end of the Bosch Rexroth conveyors prior to the case packer, they stop and accumulate at the end of each of the conveyors. An electronic controls system counts the cartons in queue, and via a priority counting system, the control PLC establishes which conveyor lane is to be released onto the trunk line. Once 12 cartons are accumulated on any given conveyor, that conveyor is 'eligible' to release the slug of 12 cartons onto the trunk line. The slug release is accomplished through the use of pneumatic stops, escapements and right-angle pushers. The shortest conveyor line with the least amount of accumulation capacity has the highest priority, then the second, and so on. As a conveyor is signaled to release product, a custom right angle pusher activates and ejects the cartons 6 at a time onto the Bosch Rexroth trunk line. Two pusher activations (2 x 6) are required to create a slug of 12 cartons, as required for the case packer. All conveyor sections in the accumulation area are constantly monitored by the electronic controls system to keep the cycle repeating throughout the production run. Once tea cartons enter the IMA case packer in groups of 12, two full shipper cases of six cartons each are produced and discharged from the case packer. Cartons are printed and then rotated upright, to be palletized by the robotic palletizer.

CASES SOLVED

The solution has been a huge success for the manufacturing facility, increasing the speed of production without damage to the products, all in a small footprint. Mr. Goldstein states that “the project went very well from start to completion.”

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