From invention to industry standard

David Bridgewater*, Larry Page** and Sandra Hosking*** explain the history of the servo stacker, from its inception at Liberty Glass to its worldwide use today.

In the 1980s, as the machinery used in container glass manufacturing grew in size and as the speed of the process increased, USA-based Liberty Glass developed its own solution to improve the process and ensure quality containers.

Larger annealing lehrs and faster conveyors required a better way to transfer hot containers from the cross conveyor to the annealing lehr. This conveyor transfer happens shortly after the containers are moulded and while they are still hot and easily damaged, therefore any checks caused during this transfer could render the vulnerable containers unusable.

The first servo stacker

When Liberty Glass, which operated a plant in Oklahoma, installed several 15-foot lehrs and larger IS machines, it found the mechanical stackers in use at that time could not effectively transfer glass containers to lehrs of that size. The mechanical stackers were using cams and electric motors, limiting the ability to adjust movements to accommodate variations in container size, conveyor speed and other variables. This inflexibility was causing defects when transferring containers at high speeds.

As there were no lehr loaders on the market capable of handling high-speed ware flow of glass containers, Liberty Glass developed a lehr loader capable of fulfilling this need. In 1991, Liberty Glass filed for and received a patent for the first servo stacker.

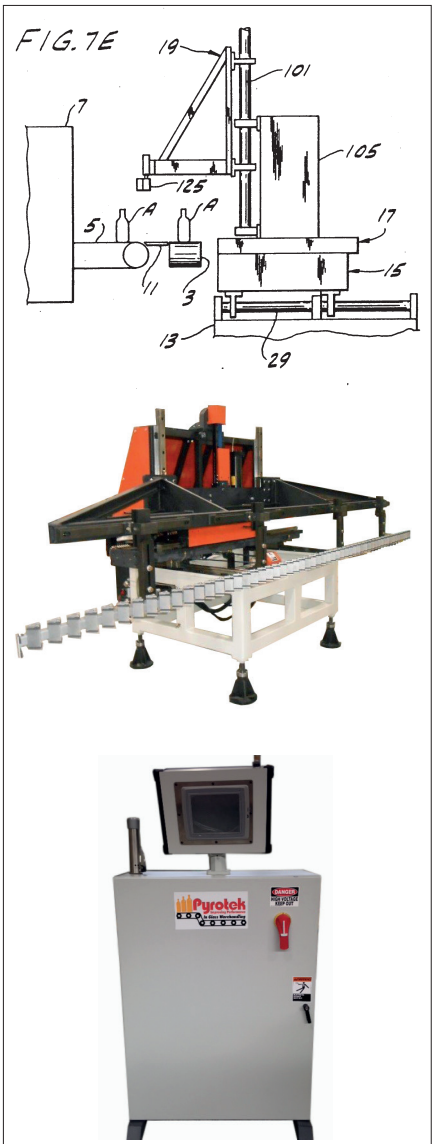
The servo stacker's 3-axis, smooth movement and electronic controls allowed for steadier transfer of bottles from the cross conveyor to the lehr, lessening contact and checking.

Its electronics enabled operators to adjust the controls and speed of the machine. The servo stacker featured a sturdy framework and a belt drive of durable aramid-fibre material.

In 2014, after several acquisitions, Pyrotek purchased the assets of Infinity Machine, which held the original patent technology. This gave Pyrotek the historic know-how and ability to expand and grow its hot ware handling product line for the container glass industry.

A global use

While the basic mechanical parts of servo stackers have not changed much since its inception, electronics have. Today, Pyrotek's servo stacker uses touchscreen controls with its proprietary software that allows manufacturers to enter full job descriptions and hold more jobs in memory. The software also enables adjustments during production. If the stacker is contacting the bottles too hard, the speed can be slowed, and the servo stacker can be adjusted to match the speed of the lehr chain, for example.



▲Top: Drawings from the first-generation servo stacker patent Liberty Glass Co. filed for in 1991. Middle: Pyrotek's Servo 9000 Stacker. Bottom: Pyrotek's custom-built control panel and touchscreen for the Servo 9000 Stacker.

While the development of the servo stacker stemmed from Liberty Glass's own needs, the company later sold the equipment to container glass manufacturers around the world, many of which are still in operation today.

With proper maintenance and electronic upgrades, Pyrotek servo stackers can operate for many years, and some have been in operation for more than 20 years with an even longer expected service life. The servo stacker's design also allows maintenance and repairs to be accomplished in-house during normal job changes.

When the initial Liberty Glass patent expired in 2008, other equipment manufacturers introduced their own versions of the servo stacker to the market, making it an industry standard and a key piece of equipment in the container glass manufacturing process throughout the world. Pyrotek servo stackers remain an industry leader in strength, operator flexibility and longevity.

Today, Pyrotek offers the Servo 9000 Stacker, which has recently been upgraded to feature a touchscreen and control panel, as well as upgraded software that yields smooth and efficient operation, improving production and melt-to-pack ratios.

The equipment can optimally accommodate 10–20 foot lehr widths.

Pyrotek also offers rebuilds, extending the service life of these machines. The company's staff of field engineers provides training and support with machine installation and software. ■

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