

SOLUTIONS IN ACTION

PACK EXPO 2008



The Rotary Monoblock Filler and Capper from Federal



The Single Spindle Capper from Federal



*Allen-Bradley® CompactLogix™
Programmable Automation Controller*



*Allen-Bradley® Kinetix® 6000
Servo Drives*



Booth No. S-2817

As a manufacturer of stainless-steel liquid-filling equipment, **Federal Manufacturing** designs machines to meet the sanitary and operating standards in the dairy, food, pharmaceutical, beverage, personal care, household, paint and automotive finish industries. This Milwaukee, Wis based OEM builds a variety of rotary gravity filling machines, which can be built in fill-to-level or net-weight versions.

Additionally, Federal builds machines for inline filling and freestanding cappers, as well as CIP/SIP, blending and dosing systems, container sanitizing systems, sterile air and water systems, and container rejection systems.

At PACK EXPO 2008, Federal will introduce two new machines – a **rotary monoblock filler and capper**, and **new model single-spindle capping machine**. The filler and capper machine has been customized for an oil products company while the new model capping system is a servo-driven machine used in food applications.

The **rotary monoblock filler and capper machine** is a net-weight version that has 30 filling valves and 10 screw-capping stations. Specific to this machine, quart- and gallon-sized containers will be filled with motor oil and lubricant. Incorporated in the machine is a drive and capper deck with a timing mechanism and screw capping system, as well as filling carousel deck. Large in size, the machine measures 125 inches wide by 200 inches long with a 2160mm valve pitch diameter.

This machine dispenses product from a tank through an air-actuated valve. Empty bottles are fed onto a load-cell platform, weighed and filled based on information gathered, and sent to a computer-monitoring system. The computer initiates the opening of the filling valve and loads to a predetermined weight. Throughout the filling process, the system is transmitting information projecting a cut-off time to prevent overweight bottles. Each container is weighed for a second time, so in the next revolution the needed weight and level adjustments can be made.

Filled bottles go into a capping carousel where caps are dispensed down to a pickup point. Once the caps are picked up, they are positioned on top of each bottle and turned to tighten and secure. The machine processes 300 quarts (120 gallons) per minute.

Sustainability is a factor when using petroleum-based product. The machine's net-weight metering ability accurately fills bottles without using excess product, providing the end user with an easy way to measure return on investment.

Solutions in action at Pack Expo 2008

Federal's second featured machine, the **new model single-spindle capping system**, is a stainless-steel washdown machine that applies two different screw caps to two size bottles. In this case, the machine was made to fill liquid margarine bottles. The machine is run by servo drives and is approximately four feet by eight feet by eight feet. Servo drives are used to position the bottles underneath the capping heads. Once containers are centered, the drives rotate to pick up the caps from one of two sorters. The heads are lowered to pick the caps up. Then, the capping heads screw the caps on each bottle. Finally, the bottles are ejected from the capper and moved into a turning mechanism, which turns the bottles for placement into a case packer.

The drives also measure the revolutions each cap makes in the capping head, as well as the final torque that is produced by the drives. Stored in the data system, this information provides customers with superior diagnostics. In addition, the machine has two sorting and discharge systems to quickly change the cap arm rotation if product lines are switched. The machine can cap 25 2.5-gallon containers per minute.

Prior to the single-spindle capping machine, the end user had to hand-cap all bottles using seven employees over three shifts, six days a week. This machine will replace all hand-capping, which will help to quickly increase efficiency, profitability and product quality.

To meet user needs on both machines, Federal turned to Rockwell Automation and its Allen-Bradley® CompactLogix™ programmable automation controller (PAC). The CompactLogix PAC leverages the Rockwell Automation Logix Control Platform. This platform includes multidisciplinary control, open-networking technology, and communications services to help increase functionality, scalability and flexibility.

Both systems use a single programming environment – Rockwell Software® RSLogix™ 5000 design and configuration software. The software offers high-end features such as a position camera, electronic gearing, and registration to help control the product on-time and in-phase. Other features like partial import of programs, routines and add-on instructions (AOIs) are available, so an end user can make sweeping control strategy changes without affecting production.

A broad range of Allen-Bradley industrial control components also are incorporated in each control package including pushbuttons, sensors, alarms and lights, and cables and cordsets. The components help provide safety monitoring, higher reliability and lower maintenance costs, and are widely available through the Rockwell Automation worldwide distributor network.

Allen-Bradley PowerFlex® AC drives are used in the two machines, but specific to the filling and capping machine, the drives are responsible for the machine's independent speed control. This feature maintains the capping heads' speed regardless of filler speed, lessening downtime due to product spills and cap breakage.

The single-spindle capping machine uses Allen Bradley Kinetix® 6000 multi-axis servo drives and Allen-Bradley MP-Series™ servo motors for high-speed control and motion application that is required throughout the process. With the integrated Kinetix motion control built in, the CompactLogix PAC eliminates the need for a separate motion controller, thus significantly reducing programming time, minimizing wiring and improving synchronization.

"Since we are a smaller company, it is great to have Rockwell Automation as a partner," said Otis Cobb, president, Federal Manufacturing. "They provide us with excellent support and on-site service, which helps us to build a better product for our customers."

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