

Why Two Heads Are Better Than One!

by:

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A forming and welding machine with the flexibility to make complex parts with the shortest possible distances between bends.

Increased productivity demands of wire forming customers requires machine builders to continuously improve through innovation and design expertise. Flexibility and ease of operation play major roles in today's marketplace. And machine design concepts must reflect this trend.

A Customer Request Drives New Technology

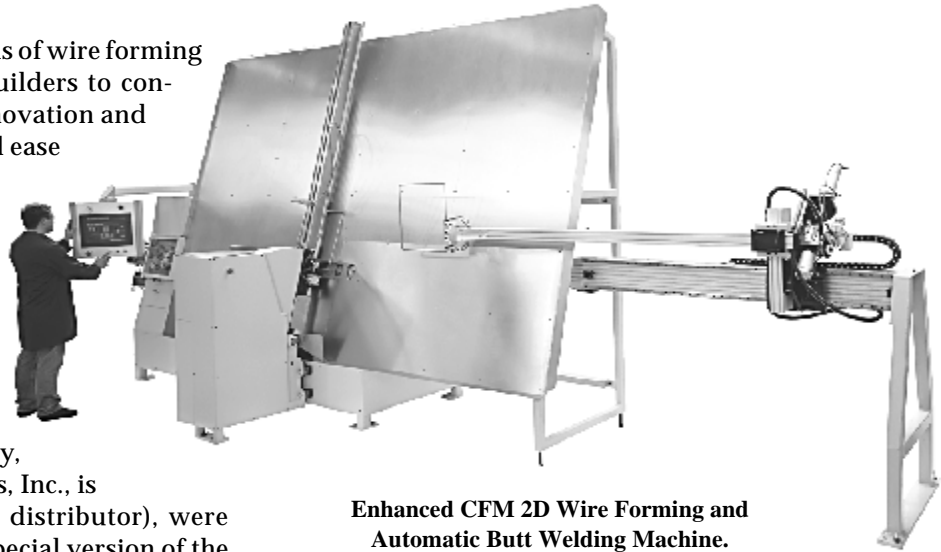
In 2002, engineers at **Whitelegg Machines Ltd.**, of Dorking, Surrey, UK (for which Forming Systems, Inc., is the exclusive North American distributor), were given the task of producing a special version of the CFM 2D Wire Forming and Automatic Butt Welding Machine. The goal was to manufacture a machine with the largest possible wire range, a maximum frame size of 2 x 1 m (6.6' x 3.3') and the capability of producing demanding parts with very short distances between bends such as hooks and eyelets. The client required the most flexible machine possible for a wide variety of current and future business opportunities.

The Whitelegg engineers took this opportunity to introduce new mechanical and electrical systems throughout the machine. With over 200 CFM machines running in the field, all mechanical, electrical and control system aspects were assessed to maximize reliability and performance.

Larger Frame Size. Initially, the machine frame was stretched to allow a theoretical maximum frame size of 2 x 2 m (6.6' x 6.6'), giving the machine an overall height of 3.3 m (10.8'). Equipped with a servo unload and stacking system essential for the production of these large frames, the overall length of the installation came to 14.5 m (47.6').

Capability to Produce Small Complex Parts. The stretching of the machine was of course a relatively simple exercise. The real technical challenge was to be able to produce and handle small and complex parts with such a large machine.

The answer was determined to be an additional forming head that addressed all of the limitations of the standard head. And in addition to making parts that



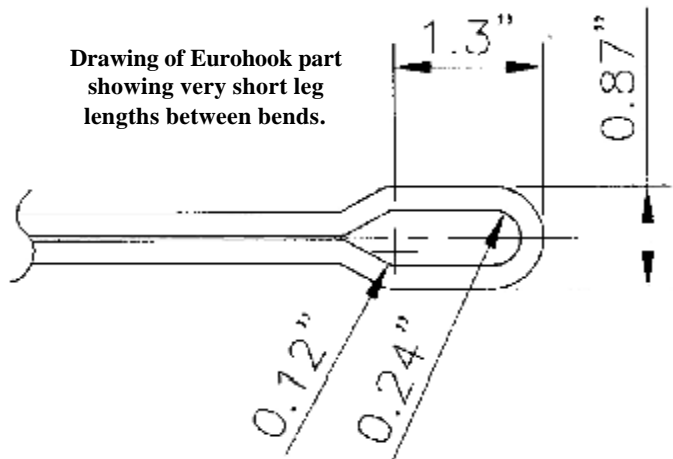
Enhanced CFM 2D Wire Forming and Automatic Butt Welding Machine.

used both bend heads, the machine is capable of making surprisingly small products with different bend radii and very short leg lengths between them (see accompanying Eurohook drawing).

Achieving this form and maintaining the production tolerances for leg alignment was the real challenge.

The standard bend head is very flexible and can make all popular shapes such as rings, frames, card pockets and stars, all butt-welded. It can also make an infinite variety of unwelded shapes, but is limited by the tooling type when making products with very close and acute bends such as hooks, loops and other intricate forms. This is where the secondary bend

Drawing of Eurohook part showing very short leg lengths between bends.



head comes in. It has both inner and outer revolving members, and the unique exchangeable tooling heads can be fitted with a combination of bending pins and shaped blocks that can produce the tightest bends in both directions. The drive system allows the wire in the forming head to be fed forward and backward an infinite number of times in one cycle.

Both forming heads have independent servo control for maximum flexibility. And with some software revision, the functionality and ease of programming was perfected.

In addition to the new bending head, the CFM forming and welding machine was fitted with a new design of standard bend head in order to achieve faster cycle times, smoother operation and increased time between maintenance periods.

Similar redesign procedures were applied to the feed gearbox assembly that resulted in less mechanical machine stresses.

Enhanced Control Section


A new user-friendly touch screen man-machine interface was also added to the CFM forming and welding machine to enhance parts programming capability and machine operation. To further enhance the machine specification, condition monitoring of the drives and motors has also been added. This means that while the machine is running, the characteristics of the motors and drives such as temperature and utilization percentage can be monitored with any potential problems identified before breakdown and valuable loss of production occurs.

To date Whitelegg Machines is happy to announce that no such failures have occurred.

Conclusion

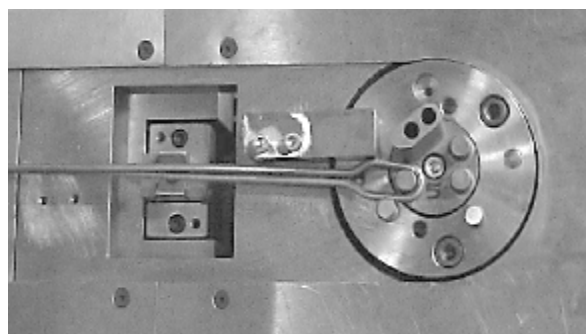
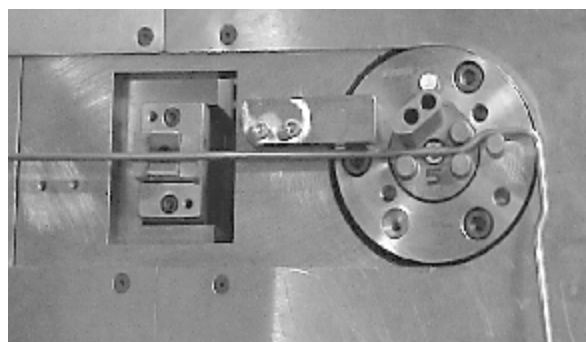
Whitelegg Machines Ltd., achieved a "world first" with its patented Ring Forming and Butt Welding Machines in 1972, and then another "world first" with its computer-controlled Universal Wire Forming and Butt Welding Machine type RR in 1985. The introduction of the CFM forming and welding machine range in 1993 together with the latest design developments in 2003 demonstrates Whitelegg Machine's continued commitment to design innovation.

The company's long and extensive experience in the automatic butt welding of wire and 2-dimensional forming in general are continuing to provide real production benefits to CFM forming and welding machine users worldwide.

To learn more about CFM 2D Wire Forming and Automatic Butt Welding Machines, contact the author at the address on the first page of this article, see the Forming Systems, Inc., advertisement on the Inside Back Cover of this magazine or **Circle 202.** 



Second bending head developed for CFM 2D forming and welding machine.



Closeups of hooked part being formed on CFM machine's second bend head.

Company Profile...Forming Systems, Inc. is a full service distributor of springmaking, spring testing, wire forming, wire bending, wire forming and welding, slide forming and strip forming machines. Also provided is training, tooling, service and spare parts for all machines offered. The company's strength is its ability to provide the best wire forming and spring making technologies and solutions from around the world. Forming Systems Inc. is the exclusive distributor in the USA, Canada and Mexico for the machines manufactured by **Whitelegg Machines Ltd.**