

A publication of

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New Economical Servo Controlled Feed and Cut System

As new challenges are presented, we constantly try to develop systems that will satisfy the requirements and at the same time provide cost effective solutions. A recent project demanded an accurate and repeatable strip feed and cut to length system that could process long lengths (8"-42") of tempered steel strip from a coil, providing a minimal burr cut at a high throughput rate. Feed length changes had to be easily accomplished with minimal down time between set ups. These cut lengths are used in a constant force spring application that required an end forming operation on both ends. The tempered strip therefore had to be annealed for approximately 1.5" on each end. To accomplish this, an RF heating system and coil was positioned ahead of the feed and cut system. A 3 inch long section would be heated during the cut cycle while the material was stationary, and the subsequent feed would position the 3" section in the center of the cut station. To operate in conjunction with the feed system, there would need to be a pause feature provided within the feed controls. The timed pause function also had to be adjustable to allow for different time cycles, depending upon the specific material that was being processed.



Standard TAK Pneumatic Cutter Head

By selecting an off-the-shelf, commercially available drive, controller and touch screen interface, customizing the programming to suit our application, and integrating our standard

feed drive and cutter mechanism, we were able to put together a very economical system that met the customers needs and satisfied the throughput and accuracy requirements. The resulting software/hardware package is now offered as a standard control system for all of our roll and dual-belt feed systems. (see page 2)

The unit pictured here is equipped with one pair of feed rolls. Depending upon the pull force requirements, two and three pairs of the standard feed roll modules can also be utilized. Also pictured is the standard manual cam lever grip mechanism to apply feed roll pressure. This can be substituted with a pneumatic cylinder system that allows for automatic opening/closing of the feed rolls that may be necessary for other applications.

Some of the basic system control features are as follows:

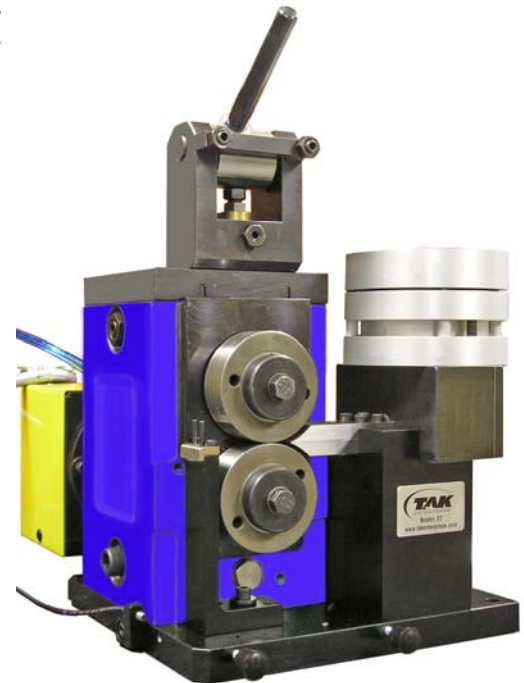
- ⇒ System can operate as the master or as a slave module through a simple toggle switch on the touch screen
- ⇒ Toggle between inch/metric operation
- ⇒ Jog forward and reverse
- ⇒ Adjustable Feed accel/decel values
- ⇒ Adjustable timed pause function
- ⇒ Feed roll diameter compensation
- ⇒ Feed rate adjustable to 40 in/sec
- ⇒ Standard auxiliary fault I/O
- ⇒ Batch counter
- ⇒ Cumulative parts counter

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Or, click here to link to our website:

<http://www.takenterprises.com/>



2, 4 and 6 roll drives are available, depending upon the material and pull force requirements

Click on the link below to see a video of this Servo Feed and Cut System in Operation

<http://www.youtube.com/watch?v=7BcAEHhualc>

Dual Belt Tractor Feed Displayed at ATX /MDM Assembly Expo

At the recent ATX/MDM Expo in Anaheim, California, we displayed our Dual Belt Tractor Feed System, a Colombi In-Line Spring Coiler, various Colombi spring detangler and spring delivery systems, and several other standard TAK products. TAK Enterprises, along with our regional representatives, Doug Lamberson of Lambtech Enterprises in California, Cesar Martinez and Angel Rivera of Global Engineering in Tijuana, Mexico, Bob Buehrer of Spectral Systems in California and Jeffrey Given of Comtech North America in Michigan, manned the TAK booth (fig.1) from February 9th-11th at the Anaheim Convention Center. We took the opportunity



Fig.1

to display one of our newer products, the Dual Belt Tractor Feed, (fig.2) to the west coast marketplace. Set up to process .187" wide X .010" thick strip, we demonstrated the

flexibility of the system to be able to rapidly change feed lengths, feed rates and pause time functions. Powered with our standard servo control system, up to 40" per second of continuous material can be processed. Using the standard "Pause Time" function, (fig.3) a variable delay between feed cycles can be programmed to accommodate prior operations that must be performed on the wire or strip. The pancake coil of strip was delivered to the tractor feed via a motorized payoff that provided a constant tension on the strip as it was pulled through the #0 PWS Single Plane Precision Wire Straightener. A Standard #2 TAK pneumatic cutter head, (fig.4) fitted with our quill-on-quill precision cutting tools provided a burr-free shear on the blanks.

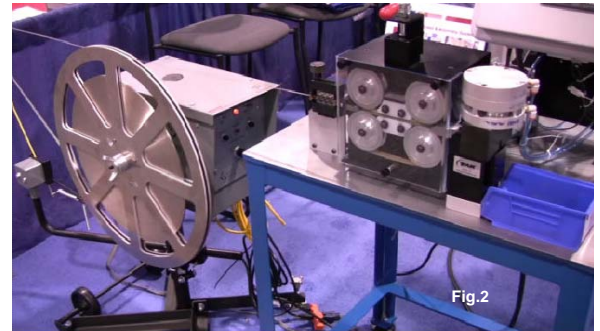
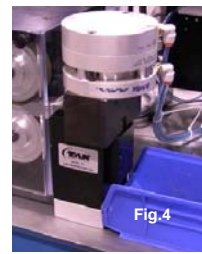
Since introducing the Dual Belt Tractor Feed System, we have had inquiries for a wide variety of applications including such materials as plastic tubing, jewelry chain, extruded composites, continuous springs, insulated cable, and numerous precious metals. Some materials, particularly in the case of medical devices, have restrictions on the types of material that can come in contact with the product being fed. The ability to select the type of rubber feed drive belt material from a range of hardnesses and compositions affords even more flexibility to insure compatibility. If you have a challenging or unusual feed application, pass it along and we will let you know if it is doable.



Fig.4



From left to right: Cesar Martinez from Global Engineering, Norm Pierce and Woody Griffing of TAK Enterprises, and Angel Rivera from Global Engineering. Would you buy a used car from any of these guys?!



To View the Dual Belt Tractor Feed in Operation Click Here <http://www.youtube.com/watch?v=1bCfRqjsVGs>

TAKniques : • Case History •

Abrasive Cutting Attachment for Servo Feed and Cut System to Provide Deformation-Free Cut Condition

Product:
Steel Jacketed Coaxial Cable Lengths

Objective:
Automate the feeding, straightening and accurate cut-to-length of stainless steel jacketed coaxial cable with repeatable lengths up to 40 feet. Cut condition must have minimal burr and no deformation of cable end ID or OD.

Solution:
To satisfy the requirement for a deformation-free cut condition, it was not possible to utilize a standard quill-on-quill shear cutting process, as the pressure required to complete the shear resulted in an out-of-round condition on the cable ends. An automated abrasive wheel cutting station was designed to provide a ground cut condition that did not deform the cable ends. To achieve a non-deformed end cut with minimal burr, the cable was fed through a set of quills that were sized to be just slightly larger than the cable OD, with a space between them equal to the thickness of the cutoff wheel. The wheel was then brought down through the gap via a pneumatic cylinder with adjustable stops to limit the travel. The next feed cycle pushed the cut cable through the quills and knocked off any remaining burr.

Accuracy and repeatability of a roll type servo controlled feed process requires that the material being fed is of a consistent diameter. The accuracy of the feed length is a function of the working diameter of the feed rolls and consistency of the material OD. The servo control drives the servo motor in pulses that are equal

to a given amount of reel roll rotation. Thus, if the material varies in diameter, it in effect changes the feed roll working diameter. In this case, the density of the insulating material within the coaxial cable varied, which resulted in an inconsistent diameter when compressed between the feed rolls. This caused a condition in which a programmed feed length of 40' of cable could result in a feed variation of as much as 1/2". To eliminate this potential variation in a production environment, an additional encoder was added to the entry portion of the feed rolls. The shaft on this encoder was driven by the cable actually being pulled through it, and this data was checked against the feed length data programmed into the servo control. Constant cross checking between the servo drive and the encoder data ensured that the actual cable length fed matched the programmed length desired.

Various cable length requirements are saved to a menu as part numbers, and are called up by the operator on the touch screen interface. The coils of cable are fed to the servo system via a custom built non-motorized payoff that incorporates a pneumatic brake to stop the turntable from rotating as soon as the feed rolls stop, thus preventing free-wheeling of the coil bundle between feed cycles. The cable was straightened using a standard TAK Model #4 Quick Release Precision Wire Straightener. The cut cable lengths were fed onto the customers existing out-feed table for further processing.

For more information contact us at www.takenterprises.com

Servo Feed and Cutoff System for Jacketed Coaxial Cable Cut to Various Lengths



Automated Abrasive Wheel Cutting Station
(Guards removed for clarity)

To view the abrasive cut-to-length system in operation, click on the following link:

<http://www.youtube.com/watch?v=9kxYLPmapo0>