



Mercier Turner introduces the CNC Splitting Machine

The endless band knife leather splitting machine first conceived and built in the nineteenth century has ever since, proudly and justly, been regarded as the most sophisticated precision piece of equipment used in the leather making industry. Despite many changes since in structure, control, components, configuration, feeding and extraction systems, the actual mechanism of the splitting operation has remained much the same. What the Mercier Turner "Newsplit" machine offers is advanced control of the setting, feeding and precision in the splitting action itself. Profile and function of band knife, substance control mechanisms and transport systems is now precision programmed and controlled by Windows CNC.



The CNC Splitting Machine.

Computerised Numerical Control (CNC) begins with the Mercier Turner specifically developed operator/splitting machine interface by means of touchscreen ready to use in any selected language. The system employs programs and controls all the splitting parameters, namely leather substance, profile (deformation) of the substance roller, the speeds of substance and ring roller as well as the position of the lower bridge and that of the band knife. Ring roller scraper cleaning whilst the splitter is running can be timed automatically at programmable intervals.

Intelligent monitoring of the required splitting parameters is achieved through controlling the position of all the axes respective to the position of the band knife thus eliminating the possibility of rollers coming into contact and ruling out human error. Automatic starting of the splitter without operator intervention is also possible. The number of pieces processed is counted automatically.

A production monitoring system registers all working data including customer identity, leather quantity, type and substance - amongst others. Data are printable and can be monitored directly from a designated computer.

There is permanent connection with French machine builder's server providing immediate remote assistance as well as automatic data saving. Automatic trouble shooting available also makes maintenance easy and a preventive maintenance system can minimise costly breakdowns. To protect maintenance personnel an "accreditation level control" has been

introduced. A number of levels, each only accessible with its own password, exists. (For example, a Level 1 when opened allows only a specific class and the starting/stopping of the machine).

The Engineering of the Newsplit

CNC programming, widely used on machine tools since the end of the last century, is one of several examples of technology transfer from general industry to the leather making sector. Its application in this area however is limited as many of its processing machines are not complex enough to warrant this technology. Nevertheless, Mercier Turner has told *World Leather* that CNC had been introduced by them already in 2001, hence their extensive experience in this field. Their adoption of CNC together with the extraordinary precision and control of the many mechanical functions is to a large extent achieved with the use of high power transistor assisted brushless electric motors. Amongst many features, such motors, also described as stepper motors, have the capability stop or signal the rotors in defined angular positions. Continuous power supply can achieve much faster rotation in comparison with the induction motor type.

Based upon such features Mercier Turner drives rubber and ring roller by two reversible brushless motors with real time speed indication. A brushless motor actuates the opening of the lower splitter bridge with left and right adjustment. Closing is hydraulic and the subsequent adjustment of the ring roller position is effected by the other brushless motor. The



substance roller is also independently driven by a brushless motor and is reversible.

The further development of design and construction of the Newsplit machine, based upon many years of operational experience, has also produced more technical innovations which include adjustable feed speed up to 40m/minute and instantaneous opening and closing of the upper splitter bridge. The rubber rollers are now replaced by stainless steel rollers to avoid deflection. The band knife, apart from the brushless motor drive, has a new automatic advance system by means of optical fibre guidance. Positioning of the band knife is in steps of 0.01mm. Improved and reliable band lubrication is by direct injection of lubricant into the jaw plates.

Grinding motors are now mounted on sliding guides to guarantee accurate cutting edges. Automatic correction of grinding wheel roundness imperfection and knife cleaning is by a new system.

Finally safety is the last but not the least aspect. The moving components of the grinding mechanisms are fully enclosed and its doors have safety contactors. The band knife cannot be accessed without opening and removing covers. If the emergency button is activated the band knife retreats to the inside of the jaw plates.

CNC automatically actuated machine movements cause a safety bar to control the front part of the machine if clean - otherwise the machine cannot move. A set of triple warning lights indicates the status of the machine such as: machine under tension; machine working; and machine in motion or under maintenance. Ⓢ



Newsplit band knife drive and sharpening equipment are securely protected in the right hand part of the machine behind the transparent safety doors shown.

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