



Robotics in leather making?

Italian machine builder Emmezeta brings it a step nearer.



The O1ne Emmezeta Toggle Dryer showing the loading station and frame transport to the drying tunnel.

The process of leather making at a certain stage involves the drying and extending of skins or hides. In the pre-industrial period manual pulling to stretch and applying heated air in chambers to dry was common. Next followed a degree of mechanisation where clips or toggles were used for the fixing and stretching of the leathers. Controlled drying took place by passing the leathers through airflow tunnels. This stage became known as toggling and the machinery for it as toggle dryers. And the system is still currently and generally used even in this advanced industrial epoch. However, it fails in two ways: first, it requires a lot of manpower whose performance can and does vary, hence the leathers are likely to vary in extension with an ultimate variation in final characteristics. Second, the degree of drying, i.e. the removal of water from the leather as well as the real temperature of the leathers is not precisely and timeously measured in current toggle dryers with the result that these settings are difficult or impossible to correct. Here again the quality and the characteristics of the finished article might not be what is required.

At this point in comes the new generation of toggle drying in a machine created and named the “O1ne” by Emmezeta which, in short, not only offers instrumentation indicating and recording precisely leather humidity and temperature of the actual leather pieces but also has the ability to programme and alter elements of the dryer to the point where wrong settings are brought back into line. All this occurs automatically, hence robotics play a part.

A look at the details of the system will clarify the concept. With most modern toggle dryers in use, the drying and exposure timing of the leathers depend on the temperature of

the air in circulation in the appropriate drying cell. The actual condition of the leather then is a matter of operator experience but, however, leathers vary in size, structure and shape so this method of simply using the air circulation temperature only cannot be relied upon as a means of creating the optimum drying conditions.

To achieve this condition precisely and reliably the O1ne system establishes the moisture content of the leather employing a group of sensors combined in software based on evaporated humidity together with perceived temperature. A coefficient tying the degree of evaporation to the moisture content reading of the leather exists, exhibiting the correct relationship between working temperature and real humidity during the process. It is this which makes it possible to show the actual degree of humidity in every drying cell thus continuously displaying the optimum drying curve for the leathers and prescribing constant control over all the phases of the drying process throughout the drying tunnel. The element of “robotics” at this point becomes relevant as this patented system based upon its readings acts directly upon parameters to be set using the airflow through the cell, i.e. no manual intervention is required.

Turning to the manual and mechanical functions of the O1ne, Emmezeta has developed several measures designed to reduce energy consumption, rationalise manpower, increase productivity and improve uniformity in stretch, both within individual leathers as well as across the whole batches entering the drying tunnel. Energy is saved by recycling the air heated in the cell system rather exhausting heat to the atmosphere. Manpower is saved and productivity is increased by introducing automatic opening of the frames. Stretch uniformity is obtained



Section of new Feltre Works where Emmezeta machines are also erected. Toggle dryer O1ne is seen in the background being assembled.

by means of a four phase pulling arrangement which helps to relax the leather fibres which minimises damage and produces satisfactory yield.

Another system of toggling known as the “Mach Toggle Dryer” was developed by Emmezeta a number of years ago. *World Leather* has already reported on this previously but further development has resulted in greater productivity, higher leather yield as well as by the rationalisation of labour. Increased productivity is achieved by automation of previously manual operations. Leather stretch can now be varied automatically always in relation to the leather type, its requirements and the desired conditioning degree. Positioning of the toggles continues to be determined by the operators. A high degree of air flow is provided which also results with even leather humidity content. The whole system with its automation is plc-programmed and controlled. More recently, Emmezeta has launched a two table Mach machine patented as “Mach Twin” where they report that with this configuration, because of the greater number of toggling frames, leather dwell time in the drying tunnel can be increased. Based on this, better conditioning and stabilising of the leathers is claimed. Productivity obviously is increased based upon the use of the two working stations.

Emmezeta machinery is built at the new Feltre Srl works, a spacious, fully equipped, newly built facility not far from Arzignano in Montebello Vicentino. An absolute sign of Feltre's confidence in the future of Italian tannery machinery is thus demonstrated. The brand Emmezeta Tanmac was acquired by Feltre some eight years ago. 🌐



Mach Toggle Dryer.

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