



Grain down splitting opens the way

Leather splitting has for long been the most difficult process to introduce to "hands off" automation. At the same time operator and maintenance personnel protection and safety has been problematical because of the design of the classic splitting machine. The advent of the "upside down" grain down splitting machine developed several years ago by the Linta Company based in the Arzignano cluster has made it possible to introduce new feeding and take off systems creating the splitting line. This, as well as the changed roller/knife mounting configuration, takes hands away from the dangerous band knife edge resulting in much greater safety.

Across the board more precise splitting performance and simplified machine maintenance is the focal point of new design elements resulting in a system which together with the grain down concept, has captured a significant proportion of the market since its inception.

Main new design elements

As the system places the gauge roller below the cutting point the weight of the leather fed grain down, assists in maintaining contact between it and the gauge roller, which enhances substance uniformity for both grain and flesh split. Further, the pressure exerted by the driven section rollers now positioned above the cutting line is lessened, also a contribution to easier and more precise splitting.

A robustly constructed head frame plays a part in the accuracy of splitting by minimising the flexing of the gauge roller under the varying load conditions, a common factor in substance variations. Its shape further allows a large access space to the machine knife, the knife jaws and the gauge roller as well as to electrical and hydraulic equipment connections.

An important design element is the mounting of the jaw plate unit in an independent support frame separating it from the knife pusher assembly and allowing it to be set without affecting the cutting position of the knife. This makes for repeatability of knife setting, avoids the need for re-adjustment and results in enhanced substance accuracy. Precise positioning of the jaw plate unit support frame is achieved by means of ball bearing/screw type jacks. Opening and closing of the jaw plates is automatic. Knife and jaw plate cleaning, knife change, cleaning and maintenance of the whole area is thereby made easy and straight forward. Checking of knife play in the jaw unit becomes unnecessary as it always returns to the correct position...

Gauge roller curvature is actuated in six positions for greater accuracy and is capable of being monitored and controlled automatically. There are two sets of gauge roller supports to resist both horizontal and vertical forces. Again the main

feature is higher precision as well as reducing the danger of parts of the leather becoming entangled.

Gauge roller and section rollers are driven independently making it possible to run them at differential speed. For example using this facility feed rate can be slowed by running the ring rollers at a lower speed but still maintaining an appropriate gauge roller speed to maximise area.

The most import design aspect related to operational safety is the shielding of the knife cutting edge within the jaw plate assembly whenever the machine is open. General safety is also enhanced when the automatic feed conveyor is coupled to the machine as the operator is thus remote from danger points. The feed conveyer further gives scope for increased throughput as the operator is solely concerned with loading the leather on a flat conveyor once all the performance parameters are programmed.

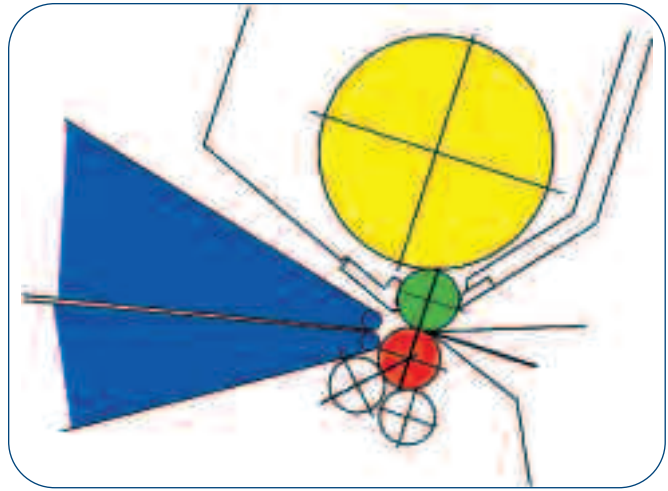
Overall the configuration of the grain down splitting system lessens the need for the highly critical adjustment and positioning of the machine elements in comparison with classic systems. All types of splitting lend themselves to the grain down system. 



*G. Tandura, Linta managing director
and originator of the concept*



View across the splitting machine in the open position showing the opened jaw plate assembly. The knife is removed.



The grain down machine configuration.

Elements from the top down:

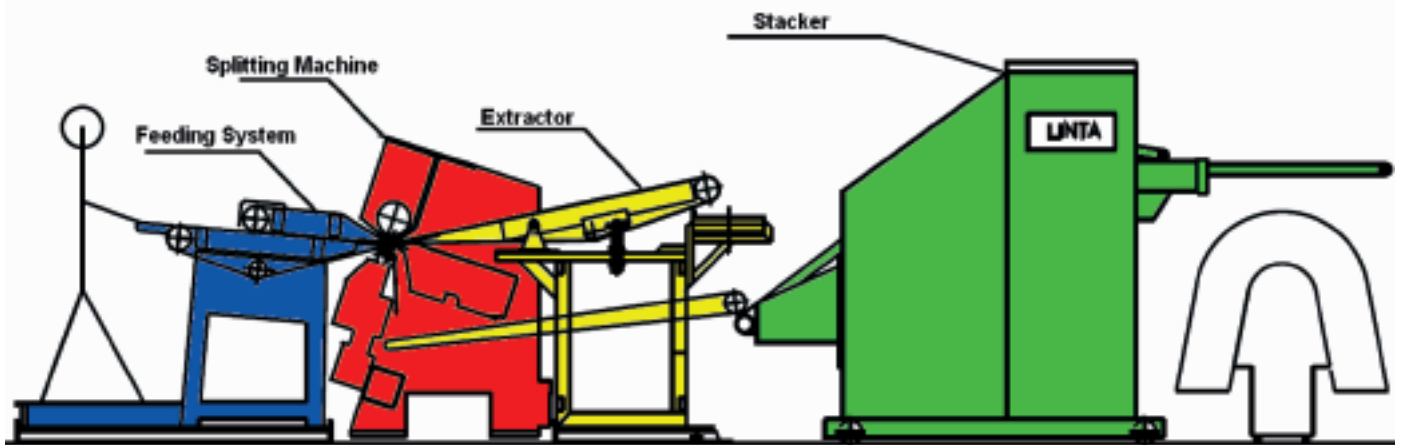
Yellow – Section roller support roller.

Green – Section rollers.

Red – Gauge roller.

White – Gauge roller support rollers.

Blue (at left) – Nose of leather feeding conveyor.



Schematic representation of the splitting line.

“The grain down splitting concept also plays a part in the progressive de-skilling trend taking place in leather production. The splitting machine operator has always been seen as one of the most skilled tannery worker requiring experience and skill in the setting up of the machine but frequently employed to feeds the leather into the machine as well. With the new concept the function is split. Less experienced operators are able to feed whilst the fully skilled person may be deployed further for other functions.”

The automatic feed conveyor showing how operators are well away from nip, the band knife and the other operating elements of the machine.

