



The evolution of the throughfeed flesher

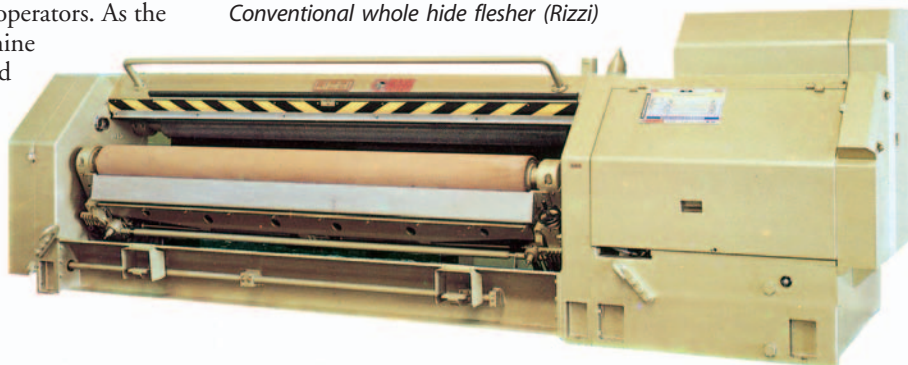
Of all the messy and unpleasant jobs in the tannery, fleshing is probably the most messy and unpleasant. Whether it is coping with the soggy hair and dung balls of green fleshing or the slippery slime of lime fleshing, it is a job that requires of its operators mainly brute strength and a strong stomach. Similarly, the traditional requirements of a successful fleshing machine have been strength, ruggedness, and an ability to keep on working with the minimum of maintenance and tender loving care. Fleshing is a 'Cinderella' operation, and perhaps that is why today's modern, sophisticated throughfeed fleshing machines have had such a long gestation, while technological advance in areas such as finishing has galloped ahead.

The conventional multi-roller fleshing machine served tanners for the best part of a century before they began to take an interest in improving the productivity of the operation. Operation of the conventional whole hide flesher requires two brawny operators. With the flesher in the 'open' position, they drape the hide, flesh upwards, over the rubberised support roller with the butt half hanging down into the machine. When the machine closes, the hide is held against the rotating bladed cylinder by a rubber bolster, while the nips between the grooved transport rollers and the support roller pull the hide back out to the operators. As the end of the hide comes out, they open the machine and turn the hide round to drop the unfleshed neck half down into the machine. The machine then closes to flesh the other half of the hide but, as it is fed out of the machine, it is allowed to run over the rubber roller and fall down to a chute or conveyor beneath the machine.

Whole hide fleshers were invariably mounted on platforms to allow the fleshed hides space to fall beneath and be carried away. To save the operators from having to drag the

heavy hides out of containers to feed to the fleshing machine, overhead conveyors were developed to lift the hides from floor level and deliver them hanging directly over the rubber roller. Two types of conveyor were developed: the reciprocating so-called 'flying cow' and the endless chain. With the former, the hide is clipped to a chain hanging from a lifting carriage which runs along a rail hung from the beamhouse roof; the carriage lifts the hide and then traverses it to a release position above the fleshing machine. These units were usually duplicated, with the carriages used alternately to avoid any lost time and maximise fleshing throughput. The endless chain type of conveyor has a loop of track with hanging chains and clips which runs from the floor loading position, rises up to an unloading position above the flesher and then runs back down. The operator at floor level clips the neck of a hide to each hanging chain, and it is slowly carried in procession up above the fleshing machine. The conveyor runs continuously at a speed regulated to deliver the next hide above the machine as the preceding fleshed hide falls to the chute or conveyor. Use of a feed conveyor of either type adds at least one operator to the team, but ensures that the fleshing machine operates at maximum efficiency, allowing a ➤

Conventional whole hide flesher (Rizzi)



Persico "Perscarma" throughfeed flesher fed by overhead chain conveyor



Outfeed of Persico with hides delivered to transverse conveyor



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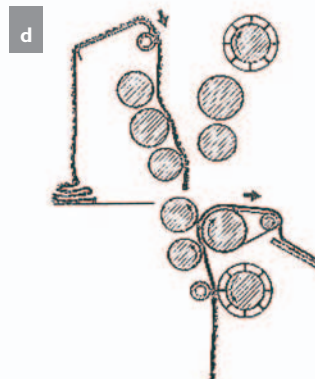
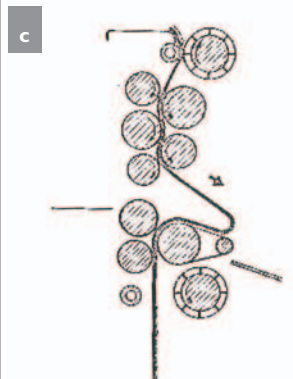
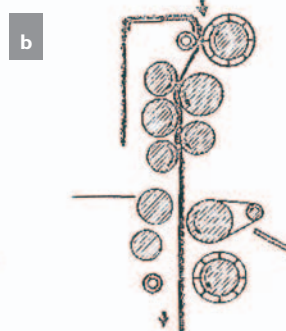
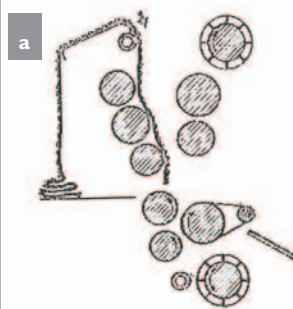
throughput of up to 180 hides/hour.

The advent of tanneries working several thousand hides per day necessitated more than one flesher and fleshing crew to keep them fed. With two fleshers working side by side in the conventional way, one bright individual had the idea that productivity could be improved by linking them in a flow line. The first flesher was mounted on a high pedestal, and its crew simply fleshed one half of the hide and allowed it to run over the support roller and fall down a chute. The chute carried the half-fleshed hide to the second flesher, mounted on a lower pedestal, whose crew fed it through their machine to flesh the other half. This arrangement, so-called 'back-to-back' fleshing, eliminates one operator from the combined crew and speeds up the operation. It has the advantage that either flesher can still be used independently if throughput is low or maintenance is required on one machine, and it can still be found in some large tanneries. The concept of back-to-back fleshing would eventually prove to be the basis for today's successful throughfeed flesher designs.

From the 1970s, machinery manufacturers began experimenting with designs for throughfeed fleshers, but most were unsuccessful. One fearsome device had the operators on top of the machine, lowering the skin or hide onto a transport roller system which swung one way to flesh half the hide against one bladed cylinder, then the other way to flesh the second half against a second bladed cylinder. Eventually, the Turner company developed an arrangement based on the back-to-back

Operation of a Turner/Persico throughfeed flesher:-

- Hide fed into top of open machine
- Top half of machine closes to flesh second half of hide
- Hide is gripped in lower half of machine
- Lower half of machine closes to flesh first half of hide, which feeds out as a new hide is fed in



*straight from
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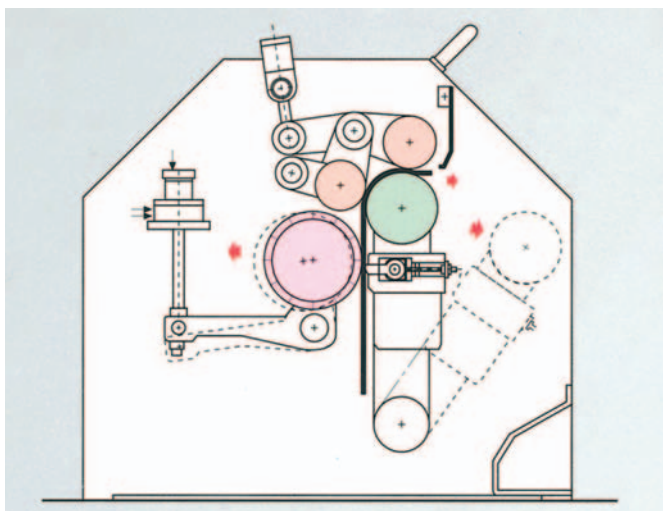
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Cross-section of a conventional flesher (Mosconi)

concept, which was essentially two conventional fleshing machines in one frame, the first mounted upside down above the second. The rubberised transport rollers are fixed in the frame, but the bolsters and grooved transport rollers are mounted on a pivoting frame, so that one half of the machine is open while the other is closed. With the upper part open, the operators introduce the hide over the top bolster, hanging down between the support and transport rollers. When the upper part is closed, the hide is nipped and pulled into the machine while the trailing half of the hide is fleshed. The leading edge of the hide drops into the open nip of the lower mechanism. As the trailing edge clears the upper bladed cylinder, the frame pivots to open the upper part and close the bottom part of the machine. The first half of the hide is now fleshed against the lower bladed cylinder, and the hide is fed out onto a conveyor belt which delivers it out of the back of the machine. Simultaneously, the next hide is being introduced into the top of the machine.

This successful design was built by Moenus Turner and also under licence by the Italian manufacturer Persico as its Perscarna model. When the original Turner group got into difficulties and was broken up, Persico continued to manufacture and develop the design, and slowly it became established, first in Italy and then throughout the world. The Italian manufacturer 3P introduced a similar machine in 1979, which it called the Pirana, and has now sold over 150 units worldwide. Mercier Freres launched its own design in 1988 called the Omnivor, which featured a continuous flow path for the hide through the machine, but this was not particularly successful. The current Omnivor 5 throughfeed flesher now offered by the reborn ➤



3P 'Pirana' throughfeed fleshing machine for whole hides



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THE EVOLUTION OF THE THROUGHFEED FLESHER



Turner "Omnivor 5" throughfeed flesher of 3100mm working width

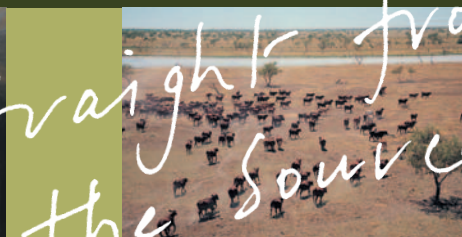
Turner company, working from the old Mercier premises in Annonay, is a completely different design dating from 1998.

The adoption of the throughfeed flesher has been slow and

protracted, principally because they are expensive, complex machines which demand a high standard of maintenance. It has been the increasing costs of labour over the last twenty years that have made the concept progressively more attractive to tanners. Throughput rates of up to 350 hides per hour are now achieved with fleshing crews of three or four operators. Today, there are many hundreds of throughfeed fleshing machines in service throughout the world, and they have become the first-choice option for modern, high-throughput tanneries. Current development is mainly in the mechanical detail of these machines, improving accessibility, reliability and resistance to corrosion. Despite the occasional discussion of concepts, such as fleshing by high pressure water jet, it seems that fleshing by bladed cylinder is the optimum for both cleaning the hide and opening it up for chemical penetration. It seems likely, therefore, that the throughfeed fleshing machine, in its present form, is likely to have as long and illustrious a career as the conventional flesher before it. 



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