



Flour F 10

A revolution in wheat milling

Aanutec has perfected a simplified milling system using only 10% of energy in comparison to traditional milling, thus giving it the name F 10.

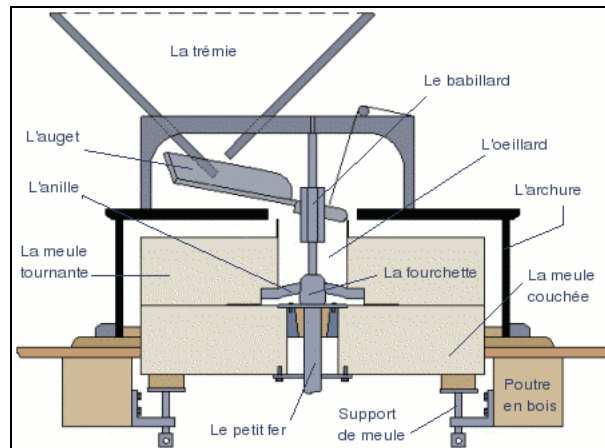
This system was developed in collaboration with Ader, an apolitical association for the development of renewable energy.

Milling over the years

In the past, the simple and economical method was to pass grain between two rough stones, one of which was operated manually using hydraulic, animal or electric force. This method produced flour that was whole and a little coarse. Sieving removes some of the bran, but the flour is still "mixed", that is, it still contains enough bran, which is too finely ground to be removed by sieving.



or



Present day. Since 1830, an engineer from Zurich named Müller, a word that means... "miller" in German, who, while discussing with his dentist, had the idea of replacing millstones with metal rollers. The roller mill gently and sequentially crushes the grain, while between each pass sieving in a new pair of rollers and thus getting very nice flour without roughness. There are in fact 6 to 18 pairs of rollers, some are fluted and the others smooth, with as many sieves and pressure or bucket based conveying systems. This is very complicated and this method, through automated and in constant evolution, is not the best example of good rationalisation. In addition, losses are substantial and this process, because of its complexity, requires highly skilled workers to manage the whole system. Its weak point is the loss of sensory qualities due to multiple passes in conveyors and sifters, installations that are almost never cleaned.



Series of Bühler mills



Sifters

In the future. Most mills will continue this milling technology using rotary rollers, even though other technologies are inching, or rather have inched forward. In fact, a patent filed in 1894, and which has never been applied, was updated at Orbe in 1997. This process was described in ADER's book "Energy in the future."

This milling, called "Flour F10", shows that a high quality flour, with higher yields, could be produced by using 10 times less energy.

At the Museum of wheat and bread at Echallens, this F10 flour was tested on about thirty kinds of breads and pastries. They described it as excellent and easier to work with than traditional flour.

Principle of F10 milling: The special feature of this mill is its simplicity. Just one pass is enough through the mill turning at very high speed, around 10,000 rpm, followed by a single sieving to obtain quality flour, with very high yield, very clean bran and without industrial taste. This mill called "*multi-pin*" has been used since long for a wide variety of milling, especially to obtain very fine powders, like icing sugar and a wide variety of chemical or food products. It is made up of several rows of gear teeth on a fixed support and a second movable support that is rotating at high speed. Wheat grain enters in the centre, it is not crushed, but is beaten while passing through the various rows of gear teeth. The peripheral speed is around 130 meters per second.

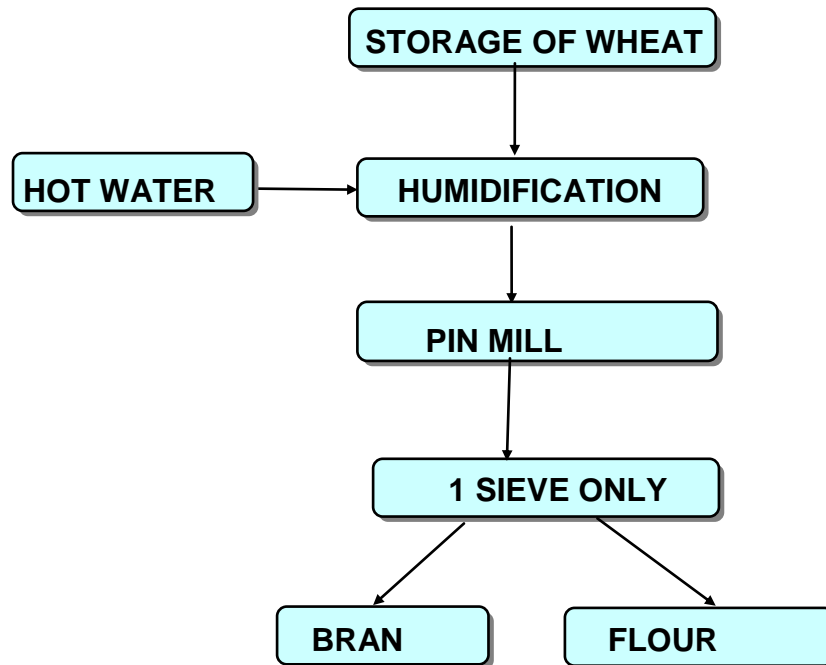
The principle of the process is to finely grind the wheat kernel, without breaking its bran too much. Bran has the characteristic that if it is very moist, it becomes very soft and behaves like rubber and does not break up when passing between the gear teeth. The trick therefore is to quickly moisten the grain's surface for a few minutes before milling. The inside of the grain is not over-moistened and allows itself to be finely milled. Therefore just one pass through the mill and one sieving to separate the bran is enough. By varying the diameter of the sieve meshes, it is possible to get different types of flour: bran, half-white, white. It is also possible to get whole meal, without sieving, which further simplifies the process. Another advantage, this turbine draws in enormous amount of air, which helps in instantly removing the added water.

Another interesting fact is that this method allows for very small productions, from a few kilograms per hour to several tonnes if necessary. This is possible since the system is easily expandable, which is not the case in a traditional mill.

Advantages

- The same installation can be used to grind durum wheat without any additional installation.
- Using the same mill, the flow rate can be adjusted from 1 to five without any problem.
- For fairly large flow rates, only the multi-pin mill type has to be adjusted by selecting a machine with a different diameter. This is possible since this process is scalable, which is not the case in roller lines.
- Guaranteed destruction of insects that may be present in the wheat.
- No mechanical or industrial tastes or smells.
- Very clean bran, with no kernel pieces.
- Significant reduction in energy consumption.
- Easy to use and does not require trained workers.
- Milling of all types of cereals.
- Allows small quantities of local productions.
- Opportunity for farmers or traditional mills to diversify.
- Forming a cooperative simplifies the organisation of work, financing of the line and prevents being absorbed by a third party.
- Compact installation and with low total volume

Milling line F 10



The multi-pin mill open

