**Equipment evolution: Pressing (batch)**

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**There were few advances in press design between Ancient Rome and pre-industrial Europe**

Most of the beam presses and the direct external screw press below were described by Roman era authors (Cato c. 160 BC, Hero c. AD 60, Pliny c. AD 80) but were still being used in the 1700s.

**Compound machine**

This design described by Cato c. 160 BC combines the mechanical advantage of the beam with that of a windlass.

**Direct external screw**

The elimination of the beam and use of a direct screw made presses smaller. Advances in thread-cutting described by Hero likely made this design possible. First century AD.

**Fixed metal internal screw**

Metal replaced wooden screws. The screw became the fixed element of the press with the nut now being turned to tighten. This allowed even smaller presses c. 1830.

**Percussion press nut**

A top wheel is spun and a collar on the wheel hits a collar on the nut to tighten/loosen it. This allowed greater compression than possible with a simple nut and handle.

**Ratcheting press nut**

This revolutionary device provided such mechanical advantage that 1 or 2 people could now press quite large quantities of grapes. The nut also conveniently progressed as the handle was both pushed and pulled. Mabille c. 1890.

**Accumulators**

Traditionally a pile of wooden blocks was stacked between the press nut and pressing plate. The elasticity of the wood meant that when tightening stopped, the juice would continue to flow for a period. The assembly and disassembly of the blocks was labour intensive. Spring pressure accumulators removed the need for the wooden blocks.

**Footing attached to the ground**

This invention, a rope was typically wound using beam or central screws presses.

**Connection to the frame**

The connection of the screw section to the frame eliminated the need for frame footings. The press was no longer connected to the ground.

**Beam**

In 1762 the Encyclopédie of Diderot and d’Alembert provided this elaborate illustration of a double chamber horizontal press. Later reports suggest this design was too slow, did not provide sufficient pressure and would need expensive metal gears to be effective.

**Horizontal plate**

In 1804, Ménard-Naudin patented a cylindrical horizontal press that automated the cake crumbling process. Two plates running on a fixed screw and guide rail on the basket, press as the basket is rotated in one direction and crumble as it is rotated in the other (aided by a system of internal rings and chains).

**Protection from oxygen**

During crumbling inert gas is injected into the press chamber (and recycled in some designs) or SO₂ solution is sprayed.

**Horizontal plate presses**

Horizontal plate presses were perfected and mass produced after 1945 by CMCCL, Viasl. They became extremely common.

**Mass production**

From the late 1800s there was an increasing use of power for pressing instead of manual labour. Hydraulics were also used together with multiple mobile press baskets such that one basket could be filled while another was being pressed.

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