

Ink-making & Rollers

INKMAKING

Oil paint had been invented by monks in the middle ages, and printing inks using similar materials were already in use before Gutenberg. Black ink was based on soot which is almost pure, very fine-particle, carbon, mixed into linseed oil that had been boiled. The boiled oil dried by the chemical process of oxidation on exposure to air—stored in bulk it merely formed a skin, but in the thin layer applied in printing, it dried in a few hours. In technical terms, the oil is the *vehicle* or *medium* and the soot the *pigment*. Later inks became much more complex, with chemicals added to aid or slow drying, or suit special needs such as adhering to metal or plastic.

Early printers made their own ink, and the process of boiling the oil over an open fire was rather hazardous, since linseed oil is very flammable. Several serious fires are supposed to have been caused this way, and printers were made to go outside the town walls to boil their oil. This is supposedly the origin of the printers' outing

known as a *Wayzgoose*. Coloured inks were much more expensive than black, because of the difficulty in finding pigments, and this all changed with the nineteenth century growth of industrial chemistry, and the production of cheap 'artificial' pigments, and the introduction of new vehicles (mostly mineral-oil derived) and inks for new processes. Letterpress newspaper-printing for example used a simple mineral-oil vehicle (much the same as car engine-oil) which didn't dry, but merely soaked into the paper: hence the way newspapers used to smudge, blacken hands, and leave a legible print on the chips they were used to wrap! Modern newspapers use inks that dry.

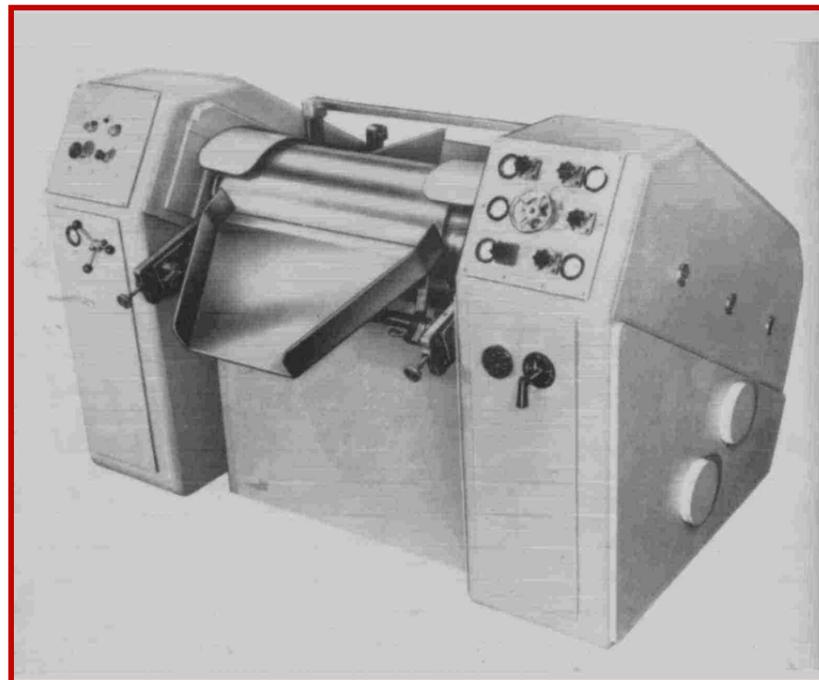
Mixing the pigment into the vehicle is not as simple as it seems, and when hand-printing, the ink was usually rolled out onto a slab, and frequently rolled out with the ink balls or a roller, or using a *muller*, a metal disk that was ground in a circular motion over the slab, to keep the pigment properly distributed. Mechanical presses used sets (*trains*) of rollers to do this as well as applying the ink evenly.

ROLLER MAKING

Printers initially used *ink-balls*: these looked like boxing-gloves; a ball of wool covered in leather, mounted on a wooden handle. They were kept soft by soaking in urine, and the ink was picked up from a slab, and dabbed on the type with a circular motion.

Mechanical printing demanded a new process, and rollers were developed, but at first made rather awkwardly of leather. *Composition* rollers were invented using a mixture of glycerine and gelatine (much like ordinary edible jelly) cast in a metal cylinder. These were not very durable, and they swell and shrink if damp or too dry, but easily re-cast by the printer as needed.

Rubber rollers, and later polyurethane, were much more accurate and durable, and though widely used on twentieth century presses industrially, were never considered by perfectionists as quite as good at inking as composition. These could not be made by the printer, but had to be supplied by specialist manufacturers.



Ink-making: The machine on the left is a Three-roll Mill, used to ensure the pigment was dispersed properly in the medium. It has three steel rollers running at different speeds, effectively grinding the ink between each pair just as had been done by a hand muller, or in a mortar & pestle.

Roller-casting: A split roller-mould, below, and a vertical one, right, showing the roller being extracted by hand. Further right is the industrial 'Gatling Gun' tank where several roller moulds for rubber or plastic were arranged together in a water jacket, allowing pre-heating and then cooling after casting.

