French Worsted Drawing

By Leon Faux

(A Series of Articles on French Worsted Spinning)

The doubling of the mixing gill-boxes described above is much greater than that of the ordinary gill-box. If for example a mixing gill with four heads doubles five slivers per head, the doubling by superimposition is 20 (4x5). On the other hand with an ordinary gill-box the doubling by bringing the slivers side by side is only 5 (1x5).

This type of mixing gill-box is used specially in the mixing group in preparation for spinning, which will be described later. It is a necessity in a mixing group of machines working on dyed top, in order to obtain a rapid and perfect mixture which it would be difficult to produce with the ordinary gill-box. In laying out a set of mixing machines in preparation for spinning, the can gill-box in the last machine of the group gives a much better feed for the first passage of the coarse machines. The sliver delivered to the can by the gill-boxes, when delivered to the next box, is in the form of an open and relatively thin sheet of wool, which enters completely and regularly into the pins of the porcupine roll of each head. The result is greater regularity of the sliver and the prevention of the bunches which are caused by the sudden penetration of heavy slivers by the pins of the upper porcupine roll during the drawing operation.

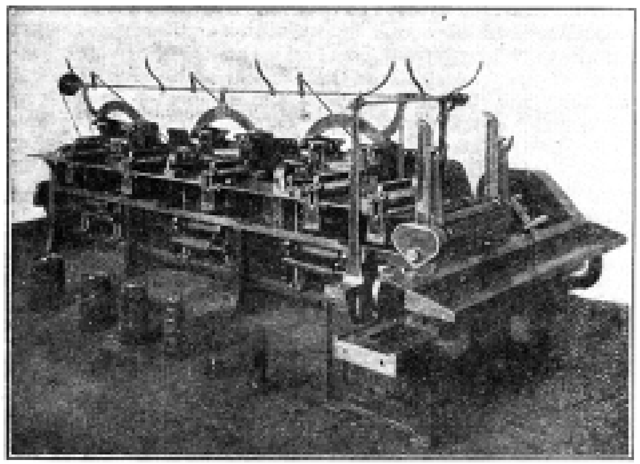

Fig. 141. S. A. C. M. 3-Head Intersecting Gill-Box.

Fig. 141 represents a mixing gill-box with three independent heads, all the three slivers driven by the heads being united in one sliver by the auxiliary head which does not draft the material.

Winding the Sliver on Bobbins.

The variable doubling of the slivers at each passage makes it necessary to arrange them by hand for feeding from the bobbins of the preceding operation. It is possible to feed the slivers from one operation to another by mechanical means in accordance with the principle of double drawing, Fig. 86, but the doubling under such conditions does not give the necessary uniformity in the resulting sliver. The fine places, bunches and other irregularities which may occur in the sliver from the preceding mechanism are not removed by their relative deplacement and thus, instead of disappearing in the succeeding operation, are really made more pronounced. Mechanical feeding is imcompatible without the principle of doubling, because with the object of increasing the doubling on which the intimate mixture of fibers depends, the rearrangement of the bobbins at each passage is necessary for the mixture of the slivers delivered by the different machines.

As a rule, the doubling of the bobbins should be as great as possible at each preparatory machine in order to correct the slight variations in the sliver and obtain homogeneous and regular roving. The feeding of the slivers by hand necessitates winding the sliver on bobbins or spools, each carrying the greatest possible length of sliver in the smallest possible space, and wound so that the sliver will unwind without breakage and without a deformation of the bobbin. To meet these requirements the frames from the cards to the roving-frames are equipped to wind the sliver on bobbins or in certain cases deliver it into cans.

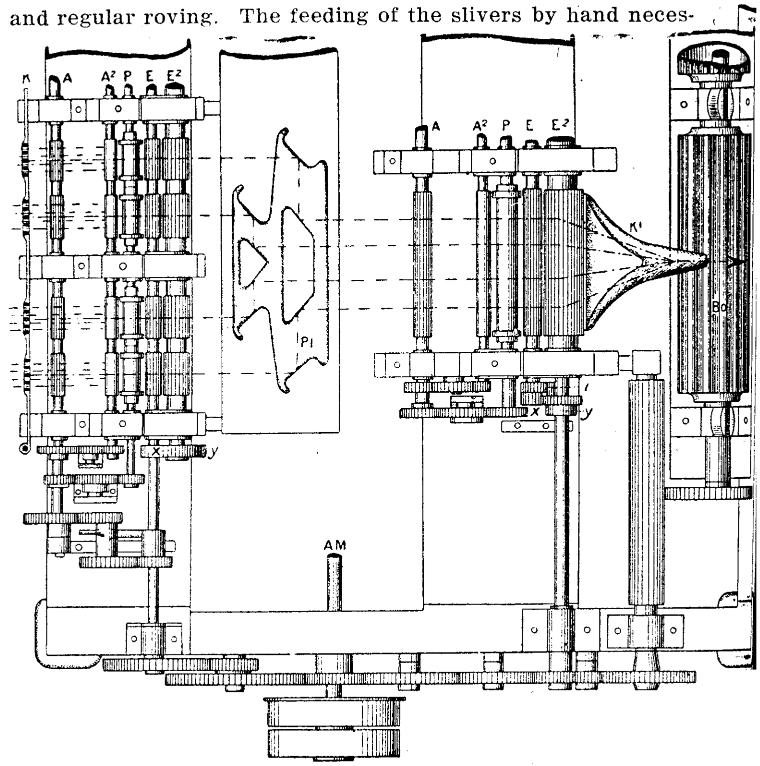

Fig. 86. Multiple Drawing Frame.

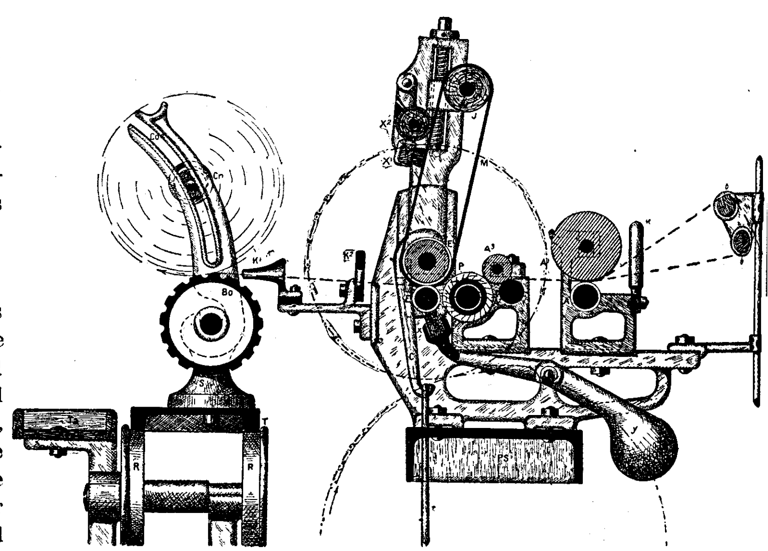

Fig. 88. Section of Drawing Frame.

Bobbin-Winding Frame.

The bobbin winder consists of a carriage T, Figs. 88 and

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Purifying Water for Silk Processes

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We have noted in previous articles that it is essential in rinsing silk to use water as pure as possible, particularly water that is free from earthy alkalies (C *a*, M *g*), because these salts in combination with soda soap used in boiling-off form insoluble soaps which become fixed on the fiber to the great injury of the luster and durability of the silk. We recall one dye house where the silk was rinsed in impure water, the silk pieces containing traces of lime soap, with the result that the finished goods had an odor of hot grease which made them unmerchantable. It was almost impossible to remove this odor which increased with time, and the goods also turned yellow.

The action of calcareous water and the formation of lime soap is shown by the following method: Two small skeins of silk are boiled in a soap bath. One of them is then rinsed in distilled water, and the other in calcareous water. After drying the two skeins present a marked difference in luster, the first one being more brilliant, and the second duller. I have made this test with water standing at 24° hydrometric, which is not very calcareous. Nevertheless, the difference in luster was quite pronounced. I have examined the two samples under a microscope with an enlargement of about 560 diameters, and the appearance of the two is shown in Figs. 4 and 5. Fig. 4 shows the silk boiled in distilled water, the filaments being in good condition with only a few very small spots visible. Fig. 5 shows the other sample boiled in calcareous water, there being a large number of spots, some small and either isolated or in groups, while others are larger giving the appearance of a crust on the surface of the fiber. This test shows clearly the action of calcareous water in the rinsing process. When the water contains lime it is consequently necessary to subject it to a process of purification.

Up to a few years ago it was a custom in the industry to confuse the purification of water for dyeing with the purification of water for steam boilers, this confusion being due to the fact that the old methods of purification were nearly the same for both purposes. Since the new processes of purification have been introduced a sharp difference has been made between the methods which are suited only for purifying water for boiler use and other methods which are suited specially for purifying water for dyeing and scouring textile materials. As a matter of fact the object to be attained is very different in each case. For boiler use it is necessary to use water that does not attack the boiler plates and piping and which does not form a scale inside the boiler. It is necessary consequently to avoid alkaline waters which attack the boiler plates and piping. A number of specialists are of the opinion that water which is too pure does not give the best results in evaporation and attacks the plates more energetically than the calcareous waters.

As for the formation of scale which must be scraped off and which is liable to cause the plates to burn out, it has been found that this is due to the presence of sulphate of lime, which being soluble in water is slowly deposited on the plates in the form of crystals which imprison between them the pulverized deposit and form a solid mass of tartar. This is why certain processes of water purification are designed to precipitate immediately the sulphate of lime in the form of pulverized sulphite of baryum, preventing the deposit of the hard crystals. (William's process.)

For the boiling-off and dyeing processes, however, it is necessary to use perfectly clear water as free as possible from alkaline earthy salts (lime and magnesia). If these conditions cannot be obtained and there remains a very slight excess of alkaline substances in the water (carbonate or bi-carbonate of soda), this excess can be tolerated providing there is no trace of caustic alkali.

The purification of water for dyeing is accomplished at the present time by two principal methods which can be used in combination: (1) old method of precipitation; (2) permutation process. These two processes will be described in the succeeding articles.

FRENCH WORSTED DRAWING.

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92, carried by the wheels R, and having a vibratory movement corresponding to the length of the bobbin.

One roller B o^1, Fig. 88, or two rollers, Fig. 92, in which are cut deep grooves, are set in fixed bearings and have a supplementary rotary motion.

These supports of the rollers B *o* have open slides C o^2 guiding the mandrel M *a*, the shaft of which carries at each end a knob or button which engages with each slide. The rotary funnel K^1 placed as near as possible to B *o* condenses

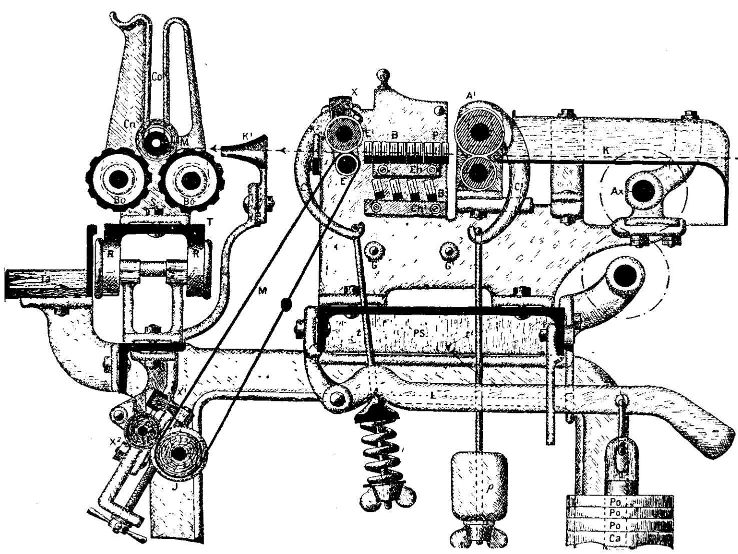

Fig. 92. Drawing Mechanism.

the drawn fibers into a sliver and presents them to the winding rolls. The sliver is wound on a hollow tube made of wood, pressed paper or tin. This tube on which the sliver is firmly wound enables the material to be easily handled and held in position on the spindle of the feed-rack when being unwound for delivery to the next machine.

The tube C *n* is slipped over the mandrel M *a* and the knobs of the latter are placed in the slides C o^2 of the side supports S. The spool is filled by the vibratory and rotary motions of the roller B *o*, which wind the sliver in superimposed spiral layers forming a solid mass. The weight of the mandrel M *a* compresses the sliver and increases the solidity of the mass of wool, which is necessary in order to prevent its becoming broken and also to facilitate handling of it.

Custom combers compress the sliver still more by placing movable weights in the open guides C o^2, these resting on the knobs of the mandrel M *a*. This extra pressure increases the solidity of the mass of wool and consequently increases the capacity of a spool and facilitates packing of material in bales.