

## From Manual Work to the Modern Plant Part II

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We have previously seen that my father could not find any partner interested in developing the continuous casting and rolling technology for copper rod. The statement “Nemo propheta in patria” (nobody is a prophet in his own country) is still valid in modern times, even if it is more than two thousand years old!

My father would have preferred an Italian partner, but ... no way. The few potential industrial joint-venture prospects declined every proposal he could make. We have already touched on the political and commercial obstacles he faced due to the stringent need of the Italian industries to maintain a smooth relationship with the Mines and the wire-bar Rolling Mills. They were against continuous casting so the Italians followed this position.

Ilario Properzi always held in high esteem everything made in Germany, but did not like the Germans very much and this was understandable. When he was a very young man in the Italian army he fought against Germany and Austria for three long years and the memories of the Second World War and the Nazi occupation were still very fresh in his mind. In any case, business is business and Felten & Guilleaume was a highly reputed company and the first real opportunity which presented itself at the time.

So, one Model 6 wheel and belt caster for copper was installed and tested near Kohl on the basis of an agreement signed on March 13, 1958. It was a small machine with 1.100 mm casting wheel with improved pouring tundish and with its spout at the 1:30 position for casting. This is an arrangement that others still have in use, although we prefer to use the vertical casting position and have done so since 1970. Additionally, the design of the spray cooling was experimental.

Only five months after the agreement was signed, Felten & Guilleaume wrote on August 20: “Experiments have attained a good partial success....” and this was the good news.

Properzi Copper Rolling Mill installed at Carrollton (GA) in 1963



A few months later the bad news arrived.

In their letter of December 18, 1958 they explained their position and at the same time the general situation of that era.

*“...Although the experiments cannot be considered as concluded, we believe that our objectives will be attained. We would also dare to invest further money for these experiments if the end and conclusion of this venture would not give us some worries.”*

*“We see things so that Continuus will be inclined to sell as much equipment as possible. The customers for such equipment will not only be the cable and the wire manufacturers, but primarily the Mines (copper producers). Then the Mines will appear on the market no longer with wire-bars, but also with cast rod, as the previous passing through wire-bars causes additional costs. The Mines could also place on the market cheaper rod than the one produced by rolling mills. We have big worries about this and we are of the opinion that our costs for further investments on experiments should be considered as lost money...”*

This was disappointing, but the trials produced many useful indications and highlighted the need for a bigger casting machine and a more powerful rolling mill. The first sketches of the Properzi Model 7 were placed on the drawing board. The casting wheel was upgraded to 1,400 mm ( $\approx 27\%$  increase).

The limit at the time was the copper ring that was very difficult to produce from a sound billet of sufficient weight. Today, when we ordinarily supply 4,200 mm copper rings, this limitation sounds incredible. The new rolling mill had 17 rolling stands for an inlet bar maximum cross section of 2,100 mm<sup>2</sup> and exit diameters of 7.6 mm (Al) or 6.35 mm (Cu). The diameter of the 3 rolls in each stand was 270 mm (a 50% increase from the previous Model No. 6). Reduction per stand was always 20% in area. Naturally, there was only one A.C. motor (500 HP) following the Properzi style.

This new model was presented and after that several Model 7 lines were delivered and began production of Aluminium rod. In October 1961, J.B. Russell of Nichols (Properzi's agent) stated again in his paper presented before the Wire Association Convention at French Lick, Indiana: "Ilario Properzi has long had his eyes on copper. As early as 1954 he had successfully cast and rolled copper – (not in continuous operation, w.n.) – on an experimental basis using Model 5 equipment..." The title of this paper was "Progress Report on the New Model 7 Properzi Equipment for the Continuous Casting and Rolling of Copper, Aluminum and Zinc."

However, four key issues were still very much open, and they included the furnace system, the continuous quality control of the molten copper, the kind of refractory and material for the tundish and spout and the steel belt life. At a less important level were the wheel cooling and the rolling mill sequence. Additional efforts in promoting his continuous casting and rolling system versus wire-bars casting and separate rolling method finally ended in two great success stories.

You will find out more in the next issue ...! *by G. Properzi*

