The Wheel and Belt casting machine has found one of its best applications in the production of (10kg) foundry aluminium alloys ingots. The maximum cross section area of ingots producible with this process is around 7,000mm². The resulting ingot, considering a length of 720mm, has a nominal weight of 13.6kg (30 pounds).

Therefore, the production of heavy (22.5kg) ingots could not be covered by this conventional casting machine.

These are the global considerations that have moved our President, Mr. Giulio Properzi, to study a different configuration of the “continuous closed mould” keeping all the well-known advantages granted by the classic casting wheel and belt system. Our engineering studies’ result has been what we call PROPERZI TRACK & BELT CASTER represented in the photo here below.

The circular copper ring mould has been replaced by a plurality of blocks made by a copper alloy and arranged in succession on a chain as per the figure here below. As a consequence, the closed continuous mould is composed on the upper side by the continuous steel belt and on the other three sides by the three sides of the a plurality of blocks as we have said. (We will come back to this important point during the course of the present description). The length of the mould is determined by the distance between the pressing roll [1] and the pressing roll [2]. The tracking wheels (A) and (B) move the caterpillar, like the chain of the bicycle.

The steel belt is pushed against the active chain of blocks, to form the top part of the closed continuous mould, by a series of antifriction skids operated by pneumatic pistons. The steel belt is powered by wheel [2], in a way that in any point of the closed mould the speed of the caterpillar and the speed of the steel belt are exactly the same. It is needless to say that the speed of the caterpillar is equal to the casting speed. It is quite evident that we can have very long mould, i.e. very high production rate, without having negative effect on the foundation and installation costs. Coming back to the pending point of the configuration of the cross section of the continuous mold, it is clearly represented in the figure here below.

Each copper block can be seen as a portion of arc of the classic Properzi ring mould with bending radius equal to infinity. The cross section of the mould has a trapezoidal shape. The top part of the continuous mould is enclosed by the steel belt, while the copper block constitute the other three sides of the mould. The mould is cooled long all its length (from the tangency point of the wheel 1 through the tangency point of the wheel 2) on four sides, by adjustable and calibrated spray nozzles. This allows to have the necessary flexibility for optimizing the cooling curve to the type of alloy being cast.

With this system is now possible to produce heavy ingots (22.5kg and more) at a production rate exceeding 30 t/h.