Abstract.

Pouring nozzle and assembly of such a pouring nozzle with an inner nozzle.

The invention relates to a pouring nozzle 30 comprising at its upstream end 32 a generally rectangular shaped plate 34 with a top surface 16 and a bottom surface. The nozzle 30 also comprises a tube 38 the axis 40 of which is substantially orthogonal to the top surface 16 of the plate 34. The tube 38 extends from the bottom surface of the plate 34 to the downstream end 36 of the nozzle. The nozzle comprises a pouring channel consisting of the inlet orifice 18 formed through the surface 16 of the plate 34, a bore in the plate 34, a bore 50 in the tube 38; the downstream end 36 of the tube is closed and the pouring channel emerges close to the downstream end 36 through outlets 46, 46' formed in the lateral walls of the tube 38. The orifice of the plate 34, the bores of the plate and of the tube and the outlets being in fluid connection. The outlets 46, 46' are disposed symmetrically on either side of the axis 40 of the tube 38. The centres of the outlets 46, 46' on either side of the axis 40 define an axis 48 of the outlets substantially orthogonal to the axis 40 of the tube 38. The axis of the outlets is substantially parallel to a pair of sides of the plate 34. The orifice 18 is oblong and has a major axis 42 and a minor axis 44. The minor axis 44 of the orifice 18 is parallel to the axis 48 of the outlets. According to another of its objects, the present invention also relates to an assembly of such a nozzle with an inner nozzle. This nozzle as well as its assembly with an inner nozzle are used for the continuous casting of steel from a tundish towards a continuous casting mould.

Figure 3

Claims.

1. Pouring nozzle (30) for the continuous casting of steel from a tundish towards a continuous casting mould comprising, at one end, referred to as the upstream end (32), a generally rectangular-shaped plate (34) with a top surface (16) and a bottom surface, and a tube (38), the axis (40) of the tube being substantially orthogonal to the top surface (16) of the plate (34), extending from the bottom surface of the said plate to an opposite end of the nozzle, referred to as the downstream end (36), the nozzle (30) comprising a pouring channel consisting of an inlet orifice (18) formed through the surface (16) of the plate (34), a bore in the plate, a bore (50) in the tube, the downstream end (36) of the tube being closed and the pouring channel emerging close to the downstream end (36) through outlets (46, 46') formed in the lateral walls of the tube (38), the orifice in the plate (18), the bores in the plate and in the tube and the outlets being in fluid connection, the outlets (46, 46') being disposed symmetrically on either side of the axis (40) of the tube (38), the centres of the outlets (46, 46') on either side of the axis (40) defining an axis, referred to as the axis of the outlets (48), substantially orthogonal to the axis (40) of the tube (38), the axis of the outlets (48) being substantially parallel to a pair of sides of the plate (34)
   characterised in that
   the orifice (18) is oblong and has a major axis (42) and a minor axis (44) **and in that** the minor axis (44) of the orifice (18) is parallel to the axis of the outlets (48).
2. Pouring nozzle (30) according to claim 1, wherein the major axis (42) of the oblong orifice (18) is off centre with respect to the sides of the rectangle perpendicular to the axis of the outlets (48).
3. Pouring nozzle (30) according to either one of claims 1 or 2, wherein the dimension of the plate (34) in the direction corresponding to the axis of the outlets (38) is equal to at least three times the dimension of the minor axis (44) of the orifice (18).
4. Pouring nozzle (30) according to any one of claims 1 to 3, wherein the oblong orifice (18) is conformed in two arcs of circles the radii of which are identical and correspond to twice the distance separating the centres thereof connected by parallel straight-line segments, with identical lengths and perpendicular to the axis of the outlets (48).
5. Pouring nozzle (30) according to any one of claims 1 to 4, wherein the pouring channel changes from an oblong cross section to a circular cross section over a distance of between 20 and 50 mm as from the top surface (16) of the plate (34).
6. Pouring nozzle (30) according to claim 5, wherein the change in cross section is accompanied by a reduction in the cross section of flow.
7. Assembly of a pouring nozzle (30) according to any one of claims 1 to 6 and an inner nozzle, the inner nozzle comprising a plate at one end, referred to as the downstream end, provided with a discharge orifice, the seal between the pouring nozzle and the inner nozzle being effected by a joint between the downstream plate of the inner nozzle and the upstream plate

(34) of the pouring nozzle, **characterised in that** the discharge orifice of the inner nozzle is conformed in a substantially identical manner to the inlet orifice (18) of the pouring channel in the pouring nozzle (30) so that, in the pouring position, the two orifices communicate fluidly.

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[HRISHIKESH RAY CHAUDHURY]
OF REMFRY & SAGAR
ATTORNEY FOR THE APPLICANT[S]

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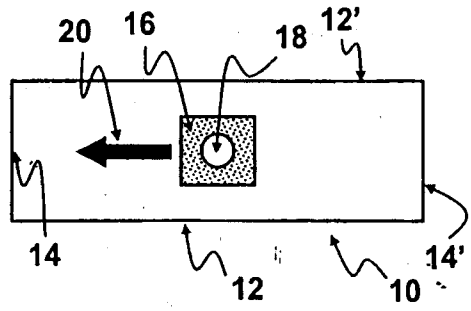

Fig. 1
Prior art

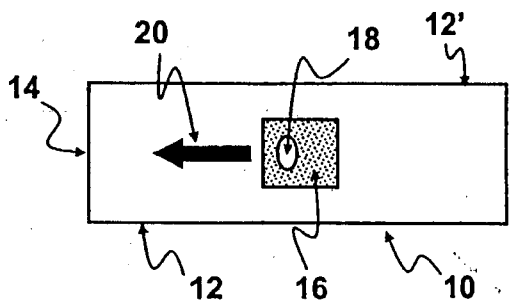

Fig. 2

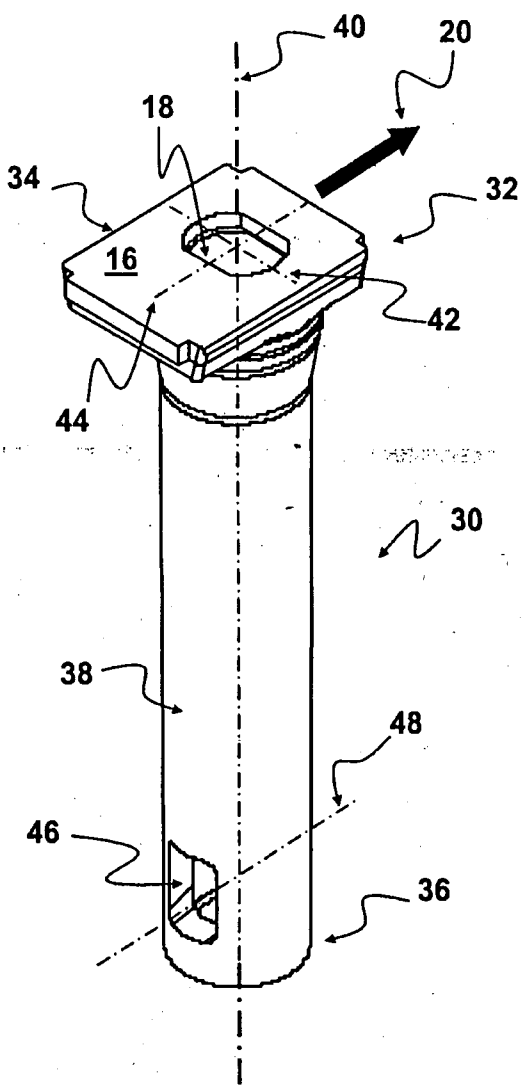

Fig. 3

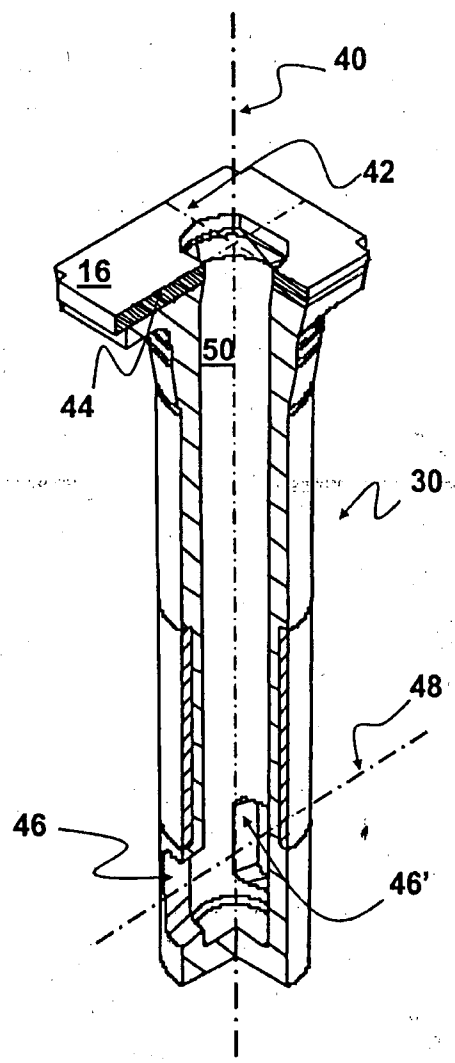

Fig. 4

(HRISHIKESH RAY CHAUDHURY)
OF REMFRY & SAGAR
ATTORNEY FOR THE APPLICANTS