

Title (en)  
ELECTROMAGNETIC VALVE

Title (de)  
ELEKTROMAGNETISCHES VENTIL

Title (fr)  
ELECTROVANNE

Publication  
**EP 0914223 A1 19990512 (EN)**

Application  
**EP 97920852 A 19970507**

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• GB 9701245 W 19970507  
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Abstract (en)  
[origin: GB2312861A] In the continuous casting of steel the liquid, molten, metal is poured under gravity from a reservoir container known as a tundish through a tube into an open-bottomed, water-cooled mould from which a solidifying strand of steel is withdrawn continuously. Accurate control of the pouring is traditionally accomplished by hydraulic manipulation either of a slide gate fitting across the pouring tube or of a conical ceramic stopper in the tundish outlet, but these devices are subject to blockage and erosion, to freezing up of the apertures through which the melt passes, to leakage, and to wear, all of which make accurate control difficult and necessitate frequent replacement of the moving parts. Ideally, a control valve for this sort of use should have no moving parts, be capable of rapid and continuously variable flow rate adjustment, be usable with standard pouring tubes, and should be small and light. The present invention proposes a form of electromagnetic valve which substantially or wholly meets the desired criteria. More specifically there is to be created across or around the outlet/pouring tube (channel) of the molten metal reservoir ( the tundish, for example) an alternating electromagnetic field, that there be induced electrical currents - eddy currents - in the molten metal as it passes through this field, which eddy currents interact, directly or indirectly, with the applied magnetic field, and that the directions and magnitudes of the field and of the induced eddy currents are arranged such that forces are generated in the molten metal which oppose the downward flow of the liquid and so provide the desired controllability of the passage of the metal through the outlet. The channel may have a reducing cross-section or alternatively there may be two magnetic field generators.

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