

Title (en)  
STEEL CONTINUOUS CASTING METHOD AND IN-MOLD MOLTEN STEEL FLUIDITY CONTROLLER

Title (de)  
STRANGGUSSVERFAHREN FÜR STAHL UND STAHLSCHELMZENFLUIDITÄTSSTEUERUNG IN DER FORM

Title (fr)  
PROCÉDÉ DE COULÉE CONTINUE D'ACIER ET CONTRÔLEUR DE FLUIDITÉ D'ACIER FONDU EN MOULE

Publication  
**EP 2151291 A4 20131016 (EN)**

Application  
**EP 08740580 A 20080417**

Priority  
• JP 2008057510 W 20080417  
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Abstract (en)  
[origin: EP2151291A1] PROBLEM: To provide improved electromagnetic stirring properties below the meniscus using a dual-purpose coil that performs both electromagnetic braking and electromagnetic stirring. MEANS: A method of continuous steel casting which selectively causes electromagnetic braking or electromagnetic stirring to act on molten steel in a mold by applying direct current or 3-phase alternating current to an electromagnetic coil disposed on a wide side of a mold. The electromagnetic coil 5 has n teeth 5a disposed on each wide side. The teeth 5a are provided with inner winding 5c around each tooth. An outer winding 5d is further provided around every two teeth which have been provided with inner winding 5c, so as to form a single unit. A core 5b of the electromagnetic coil 5, which includes the teeth 5a, is disposed within a vertical region of the mold, with the vertical region extending from a meniscus of the molten steel to a position of an outlet port 1a of immersion nozzle 1 of the mold. An electromagnetic force is induced in the molten steel 2 below the meniscus when electromagnetically stirring the molten steel 2 in the mold 3. The electromagnetic force is preferably at least twice the electromagnetic force induced at the position where the outlet port 1a of the immersion nozzle 1 is placed. ADVANTAGEOUS EFFECT: A favorable swirling flow can be formed even under the meniscus of the molten steel.

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CPC (source: EP KR)  
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• [AD] JP 2007007719 A 20070118 - SUMITOMO METAL IND  
• [AD] JP 2005349454 A 20051222 - SUMITOMO METAL IND  
• [A] JP 2004314096 A 20041111 - JFE STEEL KK  
• [A] JP 2004322179 A 20041118 - SUMITOMO METAL IND  
• [A] WO 03041893 A1 20030522 - ABB AB [SE], et al  
• [A] JP 2003039141 A 20030212 - NIPPON STEEL CORP  
• [A] US 5746268 A 19980505 - FUJISAKI KEISUKE [JP], et al  
• See references of WO 2008149608A1

Cited by  
CN104690242A; EP3590628A4

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