

## Title (en)

ELECTROMAGNETIC COIL DEVICE FOR USE OF IN-MOLD MOLTEN STEEL CAPABLE OF SERVING BOTH AS ELECTROMAGNETIC STIR AND ELECTROMAGNETIC BRAKE

## Title (de)

ELEKTROMAGNETISCHE SPULENVORRICHTUNG ZUR VERWENDUNG BEI IN DER FORM GESCHMOLZENEM STAHL, DIE SOWOHL ALS ELEKTROMAGNETISCHE RÜHRVORRICHTUNG ALS AUCH ALS ELEKTROMAGNETISCHE BREMSE DIENEN KANN

## Title (fr)

DISPOSITIF À BOBINE ÉLECTROMAGNÉTIQUE POUR ACIER FONDU EN MOULE, AYANT À LA FOIS UN EFFET DE BRASSAGE ET DE FREIN ÉLECTROMAGNÉTIQUE

## Publication

**EP 2218528 A4 20140108 (EN)**

## Application

**EP 08848743 A 20081010**

## Priority

- JP 2008068486 W 20081010
- JP 2007298484 A 20071116

## Abstract (en)

[origin: EP2218528A1] PROBLEM: To optimize the relationship between the inner and outer windings of a multi-function coil. MEANS: An electromagnetic coil system for continuous casting of steel configured to selectively activate electromagnetic stirring and electromagnetic braking of molten steel by applying a direct current or at least a 3-phase alternating current to an electromagnetic coil. The electromagnetic coil is provided with two teeth 1aa extending from yoke 1ab. An inner winding 1b is provided around the two teeth 1aa, and an outer winding 1c is further provided around the outside. A number of coil turns of the outer winding 1c is equal to a number of coil turns -of the inner winding 1b, if the number of coil turns of the inner winding 1b is sufficient. The number of coil turns of the outer winding 1c is greater than the number of coil turns of the inner winding 1b and no more than 2.5 times the number of coil turns of the inner winding 1b, if the number of coil turns of the inner winding 1b is insufficient. The electromagnetic coil is arranged so that there are n coils disposed on each wide side 1a, where n is a natural number greater than or equal to 2, and the core 1a of a magnetic material is disposed in a range extending in a vertical direction from a position of the meniscus and including an outlet port of immersion nozzle 4. ADVANTAGEOUS EFFECT: Sufficient stirring performance and braking performance can be ensured, even if the inner winding does not have the necessary number of coil turns.

## IPC 8 full level

**B22D 11/115** (2006.01); **H01F 3/00** (2006.01); **H01F 7/20** (2006.01)

## CPC (source: EP)

**B22D 11/115** (2013.01); **H01F 3/00** (2013.01); **H01F 7/20** (2013.01)

## Citation (search report)

- No further relevant documents disclosed
- See references of WO 2009063711A1

## Cited by

CN106466708A; CN105014029A; EP2808103A4; US10207318B2; WO2016078718A1

## Designated contracting state (EPC)

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR

## DOCDB simple family (publication)

**EP 2218528 A1 20100818; EP 2218528 A4 20140108; EP 2218528 B1 20150624**; BR PI0820371 A2 20150512; BR PI0820371 B1 20191022; CN 101868311 A 20101020; CN 101868311 B 20121128; JP 2009119515 A 20090604; JP 5023989 B2 20120912; KR 101207679 B1 20121203; KR 20100080945 A 20100713; WO 2009063711 A1 20090522

## DOCDB simple family (application)

**EP 08848743 A 20081010**; BR PI0820371 A 20081010; CN 200880116325 A 20081010; JP 2007298484 A 20071116; JP 2008068486 W 20081010; KR 20107013161 A 20081010