Title (en)

ENERGY- AND YIELD-OPTIMIZED METHOD AND PLANT FOR PRODUCING HOT STEEL STRIP

Title (de)

ENERGIE- UND AUSBRINGUNGSOPTIMIERTES VERFAHREN UND ANLAGE ZUR ERZEUGUNG VON STAHLWARMBAND

Title (fr)

PROCÉDÉ À ÉNERGIE ET RENDEMENT OPTIMISÉS ET INSTALLATION DE PRODUCTION D'UNE BANDE D'ACIER LAMINÉE À CHAUD

Publication

**EP 2627465 B1 20160323 (DE)**

Application

**EP 11774009 A 20111010**

Priority

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Abstract (en)

[origin: EP2441539A1] The method of continuously or semi-continuously producing hot steel strip, comprises rolling a slab (3) guided through a slab-guiding device (6) in four rolling stages using a four-stand roughing train (4) or in five rolling stages using a five-stand roughing train to form an intermediate strip (3'), heating the intermediate strip using an inductive heating device by a cross-field heating method at 1170[deg] C for 5-13 seconds, cooling the intermediate strip at a cooling rate of 2.5 K/m, and rolling the intermediate strip in four rolling stages using the four-stand roughing train. The method of continuously or semi-continuously producing hot steel strip, comprises rolling a slab (3) guided through a slab-guiding device (6) in four rolling stages using a four-stand roughing train (4) or in five rolling stages using a five-stand roughing train to form an intermediate strip (3'), heating the intermediate strip using an inductive heating device by a cross-field heating method at 1170[deg] C for 5-13 seconds, cooling the intermediate strip at a cooling rate of 2.5 K/m, rolling the intermediate strip in four rolling stages using the four-stand roughing train or in five rolling stages using the five-stand roughing train to form a final strip (3") with a thickness of less than 1.2 mm, and cooling the final strip between an end of the slab-guiding device and an inlet region of the roughing train by an ambient temperature. The thickness of the slab that is cast in a die is reduced to 95-115 mm in a liquid core reduction process using the adjoining slab-guiding device. A slab support length measured between the meniscus such as a bath level of the die and an end of the slab-guiding device facing the roughing train is >= 20.1-23 m, and a casting speed is 3.8-7 m/min. The slabs with different thicknesses are poured into the cast, where the slab with 110-120 mm thickness is produced at the casting speed of 3.8-5 m/min, the slab with 95-110 mm thickness is produced at the casting speed of 5-5.9 m/min and the slab with 102 mm thickness is produced at the casting speed of >= 5.9 m/min. The slab is rolled in the roughing train within 50 seconds, where a first slab is rolled in the roughing train within 6.2 minutes. A reduction in the thickness of 40-55% of the slab carried out in the roughing train in per rolling stage. The intermediate strip is rolled in the finishing roughing train within 8 seconds. The slab exiting from the die and entering into the slab-guiding device has a slab thickness of 115-125 mm. Guiding elements of the slab-guiding device are adjusted relative to a longitudinal axis of the slab for the liquid core thickness reduction of the slab, where an adjustment of the guide elements is performed depending on the material of the slab and/or the casting speed. The slab thickness is: dynamically and quasi-statically adjustable at the beginning of a casting sequence such as shortly after discharge of the slab from the die; and adjustable during the casting process or during the passage of the slab through the slab-guiding device. The slab thickness measured with the casting speed is observed in a stationary-continuous operation of the plant according to vc = K/d 2>for using a spray device in a region of the slab-guiding device that is hard to be cooled by applying 3-4 liters of coolant per kg slab steel, where K is a speed factor at a slab supporting length of 17.5 m in a corridor area of 45500-48900, which is suitable for the determination of casting speeds or slab thickness for the plant. The slab thickness measured with the casting speed is observed in the stationary-continuous operation of the plant according to vc = K/d 2>for using a spray device in a region of the slab-guiding device that is medium-hard to be cooled by applying 3-4 liters of coolant per kg slab steel, where K is the speed factor at a slab supporting length of 17.5 m in a corridor area of 59,9000-64,600, which is suitable for the determination of casting speeds or slab thickness for the plant. The slab thickness measured with the casting speed is observed in the stationary-continuous operation of the plant according to vc = K/d 2>for using a spray device in a region of the slab-guiding device that is soft to be cooled by applying less than 2.2 liters of coolant per kg slab steel, where K is the speed factor at a slab supporting length of 23 m in a corridor area of 53950-59000, which is suitable for the determination of casting speeds or slab thickness for the plant. An independent claim is included for a plant for continuous or semi-continuous production of hot steel strip.

IPC 8 full level

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