

Title (en)  
Process and installation for continuous case hardening

Title (de)  
Verfahren und Anlage zum kontinuierlichen Einsatzhärten

Title (fr)  
Procédé et installation de cémentation continue

Publication  
**EP 2186916 B1 20131002 (DE)**

Application  
**EP 08169293 A 20081117**

Priority  
EP 08169293 A 20081117

Abstract (en)  
[origin: EP2186916A1] The method comprises activating a workpiece (100) in a pre-oxidation oven (1) at 400-500[deg] C, introducing the workpiece in a rotary hearth furnace (50) over a lockable loading/unloading opening (53) of the rotary hearth furnace with a first loading/unloading manipulator (10, 10'), heating the workpiece at predetermined carburizing temperature, carburizing the workpiece for reaching a predetermined carburization depth and hardening the workpiece at a predetermined hardening temperature, and taking out the workpiece with the first loading/unloading manipulator from the rotary hearth furnace. The method comprises activating a workpiece (100) in a pre-oxidation oven (1) at 400-500[deg] C, introducing the workpiece in a rotary hearth furnace (50) over a lockable loading/unloading opening (53) of the rotary hearth furnace with a first loading/unloading manipulator (10, 10'), heating the workpiece at predetermined carburizing temperature, carburizing the workpiece for reaching a predetermined carburization depth and hardening the workpiece at a predetermined hardening temperature, taking out the workpiece with the first loading/unloading manipulator from the rotary hearth furnace over the loading/unloading opening and arranging the workpiece on a first elevation arrangement of a quenching means, where the elevation arrangement is associated to the loading/unloading opening, lowering the workpiece in a quenching medium and quenching the workpiece at core temperature of 60-150[deg] C for reaching a predetermined hardening depth and a predetermined hardness, pre-treating the workpiece for tempering, where the pre-treatment comprises washing, cooling and drying and the workpiece has a core temperature of 25-35[deg] C after the pre-treatment, and tempering the workpiece at 160-180[deg] C. The quenching of the workpiece is carried out in such a way that the workpiece is quenched in a first chamber of the quenching means associated to the rotary hearth furnace, with a first quenching medium for a predetermined time duration. The workpiece is put down after the first quenching process with the loading/unloading manipulator on a second elevation arrangement in a second chamber of the quenching unit, is lowered and quenched with the second quenching medium. The core temperature of the workpiece is 60-150[deg] C. The workpiece is put down by the first elevation arrangement in first quenching medium on a rotary disc of the rotating unit that rotates the workpiece with an adjustable number of revolutions in the quenching medium. The first elevation unit is lowered for dropping the workpiece over the external circumference of the rotating plate of the rotating device towards bottom. The workpiece is again cooled after the pre-treatment process, which is carried out for 20 minutes per mm of hardening depth. The workpiece is arranged directly after the cooling. The workpiece is subjected after tempering in part area of a shot peening hardening. An independent claim is included for a plant for continuous case hardening of workpieces.

IPC 8 full level  
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CPC (source: EP)  
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