

# UNITED STATES PATENT OFFICE.

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## PROCESS OF QUENCHING COKE.

958,651.

Specification of Letters Patent.

Patented May 17, 1910.

No Drawing.

Application filed June 5, 1909. Serial No. 500,302.

*To all whom it may concern:*

Be it known that I, HEINRICH KOPPERS, a citizen of Germany, residing at Essen-on-the-Ruhr, Germany, have invented new and useful Improvements in Processes of Quenching Coke, of which the following is a specification.

With the processes for quenching coke, hitherto employed, water is sprayed over each batch of white hot coke discharged from an oven. In order to effect a thorough quenching, water must necessarily be used in large quantities, of which the partly cooled coke, owing to its porous structure, will absorb a considerable amount. The water thus introduced into the coke is not only an unnecessary ballast during shipment, but is highly undesirable when using the coke in blast or cupola furnaces. Moreover, the cold water, when sprayed on the white hot coke in large quantities, will cause the coke to cool suddenly and become brittle, and this brittleness causes it to crack, so that the mechanical resistance of the coke is greatly impaired.

This invention relates to a novel process of quenching white hot coke which overcomes all these disadvantages. For this purpose the white hot coke coming from the coke chamber is discharged into a bath containing a quantity of water which is of a depth to completely immerse the coke. The water should be preheated to such a degree that the heat contained in the coke is sufficient to raise the water temperature to the boiling point. In this way the coke, while submerged, is not able to take up any water, because its pores will be immediately filled with steam. Each lump of hot coke, while being submerged in boiling water, is surrounded by a steam jacket and consequently the heat is gradually extracted from the coke and there is no sudden cooling to cause brittleness, which, in turn, would result in cracking. When the coke lumps have been immersed for such a length of time that they are covered with cooled crusts, while their

cores are still hot, the water is run off. Even at this stage, the water still adhering to the coke lumps will not enter the pores thereof, but will be evaporated, owing to the heat emanating from the cores of said lumps. The small amount of water produced by the condensation of the steam contained in the pores is so insignificant that it may practically be ignored.

In carrying out my invention, I proceed as follows: An open tank car traveling on a track arranged in front of the battery of ovens and partly filled with warm water is run in front of the coking chamber to be emptied. The track should occupy such a level that the coke discharged from the oven falls into the car and for the purpose of evenly distributing the charge, the car is simultaneously moved transversely toward the coking chamber. This prevents the coke from falling against a hard surface and from being broken into small pieces. When the water has been brought to a boiling point and each piece of coke is covered with a cooled crust, the water is run off, and then the tank is tipped to unload the coke. The water still adhering to the several pieces of coke will not penetrate into the same, owing to the hot state of the coke, but will be evaporated and thus driven off.

I claim:

Process of quenching coke, which consists in immersing the output of each coking chamber of a coke oven in hot water for a length of time sufficient to envelop the core of each coke lump by a cooled protecting crust, and then exposing the coke to the atmosphere, whereby a uniform quality of non-brittle coke of the entire output is produced.

Signed by me at Joliet, Will county, Illinois, this 2nd day of June, 1909.

HEINRICH KOPPERS.

Witnesses:

EDWIN S. MUNROE,  
R. GUNDERSON.