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J. STRATMANN ET AL

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QUENCH CHAMBER CONSTRUCTION FOR THE QUENCHING OF COKE

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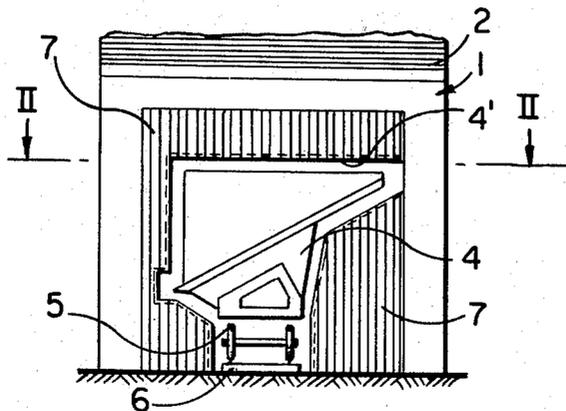


FIG. 1

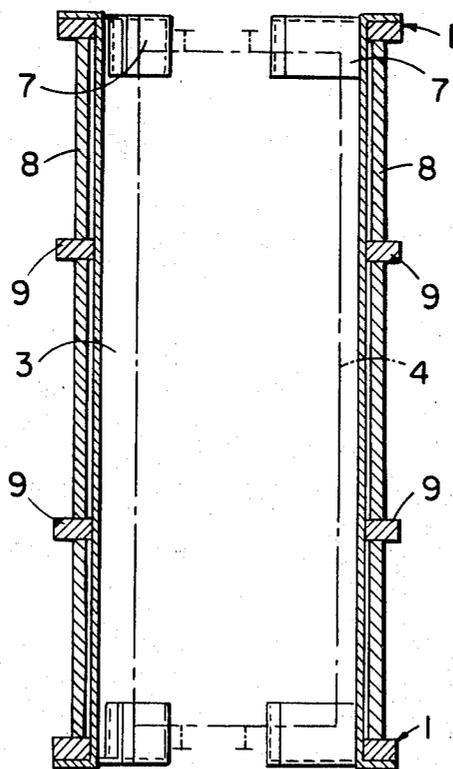


FIG. 2

INVENTORS

Josef Stratmann
Manfred Strobel

by

McBlew & Torrey

ATTORNEYS

1

2

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QUENCH CHAMBER CONSTRUCTION FOR THE QUENCHING OF COKE

Josef Stratmann and Manfred Strobel, Recklinghausen, Germany, assignors to Firma Carl Still, Recklinghausen, Germany

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3 Claims

ABSTRACT OF THE DISCLOSURE

A quench chamber construction for the quenching of coke includes a passageway with at least one end thereof having a narrowed opening which is formed precisely in the configuration of a quench car which is adapted to contain and transport the glowing hot coke. The car is moved over a trackway on wheels and includes a body having a trough shaped lower portion and a trapezoidal shaped upper portion and the entrance to the quench chamber is defined by a passageway made to the outline of the car so that the car forms a seal with the passageway.

SUMMARY OF THE INVENTION

This invention relates in general to the construction of coking furnaces and in particular, to a new and useful quenching chamber for red hot coke which is ejected from the coking furnace and when includes an entrance way for a coke car formed in the precise outline of the car in order to provide a seal with the car.

The quenching of red hot coke ejected from a coke oven is usually effected by delivering the coke to a quench car which is moved into a quenching chamber which is formed at the lower end of a quenching tower. The coke is sprayed with water from nozzles and quenched while it is retained in the car. The resulting gases and vapors rise into the stack of the quenching tower where they are treated by water spraying in order to precipitate the entrained solid coke particles and to prevent the atmosphere in the vicinity of the quenching tower from becoming polluted with such solid coke particles. The chimney also contains baffles around which the gases are directed in order to remove the particles from the air by a striking action. The vapor sprinkling water is removed in a manner such that it does not come into contact with the coke.

The vapors are sprinkled with water in a manner permitting recondensing of as much evaporated water as possible in order that only a small amount of fresh water need be sluiced into the quenching cycle and very little steam is precipitated in the nearby and farther reaches of the quenching tower. The condensing of the steam of the vapor succeeds best when the gas component of the vapors is as small as possible.

In a known quenching system, the gas component of the vapors is increased and the condensation is favorably influenced due to the fact that the air has almost unhindered access to the quenching chamber and is drawn in by the rising vapors which occur during quenching. The volume of the quenched vapors is thereby greatly increased and in order to keep the velocity low the cross section of the stack must be considerably increased to avoid the passing of large quantities of dust into the atmosphere at the stack opening. The enlargement of the stack cross section requires a considerable extra expenditure for material.

Quenching systems are known where during the

quenching process the quenched chamber is closed by gates. However, an extensive air seal can be achieved only when the quench car has its own drive or is separated from the traction device during quenching because otherwise the bumpers and coupling rod systems of the car do not permit a complete seal of the quench chamber. The continuous removal and coupling and uncoupling of the quenched car is bothersome and time consuming in operation especially since there are no known automatic couplings which will operate reliably under the different difficult working conditions and coke operations which require defined quenching. It is known to seal the quench zone hermetically by designing it as a bell which immerses by its lower edge into a water cup. To ensure that during the entire quenching process the coke is suffocated in steam, it is known to close the quench car by lowerable gates after the entrance of the quench car laden with red hot coke. After the car enters there is a regulation of pressure in the chamber by lateral registers whose weight is compensated to the desired degree counterweights.

It is also known to provide, for the quench car which is laden with red hot coke, covers in the form of a hood sealed by means of an immersion cup. In this construction the steam which develops as the quenching water is being sprayed onto the coke is passed through the coke. All of the known devices are complicated constructions with movable parts which are necessary to achieve the seal of the quench car and the surrounding chamber from the outside air.

Another known device is to provide the quench car with end faces having rectangular plates or box-like structures which fill out the entrance and the passage profiles of the quenched chamber. By such an arrangement, the plates or boxes at the ends of the coke car make the quench car clumsy and heavy. In addition, a box or plates obstruct the view.

It has been found that the sealing of the quench zone of the coke quenching units against the access of outside air when the quench car is in position within the zone, may be achieved by a simple technical means without the arrangement of the boxes or plates on the quench car if the form of the quench zone entrances or passages corresponds to the cross section profile of the quench car and the passage profiles are designed as short tunnels. If necessary both the passage profiles and the cross section profile of the quench car are so designed that the quench car locomotive, which for the sake of visibility carries higher superstructure than the quench car itself, can traverse the quench zone. For this purpose, it is merely necessary, for example, to provide the end walls of the quench car box with a shield-like superstructure which corresponds to the higher profile of the locomotive and to adapt the passage profiles accordingly. Furthermore, in order to reduce the cross section of residual openings remaining when the quench car is in the zone masonry walls may be erected in the region of the tunnel entrance to provide wall profiles to the height of the quench car axles and between the rails of the quench car track.

Accordingly, it is an object of the invention to provide an improved means for sealing a quench chamber which accommodates a quench car which is to be adapted to be loaded with glowing coke wherein the quench chamber entrance or the complete passage through the quench chamber is made to a configuration corresponding to the profile or cross section of the quench car and the passage is designed preferably as a short tunnel.

A further object of the invention is to provide a quench chamber sealing arrangement for accommodating a quench car which is simple in design, rugged in construction and economical to manufacture.

3

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there is illustrated and described a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a front view of a quench chamber with a quench car therein forming a seal therewith as constructed in accordance with the invention;

FIG. 2 is a horizontal section along the line II—II of FIG. 1.

GENERAL DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings in particular, the invention embodied therein comprises a quench car entrance generally designated 1 to a quench chamber 3 which is formed as a rectangular tunnel and which is connected intermediate its length to the lower end of a quenching tower or stack 2, the lower part of which is indicated. A quench car 4 having wheels 5 moves along a rail track 6 which extends into the quench chamber 3.

In accordance with a feature of the invention, the complete tunnel passage, or at least the entrance and exit, is formed by wall elements 7 defining an opening 4' which is substantially identical to the profile of the car 4. The wall elements 7 are about 1½ meters long and are adapted in their form to the cross section profile of the quenched car 4. Between the quench car ends and the passage profile there are gaps of a width of about 0.20 meter. The quench chamber includes side walls 8, 8 having reinforcement pillars 9 at spaced longitudinal locations.

When the quenching car is in the quenching chamber, as indicated in dot-and-dash lines in FIG. 2, the end walls of the car, which are of substantially the same outline as the opening at the entrances at each end so that they substantially close off these openings at the ends, prevent the discharge of high temperature gases from the quench-

4

ing chamber. Thus, all of the high temperature gases are removed through the chimney or stack 2, which is at an elevation such that they do not pollute the immediate vicinity. The stack 2 may also be provided with suitable elements for removing the pollutants from the high temperature gases.

What is claimed is:

1. A seal construction for a quench zone of a coking system, comprising high temperature resistant wall means defining a glowing coke quenching chamber having a chimney portion intermediate its length for the discharge of high temperature coke gases and having at least one entrance with at least one opening therein, and a quench car for carrying glowing coke adapted to be moved into the quench chamber having a cross-sectional outline substantially equal to the cross-sectional outline defined by the opening in said entrance, said car being adapted to fit in the entrance and having an end wall of temperature resistant material of substantially the same outline as said opening and substantially closing off said opening to form a seal therewith and preventing the high temperature gases from escaping through the opening during quenching and means in said chamber for spraying quenching fluid onto the glowing coke.

2. A seal construction, according to claim 1, including shield type superstructures mounted on said quench car having an outline corresponding to the higher superstructures of a quench car locomotive and being adapted to the configuration of the passage opening.

3. A seal construction, according to claim 1, wherein said chamber is provided with an entrance at each end and includes a plurality of spaced longitudinal supports.

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NORMAN YUDKOFF, Primary Examiner

D. EDWARDS, Assistant Examiner