

[54] COLLECTING HOOD FOR COKE- QUENCHING CARS

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[58] Field of Search55/385, 467; 239/184, 186, 239/187, 185; 202/227, 229, 230, 263

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[57]

ABSTRACT

Anti-pollution apparatus comprising a hood carried on a cantilever arm supported on a hood car mounted on tracks. The hood extends over a coke-quenching car mounted on the same tracks as the hood car and is connected to a suction and dust extraction device such that gases and dust which rise from the coke batch as it is pushed out of a horizontal by-product coke oven and into the quenching car will be conveyed to a gas-stream purifying device rather than being permitted to escape into the air. As the quenching car moves from the coke oven to a quenching station, the hood car and the hood carried thereby follows such that the hood continually covers the quenching car and prevents the escape of pollutants.

8 Claims, 3 Drawing Figures

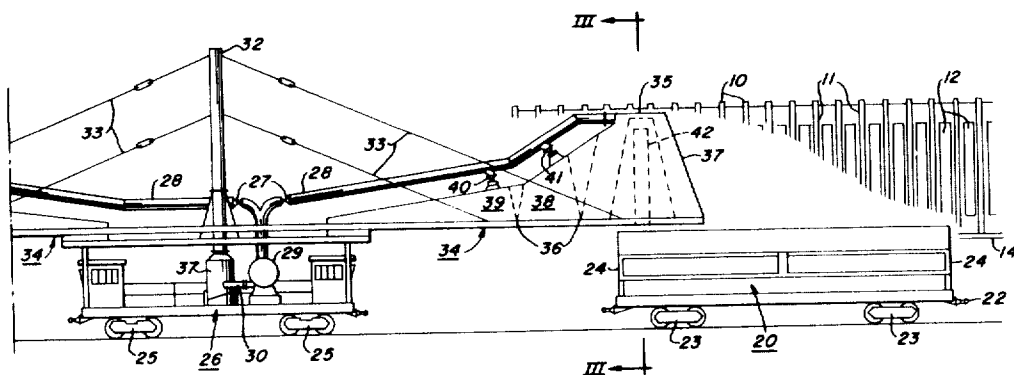
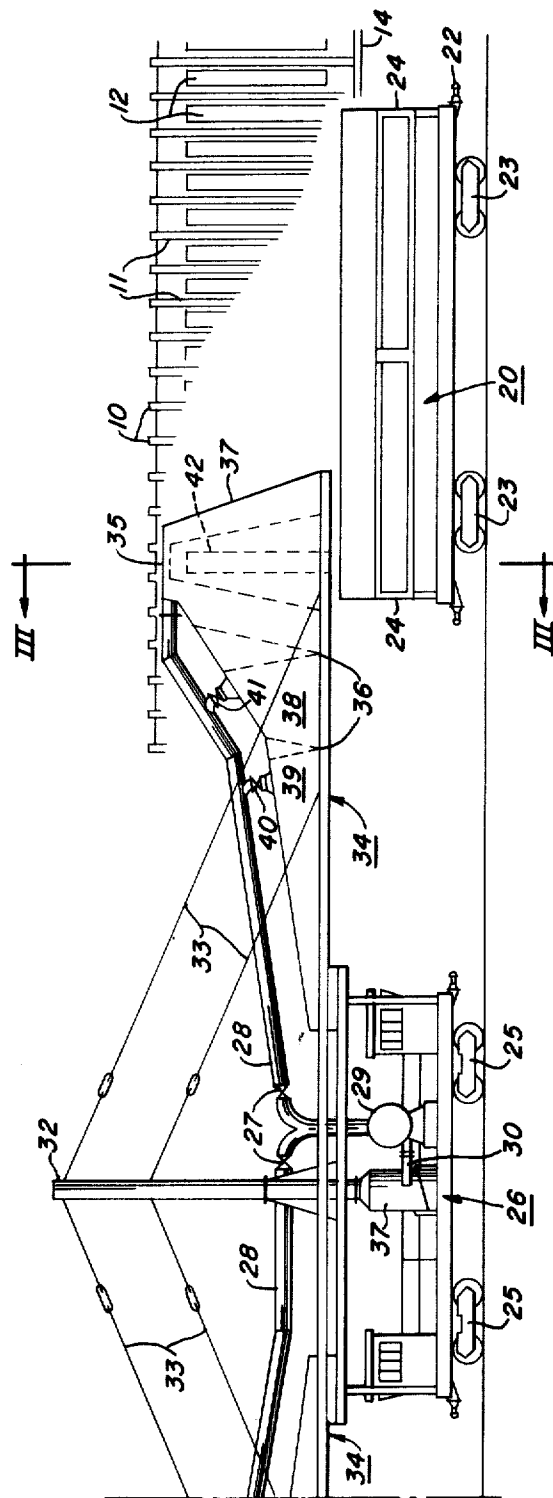


FIG. 1



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FIG. 2

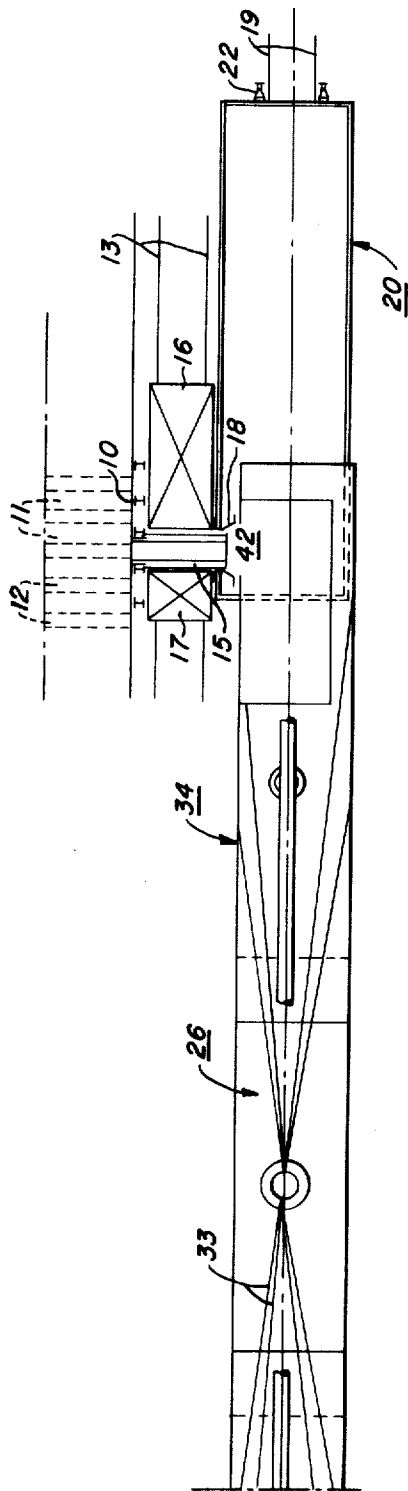
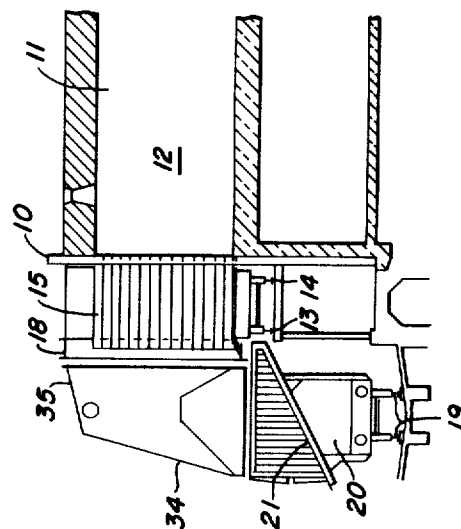


FIG. 3



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COLLECTING HOOD FOR COKE-QUENCHING CARS

BACKGROUND OF THE INVENTION

As is known, the dust and smoke nuisance which is produced during the discharge of coke batches from horizontal by-product coke ovens into a coke-quenching car is so unbearable in thickly populated areas that its avoidance is always a very urgent problem, particularly in view of the ever-increasing pollution of the air from various sources.

In the past, attempts have been made to abate this problem by providing the coke guide at the discharge side of the coke oven with a hood connecting to a dust separator, or by providing a hood over the quenching car itself. As the incandescent coke leaves the oven and falls onto an inclined ramp at the bottom of the coke-quenching car, large quantities of dust and smoke are released from the falling and ricocheting coke. The hood, therefore, constituted an attempt to collect these pollutants before they were discharged into the air.

Such prior art hoods, however, are only partially effective and do not prevent the escape of dust and pollutants into the air as the quenching car is moved from the coke oven to a quenching station. That is, while the coke in the quenching car is moved to a quenching station, the lively combustion process of the coke continues, once it has begun. This produces an upward-directed dust-laden air current. When attempts are made to incorporate a hood into the construction of the coke-quenching car itself, the weight of the car is materially increased, and the hood prevents placing hoisting devices, possibly for cleaning coke oven doors, on the car since the service passage along a larger group of adjacent ovens becomes practically inaccessible as a result.

SUMMARY OF THE INVENTION

The present invention provides a collecting hood for coke-quenching cars which suppresses the dust nuisance due to the burning coke during the entire period from the initial discharge of coke into the car until the car has reached a quenching station. Furthermore, the invention does not require any noteworthy modification of the coke oven arrangement such as gate lifts, coke cake guide grids and the like.

In accordance with the invention, a dust and smoke collecting hood is arranged on a track-mounted car which is separate and apart from the coke-quenching car but which can travel on the same tracks as the coke-quenching car. The car on which the collecting hood is mounted can be moved next to the coke-quenching car with the collecting hood extending out over the quenching car in cantilever beam relationship. The collecting hood is at such a height and of such length that it is in a position to cover the entire top of the quenching car.

When coke is discharged from a coke oven, it is pushed out of an oven chamber by a mechanism on the side of the oven opposite the discharge side. The discharge side of the oven is equipped with a door-extracting machine and a coke guide. The function of the door machine is to remove and hold the discharge guide door during the pushing of an oven and to place an attached coke guide in the proper position to conduct the coke across a bench to the quenching car. The collecting hood of the invention, as mentioned above, is carried in cantilever beam fashion on a car mounted on the same rails as the quenching car such that the quenching car can move underneath the hood, starting from the end of the hood remote from the car on which the hood is carried. The length of the hood is at least as long as the quenching car so that the entire car will fit under the hood. The end of the hood opposite the car on which it is carried has a height such that one side wall thereof may be provided with a door which can be aligned with the discharge opening in a coke oven chamber to permit the coke to pass through this opening and into the interior of the hood, whereupon it falls down into the quenching car.

In an unloading operation, one end of a quenching car is moved into alignment with a coke oven chamber which is to be emptied; and the hood is moved over this end of the

quenching car with its opening aligned with the oven chamber which is to be emptied. Thereafter, as the coke is pushed out into the hood and down into the quenching car, the quenching car is progressively moved toward the car which the cantilever-type hood is supported until the entire car is filled with coke and is entirely beneath the hood. Thereafter, the quenching car, as well as the car which carries the hood, are moved together as a unit to a quenching station with the hood remaining over the quenching car to collect any dust or gases.

In order to exhaust the gases which are formed in the burning coke, a pipe is directed along the hood and is provided with several connections to the interior of the hood. These connections are located at different distances from the inner end of the hood and can be connected or disconnected from gas-purifying apparatus in such a way that the gases are exhausted only from those sections of the hood which are located above the portions of the coke-quenching car which are loaded with coke. Furthermore, the space below the collecting hood can be divided into individual chambers which are located one after another in the quenching car's direction of travel as it is loaded. This is accomplished by partitions which basically run vertically and which extend to the roof of the hood or to the cover of the hood. Each one of these divided areas, in turn, is provided with a connection to an exhaust pipe leading to a gas-purifying device.

The above and other objects and features of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings which form a part of this specification, and in which:

FIG. 1 is an elevational or plan view of a coke oven battery of horizontal chamber ovens as viewed from the coking or discharge side, together with a quenching car standing before the discharge side and a car which can be driven on the same rails as the quenching car and on which two collecting hoods are arranged;

FIG. 2 is a top view of the apparatus shown in FIG. 1; and

FIG. 3 is a cross-sectional view taken substantially along line III—III OF FIG. 1.

With reference now to the drawings, anchor posts 10 are provided at the discharge or coking side of a coke oven, these anchor posts serving to support masonry walls 11 which divide the coke oven into adjacent coking chambers 12. A platform 14 (FIGS. 1 and 3) extends along the front of the chambers 12 and is provided with tracks or rails 13. The rails 13, in turn, receive a car which supports a coke guide 15, a door-extracting machine 16 and a stand 17 for a maintenance man. Carried on elements 16 and 17, and framing the coke cake guide 15 is a frame-like jacket 18.

Beneath rails 13 and to the left side thereof as viewed in FIG. 3 are rails 19. Mounted on rails 19 is a coke-quenching car 20. It has a sloping bottom 21 (FIG. 3) on which the burning coke is dropped and on which it is taken to a quenching station. The quenching car 20 is provided at its opposite ends with walls 24 (FIG. 1) and has two wheel trucks 23. An electric locomotive, not shown, is usually connected to the quenching car and engages a bumper 22 on the car 20 for moving it forwardly or backwardly, as the case may be. Alternatively, the car can be driven directly by electric motors connected to the wheels on the trucks 23.

Also mounted on the tracks 19 adjacent the car 20 is a hood car 26 on which two collecting hoods 34 are mounted and extend outwardly therefrom in cantilever beam fashion, only one hood being shown in FIGS. 1 and 2. The hood car 26 is provided with two wheel trucks 25 whose wheels are preferably driven by integral, electric motors; however an auxiliary locomotive can be used if desired. The hood car 26 carries suction pipes 28 which can be closed by valves 27 and which empty into a blower 29. The exhaust conduit 30 of the blower 29, in turn, is connected to a wet-dust extractor 37 or other similar gas-stream purifying device provided with an exhaust flue 32 from which the purified air emerges. The two hoods 34 extend on opposite sides of the car 26 and toward coke-quenching cars, such as car 20, and are supported in cantilever beam fashion from the flue 32 by means of cables 33.

The hoods 34 are designed such that their roof or top 35 gradually rises starting from the hood car 26 outwardly. At the outermost end of the hood 34, the roof or top 35 reaches a height such that the coke cake can enter under the hood during the pushing or discharging operation. As shown in FIG. 3, the back of the hood is essentially vertical and closely adjacent the flanged opening or jacket 18 which becomes aligned with an opening 42 in the back of the hood 34.

The interior of the hood is divided into several individual chambers by walls 36 which are basically vertical. In addition to the highest chamber at the outermost end of the hood 34, other chambers 38 and 39 are formed. Each of these chambers is provided with a connection to the suction pipe 28. Valves 40 and 41 are incorporated in the connection and can be opened or closed manually or actuated by adjusting devices which are dependent upon the travel of the quenching car 20. That is, as the car 20 moves from right to left as viewed in FIG. 1, initially it will be beneath only the highest chamber containing the opening 42. However, as it continues to progress to the left, portions of the car will be beneath the chambers 38 and 39 such that at these times, the valves 41 and 40 will be opened, in that sequence, to exhaust the gases now collecting in the chambers 38 and 39. As will be understood, the hood 34 which extends to the left in FIG. 1 is identical to the hood already described.

The operation of the invention is as follows: Initially, the quenching car is moved into the position shown in FIGS. 1 and 2. In this position, its end remote from a quenching station is located before the oven chamber which is to be emptied. The car 26, at the same time, is moved into a position wherein the opening in the jacket or flange 18 is aligned with opening 42 in the vertical side wall of the hood 34. During pushing of the coke and as the coke is being discharged into the quenching car 20, the car 26 remains stationary; however quenching car 20 is moved toward the car 26 in order to obtain as uniform a distribution of the burning coke as possible over the entire inclined floor of the quenching car 20. As will be understood, the hood 34 is long enough such that the entire length of the quenching car can move under it. Suction pipe 28 is connected to the blower 29 as soon as the pushing or discharge operation begins. If the quenching car 20 has reached a position at which at least a part of the car is beneath chamber 38 of the hood, valve 41 is opened. Thereafter, valve 40 is opened as the end of the car moves under chamber 39 such that the gases and vapors which are formed by the burning coke are exhausted and as little additional air as possible is sucked from the surrounding area. Once the pushing operation has been completed, the quenching car 20 as well as the hood car 26 move together as a unit and at the same time move toward a

quenching station. The burning coke is, therefore, beneath the hood 34 and gases collected and passed through the air cleaning device 31 until the quenching station is reached and the coke is quenched.

Although the invention has been shown in connection with a certain specific embodiment, it will be readily apparent to those skilled in the art that various changes in form and arrangement of parts may be made to suit requirements without departing from the spirit and scope of the invention.

I claim as my invention:

1. In apparatus for preventing dust and gases from escaping into the atmosphere as burning coke is discharged from a coke oven into a quenching car and during the time that the quenching car travels to a quenching station; the combination of a second car movable in unison with said quenching car and having a hood carried thereon in cantilever beam relationship and projecting from one end thereof to at least partially cover the top of said quenching car as coke is being discharged into the quenching car, said hood having a length great enough to cover the entire length of said quenching car, the arrangement being such that the quenching car is moved under the hood as it is being filled with coke and thereafter is moved in unison with said second car to a quenching station with the hood covering the quenching car.

2. The apparatus of claim 1 wherein said quenching car and said second car are both mounted for movement on the same rails.

3. The apparatus of claim 1 characterized in that the height of said hood at its end remote from said second car is of sufficient height to permit a pushed coke cake to enter the hood and drop down into the quenching car.

4. The apparatus of claim 1 including a conduit extending along said hood for exhausting gases which are collected by the hood, and including a plurality of valves connecting said conduit to the interior of said hood at spaced points along its length.

5. The apparatus of claim 4 wherein the collecting hood is divided into individual zones by essentially vertical walls extending across the width of the hood.

6. The apparatus of claim 1 including a frame-like jacket surrounding a coke guide located adjacent said quenching car, and an opening in the side of said hood adapted to be aligned with said frame-like jacket.

7. The apparatus of claim 1 wherein there are two hoods carried on said second car and projecting outwardly from opposite ends of said car in cantilever beam relationship.

8. The combination of claim 4 wherein said conduit is connected to the suction side of a blower, the exhaust side of said blower being connected to a gas-stream purifying device.

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