United States Patent [19]

Schon

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[54] APPARATUS FOR PREVENTING AIR POLLUTION DURING COKE OVEN DISCHARGE

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[52] **U.S. Cl.** **202/263**, 202/227

[51] **Int. Cl.** **C10b 33/00**

[58] **Field of Search** ..... 202/227–230, 262, 202/263; 98/115 MV

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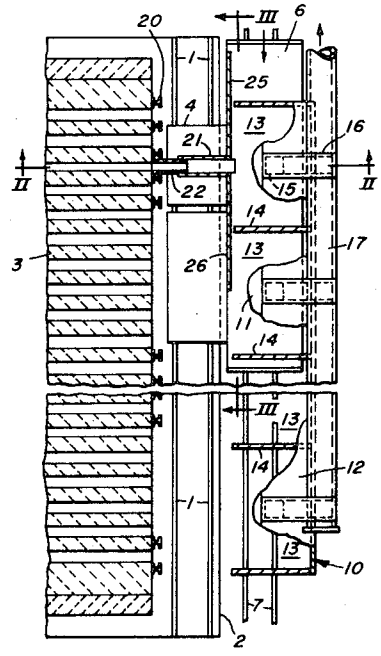
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Assistant Examiner—David Edwards
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[57] **ABSTRACT**

A tubular coke guide, supported by a carriage in front of a row of coke ovens, receives coke from each oven in succession and discharges it into a quencher car. This car is covered by a stationary housing extending throughout the length of the row of ovens. The housing has a roof and an outer wall extending therefrom down close to the outer side of the quencher car. The bottom and inner side of the housing are open and the inside of the housing is divided into cells by means of transverse upright partitions. The upper part of each cell is provided with a valved outlet connected to a suction line. Upright closure walls supported by the carriage extend from the outer end of the coke guide in opposite directions along the housing far enough to close the side of the cell beside them. The tops of these walls substantially engage the housing roof, and their bottoms are close to the inner side of the car. The cell into which the coke is being discharged therefore will have four side walls and a roof so that the smoke and dust produced in the cell will be drawn out through its outlet by means of the suction line.

8 Claims, 9 Drawing Figures

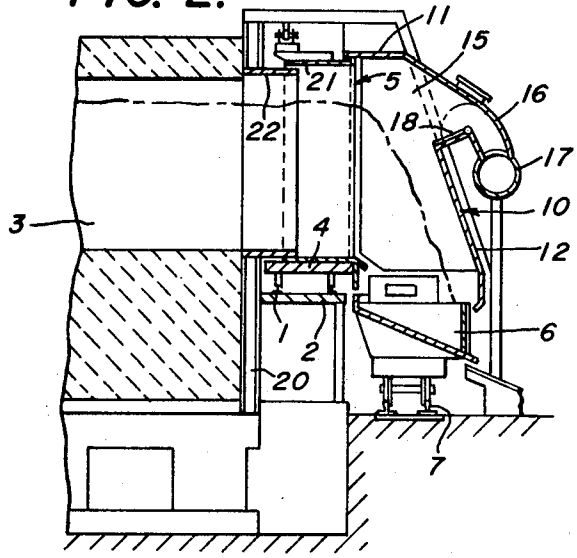


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SHEET 1 OF 3

FIG. 2.



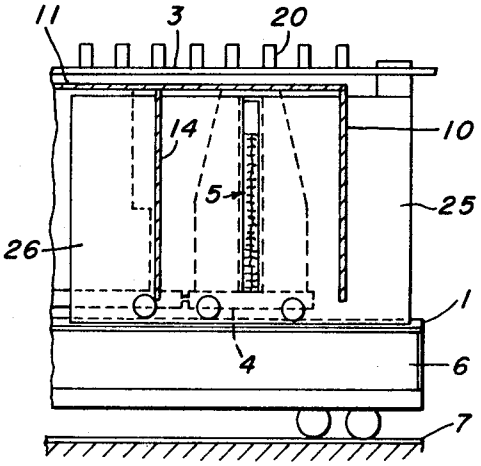


FIG. 3.

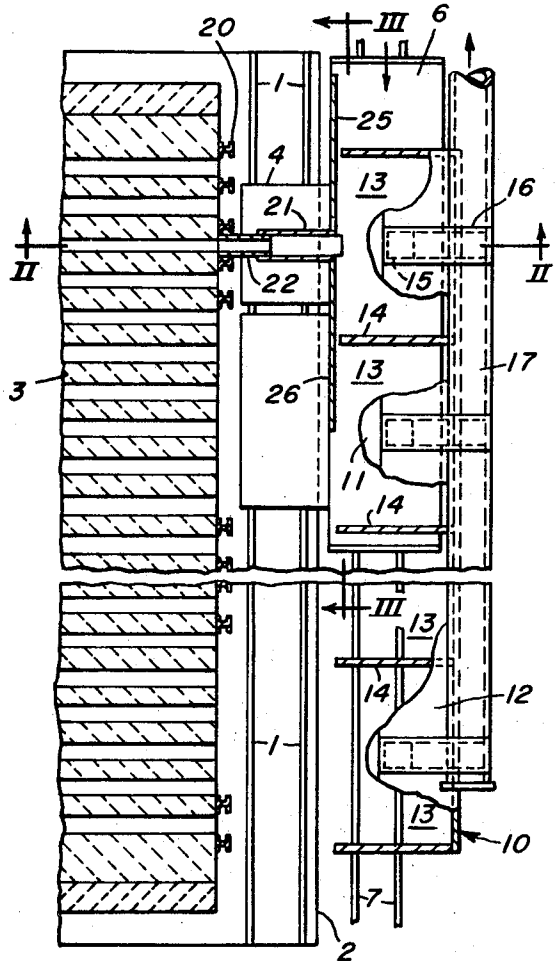
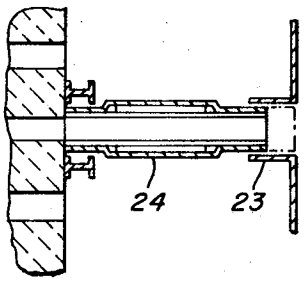


FIG. 1.

FIG. 4.



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FIG. 5.

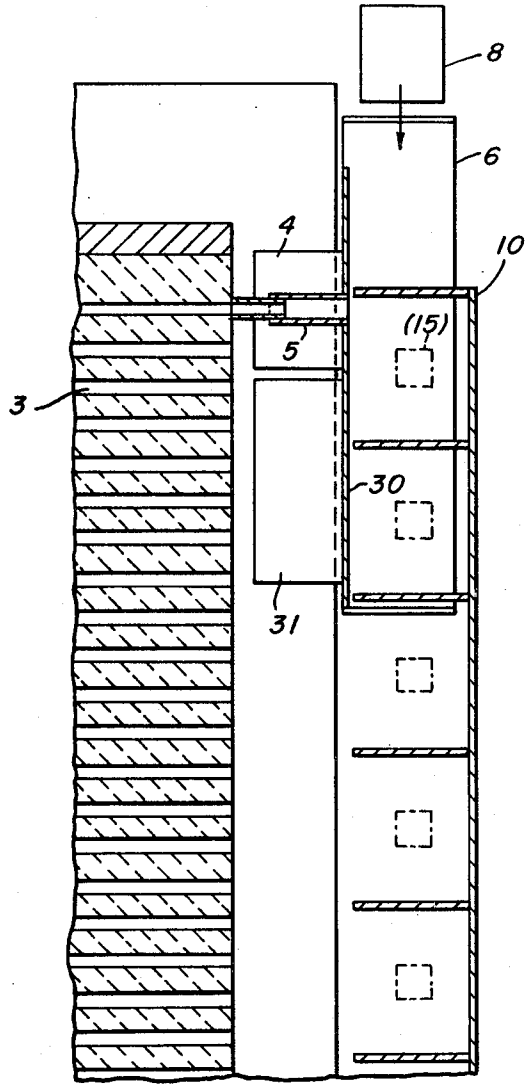
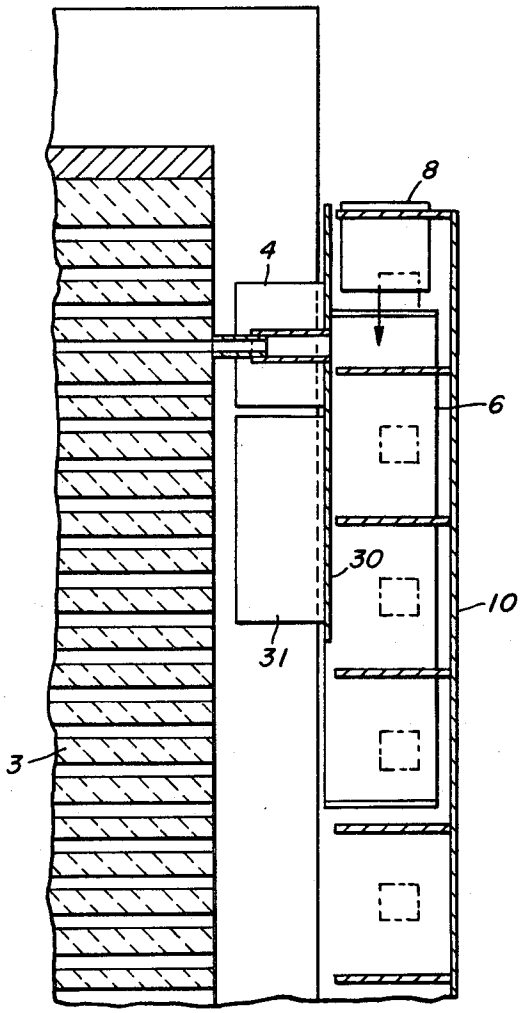


FIG. 6.



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FIG. 7.

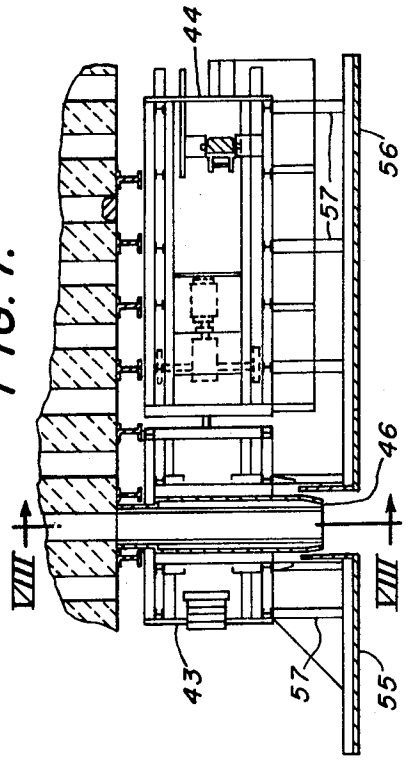


FIG. 9.

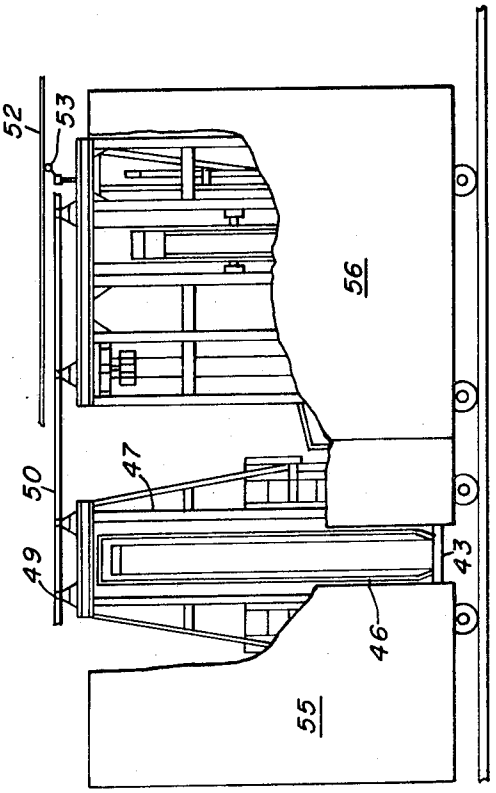
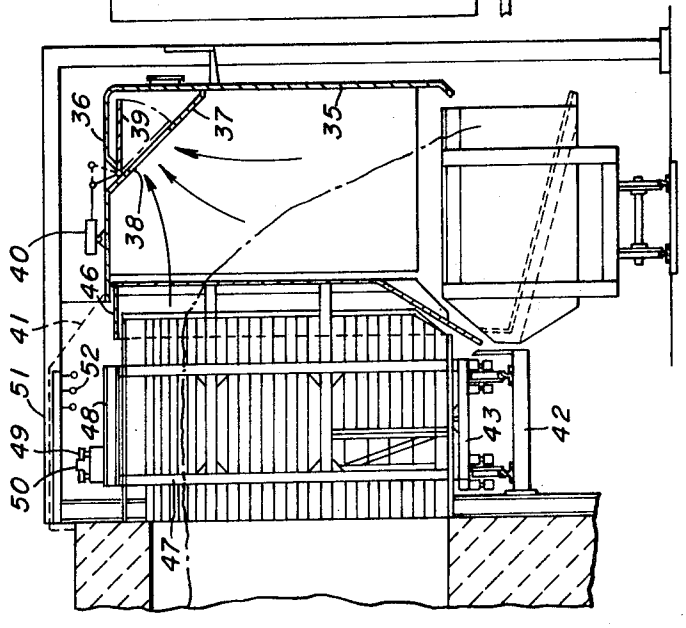


FIG. 8.



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APPARATUS FOR PREVENTING AIR POLLUTION DURING COKE OVEN DISCHARGE

When, during the discharge of a coke oven, the coke is forced through a guide passage and then falls downwardly onto the loading tray of a quencher car, the hot coke reacts vigorously with the air and thereby produces smoke and hot gases which, in a fast upward drift, carry a large amount of dust. To avoid the usual results and annoyances of such smoke and dust development, various arrangements have been tried. For example, containers have been provided that are movable along a row of coke ovens for receiving the coke being discharged. The smoke is removed from the containers by suction, and the coke is partly or completely quenched while in them. Also, hoods have been provided which are movable along the ovens and are provided with suction means for the removal of gases forming during discharge of the ovens.

It is among the objects of this invention to avoid formation of smoke and dust, during discharge of coke ovens, with less expensive means than used heretofore, and to separate those persons who remove, clean and reinsert the oven doors from smoke rising from a quencher car.

In accordance with this invention, the apparatus for preventing pollution during the discharge of coke ovens includes a stationary housing covering the track of the quencher car throughout the length of the series of ovens and having an outer wall extending down to a point close to the outer side of the quencher car, the housing being open downwardly and toward the ovens and having transverse upright partitions therein at a distance from each other corresponding to the width of several ovens. The partitions divide the housing into cells. Each cell has an opening providing communication with a suction line extending along the housing, with a valve for the opening to permit it to be closed. In order to close the oven side of the cells during discharge of the ovens, the carriage carrying a tubular coke guide also carries wing-like substantially upright walls that extend from the guide in opposite directions along the ovens and downwardly to the quencher cars. They also substantially engage the housing roof and the inner edges of the partitions, thereby closing off those cells in which dust and smoke are present. The length of these closure walls depends on the distance between the partitions.

The invention is illustrated in the accompanying drawings, in which:

FIG. 1 is a horizontal section through the housing and coke ovens, showing one of the ovens being discharged;

FIG. 2 is a vertical section taken on the line II—II of FIG. 1;

FIG. 3 is a vertical section taken on the line III—III of FIG. 1;

FIG. 4 is a horizontal section through a guide for coke moving from an oven and to a quencher car;

FIG. 5 is a view similar to FIG. 1, but showing a modification;

FIG. 6 is a view like FIG. 5, but showing the movable elements in a different location;

FIG. 7 is a fragmentary horizontal section showing additional equipment and a different arrangement of carriages;

FIG. 8 is a vertical section taken on the line VIII—VIII of FIG. 7; and

FIG. 9 is a side view of the carriages with the closure walls that they carry.

Referring to FIGS. 1, 2 and 3 of the drawings, a carriage track 1 extends along the service platform 2 in front of a row or battery of coke ovens 3 a short distance below their discharge doors. Running on this track is a carriage 4 that supports a coke guide 5 or chute, through which coke passes from an oven to a coke quencher car 6 mounted on a track 7 in front of, but below, the first track. The quencher car can be moved along its track by means of a traction engine 8, such as indicated in FIGS. 5 and 6.

When coke is pushed from an oven through guide 5 and into quencher car 6 below the outer end of the guide, smoke and dust are formed, the smoke moving upwardly rapidly and carrying along with it a quantity of coke particles. If the quencher car is disposed in the free atmosphere, the latter is polluted by annoying clouds of smoke and dust. To prevent this pollution of the atmosphere from occurring, a stationary housing 10 is permanently mounted over the quencher car and extends throughout the length of the row of ovens. This housing has a roof 11 and an outer wall 12 extending from the roof downwardly at an inclination to a point close to the outer side of the car. The roof extends inwardly above the outer edge of carriage 1 between the quencher car and the ovens. The bottom and the inner side of the stationary housing facing the ovens are open.

The inside of the housing is divided into a row of cells 13 by means of transverse upright partitions 14. Preferably, the partitions are spaced apart a distance equal to the combined width of several of the ovens. The dust and smoke produced by the discharging coke will rise toward the top of the cell in which coke is being discharged from the guide into the quencher car. To remove this smoke and dust, the upper part of each cell is provided with an outlet opening 15 in its inclined side wall, from which a short pipe 16 extends down to a horizontal suction line 17 connected at one end with conventional apparatus for drawing air through the line. The outlet is provided with a valve 18. The smoke and dust therefore are drawn out of the cell into the suction line and conducted away to smoke and dust removing apparatus, from which the clean gases may be released into the atmosphere.

To prevent smoke rising into the atmosphere between the ovens and the housing cells, the coke guide must completely enclose the coke passing through it and therefore it is made tubular. That is, it has a top wall as well as bottom and side walls. The guide is rectangular in cross section and has an inlet large enough to fit around the discharge opening of the coke oven. To enable the coke guide to be moved laterally from oven to oven, it is necessary that the guide be movable away from the ovens far enough to pass the structural columns 20 that engage the front ends of the oven walls between their doors. For this purpose the guide can be made in two sections, one of which telescopes within the other. The front or outer section 21 of the guide is rigidly mounted on the carriage, but the other section 22 telescopes into the outer section. The two sections can have approximately the same length, as shown in FIG. 1, or as shown in FIG. 4, the outer section 23 can be quite short, which necessitates having a much longer movable inner section 24.

Although the suction line will draw off the smoke and dust from within a cell of the housing, some might escape from the open inner side of the housing. To avoid this, movable walls are provided for closing the inner sides of the cells in succession. Accordingly, two substantially upright closure walls **25** and **26** are rigidly mounted on the carriage, the walls extending in opposite directions away from the opposite sides of the outer end of the tubular coke guide **5**. These walls nearly touch the overhanging roof of the housing and also are disposed close to the inner edges of the partitions **14**. The closure walls also extend downwardly to a point close to the inner side of the quencher car. It is important that either closure wall be long enough to close the oven side of the cell receiving the coke when the coke guide is at an end of that cell.

It will be seen in FIG. **1** that while a group of ovens are being discharged through a given cell into the underlying quencher car, the oven side of that cell is closed by one or both of the upright closure walls **25** and **26**, whereby the cell has four side walls and a roof. These, combined with the updraft through the cell to its outlet, prevent the smoke and dust from escaping from the cell except through the suction line **17**. During discharge of coke the outlet valve **18** of the cell into which an oven is discharging will be open, but it is common practice to move the quencher car forward along the track so that the coke falling into it will be evenly distributed in the car. If, during such movement of the car, smoke develops in the next cell the valve for that cell likewise is opened so that smoke rising from the car will be drawn off through the suction line.

In the modification shown in FIGS. **5** and **6**, the forward closure wall **30** is shown long enough to close the second cell when the first cell starts to receive coke. This long wall also serves to separate the cell housing from the long carriage **31** that carries door operating machinery and the like, thereby helping to protect workmen from smoke in the cells.

In the modification shown in FIG. **8**, the housing for removing smoke and dust is constructed slightly differently from the one first described. In this embodiment of the invention the outer side wall **35** of the housing is vertical and perpendicular to the roof **36**. Inside the housing, in the upper front corner, an inclined wall **37** extends throughout the length of the housing and from its roof to its front wall. The triangular passage thus formed serves as the suction line for the housing. An outlet **38** from each cell into this passage is formed in the inclined wall and is controlled by a valve **39** that may be operated by an electrically controlled operating cylinder **40**. The cylinders may be operated either by means of push buttons, or automatically by switches mounted on the coke guide. In FIG. **8** there are broken lines **41** that indicate how the roof of the housing can be extended, if desired, toward the ovens so that is will completely cover the space between them and the partition walls in the housing. With this arrangement the whole oven-operating platform **42** where the carriages **43** and **44** are mounted would be covered.

FIGS. **7** and **9** show in more detail how the coke guide **46** and the door machinery are mounted on the carriages. The coke guide is supported at each side by a frame formed from two vertical columns **47** and cross beams **48**. Mounted on the top beams are pads carrying guide rollers **49** supported by tracks **50** above them. The tracks are mounted on the underside of beams **51** that also carry trolley wires **52** from which sliding contacts **53** supported from the carriages receive electricity. If the two carriages are coupled together, only one of them needs driving means. Closure walls **55** and **56** for the housing cells are carried by carriage **43**. To provide more room on carriage **44**, the closure walls can be spaced outwardly from the two carriages by arms **57** attached to the carriages. Also, wall **56** can be made in two sections; one supported by carriage **43** and the other by carriage **44**.

I claim:

1. Apparatus for preventing air pollution during discharge of coke from coke ovens disposed side by side in a row with doors in their front ends, comprising a carriage movable along the front of said row of ovens, a tubular coke guide supported on the carriage for selective positioning thereby in front of the different ovens to receive coke therefrom, a track in front of the carriage parallel to the row of ovens, a quencher car on the track for receiving coke discharged from said guide, a stationary housing permanently mounted to cover said track throughout the length of the row of ovens and having a roof and an outer wall extending therefrom down close to the outer side of said car, the bottom and inner side of the housing being open, transverse upright partitions in the housing dividing it into a plurality of side by side cells, the upper part of each cell being provided with an outlet, a valve for each outlet, a suction line extending along the housing and connected with said cell outlets, and upright closure walls carried by said carriage and extending from the outer end of said tubular guide in opposite directions along said housing far enough to close the side of the cell beside them, the tops of the closure walls substantially engaging the housing roof, and the bottoms of the closure walls being close to the inner side of said car, whereby the cell into which coke is being discharged will have four side walls and a roof.

2. Apparatus as claimed in claim **1**, in which said tubular coke guide is rectangular in cross section and includes a stationary section rigidly mounted on said carriage and a movable section telescoped in the stationary section and movable toward and away from the ovens, said upright closure walls extending away from opposite sides of said stationary section.

3. Apparatus as claimed in claim **1**, in which said outer wall of the housing is provided with said cell outlets and with short pipes connecting them with said suction line outside of the housing, each of said valves being located in one of said pipes.

4. Apparatus as claimed in claim **3**, in which said outer housing wall is inclined downwardly and outwardly from said roof.

5. Apparatus as claimed in claim **1**, in which said outer wall of the housing is substantially vertical, the housing has an interior inclined wall extending diagonally across its outer upper corner from its roof to its outer wall, and said inclined wall extends the length of the housing to form said suction line and is provided with said cell outlets.

6. Apparatus as claimed in claim **1**, in which the upright closure wall that extends from the tubular coke

guide forward in the direction of movement of said car during coke discharge is about twice as long as a cell.

7. Apparatus as claimed in claim 1, including a second carriage close to one end of the first-mentioned carriage, and oven door operating means on the second carriage, the closure wall beside said second carriage being substantially as long as that carriage.

8. Apparatus as claimed in claim 1, in which said housing roof extends over said tubular coke guide to the ovens.

* * * * *