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(54) COKE OVEN BATTERY INCLUDING APPARATUS FOR DETECTING
 AND CONTROLLING THE POSITIONS OF OPERATING MACHINES FOR
 THE BATTERY

(71) We, FIRMA CARL STILL, a German Kommanditgesellschaft, of Postfach 1480, 4350 Recklinghausen, Germany, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The invention relates to a coke oven battery and, more especially, to the detection and control of the positions of operating machines of the battery.

15 The term "operating machines" is intended to include devices such as the oven filling device or the larry car, the coke discharging machine, the coke cake guide car and the device which removes the red-hot coke therefrom and conveys it to the quenching device.

20 A circuit arrangement is known to ensure the positioning, in front of a particular oven of a coke oven battery, of several coke oven operating machines which operate on the two sides of the battery. Each coke oven operating machine is provided with a device to determine its local position, the local information is compared in a control device and only when the information fed in is the same and the report on the correct positioning of the oven doors is present, is the command given for the discharge drive mechanism of the coke discharging machine to be put into operation (German Offenlegungsschrift 1,571,640).

35 In this arrangement, the local information on the position of an operating machine can be provided by a counting device, e.g. an electronic pulse generator, driven by a running axle or a running wheel or a mechanical driving device of the operating machine, and transmitted as a verifiable frequency, pulse or time signal to the control device. The transmission may be by way of special contact lines or by radio or by way of the contact lines which are normally, provided to supply

electrical energy to the coke oven operating machines.

The local position of each coke oven operating machine within a specified area of a particular oven may also be detected by an additional electrical or mechanical member so that operation of the machine (for example, in the case of the coke discharging machine, the release of the means locking the discharge drive mechanism) is additionally dependent on an indication from this additional member that the machine is accurately positioned relative to the oven. This additional electrical member can also be arranged on the coke oven operating machine.

It is desirable to provide apparatus which enables the position of the individual coke oven machines to be reliably and accurately detected and enables them to be accurately positioned and which, in comparison with known arrangements is less expensive and less susceptible to trouble.

The present invention provides a coke oven battery including a plurality of operating machines and apparatus for detecting and controlling the positions of said machines, the apparatus including, for each machine, an angle encoder drivable by a running wheel of the machine and operable to allocate an absolute numerical value to the position of the machine, means operable to store the said numerical values, and means operable to receive from the angle encoders a coded report on the positions of the operating machines, to compare the said positions and to act on the drive mechanisms of the machines.

The storage means may comprise code discs for storing the numerical values as a code pattern.

The coded report delivered by the angle encoders may be transferred by way of a data transmission device to the receiving terminal.

For an arrangement according to the invention, angle encoders of one-stage or

multi-stage design may be used. The transmission of the data can be performed by radio or inductively.

5 A preferred embodiment of the invention will now be described, by way of example, with reference to the attached circuit diagram.

10 In this embodiment, a multi-stage angle encoder and a radio-controlled data transmission device are utilised.

On the coking side of the oven battery, angle encoders are provided, in a similar manner, on the larry car, the coke cake guide car and on the engine of the quenching cars. In the diagram, for each of these 15 operating machines, the numeral 1 denotes a running wheel that is not supplied with power, which can run along a rail. Its rotation is transferred by the shaft 1a to an angle encoder 2 which allocates an absolute numerical value to each position of the operating machine, these values being stored as a code pattern on code discs. The numerical values present in the 25 angle encoder 2 in BCD-code (binary coded decimal code) are fed into an input memory 3 and the information present in parallel in the memory output is divided into blocks of information and converted into serial form in a transformer 4 by a control unit 6. The series information blocks are emitted by a transmitter 5 and received by a receiver 7 which is arranged, on the machine side of the oven battery, on the coke 35 discharging machine. In a transformer 8, the received information blocks are converted into parallel again and stored in an intermediate memory 9. The transfer of the information is performed in a transmit memory 10 after the last information block has been received. The report present at the output of the receiving terminal contains in BCD-code the positions of the machines on the coking side of the battery and 45 these are compared, in a comparator 11, with the position report on the coke discharging machine which is likewise available in BCD-code from a running wheel 1, shaft 1a and angle encoder 2. When the information in the comparator 11 matches, the discharge drive mechanism of the coke discharging machine is released, in any appropriate manner, by a signal generated by the comparator.

55 One advantage which can be gained with an arrangement utilizing code discs, such as that described above, is that the reports on the positions of the coke oven operating machine are not affected by power failures. 60 Should power failures occur, then the code

remains the same. Further advantages which can be gained are that interfering pulses have no effect on the code or position reports and that, if necessary, the absolute numerical values present can be 65 called as often as desired.

WHAT WE CLAIM IS:—

1. A coke oven battery including a plurality of operating machines and apparatus for detecting and controlling the 70 positions of said machines, the apparatus including, for each machine, an angle encoder drivable by a running wheel of the machine and operable to allocate an absolute numerical value to the position of the machine, means operable to storing the said 75 numerical values, and means operable to receive from the angle encoders a coded report on the positions of the operating machines, to compare the said positions and to act on the drive mechanisms of the machines. 80

2. A coke oven battery according to claim 1, in which the storage means comprise code discs for storing the numerical values as a code pattern. 85

3. A coke oven battery according to claim 1 or claim 2, in which the angle encoder is a multi-stage angle encoder. 90

4. A coke oven battery according to any one of the preceding claims, in which the coded report delivered by the angle encoders is transferred by way of a data transmission device to the receiving terminal. 95

5. A coke oven battery according to claim 4, in which the data is transferred by radio or inductively.

6. A coke oven battery according to claim 4 or claim 5, in which the data is transferred in binary code. 100

7. A coke oven battery according to any one of the preceding claims in which one of the operating machines is a coke discharging machine and in which the receiving means is arranged on the discharging machine. 105

8. A coke oven battery including a plurality of operating machines and apparatus for detecting and controlling the positions of said machines, the apparatus being substantially as described herein with reference to, and as illustrated by, the accompanying drawing. 115

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