

June 9, 1959

R. A. POWELL

2,890,038

SINTERING MACHINE APPARATUS

Filed March 1, 1957

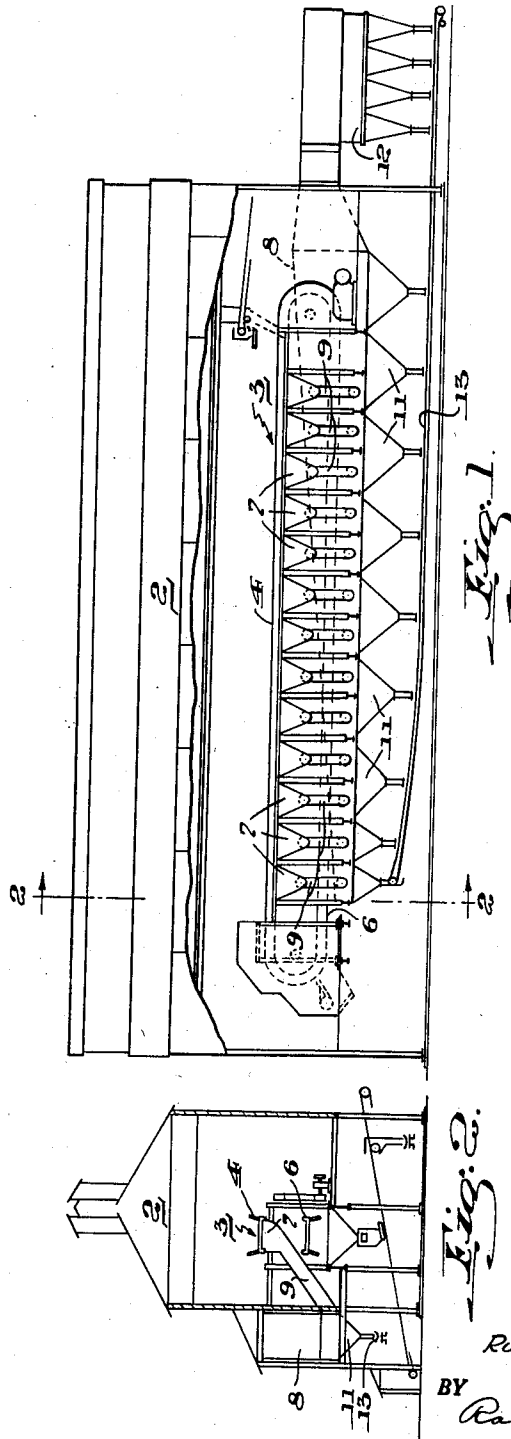


Fig. 1.

Fig. 2.

INVENTOR.
RUSSELL A. POWELL.

BY
Ralph B. Brick.
his ATTORNEY.

1

2,890,038

SINTERING MACHINE APPARATUS

Russell A. Powell, Pittsburgh, Pa., assignor to Koppers Company, Inc., a corporation of Delaware

Application March 1, 1957, Serial No. 643,268

2 Claims. (Cl. 266—21)

The present invention relates to sintering machine apparatus and more particularly to a windbox-exhaust main arrangement for sintering machine apparatus.

In the past, sintering machine apparatus has included a windbox-exhaust main arrangement wherein downleg ducts connecting the windboxes to the exhaust main have entered the exhaust main at the upper portion of the main. As a result, dust particles which have been entrained in the induced draft as it passes through the bed of material being sintered must necessarily travel downwardly through the main stream of the exhaust to be dropped out. A large portion of these particles intended for hoppers positioned below the exhaust main never reach the hoppers but instead are carried along with the main stream of the exhaust to place an additional load on the mechanical or electrical collectors positioned at the downstream end of the main. Further, with the downleg ducts arranged to enter at the upper portion of the main, it has been necessary to provide each of these ducts with an elbow joint so that the overall arrangement would not require unwarranted heights in construction. These elbow joints have presented a ready area of wear since the dust particles entrained in the induced gas stream impinge against the joints in their flow downwardly to the exhaust main.

The present invention, recognizing these many disadvantages of past practices, provides a windbox-exhaust main arrangement which eliminates the elbow joints for the downleg ducts to reduce installation and maintenance costs and to provide a compact arrangement which can be housed in buildings of minimum height. In addition, the present invention provides an exhaust main arrangement which permits a maximum dropping out of dust particles from the induced stream into the exhaust main hoppers to greatly reduce the load on mechanical and/or electrical collectors positioned at the downstream end of the exhaust main and to increase the dust collecting efficiency of the exhaust main hoppers.

Various other features of the present invention will become obvious to one skilled in the art upon reading the disclosure set forth hereinafter.

More particularly, the present invention provides, in a continuous sintering machine arrangement, conveyor means for supporting a traveling bed of material to be sintered, windbox means associated with such conveyor means to induce a draft through the bed of material, an exhaust main spaced from the conveyor means, and duct means extending in a substantially straight line between and connecting such windbox means and the exhaust main, the duct means being connected to the lower portion of the exhaust main so that a maximum dropping out of dust particles which have been entrained in the induced draft is accomplished in the exhaust main.

It is to be understood that various changes can be made by one skilled in the art in the arrangement, form, and construction of the several parts of the structure set forth hereinafter without departing from the scope or spirit of this invention.

2

Referring to the drawings,

Figure 1 is a partially broken-away schematic elevational view of a sintering machine arrangement which incorporates one advantageous embodiment of the windbox-exhaust main arrangement of the present invention; Figure 2 is a sectional view taken in a plane passing through line 2—2 of Figure 1.

As can be seen in Figure 1 of the schematic drawings, a main building 2 is provided to house the sintering machine apparatus which can be of the continuous type and which incorporates endless conveyor means broadly designated by reference numeral 3, the endless conveyor means having an upper run 4 and a lower run 6. Positioned in series below the upper run of the conveyor are a plurality of windboxes 7, these windboxes serving to accommodate the draft induced through the bed of material to be sintered as it passes over the upper run 4 of the endless conveyor. It is to be noted that the structure disclosed is only schematic and that components such as the pallet train, ignition hood, and grate bars, all well known in sintering machine apparatus, can be of various types in accordance with the results desired.

Positioned to the side of and below the windboxes 7 in spaced relation therefrom is the exhaust main 8. In the advantageous embodiment of the invention disclosed, exhaust main 8 has a trapezoidal contour, increasing progressively upward in cross-sectional area toward its exit end with its bottom side in a plane parallel to the ground level of the sintering machine apparatus. The progressive increase in cross-sectional area toward the exit end of the main provides for the increase in volume of induced gases which the main necessarily must accommodate as the downstream end thereof is approached.

As can be seen more fully in Figure 2 of the drawings, windboxes 7 are connected by downleg ducts 9 which, in the advantageous embodiment of the structure disclosed, are cylindrical in shape and which provide substantially straight line connections between the windboxes and the exhaust main. With such straight line duct connections, the elbow joints of the past and the wearing difficulties associated therewith are avoided, as has been pointed out above.

Each of the ducts 9 connects to the exhaust main 8 at the lower side of the exhaust main 8 and, as a result, a maximum dropping out of dust particles from the induced draft into the exhaust main is obtained, these particles falling into hoppers 11 positioned below the main 8 to be carried away by endless conveyor 13. Thus, when the induced draft reaches collectors 12, which collectors are shown schematically as mechanical ones in Figure 1 but which also can be of the electrical type, the dust loads on these collectors is greatly reduced.

With the structure abovedescribed, a windbox-exhaust main arrangement is provided which is inexpensive to install and maintain and which provides for maximum operation of the collecting hoppers positioned below the exhaust main and the precipitators positioned at the downstream end of the main.

The invention claimed is:

1. In a continuous sintering machine, a conveyor for supporting a bed of material to be sintered, a plurality of wind boxes associated with said conveyor for inducing a draft through the bed of material, an exhaust main having a bottom section opening into the tops of a plurality of open-ended hoppers depending therefrom, a top and side walls, said main being located wholly to one side of said conveyor, and a plurality of substantially unidirectional straight ducts, said ducts being connected at one end to one side wall of said exhaust main adjacent the bottom thereof and directed across the upper portions of said hoppers and each being connected at its other end to a respective one of said wind boxes,

3

whereby the maximum of the dust particles are discharged into said hoppers.

2. In a continuous sintering machine, an endless conveyor having an upper and lower run, said upper run being arranged to support a traveling bed of material to be sintered, a plurality of wind boxes positioned below said upper run, an exhaust main having a bottom section opening into the tops of a plurality of open-ended hoppers depending therefrom, a top and side walls, said main being located wholly to one side of said conveyor and having its bottom wall disposed below said lower run and said top being inclined relative to said conveyor so that a portion thereof adjacent the exit end of said main extends above said lower run, and a plurality of equal

4

length and substantially unidirectional straight ducts, each of said ducts being connected at one end to one side wall of said exhaust main adjacent the bottom thereof and directed across the upper portions of said hoppers and each being connected at its other end to a respective one of said wind boxes.

References Cited in the file of this patent

UNITED STATES PATENTS

10	2,254,323	Shallock	Sept. 2, 1941
	2,498,766	Pettigrew	Feb. 28, 1950
	2,768,890	Cover	Oct. 30, 1956