

[72] Inventors **Horst Seidel**
Biscofsheim;
Fred Cappel, Neu-Isenburg 11, both of
Germany
 [21] Appl. No. **810,628**
 [22] Filed **Mar. 26, 1969**
 [45] Patented **Dec. 28, 1971**
 [73] Assignee **Dravo Corporation**
Pittsburgh, Pa.
 [32] Priority **Mar. 30, 1968**
 [33] **Germany**
 [31] **P 17 58 081.3**

[56] **References Cited**
UNITED STATES PATENTS

2,874,484	2/1959	Dapses	34/187
3,161,485	12/1964	Buhrer	34/85 X
3,309,787	3/1967	Forsyth et al.	34/187 X
3,313,534	4/1967	Frans	266/21 X
3,374,998	3/1968	Stirling	266/21
3,381,948	5/1968	Stirling	266/21

Primary Examiner—Frank W. Lutter
Assistant Examiner—William Cuchlinski, Jr.
Attorney—Parmelee, Utzler and Welsh

[54] **METHOD FOR SEPARATION OF FINES FROM**
HOT BROKEN SINTER
 3 Claims, 2 Drawing Figs.

[52] U.S. Cl. **209/11,**
 34/57, 34/187, 75/5, 209/139, 209/466, 266/21
 [51] Int. Cl. **B07b 4/08**
 [50] Field of Search 209/11, 19,
 22, 28, 29, 30, 34, 35, 36, 37, 247, 261, 271, 350,
 279, 351, 138, 139, 466; 75/5; 34/57, 185, 187;
 266/21; 55/338, 339, 340

ABSTRACT: The invention is directed to the removal of granular fines or dust from broken sinter cake, before delivery thereof to a blast furnace, by subjecting the broken cake, during passage from the sinter breakers to the cooling area, to a pressurized upward blast of air which carries the sinter fines through an exhaust hood and suitable conveyor conduit into a precipitator which removes the fines for return to the sinter machine and discharges the air to the atmosphere.

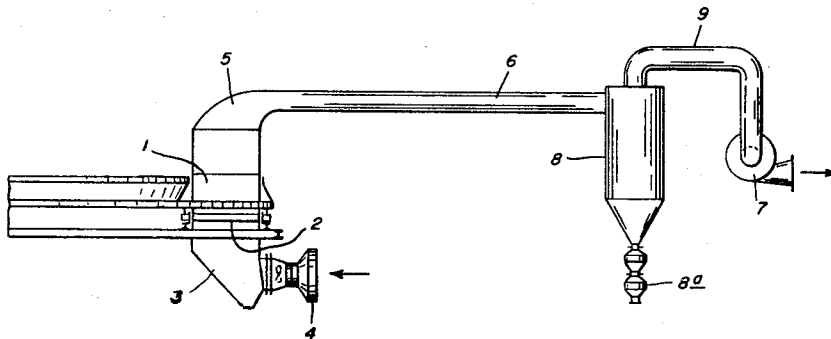
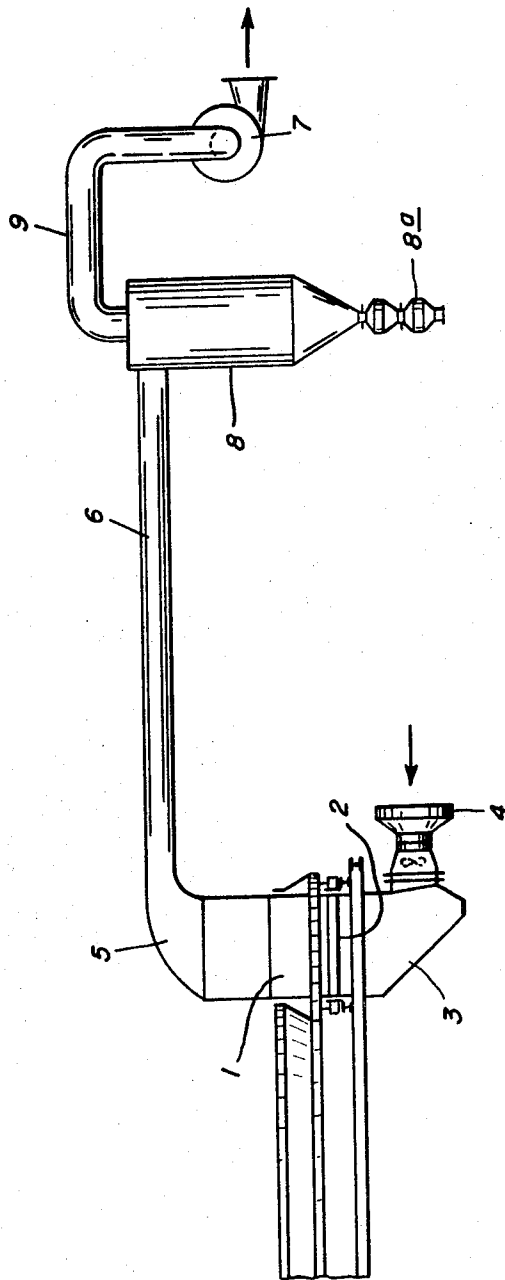
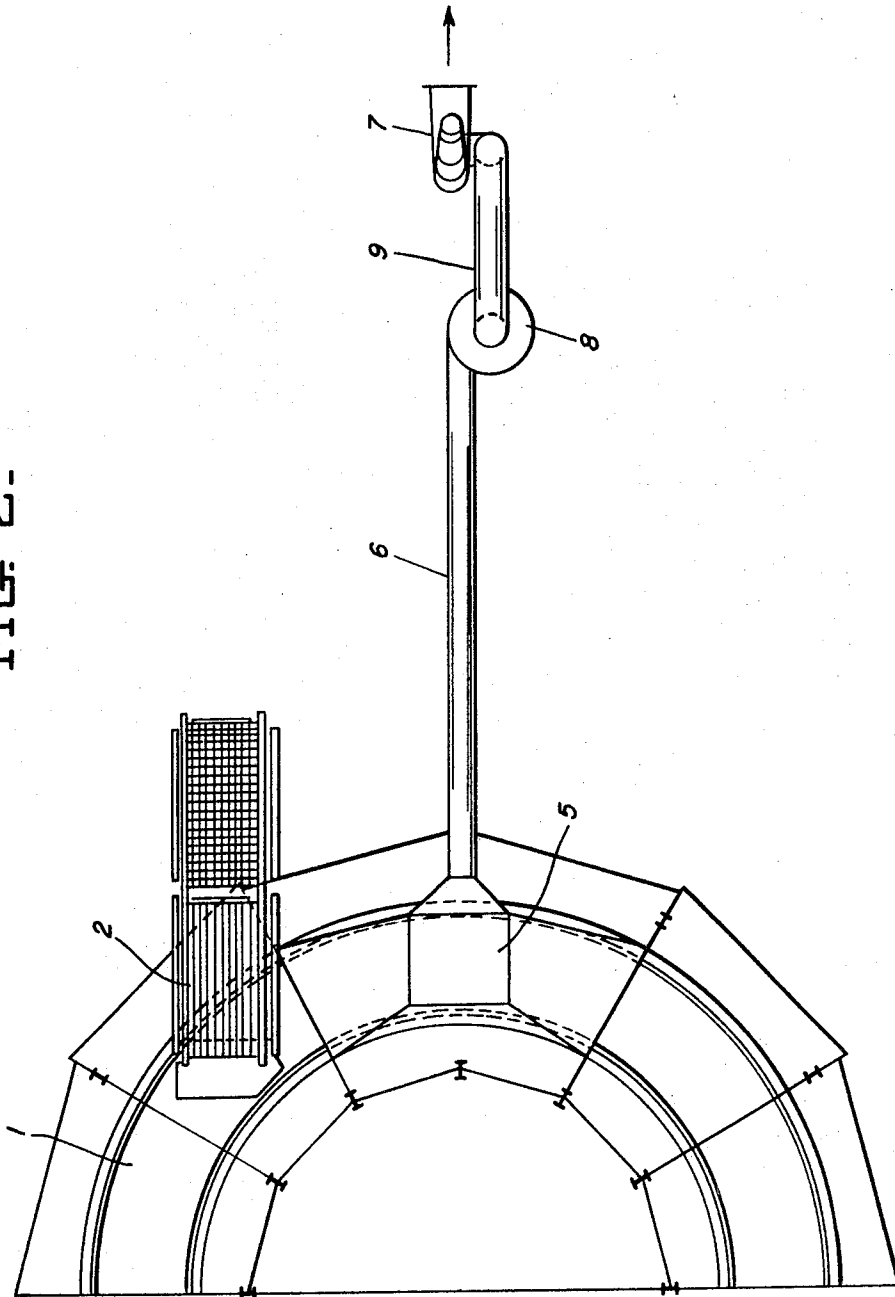


FIG. 1-



INVENTORS.
HORST SEIDEL and
FRED CAPPEL
By
Parmelee, Utley & Walsh
Attorneys

FIG. 2-



INVENTORS.
HORST SEIDEL and
FRED CAPPEL

By *Parmelee, Utley & Walsh*
Attorneys

METHOD FOR SEPARATION OF FINES FROM HOT BROKEN SINTER

BACKGROUND OF THE INVENTION

The invention is concerned with the sintering of metallic ore fines for processing in a conventional blast furnace in the manufacture of steel.

BRIEF SUMMARY OF THE INVENTION

The invention is concerned with the processing of iron ore fines for reduction in a blast furnace by agglomerating the ore fines by the known process of sintering the ore fines and fuel to form sinter cakes. The sinter cakes are discharged from the sintering line and broken into smaller sizes by known methods. During the breaking of the sinter cakes many fines are produced and are mixed with the larger size pieces of sinter. The charge such a mixture into a blast furnace would result in air pollution due to the blast air blowing said fines into the atmosphere, with consequent loss of valuable ore.

One object of the invention is to provide a suitable pressurized blast of cooling air through the broken sinter cake as it moves off the sinter feed line and through a conventional rotating sinter cooler, by collecting such blast air above said cooler and passing it through a suitable precipitator which returns the sinter fines to the sintering machine for reuse and discharges the excess air to the atmosphere.

Another object of the invention is to provide means for enclosing a portion of a rotating sinter cooling means with a suitable exhaust hood connected with a suitable precipitator and passing a blast of air under pressure through the cooling broken sinter moving beneath said hood to remove the fines therefrom and discharge such fines into a suitable precipitator. The collected fines are discharged from the bottom of the precipitator and the excess dust free air within the precipitator is withdrawn from adjacent the top of the precipitator by a suitable exhaust fan for discharge to the atmosphere.

A further object of the invention is to form the sinter cooling means as a rotating annular member which receives the crushed sinter cake from the sinter feed line and passing same through vertical pressurized air blast to remove the fines therefrom and discharge them into the precipitator.

DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a side elevation of the apparatus of the invention, and

FIG. 2 shows a plan view of the apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE INVENTION

As is well known in the art of making sinter, the sintered ore or other product is discharged from the pallet in which it is formed as a coherent mass referred to as "sinter cakes." These sinter cakes are discharged upon a grate-like support known as grizzly bars where the "cake" is engaged by a suitable tool and broken into smaller pieces, and are passed onto a sinter feeder 2. During this breaking operation, considerable amounts of still smaller pieces known as fines are formed, which are also passed onto the sinter feeder.

In the present invention we pass the broken sinter cake and fines from sinter feeder 2 on to a generally circular U-shaped rotating cooler 1 having a perforated bottom wall. Beneath cooler perforated bottom wall, in close spaced relation thereto, for a length of about one-fifth of the periphery thereof, there is mounted a suitable wind box or pressure chamber 3 having connected thereto an air pressure pump 4. The air stream from pump 4 and pressure chamber 3 flows vertically upward through the perforated bottom wall of the rotating cooler 1 and the broken sinter thereon. The fine

granular portions of the sinter cake layer are carried upwardly by the air stream into an overlying exhaust hood 5 and through conduit 6 connected therewith, into a suitable precipitator 8. An exhaust fan 7 withdraws air from the top portion of the precipitator 8 through a conduit 9 and the precipitated sinter fines are withdrawn from precipitator 8 through the bottom thereof for return to the sintering mechanism (not shown), for reuse in forming sinter cakes.

The pressure at which air from pump 4 is supplied to wind box 3 may be varied in accordance with the depth of the layer of sinter upon the sinter cooler 1. Such air pressure may vary between 4 to 32 inches water column pressure, preferably 16 to 24 inches water column pressure will suffice to remove substantially all of the granular fines of 0 to 14 mesh from the sinter.

The following table illustrates the comparative pressures of the air stream at the pressure pump and at the sinter layer for varying depth of sinter upon the rotating cooler.

Depth Sinter Layer	Air Stream Pressure at Pump	Air Stream Pressure at Sinter Layer
20"	4" to 7" W.C.	2" to 2.5" W.C.
40"	8" to 16" W.C.	6" to 7" W.C.
55"	16" to 30" W.C.	8" to 10" W.C.

The arrangement as described provides many advantages over prior practices. Thus, hot screening of the sinter for removal of fines is eliminated and a smaller granular size of return material is obtained. This results in a reduction of the recycled return material with substantial increase in capacity of the sintering strands, and reduction of coke used on the sintering strands. Additionally, there is an increase in the production output of the blast furnace receiving such sinter, due to reduction of sinter fines lost through the furnace air blast in melting. The amount of atmospheric dust is also reduced due to use of the precipitator 8 adjacent the sinter cooler. A further advantage is that such a system can be installed in many existing sintering systems, with a minimum of alterations.

We claim:

1. A method for dry classification of crushed hot sinter as received from a conventional sintering machine, comprising the steps of:

feeding the crushed sinter cake in the absence of prior screening onto a conventional rotating cooling device having a perforated sinter carrying surface, blowing a blast of pressurized air upwardly through the bottom of the perforated surface of said cooling device for displacement of sinter fines thereon while retaining the remaining of said crushed sinter on said surface, collecting the air blast and suspended fines therein from above the top surface of said perforated surface of said cooling device and discharging same into a suitable precipitator to separate the fines from said air blast, continuously withdrawing the air from the upper portion of the precipitator, and collecting the separated fines from the bottom of said precipitator and returning them to the moving sintering machine for incorporation into the sintering cake forming thereon.

2. The method as defined in claim 1, wherein said air blast is under a pressure of 4 to 32 inches W.C. of pressure, preferably 20 to 24 inches W.C.

3. The process as defined in claim 1 wherein said sinter fines displaced from the sinter layer of said air blast are less than one-eighth inch, preferably less than one thirty-second inch in size.

* * * * *