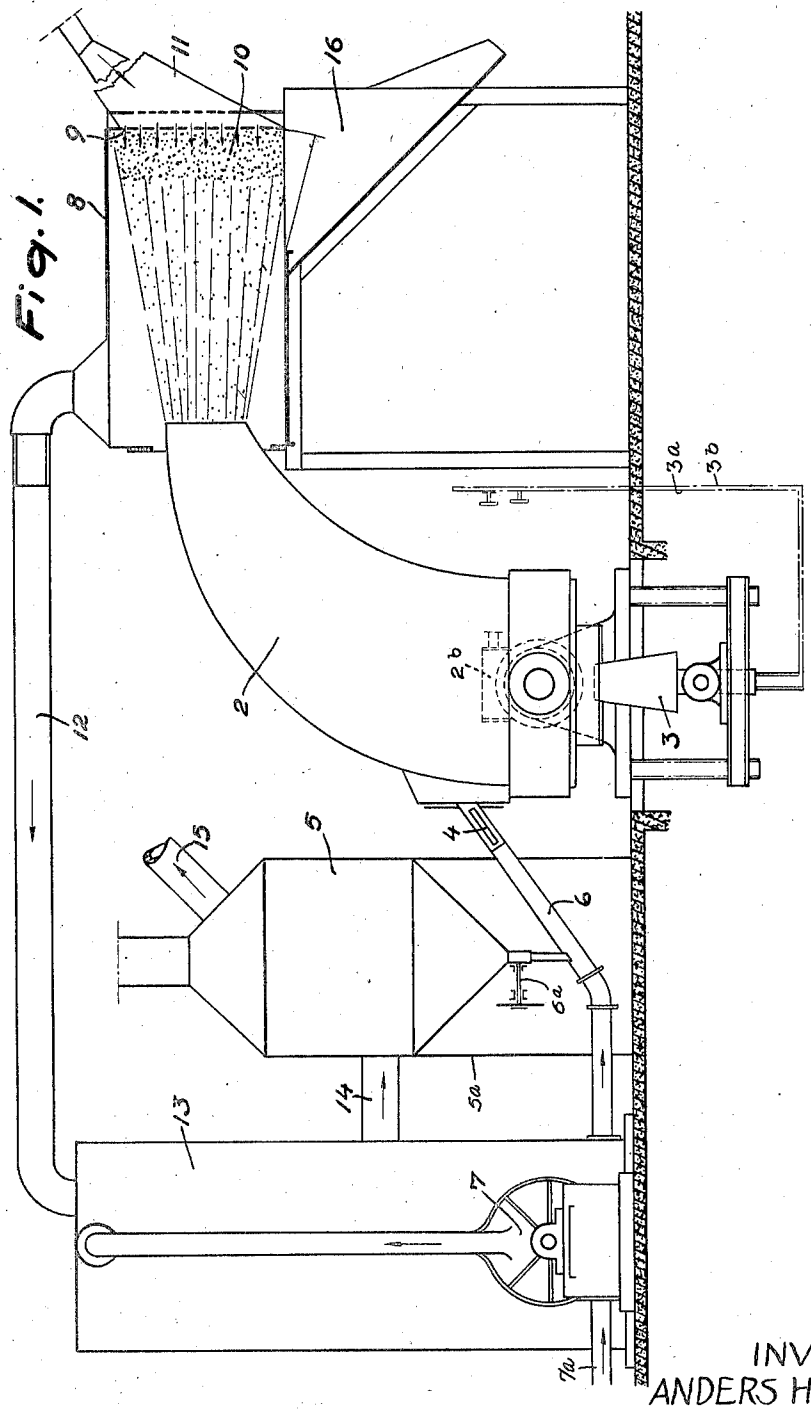
Nov. 15, 1938. A. HOLMBERG 2,137,049

PROCESS FOR THE SINTERING OF CONCENTRATES, ORES, OR THE LIKE

Filed Feb. 15, 1936 2 Sheets-Sheet 1

Fig. 1.



INVENTOR:
ANDERS HOLMBERG
BY Haseltine Lake & Co
ATTORNEYS

Nov. 15, 1938. A. HOLMBERG 2,137,049

PROCESS FOR THE SINTERING OF CONCENTRATES, ORES, OR THE LIKE

Filed Feb. 15, 1936 2 Sheets-Sheet 2

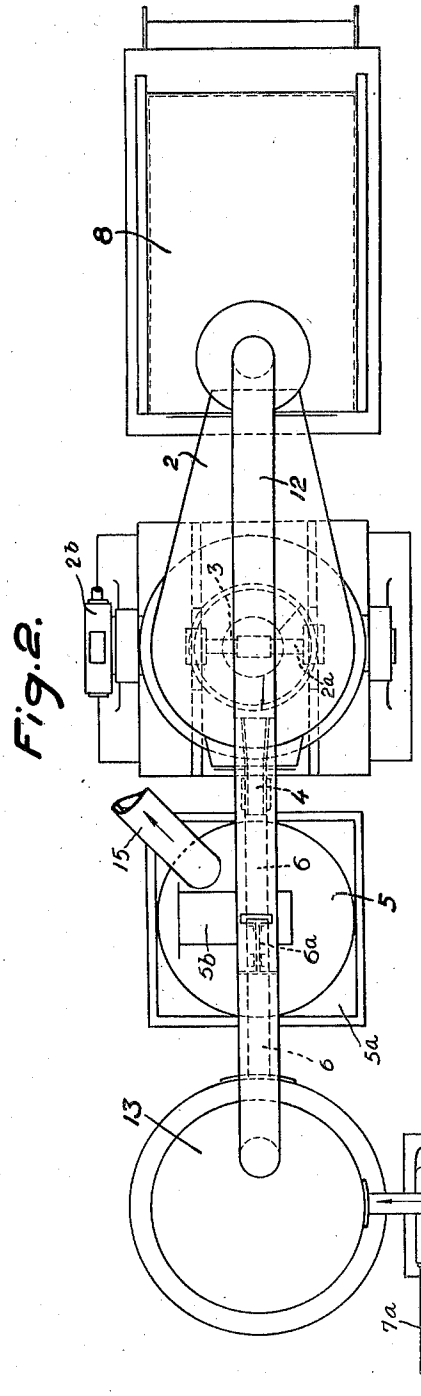


Fig. 2.

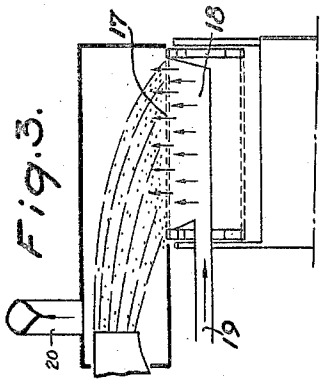


Fig. 3.

INVENTOR:
ANDERS HOLMBERG
BY Haseltine, Lake & Co.
ATTORNEYS

Patented Nov. 15, 1938

2,137,049

UNITED STATES PATENT OFFICE

2,137,049

PROCESS FOR THE SINTERING OF CONCENTRATES, ORES, OR THE LIKE

Anders Holmberg, Stockholm, Sweden

Application February 15, 1936, Serial No. 64,059
In Sweden January 25, 1935

2 Claims. (Cl. 75—5)

This invention relates to a practical and economical method for the sintering of concentrates, ores and the like pulverulent material being caused to pass through a combustion zone, so that a sintered product of the best quality is obtained as regards resistance, porosity and desulphuration as well as oxidation in such cases where the last-mentioned action is necessary. The object of the invention is also to obtain a thoroughly homogeneous sintered product and avoiding too strong scorification in the product.

The process consists chiefly therein that the particles of the material to be sintered are forced under pressure through a combustion zone and against a wall or the like after the superficial layer has been softened by the heating in the combustion zone so that owing to the force by which the ore particles are impelled and the sudden checking of their motion by impact with the wall, said particles are cemented together in their red hot condition so as to form a continuous sinter cake.

This cake thus obtained may, if necessary, be subjected to an air current for further oxidation and desulphuration.

An embodiment of a plant for carrying out the process is illustrated diagrammatically in the accompanying drawings, in order to facilitate understanding of the invention.

Fig. 1 is a conventional schematic view in side elevation of an apparatus for carrying out the process, certain portions of the apparatus being indicated in vertical section to more clearly illustrate the same. Fig. 2 is a similar view in top plan of the apparatus illustrated in Fig. 1. Fig. 3 is a conventional schematic detail view in side elevation, and partially in vertical section, of a modified form of sinter box for carrying out the process.

Referring to Figures 1 and 2 of the drawings, the reference numeral 2 indicates a heating chamber in the form of a converter which is rotatable relative to a container 2*a* by means of a worm wheel device 2*b*. In the lower part of the converter there is provided a burner 3 with supply pipes 3*a* for the fuel and 3*b* for air to support combustion, the said burner producing the necessary flame within the converter. A control spray jet 4 for the material to be sintered is provided and disposed at an angle to the longitudinal axis of the burner for projecting the pulverulent material through the converter. A container 5 for the material or ore to be sintered rests upon a frame 5*a* and communicates with an insulated conduit 6 in turn connected with the spray jet 4 so that the material from the container 5 flows down of its own volition and by gravity into the said conduit. The material to be preheated and sintered is supplied to the container 5 through a pipe 5*b* controlled by a valve 6*a*. Preheated air is passed into the conduit 6 by means of a fan 7 and projects the material to be sintered through said conduit and into the converter. The arrangement is such that the material is thrown through the flame within the converter into a sinter box 8 located outside of and adjacent to the converter. The material to be sintered, which during its passage through the flame or heating zone is heated to sintering condition, is thrown towards a side 9 of the sinter box, the said side facing the converter, and is cemented together to form a sinter cake 10. In the wall 9 there are illustrated openings for fresh air which is forced in the opposite direction into the sinter box from a tube 11 for causing the oxidation and desulphuration of the sintered product. The gases with the excess heat produced from the blowing are exhausted from the sinter box 8 by a conduit 12 to an air preheater 13. Fresh air is also supplied to the air preheater through the conduit 7*a* by the fan 7, the said air being heated in the air preheater by the gases coming from the sinter box. By means of a conduit 14 part of the preheated air is led to the material container 5 for the purpose of preheating the material to be sintered. The gases introduced into the container 5 escape to the funnel or stack through an exhaust port 15. As has been stated above, another part of the preheated air is forced into the conduit 6 in order to carry along the material to be sintered through the flame.

The finished sintered product is discharged into a pocket 16 located below the sinter box and is then brought further in order to be charged into a furnace or used for some other purpose.

In the embodiment cited above the material is thrown against a vertical wall 9, and a fresh oxidizing air current is directed through the material substantially against the direction of motion of the material. In the sinter box shown in Figure 3 the material projected through the flame is allowed to fall upon a horizontal plane 17 which preferably may consist of a travelling grate which discharges the product during simultaneous desulphuration and oxidation by means of an air current forced through the grate and the products chiefly against the direction of motion of the ejected particles, the said air current coming from a box 18 into which the air is forced through a

pipe 19. 20 indicates a conduit to the air preheater.

Of course, any suitable heat source may be used instead of the oil burner. If the sintering temperature of the material is relatively low the said material may be heated without a converter in which case the material is thrown into the sinter box.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The process of sintering ores and other pulverulent or granular substances for use in a subsequent metallurgical reduction, which consists in projecting the pulverulent substances by an air blast transversely through a heating zone to heat and partially fuse each particle of the substance and thence projecting the heated particles in approximately the same general direction as they were first projected violently against an obstructing perforated impact member capable of suddenly arresting movement of said particles whereby to cement the partially fused and heated particles together into an agglomerated unitary sintered mass or cake, passing air through the perforations of said member into said mass to oxidize the same, and utilizing the exhaust gases of said sintered product for preheating the air for projecting the particles through said heating zone and against said impact member.

2. The process of sintering ores and other pulverulent or granular materials for use in a subsequent metallurgical reduction, which consists in projecting the pulverulent material by an air blast transversely through a heating zone to heat and partially fuse each particle of the material and thence violently projecting the heated particles in approximately the same general direction as they were first projected against a perforated impact member capable of suddenly arresting movement of said particles whereby to cement the partially fused and heated particles together into an agglomerated unitary sintered mass or cake, simultaneously passing air in the opposite direction through the perforations of said member into said mass to oxidize and desulphurate the same, utilizing the exhaust gases of said sintered product for preheating the air for projecting the particles through said heating zone and thence against said impact member, and also utilizing said exhaust gases for preheating the pulverulent material to be sintered.

ANDERS HOLMBERG.