Aug. 19, 1930. E. JUNGELS 1,773,228

GRINDING AND SEPARATING MILL

Filed Nov. 5, 1928

Fig. 1.

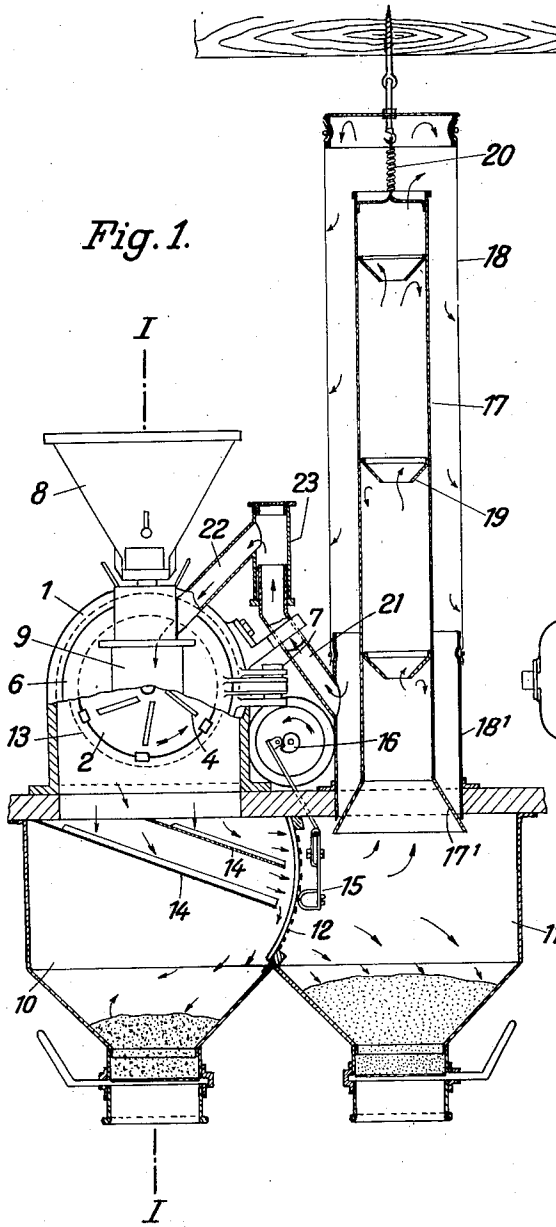
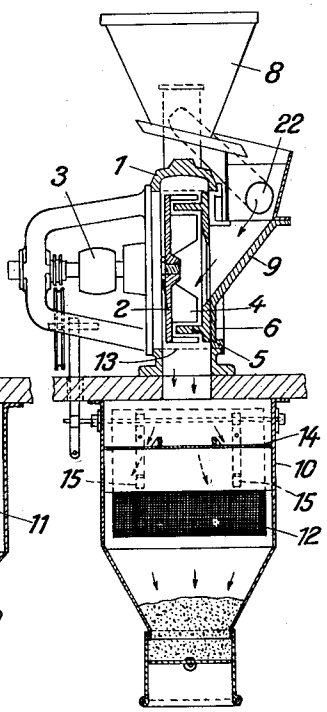


Fig. 2.



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GRINDING AND SEPARATING MILL

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The invention relates to a grinding mill to which a separating device is attached. By means of this invention a grinding mill is provided in which the ground material, after the grinding process and with the aid of the grinding mill itself, is separated into finer and coarser particles.

The essential object of the invention is to provide means for blasting the ground material from a hammer mill against one or more separating surfaces by means of a current of compressed air which is generated by the mill itself, in such a manner, that the ground material is separated immediately after the grinding process. The lighter particles, which remain suspended in the air after separation being caught by a dust removing device which is connected with the interior of one of a plurality of separating chambers.

The dust removing device is provided with a vertical tube which projects into a filtering tube, the vertical tube being held suspended on a spring and having its lower end funnel-shaped, so that by these means the vertical tube is adapted to hold the lower end of the filtering tube closed until a load of the finer ground particles corresponding to the tension of the suspension spring has accumulated in the lower end of the filtering tube, whereafter the material contained in the latter tube is automatically discharged.

In order to prevent a depreciation of the efficiency of the separating device when the filtering tube becomes clogged, the interior of the dust removing device is connected with the inlet of the hammer mill by means of a circulation canal. Hereby a perfect circulation of the compressed air current is attained.

In the accompanying drawing the invention is illustrated in one form by way of example, in which Figure 1 is a side elevation of the entire plane, respectively a cross section; and Figure 2, a vertical section at the line I—I of Figure 1.

Inside of the casing 1 of the hammer mill the rotatable hammer plate 2 is provided, which for instance, is driven by the pulley 3 in a known manner. The stationary grinding members 5 are fastened to the cover 6 of the mill casing 1. This cover is hinged on a stud 7 which is held in a suitable lug on the casing of the mill. A plurality of the rotatable grinding members 4 are designed wing-shaped.

The material which is to be ground comes from the hopper 8 into the inlet 9 and from there to casing of the mill.

The rotatable hammer plate 2 does not serve the purpose of grinding the material only, as it also generates a current of compressed air because of its high revolutionary speed, and this air is made efficient for separation.

In the example shown the separating device comprises two air and dusttight chambers 10 and 11, which are separated from one another by means of the interchangeable separating sieve 12. By means of the current of compressed air the ground material is forced through the sieve 13 onto the distributing surfaces 14 in the chamber 10. From here it is blasted against the sieve surface 12. Whereas the coarser material remains in the chamber 10 the finer material is transported to the chamber 11. In order to prevent clogging of the sieve 12 the tappers 15 are provided, these being actuated by means of a cam 16 which is provided on the main shaft.

That part of the finer ground material which is forced through the sieve 12 and which is not deposited in the chamber 11 is caught by the dust removing device which is connected thereto. This comprises a vertical cleaning canal 17 that projects into a filtering tube 18 and which is shut off by means of the funnel shaped end 17^1 of the cleaning canal 17. The funnel shaped members 19 are provided in the cleaning canal 17 to generate air eddies that will cause the finer ground particles to deposit. In order to attain an automatic emptying out of the finer ground material which has accumulated between the lower end of the filtering tube 18 and the cleaning canal 17, the cleaning canal 17 is hung up on a suitable spring 20, so that the shutting-off funnel 17^1 is opened automatically by a load corresponding to the tension of the spring 20.

In order to prevent the efficiency of the separating device from being unfavorably influ-

enced and to assure an unimpeded circulation of the compressed air current when the filtering tube becomes clogged, a circulation canal 21, which branches off from the lower end 18^1 of the separating device, is provided, the pipe 22 which is a part of the circulation canal 21 being in connection with the interior of the inlet 9, so that the compressed air current arrives at this part of the mill in which there is always an under pressure prevailing.

Between the parts 21 and 22 of the circulation canal, a vertical pipe 23 is provided which is adapted to be rotated loosely on the pipe 21. The axis of the pipe 23 lies in the same axis as the stud 7, so that it is possible to open the door 6 without any hindrance.

The ground material in the chambers 10 and 11 can be taken out through the lower outlets or discharged into suitable means of transportation. The coarser particles may, for instance, also be returned into the mill by means of suitable means of transportation.

The automatic sifting and dust removing device described above can be very easily mounted onto any existing mill.

I claim:

1. A grinding and separating mill, comprising a casing, a rotary grinding member therein having a plurality of rotating wing-shaped grinding and disintegrating members arranged to produce a strong air current, a collecting container for the ground material at the lower side of the casing and into which the casing discharges, said container having a sieve dividing the same into two compartments, and guiding walls below the discharge opening of the casing and in the upper portion of one compartment of the container and arranged to cause the air current produced by the rotating wings to blow the ground material against and through said sieve.

2. A grinding and separating mill as claimed in claim 1, in which the sieve is vertically positioned and interchangeable with another.

3. A grinding and separating mill as claimed in claim 1, including also a dust removing device for the air current and which is connected with that compartment of said collecting container which in the direction of movement of the air current is located behind said sieve.

In testimony whereof I have affixed my signature.

ERWIN JUNGELS.