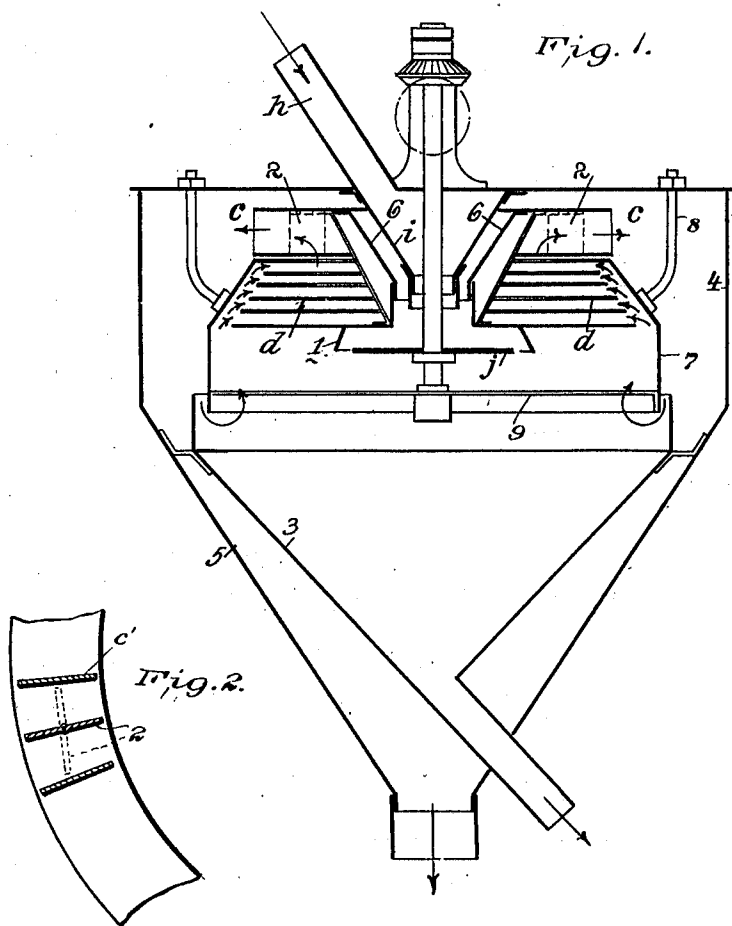


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PNEUMATIC SEPARATOR.
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988,486.

Patented Apr. 4, 1911.



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UNITED STATES PATENT OFFICE.

ROBERT MOODIE, OF RAYLEIGH, ENGLAND.

PNEUMATIC SEPARATOR.

988,486.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROBERT MOODIE, a subject of the King of Great Britain, and a resident of The Weir, Rayleigh, Essex, England, have invented certain new and useful Improvements in Pneumatic Separators, of which the following is a specification.

The invention relates to pneumatic separators of the class described in my prior Patent No. 919,291, granted April 20, 1909, and it consists in certain improvements on the said separator, the fan being located above the disk wheel, and the goods to be separated being fed to a spreader plate provided below the disk wheel and throwing the goods in the well known manner against a ring. From the latter all but relatively fine particles fall into the grit hopper and such relatively fine particles are transmitted, by the blast from the fan, into the disk wheel. Thereby the fineness of the separated goods is increased, and there is less liability of sputtering grains being taken along. Furthermore, when constructing the apparatus as described, the blast of air flowing back after the pneumatic feeding process is prevented from crossing the separated fine goods and from taking a part of the latter back into the grits. Finally the apparatus is simple in construction and it can be made at a low cost.

In the accompanying drawing, Figure 1 is a vertical sectional view through a separator constructed in accordance with the present invention; Fig. 2 is a detail horizontal sectional view through a portion of the fan.

Referring to the drawing, the particular embodiment of the invention shown comprises an exterior casing 4 having a tapering lower end 5, terminating in a discharge spout, a distributor plate *j* supported by a vertical shaft extending through the top of the casing and adapted to be rotated by suitable gearing, a hopper *i* connected with the top of the casing and having a supply pipe *h* extending outwardly beyond the top of the casing, said hopper surrounding the vertical driving shaft and having its discharge end above the distributor plate *j*, a fan arranged above the distributor plate, and a plurality of annular separator plates *d* arranged between the fan and distributor plate and adapted to turn therewith.

The plates *d* as shown are of different diameters and are superposed in regular order

with the largest one at the bottom so that the series as a whole provides a body which tapers slightly toward the upper end. Means are provided whereby the current of air created by the fan is caused to travel inwardly over each of the several plates *d*, from the outer to the inner edges thereof and is prevented from interfering with the flow of material from the hopper *i* to the distributor plate *j*. As shown, such means comprise a sleeve 6 cooperating with a sleeve extending upwardly from the opening in the lower annular plate *d* so that the passage of the current of air created by the fan to the material falling from the hopper *i* is prevented. An outer hood 7 is supported from the top of the casing by bolts 8 and conforms in shape to the arrangement of the separator plates being spaced from the peripheries thereof sufficiently to provide a passage for the air current. As shown, the lower end of such hood is braced by a transverse angle iron 9 in which the bearing for the lower end of the driving shaft is mounted.

The lower separator plate *d* is provided with a depending section 1 which extends to the plane of the distributor disk, being of slightly greater diameter than said disk to provide a passage for the particles of material thrown from the disk.

The fan *c* is provided with a series of relatively stationary blades *C'* between which are arranged adjustable blades or flaps 2. As shown these adjustable flaps are centrally pivoted to the body of the fan and adapted to be turned to close the passage between adjacent blades *C'* to vary the strength of current created by the fan. When the flaps 2 are extending substantially parallel to the stationary blades *C'*, a current of maximum strength will be produced by the fan. By turning said flaps upon their pivots to close to a greater or less extent the space separating adjacent stationary blades, the strength of the air current may be reduced.

A grit hopper or receptacle 3 is arranged within the casing beneath the distributor plate and has a discharge spout extending outwardly through the side wall of the section 5 of the outer casing. As shown, the upper edge of this grit receptacle is slightly above the lower end of the hood 7 and separated from such hood by a relatively narrow space.

The operation and some of the advantages

of the separator herein described can be briefly stated as follows: The goods are fed through the tube *h* and in the direction of the arrow shown. The goods fall into the hopper *i* and from the latter on the spreader plate *j*. From the latter they are thrown against the ring *l*. Above the spreader plate *j* and the ring *l* the disk wheel *d* is located, and above the latter the fan *c*. The fan *c* the wings of which can individually be thrown out of operation by means of flaps 2 draws in the air and dust in a greater or less degree. The latter are forced to pass through the rotating disks *d* and the heavier particles which may have been taken along and which fall in the revolving disks are thrown back by centrifugal action into the grits hopper 3, while the finer particles and the air are not at all or only in a slight degree affected by the centrifugal force. The fine particles get into the dust separator chamber 4, from which they get into the dust hopper 5 after being deposited. To regulate the sucking action of the fan *c* by means of the flaps 2 is advantageous over regulating the same by turning the wings of the fan, because the intensity of the whirling action of the air within the chamber 4 remains the same if the position of the wings is not altered. By means of the revolving hopper 6 which is directly connected with the fan *c* and the cover of the ring *l* any side draft of the air is avoided.

What I claim is:

1. In a separator of the character described, the combination of a casing, a hopper opening through the top of the casing, a revoluble distributor disk within the casing, below the discharge end of the hopper, a revoluble fan above said disk, a receptacle below the disk for the relatively coarse particles falling therefrom, a plurality of superposed revoluble disks arranged between the distributor disk and fan, and means for causing a current of air to travel across the surface of said disks from their outer to their inner edges.

2. In a separator of the class described, the combination of a casing, a hopper opening through the top of the casing, a revoluble distributor disk within the casing below the discharge end of the hopper, a revoluble fan above the distributor disk, a revoluble annular separator plate arranged between

the distributor disk and fan and of greater diameter than said disk, means for causing the current of air, created by the fan, to travel across the surface of said plate from the outer to the inner edge thereof, and a receptacle within the casing arranged to receive the relatively coarse particles separated by the action of said disk and plate, the fine particles carried by the air current being deposited in the casing outside of said receptacle.

3. In a separator of the class described, the combination of a casing, a hopper opening through the top of the casing, a revoluble distributor disk within the casing below the discharge end of the hopper, a revoluble fan above the distributor disk, a plurality of revoluble annular separator plates arranged one above the other between the distributor disk and fan, each of said plates being of greater diameter than the distributor disk, means for causing the current of air created by the fan to travel across the surfaces of said plates from the outer to the inner edges thereof, and a receptacle within the casing adapted to receive the relatively coarse particles separated by the action of said disk and plates.

4. In a separator of the class described, the combination of a casing, a hopper opening through the top of the casing, a revoluble distributor disk within the casing below the discharge end of the hopper, a revoluble fan above the distributor disk, a plurality of revoluble annular separator plates between the distributor disk and fan, said plates being of different diameters and superposed in regular order with the one of greatest diameter adjacent the distributor disk, means for causing the current of air created by the fan to travel across the surfaces of said plates from the outer to the inner edges thereof, and a receptacle within the casing adapted to receive the relatively coarse particles separated by the action of said disk and plates.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT MOODIE.

Witnesses:

H. D. JAMESON,
T. L. RAND.