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W. F. HARLOW

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APPARATUS FOR GRADING POWDERED MATERIAL

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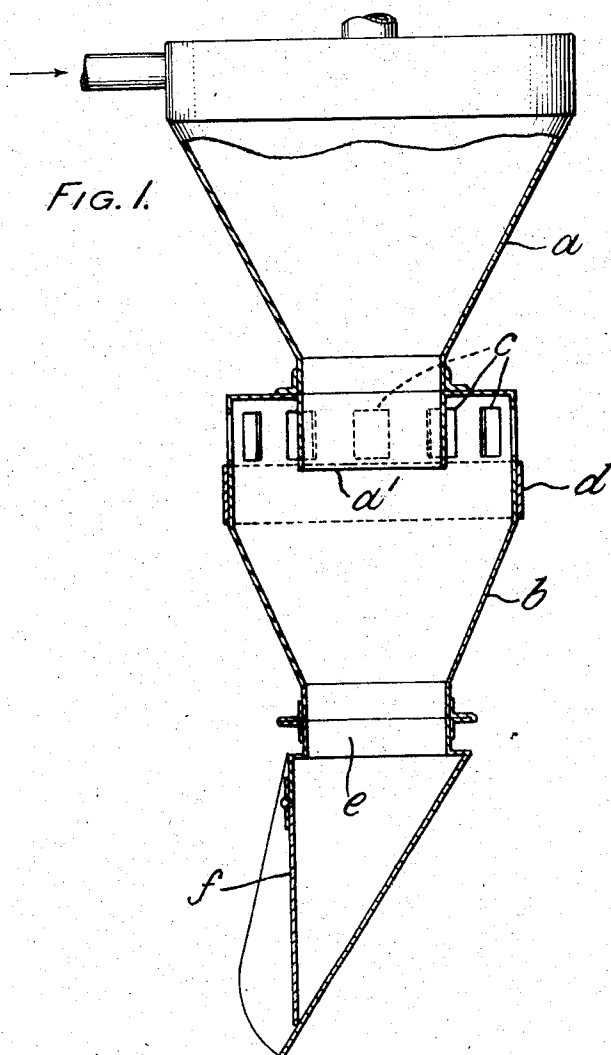
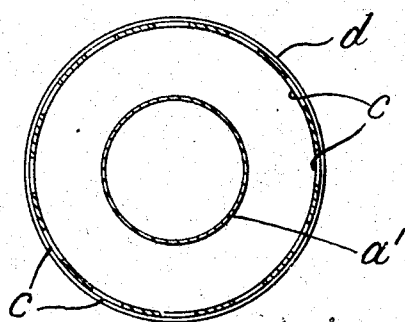


FIG. 2.



Inventor
Walter Fred Harlow
By Spear, Donaldson & Hall
ATTYS

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APPARATUS FOR GRADING POWDERED MATERIAL

Walter Fred Harlow, Quarndon, England, assignor
to International Combustion Limited, London,
England, a British company

Application January 11, 1943, Serial No. 472,030
In Great Britain March 18, 1942

1 Claim. (Cl. 209—144)

The present invention relates to apparatus of the cyclone type for grading powdered material, the apparatus enabling extremely fine material to be collected from a milled product.

In apparatus of this kind it has previously been proposed to employ two superposed cyclones of which the upper one receives air-borne particles, while air is introduced into the lower one.

According to the present invention, which relates to apparatus of this type, means are provided for regulating the admission of air into the lower cyclone, such means being conveniently in the form of a plurality of air admission ports arranged around the periphery of the lower cyclone, the available area of the ports being adjusted by means of a sliding sleeve or other suitable means.

One form of construction of the invention is illustrated in the annexed drawing, in which—

Fig. 1 is a sectional elevation, and

Fig. 2 is a sectional plan view of the lower cyclone.

In the drawing, *a* is the upper cyclone, of which the lower part has an outlet *a'*, and extends into the lower cyclone *b*, which is provided near its upper surface with a plurality of air admission ports *c*, of which the effective area can be regulated by means of a sliding sleeve *d*. The coarse separated particles collect in the lower part of the cyclone *b*, which is provided with an outlet *e* closed by a non-return valve *f*, while the fine particles are carried out of the upper cyclone.

The vortex created in the large cyclone *a* by the entry of the stream of air-borne material in a tangential manner throws the solid particles to the periphery, thereby increasing their concentration to such a point that they are no longer air borne and they descend to the bottom and fall

into the lower cyclone *b*, at the same time whirling round the inside surface of the connecting pipe. The spinning motion of the air in the upper cyclone is communicated to the air in the lower cyclone as this has been found to acquire a high angular velocity. The air which is admitted through the ports *c* has, therefore, imparted to it a rotating motion and this has to descend below the end of the connecting pipe, which it afterwards enters. It then rises to the outlet of the upper cyclone and leaves with the air originally introduced with the material. It will be seen that the particles thrown out of suspension in the top cyclone have to fall through a rising and spinning column of air, which effectively disengages the finer particles. Since the air in the lower cyclone is spinning, a cyclonic or separating action takes place also in this cyclone which prevents large particles being carried up to the outlet. If the amount of admitted air through the ports is small, only the finest particles will be entrained, but the size of the particles can obviously be varied by adjusting the quantity of air.

I claim:

Apparatus for grading powdered material comprising, two superposed cyclones with the upper cyclone receiving air-borne particles, the lower cyclone having a plurality of ports therein circumferentially spaced around the periphery of the lower cyclone for admitting air into the lower cyclone, a sleeve embracing the periphery of the lower cyclone adjacent said ports slidable axially for adjusting the open area of said ports, and an annular outlet depending from the upper cyclone into the lower cyclone and terminated at a position below said ports.

WALTER FRED HARLOW.