

Aug. 1, 1939.

J. D. WHITE

2,167,700

PAINT MILL

Filed Oct. 15, 1935

2 Sheets-Sheet 1

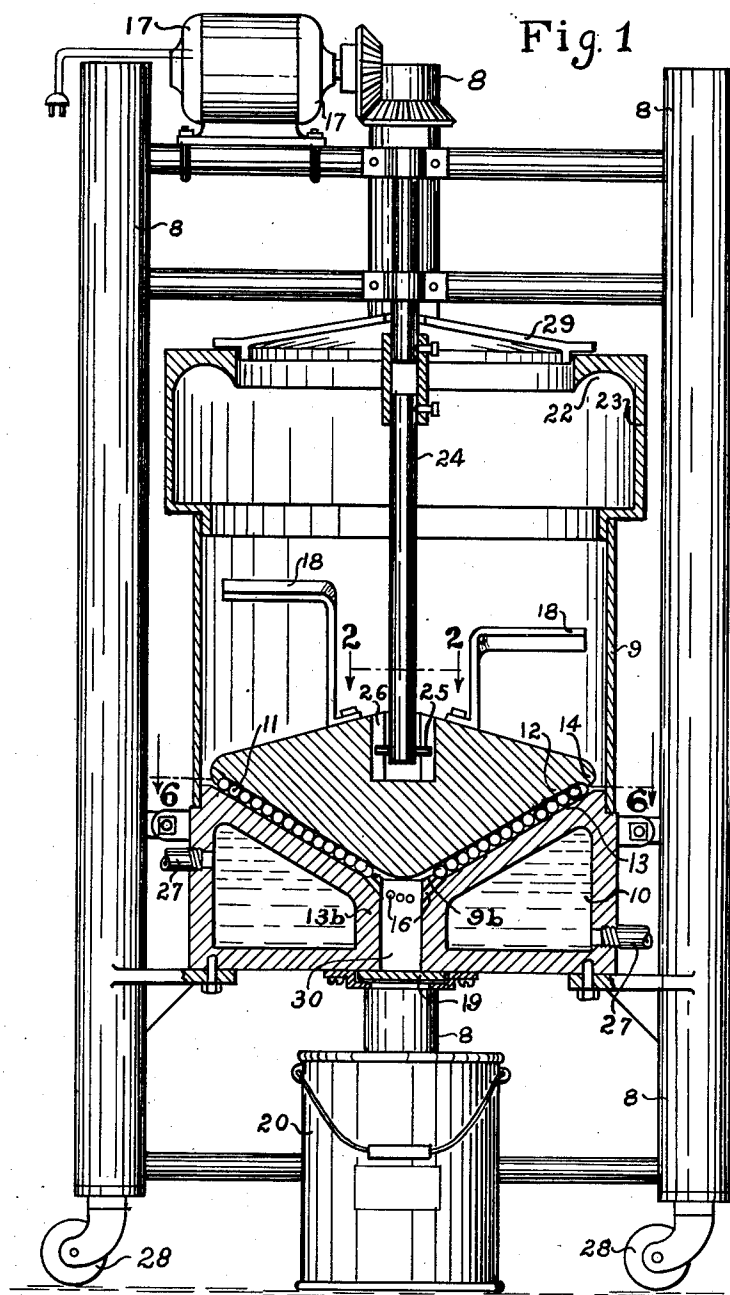
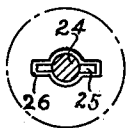


Fig. 2



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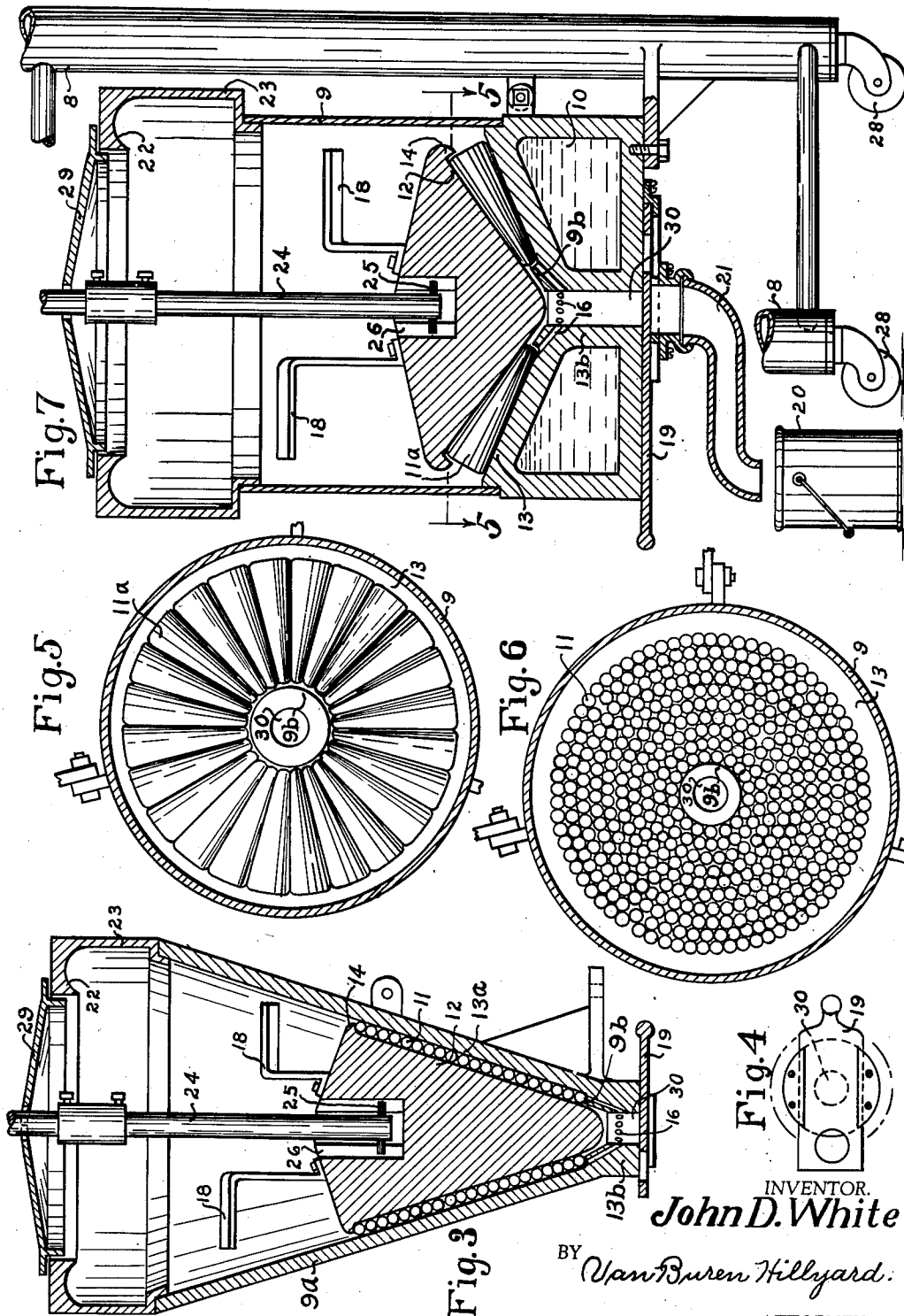
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PAINT MILL

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4 Claims. (Cl. 83—22)

The invention relates to tritulating, comminuting or like machinery for grinding or reducing material to an impalpable powder and, when required, mixing it with a vehicle, such as oil, water, or other fluid carrier according to the desired composition or product to be produced. The invention provides a machine of the type and for the purpose aforesaid which is simple in construction, rapid in operation, dependable in service, sturdy, easy of manipulation, compact, economical in upkeep, and readily accessible for assembling, dismantling, or other required purposes.

While the drawings illustrate a preferred embodiment of the invention, it is to be understood that in adapting the same to meet specific needs and requirements, the design may be varied and changes in the minor details of construction may be resorted to within the scope of the invention as claimed, without departing from the spirit thereof.

For a full understanding of the invention and the merits thereof, reference is to be had to the following description and the drawings hereto attached, in which:

Figure 1 is an elevational view showing a preferred form of the invention, the mill proper being in vertical central section.

Figure 2 is a sectional detail on the line 2—2 of Figure 1.

Figure 3 is a vertical central section of a modification.

Figure 4 is a bottom view of the mill shown in Figure 3.

Figure 5 is a detail section on the line 5—5 of Figure 7, with the pressure member removed.

Figure 6 is a detail section on the line 6—6 of Figure 1, the rotary pressure member being omitted.

Figure 7 is a view similar to Figure 1, of a further modification.

Corresponding and like parts are referred to in the following description and designated in the several views of the drawings by like reference characters.

The numeral 8 designates a suitable framework for supporting the component parts of the mill and is shown mounted on casters 28 to admit of ready and convenient shifting from one point to another when required.

The mill comprises an upper pressure member and a lower bed member. Between these two members mobile tritulating elements are disposed and may consist of balls 11 or rollers 11a. These elements lie close together, as shown most clear-

ly in Figures 5 and 6. This requires rollers of tapering form, as indicated in Figures 5 and 7. The rollers revolve about the axis of the mill, and each rotates about its individual axis. The balls roll and are free to move in every direction.

The lower or bed member is generally funnel-shaped and may spread, as designated at 13 in Figures 1 and 7, or may have the form of a cone, as shown at 13a in Figure 3. A hopper 9 is fitted to the member 13. The upper portion of the member 13a provides a hopper 9a. These hoppers, 9, 9a hold the material during the process of grinding. Extensions 23 form continuations of the hoppers and are preferably fitted thereto by a slip joint to admit of ready removal. Overhanging portions 22 project inwardly from the top of the hopper and curve downwardly and function as splash arresters and deflectors to return any up-flowing material back into the central portion of the bed and the opening 30 therein provides an outlet which is controlled by a cut off 19 slidable across the neck 13b. An inner shoulder 9b is formed at the upper end of the neck 13b. Small openings 16 extend through the shouldered portion of the neck 13b and connect with the outlet 30. The lower or bed member may be hollow to provide a space 10 through which a heating or cooling medium may be circulated to obtain the temperature best suited to the material being ground.

The pressure member 12 conforms approximately to the lower member and may be broad, or elongated, and is rotatable from a suitable source of power 17, by means of a shaft 24. For convenience, the shaft 24 comprises coupled sections and has a universal joint connection with the member 12 to insure even distribution of the pressure. The lower end of the shaft 24 enters an opening in the upper part of the member and carries a pin 25 which operates in grooves 26 connecting with said opening. An outer shoulder 14 is formed at the top of the pressure member. The mobile tritulating elements 11 and 11a are confined between the shoulders 14 and 9b and nearly or quite fill the space formed between the pressure member and bed member. Agitators 18 are carried by the pressure member, being attached thereto in any preferred manner, and mix and stir the material. A sectional cover 29 closes the top of the hopper. The top of the member 12 slopes outwardly and downwardly to direct the material into the space in which the mobile grinding elements are located.

By reason of the construction the material is ground faster at the top or periphery of the mill

than at the bottom or center, due to the greater extent of surfaces in opposition, as will be appreciated. When the outlet 30 is closed the material is subjected to a continued grinding action until the desired degree of fineness is obtained. When the material consists of a vehicle and a pigment, the mill may be sufficiently cleaned to admit of changing the color without impairment of the product, by introduction of solvent and running the mill at high speed for a short time. A spout 21 may be connected to the outlet 30 by a swivel joint to be readily adjusted to discharge the product into a can or container 20. The balls 11 are free to rotate in every direction, whereas the rollers 11a only have a rotary and revolving movement and bear a fixed relation. The rotary member is of a sufficient weight to exert a pressure to effect a grinding of the material when the mill is in operation. The bed member is depressed or concave and the pressure member approximately convex to conform thereto. The grinding elements have a snug fit between the two members and coact therewith to reduce the material when the mill is in action.

Having thus described the invention, what I claim is:

1. A mill of the character specified comprising a bed having a depending neck portion in which is formed an outlet and having an inner shoulder and a plurality of small openings leading from the shoulder and connecting with the outlet, a coacting rotary pressure member having an outer shoulder, mobile tritulating elements between the bed and pressure member and confined between the shoulders thereof, means for rotating said pressure member, and agitators carried by the pressure member.

2. A mill substantially as specified comprising a centrally depressed bed having a depending portion in which is formed an outlet, and having an inner shoulder adjacent and surrounding the outlet from which a plurality of openings extend and connect with the outlet, a cut off operating across the outlet, a hopper projecting from the bed and provided with a combined splash arrester and deflector, a tapering rotary pressure member having an outer shoulder, mobile tritulating elements between the bed and pressure member and confined between the

shoulders thereof, means for rotating said pressure member, agitators carried by the pressure member, and a drive shaft connected with the pressure member by an approximate universal joint.

3. A mill of the character described comprising a bed having a concave surface provided with a central discharge opening approximately at the lowest point of said surface with said concave surface tapering upwardly in all directions from the top of said discharge opening at an appreciable acute angle to a horizontal plane, a rotary pressure member centrally disposed relative to the concave surface and having a substantially inverted-conical under surface, said under surface being substantially continuous approximately to an apex located at the axis of the discharge opening, mobile tritulating elements freely movable in all directions between the pressure member and the bed surface, means at the periphery of the pressure member and adjacent the center of the bed surrounding the discharge opening for confining said mobile elements therebetween, and means for rotating said pressure member and having a loose connection therewith for relative movement between said pressure member and the rotating means.

4. A mill of the character described comprising a bed having a concave surface provided with a central discharge opening approximately at the lowest point of said surface with said concave surface tapering upwardly in all directions from the top of said discharge opening at an appreciable acute angle to a horizontal plane, a rotary pressure member centrally disposed relative to the concave surface and having a substantially inverted-conical under surface, said under surface being substantially continuous approximately to an apex located at the axis of the discharge opening, said bed having an annular shoulder around the discharge opening with orifices extending through said shoulder to said discharge opening, the pressure member having an outer shoulder, mobile tritulating elements freely movable in all directions between the pressure member and the bed surface and confined between the shoulders, and means for rotating said pressure member.

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