

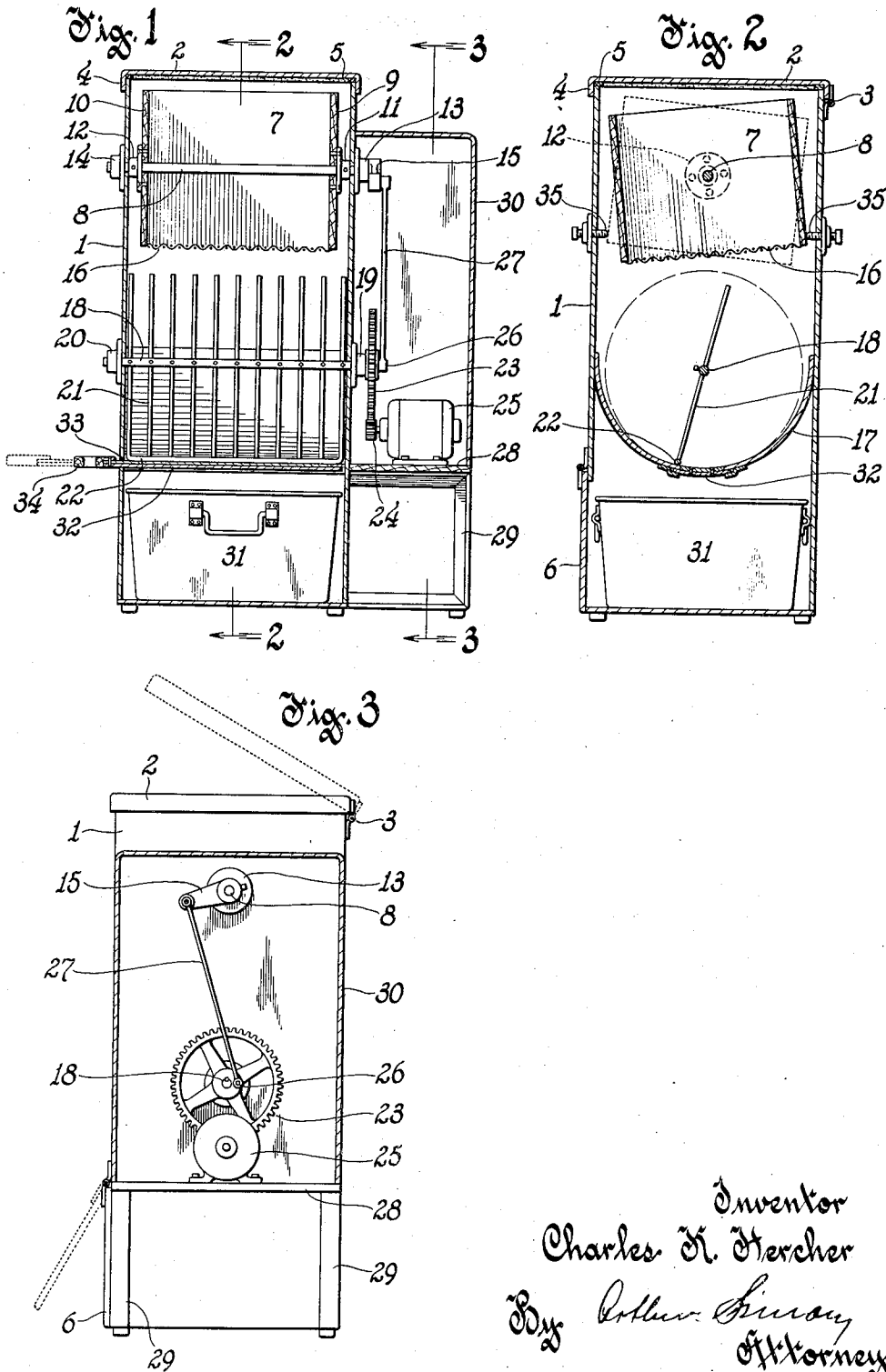
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BRONZE MIXER AND CONDITIONER

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BRONZE MIXER AND CONDITIONER

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3 Claims. (Cl. 259—48)

This invention relates to improvements in mixing and conditioning devices and while not limited thereto is particularly applicable to the mixing, sifting, and conditioning of bronzes used for lithographing and other processes.

In using bronzes for lithographing processes some of the powder comes in contact with the printing ink and other impurities which cause it to agglomerate into lumps, or the impurities interfere otherwise with the printing process. It is therefore customary to remove the powder after several hours of operation of the printing machine from the bronze fountain and sift it to remove the lumps and impurities, while at the same time adding fresh powder. The latter should be intimately mixed with the old powder so as to avoid any difference in color throughout the mass of the powder resulting from stratification of the discolored and fresh powder. The mixing has heretofore been done by hand as no suitable apparatus was available. Hand mixing, however, has many disadvantages, some of which are the following:

The individual powder particles are of a flaky nature and the intimate mixing of such flaky material into a homogeneous mass is extremely difficult and time-consuming.

The mixing of the powder disperses some of it. The powder dusts are irritating to the operator and often dangerous to his health and the health of other occupants of a room filled with suspended powder.

The suspended powder in the room floats into the lithographing apparatus and injures it and often spoils work which is being printed or which is stored in the room.

An appreciable amount of powder is lost by dispersion in the room by manual mixing and sifting.

The present invention eliminates the aforementioned and other difficulties and affords a thorough sifting and mixing of the powders to restore them to their highest quality and usefulness.

An object of the invention is to provide a process and a machine which intimately mixes powders of different quality into a homogeneous mass while the powders are dispersed or suspended in air or another gas.

Another object is to provide a machine which efficiently removes impurities and lumps from powders.

Another object is to provide a method and a machine which is dust tight and thus protects the operators from inhaling powder dust.

Another object is to provide a method and a machine which is rapid in operation.

Another object is to provide a machine in which the mixed powder can be stored and protected until it is needed.

Another object is to provide a power operated machine of the aforementioned character.

Another object is to provide a machine which is compact and easily transported from one place to another.

Another object is to provide a machine which requires a minimum of attention.

Other objects and advantages will hereinafter appear.

The machine comprises a dust tight cabinet divided into an upper and a lower compartment. Mounted in the upper compartment is an oscillatable basket having a finely perforated wall and adapted to receive the powders to be mixed and screened. Therebelow the upper compartment is provided with an agitator having revolving arms or paddles, which agitate and mix the screened powder. The powder which settles in the compartment can be released into a pan in the bottom compartment of the cabinet by the opening of a slide in the lower part of said upper compartment. A motor is geared to the shaft of the agitator to revolve the same, while the basket is pivotally supported on a second shaft which is connected to the first mentioned shaft by a connecting rod and crank in such a manner that upon rotation of said agitator by the motor, the basket is oscillated forth and back to agitate the powder therein to thereby mix it and pass it through the perforations in the basket into the lower part of the upper compartment.

The accompanying drawing is illustrative of an embodiment of the invention.

In the drawing, Figure 1 is a vertical section through the machine parallel with the operating shafts.

Fig. 2 is a transverse vertical section along the line 2—2 of Fig. 1, while

Fig. 3 is a vertical section along the line 3—3 of Fig. 1.

Referring to the drawing the machine comprises a frame or cabinet 1 which is provided with a top door 2, hinged to the body of the cabinet by means of hinges 3 and further provided with flanges 4 which fit closely over the outside of the cabinet. To make the door 2 completely dust tight, a packing strip of felt 5 or other suitable material is attached to the inside surface of the door 2 in a manner to engage the top edge of the cabinet. The cabinet is also pro-

vided at its lower part with a hinged door 6 the purpose of which will be explained hereafter.

A screening basket or shaker 7 of rectangular shape is supported by a shaft 8 which passes through its side walls 9 and 10 to which it is fastened by means of flanges 11 and 12 respectively, and the shaft in turn is pivotally supported in bearings 13 and 14 respectively, the latter being attached to two opposite sides of the cabinet 1. One end of the shaft extends beyond the bearing 13 and has attached thereto a lever or crank 15. The bottom of the basket 7 is provided with a screen 16 of suitable fineness for passing the powder.

Mounted in the cabinet 1 below the basket 7 is a semicircular wall 17 which with two sides of the box forms a mixing chamber having a substantially semi-cylindrical bottom for reception of the powder dropping through the screen 16. A rotatable shaft 18 is pivotally mounted in bearings 19 and 20 fastened to opposite side walls of the cabinet. The shaft 18 is parallel to the shaft 8 and substantially coaxial with the central axis of the wall 17. The shaft 18 is provided with a series of radial rods or paddles 21 preferably comprising wires extending close to the surface of the wall 17 and having their ends at one side of the center connected with a cross wire 22, which enhances the stirring action of said paddles. The shaft 18 is extended outside of the cabinet beyond the bearing 19 and has keyed thereto a gear 23 which meshes with a pinion 24 of a driving motor 25. The gear 23 is provided with an eccentric pin 26 on which is pivotally mounted a connecting rod 27, the other end of which engages the crank 15, the arrangement being such that as the gear 23 rotates it oscillates the shaft 8 through the medium of the connecting rod 27.

The motor 25 is mounted on a base plate 28 which in turn is supported from the cabinet 1 by suitable brackets 29. A cover 30 which is attached to the cabinet 1 and base plate 28 encloses the motor and gearing.

The cabinet is arranged to receive a receptacle 31 which can be inserted through the door 6 and which is employed when it is desired to withdraw finished powder from the cabinet. For this purpose the lower central part of the wall 17 is provided with a slide 32 which passes through a dust tight slot 33 in one wall of the cabinet and which is provided outside thereof with an operating handle 34.

To enhance the shaking effect of the oscillation of the basket 7, the cabinet may be provided with adjustable abutments 35 which engage the basket 7 as it approaches its limits of travel to produce an impact thereon which causes the powder to more readily pass through the screen 16. The resiliency of the basket and the lost motion of the various parts are sufficient to prevent any injurious strains on the parts when the basket engages the stops 35. The impact referred to may also be supplied by providing a lost motion, for instance, in the connection between the rod 27 and the crank 15.

If it is desired to screen used powder and/or mix it with new powder, the respective material is placed into the basket 7 and the cover 2 is closed, whereupon the motor 25 is started. Thereupon the basket 7 is shaken and the powder therein is thoroughly mixed and gradually passes through the screen 16 into the upper compartment where it is further agitated and mixed by the rotating paddles 21. In addition, due to the turbulence of the air created by the paddles

the particles as they pass from the screen 16 are for some time held in suspension and thus are further mixed by the action of the paddles and of the turbulent air.

After the powder has been mixed it may be withdrawn by the opening of the slide 32 whereupon it drops into the pan 31. The entire process takes place in the dust tight cabinet and no powder can escape and injure the workmen or the work. All foreign matter in the used powder is retained on the screen 16, while all lumps are thoroughly broken up before the particles can pass through the screen. The labor required is a minimum, as it is only necessary to place the powder into the basket after which the motor is started and the entire operation thereafter is automatic and requires no further attention. The entire apparatus, being compact and self contained, may be easily moved where it is needed.

It is of course possible to replace the motor by hand operating means. I do not wish to limit myself to the embodiment of the invention illustrated and described in the present application, but claim all obvious modifications thereof coming within the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. A casing enclosing an air tight chamber, a receptacle disposed in the upper part of said chamber and oscillatable to sift bronze printing powder through a sieve at its bottom, an agitator disposed in said chamber below said receptacle and rotatable to agitate the air for delaying the settling of the powder passing through said sieve and thereby prolong its exposure to the air, and means to simultaneously rotate said agitator and oscillate said receptacle.

2. A casing enclosing an air tight chamber having a concave, substantially semi-circular bottom, a receptacle disposed in the upper part of said chamber having a perforate screening wall and oscillatable about a horizontal axis to sift metal printing powder through said wall, an agitator disposed in said chamber below said receptacle, provided with radial paddles and rotatable about an axis substantially concentric with said bottom to agitate the air in said chamber for delaying the settling of the powder passing through said wall and thereby prolong its exposure to the air, and means to simultaneously rotate said agitator and to oscillate said receptacle.

3. A casing enclosing an air tight chamber having a concave, substantially semi-circular bottom, a receptacle disposed in the upper part of said chamber having a perforated screening wall and a shaft for oscillation thereof about a horizontal axis to sift metal printing powder through said wall, an agitator disposed in said chamber below said receptacle, provided with radial paddles and with an agitator shaft to afford rotation about an axis substantially concentric with said bottom to agitate the air in said chamber for delaying the settling of the powder passing through said wall and thereby prolong its exposure to the air, bearings for said shafts attached to said casing, a motor, a driving connection between said motor and said agitator shaft to rotate the latter in accordance with the rotation of said motor, and a connection between said agitator shaft and said receptacle shaft adapted to oscillate said receptacle simultaneously with the rotation of said agitator.

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