Aug. 2, 1938. A. K. TAYLOR 2,125,472

BRONZER

Filed March 26, 1936 3 Sheets-Sheet 1

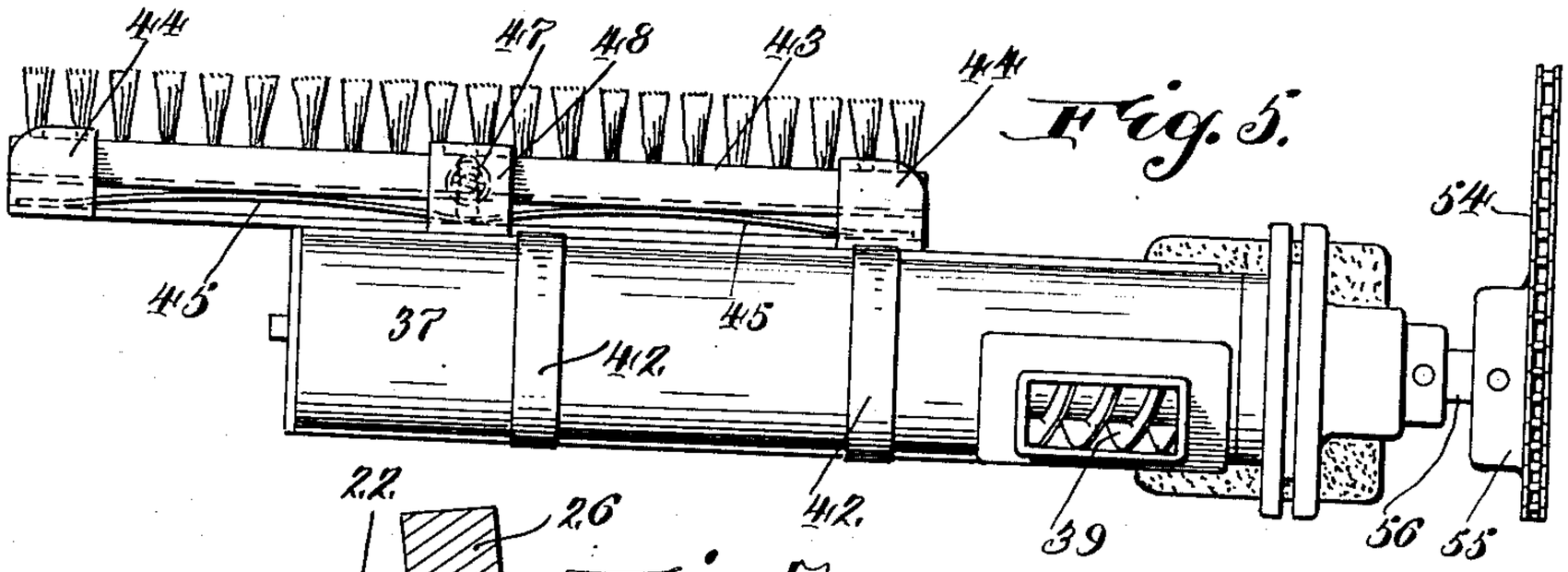

Fig. 5.

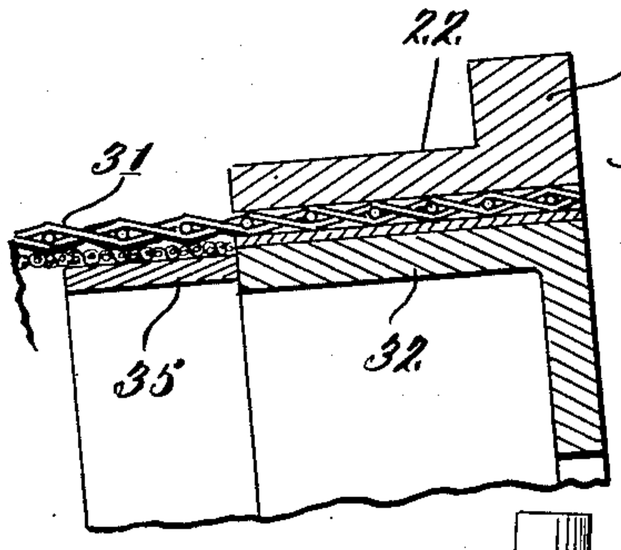

Fig. 7.

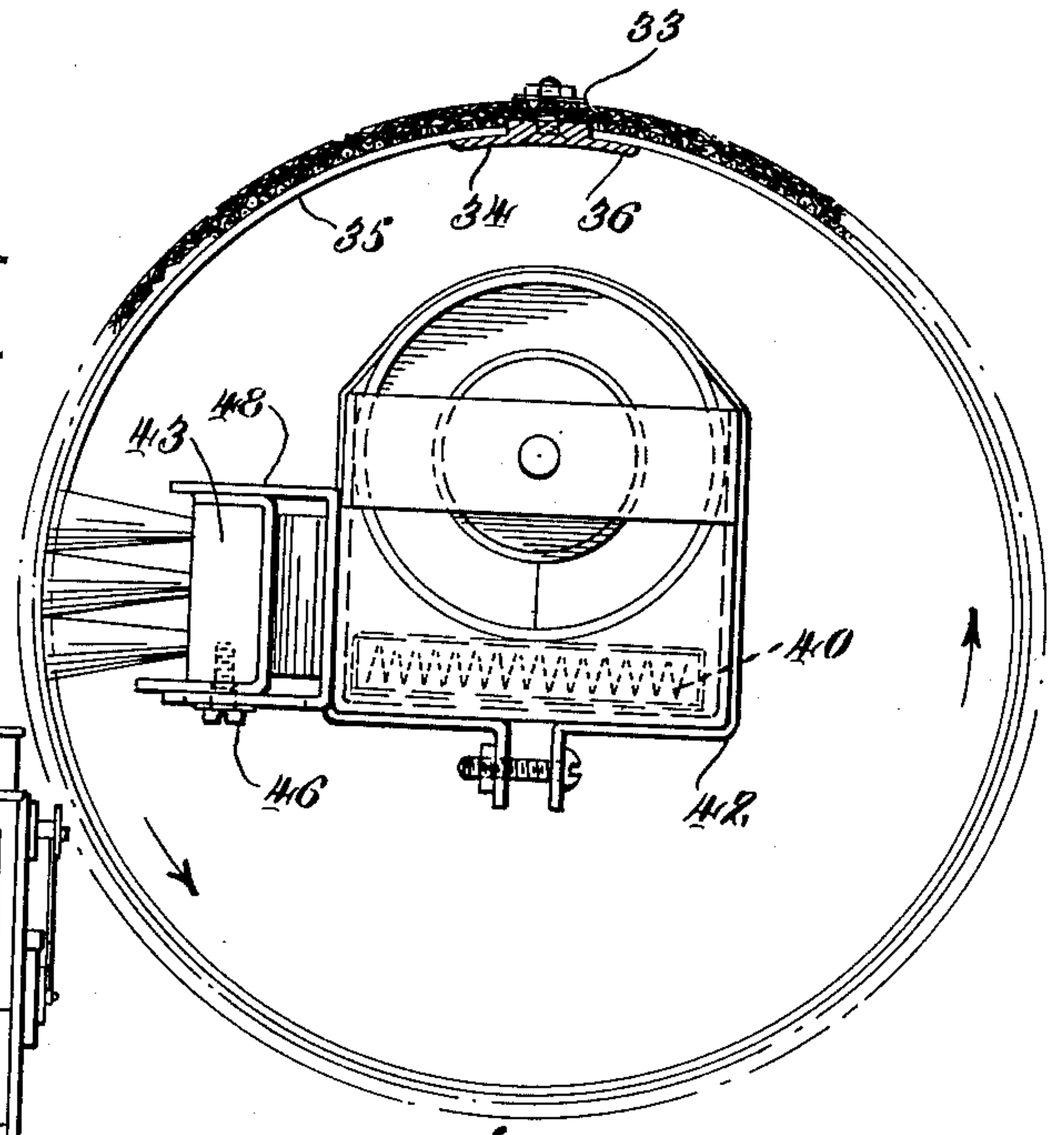

Fig. 6.

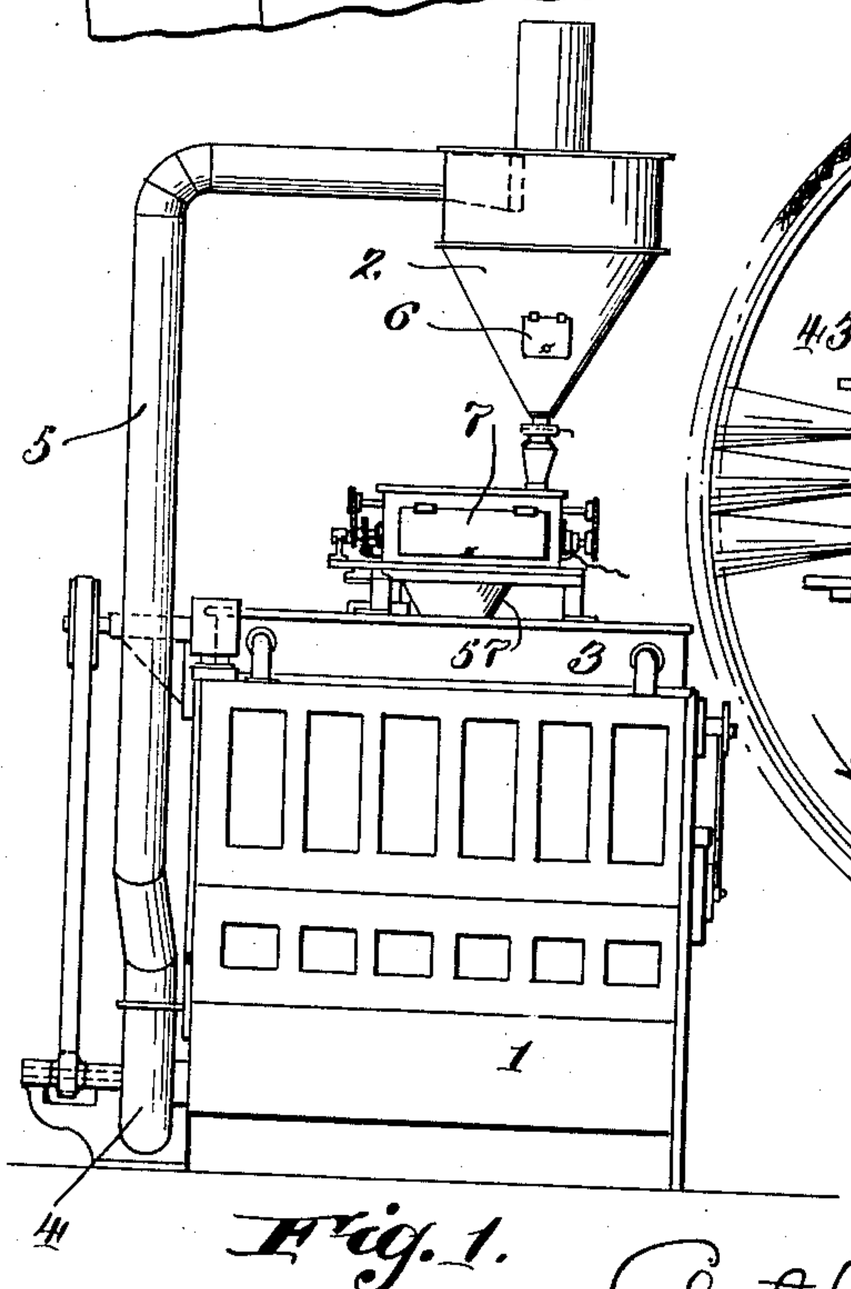

Fig. 1.

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Aug. 2, 1938. A. K. TAYLOR 2,125,472

BRONZER

Filed March 26, 1936 3 Sheets-Sheet 2

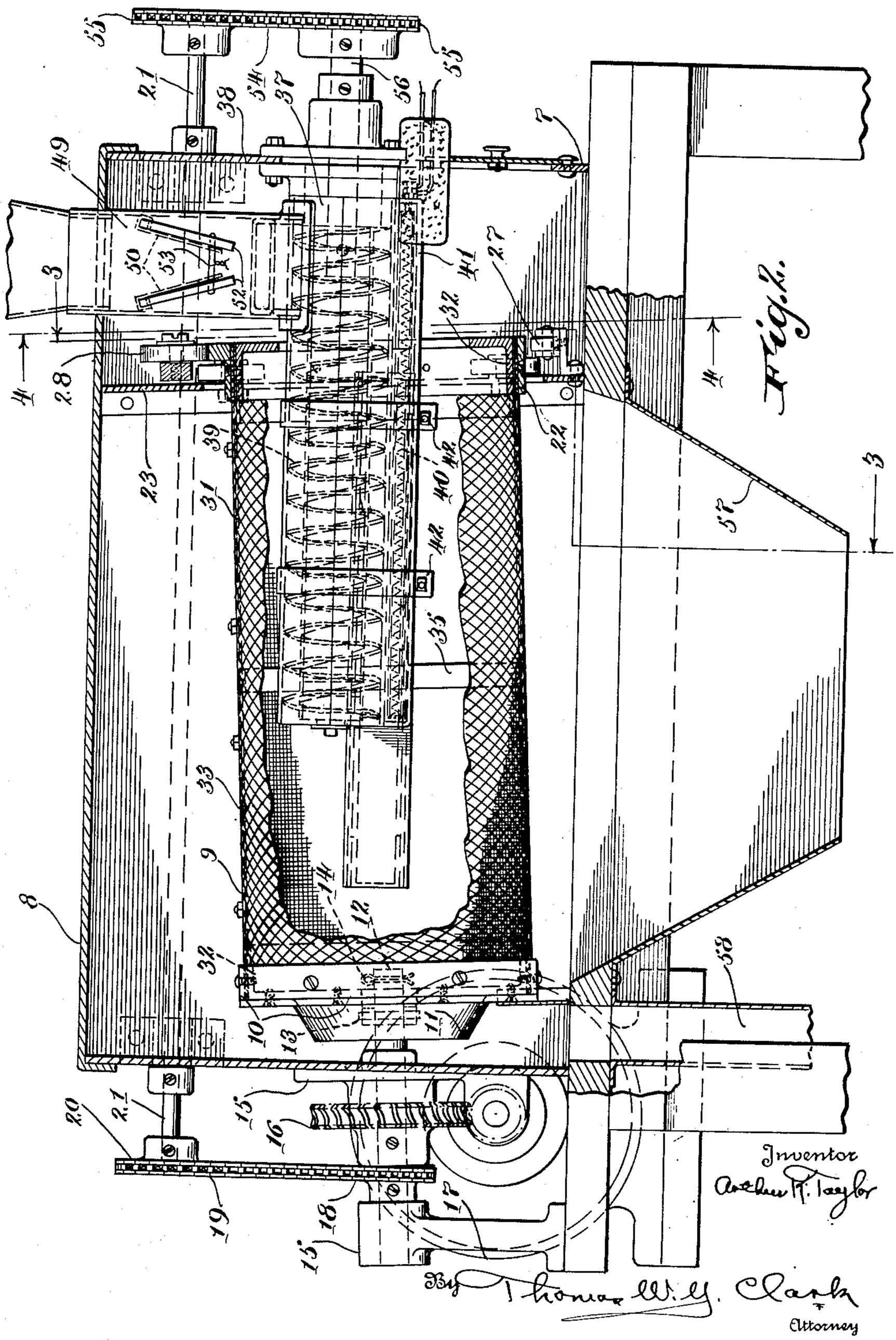

Fig. 2.

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BRONZER

Filed March 26, 1936 3 Sheets-Sheet 3

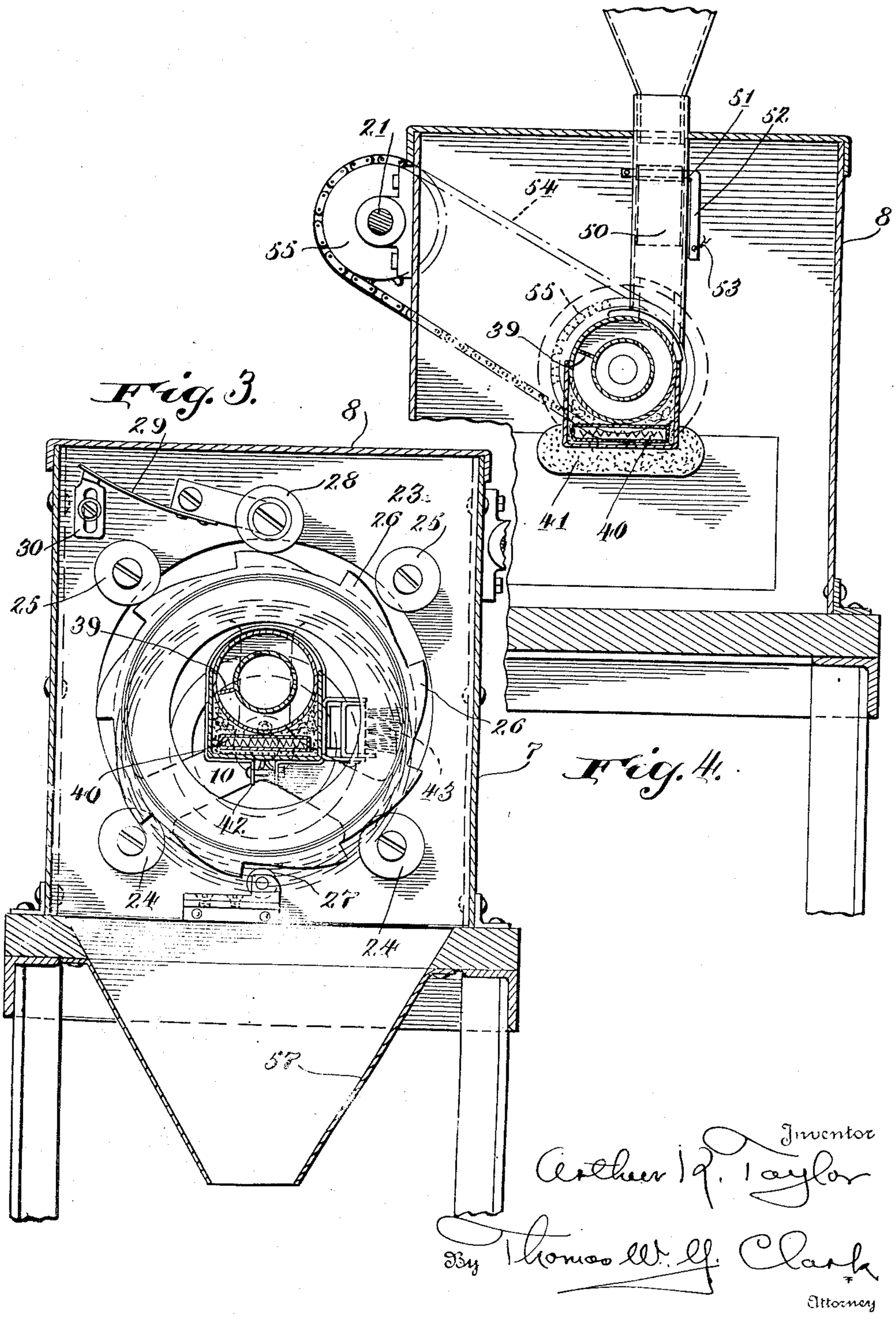

Fig. 3.

Fig. 4.

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Patented Aug. 2, 1938

2,125,472

UNITED STATES PATENT OFFICE

2,125,472

BRONZER

Arthur K. Taylor, Baltimore, Md., assignor to The United States Printing and Lithograph Company, Baltimore, Md., a corporation of Ohio

Application March 26, 1936, Serial No. 70,940

8 Claims. (Cl. 91—43)

This invention relates to an improvement in a bronzing machine in which bronze or similar powders are placed upon paper or fabric coming from a printing, lithographing or other type of machine. Such machines are equipped with mechanism to thoroughly apply bronze powders, which are small metallic particles, onto the design printed with sizing on the paper or fabric. After bronze has been applied to the surface desired the surplus bronze is brushed off that surface and is withdrawn from the machine and either returned thereto for further use or it is removed therefrom and after reconditioning is re-used. Such bronze coming from the machine is very frequently moist because of the sizing with which it has been in contact on the printed sheet. The moistened particles of the bronze oftentimes adhere together and form agglomerated lumps. These lumps are in no condition to be returned to the machine for immediate use and the moisture on even the smaller particles dulls the appearance of the bronze so that very frequently it has had to be heated and reconditioned before it can again be used. In the operation of bronzing particles of lint brushed from the paper as well as small bits of wool and cotton fabric from the bronzing rollers also become mixed with the bronze powder and have to be removed before the bronze is in condition to be used again.

Although the invention may be applied to practically any type of bronzing machine, I have shown it as adapted to a bronzing machine of the type shown in the patent to Hafner, patented April 13, 1915 and bearing No. 1,135,788. Various parts of my invention may likewise be used in other sifting operations in which similar results may be desired.

In order that the invention may be more readily understood reference will now be made to the accompanying drawings in which:

Figure 1 is a rear elevation of a bronzing machine such as that disclosed in the above mentioned patent showing the new improvement of this invention combined therewith.

Figure 2 is a longitudinal sectional view of the bronze conditioning means.

Figure 3 is a partial sectional view substantially on lines 3—3 of Figure 2.

Figure 4 is a partial sectional view substantially on line 4—4 of Figure 2.

Figure 5 is a top plan view of the bronze feeder and screen brush.

Figure 6 is an end view of the mechanism of Figure 5 showing the same in the cylindrical screen and looking toward the inside end of the feeder.

Figure 7 is a fragmentary sectional view of the end of the screen showing the support therefor.

In the drawings similar numerals refer to similar parts throughout the several views.

The bronzing machine 1 has therein the usual bronze applying mechanism shown in the above referred to patent to Hafner. In previous practice bronze has been fed from a cyclone separator to a hopper 3 where it is passed to the sheets to which it is applied, which are not shown. After surplus bronze has fallen and been brushed from these sheets the same is withdrawn from the bronzer by means of a suction fan 4 which blows the same back through the conveyor duct 5 to the cyclone separator 2 where it might ordinarily again pass down to the bronzing machine. New bronze which has not gone through the machine may by various means be mixed with the proper proportion of old bronze and again be introduced in the hopper 3 and a door 6, as shown in Figure 1, is one means by which the mixture may be introduced to the combined mechanism of the bronzer with this invention.

The conditioning apparatus of this invention, generally indicated at 7, receives bronze from the cyclone separator 2 and conditions the same before it is introduced to the bronzing machine proper through hopper 3.

The conditioning mechanism comprises a housing 8 enclosing a cylindrical rotatable screen 9. This screen is preferably slightly inclined and at the lower end it is supported by a mounting 10 having an upwardly inclined lip 11 and the mounting also has therein a spider support, by means of which the same is attached to the shaft 12. The hub of the mounting on shaft 12 comprises a sleeve loosely fitting over shaft 12 with oppositely placed longitudinally extending U shaped slots extending around a pin 13 fast in shaft 12. After placing the sleeve over the shaft 12, cotter pin 14 is inserted in shaft 12 to keep the sleeve from coming off the shaft. Shaft 12 is mounted in bearings 15. The shaft has rigidly attached thereto worm wheel 16 which is driven by a worm gear from motor 17; also fast on shaft 12 is a gear wheel 18 driving chain 19 and which in turn drives gear 20 on shaft 21.

The upper end of the cylindrical screen has thereon an outer collar 22 which extends through an opening in a partition 23 in casing 8. By means of this collar 22 the upper end of the screen is supported on rollers 24 at the bottom of this partition 23 and rollers 25 at the top of

the partition, which limit the upper and sidewise movements of the collar 22. The extreme outer end of the collar has thereon a plurality of cams 26 which are preferably evenly spaced about the circumference of the collar. Beneath these cams on the partition 23 centrally of the rollers 24 is another roller 27 on which the cams ride up when they are turned clockwise. This roller 27 is placed, as shown in Figure 3, in such position that when the same is opposite the highest portion of the cams the cylindrical screen is supported on rollers 24 by the collar 22, but when the cams ride up with their lowest portion on the roller 27 the collar 22 is raised from the rollers 24 a suitable distance, so that when the cam ends and falls from the roller 27 the cylindrical screen will fall vertically until stopped by the collar 22 contacting with rollers 24.

The sharpness of this fall can be increased by means of an additional roller 28 contacting with the top of the cammed surface and held thereagainst by a spring 29. The pressure on the spring 29 may be varied by adjustment of its supporting mechanism 30, so that the degree of shock or jar imparted to the screen may be increased or decreased as may be desired.

The cylindrical screen 9 is made up of a coarse mesh screen 31 in which the wires are placed on the diagonal as shown in Figure 2. This coarse mesh screen is supported in mounting 10 and in collar 22 by means of screws passing through the same to inner collars 32. Extending longitudinally of the screen is a strip 33 on the outside thereof and another strip 34 on the inside thereof which are bolted together. The diagonal placing of the wires of the outer screen enables the screen to maintain its accurate longitudinal alignment even though considerable torque is applied thereto by means of the driving mechanism rotating the screen. A fine, preferably 80 mesh, screen is supported inside of this coarse screen. This fine screen is held against the outer screen by means of spring rings 35 at the center and at each end thereof and it is longitudinally placed under lips 36 of longitudinal bar 34. This support of the fine screen holds it in place even in view of the severity of the jar periodically imparted thereto.

A cylindrical casing 37 is rigidly fixed to the the outer end 38 of casing 8. This casing 37 extends longitudinally into the cylindrical screen and passing therethrough is a screw conveyor 39 to feed material in dispersed formation into the screen. The electrical heating element 40, enclosed in a protective casing 41, is held securely up against the casing 37 by means of brackets 42. This heating element heats the material passing along casing 37 in its dispersed condition and the material is spread, or dispersed, due to its being fed by screw or auger 39.

A brush 43 is loosely mounted in U-shaped brackets 44 attached to casing 37 and it is resiliently pushed from its brackets by separate springs 45 attached at their outer ends to the bases of brackets 44. A screw 46 passing through an elongated opening 47 in central bracket 48 limits the outward movement of the brush in respect to its supporting brackets 44. This resiliently loose mounting of the brush enables it to constantly contact the side of the inside of the screen 9 during its vibration.

Bronze is fed from the cyclone separator 2 through a throat 49 the lower end of which opens into an opening in the top of screw casing 37. In this throat are leaves 50 non-rotatably mounted on rods 51 which have angled extensions 52, these extensions may be variably and loosely connected together by wire 53. The jarring of screen 9 imparts a jarring movement to the throat 49 and causes leaves 50 to vibrate so that the throat does not become stopped up even though the leaves may be drawn fairly close together in limiting the supply of the material fed through the throat to the screw feed. Shaft 21 through means of chain 54 and gears 55 drives shaft 56 on which the screw 39 is mounted.

Bronze passing through the throat 49 into the casing 37 is fed forward and heated, which heating drives off the moisture due to the accumulation of size or other reasons and drops the same into the screen 9 which rotates and jars and shakes some of the bronze through it. The material passing through is guided by means of chute 57 into the hopper 3 of the bronzing machine. Coarse particles, that are not broken up by means of the heat and jarring, ride up on the upwardly projecting edge 11 and finally ride over the same and fall through chute 58 to a waste container.

The conditioning mechanism involves heating and separating means for bronze which conditions it and brightens it for the desired surface, so that there may be a continuous course of bronze through the machine and that which is entirely unsuitable is passed therefrom and as it becomes desirable old and new bronze may be fed to the machine in any desired proportion. It has been found in practice that this conditioning mechanism saves a large proportion of the bronze formerly discarded and therefore saves very considerable in the expense of the application of bronze to surfaces.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A material separating mechanism comprising a rotatable cylindrical screen, rotating means attached thereto at one end, means to periodically move the other end of said screen from its normal path of rotation and to return it thereto with a jar, power driven conveyor means extending into said cylindrical screen to feed material thereto and brushing means attached to said conveyor means within said cylindrical screen and pressing outwardly resiliently against said rotating jarring screen to prevent material from adhering thereto.

2. In a bronzing machine, a substantially horizontal rotary cylindrical screen, a driven conveyor extending into the same at one end thereof to pass bronze thereinto, means to feed bronze to said conveyor, said conveyor spreading and maintaining in dispersed condition said bronze during its conveyance into said screen, means to heat the bronze while dispersed and during its conveyance into said screen, means to rotate said screen and means to collect the larger particles of material not passing through the walls of said screen separate from the particles passing therethrough.

3. In a bronzing machine, a substantially horizontal rotary cylindrical screen, a driven conveyor extending into the same at one end thereof to pass bronze thereinto, means to feed bronze to said conveyor, said conveyor spreading and maintaining in dispersed condition said bronze during its conveyance into said screen, means to heat the bronze while dispersed and during its conveyance into said screen, and while in said screen means to rotate said screen and means to collect

the larger particles of material not passing through the walls of said screen separate from the particles passing therethrough and means to periodically jar said screen to force the finer particles of bronze therethrough and to the material to be bronzed.

4. A material separating mechanism comprising a substantially horizontal rotatable cylindrical screen, a supporting collar and a multiple cammed wheel on and concentric with said screen at one end thereof, means to support said collar in the normal rotation thereof with said screen, means on which said cam wheel rides to periodically move the path of rotation of said collar from its supporting means and means to return it thereto with a jar, means to rotate said screen and a conveyor extending axially into said screen, through said collar and wheel, to feed material into the screen, a chute having a throat with swinging leaves therein to feed material to said conveyor, said chute and collar supporting means having a common support and the jarring of said screen imparting a jarring, swinging motion to said leaves.

5. A material separating mechanism comprising a substantially horizontal rotatable cylindrical screen, a supporting collar and a multiple cammed wheel on and concentric with said screen at one end thereof, means to support said collar in the normal rotation thereof with said screen, means on which said cam wheel rides to periodically move the path of rotation of said collar from its supporting means and means to return it thereto with a jar, means to rotate said screen and a conveyor extending axially into said screen, through said collar and wheel, to feed material into the screen, a chute having a throat with swinging leaves therein to feed material to said conveyor, the proximity of portions of said leaves being adjustable to vary the amount of material passing therethrough, said cute and collar supporting means having a common support and the jarring of said screen imparting a jarring, swinging motion to said leaves.

6. A material separating mechanism comprising a slightly inclined rotatable cylindrical screen, rotating means attached thereto at the lower end, said end being open to allow the escape of coarse particles therethrough, means to periodically move the other end of said screen from its normal path of rotation and to return it thereto with a jar and a driven conveyor extending axially a substantial distance into the upper end of said cylindrical screen to feed material thereinto, means to feed material to said conveyor, said conveyor spreading and maintaining in dispersed condition said material during its conveyance into said screen.

7. A material separating mechanism, comprising a substantially horizontal rotatable cylindrical screen, said screen being supported exteriorly at one end thereof to allow an unobstructed opening thereinto axially, means to periodically move said end of said screen from its normal path of rotation and to return it thereto with a jar, a casing projecting longitudinally into said cylindrical screen from said end axially thereof for a substantial distance and means to feed material therethrough into said screen and means to heat said casing and thereby to heat said material while the same is being fed, and while the same is in said screen, after leaving said casing.

8. In a bronzing machine means to feed conditioned bronze thereto comprising a substantially horizontal rotatable cylindrical screen, a supporting collar and a multiple cammed wheel on and concentric with said screen at one end thereof, means to support said collar in the normal rotation thereof with said screen, means on which said cammed wheel rides to periodically move the path of rotation of said collar from its supporting means and means to return it thereto with a jar, means to rotate said screen and a driven conveyor to pass unconditioned bronze thereinto, means to feed said bronze to said conveyor, said conveyor spreading and maintaining in dispersed condition said bronze during its conveyance into said screen, means to heat the bronze while dispersed and during its conveyance into said screen and also while it is in said screen after leaving said conveyor, means to pass the bronze passing through said screen to the material to be bronzed and means to return unused bronze to said unconditioned bronze feeding means.

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