Sept. 22, 1953 A. J. D'ANGELO 2,652,805

APPARATUS FOR COATING TABLETS, PILLS, OR OTHER SMALL OBJECTS

Filed June 26, 1951 3 Sheets-Sheet 1

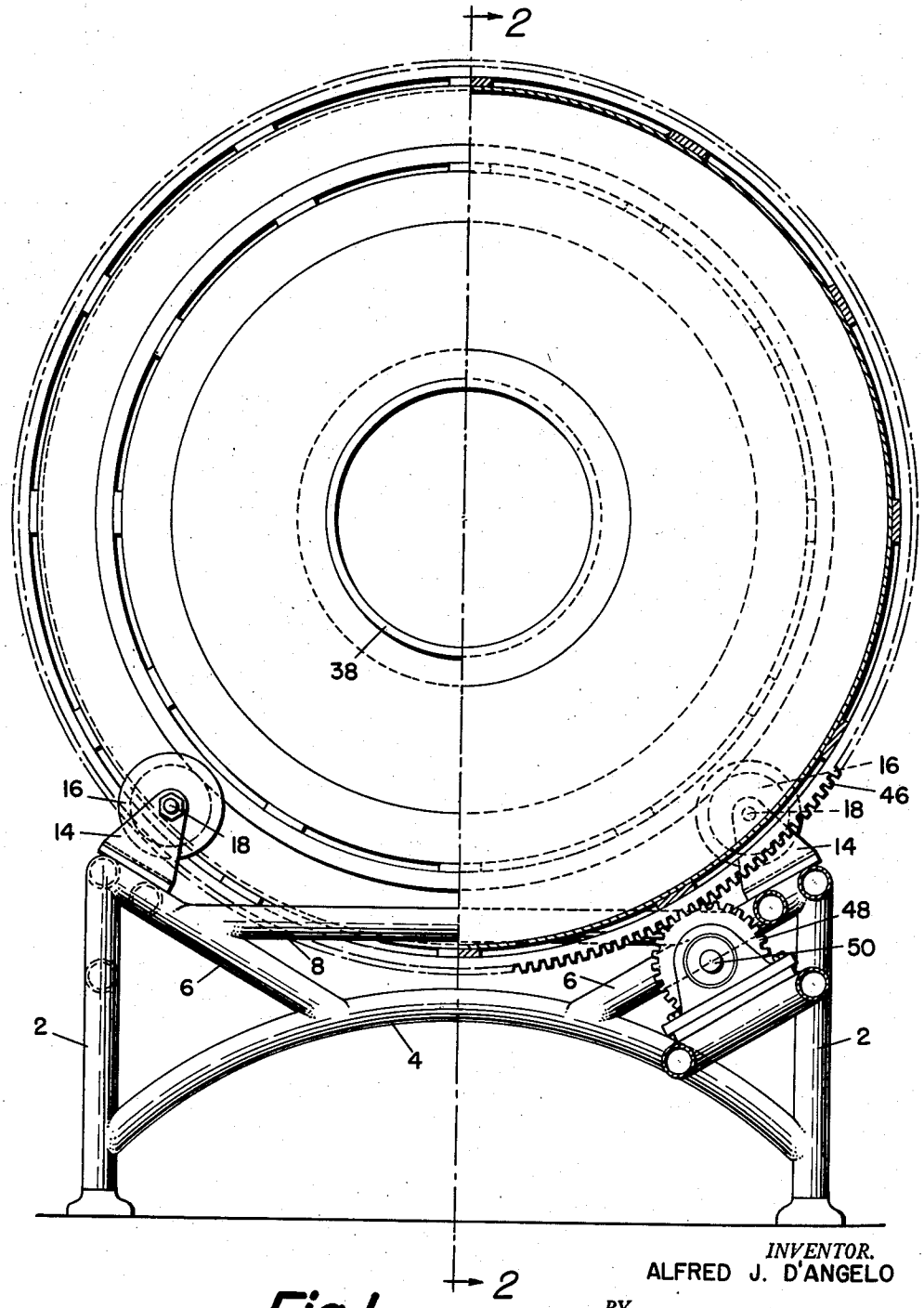


Fig. 1

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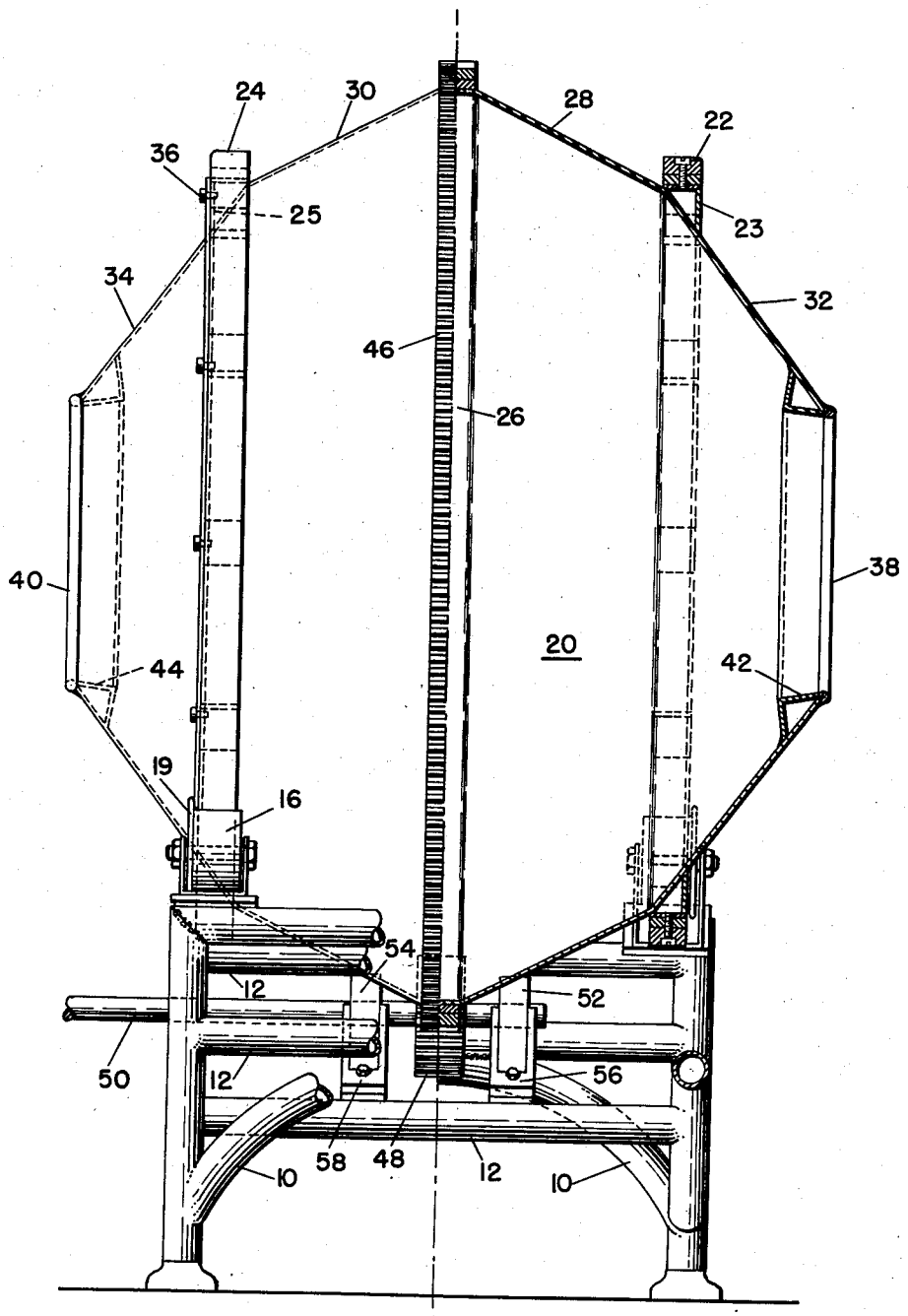


Fig. 2

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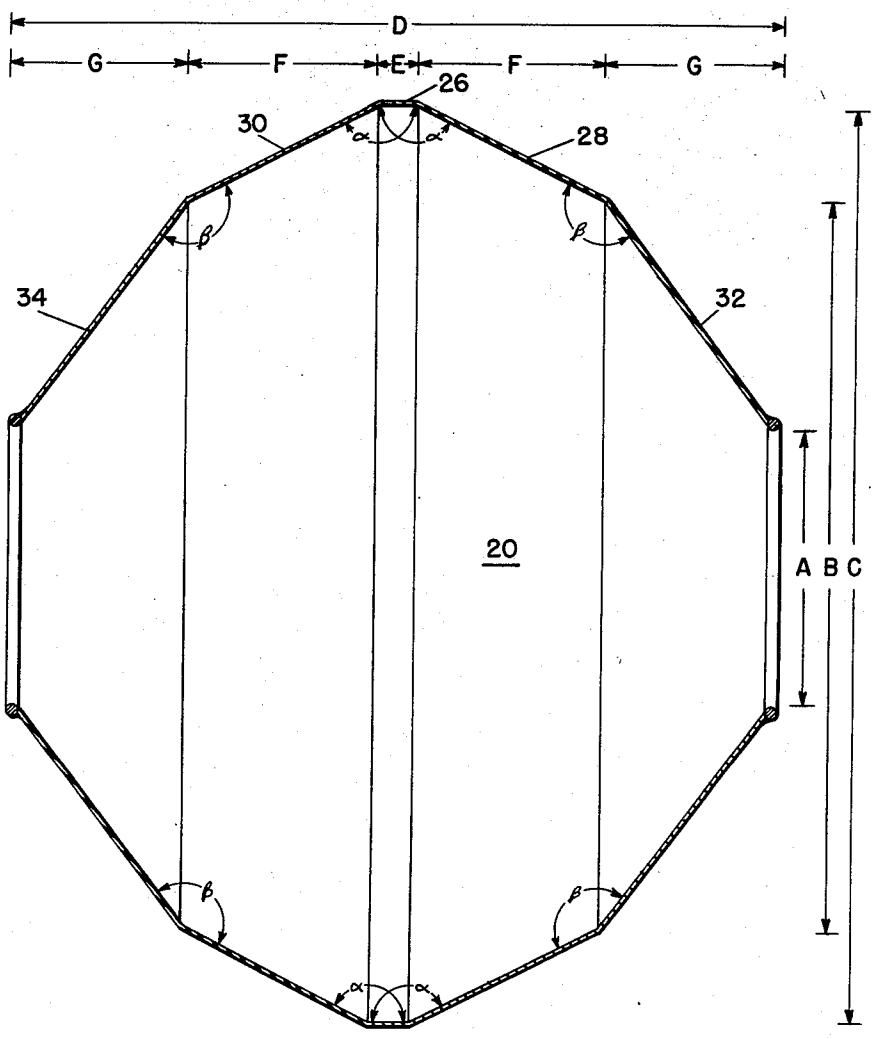


Fig. 3

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UNITED STATES PATENT OFFICE

2,652,805

APPARATUS FOR COATING TABLETS, PILLS, OR OTHER SMALL OBJECTS

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Application June 26, 1951, Serial No. 233,567

3 Claims. (Cl. 118—19)

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This invention relates to an apparatus for applying a coating to small objects, more specifically pills or tablets.

It is desirable to apply a coating to many types of small objects. Specifically, it is desirable to apply a coating to tablets or pills which are orally administered. Examples of such tablets are those containing ferrous sulfate, khellin and vitamin preparations. A coating is applied to ferrous sulfate tablets to prevent oxidation of the ferrous sulfate and to protect the teeth of those taking the tablets. It is also desirable to coat certain tablets or pills in order to make them more palatable or control disintegration.

The coating may be of many types and may be, for example, a sugar coating or composition coating made up of a number of ingredients. The coating is usually applied in several or many layers and, in special cases, 2½ to 3 days are required to get all the various coatings on the tablets.

Heretofore, coatings had been applied to pills or tablets in conventional coating pans. These coating pans have several deficiencies, among which are small volume and the high cost of labor resulting from the small volume, since much manual handling is required.

It is, therefore, an object of this invention to provide a device for coating small objects, such as pills or tablets, in which a much larger volume will be handled than with the coating pans heretofore known.

It is a further object of this invention to provide a device for coating small objects, such as pills or tablets, in which a more unifarm coating is applied to the small objects.

It is a further object of this invention to provide a device for coating small objects, such as pills or tablets, in which the labor cost incident to the coating operation is greatly reduced.

In the accompanying drawings, there is disclosed one embodiment of the invention in which:

Figure 1 is a front view of the device of this invention shown partly in section.

Figure 2 is a sectional view of the device of this invention taken on lone 2—2 of Figure 1.

Figure 3 is a schematic view of the device of this invention taken on line 2—2 of Figure 1, showing the rotatable drum portion of the device.

Referring specifically to Figure 1, the device is mounted on a support made of welded steel pipe or other like material, having upstanding legs 2, arcuate bracing members 4, bracing members 6 and horizontal members 8.

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Referring specifically to Figure 2, the support also has arcuate members 10 and horizontal supporting members 12.

Referring again to Figure 1, brackets 14 are mounted on bracing members 6 and horizontal members 12. Mounted on brackets 14 are rollers 16, said rollers being journalled on studs 18 by bearings, such as ball or roller bearings well known in the art.

Referring specifically to Figure 2, rollers 16 are provided with flanges 19.

Drum 20 is supported on rollers 16 by two tires 22 and 24 respectively. Drum 20 may be made of hot rolled steel, aluminum, plastic, or other like material. Tires 22 and 24 are mounted on supporting brackets 23 and 25. Drum 20 is held in proper position on rollers 16 by flanges 19 which engage the vertical surfaces of tires 22 and 24.

Drum 20 has a cylindrical section 26 in the center thereof and has two sides, each of which is formed in the shape of two truncated cones. Truncated cones 28 and 30 are identical in size and shape and are joined to central cylindrical section 26 by welding. Truncated cones 32 and 34 are identical in size and shape. Truncated cone 32 is joined to cone 28 by welding and truncated cone 34 is bolted to supporting bracket 25 by bolts 36.

Cones 32 and 34 are provided with apertures 38 and 40, respectively. Adjacent aperture 38 on the interior of drum 20 is shelf 42, and corresponding shelf 44 is provided adjacent aperture 40 in drum 20.

Mounted on central cylindrical section 26 is gear 46 which meshes with drive gear 48. Drive gear 48 is fixedly secured to shaft 50, said shaft being mounted in bearings 52 and 54, supported by brackets 56 and 58. Drive shaft 50 may be connected to any source of power to rotate drum 20 at the desired speed.

Referring specifically to Figure 3, it has been determined that the angles with which the sides of truncated cones 28 and 30 join cylindrical section 26 and the angles with which truncated cones 32 and 34 join cones 28 and 30 are critical. These angles are designated by alpha and beta in Figure 3.

If these angles are not correct, coatings will be improperly appliel to small objects in drum 20 and the coatings will not dry. In order to obtain a proper tumbling action of the objects of drum 20, as drum 20 rotates, and thus obtain the proper drying of the coating, it has been determined that angle alpha should be about 152° and angle beta should be about 154°. The di-

mensions of the embodiment shown are: A=19.5 inches, inside diameter; B=49.5 inches, inside diameter; C=63.0 inchess, inside diameter; D=51.0 inches; E=2.5 inches; F=13.0 inches; and G=11.25 inches. These dimensions are given by way of illustration and not by way of limitation.

The operation of the device is as follows:

A batch of pills or tablets to which a coating is to be applied, said batch usually weighing approximately 650 lbs., may be placed in drum **20**. Drum **20** is then rotated, usually at a speed of 5 to 10 R. P. M., although it will be appreciated that any other speeds may be employed by rotating shaft **50** by any convenient power means. Gear **48**, mounted on shaft **50** and meshing with gear **46** on drum **20**, will then rotate drum **20**.

As drum **20** rotates, it will be appreciated that some dust is formed, due to attrition of the objects in rotating drum **20**. A blower may be inserted in aperture **38** and a vacuum blower in aperture **40**, to remove this dust.

As drum **20** rotates and the pills therein are tumbled upon each other, a coating liquid and/or powder may be added to the pills or tablets in the drum and, as the pills or tablets are tumbled upon each other, the coating material is uniformly distributed over the surfaces of the pills or tablets. Any number of coats of either a single coating material or of various coating materials may be added to the pills or tablets in the rotating drum. The angles with which the sides of the drum join each other are so selected that an efficient tumbling action is obtained which causes the coating to dry rapidly.

When the desired coating has been applied to the objects, such as pills or tablets, in the rotating drum **20**, the rotation of drum **20** is stopped and the coated pills or tablets may be manually removed.

From the foregoing description, it will be appreciated that the present invention provides an efficient apparatus for applying coatings to small objects. Due to the size of the apparatus, it is capable of handling much larger loads than the conventional coating pans of the prior art, and it is also much easier to clean. Further, much less labor is required to coat any equivalent number of pills or tablets with the device of the present invention than with devices known to the prior art.

It will be appreciated by those skilled in the art that various modifications may be made

within the scope of this invention without departing from the spirit thereof, and the scope of the invention is to be restricted only in accordance with the appended claims.

What is claimed is:

1. In a device of the character described, a rotatable drum having a horizontal axis and mounted on a support for rotation about said horizontal axis, said drum having a central cylindrical section and two sides, each formed in the shape of two truncated cones, each of the first of said truncated cones joining said cylindrical section at an interior angle of about 152°, each of the second of said truncated cones joining each of said first truncated cones at an interior angle of about 154°, and each of said second truncated cones being provided with an aperture.

2. In a device of the character described, a rotatable drum having a horizontal axis and mounted on a support for rotation about said horizontal axis, said drum having a central cylindrical section and two sides, each formed in the shape of two truncated cones, each of the first of said truncated cones joining said cylindrical section at an interior angle of substantially 152°, each of the second of said truncated cones joining each of said first truncated cones at an interior angle of substantially 154°, and each of said second truncated cones being provided with an aperture lying in a plane parallel to the vertical axis of said drum.

3. A device for coating small objects comprising a rotatable drum having a horizontal axis and mounted on a support for rotation about said horizontal axis, said drum having a central cylindrical section and two sides, each formed in the shape of two truncated cones, each of the first of said truncated cones joining said cylindrical section at an interior angle of about 152°, each of the second of said truncated cones joining each of said first truncated cones at an angle of about 154°, each of said second truncated cones being provided with an aperture lying in a plane parallel to the vertical axis of said drum, the inside diameter of said drum taken on the horizontal axis thereof being about 51 inches, and the inside diameter of said drum taken on the verticle axis thereof being about 63 inches.

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No references cited.