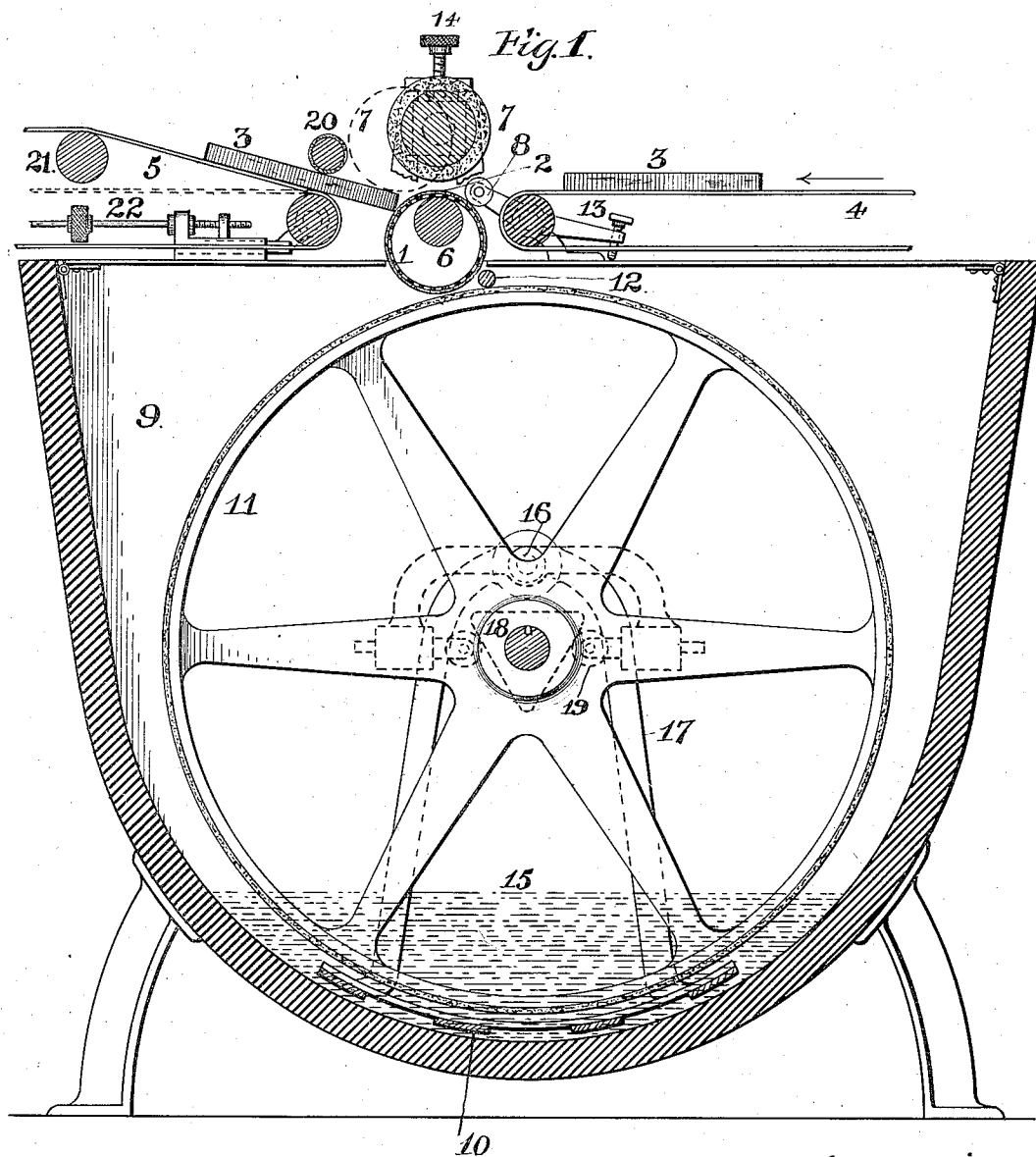


F. E. GOLDSMITH.
PROCESS OF COATING.
APPLICATION FILED APR. 25, 1905.

1,162,349.

Patented Nov. 30, 1915.
3 SHEETS—SHEET 1.



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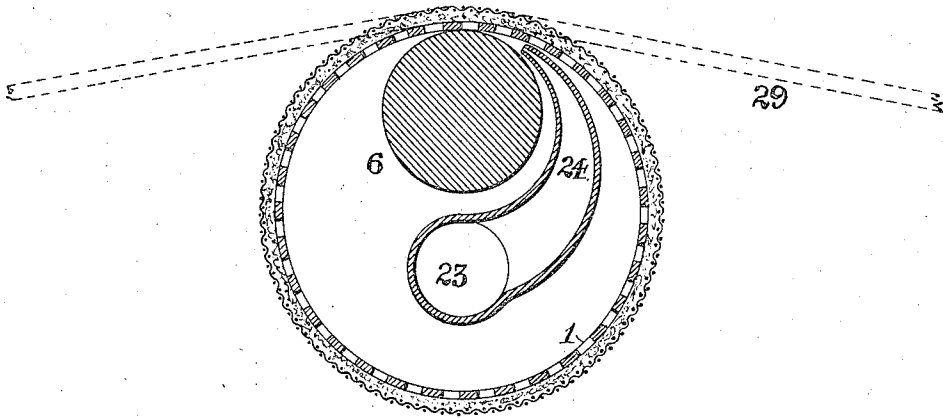


Fig. 2.

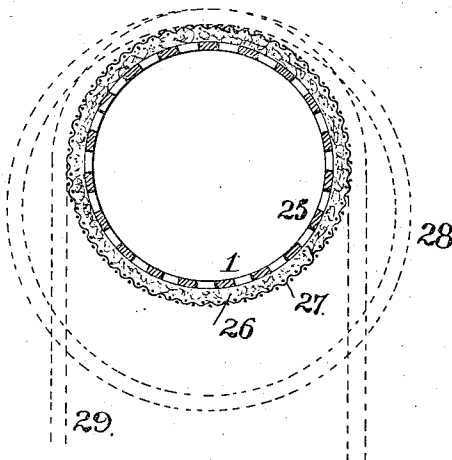


Fig. 3

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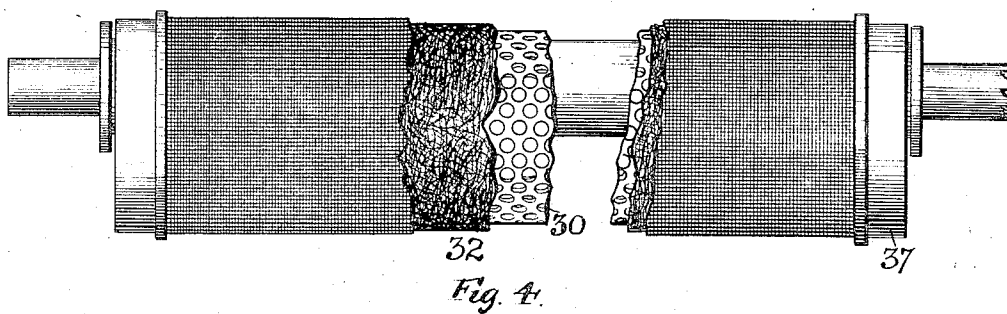
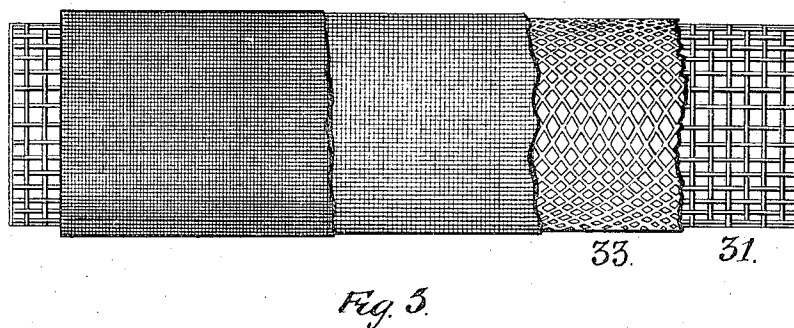
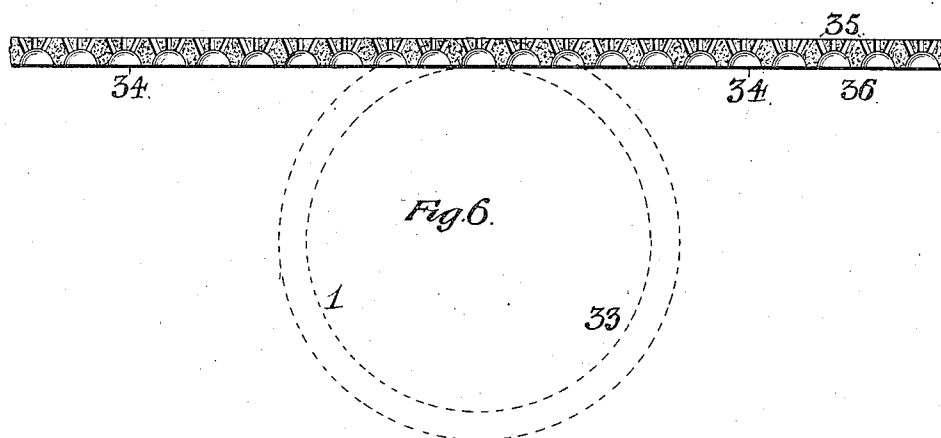
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UNITED STATES PATENT OFFICE.

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PROCESS OF COATING.

1,162,349.

Specification of Letters Patent.

Patented Nov. 30, 1915.

Application filed April 25, 1905. Serial No. 257,370.

To all whom it may concern:

Be it known that I, FREDERICK E. GOLDSMITH, citizen of the United States, and a resident of Middletown, in the county of Butler and State of Ohio, have invented certain new and useful Improvements in Processes of Coating, of which the following is a complete specification.

My invention relates to the application of a fluid or plastic coating to the surfaces of objects, such as tile and the like.

The invention consists in the herein described method of applying such fluid or plastic, the details of which will be first fully described, and the characteristic features thereof will be formulated in the claims which follow.

For purposes of definiteness the surface which receives the fluid coating is called the "carrier." That part of the carrier which transfers the coating to the object to be coated is the "impression zone". The fluid or plastic composition to be applied is the "coating." The material, object, tile or the like, to be coated is denominated the "object." The means for bringing the object and carrier together is the "incoming conveyer" while the means for separating them is called the "outgoing conveyer." By "supporting abutment" is meant the support for the carrier in the neighborhood of the impression zone.

The coating in the fluid state is supplied to an absorptive, pervious carrier which is saturated therewith. The coating is taken from the carrier by contact of the object therewith. The supply of coating may be aided by some degree of compression causing a flow of coating to the impression zone. This compression may be governed by the object as it receives its coat. The supply of coating may be well controlled by means tending to bring the carrier toward a supporting abutment in advance of the impression zone for the purpose of securing an even and adequate coating upon the surface of the carrier. Means are also employed to withdraw the body of the coating from the surface of the carrier as the object is being, or about to be, separated from the carrier, for the purpose of preventing any undue deposit of coating upon the object at any point, where evenly coated objects of a specified coating are desired.

A characteristic feature of the process

may be illustrated by the diagrammatic Figure 1, illustrating in sectional elevation the carrier 1, the impression zone 2, the object to be coated 3, the incoming conveyer 4, the outgoing conveyer 5, the supporting abutment 6, the guiding, feeding, or compression means 7, and the controlling means 8. To the above elements may be added a source of supply 9, for the fluid coating, moving means 10 for agitating the same, transmitting means 11, as a rotary roll, for carrying the coating to the carrier, a dam 12 for forming a pool of coating in proximity to the carrier, adjusting means 13 for varying the controlling means 8, and adjusting means 14 for varying the compression means 7. The carrier is preferably characterized by a sufficient rigidity to enable it to bear uniformly along the length of the supporting abutment 6.

To enable one to easily perceive the broader view of the present invention it is desirable to clearly understand at least one specific manner of carrying out the process, keeping in mind however that this specific description is not commensurate with the generic method, being but a single one of many manifestations thereof.

In a tank 9 is placed a quantity of fluid coating 15. A suitably journaled rotary drum 11 is adapted to dip into the coating and carry it on its periphery to the carrier 1. The carrier is adapted to rotate in close proximity to the drum 11, but preferably out of contact therewith. A rotary dam is located upon the drum to the rear of the carrier contact to dam up a pool of coating in contact with the carrier. The rotary carrier 1 is a hollow shell or sleeve of absorptive elastic pervious material, which may be positively driven, or which may partake of the motion of the rotary supporting abutment 6 mounted in suitable bearings. The carrier 1 may be moved or adjusted laterally by bringing one or more rolls 8 to bear thereon, so that a portion of the carrier in advance of the impression zone 2 may be brought against the rotary abutment with sufficient compression to cause a flow of coating to the surface of the carrier. After the coated object 3 leaves the impression zone 2 the surface flow of coating on the carrier 1 sinks into the body thereof, due to its release from or passage beyond the bearing 8, or to the tendency to create a vacuum

between the carrier and the supporting abutment 6 as they separate.

The incoming conveyer is an endless belt 4 carried upon rolls. The outgoing conveyer 5 is similar in construction to conveyer 4, but the whole conveyer 5 is adjustable longitudinally whereby its receiving end may be set at varied distances from the carrier 1. This adjustability permits the object coated (depending upon its length) to strike such an angle with respect to the carrier that no excess or ridge of coating is left upon the rear of the object as it leaves the carrier, a condition likely to result unless special provision is made to prevent the same.

An elastic guiding or feeding roll 7 is adjustable vertically for different sized objects 3, and may, if desired, effect some degree of compression, as they pass through the impression zone.

Fig. 1 is a cross-section and diagrammatic view of a machine embodying the improved process. Figs 2 and 3 are similar views of modified forms of the coating means. Fig. 4 is a side view partly broken away of a form of the coating carrier, and Fig. 5 is a similar view of another form thereof with the carrier support removed. Fig. 6 is a cross-section of another form of carrier.

An agitator 10 is provided in the tank of coating, below the drum, of any desired construction. It is mounted at 16 on a vibrating frame 17 and may constantly agitate the coating 15 between the underside of the transmitting means 11 and bottom of the supply 9.

Yielding means between the positive drive and the agitator, such as a drive cam 18 and spring-supported roll contacts 19 prevent any tendency of the connections breaking if the coating mass at the bottom of the tank should dry or solidify. In the latter case the agitator loosens up the material and itself gradually.

20 is a feed roll assisting in carrying the coated objects away on the conveyer 5.

It should be understood that the process may be carried out by other specific mechanism than that shown and just described. The incoming and outgoing conveyers 4 and 5 may be of any known form. The abutment 6 may be stationary and of various shapes. Instead of the rollers 8 bearing on the exterior surface of the shell 1, the shell or carrier may be tilted by means of rollers bearing on the interior surface of the carrier, or other means may be employed to shift the carrier to bring its point of contact with the supporting abutment into a position in advance of the impression cylinder. The dam may be a stationary pocket instead of rotary. The coating may be supplied to the carrier by means other than a

drum. It may be pumped through a pipe and supplied to the carrier through suitable orifices, or an endless belt may take the place of the drum. Instead of the outgoing conveyer being adjustable to and from the carrier, it may be inclined to the path of travel of the objects coated, and pass over a roll 21. Or the roll 7, hung in bearings oscillating about the impression zone, may swing to the position shown in dotted lines and carry the coated object 3 into substantially the position shown. Where the outgoing conveyer is adjustable to and from the coating carrier the loose character of the coating surface is not essential, nor where the conveyer is inclined. In fact several independent means of effecting the control of the uniform application of the coating to the object as the latter leaves the carrier are contemplated; as, for example, (1) adjusting the foraminous surface upon the support; (2) inclining the outgoing conveyer to the line of travel of the object coated; (3) adjusting the outgoing conveyer bodily to and from the carrier to vary the distance between them; and (4) oscillating the compression roll above the surface of the coating carrier.

22 are means for adjusting conveyer 5. Instead of the feed-drum the source of coating supply may be a pipe leading the coating solution to and upon the carrier, or under the carrier, and against it preferably in the neighborhood of the impression zone, so that the coating will be carried forward thereto. A feature of this inner or under supply to the carrier serves to effect both the screening and the supply of the coating to the carrier. By this latter plan ill-digested coating which ordinarily would be carried up on the outside method of supply and deposited upon the surface of the object coated, is prevented entirely by this inner method of screening supply.

Other coating-supply means are shown in Figs. 2 and 3. In Fig. 2 the coating is pumped through a tube 23 having lips 24, between which the coating is caused to flow (by a pump, fountain, or the like) to the carrier and carrier support. In Fig. 3 the carrier or carrier-support itself is made of conductor of the coating. The coating flows out through the perforated shell 25 to the carrier, which may be composed of elastic cellular material 26 thereon, and an outer foraminous sleeve 27. But the particular construction of the carrier may be varied within wide limits. In an exterior supply system the carrier may be imperforate and rigid, pervious or elastic. In an interior supply system the carrier is preferably perforate, and rigid or elastic.

In any of the forms in Figs. 1, 2 and 3 the carrier may assume the form of a sleeve 1, or a plurality of sleeves; (1 and 28 Fig. 130

3) or a belt, (29 Figs. 2 and 3) or a sleeve and belt (1 and 29 Figs. 2 and 3.)

In the shell or sleeve form of a carrier, the inner surface may be perforated metal 30 5 (Fig. 4) or woven metal 31 (Fig. 5.) The surrounding layer may be elastic fiber 32 or elastic composition 33, such as rubber. Good results are secured by cross-ribbing the fabric 33; those in the form 33 shown (in- 10 clined) giving better results than where the ribs are axially and diametrically disposed. Excellent results are also obtained by making a composition fabric 33 (Fig. 6) with a series of cells or pockets 34 freely open on 15 the inner side 36 and having a series of relatively smaller perforations 35. As this style of carrier, whether of the belt or sleeve form is brought in contact with the carrier-sup- 20 port, a graduated supply of coating is pumped out of it, by regulated compression, sufficient to evenly coat the object. In the sleeve form I may employ flanged collars 37 on either end of the sleeve against which may bear the rolls 8. The flanges prevent 25 the lateral spread of the coating and the collars serve to transmit the rolling adjustment of the sleeve. Other means of effecting the adjustment of the carrier with respect to its support may be employed. One 30 or more rolls for example may be arranged to bear on the inner periphery of the sleeve 1, or the axis of the sleeve may be made to shift in any way. In fact many known means may be employed for performing all 35 these functions, all of which are contemplated in the improved process. The apparatus may be fed over the objects instead of the objects being fed to the apparatus. The coating carrier its support, the agitator, 40 drum, conveyers, &c., may all be driven from one source of power by suitable known means.

The coating carrier 1, in the particular form selected for illustration, shows an inner 45 perforated shell, a cellular elastic covering over the shell, and a pervious or foraminous exterior layer preferably of metal. It is a very difficult matter to coat some kinds of articles by machines. Tiles, for in- 50 stance, have been covered for glazing purposes entirely by hand commercially, owing to the presence of these hitherto insurmountable difficulties. The lips 24 may be adjustably set to and from the coating carrier 55 by making the tube 23 oscillatingly adjustable in its supports.

The process consists, as will be understood

from the foregoing description, in maintaining a main supply of glaze material or coating, this being the supply contained in the 60 main tub or reservoir; in circulating the glaze from this main supply to a small mass, which is maintained in proper condition for immediate application to the tiles, with its 65 upper part open for contact by the lower surfaces of the tiles, this small mass being, in this embodiment, the coating carried in the pervious coating roll at, or near, the top thereof; and in passing the tiles with their lower surfaces only in shallow contact with 70 said small mass of coating material. The process further consists, in some cases, in withdrawing part of the glaze composition to prevent excess deposit thereof on the rear edges of the tiles. The process also 75 comprises, in some cases, the supplying from the main quantity of glaze material to the small mass, a quantity of glaze in excess to the amount required for use, and returning this excess from the small mass to said main 80 quantity of coating material.

I claim as my invention:—

1. The process of coating tiles or similar objects, consisting in maintaining a small mass of glaze composition with its upper 85 part open for application to the lower surfaces of tiles, supplying glaze composition to the mass from a main supply, and passing tiles with their lower surfaces only in shallow contact with said mass. 90

2. The process of coating tiles or similar objects, consisting in maintaining a small mass of glaze composition with its upper part open for application to the lower surfaces of tiles, supplying glaze composition 95 to the mass from a main supply, passing tiles with their lower surfaces only in shallow contact with said mass, and withdrawing glaze composition to prevent an excess deposit thereof on the rear edges of the tiles. 100

3. The process of coating tiles or similar objects, consisting in continuously stirring a main quantity of glaze composition, circulating glaze from said main quantity to a small mass of glaze composition having its 105 upper part open for application to the lower surfaces of tiles, returning excess glaze from said small mass to said main quantity, and passing tiles with their lower surfaces only in shallow contact with said mass.

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