H. STOMMEL.

TILE GLAZING MACHINE.

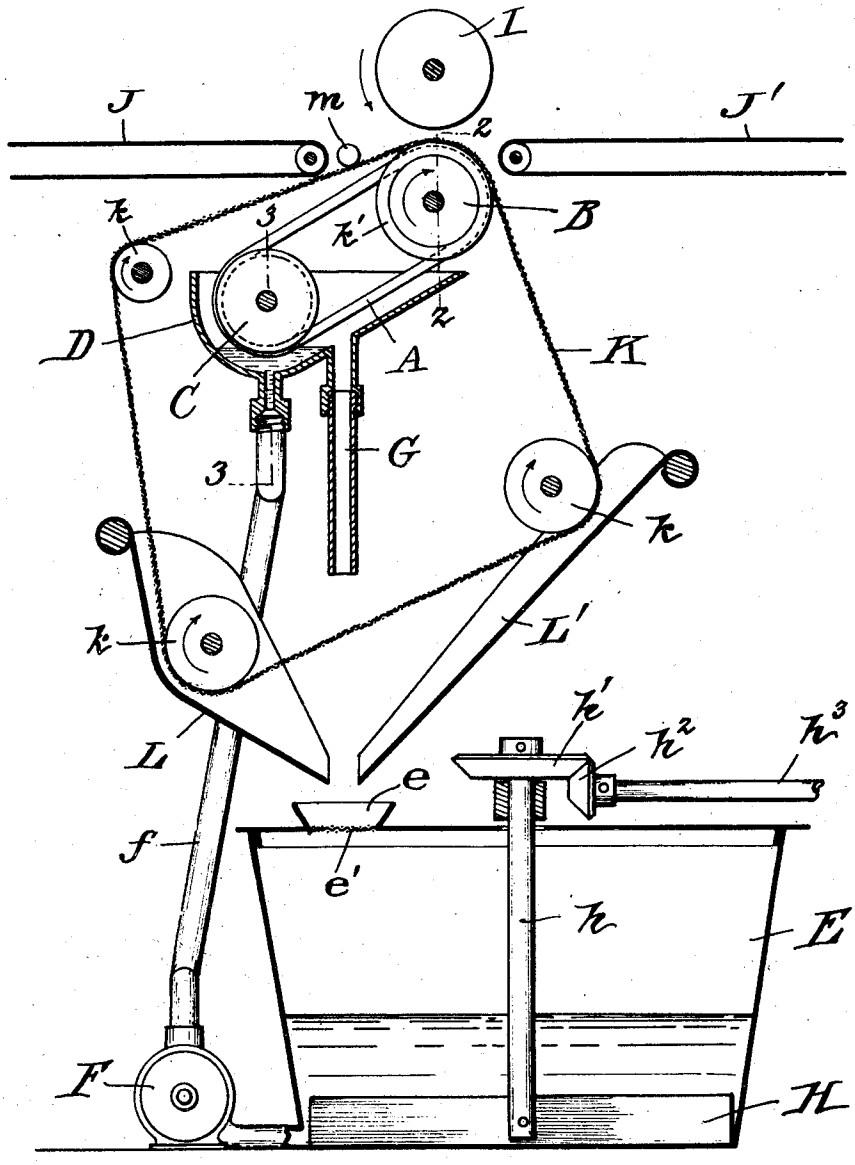
APPLICATION FILED JUNE 18, 1917.

1,259,925.

Patented Mar. 19, 1918.

2 SHEETS—SHEET 1.

Fig. 1.



Inventor

Hugo Stommel.

By his Attorney

Jas. H Griffin

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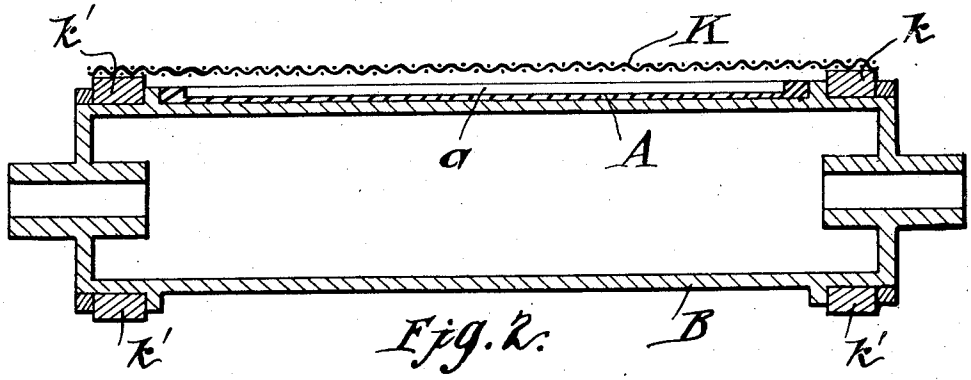


Fig. 2.

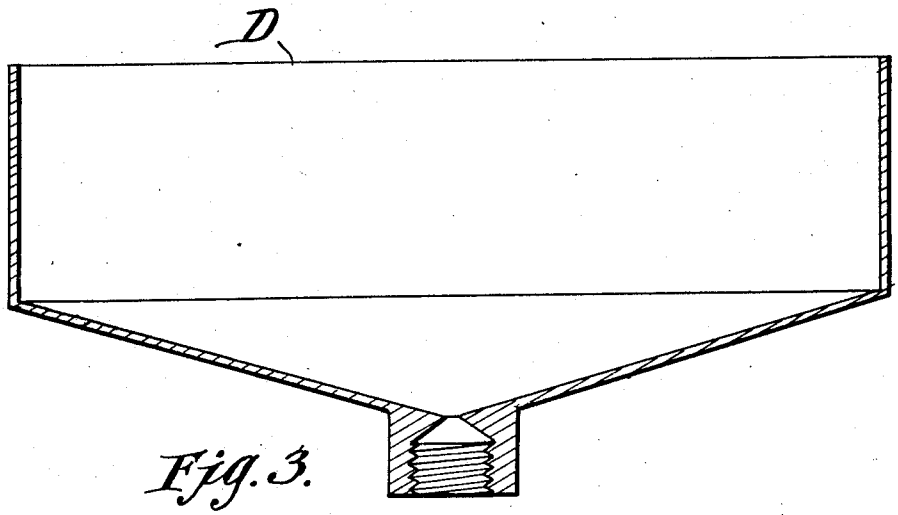


Fig. 3.

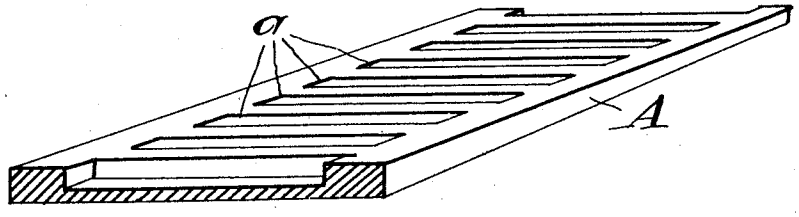


Fig. 4.

Inventor

Hugo Stommel.

By his Attorney

Jas. H. Griffin

UNITED STATES PATENT OFFICE.

HUGO STOMMEL, OF RED BANK, NEW JERSEY.

TILE-GLAZING MACHINE.

1,259,925. Specification of Letters Patent. Patented Mar. 19, 1918.

Application filed June 18, 1917. Serial No. 175,247.

To all whom it may concern:

Be it known that I, HUGO STOMMEL, a citizen of the United States, residing in Red Bank, county of Monmouth, and State of New Jersey, have invented a certain new and useful Tile-Glazing Machine, of which the following is a specification.

This invention is a tile glazing machine, being particularly adapted to apply coatings to ceramic tiles. The present invention is an improvement on the tile coating apparatus of my prior application filed October 20, 1916, Serial Number 126,656, which is particularly directed to conveyer means for conveying the glazing solution from a reservoir to a tile and applying the same to one face thereof. This prior mechanism, while operating with great efficiency, has been found in practice to place too great a strain upon the haircloth facing with which the conveyer is provided, so that, in time, said facing becomes worn and the coating is not supplied with as great precision as initially. This is largely due to the fact that the facing of haircloth is carried directly by the conveyer and, during the operations of the conveyer, is caused to travel around the outer periphery thereof a greater circumferential distance than the inner periphery of the conveyer, so that the haircloth is placed under more or less tension and greater strains than are conducive to its maximum efficiency for long periods of use.

With the foregoing considerations in mind, the object of the present invention is to provide a construction wherein the web which engages with the tile is not laid in face-engaging relation to the conveyer throughout its entire extent, but moves independently of the conveyer and is guided by its own directional rollers, whereby it is fed to the glaze applying point only as required and is not forcibly operated by the conveyer, as heretofore, either through friction or positive mechanical operations.

Speaking generally, the invention embodies a conveyer member, the outer periphery of which is adapted to be charged with a tile glazing solution for the purpose of conveying the same to the point of application to the tile, while between the conveyer and the tile, when the latter is in glaze receiving position, extends one reach of a foraminous web which is, preferably, normally free from engagement with the glaze carrying surface of the conveyer. A pressure roll coöperates with the tile when at the glaze applying point, which roll serves to press the tile tightly against the foraminous web and force said web tightly against the glaze charged surface of the conveyer, whereby said glaze is squeezed out of the conveyer, passes through the interstices of the web, and is applied to the face of the tile. In the preferred form of the invention, the conveyer operates substantially constantly, but the web operates only intermittently, being actuated by the tile, itself, during the passage of said tile past the glaze applying point. Thus, the web is moved only while glaze is being actually applied to the tile, and, being actuated by the tile, does not scrape over the surface thereof and cause ridges to be left in the glazed surface after the tile has passed on its way.

Features of the invention, other than those specified, as well as the advantages thereof, will be apparent from the hereinafter detailed description taken in conjunction with the accompanying drawings.

In the accompanying drawings, I have illustrated one practical embodiment of the invention, but the construction therein shown is to be understood as illustrative, only, and not as defining the limits of the invention.

Figure 1 is a diagrammatic showing of a tile glazing machine embodying the present invention.

Fig. 2 is a central section of one of the conveyer carrying rolls, said section being taken in the plane of the line 2—2 of Fig. 1.

Fig. 3 is a section through the well from which the conveyer is charged with tile glazing solution, said section being taken in the plane of the line 3—3 of Fig. 1, and

Fig. 4 is a perspective detail of a portion of the preferred form of conveyer.

Referring to the drawings, A designates an endless conveyer belt which is mounted for travel around a pair of spaced rolls B C, either one or both of said rolls being driven as desired. The conveyer belt may vary in construction, but the preferred form is shown in Fig. 4, the same embodying an endless belt of resilient material provided with transverse slots or pockets *a*, after the manner shown and described in my prior application hereinbefore referred to. Conveyer belt A may be provided, if desired, with a laminated covering of foraminous

plies, as shown in the prior application, or this covering may be dispensed with in carrying out the present invention. As shown in the drawings, the conveyer has no cover, but the pockets *a* are open and entirely exposed.

Rolls B and C are mounted on horizontal axes, but the roll B is higher than roll C, so that the conveyer travels in an inclined direction. Roll C is partially or wholly immersed in a well D, to which tile glazing solution is fed from a reservoir E by means of a pump F and a conduit *f*. Well D is provided with an overflow outlet G, which is alined with a return opening *e* in the cover of reservoir E. A screen *e'* is stretched across the return opening *e* to strain out any impurities which may be entrained by the tile glazing solution. The operation of pump F is such that a practically continuous stream of solution is fed from the reservoir to the well and back to the reservoir through the overflow G of the well and return opening *e* of the reservoir. In this way, the glazing material is maintained in suspension in the glazing liquid, and precipitation is obviated. Moreover, precipitation is precluded within reservoir E by means of a stirrer or agitator H, on the stem *h* of which is fixed a gear *h'* with which meshes a gear h^2 driven by a shaft h^3. In this manner, the tile glazing solution is kept stirred up at all times, and the best results are obtained. It will be noted from Figs. 1 and 3, and particularly the latter, that the inlet to well D for the glazing solution broadens out as it approaches the base of the well, for two reasons, viz., to feed throughout the entire width of the well and, by such feeding, to preclude caking of the material, such as would be apt to occur around a small inlet opening.

With this construction, a portion of conveyer belt A is at all times immersed in the tile glazing solution, and, as the belt advances, the grooves or channels *a* are successively dipped below the surface of the solution and emerge therefrom charged with said solution. The continued travel of the belt moves the charged or loaded channels around roll C and upwardly and over roll B.

Positioned above roll B is a pressure roller I, preferably driven in synchronism with roll B, but in a contrary direction, so that, through the conjoint operation of the rolls, a tile may be fed between them. Such tile may be manually fed to said rolls and manually moved therefrom, but, in the preferred form of the invention, this is accomplished automatically by means of conveyer aprons J J', conveyer apron J feeding the tiles to the glaze applying point and apron J' delivering them therefrom.

K designates an endless foraminous web which may be of horsehair, wire mesh, or other suitable material. This endless web is laid about a plurality of directional rollers *k* and about loose rollers *k'* mounted at the opposite ends of roll B, as clearly shown in Figs. 1 and 2. Rollers *k'* are mounted for idle movement on the opposite ends of roll B and are, in effect, idlers. They are of sufficient diameter to space the foraminous web K away from the outer periphery of conveyer belt A, so that, during the normal operation of the machine, web K is free from engagement with the charged surface of the conveyer belt, as clearly shown in Fig. 2. Moreover, it will appear that, while rolls B and C are positively operated to turn at a constant speed, the web K has no positively driven part, but normally remains stationary.

However, when a tile is passed between rolls B and I, the latter forces the tile down upon the portion of web K which is in engagement with the idlers *k'* and, by so doing, presses said web tightly against the charged face of the conveyer belt, which, being resilient, is, itself, compressed and the tile glazing solution contained in the pockets *a* is thereby squeezed out of said pockets and through web K to impinge the lower face of the tile. The tile moves from apron J between rolls B and I, and thence to discharge apron J', the movement thereof being of a forward, steady nature. While the tile is in engagement with web K, movement of said tile will cause the web to travel, but, as soon as the tile is discharged from between rolls B and I and onto apron J', web K no longer has any driving means and immediately becomes stationary and assumes its spaced relation with respect to the conveyer belt.

The conjoint movement of web K at a constant speed with the passage of the tile, while in engagement therewith, assures maximum efficiency in the application of the tile glazing solution to one face of the tile, since, manifestly, there is no relative movement between the web and said face of the tile, and no scratching or rubbing of the solution over said face by the web can occur. Accordingly, the tile glazing solution will be deposited upon the tile by means which is movable therewith at a speed uniform with the speed of the tile, and this is an important consideration. Moreover, web K is not subjected to any particular strain, nor is the tile glazing solution banked up on the edges of the tile to form beads, as has heretofore so universally been the case.

A further and very important feature of the invention is best illustrated in Fig. 1, wherein the directional rollers *k* are so disposed as to lead a portion of web K intermediate the lower end of the overflow G of the well and the return opening *e* of the reservoir, so that the tile glazing solution

which overflows the well through pipe G falls directly upon web K. This results in the carrying of a portion of the overflowed solution along with the web until said web passes about roller *k* immediately to the left of the point where said solution is deposited upon the web. In passing about this roller, the majority of the solution is forced through the web and is returned to return opening *e* of the reservoir by a guide chute L mounted in fixed position and having its discharge end over the opening *e* of the reservoir. The inertia of the solution, as it falls from overflow G upon the web, causes some of said solution to immediately pass through the web, carrying therewith any material which may have partially hardened in the interstices of said web, and this action is further carried out when the rest of the solution is squeezed through the web by the passage thereof around roller *k* as described. Thus, the operation of the overflowed solution serves to keep the interstices of the web free from obstruction, *i. e.*, open, so as to better perform the function of delivering the tile glazing solution from the conveyer belt through said interstices onto the tile. Of course, as the web advances beyond said roller *k*, it carries therewith some solution, but this solution is preferably spread about evenly over the face of the web by a spreading roller *m*, adapted to lie, with its own weight, upon web K at a point just forward of the tile glazing point. The weight of roller *m* is sufficient to uniformly spread the coating solution which is on the surface of the web freely over the entire width thereof and to remove all bubbles and lumps which may be in said solution. Roller *m* has the further function of automatically taking up the slack in the web, although, if desired, one of the rollers *k* may be made adjustable to mechanically take up this slack, leaving roller *m* to merely spread the solution uniformly over the surface of the web.

At the conclusion of the operation of applying the glaze to a tile, some of the solution which has been carried to the glazing point by the conveyer may run down that portion of the belt to the right of roll B, but this superfluous solution will simply follow along the web and will be guided into the return opening *e* of the reservoir by a chute L′ similar to chute L. However, it is an advantage to have the superfluous solution follow along the web as described, since it keeps the web moist and precludes drying or hardening of the solution during the passage of any particular portion of the web from the tile glazing point to the point of application of the overflow of solution, where it is again wet. Thus, web K is maintained in a moist or wet condition at all times during the operation of the machine, and hardening of the tile coating solution within the interstices of said web is obviated. The web is thus kept at all times in foraminous condition and ready for immediate operation. This I consider an important advance over the prior art, as practically all previously suggested machines have the disadvantage of the coating solution drying within the facing or outer covering of the conveyer, or that portion of the machine which applies the solution directly to the tile, thereby rendering certain portions of said facing entirely unadapted to apply the coating solution.

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

1. A tile glazing machine embodying means for conveying a coating solution to a tile, means for positively actuating said conveying means, and a foraminous member positioned to extend between the tile and the conveying means, said member being movable with respect to the conveying means and operable by a moving tile independently of the means for actuating the conveying means.

2. A tile glazing machine embodying means for conveying a coating solution to a tile, means for positively actuating said conveying means, and a foraminous web positioned to extend between the tile and the conveying means, said web being movable with respect to the conveying means and operable by a moving tile independently of the means for actuating the conveying means.

3. A tile glazing machine embodying a conveyer, a portion of which is immersed in a tile coating solution, means for actuating the conveyer to deliver the solution to the glazing point, a pressure roll coöperating with the conveyer at the glazing point, and a foraminous member passing between the conveyer and the pressure roll and supported on idlers, whereby the passage of a tile between the foraminous member and the pressure roll causes said member to move at the same speed as the tile and squeeze the glazing solution from the conveyer, through the foraminous member, and deposit said solution upon the tile.

4. A tile glazing machine embodying a conveyer, a portion of which is immersed in a tile coating solution, means for actuating the conveyer to deliver the solution to the glazing point, a pressure roll coöperating with the conveyer at the glazing point, and an endless foraminous web passing between the conveyer and the pressure roll and supported on idlers, whereby the passage of a tile between the foraminous web and the pressure roll causes said web to move at the same speed as the tile and squeeze the glazing solution from the conveyer, through the foraminous web, and deposit said solution upon the tile.

5. A tile glazing machine embodying a

conveyer belt, a portion of which is immersed in a tile coating solution, means for actuating the conveyer belt to deliver the solution to the glazing point, a pressure roll coöperating with the conveyer belt at the glazing point, and an endless foraminous web passing between the conveyer belt and the pressure roll and supported on idlers, whereby the passage of a tile between the foraminous web and the pressure roll causes said web to move at the same speed as the tile and squeeze the glazing solution from the conveyer belt, through the foraminous web, and deposit said solution upon the tile.

6. A tile glazing machine embodying an endless conveyer belt supported for travel about a pair of spaced rolls, means for rotating the rolls for the purpose of imparting movement to the belt, a well containing a glazing solution in which a portion of the conveyer belt is immersed, said well being provided with an over-flow, and means for supplying the glazing solution to the well, in combination with an endless foraminous web positioned to extend over the conveyer belt at the glaze applying point and on which web is also deposited the solution overflowing the well, whereby the glazing solution is fed to the tile through the web at the glazing point and the web is kept clean and wet by the over-flow from the well.

7. A tile glazing machine embodying an endless conveyer belt supported for travel about a pair of spaced rolls, means for rotating the rolls for the purpose of imparting movement to the belt, a well containing a glazing solution in which a portion of the conveyer belt is immersed, said well being provided with an over-flow, and means for supplying the glazing solution to the well, in combination with an endless foraminous web embracing a plurality of idlers and positioned to extend over the conveyer belt at the glaze applying point and on which web is also deposited the solution over-flowing the well, whereby the glazing solution is fed to the tile through the web at the glazing point and the web is kept clean and wet by the over-flow from the well.

8. A tile glazing machine embodying means for conveying a tile glazing solution to, and applying the same to one face of, a tile, an endless foraminous web extending between the conveying means and the tile, and through which web the solution is fed to the tile, and a well containing the solution with which the conveying means is charged, said well being provided with an over-flow adapted to discharge upon the web for the purpose of maintaining the interstices of said web open and unobstructed.

9. A tile glazing machine embodying means for conveying a tile glazing solution to, and applying the same to one face of, a tile, an endless foraminous web extending between the conveying means and the tile, and through which web the solution is fed to the tile, a well containing the solution with which the conveying means is charged, said well being provided with an over-flow adapted to discharge upon the web for the purpose of maintaining the interstices of said web open and unobstructed, and means for constantly supplying the solution to the well to render the over-flow continuous.

10. A tile coating machine embodying an endless foraminous web mounted on idlers and adapted to be moved by a moving tile when the same engages therewith, and means for feeding a tile coating solution through said web to be deposited on the tile.

11. A tile coating machine embodying an endless foraminous web mounted on idlers and adapted to be moved by a moving tile when the same engages therewith, means for feeding a tile coating solution through said web to be deposited on the tile, and means for automatically taking up the slack in the web.

12. A tile coating machine embodying an endless foraminous web mounted on idlers and adapted to be moved by a moving tile when the same engages therewith, means for feeding a tile coating solution through said web to be deposited on the tile, and means for causing the constant washing of the web by a stream of the coating solution, whereby the interstices of the web are maintaained open and unobstructed.

13. A tile coating machine embodying an endless foraminous web mounted on idlers and adapted to be moved by a moving tile when the same engages therewith, means for feeding a tile coating solution through said web to be deposited on the tile, and means for maintaining the interstices of the web open and unobstructed.

14. A tile coating machine embodying an endless foraminous web, means for feeding a coating solution through the web to be deposited on a tile, and means for causing a stream of the coating solution to play upon the web for cleaning out the interstices thereof.

In testimony whereof I have signed my name to this specification.

HUGO STOMMEL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."