H. STOMMEL.

TILE GLAZING MACHINE.

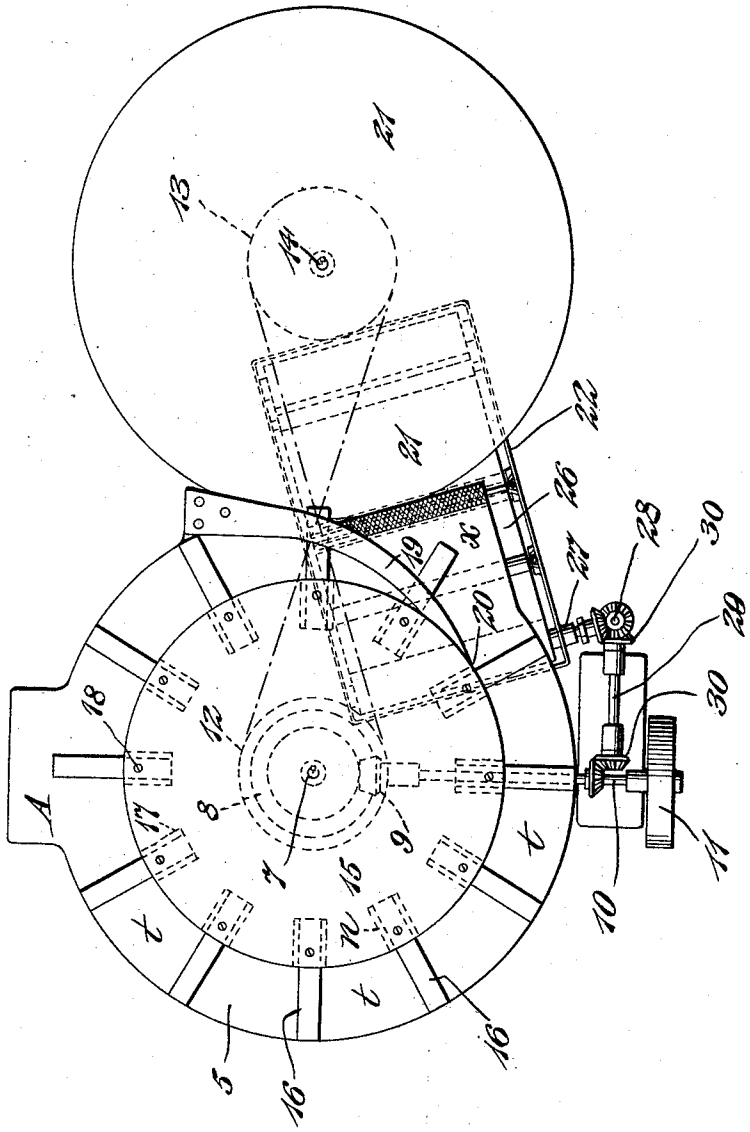
APPLICATION FILED OCT. 16, 1911.

1,053,239.

Patented Feb. 18, 1913.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

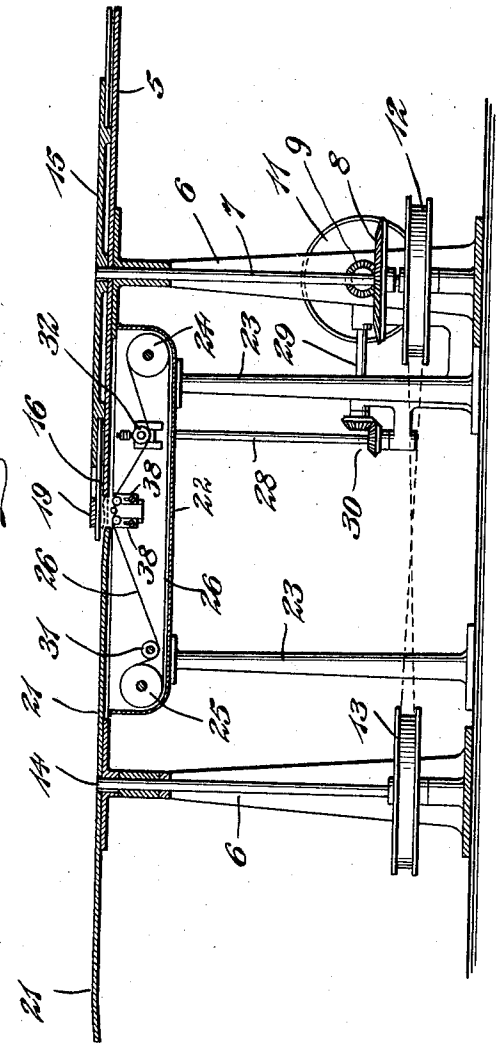


Fig. 4.

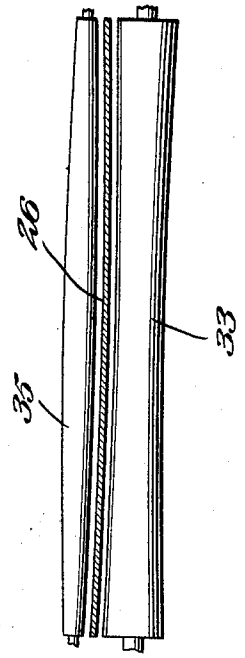
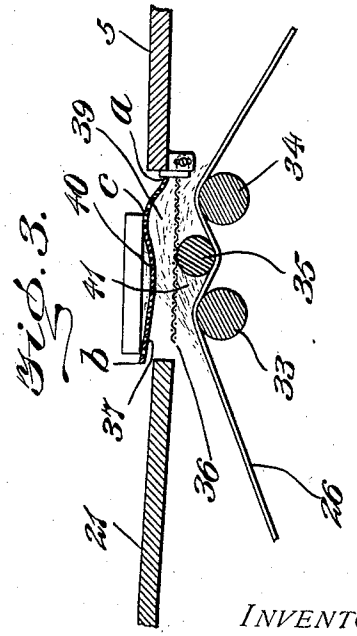


Fig. 3.



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TILE-GLAZING MACHINE.

1,053,239. Specification of Letters Patent. Patented Feb. 18, 1913.

Application filed October 16, 1911. Serial No. 654,883.

To all whom it may concern:

Be it known that I, HUGO STOMMEL, a citizen of the United States, residing at 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 wherein the tiles are automatically carried to a coating mechanism, and are likewise carried away from said coating mechanism after the coating material shall have been applied to the tiles.

One part of the invention consists of tile feeding mechanism which is so related to a coating mechanism as to move the tiles diagonally across one element of the coating mechanism, which element operates to apply the coating material to the face of the tile, the tiles being so moved relative to the coating element as to apply the coating material uniformly and in a thin layer to the under face of the tile.

Another part of the invention consists of a coating mechanism which operates to apply the coating material to a tile in a manner to prevent the formation of a bead or ridge on the edge of the tile, such bead or ridge being due to an excess of coating material along the edges of the tile.

The machine embodies a plurality of rotary tables, one of said tables coöperating with a cam track for moving tiles diagonally across a coating mechanism, whereby the tiles are delivered to another of the rotating tables.

The machine embodies, also, a coating mechanism comprising a tank for the coating material, an endless belt running over rollers positioned within said tank, means for adjusting the tension on said belt, means for producing a pocket in the bight of said belt, and tile engaging means coöperating with the pocket of said belt, for keeping the pocket filled with the coating material and for supplying said coating material uniformly and in a thin layer to the under surface of the tiles.

Other features of the invention and the advantages thereof will appear from the following detailed description, taken in connection with the accompanying drawings, wherein I have illustrated one practical embodiment of the invention, but the construction shown in said drawings is to be considered as illustrative, only, and not as defining the limits of the invention.

Figure 1 is a plan view of the machine. Fig. 2 is a side elevation, partly in section, through the coöperating tables and the coating mechanism. Fig. 3 is a detail sectional view, on an enlarged scale, showing the adjustable tile engaging elements of the coating mechanism. Fig. 4 is a detail view, in cross section, of the coöperating rollers of the coating mechanism between which the endless apron passes.

A stationary table 5 is mounted upon a suitable frame or support 6, said table being provided with a shelf, A. Within suitable bearings on this frame 6 is rotatably mounted a vertical shaft 7, motion being imparted to said shaft by means of a gear 8 on the shaft meshing with a pinion 9 on a countershaft 10. The countershaft 10 is rotated by any suitable means, as by the pulley 11 to which power is communicated by a suitable belt. A pulley 12 is mounted on shaft 7, and this pulley is adapted to be operatively connected by a belt (not shown) to pulley 13 on vertical shaft 14.

Above the stationary table 5, and parallel thereto, is a rotary member in the form of a feed table 15, which is rigidly secured to the vertical shaft 7 so as to rotate therewith. This table 15 is, preferably, of less diameter than stationary table 5, as shown in Fig. 1, and a plurality of arms 16 are secured at, or near, the periphery of table 15, said arms being preferably spaced at regular intervals circumferentially around the table and retained in position on the under surface of the table by suitable means, such as the coöperating flanges 17 and bolts or screws 18.

A guard or cam-track 19 is bolted, or otherwise secured, at one end to stationary table 5, near the periphery thereof, whereas the other end of this guard or track terminates at 20, at which point said guard is in contact with the rotary table 15, the guard thereby forming an obstruction diagonally across the path of feed of the tiles from the stationary table 5. Said path of feed of the tiles is across the space between the peripheral edges of stationary table 5, and rotary table 15, and in this path of feed is positioned a shelf, x, which covers a part of the coating mechanism. The radial arms 16 of the rotary table 15, are adapted to pass under the guard 19, and they coöperate with said

guard in pushing tiles from the tile track on the table 5, over or across the coating mechanism, and to and upon another rotating table 21. Said latter table 21 is, preferably, in the same horizontal plane as the stationary table 5. This table 21 is rigid with vertical shaft 14, and is rotated by said shaft.

A tank 22, which contains the coating material, is positioned beneath a part of the stationary table 5 and the rotary table 21, said tank being supported by columns 23, or by any other suitable means, so as to span the space between the adjacent edges of the two rotating tables.

Within the tank 22, and preferably at the respective ends thereof, are mounted drums 24, 25, around which passes an endless apron 26, which serves to agitate the coating material and to convey the latter to an element by which the coating material is supplied to the tiles. Motion is imparted to the drums and to the endless apron by any suitable means, but in the practical embodiment shown, the drum 24 is rigid with a shaft 27, which shaft is geared to a vertical shaft 28, motion being imparted to said shaft 28 from shaft 10, by a countershaft 29, geared at 30 to said shafts 10 and 28. Rollers 31, 32 are provided within the tank to engage with the endless apron 26 in order to guide said apron and regulate the tension thereof. Roller 32 is mounted in bearings which are held between flanges formed in the side walls of the tank, whereby said roller may be adjusted vertically for the purpose of regulating the tension on said endless apron.

One feature of this invention is the coating mechanism which is adjustably mounted within the tank 22. In the practical embodiment of the device, I have shown (in Figs. 3 and 4) the coating mechanism as embodying the endless apron 26, a plurality of pocket forming members 33, 34 and 35, two of said members being the rollers 33, 34 over which the endless apron 26 passes, and the third being a roller 35 which is positioned between said rollers 33, 34 and which operates upon the top surface of said apron, a foraminous screen 36, and a tile engaging apron 37. Said rollers 33, 34, 35, screen 36, and apron 37 are mounted in a frame of any suitable construction, which frame is adjustable, in guides 38, with relation to the tank 22, and, also, with relation to the meeting edges of stationary table 5 and rotary table 21, between which tables the coating mechanism is located. The rollers, screen and apron extend, preferably, the full width of the tank.

Screen 36 is in a horizontal plane above, and preferably in contact with, roller 35, said screen being composed of any suitable foraminous material such as wire cloth, canvas or fiber.

The apron 37 is positioned above the foraminous screen 36, and substantially parallel therewith, a narrow chamber 39 being formed between said screen 36 and the apron 37. This apron is constructed preferably of hard rubber, provided with a series of perforations 40, and said screen is attached along one edge to the frame of the coating mechanism, but the other edge of the apron is bent to form a lip *b* which is unattached or free, said lip being above, or in the same horizontal plane as, table 21. It is preferred to construct the apron with an uneven surface, thereby providing the same with a slight longitudinal depression, and also with a slight ridge, *c*, between said depression and the attached edge of the apron.

It is preferred to provide a concave surface on each of the rollers 33 and 34, and to provide roller 35 with a convex surface, whereby as the endless apron 26 passes over rollers 33, 34 and under roller 35, a pocket 41 will be formed in the bight of the belt, so that the coating material carried by the belt will be brought into contact with roller 35, said roller forming a dam or obstruction in said pocket 41 to the passage of the coating material.

It will be understood that when the apron 26 is in operation, the coating material quickly fills pocket 41, and said material will be forced through foraminous screen 36 and into chamber 39 in an effort to pass over roller 35 to return to the supply tank, and that some of this coating material will flow through the perforations of apron 37. This provides a shallow pool of coating material in the depression of the apron as indicated graphically in Fig. 3, for the purpose of applying a thin coating of the material to the under surface of the tile as it passes over the apron. The tile engaging apron 37 is positioned in such relation to the stationary table 5 and rotary table 21 that said apron, or a part thereof, is in the path of the tiles adapted to be moved from one table to the other and over the coating mechanism, whereby the said apron is adapted to contact with the tiles when moving over the coating mechanism, but, as shown in Fig. 3, one end portion of the apron is free or unattached so that the apron is adapted to have free movement relative to the pool of coating material under the pressure of the tiles which engage with the apron. The ridge and the lip of the flexible apron operate to prevent the coating material from flowing on to the tables 5 and 21. Furthermore, the upraised lip of the apron engages the coated surface of the tile in a way to remove the surplus coating material from said tile, and thereby prevent the formation of a ridge or bead along the edge of the tile after the same shall have been baked.

As shown in Fig. 3, the screen 36 and

apron 37 are attached in any suitable way to a plate, *a*, and this plate is in turn fastened by suitable adjusting means to stationary table 5, whereby the screen and the apron are supported independently of the means for supplying the coating material to the pocket.

When it is desired to adjust the tile engaging apron with reference to the tables, the plate, *a*, is raised or lowered with respect to table 5. The frame which supports the coöperating feed rollers 33, 34, 35 may be adjusted vertically within the tank, as shown by Fig. 2, in which event the tension may be applied to, or removed from the endless apron by the adjustment of roller 32.

The operation is as follows: Tables 15 and 21 are operatively connected by a belt running over pulleys 12 and 13, and said tables are rotated at the same rate of speed by the power of shaft 10. Movement is applied to the endless apron 26 in the supply tank 22 by the rotation of drum 24 which is operated by shafts 10, 29, 28 and 27. The tiles to be coated are placed upon the shelf A of the stationary table 5 in the path of travel of the radial arms 16, which are mounted on the revolving table 15. In feeding tiles having a straight edge, the operator places the tiles upon that part, *t*, of the stationary table so that the straight edge of a tile engages with the straight side of one of the radial arms 16, thus precluding any relative movement between the tile and the arm with which it engages, whereby the tile will be pushed around the stationary table without having any tendency to be pushed over the edge of the table. The movement of the radial arms with the table 15 causes the arms 16 to engage the tiles with a pushing action, thereby moving the tiles upon the stationary table and advancing them from the apron A until they come into contact with the point 20 of cam track 19, whereupon said tiles are deflected away from the peripheral edge of table 15 and toward table 21, said tiles passing diagonally over the coating apron 37 situated between table 5 and table 21. In passing over the coating apron 37 one corner of a tile comes into contact with the shallow pool of coating material contained in the depression of said apron, after which the whole lower surface of the tile is successively or gradually coated, the lip, *b*, engaging the tile as it passes from the bath of coating material to table 21 and serving to remove the surplus coating material from the tile.

In prior machines for coating tiles, which have come to my knowledge, provision is made for moving the tile in a straight direction across the coating mechanism, as a result of which an excess of the coating material is left on the tile at the rear edge, thus resulting in the formation of a rib or bead on the coated surface of the tile. In my machine, the tile is so moved as to present one corner thereof to the coating mechanism, and said tile is moved in a diagonal direction across the coating mechanism so that the part of the tile last to leave the coating mechanism is the opposite rearmost corner. As a result of this operation, the coating mechanism acts to wipe off the surplus material at the rear edge and corner of the tile, and thus the coating material is applied in a thin film or layer uniform in thickness over the entire surface of the tile, the coating material being uniform at the edge, as well as upon the surface of said tile, whereby said coating material does not leave a rib or bead at the rear edge portion of the tile.

The apron coöperating with rollers 33, 35, 34, forms a pocket, 41, for the reception of the coating material, said material being carried by the apron from the lower portion of the tank up to the pocket 41, thence into chamber 39 between the foraminous screen 36 and perforated apron 37, flooding the depression in said apron, back through the screen 36 and on to belt 26 by which it is conducted back to the supply tank.

It will be noted that the apron 37 and the foraminous screen 36 employed in my construction are not attached to any part connected with the tank nor to the means for supplying the coating material to the screen and the apron. Contrariwise, screen 36 and apron 37 are supported independently of the material supply means, to wit:— by securing them to the stationary table in a novel relation to the material supply means. Furthermore, the screen and the apron referred to are fastened in position so that they are adjustable relative to the means for supplying the coating material, in order that the thickness of the layer of coating material upon the tile may be regulated. Again, the screen 36 and apron 37 coöperate in retaining a small quantity, or as it is herein referred to a pool, of the coating material quite close to the path of feed of the tiles, thus securing a most important function.

It is found that ordinary wire screens have a tendency to become clogged with the coating material, particularly when the machine is idle over night, etc., thus interfering with the operation to some extent. The apron 37 in my machine is composed of hard rubber, or equivalent material, and it is perforated for the flow of coating material therethrough. Practical experience with hard rubber perforated aprons shows that such an apron will not become clogged by the coating material, and particularly when the machine is standing idle, for the reason that the coating material will not become dry upon and through the perforations, such

coating material having no tendency to adhere to the hard rubber apron but will drain off it. It is to be observed, also, that the tile in passing over the hard rubber apron does not pass into physical contact with the pool of coating material in the pocket of the screen and the apron, but, on the contrary, the porous character of the unbaked material composing the tile has such an affinity for the wet coating material as to draw the coating material from the pool and to result in the application of the coating material in a thin uniform layer upon the under surface of the tile. The apron 37 thus acts as a barrier to preclude physical contact of the tile with the pool of coating material, and as a result the tile is moved steadily and at uniform speed relative to the pool of coating material instead of moving with a period of momentary rest, the effect of which is to deposit a greater quantity of coating material at one or more points than at other points, thereby producing an unevenly coated surface on the tiles.

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 a plurality of tile conveying tables, coating mechanism in coöperative relation to said tables, and means coöperating with one of said tables whereby tiles may be moved diagonally with relation to the coating mechanism.

2. In a tile glazing machine, the combination of a supply tank, means for feeding tiles in a predetermined path and across said tank, an endless conveyer apron supported within said tank for continuously feeding a coating material to a point below the path of feed of the tiles, a perforated member overhanging the point of delivery of the coating material from said conveyer apron, and means for imparting traveling movement to said conveyer apron.

3. A tile glazing machine embodying a stationary table, a rotary table concentric with said stationary table, another rotary table coöperating with said first named rotary table and said stationary table, coating mechanism, a cam-track, and arms carried by the first rotary table and coöperating with said cam-track whereby tiles are fed diagonally across the coating mechanism.

4. In a tile glazing machine, a supply tank, means for feeding tiles in a predetermined path, means for establishing a pool of coating material below the path of feed and for supplying coating material to said pool, and a perforated tile engaging apron positioned over the pool and in the path of feed of said tiles, said apron being yieldable to the movement of the tiles.

5. In a tile glazing machine, a supply tank, means for feeding tiles in a predetermined path, means for establishing a pool of coating material below the path of feed and for supplying coating material to said pool, a perforated tile engaging apron positioned over the pool and in the path of feed of said tiles, said apron being yieldable to the movement of the tiles, and a screen intermediate the pool of coating material and the tile engaging apron.

6. In a tile glazing machine, a supply tank, means for feeding tiles in a predetermined path, a material supply apron operating in said tank, means coöperating with said material supply apron for changing the path of the apron and thereby producing in the apron itself a pocket adapted to be filled with coating material for the purpose of maintaining a pool of said coating material below the path of feed of the tiles, and a separate tile engaging apron positioned above the pool, said apron being yieldable to the movement of the tiles.

7. In a tile coating mechanism, a supply tank, drums rotatably mounted in said supply tank, a material supply apron carried by said drums, means for producing a pocket in said apron, a tile engaging apron in cooperative relation to said pocket, and a screen between the tile engaging apron and said endless apron.

8. In a tile coating mechanism, a supply tank, a material supply apron mounted for movement in said tank, a plurality of rollers engaging said apron and operating to produce a pocket therein, a perforated tile-engaging apron, and a screen of foraminous material coöperating with said tile-engaging apron, said tile engaging apron and screen coöperating with the pocket of the material supply apron to supply coating material to one face of a tile as it is moved over the tile engaging apron.

9. In a tile coating mechanism, a supply tank, a material supply apron mounted for movement in said tank, a perforated tile engaging apron, a plurality of members cooperating with the material supply apron to produce a pocket therein, and a foraminous screen in operative relation to said material supply apron.

10. In a tile coating mechanism, a tank, an apron for supplying coating material contained in said tank, a screen, a tile-engaging apron coöperating with said screen, and means coöperating with said endless belt for supplying coating material through said screen and to said tile-engaging apron, and means for feeding tiles across said apron.

11. In a tile coating mechanism, a tank, means for supplying coating material contained in said tank, a tile engaging apron, a foraminous screen between said supply means and said apron, said apron and screen being adjustable with relation to said tank,

means coöperating with said supply means whereby coating material will be supplied to said apron, and means for feeding tiles diagonally across said apron.

12. In a tile coating mechanism, a tank, a tile engaging apron adjustably mounted with relation to said tank, said apron being provided with a longitudinal depression and with apertures, a screen adjacent to said apron, said screen coöperating with the apron to produce a liquid supply chamber for the apron, means for supplying coating material to said chamber, the liquid from said chamber flooding the depression of said apron, and means for feeding tiles over said apron and in contact with the coating material contained in the depression of said apron.

13. In a tile coating mechanism, means for feeding tiles in a predetermined path, means for maintaining a pool of coating material below the path of feed of the tiles, and a perforated apron intermediate the pool of coating material and the path of feed of the tiles.

14. In a tile coating mechanism, means for feeding tiles in a predetermined path, means for maintaining a pool of coating material below the path of feed of the tiles, and a perforated apron intermediate the path of feed and the pool of coating material, said apron being composed of perforated hard rubber, or equivalent material.

15. In a tile glazing machine, means for feeding tiles in a predetermined path, means for maintaining a pool of coating material below the path of feed of said tiles, a tile engaging apron positioned above the pool of coating material and adapted for contact with the tiles moving in said predetermined path, and a screen intermediate the pool of coating material and the tile engaging apron, said apron and the screen being supported independently of the pool forming means.

16. In a tile glazing machine, means for feeding tiles in a predetermined path, means for establishing a pool of coating material below the path of feed, means for supplying the coating material to said pool, and a perforated apron adjacent to the path of feed, the material from the pool being adapted to pass through the perforations of the apron.

17. In a tile glazing machine, means for feeding tiles in a predetermined path, means for establishing a pool of coating material below the path of feed, means for supplying the coating material to said pool, a perforated apron adjacent to the path of feed, and means for supporting the apron independently of the coating material supply means.

18. In a tile glazing machine, means for feeding tiles in a predetermined path, means for establishing a pool of coating material below the path of feed, a screen positioned in the plane of the pool of coating material, and a tile engaging apron positioned above said screen.

19. In a tile glazing machine, means for feeding tiles in a predetermined path, means for establishing a pool of coating material below the path of feed, a screen positioned in the plane of the pool of coating material, a tile engaging apron positioned above said screen, said tile engaging apron being free to move relative to the screen under the pressure of tiles contacting therewith, and means for supplying coating material to the pool.

20. In a tile glazing machine, means for feeding tiles in a predetermined path, means for establishing a pool of coating material below the path of feed, means for supplying the coating material to said pool, and a tile engaging apron positioned over the pool of coating material, said apron being free to have movement relative to the pool under the pressure of tiles engaging with the apron.

21. In a tile glazing machine, means for feeding tiles in a predetermined path, means for establishing a pool of coating material below the path of feed, means for supplying the coating material to said pool, and a tile engaging apron positioned over the pool of coating material, said apron being provided intermediate its ends with a depression adapted to contain a thin film of coating material.

22. In a tile glazing machine, means for feeding tiles in a predetermined path, means for establishing a pool of coating material below the path of feed, means for supplying the coating material to said pool, and a tile engaging apron positioned adjacent to said pool, said apron having an upwardly extending free end positioned in the path of feed of the tiles and adapted to be depressed by contact of the tiles therewith.

23. A tile glazing machine embodying coating mechanism, a plurality of rotary tables in coöperative relation to said coating mechanism, and means for moving the tiles in a path diagonal to the coating mechanism whereby said tiles may be advanced from one table, over the coating mechanism, and delivered upon the other table.

24. A tile glazing machine embodying coating mechanism, a tile supporting member adjacent to said coating mechanism, a rotary member provided with pushing devices in operative relation to the supporting member, whereby tiles are adapted to be pushed relative to the tile supporting member, means for deflecting the tiles from the tile supporting member and across the coating mechanism, and means for carrying coated tiles away from the coating mechanism.

25. A tile glazing machine embodying

coating mechanism, a tile supporting member adjacent to said coating mechanism, a rotary member provided with pushing devices in operative relation to the supporting member, whereby tiles are adapted to be pushed relative to the tile supporting member, a cam in the path of the tiles moved by the pushing devices, said cam being in operative relation to the coating mechanism for deflecting the tiles over said coating mechanism, and means for carrying coated tiles away from the coating mechanism.

26. In a tile coating mechanism, a supply tank, a material supply apron mounted for movement in said tank, a perforated tile engaging apron, a plurality of members cooperating with the material supply apron to produce a pocket therein, and a foraminous screen in operative relation to said material supply apron, one of said pockets forming members operating also to direct the flow of coating material through the chamber formed between the tile engaging apron and the foraminous screen.

27. In a tile glazing machine, the combination of a supply tank, means for moving tiles over said tank and in a predetermined path, an endless conveyer apron positioned within the tank, means for imparting traveling movement to said conveyer apron, said apron being operable to continuously feed a coating material to a point below the path of feed of the tiles, and a perforated member positioned intermediate the path of feed of the tiles and the point of delivery of the coating material from the conveyer apron.

28. In a tile glazing machine, the combination of a supply tank, means for moving the tiles over said tank and in a predetermined path, an endless conveyer apron positioned within the tank, means for imparting traveling movement to said conveyer apron, said apron being operable to continuously feed a coating material to a point below the path of feed of the tiles, and a perforated member positioned intermediate the path of feed of the tiles and the point of delivery of the coating material from the conveyer apron, said perforated member being supported independently of the supply tank.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HUGO STOMMEL.

Witnesses:
H. I. BERNHARD,
J. F. MOTHERSHEAD.