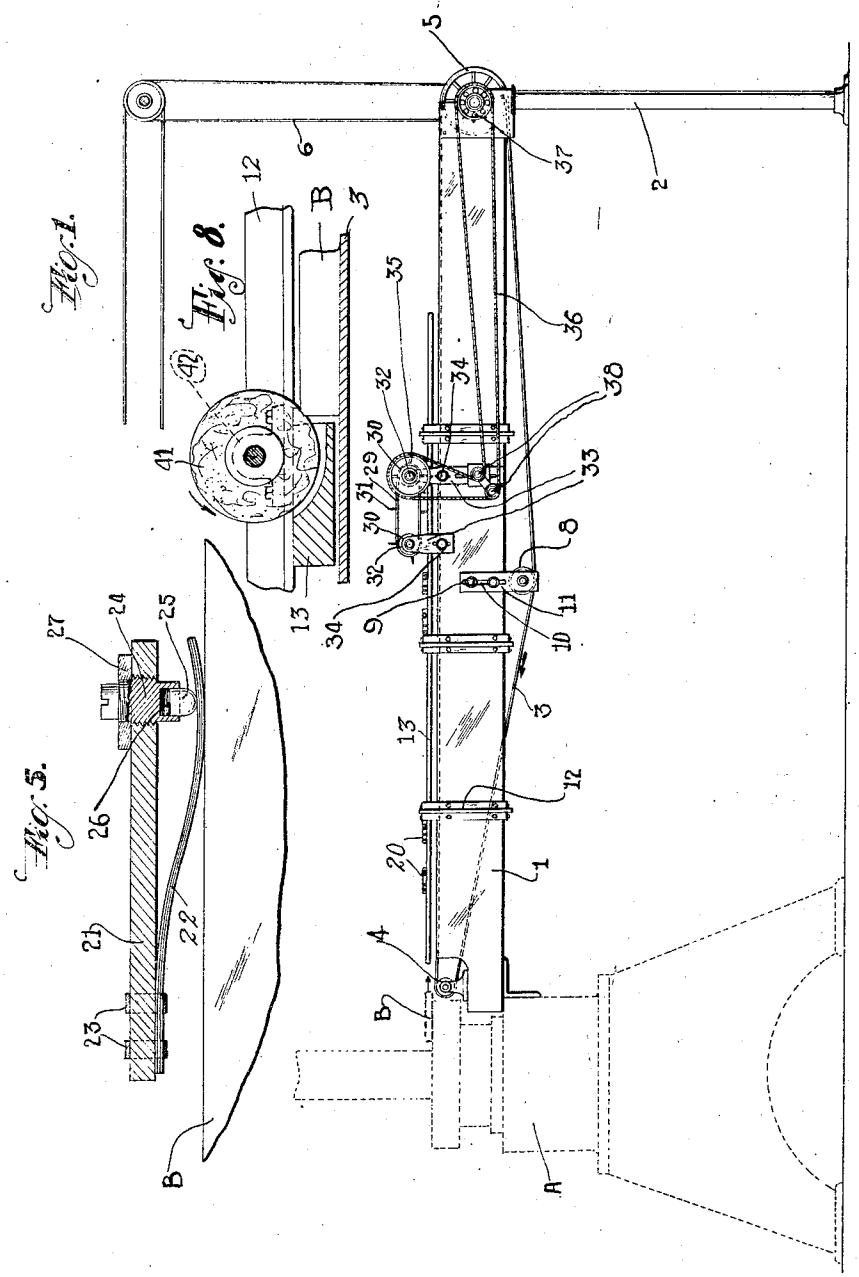
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TILE FETTLING MACHINE

Filed June 15, 1921 2 Sheets-Sheet 1



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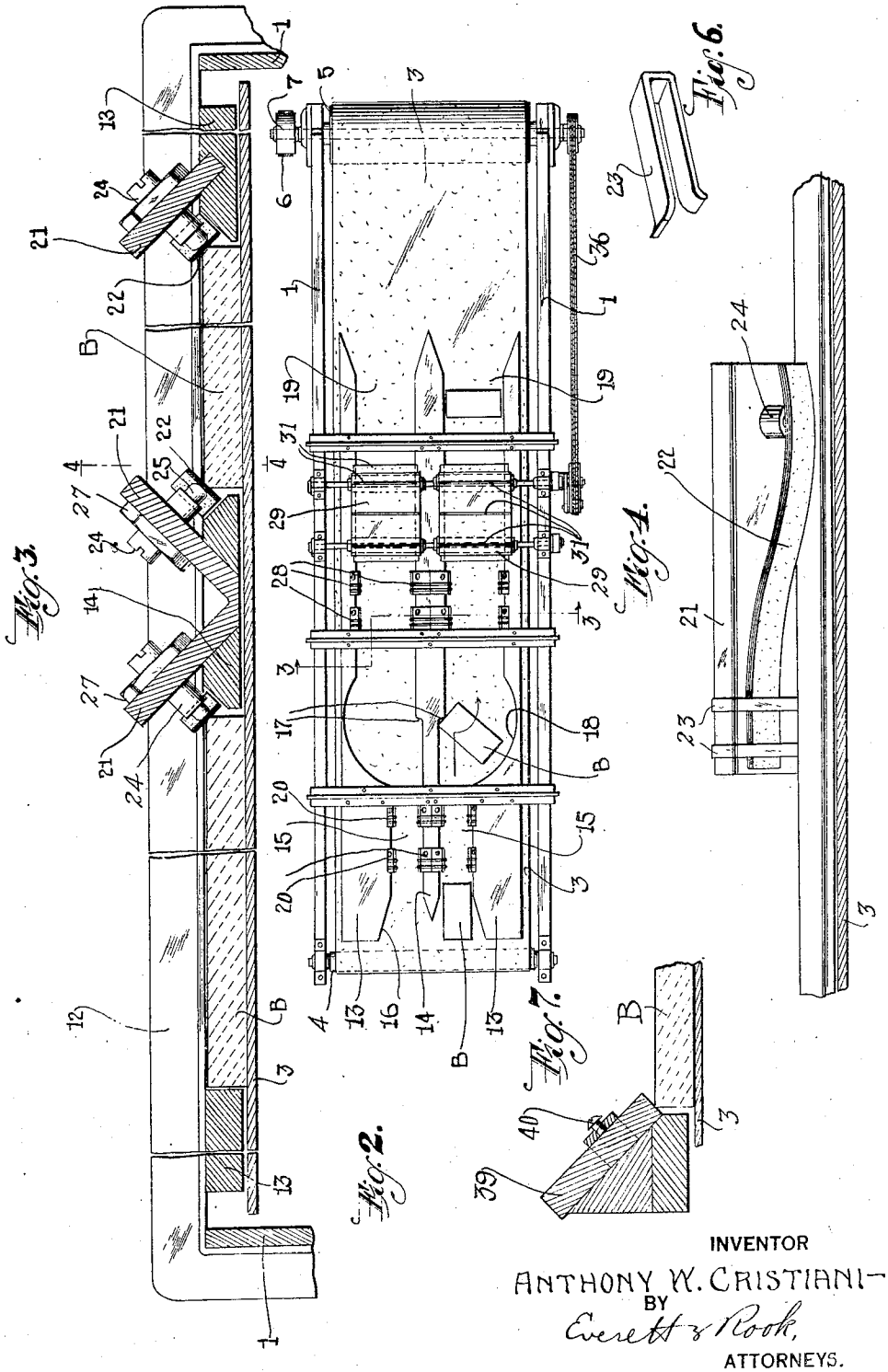


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 6.

Fig. 7.

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UNITED STATES PATENT OFFICE.

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TILE-FETTLING MACHINE.

Application filed June 15, 1921. Serial No. 477,661.

This invention relates to a machine for smoothing the rough edges of a tile which are caused by surplus material adhering to the edges during the pressing operation in a tile press due to the imperfect engagement and wear of the die members which form the tile. The smoothing operation, commonly called "fettling" or edging of tile, has been heretofore done manually by rubbing the edges with sand paper or other suitable abrasive.

The objects of my invention are to provide a machine for automatically and efficiently edging or fettling tiles, particularly before they are fired or baked to provide such a machine in which the edges of the tiles are forced into engagement with fettling members such as abrasive or "rubbing" members to smooth the edges; to provide a machine comprising an endless conveyor to receive the tile and stationary fettling members adjacent the same, whereby the tiles are conveyed into engagement with said fettling members; to provide a machine including means for causing engagement of both the end edges and side edges of a tile with fettling members; to provide an endless conveyor having a fixed guideway above the same for the tile with fettling members at the sides of said guideway whereby the tile are carried through said guideway into engagement with the fettling members; to provide an endless conveyor having a fixed guide above the same having a portion to receive a tile endwise and another portion to receive a tile sidewise, said guideway being formed intermediate said portions to cooperate with said conveyor to turn a tile from endwise position to sidewise position on the conveyor; to provide an improved fettling member to remove the rough edges of tile, and to obtain other results and advantages as may be brought out by the following description.

Referring to the accompanying drawings, in which like numerals of reference indicate the same parts throughout the several views,

Figure 1 is a side elevation of a tile fettling machine constructed in accordance with my invention, showing the same used in connection with a conventional tile press;

Figure 2 is a top plan view of the machine;

Figure 3 is a transverse vertical sectional view taken on the line 3—3 of Figure 2, looking in the direction of the arrows;

Figure 4 is a vertical longitudinal sectional view taken on the line 4—4 of Figure 3, looking in the direction of the arrows;

Figure 5 is a longitudinal sectional view through one of the fettling members;

Figure 6 is a detached perspective view of one of the clips for securing the abrading element to the body portion of the fettling member;

Figure 7 is a transverse sectional view through a modified form of abrading member, and

Figure 8 is a similar view through a further modified form of abrading member.

In the embodiment of my invention shown on the drawings, the reference numerals 1 designate the spaced and parallel sides of the frame of the machine which are adapted to be supported in any suitable manner in a substantially horizontal position. In the present instance I have shown one end of the frame supported on the bed of a tile press A, and the other end of the frame supported by means of posts 2. An endless conveyor is mounted longitudinally of the frame, and in the present instance I have shown the conveyor in the form of a belt 3 which passes around a roller 4 at the press end of the frame and around a drive roller 5 at the other end of the frame, the drive roller 5 being connected by means of a belt 6 and pulley 7 to a suitable source of power. Intermediate the ends of the lower reach of the belt 3 a belt tightener idler roller 8 may be adjustably mounted on the sides 1 of the frame in any suitable manner, as by means of the bolts 9 passing through a slot 10 in the support 11 in which the roller 8 is journaled.

The sides 1 are connected at spaced intervals in their lengths by means of inverted U-shaped braces 12 which extend transversely of the frame, as shown in Figures 1 and 2, the said members 12 being spaced from the top of the frame, as shown in Figures 1 and 3. Supported on the said braces 12 are a plurality of guides 13 and 14 spaced transversely of the belt and extending longitudinally thereof. The guides 13 are arranged at opposite edges of the belt 3 and the guide 14 is positioned substantially centrally of the belt between the guides 13. The guides 13 and 14 are slightly spaced above the belt 3, and at the end of the machine connected to the press A the guides are spaced so as to form guideways 15 between their adjacent edges to receive tiles B

endwise from the press, as shown in Figure 2. The extremities of the guides are preferably beveled as at 16 to provide a flared mouth for the guideways 15 to direct the tiles into the same. Inwardly of the guideways 15 the guide 14 is provided at opposite sides thereof with shoulders 17, and the adjacent sides of the guides 13 are provided with arcuate portions 18 whose centers are the respective shoulders 17 and which are of a radius slightly greater than the length of the tiles. Inwardly of said shoulders and arcuate portions 18 the edges of the guides 13 and 14 are so spaced as to form guideways 19 between them to receive the tiles sidewise.

Arranged on the adjacent edges of the guides 13 and 14 on opposite sides of the guideways 15 are a plurality of fettling members in the form of abrading members 20, the said abrading members comprising body portions 21 which are secured to the respective guides 13 and 14 in any suitable manner at substantially an angle of 45°, the body portions 21 on opposite sides of the guideways converging inwardly toward each other. Abrasive elements 22 are detachably secured to the undersides of the body portions 21, the said abrasive elements being preferably of a laminated construction including strips of hard fiber and sand paper, the sand paper being positioned outermost. The abrasive elements 22 are detachably secured at one end thereof to the respective body portions 21 by means of U-shaped spring clips 23 which are adapted to straddle the body portions 21 and clamp the abrasive elements between themselves and the body portions, as clearly shown in Figures 4 and 5. The upper reach of the belt 3 travels in the direction indicated by the arrows on Figure 1 in order to carry the tiles B away from the press A, and as the tiles are carried through the guideways 15 the longitudinal upper edges thereof are brought into engagement with the abrasive strips 22, as shown in Figure 3, the said abrasive strips serving to smooth the rough edges of the tile. The abrasive elements 22 are so arranged that the tile as they are conveyed by the conveyor belt move beneath the abrasive elements in the direction from the fixed ends to the free ends of the abrasive elements, thereby ensuring a light, yielding, rubbing contact or wiping action of the abrasive elements upon the edges of the tile, and enabling the abrasive elements to adjust themselves to unevenness in the tile edges without injury to the tile. It will be understood that the tile as they leave the press are quite fragile so that the pressure upon the edges of the same must be slight in order to prevent injury to the tile. It is for this purpose that I utilize the abrasive elements 22 formed of hard fiber and sand paper, since the fiber and sand paper in laminated arrangement have an inherent slight resiliency which would ordinarily be sufficient to remove the rough edges of the tile. However, to insure that sufficient pressure on the edges of the tile is obtained I may provide adjustable screws 24 in the ends of the body portions 21 opposite the clips 23 to engage the free ends of the abrasive elements 22 to force engagement thereof with the tile. If desirable, I may provide slidable plungers 25 in the ends of said screws to engage the abrasive elements 22, light springs 26 being utilized to maintain a slight pressure on the abrasive elements. It will be understood that the screws 24 are adjustable to insure proper engagement of the abrasive elements with the edges of the tile so that a proper amount of material is removed from the edges of the tile, and to hold the screws in adjusted position I may provide lock nuts 27.

After the tile B pass through the guideways 15 they are carried by the belt 3 into engagement with the shoulders 17 on the guide 14. Longitudinal movement of the tiles with the belt is thus interrupted, and the movement of the belt in connection with the engagement of the shoulders 17 with one corner of a tile causes the tile to be swung in its own plane about the shoulder as a pivot, as shown in Figure 3, so that the tile is positioned crosswise of the belt. In this position the tile are conveyed by the belt into the guideways 19, and a plurality of abrasive members 28 identical in construction with the members 20 are arranged on opposite sides of the guideways 19 to smooth the rough end edges of the tile.

During the engagement of the edges of the tile with the respective abrasive members 20 and 28 a portion of the material removed from the edges is deposited on the top of the tiles, and it is necessary that this material be removed before the tiles are glazed and baked. For the purpose of removing this dust I mount a brushing element over each of the guideways 19 to engage the top of the tiles after they have passed between the abrasive members 28. In the drawings I have shown these brushing elements as comprising endless belts 29 passing around rollers 30 journaled on the tops of the sides 1 of the frame and extending transversely of the belt 3, the said endless belts 29 being provided with transverse rows of bristles 31 which are preferably formed of camel's hair. The rollers 30 are mounted on shafts 32 which are journaled in brackets 33 vertically adjustable in any suitable manner as by the bolts 34 on the frame so as to insure proper engagement of the bristles 31 with the tops of the tiles. For the purpose of driving the brush belts 29 I may provide one of the shafts 32 with

a sprocket 35 around which passes a chain 36 which is also connected to a sprocket 37 on the shaft of the roller 5 of the conveyor belt 3. A suitable chain tightener is provided for the chain 36, and in the present instance I have shown the tightener as comprising a pair of idlers 38 which are vertically adjustable on the bracket 33. The brush belt 29 travels in a direction opposite to that of the conveyor belt 3 so that the bristles 31 effectively remove the surplus material from the tops of the tiles which travel beneath the same. It will be understood that the frictional enagement of the tiles with the conveyor belt 3 is all that insures proper movement of the tiles through the guideways 15 and 19, and it is therefore necessary to have a lightly engaging brush, such as that above described, for removing the material from the tops of the tiles without impeding the movement of the tiles with the conveyor 3. After the tiles pass out of the guideways 19 they are conveyed by the belt 3 to a suitable point where they are removed and carried through the next operation in the manufacture of tiles.

In Figure 7 I have shown a modified form of abrasive member which comprises a block of wood 39 which is adjustable in its support for proper engagement with the edge of the tile by means of a set screw 40.

In Figure 8 I have shown another modified form of abrasive member which comprises a felt roller 41 journaled in suitable bearings 42 on the frame 1 parallel to the guideways 15 and 19, the said roller 41 being adapted to engage the edge of the tile similarly to the abrasive member 22, and being rotated in the direction of the arrow.

While I have shown and described one posible embodiment of my invention, it will be understood that this is mainly for the purpose of illustrating the principles of the invention, and that many modifications and changes can be made in the detail construction of the invention without departing from the spirit or scope thereof. For instance, while I have shown a belt conveyor other types of conveyor might be utilized. Also, while I have shown two sets of guideways 15 and 19, the machine may be provided with any number of guideways desired. Therefore, I do not desire to be understood as limiting myself in the construction and use of my invention except as required by the following claims when construed in the light of the prior art. It is to be understood that by the terms "rubbing" or "abrading" elements or members, I mean any tile-fettling member or device which will rub, or remove by frictional contact, wipe, scrape, or cut the surplus material from the edges of tile, and "abrading" is not intended to be strictly construed. Another form of fettling member is shown in my copending application Serial No. 607,053, filed December 15, 1922, consisting of a rotatable hub having a plurality of radially disposed flexible strips thereon, said hub being rotatable in a plane parallel to the edge of the tile and the free ends of the strips serving to scrape or cut the surplus dust from the edges of the tile.

Having thus described the invention, what I claim is:

1. A tile fettling machine including a conveyor for a tile, a plurality of fettling members to engage the sides of a tile on said conveyor, and a guide for directing the tile to said fettling members, said guide being formed to turn the tile in its own plane to successively present angularly disposed sides of the tile in the same plane to said fettling members.

2. A tile fettling machine including a conveyor for a tile, a plurality of fettling members to engage the sides of a tile on said conveyor, and a guide for directing the tile to said fettling members, said guide having a portion to direct the tile with one side presented to one of said fettling members and another portion to direct the tile with an angularly disposed side in the same plane presented to the other of said fettling members, said guide being formed intermediate said portions with means for turning said tile in its own plane on the conveyor.

3. A tile fettling machine including a conveyor for a tile, a plurality of fettling members to engage the sides of a tile on said conveyor, and a guide for directing the tile to said fettling members fixed with respect to said conveyor, said guide having a portion to direct the tile with one side presented to one of said fettling members and another portion to direct the tile with an angularly disposed side in the same plane presented to the other of said fettling members, said guide being formed intermediate said portions with means to engage one corner of the tile whereby the tile is turned in its own plane on the conveyor.

4. A tile fettling machine including a conveyor for a tile, a plurality of fettling members to engage the sides of a tile on said conveyor, and a guide for directing the tile to said fettling members, said guide having a portion to direct the tile with one side presented to one of said fetling members and another portion to direct the tile with an anguarly disposed side presented to the other of said fettling members, said guide being formed intermediate said portions with means to interrupt movement of one corner of said tile with said conveyor and allowing the other portions of the tile to move with the conveyor, whereby the tile is turned on the conveyor.

5. A tile fettling machine including a traveling conveyor for a tile, a pair of spaced

fettling members to engage the sides of the tile on the conveyor, and a fixed guideway for directing said tile to said fettling members, said guideway having a portion to direct the tile with one side presented to one of said fettling members and another portion to direct the tile with a side angularly disposed to said first-mentioned side to the other of said fettling members, said guide being formed intermediate said portions at one side thereof with a shoulder to engage one corner of said tile, whereby movement of said corner of the tile with the conveyor is interrupted and the other portions of the tile are swung by said conveyor about said shoulder as a fulcrum to turn the tile on said conveyor.

6. A tile fettling machine including a support for tile, a fettling member including a body portion and a resilient fettling element mounted thereon to engage an edge of a tile with a yielding rubbing action, and means for producing relative movement of said support and said tile to cause a rubbing engagement of said fettling element with said edge of the tile.

7. A tile fettling machine including a support for tile, a fettling member including a body portion and a fettling element comprising a strip of resilient material fixed at one end on said body portion, the other end of said strip being normally spaced from said body portion to engage the edge of tile with a rubbing action upon relative movement of said tile and said element in one direction, and means for producing relative movement of said support and said fettling element in one direction to cause a rubbing engagement of said fettling element with said edge of the tile.

8. A tile fettling machine including a support for tile, a stationary fettling member including a body portion and a fettling element comprising a strip of resilient material fixed at one end on said body portion, the other end of said strip being normally spaced from said body portion to engage the edge of tile with a rubbing action upon relative movement of said tile and said element, and means for moving said support relatively to said fettling element to cause said tile to move into rubbing engagement with said fettling element in a direction from said fixed end of said element toward the free end thereof.

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