APPARATUS FOR CLEANING Drip PANS OF MOVING STAIRWAYS

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This invention relates to the treatment of surfaces associated with conveyors, and it has particular relation to apparatus for cleaning the drip pans of moving stairways.

Although surfaces may be treated in various ways, as by scraping, abrading, and coating, it will be assumed for the purpose of discussion that the surfaces involved are to be cleaned by brushes. The invention will be described with particular relation to the cleaning of the drip pan of a moving stairway.

The drip pan of a moving stairway in time collects appreciable quantities of oil, grease and debris. Such collections should be removed at regular intervals. In accordance with the prior art, it has been proposed that the entire drip pan of a moving stairway be covered with canvas, and that this canvas be removed at intervals for cleaning purposes. A canvas cover of this type is bulky and difficult to handle.

In accordance with the invention, a brush unit is disposed for movement by the conveyor means associated with the moving stairway over the surface of the drip pan. Conveniently, such movement may be effected by providing the brush unit with drive pins, or other suitable drive means, which are engageable in male and female relationship with the conveyor means. In a preferred embodiment of the invention, suitable guide means are provided for guiding the brush unit into position to be engaged by the conveyor means for movement over the surface of the drip pan. After the brush unit has traversed the drip pan, the guide means may guide the brush unit away from the conveyor means for the purpose of disengaging the drive pins from the conveyor means.

Preferably, the drive pins are resiliently biased for the purpose of preventing damage resulting from incorrect engagement of the drive pins by parts of the conveyor means. Desirably, the drive pins are provided with weak sections adjacent the brush unit to facilitate breakage of the drive pins adjacent the unit if, for some reason, jamming occurs.

After the brush unit has completed a cleaning or sweeping movement, it may be desirable to return the brush unit to its starting position. Such a return may be effected by reversing the conveyor means and establishing the aforesaid male and female engagement between parts of the brush unit and the conveyor means. To facilitate the return movement of the brush unit, the brush may be retracted from the surface of the drip pan during the return movement of the brush unit.

It is, therefore, an object of the invention to provide improved apparatus for treating surfaces associated with conveyors.

It is a further object of the invention to provide improved apparatus for cleaning the drip pan of a moving stairway.

It is also an object of the invention to provide apparatus for cleaning the drip pan of a moving stairway which includes a cleaning unit and guide means for guiding the cleaning unit into and out of operative engagement with the conveyor means of the moving stairway for movement of the desired surface of the drip pan.

It is an additional object of the invention to provide a cleaning unit for a moving stairway having drive pins resiliently biased toward their operative positions, and preferably having weak sections at predetermined points to facilitate breakage at the predetermined points upon application of excessive forces thereto.

It is a still further object of the invention to provide a brush unit for a moving stairway which includes a brush yieldably biased toward an operative position, and which has a latch means designed to hold the brush in an inoperative position.

It is another object of the invention to provide an improved method for cleaning the drip pan of a moving stairway.

Other objects of the invention will be apparent from the following description, taken in conjunction with the accompanying drawings, in which:

Figure 1 is a view in side elevation, with parts omitted, of a moving stairway embodying the invention;

Fig. 2 is an enlarged view in side elevation, with parts broken away, showing the upper end of the moving stairway illustrated in Fig. 1;

Fig. 3 is a view in top plan, with parts broken away, of a cleaning unit embodying the invention;

Fig. 4 is a view in front elevation of the cleaning unit shown in Fig. 3, with parts of a moving stairway added; and

Fig. 5 is a view in side elevation, the portions broken away, of the cleaning unit illustrated in Fig. 3.

Referring to the drawings, Figure 1 shows a moving stairway having a supporting structure which supports for rotation a lower sprocket and an upper sprocket. A pair of endless chains are disposed for movement about the sprockets. These chains are spaced apart in a direction perpendicular to the plane of Fig. 1, as shown more clearly in Fig. 4. At equally
spaced intervals, the chains carry axles 7 for pivotally supporting steps 9. The chains and the steps comprise parts of a resultant conveyor having an upper section 5e for conveying passengers, and a lower section 5b for returning the steps to a desired starting point. A conventional balustrade 11 is disposed adjacent the upper section 5e, and has an endless rail 13 which is moved in synchronism with the steps, in a manner well understood in the art.

For moving the steps, the upper sprocket 4 may have a driving motor 15 associated therewith. This motor is connected through suitable speed-reducing gearing 19 to a belt 17 which drives the sprocket 4. Conveniently, the motor 15 may be a three-phase alternating-current motor connected to a suitable source of three-phase power through a controller 21. The controller 21 has a button 21a which may be actuated to rotate the sprocket 4 in a clockwise direction as viewed in Fig. 1, a button 21b for actuating the sprocket 4 in a counterclockwise direction as viewed in Fig. 1, and a button 21c for stopping the moving stairway.

For receiving grease, oil and debris, a drip pan 23 is located below, and substantially parallel to, the lower section 5b of the conveyor means. In order to clean the drip pan, a brush unit 25 is provided which includes a carriage 27 and a brush 29 which is pivotally secured to the carriage. The carriage is guided through a predetermined path which is substantially parallel to the drip pan 23 by means of suitable guide rails 31. As clearly shown in Fig. 1, the guide rails 31 are substantially parallel to the section 5b; but, at the upper ends, the guide rails depart substantially from the path of the chains 5 and similarly, at their lower ends, the guide rails depart substantially from the path of the chains about the sprocket 3. The carriage 27 has one or more drive pins 33 projecting therefrom. Each pin is so located that, when it is moved from the position illustrated in Fig. 1 to the position 33a adjacent the sprocket 4, it will be in a position for engagement by one of the axles 7. For example, if the sprocket 4 is rotated in a clockwise direction as viewed in Fig. 1, the topmost approaching axle 7 will engage the drive pin 33 to urge the carriage 27 toward the lower end of the moving stairway. As the sprocket 4 continues to rotate, the carriage 27 will pass through a position 27b illustrated in dotted lines in Fig. 1, and finally reach a position 27c which is also illustrated in dotted lines. At the position 27c, the carriage has departed from the sprocket 3 sufficiently to provide clearance between the pin 33 and the axles 7 as they rotate about the sprocket 3. It will be noted that during the transit between the starting position of the carriage and the position 27c, the pin 33 is received between two of the axles in which may be termed a male and female relationship. Consequently, the carriage may be reciprocated in either of two opposite directions, depending on which of the push buttons 41a or 41b is actuated by one of the axles as it is carried around the sprocket 3. If the appropriate button of the controller is actuated to rotate the sprocket 4 in a counterclockwise direction as viewed in Fig. 1, one of the axles traveling around the sprocket 3 will engage the drive pin of the carriage 27 to move it toward the position illustrated in full lines in Fig. 1. As the drive pin 33 passes through the position illustrated by dotted lines 33c, it will move away from the associated axles to interrupt the engagement between the drive pin and the axles.

The construction of the carriage will be understood from a brief consideration of Figs. 4, 5 and 5a. Conventionally, the carriage 27 is supported from two steel angles 35 and 37. As shown in Fig. 4, the angle 35 has a horizontal leg 35a and a vertical leg 35b. Similarly, the angle 37 has a horizontal leg 37a and a vertical leg 37b. The legs 35b and 37b have secured thereto, in any suitable manner as by welding, brackets 39 and 41 (Fig. 3) which are rigidly connected to each other by a suitable strap 43. In the embodiment illustrated in the drawings, the strap 43 is connected to the brackets by suitable machine screws 45.

As previously explained, the carriage 27 is designed to be guided along suitable guide rails 31. The association of the various parts will be understood more clearly by a brief consideration of Figs. 2 and 4, wherein certain constructional features of a moving stairway are illustrated in somewhat greater detail. It will be recalled that each of the steps 9 is mounted for rotation on a separate axle 7 which is carried by the chains 5. Each of the axles 7 has two rollers 47 which are mounted for rotation with respect to the associated axle. These rollers cooperate with spaced guide tracks 43 and 51 to assist in guiding the steps. Further constructional details of moving stairways may be ascertained by reference to the prior art, such as that represented by the Dunlop patents, Nos. 2,060,491 and 2,085,076.

Referring more particularly to Fig. 4, it will be noted that each of the tracks 43 and 51 is provided with one of the guide rails 31. The guide rails 31 extend substantially parallel to the guide tracks 43 and 51 in any suitable manner as by welding. By reference to Figs. 1 and 2, it will be observed that the guide rails 31 extend substantially parallel to the drip pan 23. In order to guide the carriage 27 along the guide rails 31, the carriage is provided with four guide jaws 57, 59, 61 and 63 (Fig. 3). The jaws 57 and 59 are mounted on the angle 35 and the jaws 61 and 63 are mounted on the angle 37 in any suitable manner. In the specific embodiment herein illustrated, each of the guide jaws is associated with a block 65 which is secured to the associated angle in any suitable manner as by welding. Each guide jaw has a pin 67 projecting through an opening in the associated block 65 and through the leg 35b or 37b of the associated angle. The exposed end of each of the pins 67 is provided with an outer washer 69 and a cotter 71 engaging the associated guide jaw in mounted position. With this mounting, each guide jaw is rotatable about the axis of its associated pin 67. Such a construction permits the guide jaws to follow curves in the guide rails without difficulty. As shown in a position clearly in Fig. 3, each guide jaw has a recess for slidably receiving one of the guide rails 31.

It will be recalled that the carriage 27 is provided with drive pins 33 to which forces are ap-
applied for the purpose of moving the carriage along its associated guide rails. The construction of the guide pins will be apparent from a study of Fig. 4. The legs 35b and 37b of the angles have secured thereto, in any suitable manner, flat washers 187a and 187b. The arm 39 has a cylindrical bore 38 for the purpose of slidably receiving the pin 33. The pin 33 has a reduced 177 of reduced diameter projecting therefrom, slidably through an opening 167 in the bottom wall of the cup 15. As shown, the pin 33 has a washer 70 and a cotter pin 81 for preventing withdrawal of the drive pin from the associated cup. The cup also contains a helical spring 83 for biasing the associated guide pin 33 in an upward direction as viewed in Fig. 4. With this construction, improper engagement of the end of the drive pins by parts of the moving stairway results in retraction of the guide pins without injury thereto. As a further safeguard, each of the drive pins may be provided with a weak section 252 adjacent to the point of attachment of the drive pin to the carriage 27. If, for any reason, the carriage 27 is jammed, the drive pins break adjacent the carriage without further injury to the associated apparatus. Both of the drive pins are similarly constructed and mounted.

By reference to Figs. 3 and 4, it will be noted that two brushes 28a and 28b are employed to constitute the resultant brush 28. The brushes are secured to a steel angle 87 having a horizontal leg 81a, as viewed in Fig. 5, and a vertical leg 87b. The leg 87b has spacers 89 for engaging the backs of the brushes 28a and 28b. The spacers 89 may have pins 88a projecting therefrom to enter recesses in the backs of the brushes. The angle 87 also carries brackets 91, 93, and 95 (Fig. 4) for the purpose of supporting setscrews 87 in threaded engagement therewith. Each of the setscrews may be advanced into engagement with the backs of the brushes to secure the brushes between the setscrews and the spacers 89 (Figs. 3 and 5). Lock nuts 97a may be provided for the setscrews.

For the purpose of permitting movement of the brushes downward and away from the associated drip pan 23, the brushes are mounted for pivotal movement with respect to the carriage 27. To this end, the angle 87 is secured in any suitable manner to two spaced angle arms 99 and 101. The arm 99, as viewed in Fig. 5, has a vertical leg 98a and a horizontal leg 98b. The vertical leg has a pin 103 projecting therethrough and through the leg 35b of the angle 35 for the purpose of mounting the arm 99 for rotation with respect to the angle 35. As shown in Fig. 3, the pin 103 passes through a spacer 105 and has cotter pins 101 and washers 187a at its ends for retaining the pin 103 in the position illustrated. The arm 101 similarly is mounted for rotation relative to the angle 37 by means of a pin 103c which is similar to the pin 103. With this construction, the entire brush assembly may be rotated relative to the carriage 27 about the axis of the pins 103 and 103c.

In order to maintain the brush in operative position despite misalignments of the drip pan and tracks, the pins 103 and 103c may be allowed limited movement in an axial direction relative to the arms 99 and 101 or to the angles 35 and 37. For example in Fig. 5 the leg 99a is provided with a vertical slot 104 for receiving the pin 103 and for permitting a limited vertical movement thereof. The pin 103c may be associated similarly with the arm 101.

Springs 109 (Fig. 4) resiliently bias the brushes toward the drip pan 23. One of the springs 109 extends between the leg 35a and the arm 99; whereas, the second of the springs 109 extends between the leg 37a of the angle 37 and the arm 101. The mounting of these springs will be apparent from a study of Fig. 5. In Fig. 5, a pin 111 projects slidably through an opening in the leg 99b of the arm 99. A washer 113 and a cotter pin 115 limit movement of the pin in one direction relative to the arm 99. The remaining end of the pin projects through an opening 111 in the leg 35a of the angle 35 and through a washer 119. The end of the pin 111 is upset or enlarged to limit movement of the pin through the washer 115. It will be noted that the spring 109 surrounds the pin 111 and biases the arms together with the associated brushes toward the drip pan 23.

Latches 121 are provided for retaining the brushes in retracted position relative to the drip pan 23. One latch 121 is pivotally mounted on each of the angles 35 and 37 by means of suitable pins 123. If the brushes are moved upwardly relative to the associated carriage, the latches engage lips 125 which are secured to the angle 37 to retain the brushes in retracted or elevated position, as viewed in Fig. 5. The latches may be forced away from their associated lips to release the brushes. Upon release of the brushes, the springs 109 yieldably bias the brushes against the drip pan 23. The pins 111 have sufficient play in the associated openings of the arms and angles to permit the aforesaid movement of the brushes.

To facilitate retraction of the brushes, a fulcrum 127 for a lever is secured to the bar 43. This fulcrum may take the form of a steel plate having an opening 127a therethrough. A bar or lever 123 may be inserted through the opening 127a for the purpose of engaging the leg 87b of the angle 81 to raise the brushes from the drip pan. If it is desired to lock the carriage 27 at one end of the moving stairway, one of the angles 35 or 37 may be provided with an extension 131 having an opening 132 for reception of a suitable lock. As shown in Fig. 2, the supporting structure 1 of the moving stairway may be provided with a lug 133 having an opening 135 aligned with the opening 132 when the carriage 27 is in locking position.

It is believed that the operation of the apparatus is clear from the foregoing discussion. If it is desired to clean the drip pan 23, the moving stairway first may be stopped. The carriage 27 may be unlocked and moved from the position illustrated in Fig. 2 to the left until the drive pins 33 are in the positions illustrated in dotted lines 33a. At this point, the latches 121 may be actuated to release the brushes and permit the brushes to engage the drip pan. The moving stairway now is energized to rotate the sprocket 4 in a clockwise direction as viewed in Fig. 2. During the resultant motion of the chains, the first available axle 7 is brought into engagement with the drive pins 33 and urges the carriage 27 toward the left as viewed in Fig. 2. The motion of the carriage 27 continues until the carriage passes the sprocket 3 (Fig. 1). Since the guide rails 31 guide the carriage 27 away from the sprocket 3 in response to continued motion of the carriage toward the left, the drive pins 33 move out of operative engagement with the associated axle, as the axle rotates around the sprocket 3. Consequently, the carriage 27 comes
to a stop in the position 27c illustrated in dotted lines in Fig. 1. Oil, grease and debris swept to the lower end of the moving stairway by the brushes may be removed through suitable service openings.

Although the carriage 27 may be returned to its starting position without raising the brushes from the drip pan 23, preferably the brushes are raised. For this purpose, the lever 129 is inserted through the opening 127a of the fulcrum 126 (Fig. 5) to raise the brushes until the latches 121 engage their associated lips 125. Thereafter, the latches 121 retain the brushes in retracted position. The lever 129 is removed and, the moving stairway having been brought to a stop, the carriage 27 is moved to the right from the position 27c shown in dotted lines in Fig. 1. Such movement of the carriage positions the pins 33 for engagement by one of the axes 7 when the moving stairway is energized to rotate the sprocket 3 in a counterclockwise direction. Continued movement of the stairway then carries the carriage 27 to the upper end of the moving stairway. As the carriage 27 passes the sprocket 4, the drive pins 33 move out of engagement with the associated axle and the carriage comes to a stop. The carriage then may be moved into locking position and locked.

Although the invention has been described with reference to certain specific embodiments thereof, numerous modifications are possible. Therefore, the appended claims have been drafted to cover all modifications falling within the spirit and scope of the invention.

I claim as my invention:

1. In a treating device for treating a surface having spaced guide rails adjacent thereto, a supporting structure, a treating member, means resiliently mounting said treating member on said supporting structure for resiliently biasing the treating member toward an operative position, releasable latch means for retaining said treating member in an inoperative position to which the treating member is moved against the resiliency of its mounting, and spaced slotted guide jaws secured to the supporting structure for receiving guide rails in the slots thereof and guiding the supporting structure along spaced guide rails associated with a surface to be treated, each of the guide jaws being mounted on the supporting structure for rotation about an axis extending between the guide jaws to facilitate tracking of the guide jaws on curved guide rails.

2. In a cleaning device, a supporting structure, spaced slotted guide jaws disposed on opposite sides of the supporting structure, whereby said guide jaws may receive in the slots thereof guide rails for guiding the supporting structure over a surface to be cleaned in a predetermined path parallel to the guide rails, a drive element projecting from said supporting structure adjacent each of said sides in a direction substantially perpendicular to said path, whereby forces may be applied to the drive elements for moving the supporting structure along associated guide rails over a surface to be cleaned, a cleaning member, and means mounting the cleaning member on the supporting structure for movement toward and away from a surface located below the supporting structure, said guide jaws being castably secured to the supporting structure for rotation about an axis facilitating proper tracking of the guide jaws on curved guide rails.

3. In a moving stairway assembly, a plurality of steps, conveyor means for moving said steps in a predetermined closed path having an upper and a lower section, a carriage engageable with the conveyor means for movement therewith, and guide means for guiding the carriage from a position displaced from the conveyor means to a first position wherein the conveyor means engages the carriage to move it adjacent said lower section to a second position.

4. In a moving stairway assembly, a plurality of steps, conveyor means for moving said steps in a predetermined closed path having an upper and a lower section, a carriage engageable with the conveyor means for movement therewith, and guide means for guiding the carriage from a position displaced from the conveyor means to a first position wherein the conveyor means engages the carriage to move it adjacent said lower section to a second position, said guide means including means for guiding the carriage from said second position to a position displaced from the conveyor means.

5. In a moving stairway assembly, a plurality of steps, conveyor means for moving said steps in a predetermined closed path having an upper and a lower section, a carriage engageable with the conveyor means for movement therewith, and guide means for guiding the carriage from a position displaced from the conveyor means to a first position wherein the conveyor means engages the carriage to move it adjacent said lower section to a second position, said conveyor means being reversible for moving the steps in either of two opposite directions.

6. In a moving stairway assembly, a structure, a plurality of steps, conveyor means for moving the steps relative to the structure in a predetermined closed path having an upper section for conveying passengers, said path having a lower return section, the structure having a surface disposed below the return section, and a cleaning unit for cleaning the surface, said cleaning unit, when positioned below the return section and adjacent the surface, being engaged by the conveyor means for movement therewith, said cleaning unit when positioned below the return section and adjacent the surface, having drive means receivable in male and female relationship relative to the conveyor means for forcing the carriage to move over the surface with the conveyor means, and guide means for guiding the cleaning unit from a position displaced from the conveyor means to a first position establishing the male and female relationship for moving the cleaning unit by the conveyor means over the surface to a second position.

7. In a moving stairway assembly, a structure, a plurality of steps, conveyor means for moving the steps relative to the structure in a predetermined closed path having an upper section for conveying passengers, said path having a lower return section, the structure having a surface disposed below the return section, and a cleaning unit, when positioned below the return section and adjacent the surface, being engaged by the conveyor means for movement therewith said cleaning unit when positioned below the return section and adjacent the surface, having drive means receivable in male and female relationship relative to the conveyor means for forcing the carriage to move over the surface with the conveyor means, and guide means for guiding the cleaning unit from a position displaced from the conveyor means to a first position estab-
lishing the male and female relationship for moving the cleaning unit by the conveyor means over the surface to a second position, said guide means being receivable in male and female relationship relative to the conveyor means for forcing the carriage to move away from the conveyor means in response to continued movement of the conveyor means after said carriage has reached the second position.

8. In a moving stairway assembly, a structure, a plurality of steps, conveyor means for moving the steps relative to the structure in a predetermined closed path having an upper section for conveying passengers, said path having a lower return section, the structure having a surface disposed below the return section, and a cleaning unit for cleaning the surface, said cleaning unit, when positioned below the return section and adjacent surface, being engaged by the conveyor means for movement therewith, said cleaning unit when positioned below the return section and adjacent surface, having drive means receivable in male and female relationship relative to the conveyor means for forcing the carriage to move over the surface with the conveyor means, and guide means for guiding the cleaning unit from a position displaced from the conveyor means to a first position establishing the male and female relationship for moving the cleaning unit by the conveyor means over the surface, having drive means receivable in male and female relationship relative to the conveyor means for forcing the carriage to move in a direction substantially perpendicular to the path of movement of the carriage, and resilient means urging the drive member relative to the carriage toward the associated conveyor means.

9. In a moving stairway assembly, a plurality of steps, a supporting structure, conveyor means for moving the steps relative to the structure in a predetermined closed path having an upper section for conveying passengers, said path having a lower return section, a drip pan disposed below and substantially parallel to the return section, reversible means for moving the conveyor means and steps in either of two opposite directions, said conveyor means having spaced parts, a pair of spaced guide rails extending substantially parallel to the return section and projecting beyond the ends of the return section, a carriage member relative to the carriage for moving over said drip pan, a cleaning element pivotally associated with the carriage for movement from an operative position engaging the drip pan to a retracted position displaced from the drip pan, means resiliently biasing the cleaning element relative to the carriage into the operative position, releasable means for retaining the cleaning element in retracted position, a driving element projecting from said carriage into the space between said spaced parts, whereby the cleaning element is clear of the conveyor means.

10. In a moving stairway assembly, a plurality of steps, a supporting structure, conveyor means for moving the steps relative to the structure in a predetermined closed path having an upper section for conveying passengers, said path having a lower return section, a drip pan disposed below and substantially parallel to the return section, reversible means for moving the conveyor means and steps in either of two opposite directions, said conveyor means having spaced parts, a pair of spaced guide rails extending substantially parallel to the return section and projecting beyond the ends of the return section, a carriage member relative to the carriage for moving over said drip pan, a cleaning element pivotally associated with the carriage for movement from an operative position engaging the drip pan to a retracted position displaced from the drip pan, means resiliently biasing the cleaning element relative to the carriage into the operative position, releasable means for retaining the cleaning element in retracted position, a driving element projecting from said carriage into the space between said spaced parts, whereby the cleaning element is clear of the conveyor means.
riage from a position wherein the driving element is receivable in said space to a position wherein the driving element is clear of the conveyor means, means mounting the driving element for movement relative to the carriage in a direction perpendicular to the direction of movement of the carriage relative to the supporting structure, said last-named means.biasing said driving element relative to the carriage toward the associated conveyor means.

13. In a moving stairway assembly, a plurality of steps, a supporting structure, conveyor means for moving the steps relative to the structure in a predetermined closed path having an upper section for conveying passengers, said path having lower return section, a drip pan disposed below and substantially parallel to the return section, reversible means for moving the conveyor means and steps in either of two opposite directions, said conveyor means having spaced parts, a pair of spaced guide rails extending substantially parallel to the return section and projecting from the ends of the return section, a carriage having guides engaging the guide rails for constraining the carriage for movement over said drip pan, a cleaning element pivotally associated with the carriage for movement from an operative position engaging the drip pan to a retracted position displaced from the drip pan, means resiliently biasing the cleaning element relative to the carriage into the operative position, releasable means for retaining the cleaning element in retracted position, a driving element projecting from said carriage into the space between said spaced parts, whereby the conveyor means engages the cleaning element to move the carriage over the drip pan, said guide rails being positioned at each end thereof to guide the carriage from a position wherein the driving element is receivable in said space to a position wherein the driving element is clear of the conveyor means, the driving element having a weak section adjacent the carriage to facilitate breakage of the driving element adjacent the carriage when excessive force is applied thereto.

14. The method of cleaning the drip pan below the continuous conveyor of a moving stairway, which comprises moving a unit having a cleaning member from a position displaced from the conveyor to a position adjacent a first end of the drip pan wherein the unit engages the conveyor to be driven by the conveyor, and moving the conveyor in a path to carry the cleaning member over the surface of the drip pan toward a second end of the drip pan to sweep the drip pan, raising the cleaning member relative to the remainder of the unit to clear the drip pan, and reversing and returning the conveyor along said path to return the unit by the conveyor to the first end of the drip pan.

15. In a conveyor device, a base structure, a conveyor member, means constraining the member for movement relative to the structure through a predetermined path, said structure having a surface requiring treatment extending for a substantial distance substantially parallel to the path of said member, a treating member for treating said surface, and guide means for guiding the treating member through a path which approaches the path of the conveyor member at a first predetermined point spaced from the first predetermined point to effect a release of the treating member by the conveyor member in response to continued movement of the treating member in said first direction.

16. In a conveyor device, a base structure, a conveyor member, means constraining the member for movement relative to the structure through a predetermined path, said structure having a surface requiring treatment extending for a substantial distance substantially parallel to the path of said member, a treating member for treating said surface, and means releasably associating the treating member with the conveyor member for movement of the treating member by the conveyor member over the surface, and means selectively operable for maintaining the treating member in an operative or in an inoperative condition as it moves over said surface.

17. In a conveyor device, a base structure, a conveyor member, means constraining the member for movement relative to the structure through a predetermined path, said structure having a surface requiring treatment extending for a substantial distance substantially parallel to the path of said member, a treating member for treating said surface, means releasably associating the treating member with the conveyor member for movement of the treating member by the conveyor member over the surface, means selectively operable for maintaining the treating member in an operative or an inoperative condition as it moves over said surface, and means selectively operable for moving said conveyor member through the predetermined path in either of two opposite directions.

18. In a moving stairway assembly, a structure, a plurality of steps, conveyor means for moving the steps relative to the structure in a predetermined closed path having a section for conveying passengers and a return section, a carriage engageable with the conveyor means for movement thereby over a predetermined path from a first position to a second position, said carriage being releasable for movement from the first position to a third position out of engagement with the conveyor means, whereby the conveyor means cannot move the carriage while the carriage is in said third position.

19. In a moving stairway assembly, a structure, a plurality of steps, conveyor means for moving the steps relative to the structure in a predetermined closed path having a section for conveying passengers and a return section, a carriage engageable with the conveyor means for movement thereby over a predetermined path from a first position to a second position, said carriage being releasable for movement from the first position to a third position out of engagement with the conveyor means, whereby the conveyor means cannot move the carriage while the carriage is in said third position.

20. In a moving stairway assembly, a structure, a plurality of steps, conveyor means for moving the steps relative to the structure in a predetermined closed path having a section for conveying passengers and a return section, a carriage engageable with the conveyor means for
movement thereby over a predetermined path from a first position to a second position, said carriage being releasable for movement from the first position to a third position out of engagement with the conveyor means, whereby the conveyor means cannot move the carriage while the carriage is in said third position, the structure having a surface disposed substantially parallel and adjacent to said predetermined path, and a treating unit mounted on said carriage for treating said surface in response to movement of the carriage over said predetermined path, the conveyor means being reversible for moving the steps in either of two opposite directions, and means for moving the treating unit relative to the carriage from a location wherein the treating unit engages said surface during movement of the carriage over the predetermined path to a location wherein the treating unit clears said surface during movement of the carriage over said predetermined path, said last-named means being effective for retaining the treating unit in either of said locations.

HANS E. HANSEN.

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