No. 882,167. PATENTED MAR. 17, 1908.

R. R. RICHARDSON.

FEEDING MECHANISM FOR COATING MACHINES AND THE LIKE.

APPLICATION FILED JUNE 24, 1907.

4 SHEETS—SHEET 1.

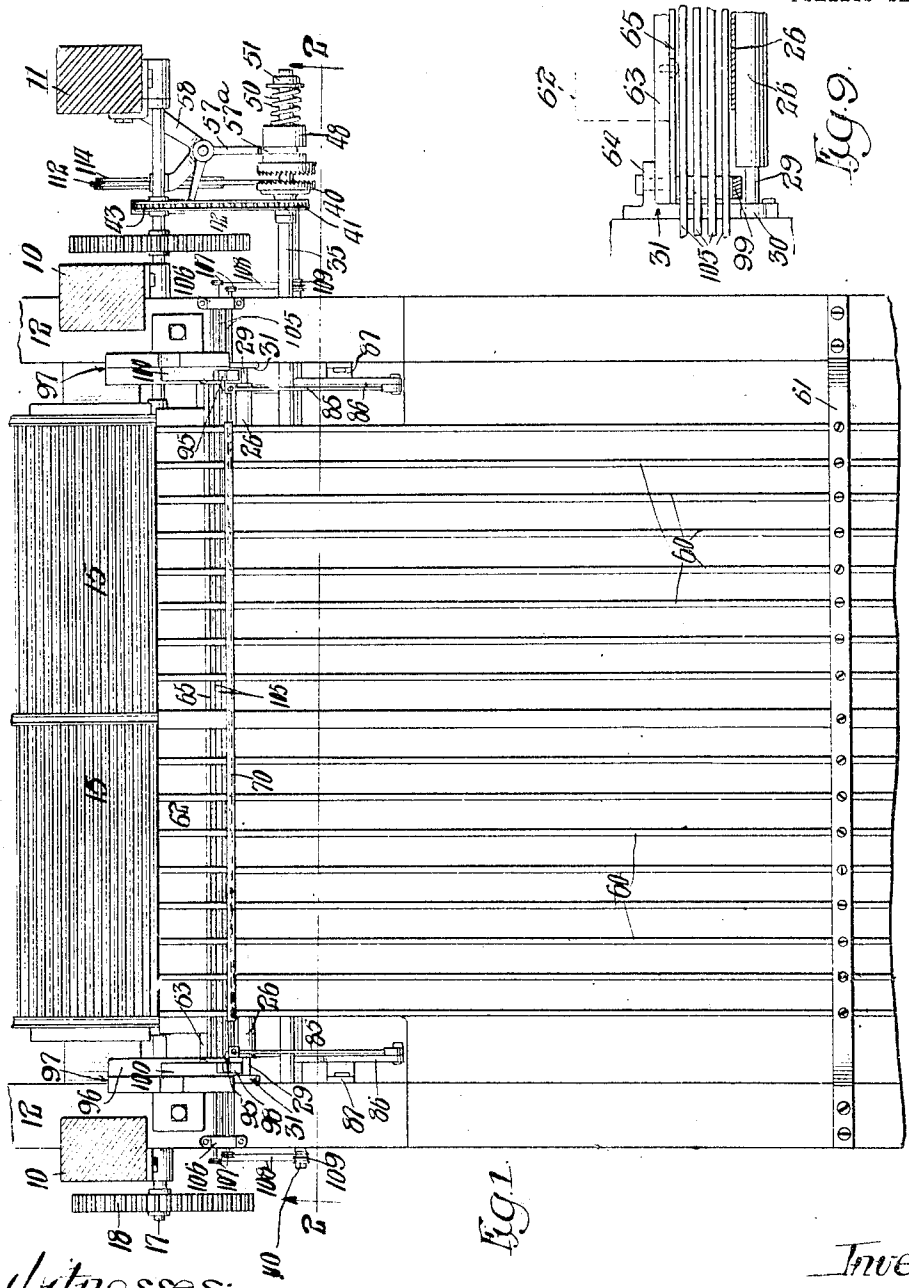


FIG. 1.

FIG. 9.

Witnesses:
P. H. Alfred
W. Hall.

Inventor
Ralph R. Richardson
by Poole & Brown
Attys

No. 882,167. PATENTED MAR. 17, 1908.

R. R. RICHARDSON.

FEEDING MECHANISM FOR COATING MACHINES AND THE LIKE.

APPLICATION FILED JUNE 24, 1907.

4 SHEETS—SHEET 2.

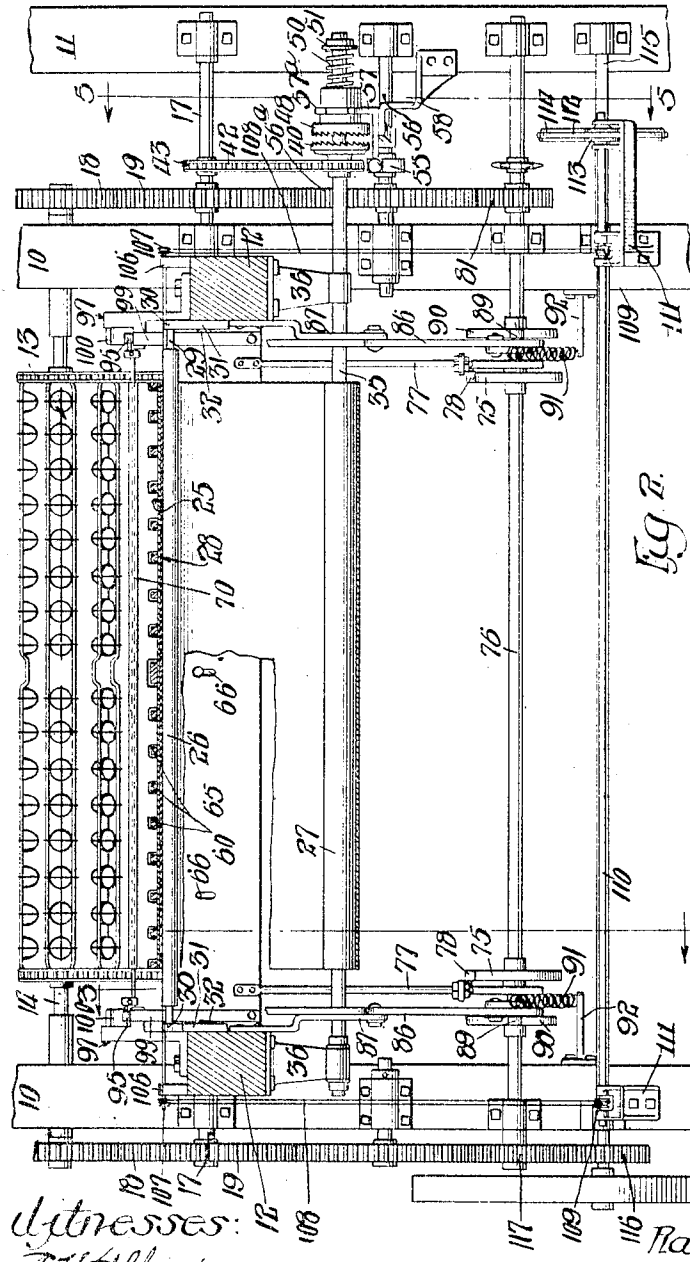


Fig. 2.

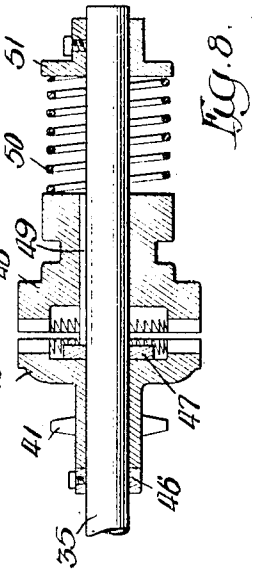


Fig. 3.

Witnesses:
F. W. Ellis
W. W. Hall.

Inventor
Ralph R. Richardson
by Poole & Brown
Attys.

No. 882,167. PATENTED MAR. 17, 1908.

R. R. RICHARDSON.

FEEDING MECHANISM FOR COATING MACHINES AND THE LIKE.

APPLICATION FILED JUNE 24, 1907.

4 SHEETS—SHEET 3.

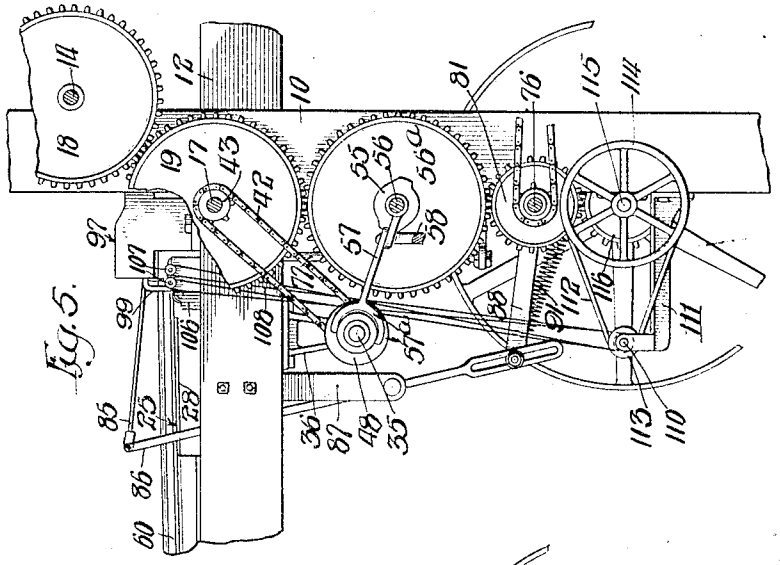


Fig. 5.

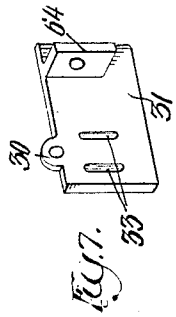


Fig. 7.

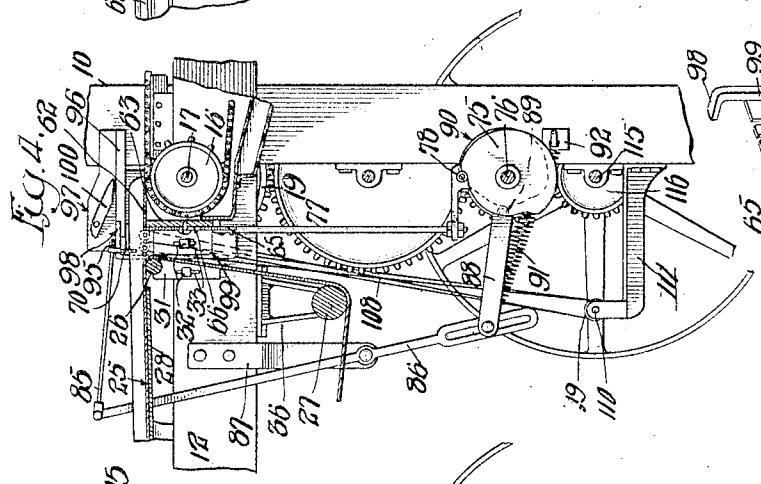


Fig. 4.

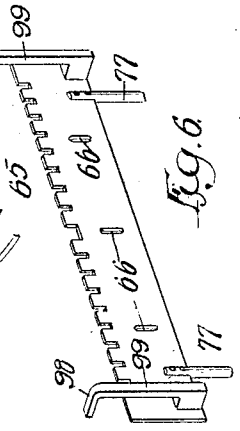


Fig. 6.

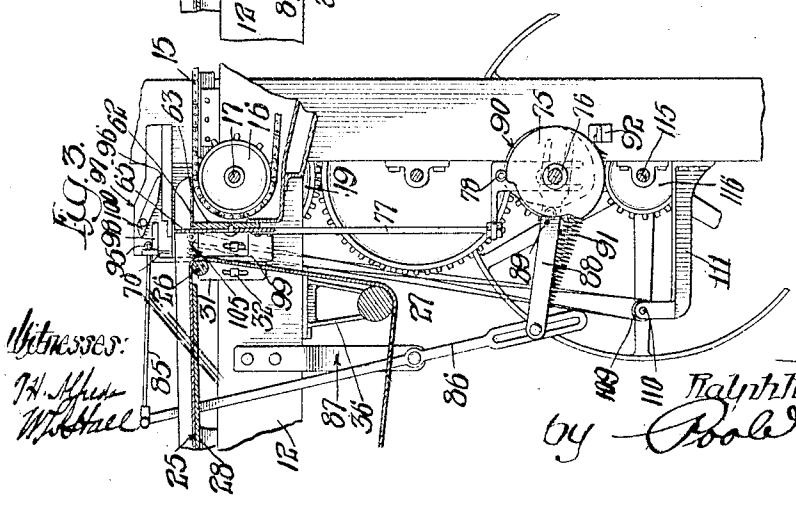


Fig. 3.

Witnesses:
W. Hoffman
W. Bottrell

Inventor
Ralph R. Richardson
by Poole & Brown
Attys.

No. 882,167. PATENTED MAR. 17, 1908.

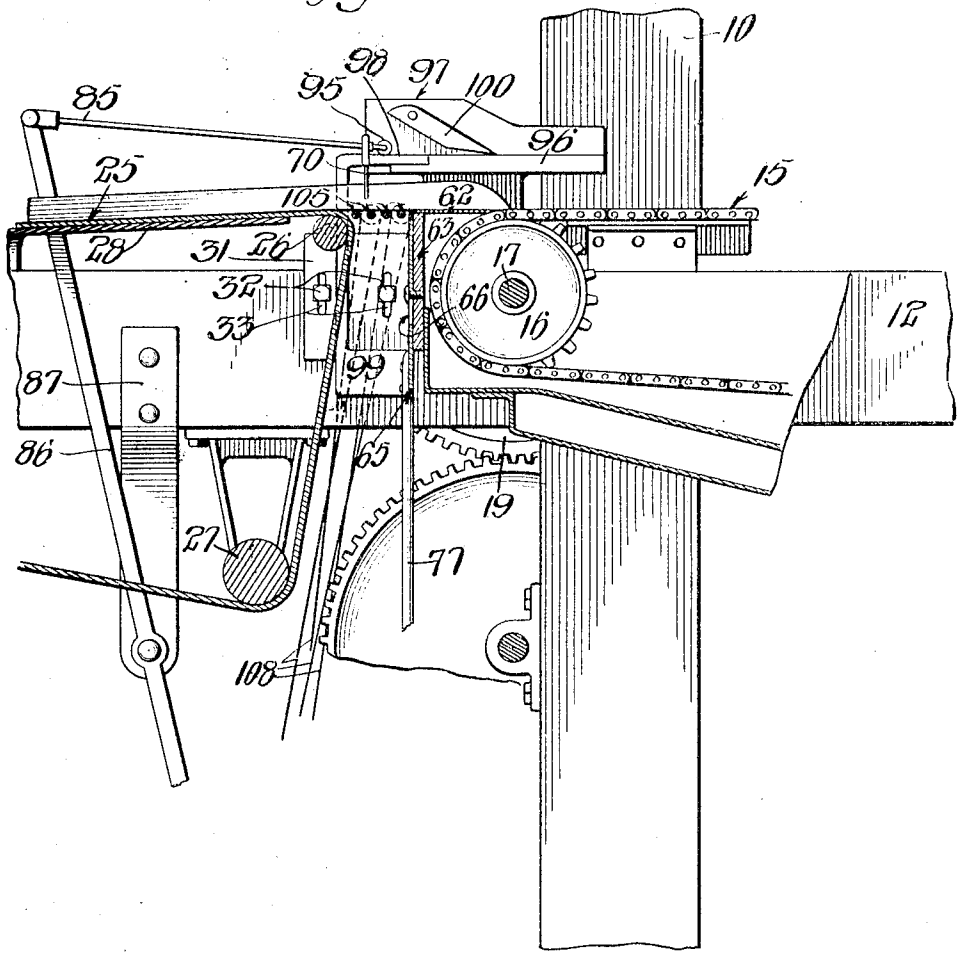
R. R. RICHARDSON.

FEEDING MECHANISM FOR COATING MACHINES AND THE LIKE.

APPLICATION FILED JUNE 24, 1907.

4 SHEETS—SHEET 4.

Fig. 4a



Witnesses:
F. H. Alfred
W. B. Hall

Inventor
Ralph R. Richardson
by Poole & Brown
Attys

UNITED STATES PATENT OFFICE.

RALPH R. RICHARDSON, OF OTTAWA, ILLINOIS.

FEEDING MECHANISM FOR COATING-MACHINES AND THE LIKE.

No. 882,167. Specification of Letters Patent. Patented March 17, 1908.

Application filed June 24, 1907. Serial No. 380,413.

To all whom it may concern:

Be it known that I, RALPH R. RICHARDSON, a citizen of the United States, and a resident of Ottawa, in the county of Lasalle and State of Illinois, have invented certain new and useful Improvements in Feeding Mechanism for Coating-Machines and the Like; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in feeding mechanisms designed to feed articles in an intermittent manner to a continuously moving carrier.

The invention is herein shown as designed to feed the articles to the carrier in a manner to deliver the articles in transverse rows upon and across the carrier and to space said rows at a predetermined distance apart longitudinally of the carrier.

One use of my improved feeding mechanism is found in connection with a coating machine, a type of which is illustrated in my copending application for U. S. Letters Patent, Serial Number 381559, filed June 29, 1907, and my improvements are herein shown as adapted to such a machine.

In the present disclosure I have shown only such parts of the coating machine proper as are necessary to illustrate the adaptation of my invention thereto, but it is to be understood that my invention may be adapted to other constructions of coating machines or machines for otherwise treating articles delivered thereto by said feeding mechanism.

As shown in the drawings:—Figure 1 is a top plan view of my improved feeding mechanism and the adjacent portions of a coating machine. Fig. 2 is a transverse section taken on line 2—2 of Fig. 1, with parts broken away. Fig. 3 is a transverse vertical section, taken on line 3—3 of Fig. 2. Fig. 4 is a like section showing the parts in different positions. Fig. 4ª is an enlarged sectional view of parts shown in Fig. 4. Fig. 5 is a transverse vertical section, taken on line 5—5 of Fig. 2. Fig. 6 is a perspective view of a vertically movable stop-bar constituting part of the feed mechanism. Fig. 7 is a perspective view of a fitting hereinafter to be described. Fig. 8 is a longitudinal section of a clutch mechanism for giving intermittent movement to the feed belt. Fig. 9 is a fragmentary horizontal section showing means for positively transferring the articles from the feed belt against the stop-bar.

As shown in the drawings, 10, 10 and 11 designate side standards, and 12, 12 horizontal rails, constituting the rigid portions of the machine frame.

13 designates the upper member of the carrier of the kind shown in my aforesaid application mounted on sprocket wheels or pulleys carried on the shaft 14 which extends between the standards 10, and 15 designates the lower member of said carrier, (Figs. 3 and 4) partially supported by pulleys 16 carried on a shaft 17 extending between and rotatively mounted in bearings on said standards 10 and 11. The said shafts 14 and 17 are geared together by gear wheels 18 and 19.

25 designates a feed belt that is trained about rollers 26, 27 located adjacent to the carrier. The upper lap of the belt is horizontal and is partially supported by a plate 28. The shaft 29 of the upper feed belt roller is mounted in ears or lugs 30 of fittings 31 (Fig. 7) that are fixed to the inner faces of the rails 12 by means of bolts 32 extending through vertical slots 33 in said fittings, whereby the plates may be adjusted vertically. The shaft 35 of the lower feed belt roller 27 is mounted in hangers 36 depending from said side rails 12. The said roller 27 constitutes the driving roller of the belt and is herein shown as associated with mechanism as follows, whereby the belt may be intermittently driven or advanced: 40 designates a clutch member that is loosely mounted on the feed belt shaft 35 between the standards 10 and 11 and is provided on its hub with a sprocket wheel 41 (Fig. 8) by which said clutch member may be driven through the medium of a sprocket chain 42 from a sprocket wheel 43 carried on the shaft 17. The clutch member 40 is held from endwise movement on the shaft 35 by collars 46, 47. 48 designates a clutch member mounted to slide endwise on the shaft 35 towards and from the clutch member 40, and fixed non-rotative on said shaft by means of a spline 49. A spring 50 surrounding the shaft is interposed between the movable clutch member and a fixed collar 51 fixed to the outer end of the said shaft, said spring normally holding the movable clutch member engaged with the stationary clutch member. When said clutch members are so engaged the feed belt is driven from the rota-

tive shaft 17. Said clutch members are disengaged to intermittently arrest the movement of the driving belt through the agency of a rotative cam 55, fixed to a shaft 56 extending between and mounted on the standards 10 and 11, and a bell-crank lever 57 pivoted at its angle to a bracket 58 supported on the adjacent post or standard 11 and the shaft 56 (Fig. 1). Said bell-crank lever is adapted for engagement at the end of one of its arms with said cam and is provided at its other end with a fork 57^a which engages a groove in the hub of the sliding clutch member 48. When the cam 55 swings the bell-crank lever forwardly and outwardly the clutch is disengaged and the feed belt arrested. The shaft 56 and the cam 55 are rotated from the shaft 17 through the medium of a gear wheel 56^a on the shaft 56 engaging the gear wheel 19 on the shaft 17.

Spacing bars 60 extend over the upper or feed lap of the belt 25 to direct the articles to be coated transversely in line with the baskets of the carrier. Said spacing bars are suspended at their forward ends from a transverse bar 61 extending between and supported on the rails 12 and are supported at their rear ends upon a narrow bridge plate 62 (Figs. 1, 3 and 4) located between the delivery part of the feed belt and the carrier. The said bridge plate is supported on the upper edge of a bar 63 extending between the rails 12 and attached at its ends to apertured lugs 64 of the fittings 31 (Fig. 7) by which the upper belt roller shaft is carried.

In the present construction, the upper lap of the feed belt is located on the same plane with the lower member 15 of the two-part carrier. There is provided between the feed belt and the carrier, just in rear of the bridge plate referred to, a vertically movable stop bar 65 which constitutes when elevated (its normal position) a stop against which the articles are arrested just before they are delivered to the carrier. Associated with said stop bar is a pusher which is so arranged relatively to the stop bar as to transfer a row of articles arrested by said bar to the carrier at a time when said stop bar is lowered, said stop bar being thereafter raised into the path of the moving articles to arrest another row. The pusher is thereafter retracted and again advanced to transfer said latter row of articles to the carrier when the stop bar is again lowered. The said stop bar is fixed to the rear face of the cross-bar 63 by means of screw-bolts which extend through vertical slots 66 in the stop bar and into said cross bar, said screw-bolts and slots constituting means for vertically guiding said stop bar. The pusher referred to comprises a horizontal bar 70 that extends transversely across the delivery part of the feed belt and has movement towards and from the carrier by mechanism hereinafter to be described. The push bar is notched on its lower edge, as shown in Fig. 2, to permit the lower edge of the bar to descend to the approximate level of the feed belt notwithstanding the spacing bars 60. The upper edge of the stop bar is likewise notched to receive said spacing bars.

The stop bar 65 is raised and lowered by means of two cams 75, 75 fixed to a rotary shaft 76 extending transversely of the frame and mounted in the standards 10 and 11, as shown in Fig. 2, and reciprocating rods 77 fixed at their upper ends to the stop bar near its opposite ends and provided near their lower ends with roller bearing studs 78 engaging the peripheries of said cams 75. The said cam rods are offset at their lower ends in order to bring said lower ends in line with the cams and the lower or offset parts of said rods are herein shown as made separate from the rods proper. Said offset lower ends of said rods are forked to straddle the shaft 76 in the manner shown in dotted lines in Fig. 3 to afford a guiding engagement therewith. The said shaft 76 is driven from the gear wheel 56^a of the shaft 56 through the medium of a pinion 81 on the shaft 76 meshing with said gear wheel. Preferably both ends of said shaft 76 are geared to the shaft 17 in the same general manner. The peripheral contour of the cams 75 is such that the stop bar is quickly brought into its lowermost position and remains in this position for a sufficient length of time for the pusher to move rearwardly thereover and transfer a row of articles to the carrier, and is quickly raised to its elevated position, in which position it remains for a longer time to arrest another row of articles delivered thereto by the feed belt.

Referring now to the mechanism for operating the pusher to transfer the articles to the carrier, the same is made as follows: Connected with and extending forwardly from each end of the pusher is a link 85. Said links are loosely connected at their forward ends to the upper ends of the cam actuated levers 86 which are pivoted between their ends to hangers or brackets 87 depending from the side rails 12. The said levers have pin and slot connection at their lower ends with horizontally reciprocating cam bars 88, which are forked at their rear ends for guiding engagement with the shaft 76, as shown in dotted lines in Fig. 3. Said cam bars carry roller bearing studs 89 which engage the peripheries of cam disks 90 fixed to said shaft 76, at the sides of the cam disks 75. Spiral springs 91, attached at their forward ends to said cam bars and at their rear ends to brackets 92 fixed to the machine frame, act through said parts to normally hold the pusher in its retracted position in front of the stop bar; and the cam disks operate to shift the pusher rearwardly to transfer a row of articles upon the carrier.

As before stated, the said pusher is advanced rearwardly for the purpose set forth at a time when the stop bar is in its lower position. The said pusher is thus advanced rearwardly in a horizontal plane. Inasmuch, however, as the stop bar is elevated before the pusher is retracted, said pusher requires to be elevated during its retractive movement. This may be accomplished by devices herein shown which are made as follows: The links 85 (Figs. 3, 4, 4ª and 5) are provided at their rear ends with laterally directed extensions 95 which preferably carry bearing rollers as shown, and said extensions travel on horizontal tracks formed partially by stationary horizontal track members 96 formed on castings 97 that are attached to and rise from the side rails 12, and formed partially by movable track members 98 which consist of rearwardly directed arms formed on upright pieces 99 fixed to the rear face of the vertically movable stop bar 65. The said movable portions of the tracks are made vertically narrower than the stationary portions thereof and when in their lowermost positions fit into offset notches in the forward ends of the stationary track members, as shown in Fig. 4, thus bringing their upper faces flush with the upper faces of the stationary track members. The extensions 95 of said links 85 constitute extension supports for the pusher and may be formed on the push bar itself with the same advantages and results.

In order to raise the pusher above the stop bar in the retractive movement of the former there are provided inclined swinging cam bars 100 which are pivoted to said members 97 above the track members 96, and are inclined rearwardly and downwardly and rest at their lower ends on said stationary track members. The said swinging cam bars 100 swing upwardly to permit the supporting extensions 95 of the pusher to pass thereunder in the advance movement of the pusher. When said pusher is retracted, however, the said extensions ride up over the cam bars 100 and thereby raise the pusher to permit it to pass over the raised stop bar. By the time the said supporting extensions 95 arrive at the rear ends of the said cam bars and drop off of the same, the movable members 98 of the tracks for said extension supports have been raised, simultaneously with the raising of the stop bar, so that said extension supports have but little distance to drop upon the movable members of the tracks. The extension supports and pusher are lowered to bring the latter into the plane of the articles to be transferred to the carrier upon the subsequent lowering of the stop bar. In order to bridge the space between said stop bar 65 and the delivery portion of the feed belt and thus insure prompt and active transfer of the rows of articles against the stop bar when the latter occupies its upper position, said space is herein shown as occupied by a plurality of rotating rods 105 located in the plane of the upper lap of the feed belt and the bridge plate 62 (Figs. 1, 3, 4 and 4ª). Said rods extend transversely across the machine and have bearing at their ends in suitable bearing blocks 106 supported on the rails 12, as best shown in Figs. 1, 2 and 5. The said rods are rotated rearwardly on their upper sides and at considerable speed. As a means of rotating said rods, they are provided at their ends with pulleys 107, 107 over which are trained suitable belts 108 which are trained over pulleys 109 fixed to a shaft 110 extending between and rotatively mounted at its ends in suitable bearings 111 on the posts 10. Said shaft is rotated through the medium of a belt 112 (Figs. 2 and 5) trained about a pulley 113 on said shaft 110 and a second pulley 114 on a shaft 115 that extends between and is rotatively mounted at its ends in suitable bearings in the posts 10 and 11. The said latter shaft is driven from the shaft 76 at the left hand side of the machine through the medium of intermeshing gear wheels 116 and 117 on said shafts. It will be understood that the rapidly rotating rollers 105, just referred to, deliver the articles to be coated or otherwise treated against the stop bar when the latter is in its upper position. The space occupied by said rollers will usually be so proportioned that but one row of the articles being operated upon will rest on said rotating rod at a given time. That is to say, such space will be made of substantially the same width as the base width of the articles being treated.

When a row of articles is to be transferred to the carrier the pusher is advanced at the same time that the stop bar is lowered and the pusher is thereafter retracted and at the same time raised above the stop bar after the stop bar has been moved to its uppermost position. Thus it will be seen that the rows of articles are delivered to and arrested by the stop bar and are transferred thereafter as rows to the carrier by the pusher so as to extend transversely across the carrier, and that the mechanism is such that the rows are spaced a predetermined distance apart on the carrier, with the articles in each row uniformly spaced.

In the present construction the feed belt is intermittently advanced in order that the rows of articles delivered to the carrier may be properly spaced on the carrier. Instead of thus intermittently advancing the feed belt and bringing it to a stop between the step by step movements, the same general results may be secured by advancing the feed belt by a slower movement. Other variations in the mechanism may be made without departing from the spirit of my invention, and I do not wish to be limited to such de-

tails except as hereinafter made the subject of specific claims.

I claim as my invention:—

1. The combination with a traveling carrier, of mechanism for delivering articles thereto comprising a feed belt in the approximate plane of the carrier, a rising and falling stop-bar between said carrier and feed belt closely adjacent to the carrier, and means for transferring the articles to the carrier when the stop-bar is moved out of the path of said articles.

2. The combination with a traveling carrier, of mechanism for delivering articles thereto comprising a feed belt, a rising and falling stop bar between the carrier and feed belt and normally in the path of the articles advanced by the feed belt and arranged to arrest said articles in rows, and a pusher for transferring each row of articles bodily to the carrier when the stop-bar is moved out of the path of said articles.

3. The combination with a traveling carrier, of mechanism for delivering articles thereto comprising a feed belt, a rising and falling stop-bar between the carrier and feed belt, a pusher for transferring the articles to the carrier when the stop-bar is lowered, and mechanism for operating and controlling said pusher constructed to advance the same in a straight line and to raise it during its retraction.

4. The combination with a traveling carrier, of mechanism for delivering articles thereto comprising a feed belt, a stop-bar arranged between the feed belt and carrier, means for raising and lowering the stop-bar, a horizontally reciprocating pusher arranged in front of said feed bar, means operating the pusher constructed to advance it to transfer a row of articles to the carrier when the stop-bar is lowered, the stop-bar being elevated before the retraction of the pusher, and means acting on the pusher during its retractive movement to raise it above said stop-bar.

5. The combination with a traveling carrier, of mechanism for delivering articles thereto comprising an intermittently advanced feed belt, a stop-bar arranged between the feed belt and carrier, means for raising and lowering the stop-bar, a horizontally reciprocating pusher arranged in front of said stop bar, means operating the pusher constructed to advance it to transfer a row of articles to the carrier when the stop-bar is lowered, the stop-bar being elevated before the retraction of the pusher, and means acting on the pusher during its retractive movement to raise it above said stop-bar.

6. The combination with a traveling carrier, of mechanism for delivering articles thereto comprising a feed belt, a rising and falling stop-bar between said carrier and feed belt, a horizontally reciprocating pusher for delivering the articles to the carrier when the stop-bar is lowered, horizontal tracks on which said pusher is supported during its advance movement, and cam devices associated with said tracks for raising said pusher above the stop-bar during its retractive movement.

7. The combination with a traveling carrier, of mechanism for delivering articles thereto comprising a feed belt, a rising and falling stop-bar between said carrier and feed belt, a horizontally reciprocating pusher for delivering the articles to the carrier when the stop-bar is lowered, horizontal tracks on which said pusher is supported during its advance movement, cam devices for raising said pusher above said stop-bar, during its retractive movement, the forward end portions of said tracks being movable with the stop-bar, whereby said movable portions of the tracks are elevated to receive the pusher when the latter passes off said cam devices.

8. The combination with a traveling carrier, of mechanism for delivering articles thereto comprising a feed belt, a rising and falling stop-bar between said carrier and feed belt, a horizontally reciprocating pusher for transferring the articles to the carrier when the stop-bar is in its lower position, horizontal tracks for supporting said pusher during its advance movement, and inclined cam bars pivoted above said tracks, so arranged that the pusher passes beneath the bars during its advance movement, but rides over said bars during its retractive movement.

9. The combination with a traveling carrier, of mechanism for delivering articles thereto comprising a feed belt, a rising and falling stop-bar between said carrier and feed belt, a horizontally reciprocating pusher for transferring the articles to the carrier when the stop-bar is lowered, horizontal tracks for supporting said pusher during its advance movement, inclined cam bars pivoted above said tracks, beneath which the ends of the pusher pass during the advance movement of the latter, said cam bars being arranged to elevate the pusher when retracted, the forward ends of the tracks for the pusher bar rising and falling with the stop-bar and arranged to occupy their upper positions to receive the pusher as the same passes off the pivoted cam bars.

10. The combination with a traveling carrier, of mechanism for delivering articles thereto comprising a feed belt, a rising and falling stop-bar between the carrier and feed belt, said belt being spaced a distance from said stop-bar, a pusher arranged to transfer the articles to the carrier when the stop-bar is moved out of the path of said articles, and means located between the stop-bar and belt for quickly directing the articles from the belt to the stop-bar.

11. The combination with a traveling car-

rier, of mechanism for delivering articles thereto comprising a feed belt, a rising and falling stop-bar between the carrier and feed belt, said belt being spaced a distance from said stop-bar, a pusher arranged to transfer the articles to the carrier when the stop-bar is moved out of the path of said articles, the space between said feed belt and stop-bar being occupied by a plurality of rotating rods which direct the articles from the feed belt against the stop-bar.

12. The combination with a traveling carrier, of mechanism for delivering articles thereto comprising a feed belt, a rising and falling stop-bar between the carrier and feed belt, a bridge plate between the stop-bar and carrier, a pusher arranged to transfer the articles over said bridge plate to the carrier when the stop-bar is out of the path of said articles, and spacing bars disposed over said carrier with their rear ends resting on said bridge plate, the stop-bar being provided at its margin with notches to receive said spacing bars.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 21st day of June A. D. 1907.

RALPH R. RICHARDSON.

Witnesses:
F. B. DAVIDSON,
H. J. BROWN.