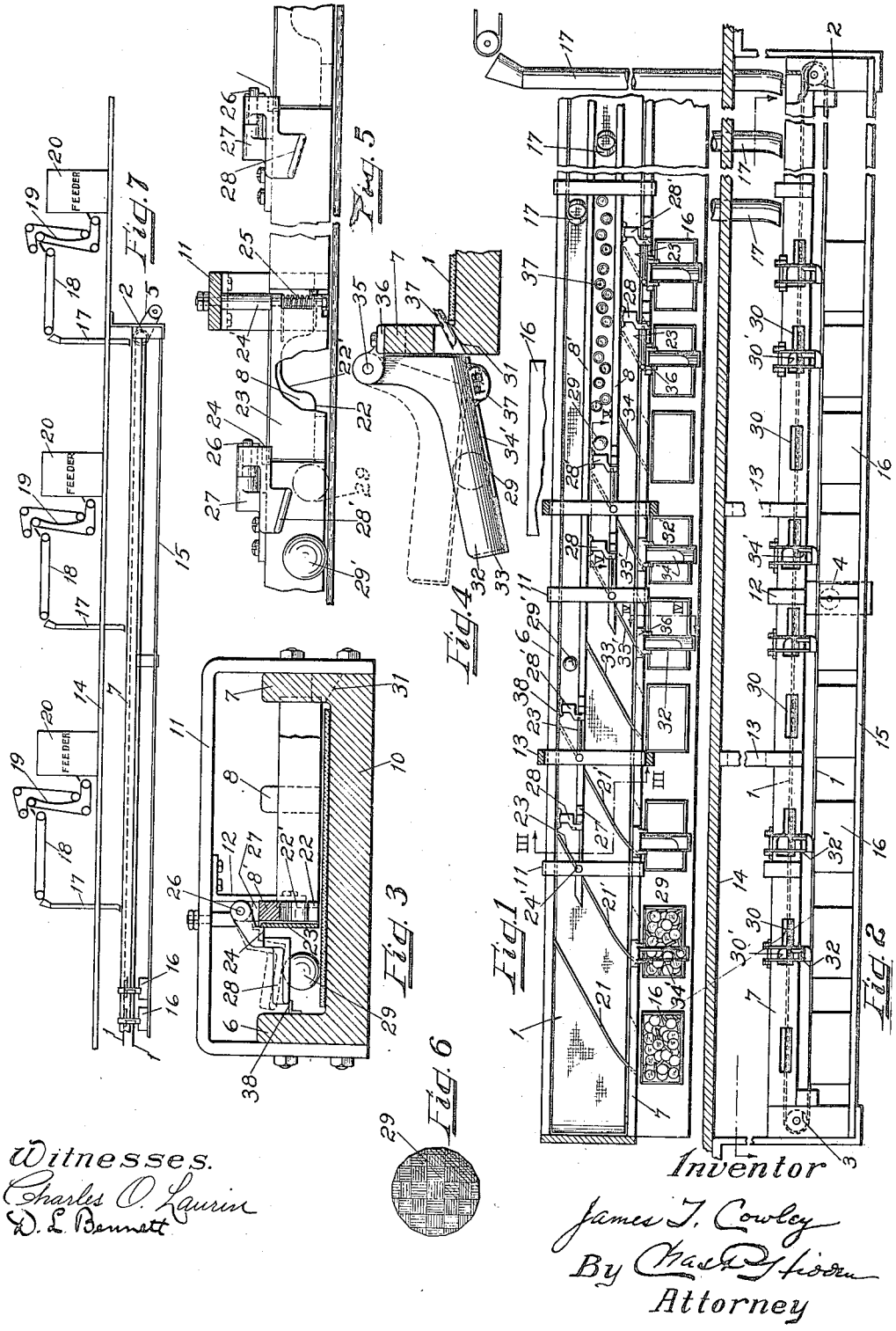
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SELECTIVE DISCHARGE CONVEYER.

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1,225,586. Patented May 8, 1917.



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SELECTIVE DISCHARGE-CONVEYER.

1,225,586. Specification of Letters Patent. Patented May 8, 1917.

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To all whom it may concern:

Be it known that I, JAMES T. COWLEY, a citizen of the United States, residing at Minot, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Selective Discharge-Conveyers, of which the following is a specification.

This invention relates to conveying apparatus in general and more particularly to belt conveyers.

It has for one of its objects the provision of means whereby a series of articles of one class or type may be despatched along a conveyer for delivery to a given point or into a given receptacle and then, at the option of the despatcher or in some other manner if desired and the exigencies of the case should require, to despatch along the conveyer a device which when it arrives at some determined point in its line of travel, will change the setting of a part of the mechanism whereby to cause articles which travel along the conveyer thereafter, to automatically deliver to a different point or into another receptacle.

Another object of the invention is to provide such a construction as that last referred to, in which the despatched setting device is caused to selectively determine the particular point at which the succeeding articles are to be delivered.

The mechanism given by way of exemplification of my invention is especially well adapted to convey or handle bottle stoppers of the class generally known as crown stoppers, but it may of course be used for the conveyance of other and very different articles.

In view of the exemplified construction therefore it is apparent that another of the objects of my invention is to provide a conveyer which shall properly convey crown stoppers or other articles from one level to another to effect the delivery of said crowns or articles after, for example, inspection and sorting of the same, to any one of a plurality of points at which such delivery should be made; while further, if desired, maintaining articles of different classes, separate while in transit.

These and other objects of my invention will be hereinafter referred to and the novel combinations of means and elements whereby said objects may be attained will be more particularly set forth in the claims appended hereto.

In the drawing which forms a part hereof and in which one embodiment of my invention is shown, like reference characters have been used to designate like parts. As I am aware of numerous changes and modifications which may be made in the exemplified construction without departing from the spirit of my invention, and as I am further aware of a wide variety of uses to which said invention may be put, I desire to be limited only by the scope of the claims broadly interpreted in the light of this specification.

Referring to the drawings:—

Figure 1 is a plan view of a conveyer provided with selective discharging devices.

Fig. 2 is a side elevation of said conveyer.

Fig. 3 is an enlarged detail section taken on line III—III of Fig. 1.

Fig. 4 is a similar section taken on line IV—IV of Fig. 1.

Fig. 5 is an enlarged detail section taken on line V—V of Fig. 1.

Fig. 6 is a perspective view of a ball used in connection with the selective unloading devices; and

Fig. 7 is a diagrammatic side elevation of the aforesaid conveyer with the feeding devices therefor.

The preferred conveyer comprises a relatively broad belt or tractor element 1, which passes around rollers or pulleys 2—3 at the respective ends thereof and has its lower side supported at suitable intervals on rollers 4, or the equivalents thereof, in a known manner.

This belt may be driven in any suitable manner, as by means of a belt 5, indicated in Fig. 7. In order to keep separate the product from the several different feeding machines, in addition to the usual sideboards 6—7, I prefer to also provide guide strips or separators 8—8′, which extend longitudinally of the belt and substantially down to the carrying surface thereof, or at least a sufficient distance to prevent the stoppers or like articles from inadvertently slipping from one to another of the compartments so formed.

The side-boards 6 and 7 may, for convenience, be integrally or otherwise connected to the bottom board or support 10 for the upper run of the conveyer belt. At intervals along the length of the conveyer, I prefer to provide yokes 11 from which the guides 8—8′ may be supported, as by means of angle-irons 12; and the entire conveyer can, in turn, be supported to advantage, in some cases, from the ceiling of the room in which it may be placed, as by means of the uprights 13, which are shown attached to the ceiling 14 to which they extend.

The conveyer frame may also support a running board 15, upon which are placed the boxes 16 or other suitable repositories to which the stoppers or other articles are delivered by the conveyer.

The articles may be introduced into the compartments or alleys formed by the side-boards and guides 8—8′ by means of chutes 17, which, as indicated in the lay-out diagrammatically shown in Fig. 7, each extend down through the floor 14 from a sorting table or belt 18; said articles being delivered to the respective sorting belts in the construction shown by way of exemplification, by means of small belt elevators 19, which need not herein be discussed, since the details thereof form no part of the present invention.

In the manufacture of bottle stoppers of the crown type, said stoppers are delivered from a feeder 20 to said elevator 19 and the product from each feeder is inspected and sorted upon the corresponding sorting table or belt 18. In Fig. 1, the lower extremities of the respective chutes 17 are shown in position above the compartments above referred to, to which they respectively correspond. For convenience of illustration and in order to draw the figures as large as possible, the right-hand chute, shown substantially in full in Figs. 2 and 7, is not shown in Fig. 1, the right-hand end of the conveyer being broken away.

In general, it is of the utmost importance that stoppers of different classes or having different decorations printed thereupon, should be kept separate and in the present construction, the nine boxes 16, shown in Figs. 1 and 2, may be regarded as being arranged in groups of 3, each of said groups corresponding to a given stopper feeder 20.

At the left-hand end of the conveyer shown in Fig. 1, is a deflector or obliquely disposed bar 21, the lower edge of which is sufficiently close to the carrying surface of the belt, to insure all stoppers which may encounter said deflector being wiped off into the most left-hand box 16; if it be elected, as is most convenient to place this box on the running board 15, in line with the other boxes, rather than at the extreme left-hand end of the conveyer. The guide 8′ does not extend as far as this deflector and said guide is laterally apertured at 22, as best shown in Fig. 3. This aperture is normally closed by a gate 23, pivoted at 24′ and secured in its closed position by a latch 24. The gate 23 has a tendency to swing to its open position, the instant that this latch is raised, each of said gates 23 being provided with a spring 25, as shown in Fig. 5. This figure, it may be here noted, shows another of these gates, but the details of construction of all of said gates are substantially alike.

Each latch 24 is horizontally pivoted, as at 26 upon a suitable bracket 27, attached, as shown in Fig. 5, to the upper edge of the corresponding guide; and said latch is also provided with an operating finger 28 or 28′, the under-face of which is relatively broad and inclined to the horizontal. Each latch is preferably operated by a ball 29 or 29′ which is delivered to and rides along upon the conveyer belt until it reaches the latch which it is intended to operate, in the manner hereinafter described. At this point, therefore, it may merely be stated that when said ball reaches its latch, the operating finger of the latter is thereby wedged up, which releases the gate 23 from said latch, whereupon the corresponding spring 25 immediately moves said gate to its open position, as indicated to the left in Fig. 1, which causes the ball, after it has cleared the operating finger, to impinge against the open gate and to be rolled thereby toward the guide or board to which such gate is hinged and through an enlargement 22′ or 30′ of the adjacent aperture 22 or 30, as the case may be. In the case of the central run-way or alley, the ball passes successively through an opening 22′ in the guard 8 and an opening 30′ in the side-board 7; being guided toward the latter by one or the other of the ball and stopper deflectors 21′—21′, depending upon the size of the ball. A ball traversing the run-way between the guide 8′ and board 6, after it has opened the gate 23 which it controls and passed through the corresponding opening 22′, will then encounter a deflector 21′ and be rolled thereby toward the adjacent opening 30′ in the side-board 7 and down a slight incline 31, as indicated in Fig. 4, into a chute 32 or 32′, the end 33 of which is preferably closed, so as to retain the ball in position therein. Preferably, the left-hand side of each of these chutes, as viewed in Fig. 2, is substantially perpendicular, while the right-hand side curves around to afford the requisite support for the ball, to permit it to roll over a slot 34′ in the bottom of the chute and through which some of the stoppers pass into the box beneath, while the ball is thus not free to drop into the box of stoppers, which might result in its loss; but is held in the lower end of the chute from which it

may be conveniently removed by the operator.

The fingers 28′ differ slightly from those designated 28, in that the former do not extend down as far toward the carrying surface of the belt as the latter. As a result, a small ball, such as that designated 29 is free to pass under any given finger 28′ without actuating the same, so that the gate 23 corresponding to said finger, remains latched, whereas when this same ball thereafter encounters a finger 28, the latter will be actuated, the corresponding gate will be opened, and the ball will preferably be caused to run into a chute or hopper 32 in the manner above described. A larger ball 29′, will however actuate the finger 28′. The series of graduated balls or equivalent gate controlling devices may of course comprise any number, the latch fingers being graduated in correspondence; but for convenience of illustration the said series in the herein described embodiment of my invention comprises but two balls 29—29′.

The chutes or hoppers 32—32′ which receive the balls may be of different sizes as shown; but the essential feature of this detail of construction if used as shown, is that the slot 34′ in each chute shall in no case be wider than the ball intended for such chute.

In order that the ball, no matter of which size, shall not roll longitudinally of the belt when being carried thereupon, I prefer to facet said ball, as shown in Fig. 6. The facets are not pronounced enough to prevent the ball from rolling into its chute when it arrives thereat; but they should be of sufficient extent to enable a ball which is traveling through a given compartment in advance of a given lot of stoppers, to maintain its lead and not roll back upon the latter; which might result in causing a mixture of stoppers in a given box.

At the left-hand end of the conveyer, therefore, we have now considered the deflectors 21—21′—21′, which respectively shunt the stoppers into the three left-hand boxes 16. Moving toward the right from these deflectors is a similar group of deflectors, the longer one of which has been designated 33 and the two shorter ones 33′. Their function is of course similarly to deflect the stoppers from the belt into the respective boxes in the next group of the same, and the means for selectively delivering said stoppers from the middle compartment or alley, between the guides 8 and 8′, is substantially the same in all respects as in the case of those above described.

The third compartment or alley between the guide 8 and the side-board 7 has the discharge of stoppers therefrom similarly controlled; but in this case but one fixed deflector is needed, this being the deflector 34 which shifts the stoppers into the box corresponding thereto, when the run-way or alley is open, or in other words when neither of the gates 23 in this alley are open.

Obviously, these gates themselves constitute deflecting means when one or the other of them is disposed in its open position and owing to the fact that the compartment is located along that edge of the belt most adjacent to the boxes, there is no necessity for providing such auxiliary deflectors as those designated 33′.

For convenience in removing the boxes from beneath the chute 32, I prefer to hinge the latter as at 35 to brackets 36, which are attached to the upper edge of the side-board 7 in any suitable manner. By making the left-hand side of each of these chutes vertical, any tendency for stoppers to cling to the side of the chute by reason of their velocity and thereby to deliver into the end of the latter instead of into the box, is substantially obviated. In Fig. 4 a stopper 37 is shown in the act of passing through the slot 34′, while the ball 29 in advance of this stopper is shown rolling down toward the closed end of the chute.

The balls may be collected from the chutes in any desired manner preparatory to sending them back to the sorting table level; but since there are but a limited number of these balls in use at any given time, it will usually be found quite satisfactory to close the ends of each chute as at 33 and to permit the balls delivered to such chutes to remain therein until an attendant can collect them for return to the inspector or inspectors.

The operation of the system will now be described:

Assuming that each of the three feeders shown in Fig. 7 is turning out or delivering stoppers to the corresponding elevator 19. As all of the gates 23 will have been latched back by the operator or attendant stationed at the selective delivery conveyer, the stoppers from the left-hand feeder, shown in Fig. 7, will be delivered to the alley or run-way between the guide 8′ and the side-board 6, through the corresponding chute 17, after said stoppers have been inspected upon the belt 18. Said stoppers will thereafter be automatically removed from the conveyer by the deflector 21 and will fall into the left-hand box 16.

In like manner the next feeder to the right, will deliver stoppers, which after inspection, will descend the intermediate chute 17 and will pass thence through the middle run-way or alley until they are removed by the deflector 33 and fall into the fourth receptacle or box from the left-hand end of the conveyer. The right-hand feeder will correspondingly supply stoppers which, after delivery through the corresponding

chute 17, will traverse the run-way nearest the line of boxes or receptacles, until they encounter the deflector 34, which will unload said stoppers into the third box from the right-hand end of the conveyer section shown in Fig. 1.

The inspector stationed at any given belt 18 may, if desired, be advised by the operator of the corresponding feeder when a given number of stoppers have been delivered to the belt 18; or said inspector may even count said stoppers. If the count is controlled by the feeder operator, then it will usually be preferable for him to shut down the feeder temporarily, in order to form a space or gap in the line of stoppers passing up the elevator, to warn the inspector that the end of the tally has been reached and in order also to give him time within which to act.

As soon as such a gap is presented to him, the inspector, having usually also been notified of the completion of the order which is to go into a certain box, thereupon deposits upon the belt 18 a ball 29, which rides along in the space between the stoppers already delivered and those which follow from the feeder and which belong to a new lot, until said ball reaches the chute 17, down which it falls, to land in the corresponding alley or run-way of the selective delivery conveyer. The belt 1 then carries this ball along and under the latch finger 28′, beneath which it freely passes; but when said ball has been carried by the belt beneath the finger 28, the latter is thereby raised out of engagement with its stop 38, releasing the door or gate 23 from the corresponding latch 24 and permitting the spring 25 of said door to move the latter to its open position.

The ball will then be shunted off into its chute in the manner above described and the succeeding stoppers will follow the ball toward the chute but will pass downwardly through the opening 34′ therein or in some cases clear of the chute altogether, by passing down through the portion of the exit opening, designated 30, directly into the box.

Thus by merely placing a ball or some equivalent device upon the belt 18, the inspector or operator at this remote point is able, at will, to effect the discharge of stoppers into one box or another.

When he desires to fill the third box from the left, in the group of boxes corresponding to said inspector, the larger ball 29′ is used in lieu of the small one 29.

The stoppers in the boxes in each group have thus all been passed upon by the inspector corresponding to such group and such boxes may be tagged or stamped with the number of such inspector so that if they are not right in number or in quality, the lax work can be promptly traced.

It frequently happens also that when a given lot of stoppers has been put through a feeder, the number being complete, it is then desired to change the class of stoppers, so that the feeder will thereafter supply to the inspector stoppers with different decorations or perhaps kinds of shives of cork. In this case the proceeding is the same and the dropping of a selective ball upon the belt between the lots of stoppers determines the box or receptacle into which the new lot is to deliver.

Each of the inspectors upon the upper floor therefore has practically absolute control of the delivery of stoppers passed by them, into any one of a number of boxes in a group of the same; it being understood of course that when a box is filled, or reasonably soon thereafter, the attendant at the belt 1, removes the filled box and replaces it with an empty one; preferably at the same time resetting the now idle switch or gate 23 which controlled the delivery of stoppers to said filled box, by relatching it under its pawl. At this time or indeed as soon as a ball delivers to its chute, it may be removed therefrom and returned to the upper floor.

Having thus described my invention what I claim is:

1. Selective-discharge conveying apparatus comprising means for conveying articles along a determined path, means for unloading said articles as they arrive at a point in said path, a controlling device to be loaded upon said conveying means, said conveying means after being loaded with said device carrying the latter lengthwise of said path, and means, controlled by said device upon its arrival at a pre-determined point in its line of travel, for unloading an article carried by said conveying means, at a point other than that aforesaid.

2. Conveying apparatus comprising means for conveying articles along a determined path, in combination with means for determining the point of discharge of an article traveling along said path, said determining means including a controlling device to be moved lengthwise of said path by a part of said conveying means and applicable to and removable from the latter and means, controlled by said device upon its arrival at a pre-determined point in its path of travel, for unloading said article from said conveying means.

3. Conveying apparatus comprising means for conveying articles along a determined path, in combination with means for determining the stopping point of an article traveling along said path, said determining means including a controlling device to be moved lengthwise of said path by a part of said conveying means and applicable to and removable from the latter and movable means, controlled by said device upon its

arrival at a pre-determined point in its path of travel, to engage said article and interrupt its further progress along said path.

4. Conveying apparatus comprising means for conveying articles along a determined path, in combination with means for determining the stopping point of an article traveling along said path, said determining means including a controlling device to be moved lengthwise of said path by a part of said conveying means and applicable to and removable from the latter and means, controlled by said device upon its arrival at a pre-determined point in its path of travel, to engage said article and interrupt its further progress along said path.

5. Conveying apparatus comprising means for conveying articles along a determined path, in combination with means for determining the point at which articles traveling along said path cease to travel therealong, said determining means including a controlling device to be conveyed along said path by said conveying means and applicable to and removable from the latter and means to engage and automatically prevent further travel of said device along said path and co-acting therewith to interrupt the movement along said path of articles, following said device.

6. Conveying apparatus comprising means for conveying articles along a determined path, in combination with means for determining the point at which articles traveling along said path cease to travel therealong, said determining means including a controlling device to be conveyed along said path by said conveying means and applicable to and removable from the latter and means, a controlling part of which is in turn controlled by said device upon its arrival at said part, for interrupting the movement of articles following said device along said path, upon their arrival at said last mentioned means.

7. Conveying apparatus comprising means for conveying articles along a determined path, in combination with means for determining the point at which articles traveling along said path shall be unloaded from said conveying means, said determining means including a controlling device to be carried along by said conveying means and applicable to and removable from the latter and means to co-act with said device to remove from said conveying means articles following said device and deposit said articles at a point determined by the location of said last mentioned means along said path.

8. Conveying apparatus comprising a conveying belt, means to co-act therewith to form a run-way through which articles travel, means to unload said articles from said conveyer, means to actuate said unloading means to operatively dispose the same, means to control said actuating means, and a device to travel through said run-way upon said belt, for actuating said controlling means to cause said unloading means to be set to unload articles traveling along said run-way behind said device.

9. Conveying apparatus comprising a conveying belt, means to co-act therewith to form a run-way through which articles travel, means to unload said articles from said conveyer, means to actuate said unloading means to operatively dispose the same, means to control said actuating means, and a device to travel along with said belt, for actuating said controlling means to cause said unloading means to be set to unload articles traveling along said run-way behind said device.

10. Conveying apparatus comprising a conveying belt, means to co-act therewith to form a run-way through which articles travel propelled by said belt, means to remove articles from said belt, and a device to travel through said run-way upon said belt like the articles carried by the latter and to co-act with said removing means to set the latter to remove from said belt articles traveling thereupon behind said device.

11. Conveying apparatus comprising a conveying belt, means to co-act therewith to form a run-way through which articles travel propelled by said belt, means to remove articles from said belt, a device to travel through said run-way upon said belt like the articles carried by the latter and to co-act with said removing means to set the latter to remove from said belt articles traveling thereupon behind said device, and means to separate said device from said articles to prevent said device becoming inadvertently mixed with the latter.

12. Conveying apparatus comprising a device for conveying articles, and mechanism, a part of which is normally stationarily located along the line of said conveying device and another part of which travels along said device in direct contact therewith substantially in the same fashion and in the same path as do said articles, for determining the disposition of the latter, said parts being engageable the one with the other and becoming operative only when the first of said parts has traveled along said conveying device into engagement with the second of the same.

13. Conveying apparatus comprising a device for conveying articles loosely therein, and mechanism, a correspondingly loose part of which travels along the line of said conveying device with any one of a plurality of its sides foremost and a second part of which is thereby caused to co-act with said first part, for determining the disposition of articles traveling along said device

in a pre-determined relation to said traveling part of said mechanism.

14. The combination of a plurality of conveying devices, a first of which devices delivers articles carried thereby to a second of said devices, means the setting of which controls the progress of said articles along said second device, and means initially loaded into said first device in advance but otherwise independently of said articles, to determine the setting of said first mentioned means to control said progress of said articles along said second device.

15. The combination of a plurality of conveying devices, a first of which devices delivers articles carried thereby to a second of said devices, means the setting of which controls the progress of said articles along said second device, and means, initially loaded into said first device and delivered by the latter to said second device in advance but otherwise independently of the delivery of said articles from said first to said second device, to determine the setting of said first mentioned means to control said progress of said articles along said second device.

16. The combination of a plurality of conveying devices, a first of which devices delivers articles carried thereby to a second of said devices, said first device having a continuously moving tractor part, means the setting of which controls the progress of said articles along said second device, and means to be operatively disposed with respect to and thereafter to travel along with said tractor part of said first conveying device, to determine, in combination with said second device, the setting and the time of setting of said first mentioned means.

17. The combination of a plurality of conveying devices having tractor parts, a first of which devices delivers articles carried thereby to a second of said devices, means the setting of which controls the progress of said articles along said second device, and means to be operatively disposed upon said first conveyer and moved along therewith and thereafter along with the tractor part of said second device, to determine the setting and the time of setting of said first mentioned means.

18. The combination of a plurality of conveying devices, a first of which devices delivers an article carried thereby to a second of said devices, and mechanism, a part of which initially travels along said first device, for determining the disposition of said article by said second device after said article has been delivered to the latter.

19. The combination of a plurality of conveying devices, a first of which devices delivers an article carried thereby to a second of said devices, said second device having a tractor element, and mechanism, a part of which initially travels along said first device and is then delivered to the tractor element of said second device, for determining the disposition of said article by said second device after said article has been delivered to the latter.

20. The combination of means for conveying articles along a determined path, with mechanism for controlling the travel of said articles, said mechanism including a plurality of selective devices to travel lengthwise of said conveying means and adjustable article controlling means the setting of which for the control of said articles is determined by said selective devices, said selective devices being different one from another and said article controlling means having a plurality of parts each of which respectively corresponds to and is normally actuated by some particular one of said selective devices.

21. Conveying apparatus comprising means for conveying articles along a determined path, means for unloading said articles as they arrive at a pre-determined one of a plurality of unloading points along said path, a plurality of selective controlling devices, each to be loaded upon said conveying means for conveyance thereby toward said unloading means, and means, controlled by said devices for setting said unloading means.

22. Conveying apparatus comprising means for conveying articles along a determined path, in combination with means for determining the point of discharge of articles traveling along said path, said determining means including a plurality of controlling devices, each movable lengthwise of said path by a part of said conveying means and applicable to and removable from the latter and means selectively controlled by said devices upon their arrival at predetermined points along said path, for unloading said articles from said conveying means.

23. Conveying apparatus comprising means for conveying articles along a determined path, in combination with means for controlling the travel of said articles along said path, and selective means to travel along said path and applicable to and removable from said conveying means, for selectively setting said determining means.

24. Conveying apparatus comprising a conveying belt, means to co-act therewith to form a run-way through which articles travel propelled by said belt, means to remove articles from said belt, and a plurality of selective devices to travel through said run-way upon said belt like the articles carried by the latter and to co-act with said removing means to selectively set the latter to remove from said belt articles traveling thereupon behind said devices.

25. Conveying apparatus comprising a device for conveying articles, and mechanism, including a plurality of selective ele-

ments, which travel along the line of said conveying device, and a corresponding number of article controlling means which are thereby caused to co-act with said selective elements, to determine the disposition of articles traveling along said device in pre-determined relationships to said elements.

26. The combination of a plurality of conveying devices, a first of which devices delivers articles carried thereby to a second of said devices, a plurality of gates the setting of which controls the progress of said articles along said second device, and selective means, initially loaded on said first device, for determining the setting of a particular one of said gates to control said progress of said articles along said second device.

27. The combination of a plurality of conveying devices, having tractor parts, a first of which devices delivers articles carried thereby to a second of said devices, a plurality of gates the setting of which controls the progress of said articles along said second device, and selective means, operatively adjustable upon said first conveying device and movable along therewith and thereafter along with the tractor part of said second device, to determine the setting and the time of the setting of a predetermined one of said gates.

28. The combination of a conveying device having a tractor part, means the setting of which controls the progress of articles along said conveying device, and selective means, loaded upon said device and propelled therealong by said tractor part, for selectively setting said controlling means.

29. Conveying apparatus comprising a device for conveying articles, and mechanism, a substantially ball-shaped part of which travels along the line of said conveying device and a second part of which is thereby caused to co-act with said ball-shaped part, for determining the disposition of articles traveling along said device in a pre-determined relation to said ball-shaped part of said mechanism.

In testimony whereof I have affixed my signature, in the presence of two witnesses.

JAMES T. COWLEY.

Witnesses:

ALICE G. CONWAY,

DAISY L. BENNETT.