April 17, 1951 W. COLBURN ET AL 2,548,948

APPARATUS FOR TREATING ARTICLES

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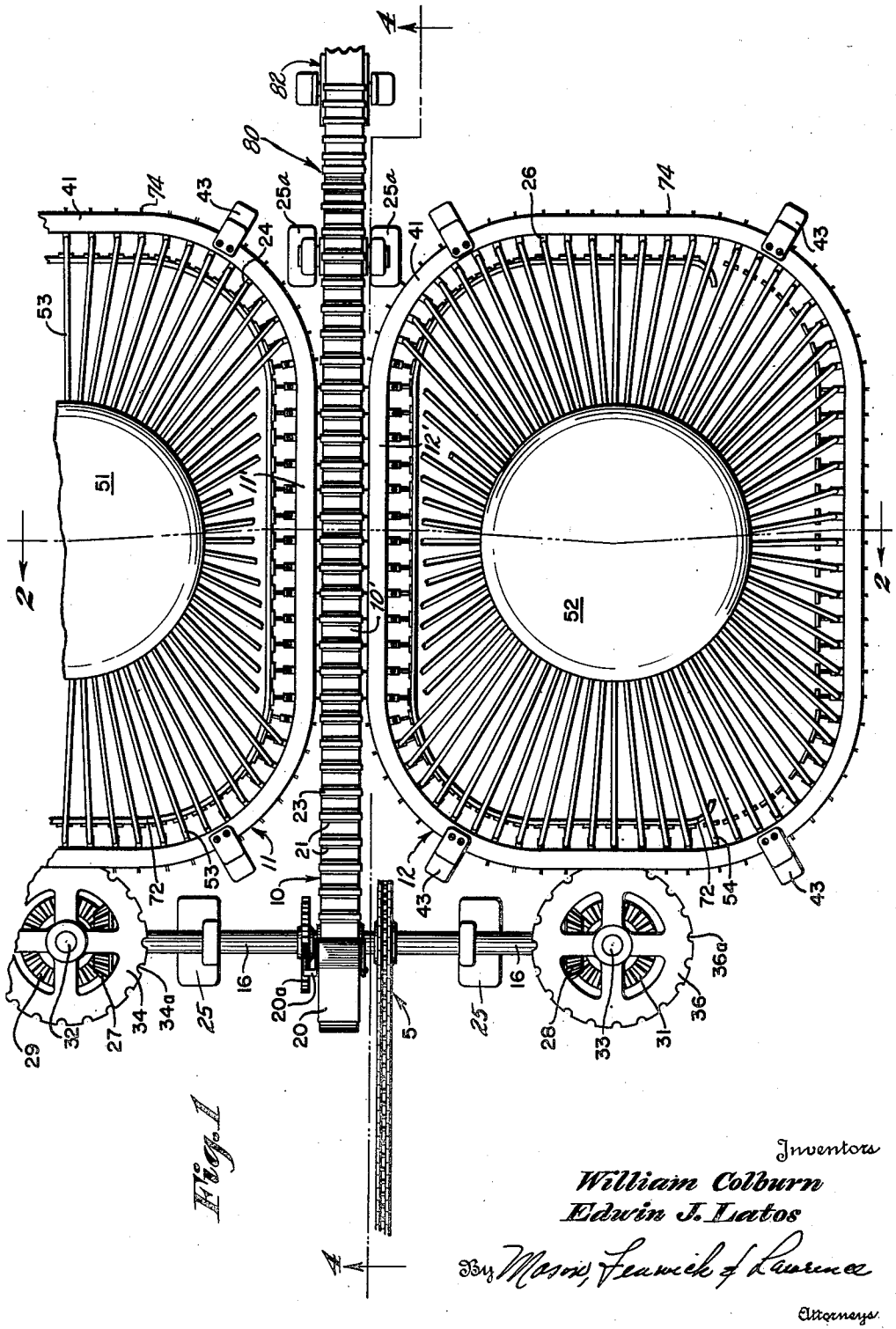


Fig. 1

Inventors
William Colburn
Edwin J. Latos
By Mason, Fenwick & Lawrence
Attorneys

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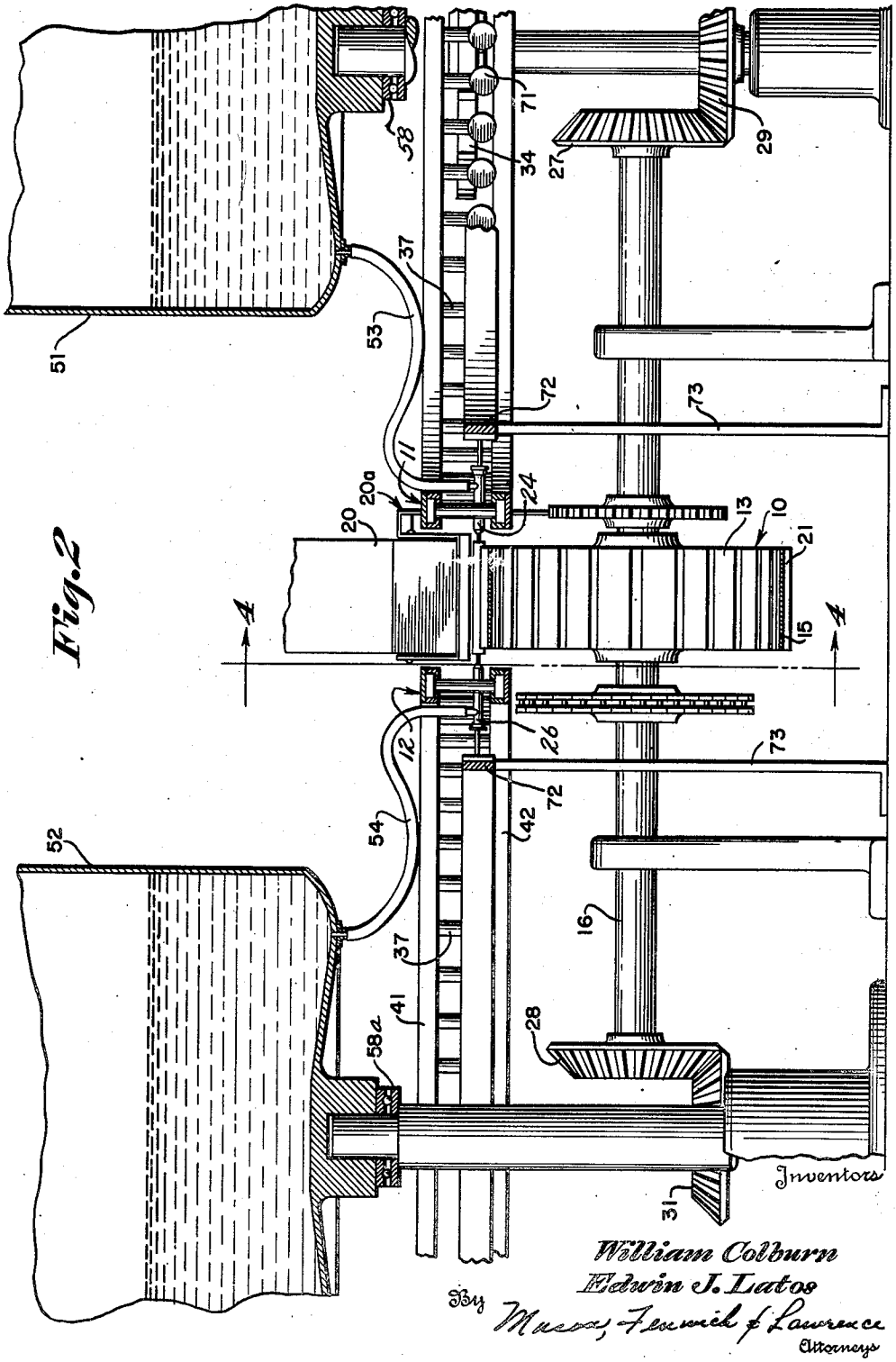


Fig. 2

Inventors
William Colburn
Edwin J. Latos
By Mason, Fenwick & Lawrence
Attorneys

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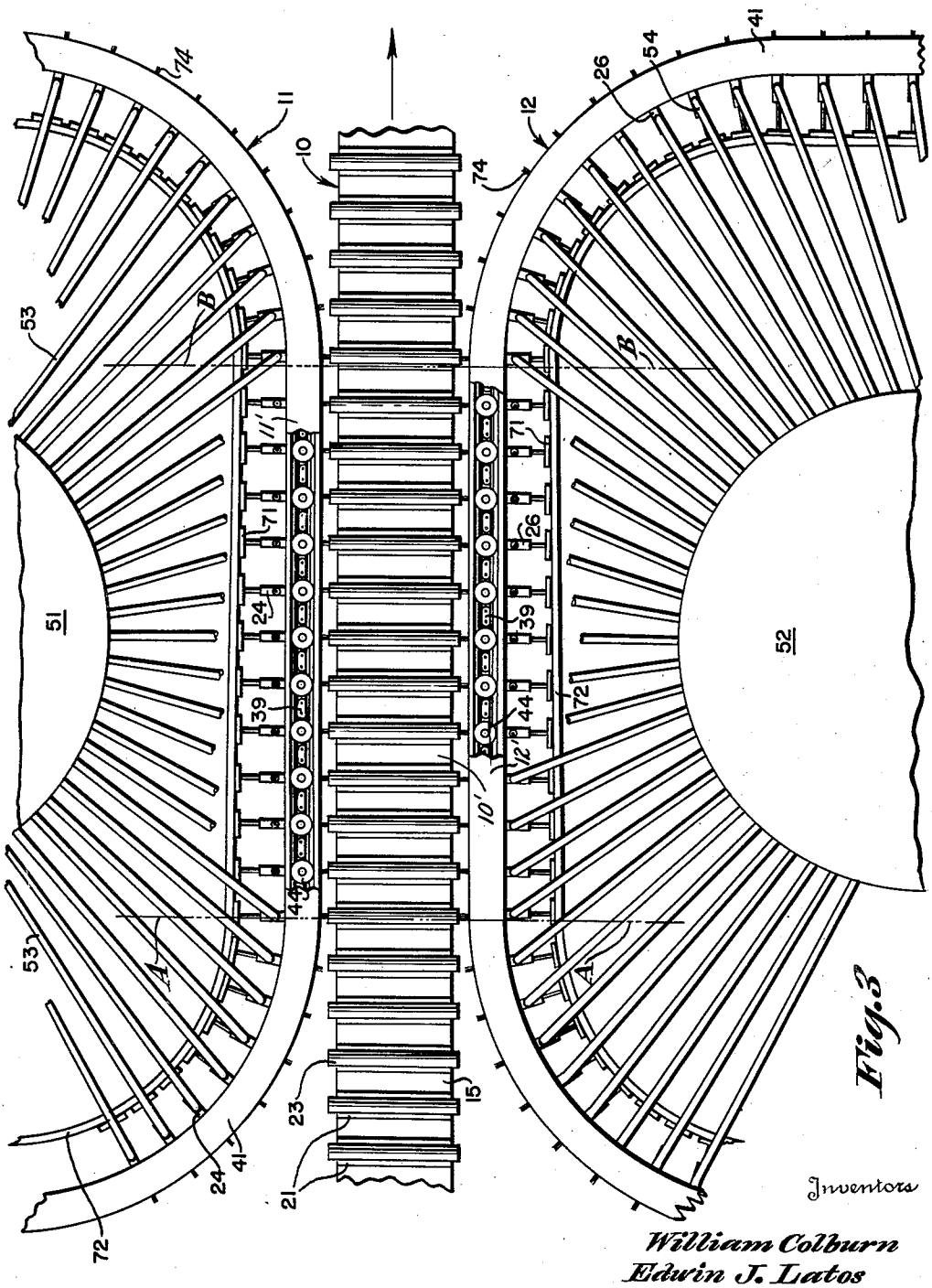


Fig. 3

Inventors
William Colburn
Edwin J. Latos
By Mason, Fenwick & Lawrence
Attorneys

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APPARATUS FOR TREATING ARTICLES

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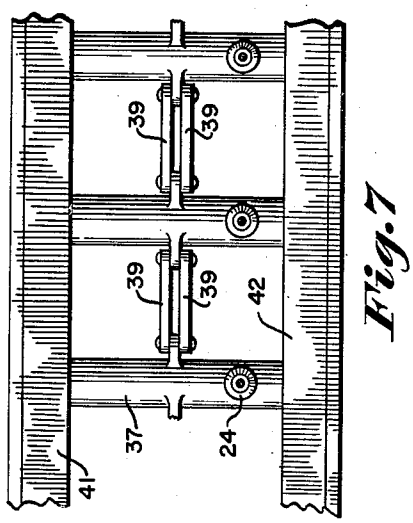


Fig. 7

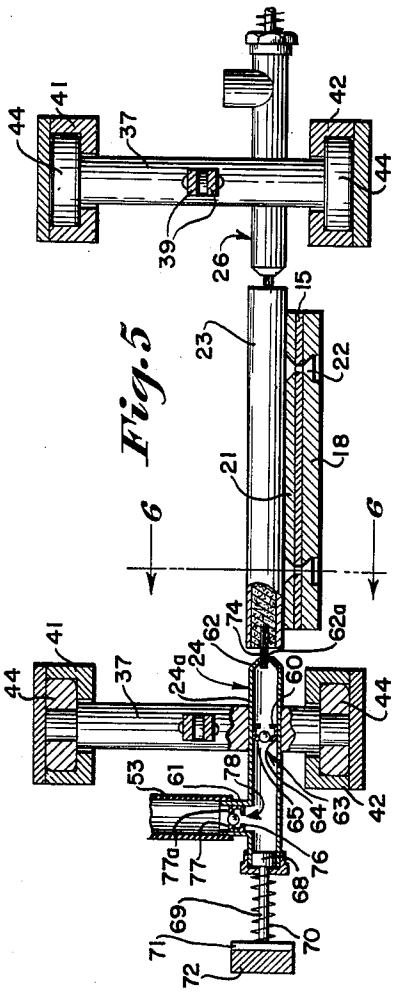


Fig. 5

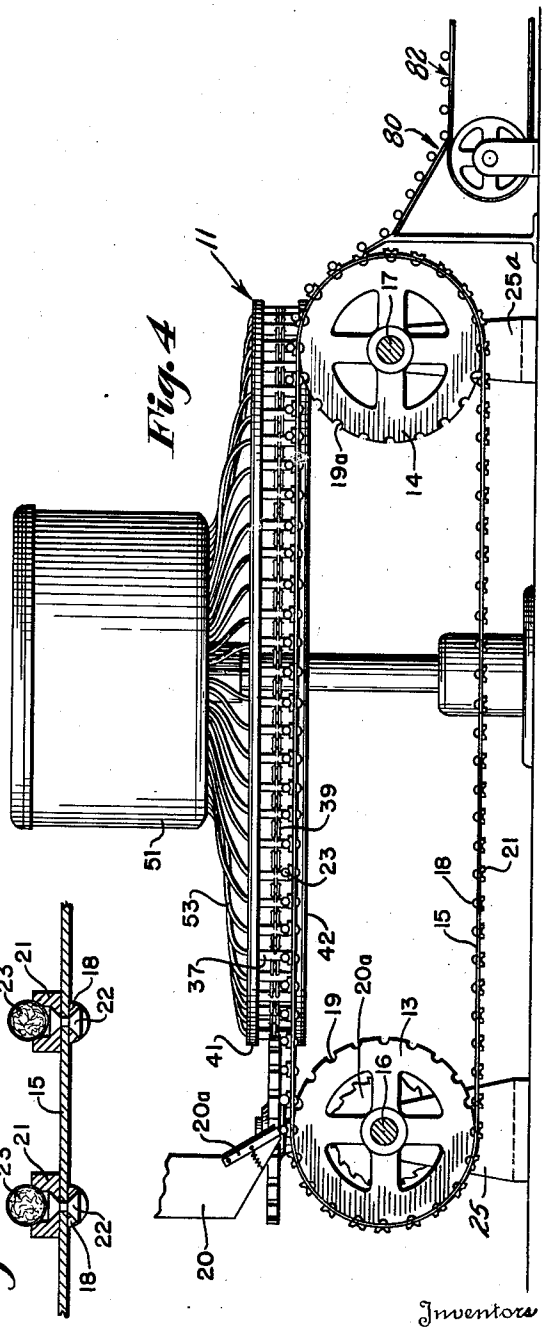


Fig. 4

Fig. 6

Inventors

William Colburn

Edwin J. Latos

By Mason, Fenwick & Lawrence

Attorneys

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UNITED STATES PATENT OFFICE

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APPARATUS FOR TREATING ARTICLES

William Colburn and Edwin J. Latos, Chicago, Ill., assignors to Grant Advertising Agency, Inc., Dallas, Tex., a corporation of Texas

Application August 16, 1946, Serial No. 691,160

4 Claims. (Cl. 131—88)

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This invention relates to apparatus for treating tobacco products, such as cigarettes, and particularly for applying a liquid solution to the ends of the cigarettes to bind the tobacco therein.

It is well known that the tendency for tobacco to fall out of the end of a cigarette is very annoying. Heretofore various attempts have been made to eliminate this objectionable feature and various materials have been used. However, the added operation of applying this material adds to the cost of the final product. It is common in the prior art to dip or spray the cigarettes with a treating material. This is not entirely satisfactory because of the cost involved and the tendency to mar or change the characteristics of the ends of the cigarette.

One of the primary objects of the present invention is to provide an improved apparatus for continuously and economically treating the ends of the cigarette with a suitable liquid material which will bind the particles or shreds of the tobacco together to prevent them from falling out of the ends.

Another object is to provide improved apparatus which will apply a treating solution to the cigarettes while the cigarettes are continuously moved on a conveyor.

Another object is to provide improved apparatus which will apply the treating solution to approximately the central portion of the cigarette whereby it will be evenly distributed throughout the ends thereof without marring or discoloring the paper.

A still further object is to provide an improved apparatus particularly adapted for treating light articles such as cigarettes, in which both ends of the cigarettes are engaged simultaneously by fluid treating means in such a way that the treating means cooperate to maintain the light weight cigarettes in fixed positions on the conveyor while being carried by the latter.

A still further object is to provide an improved apparatus for applying a predetermined amount of treating solution to the ends of the cigarette as the cigarette is moved continuously along a conveyor mechanism.

Other and further objects will be readily apparent from the following description when considered in connection with the accompanying drawings, illustrating an embodiment of the invention, and in which:

Figure 1 is a plan view of apparatus made in accordance with the invention;

Figure 2 is an elevation, partially in cross section, of the apparatus shown in Figure 1;

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Figure 3 is an enlarged partial plan view of the apparatus shown in Figure 1;

Figure 4 is a section in elevation on line 4—4 of Figure 1;

Figure 5 is a partial detailed section of Figure 2 showing an enlarged view of the fluid dispensing means for applying fluid to the ends of the cigarettes;

Figure 6 is an enlarged partial section in elevation on line 6—6 of Figure 5; and

Figure 7 is a partial side elevation showing the merry-go-round type conveyor mechanisms which carry the fluid dispensing means.

As shown in the drawings, apparatus made in accordance with the present invention comprises a conveyor 10 which is adapted to operate in a vertical plane, and two merry-go-round type conveyors 11 and 12 on the opposite sides of the conveyor 10. The conveyor 10 is adapted to carry articles to be treated, in the present instance cigarettes. The conveyors 11 and 12 operate in a horizontal plane and carry fluid dispensing means adapted to apply fluid to the ends of the cigarettes as will appear more clearly from the following description.

The conveyor 10 may comprise a belt 15 which may be made of substantially non-stretchable material such as leather, reinforced rubber or steel which runs over sprockets 13 and 14 fixed, respectively, to horizontal shafts 16 and 17. The respective shafts are suitably journaled in supports 25, 25a, as shown.

A plurality of transverse members 18 which are equally spaced on the belt 15 are adapted to engage notches or recesses 19, 19a in the sprockets 13 and 14, respectively. Transverse channel members 21 are arranged on the belt 15 opposite the transverse bars 18. Suitable rivets 22 extend through the bars 18 and the channel members 21. The longitudinal channels of the channel members 21 are adapted to receive and carry cigarettes 23 which are to be treated. The cigarettes are delivered to the channel members 21 through a hopper 20 and dispensing mechanism 20a, which is well known in the art and constitutes no part of the present invention.

As will be seen, particularly in Figures 1, 3 and 4, the conveyors 10, 11 and 12 have straight parallel reaches in juxtaposed relation throughout a portion of their travel between the points A and B in Fig. 3. The arrangement of the conveyors is such that the conveyors 11 and 12 move in paths approaching the conveyor 10 at the beginning of the straight reaches, indicated at point A and receding from the conveyor 10 at the end of

the reaches indicated by the point B. For reasons which will hereinafter become readily apparent, means are provided for driving the conveyors 10, 11 and 12 in synchronism so that the fluid treating means 24 and 26 carried by the conveyors 11 and 12 respectively, will approach and engage simultaneously the opposite ends of the cigarettes 23 carried by the conveyor 10.

To this end, the shaft 16 has suitable beveled gears 27 and 28 fixed to the opposite ends thereof. Beveled gears 27 and 28 are adapted to engage and mesh with beveled gears 29 and 31, respectively, which are fixed to vertical shafts 32 and 33, respectively. Sprockets 34 and 36, respectively, are fixed to the vertical shafts 32 and 33, respectively. The sprocket 34 has notches or recesses 34a, which are adapted to engage the cross members 37 of the conveyor 11 to drive the latter and likewise sprocket 36 has notches or recesses 36a adapted to engage corresponding cross members of the conveyor 12 to drive the latter. It will be readily apparent that the spacing of the bars 37 of the conveyor 11, and the corresponding bars of conveyor 12 must be exactly the same as the spacing of the transverse channel members 21 on the belt 15 so that each one of the fluid dispensing devices 24, 26 will engage and move in synchronism with the cigarettes 23 carried by the channel members 21. It will be obvious that the shaft 16 can be driven by any suitable prime mover or source of power, not shown, through the chain and sprocket gear mechanism 5.

Conveyors 11 and 12 are mirror images of each other, one arranged on one side of conveyor 10 and the other on the other side thereof. Therefore the description of one will suffice. As viewed in Figure 3, the conveyor 11 moves in a counterclockwise direction and conveyor 12 moves in a clockwise direction so that the straight reaches 11' and 12', respectively of both conveyors move in the same direction as the straight reach 10' of conveyor 10, as indicated by the arrow.

The conveyor 11 comprises an upper track 41 and a lower track 42, which are identical except that they are in reversed position. These tracks may be carried by any suitable supports 43. As clearly shown in the drawings, these tracks are substantially C-shaped in cross section. To permit the assembly of the conveying mechanism, the tracks are split longitudinally in such manner as to eliminate one of the overhanging edges. The conveyors, per se, comprise a plurality of bars 37 which have rollers 44 journaled upon the opposite ends thereof and which engage the inner surfaces of the channels of the C-shaped tracks. These bars are pivotally connected together by links 39. The tension on the links 39 will so position the bars 37 that the fluid dispensing means 24, 26 which are carried by the bars 37, will be maintained substantially at right angles to the axis of movement of the conveyor during all positions of the latter.

The fluid dispensing devices 24, 26 are adapted to be supplied with suitable treating fluid from containers or tanks 51, 52, respectively, which are pivotally supported on the non-friction bearings 58, 58a, associated with the conveyors 11, 12, respectively, as shown in Figure 2. Suitable flexible conduits 53, 54 connect the containers 51, 52 with the individual fluid dispensing means 24, 26, respectively. It will be readily apparent that the containers or tanks 51, 52 will be rotated with the conveyors 11, 12 by means of the flexible conduits 53, 54 respectively.

The construction and operation of the individual fluid dispensing means 24, 26 are identical and therefore the description of one will suffice. Fluid dispensing device 24 comprises a cylinder 24a which is provided with a piston 68 and a reduced conical end 62 terminating in a discharge orifice 62a. The discharge orifice 62a has a plurality of bristles 74 held in the end thereof by frictional engagement. These bristles are adapted to engage and slightly penetrate the ends of the cigarettes as the conveyors 11 and 12 approach the conveyor 10 at the beginning of the straight reaches thereof, at the point A, the penetration of the ends of the cigarettes by the bristles serving to maintain the cigarettes in proper treating relation relative to the fluid dispensing means 24, 26. The small spaces or interstices between the bristles serve as very small passages for conveying treating fluid to the ends of the cigarettes 23. The cylinder 24a is provided with an outwardly opening check valve 63 which is provided with stops 60 to limit the outward movement thereof. A seat 64 for the check valve is carried by an annular press fit insert 65 inside the cylinder 24a. A suitable inlet 61 to which each of the flexible conduits 53 is connected is provided with an inwardly opening check valve 78. The check valve has suitable stop means 76 to limit its inward movement in the opening position and has a valve seat 77 carried by an annular press fit insert 77a. The piston 68 is attached to a piston rod 69 on the end of which is carried a guide shoe 71. A suitable compression spring 70 is adapted resiliently to force the guide shoe 71 against a suitable guide rail 72 which is positioned along the straight reach of the conveyor 10. As shown in Figure 3, the guide rail 72 is inclined toward the axis of the conveyor 10 from point A to point B. The movement of the straight reaches of the conveyors 10, 11 and 12, as shown in Figures 1 and 3, is in the direction of the arrow in Figure 3. Therefore, as the conveyors move along their straight reaches, the guide shoe 71 engaging the guide rail 72, is continuously and slowly moved to the right to force the piston 68 toward the discharge orifice 62a of the fluid dispensing device 24, to thereby force liquid through the spaces between the bristles 74 into the ends of the cigarettes 23. It will be apparent that during the movement of the piston 68 toward the discharge orifice 62a by the guide rail 72 the check valve 78 will move against its seat 77 to prevent the liquid from flowing back into the conduit 53 and the check valve 63 will move from its seat 64 against the stops 60 to permit the fluid to be discharged through the discharge orifice 62a. As the conveyors 11 and 12 start into the curved portion of the track beyond the point B on the straight reaches of the conveyors, it will be apparent that the bristles 74 will be gradually retracted from the ends of the cigarettes 23. Likewise, as the guide shoe 71 moves beyond the end of the guide rail 72, the spring 70 will urge return movement of the piston rod 69 and piston 68 back to its original position, thus creating a suction through the inlet 61 to unseat the inwardly opening check valve 78 and fill the cylinder 24a with a predetermined amount of fluid drawn through the conduit 53. As the conveyors continue to move each of the channel members 21 will receive a cigarette 23 from the hopper 20, the ends of which cigarette will be subsequently engaged and treated by the fluid dispensing devices 24, 26 in a continuous succession. Suitable additional conveyor means may be

provided in association with the conveyor 10 and beyond the point B on the straight reach 10' thereof to convey the treated cigarettes to suitable packaging machines and the like, and in the preferred form illustrated comprises a suitable chute 80 and additional endless conveyor assembly 82.

From the foregoing description it will be apparent that the invention provides an improved apparatus for treating light weight articles such as cigarettes, in which the articles are carried on a conveyor moving in a predetermined path, while fluid treating devices are moved in paths so that they engage, treat and then recede from the opposite ends of the articles while the latter are continuously moving.

Although the invention has been described in considerable detail, it will be apparent to those skilled in the art that many variations are possible without departing from the inventive concept. It is therefore desired that the invention not be limited except insofar as is made necessary by the prior art and by the appended claims.

Having thus described the invention, what is claimed is:

1. Apparatus of the type described, comprising a conveyor adapted to operate in a vertical plane and having a straight horizontal reach, a second endless conveyor on one side of said straight reach of said first conveyor, and a third endless conveyor on the other side of said first conveyor, each of said second and third conveyors lying wholly in a horizontal plane and having, respectively, straight reaches in juxtaposition to the horizontal reach of said first conveyor, fluid dispensing means carried by said second and third conveyors, each of said second and third conveyors adapted to move in curved paths in the horizontal plane of said straight reach of said first conveyor and adjacent the ends of said straight reach of said first conveyor, and means for operating said conveyors in synchronism whereby when said conveyors are operated said fluid dispensing means will approach the axis of movement of said first conveyor and will move in synchronism with the latter throughout the extent of said straight reach and will recede from the axis of said first conveyor at the end of said straight reach.

2. Apparatus of the type described, comprising a conveyor adapted to carry light weight cylindrical articles to be treated, such as cigarettes, a second conveyor, each of said conveyors having a substantially straight reach, said reaches being parallel to each other, the relative position of said conveyors being such that the latter approach each other adjacent one end of said straight reaches, and means carried by said second conveyor for engaging and treating said articles as said means approach the straight reach of said first conveyor, said treating means comprising a cylinder having a plurality of bristles frictionally held in the end thereof in such a manner that the bristles are arranged in the form of a bundle so that the interstices between the bristles serve as small passages for conveying treating fluid to the immediate area of the article contacted, said straight reaches being closely spaced so that the bristles will penetrate the article and the penetration of the article being treated by the individual bristles serving to maintain the articles in proper treating relation, and means responsive to the movement of said second conveyor for controlling the treatment of said articles carried by said first conveyor.

3. Apparatus of the type described, comprising a conveyor adapted to carry light weight cylindrical articles to be treated, such as cigarettes, a second conveyor, each of said conveyors having a substantially straight reach, said reaches being parallel to each other, the relative position of said conveyors being such that the latter approach each other adjacent one end of said straight reaches, and means operably associated with said second conveyor for engaging and treating said articles carried by said first conveyor with a treating solution, said treating means comprising a plurality of cylinders through which the treating solution is fed and a bundle of bristles frictionally held in the end of each of said cylinders, said straight reaches being closely spaced so that the bristles will penetrate the ends of said articles as said conveyors approach each other adjacent one end of said straight reaches, the interstices between said bristles forming small passages for conveying the treating fluid from said cylinders to the areas of said articles being treated.

4. Apparatus of the type described, comprising a conveyor adapted for carrying light weight cylindrical articles to be treated, such as cigarettes, a second conveyor for carrying a plurality of fluid dispensing devices, a fixed guide element, each of said fluid dispensing devices comprising a cylinder having a discharge orifice provided with a bundle of bristles frictionally held therein, said conveyors being closely spaced so that the outer ends of the bristles will engage and penetrate the articles being treated, a piston in said cylinder, an inlet for said cylinder, a source of supply of treating fluid connected to said inlet, an outwardly opening check valve between said inlet and said discharge orifice, and means operably associated with said guide element to move said piston toward said discharge orifice to force fluid through said outwardly opening check valve and through said discharge orifice in response to movement of said second conveyor, said outwardly opening check valve adapted to close when said piston returns, whereby the return movement of said piston creates a suction through said inlet to fill said cylinder with a predetermined amount of fluid.

WILLIAM COLBURN.
EDWIN J. LATOS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
821,879	Meyer	May 29, 1906
903,311	Peter	Nov. 10, 1908
2,003,778	Willis	June 4, 1935
2,113,244	Shevlin	Apr. 5, 1938
2,134,735	Reinhold	Nov. 1, 1938
2,322,747	Shand	June 29, 1943

FOREIGN PATENTS

Number	Country	Date
453,483	Great Britain	Sept. 7, 1936