

July 23, 1935.

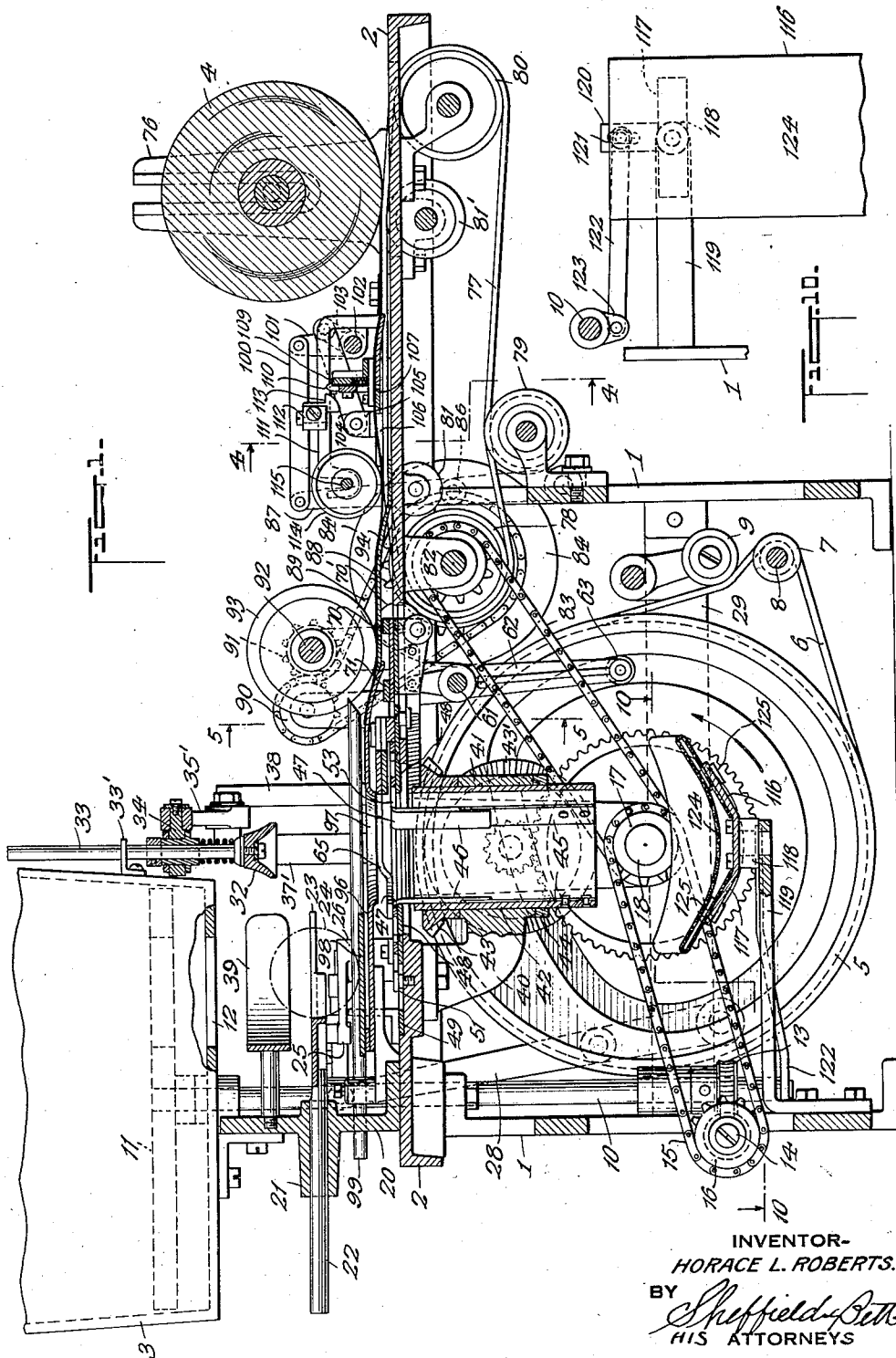
H. L. ROBERTS

2,009,241

MACHINE FOR WRAPPING FRUITS, ETC

Filed July 27, 1932

4 Sheets-Sheet 1



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4 Sheets-Sheet 2

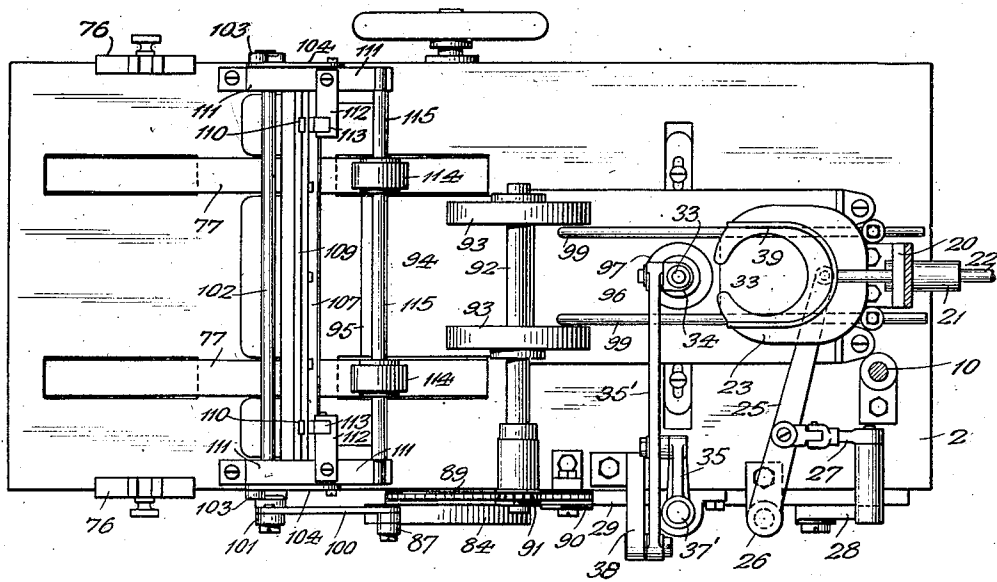


Fig. 2.

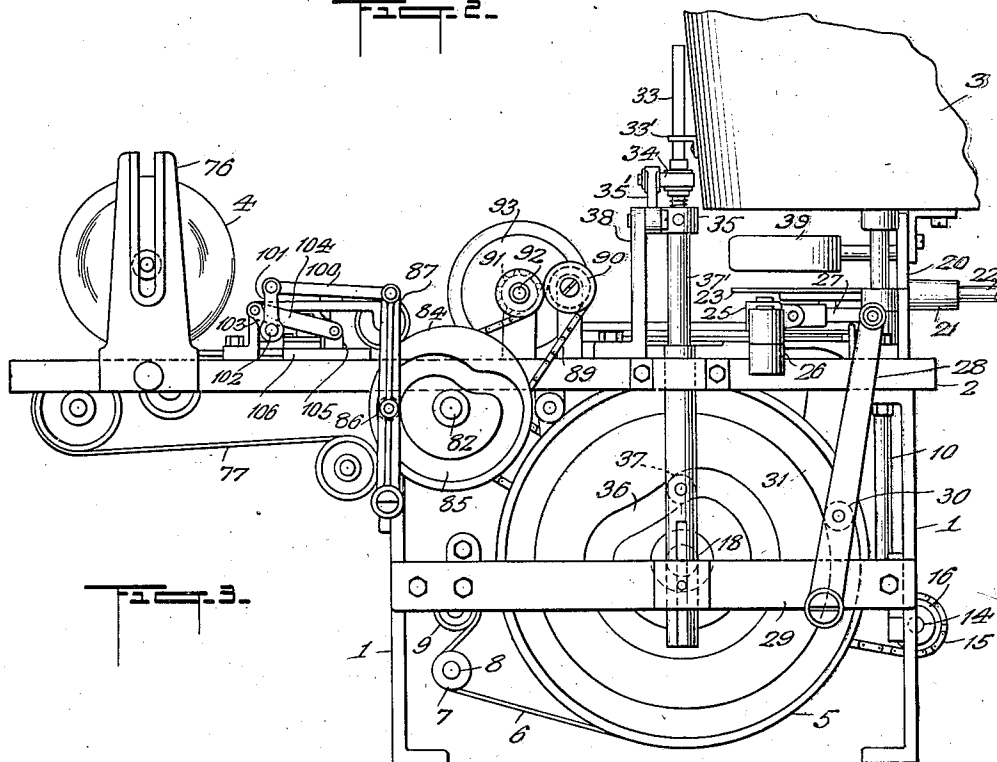


Fig. 3.

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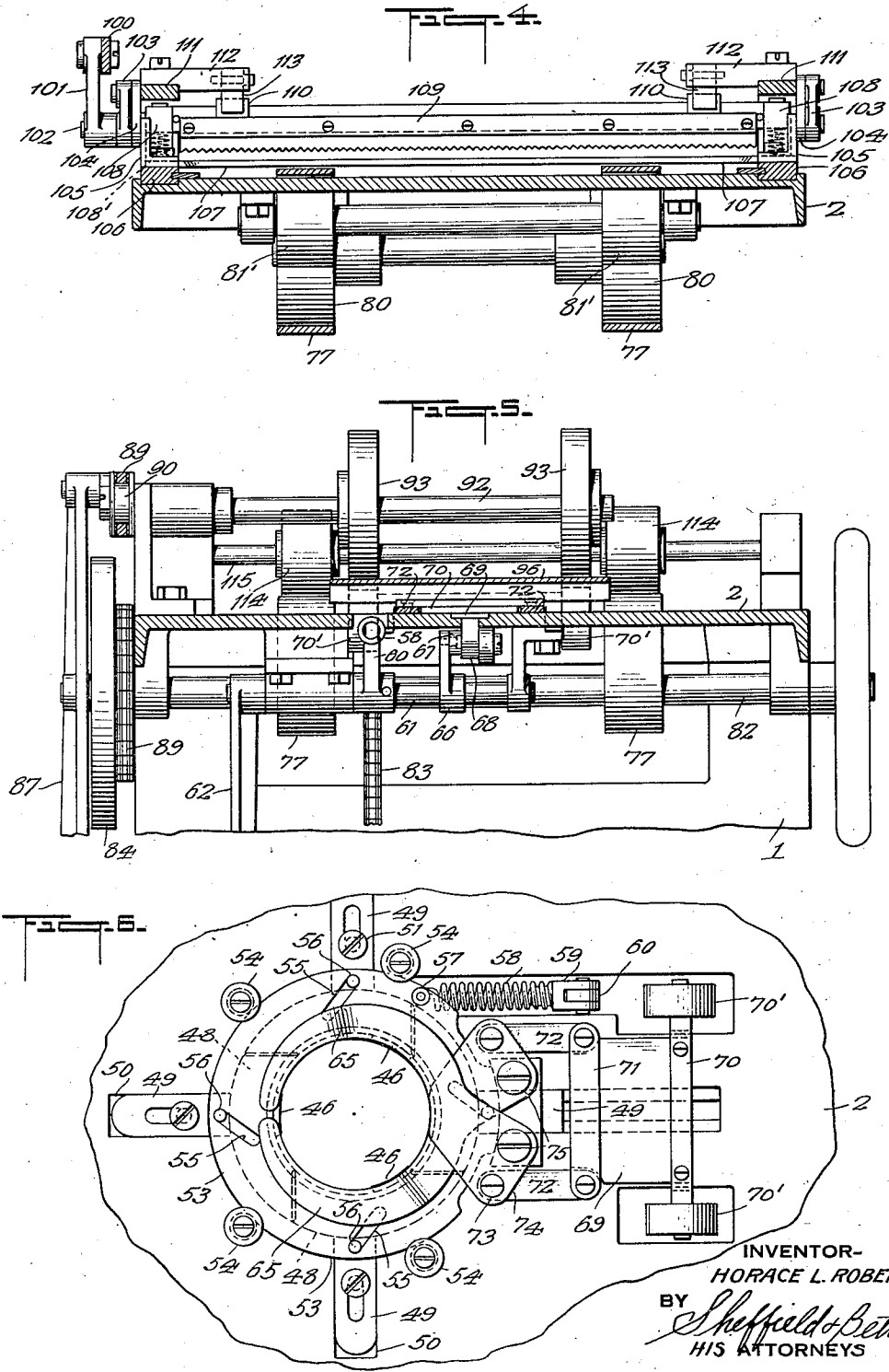
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4 Sheets-Sheet 3



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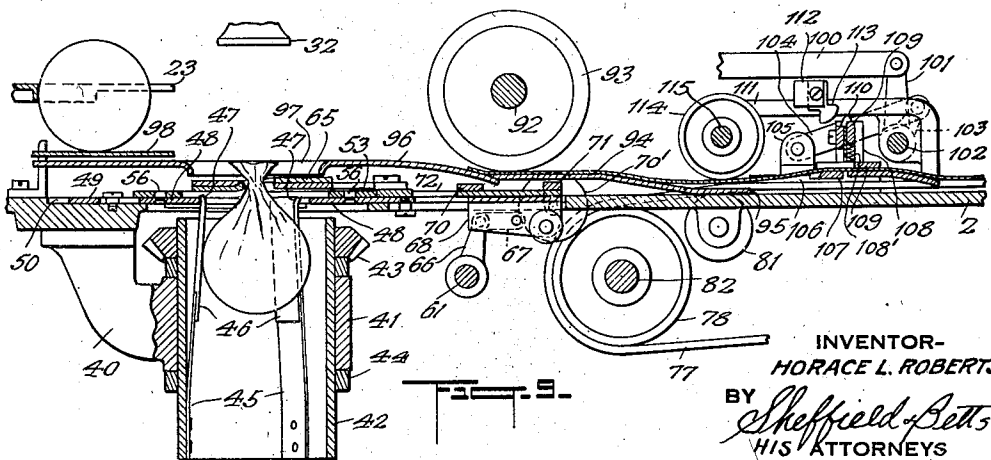
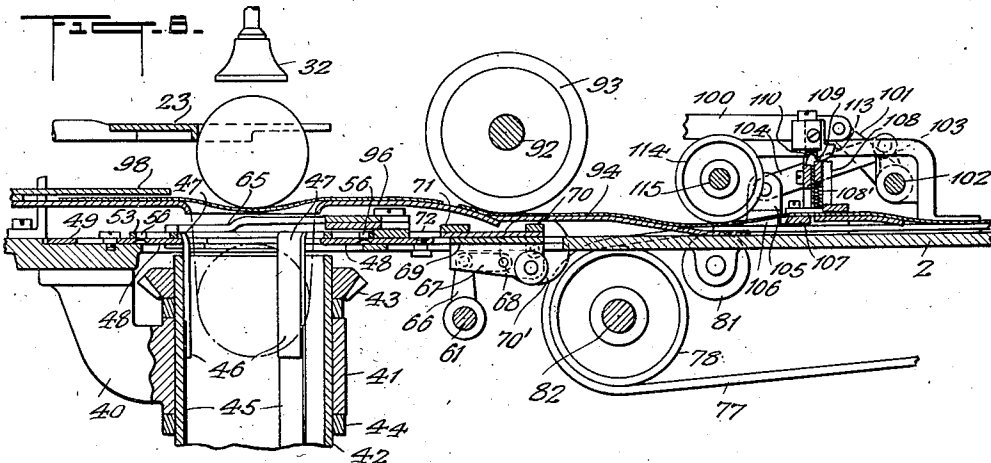
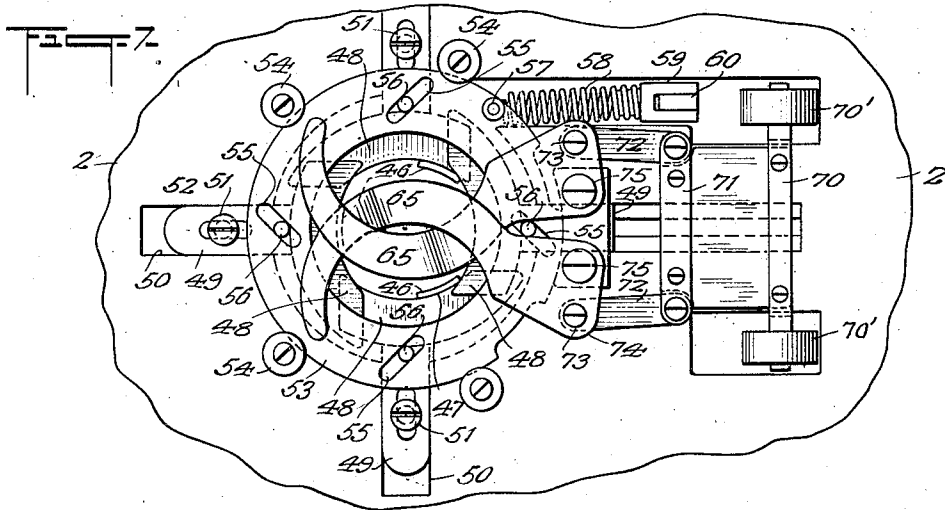
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,009,241

MACHINE FOR WRAPPING FRUITS, ETC.

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Application July 27, 1932, Serial No. 624,935

5 Claims. (Cl. 93-5)

This invention relates to a machine for rapidly and efficiently wrapping paper or other similar material about fruit of approximately spherical form, such as oranges, and for wrapping other articles for which the machine may be adapted.

The object of my invention is the production of a machine which will rapidly and efficiently wrap fruit and similar articles with paper, so that the same may be protected and preserved thereby, and may be easily packed in a suitable box or container immediately after wrapping or otherwise.

Briefly stated, my invention comprises a machine which is provided with a suitable hopper for holding and supplying the articles to be wrapped consecutively to the means for wrapping the same. Associated with the hopper is a table or other suitable support having a rotary receiver which is operated as to grasp and rotate the article, so that the wrapper may be twisted into a spiral form at its margin above the article. This is accomplished by feeding a series of sheets of paper or other suitable material from an accumulated stack or roll thereof, and then introducing said sheets to the wrapping portion of the machine, so that the fruit or other articles when delivered from the hopper will engage the sheets and both will be carried into the rotary portion of the device. Thereafter, certain sectorial pieces complete the enclosing of the article by the wrapper, and certain oscillating fingers or arms engage the upper portion of the wrapper to prevent its turning while the wrapped fruit is being rotated to form a twist in the wrapper above the fruit to hold the wrapper in position.

For a detailed description of one form of my invention, which I at present deem preferable, reference may be had to the following specification and to the accompanying drawings forming a part thereof.

Figure 1 is a longitudinal sectional view through the central portion of my machine as assembled and indicating the operative relation of the parts;

Fig. 2 is a plan view thereof with the hopper or feeding portion removed;

Fig. 3 is a side elevation thereof showing the relation of the operating parts, including cams for moving said parts;

Fig. 4 is a transverse sectional view taken substantially upon the line 4-4 of Fig. 1;

Fig. 5 is a transverse sectional view taken substantially on the line 5-5 of Fig. 1;

Fig. 6 is a plan view showing the receiving and wrapping portion of the apparatus having the

wrapping sectors and the paper clamping arms in position;

Fig. 7 is a view similar to Fig. 6, but showing the closing segments and the holding arms in their closed positions;

Fig. 8 is a longitudinal sectional view similar to that of Fig. 1, but showing the article to be wrapped in its initial position just before being forced into the wrapping tube;

Fig. 9 is a longitudinal sectional view similar to Fig. 8, but showing the article in the position when the margins thereof are twisted to close the wrapper about the article; and

Fig. 10 is a plan view of the trough for receiving and distributing the articles after the wrapping operation.

Referring to the drawings, the numeral 1 indicates a plurality of supports or standards which carry a horizontal table 2 upon which the main parts of the machine are mounted.

The numeral 3 indicates a hopper in which the fruit is placed in order to feed the same to the wrapping machine. The numeral 4 indicates a roll or supply of paper, portions of which are fed to the wrapping mechanism to be wrapped about the fruit. The numeral 5 is a main driving pulley and cam which is rotated in any suitable way, such as by a belt 6 passing over a smaller pulley 7 on the shaft 8 of a suitable main driving device, such as that of an electric motor (not shown). A pivoted or loose pulley 9 is provided to determine the requisite tension on the belt 6 of the driving mechanism.

Attached to the left hand frame or support of the machine is a vertical shaft 10 which passes through the table and enters the hopper 3 where it engages a rotatable plate 11 which is provided with suitable holes or other devices to move the fruit successively over the hole 12 in the bottom of the hopper. At the lower end of the shaft 10 is a suitable worm gear 13 which engages a complementary worm gear on the horizontal shaft 14, which shaft is rotated in any suitable way, as by the sprocket chain 15, engaging the sprocket wheel 16. The sprocket chain 15 also engages a second sprocket wheel 17 on the main shaft 18 of the machine, which also carries the main driving wheel 5. Thus the distributor or selector 11 in the hopper 3 is continuously rotated to successively present the fruit for wrapping at the desired intervals.

On the table or plate 2 of the machine is the angle iron or bracket 20, the upper end of which supports the hopper 3, and is also provided with a tube or sleeve 21 within which a rod 22 is adapt-

ed to reciprocate. Rod 22 has attached to its outer end a horseshoe-shaped guide 23 serving to guide or move the fruit into the correct position for insertion in the wrapping apparatus. The rod 20 is caused to reciprocate back and forth, so that the fruit, indicated by the dotted circle 24, is forced over the cylinder constituting the device for rotating the fruit, by means of a lever 25 which is connected to the horseshoe-shaped guide 23 at its outer end, and the inner end of which is fixed on the end of a vertical stud which pivots a lever as at 26, Fig. 2. The lever 25 has pivoted thereto a link 27 connected with a vertical oscillating lever 28 which is pivoted on the longitudinal bar 29 of the lower portion of the machine. The lever 28 is provided with a cam follower 30 which runs in a suitable cam groove 31 in the driving wheel 5. It will thus be seen that as the driving wheel 5 rotates, the cam follower will be moved to oscillate about the pivot of the lever 28, and will therefore reciprocate the guide 23, so that the fruit is pushed toward the right (Fig. 1) over the wrapping portion of the apparatus. In order that the fruit when placed in the latter position may be positively forced into the rotating cylinder, a plunger 32 is provided which has a vertically reciprocating movement by reason of its being carried on the vertical rod 33 which is located in its correct position by a suitable bracket 33' fastened to the hopper 3. The vertical reciprocation of the rod 33 is produced by the action of the cam groove 36 and cam follower 37 on the outer side of the driving wheel 5. A vertical rod 37' having at its upper end an arm 35 connected with a lever 35', said lever being pivotally mounted in a bracket 38, its outer end being connected to a bearing collar 34 through which the rod 33 passes. The plunger 32 may be made of any suitable material, but preferably of soft material, such as rubber, so that the fruit may not be injured by contact therewith. A second fixed guide device 39 of substantially U-shaped form is also supported by the bracket 20, as indicated in Figs. 1 and 2.

Attached to the under side of the table 2 is a bracket 40 which is provided with a tubular portion 41 on which is rotatably supported a cylindrical or tubular receiver 42. This member is provided at its upper end with a miter gear portion 43 and is preferably provided with a fixed collar 44 to hold the same in position. The miter gear 43 is driven in any suitable way, such as by meshing with the miter gear 43', which is driven from the main shaft, as indicated in Fig. 1. The cylindrical member 42 is provided with a plurality of spring fingers 45 which are attached in any suitable way to the lower margin of said cylindrical member 44, as indicated in Figs. 1 and 9. The main portion of these fingers or springs is made of spring steel and carry at their upper ends brass contacting strips 46, the upper ends of which are bent or curved outwardly, as indicated at 47 (Figs. 1, 8 and 9). On the upper surface of the plate of table 2 are located a plurality of sectorial members 48, more clearly illustrated in Figs. 6 and 7. As indicated, these sectorial pieces are preferably four in number, and are supported by radial arms or lugs 49 which slide in shallow grooves 50 in the top of the table 2. They are held in such position by reason of the machine screws 51 which pass through slots 52 in said arms 50. The sectorial pieces 48 are so positioned relative to each other that when they are moved inward one pair slides over and in contact with the lower pair, as indicated in Fig.

7. It will be noted, with particular reference to Figs. 1, 7, 8 and 9, that the sectorial pieces 48 are adapted to contact with the upper ends 47 of the brass tipped fingers 45, so that when said pieces are moved inward toward the axis of the cylinder member 42, said fingers will be also carried inward with them, and consequently will engage the article being wrapped outside of the wrapper thereon (Fig. 9) with a certain amount of spring pressure.

This pressure is produced as follows: Referring to Fig. 6, it will be seen that there is a ring or annulus 53 which is adapted to oscillate above the sectorial pieces 48. This is held in correct position by the grooved rollers 54. It is also provided with a plurality of inclined slots 55 which engage pins 56 in the lugs 49 of the sectorial pieces. The ring or annulus 53 is also provided with an anchoring screw or pin 57 which receives one end of the helical spring 58. The other end of said spring is connected with a pivoted yoke 59 which engages the upper end of a vertical lever 60, which is fixed on the horizontal shaft 61 (see Figs. 1 and 5). The shaft 61 is oscillated by means of a lever 62 attached to the left hand end thereof (Fig. 5) and this lever at its lower end is provided with a cam follower 63, which engages the cam groove 64 in the driving wheel 5 (Fig. 1).

It will now be seen that as the shaft 61 oscillates, the lever 60 will oscillate and will periodically increase the tension on the spring 58. This will cause the ring or annulus 53 to rotate, and since the pins 56 will then travel radially toward the center of the ring, the sectorial pieces 48 will be caused to move inward against the tension of the spring fingers 45 the upper ends of said fingers will thereby be brought closer together and the orange or other article within the cylinder will be firmly gripped thereby, as indicated in Fig. 9.

This action of the spring fingers 46 is of great importance in the results accomplished by this machine. It will be appreciated by one having knowledge of the action of machines of this character that when the paper is twisted to complete the wrapping above the fruit there is an upward pull or tension on the wrapper tending to lift the fruit out of the holding means. In this device the inward flexing or convergence of the spring fingers 46 during the wrapping or twisting operation effectually prevents any upward motion of the fruit which would tend to reduce the gripping action or frictional contacts. Furthermore, when the spring fingers move radially outward after the wrapping operation is completed the fruit is permitted to fall into the receiver without any further action of any parts of the machine to eject it.

Simultaneously with the movement of the sectorial pieces the ends of paper above the orange will be gripped and engaged by the curved arms or fingers 65. This is accomplished by the movement of the lever 62, above referred to. The shaft 61 (Fig. 5) is provided with a lever 66, the upper end of which carries a connecting link 67, which is pivoted to a downwardly projecting pin or lug 68. This lug projects from a plate 69 which is adapted to reciprocate toward the right and left, as indicated in Figs. 6, 8 and 9. The plate 69 carries two cross-bars 70 and 71, the latter of which has its ends pivotally connected with longitudinally extending links 72, 72. The opposite ends of said links pivotally engage the inner enlarged ends 73 of the arms or fingers 65, as indi-

cated at 74. Said enlarged ends of the arms 65 are pivoted on fixed projections, as at 75, so that the said arms may swing from the position indicated in Fig. 6 to the position indicated in Fig. 7.

5 The bar 70 carries contact wheels 70'.

It will now be seen that when the cross-bar 71 is moved toward the right (Fig. 6) the links 72 will draw pivots 74 toward the right, and consequently turn the arms 65 about their pivots 10 75, so that the arms will be in the position indicated in Fig. 7. In this position the paper projecting from the fruit which has been forced below the level of the table will be engaged and so gripped as to prevent the drawing of the paper 15 above said arms, and the continued turning of the fruit as rotated by the cylinder and the ends 47 of the fingers 45 will twist the paper so as to form a complete enclosure for the fruit in the paper below.

20 Now, referring to the means for feeding the paper to the wrapping device, it will be seen by reference to Fig. 1 that the roll 4 is supported in a suitable pair of standards 76 having slots which allow the shaft of the roll to travel downward as 25 the roll decreases in size. Beneath the roll 4 are two belts 77 of suitable flexible material, such as leather, rubber or cloth, and these are adapted to travel in grooves over the pulleys 78, 79, 80, 81 and 81'. The latter are located substantially directly below the roll 4 so that the 30 weight of the roll on the belt 77 will be taken up by the pulleys 81' and given the necessary frictional contact between the roll and said belts. The pulley 78 is mounted on the transverse shaft 35 82, which is driven by a sprocket chain 83 carried on the main driving shaft 18. One end of the shaft 82 carries a cam wheel 84 having a groove 85 which is adapted to contain a follower 86 on the lever 87, to be referred to hereinafter. 40 The shaft 82 also carries a second sprocket wheel 88 which engages a sprocket chain 89. This sprocket chain extends upwardly toward the right (Fig. 3) and engages a fixed but rotatable sprocket wheel 90. The chain also engages a second 45 sprocket wheel 91 on the end of transverse shaft 92 (Figs. 2 and 3). The shaft 92 is also provided with two disc wheels 93, the peripheries of which are provided with suitable anti-friction material, such as leather or rubber. These wheels 50 are adapted to contact with the paper above the wheels 70' when the latter are in their forward positions.

A horizontal plate 95 is fastened to the table at the point 95 as indicated in Figs. 8 and 9. 55 The right hand edge of the plate 94 rests upon the second plate 96, which is provided with a central opening 97, the edge of the plate being drawn downward so as to form a rounded margin. The plate is held in position in any suitable 60 way so that it is located above the arms 65 and the sectorial pieces 48. The plate 96 also has located slightly above it a second plate 98, which is provided with forwardly extending guide arms 99, as indicated in Fig. 2. These arms prevent 65 the orange or other fruit from rolling sidewise and allows it to be placed directly above the opening in the table. It will now be seen that, as the pulleys 78, 79, 80, 81 and 81' are rotated, the roll of paper 4 will also be rotated and the 70 end thereof which falls away from the roll will be carried toward the left (Figs. 1, 8, and 9) until the end has come to lie over the opening 97 in the plate 96. However, during the passage of the paper in this direction, the cutting mechanism for severing the strip of paper into sheets

will come into operation. This may be described as follows:

The lever 87 is pivoted at its upper end to a connecting rod 100, and the opposite end of said 5 connecting rod is pivoted to the vertical lever 101. The lower end of said lever is fixed to a horizontal shaft 102. This shaft also is provided with two levers 103 which are connected respectively to links or connecting bars 104 adjacent 10 the opposite ends thereof. These bars are pivoted to a projection 105 on a slidable frame 106. The ends of this frame also carry a transverse strip 107 which forms the lower member of the cutting or severing device for the paper. 15 The upper member of the severing device comprises a pair of vertical standards 108 which are located upon the ends 106 of the frame above mentioned. These standards receive the ends of the transverse cutting bar or knife 109, which is slidably mounted thereon. The holder of the 20 knife blade proper is provided on its upper edge with two slight projections 110, which are so placed as to depress the blade at the proper point, said blade being held in the upper limit of its position by suitable springs 108', as indicated in 25 Figs. 8 and 9. The numeral 111 indicates a pair of bars or brackets fixed to the top of the machine table, and this carries a pair of inwardly extending arms 112, from which project pivot 30 pawls 113 having cam surfaces, as indicated in Figs. 8 and 9. These pawls are located in the path of the projections 110 so that when the same contact with said projections the knife blade will be depressed. This will come at a point which 35 is accurately above the edge of the lower transverse knife member 107. When said cutting member has been depressed, the paper will be perforated and then separated by the action of the rolls 70' and 93, which then have approached 40 each other. This will not delay the onward movement of the paper as it is advanced by the belt 77. When the projections 110 have passed beyond the end of the pawls 113, the upper member of the cutting device will be immediately released and said member will spring upward into 45 its normal position, as indicated in Fig. 8. Upon the reverse movement of the cutting device caused by the continued movement of the cam 84, the pawls 113 will be allowed to swing toward the right, and the cutting knife will not be further 50 depressed until the next movement toward the left for severing the successive sheets.

It will be seen that after the sheet has been cut it will be advanced by the motion of the belts 77, and in order to aid the same after the cutting 55 has taken place, small weighted wheels 114 are provided, the transverse shaft 115, which carries the same, being supported at its ends in suitable slots in the bracket 111, as indicated in Figs. 1 and 2. After being advanced by the belts, 60 the paper, upon reaching the wheels 93, will come above the friction wheels 70' (Figs. 5 and 6) and when said wheels are in their forward position, the wheels 93 will further advance the paper above the plate 96 at a somewhat higher rate of 65 travel until it is in position above the opening 97, so positioning the paper is coincident with the placing of the parts in proper position to begin the wrapping of the next succeeding orange, other fruit or article. The operation of the device in successive steps may be described as follows:

Assuming that the wrapping paper has been placed above the opening 97, as last above described, an orange or other fruit which is dropped 75

through the hole 12 in the bottom of the hopper 3, will strike on the plate 98, from which position (Fig. 1) it will be projected toward the right by the horizontal action of the rod 22 and the member 23. It will then be placed above the paper, as indicated in Fig. 8. The plunger 32 then descends the necessary amount to push the fruit into the position shown in dotted lines in Fig. 8. The plunger is then withdrawn, and the sectorial pieces 48 immediately contract the paper above the fruit and force the spring fingers 47 inward. This serves to cause the latter to engage the fruit so as to prevent any tendency to move upward and since said cylinder is continuously rotating, the fruit with its wrapper will be revolved on a vertical axis, and as the curved arms or fingers 65 have also been brought into the position shown in Fig. 7, the paper above the fruit will be held firmly, so that a twist is made in the margin of the paper, thereby wrapping the paper tightly about the fruit without upward movement thereof. Immediately thereafter the spring fingers and the sectorial pieces are withdrawn by the action of the operating cam, and since the spring fingers are thus released to return to their normal positions, the fruit is allowed to drop freely into a suitable trough, tray or other container below the cylinder 42. Immediately thereafter the next sheet of paper has been steadily advancing and so is placed in position above the opening 97, and the parts are in position to repeat the wrapping of the next article. From actual tests of my machine this can be accomplished at the rate of 50 to 80 per minute.

As a further improvement in connection with this machine, I have devised a receiver which enables the fruit to be packed more quickly and efficiently in boxes or cartons as they are released from the machine. This apparatus consists of a trough or chute 116 (Figs. 1 and 10). This is supported upon a transverse strip 117 of steel or other rigid material, which strip is attached to a block 118, said block being pivoted on bracket 119. Block 118 has a rearwardly extending projection 120 provided with a slot allowing adjustment of a pivot 121 on the end of and connecting rod 122 (Fig. 10). The opposite end of said connecting rod 122 is pivoted to a crank arm 123 on the lower end of the vertical shaft 10.

From this description, it will be seen that when the crank arm 123 rotates with the shaft 10, the projection 120 will be oscillated so that the chute 116 will also be oscillated and its outer end, which projects slightly beyond the frame of the machine, will distribute the wrapped fruit or similar articles at different points in the box or other receptacle in which it is packed. The trough or chute 116 is preferably covered with a suitable layer of soft material 124, which may be canvas, felt or other fibrous material held in position by suitable clips 125 or otherwise.

Having thus described this embodiment of my invention, what I claim and desire to protect by Letters Patent is:

1. In a machine for wrapping substantially spherical articles with thin, flexible material, a

continuously rotating receiver, resilient contact devices fixed adjacent the lower margin thereof for frictionally engaging said material and said articles, means for feeding sheets of said material to a position above said receiver, devices for gathering said material about the upper part of said articles and for forcing radially inward the upper ends of said contact devices, and gripping fingers for engaging and effecting a twist in said material above said receiver, beginning at the surface of said articles.

2. In a machine for wrapping articles with thin, flexible material, a rotatable receiver for rotating the article to be wrapped, means for supplying sheets of said material adjacent the upper end thereof, radially movable resilient contacting strips fixed in the lower end of said receiver for holding said articles in position therein, a plurality of radially movable pieces for forcing the upper ends of said contacting strips inward and gathering the wrapper about said article, and a plurality of pivoted fingers adapted to engage and grip said wrapping material above said pieces, whereby a twist is produced therein.

3. In a machine for wrapping articles with thin, flexible material, a rotatable receiver for rotating the articles to be wrapped, resilient strips fixed to the lower portion thereof and extending upward to points adjacent the upper end thereof, means for successively feeding said articles to a position above said receiver, devices for supplying said material at a position above said receiver, a device for forcing said articles and said material into said receiver between said strips, sectorial pieces for gathering said sheets about said article and acting to move the ends of said strips inward, and radially movable fingers for holding the ends of said material stationary to produce a twist therein.

4. In a machine for wrapping articles with paper and the like, and having paper feeding apparatus, the improvement which comprises a substantially cylindrical rotatable receiver for said articles and paper, resilient strips fixed adjacent the lower end of said receiver, means for moving inward and releasing the upper free ends of said strips, and means for intermittently and frictionally engaging said paper to hold the same stationary and effect a twist therein.

5. In a machine for wrapping articles with paper and the like and having paper feeding apparatus, means for forcing the articles and the paper to be wrapped downward, a rotatable receiver for said articles and paper, resilient strips fixed to the lower portion of said receiver, means for moving the upper free ends of said strips radially inward to frictionally engage said articles and said paper and to gather the latter about the upper portion of said articles and to retract said strips to release said articles when wrapped, a plurality of curved fingers pivoted above said receiver, and devices for moving said fingers inward to engage the wrapping paper to hold the same stationary and effect a twist therein.

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