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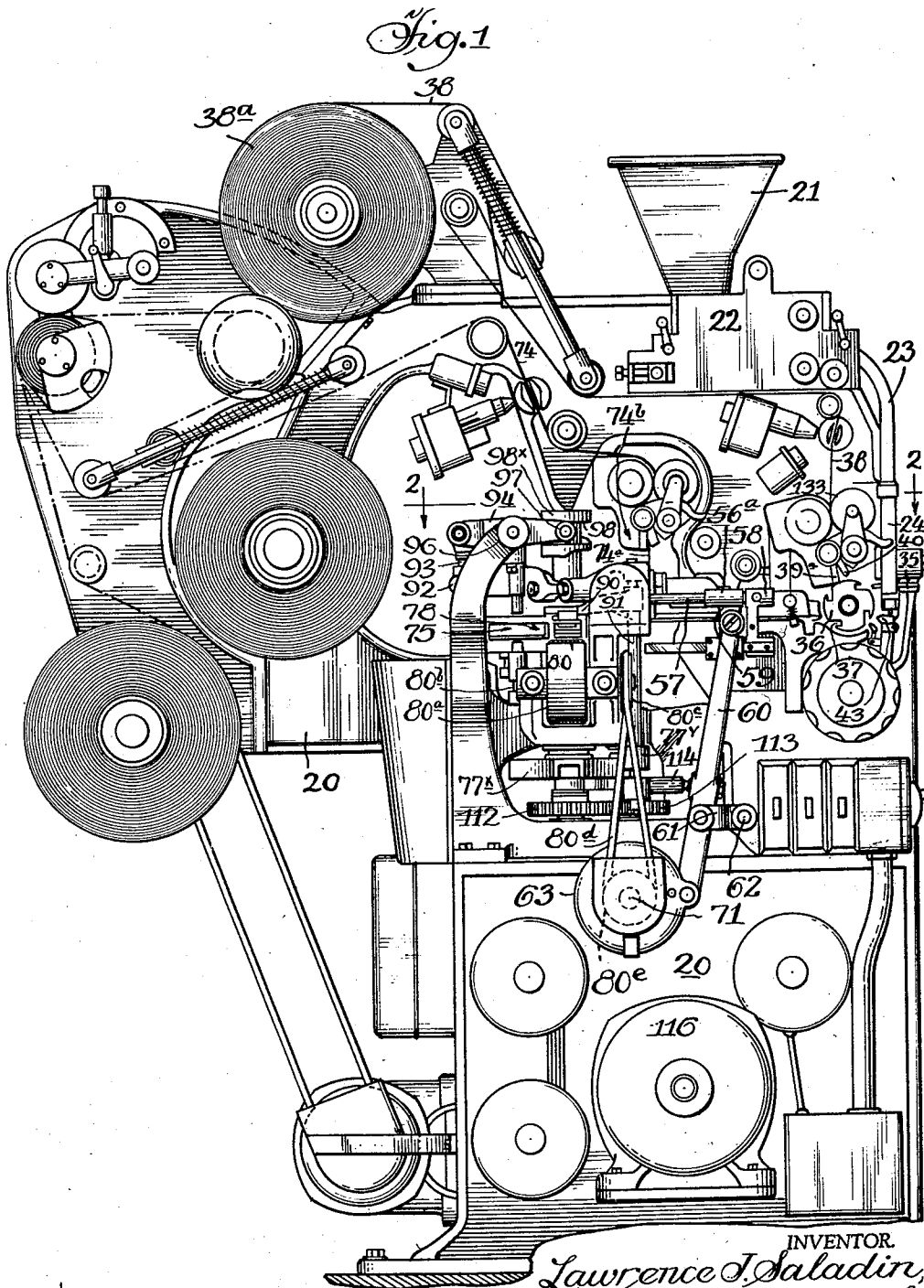
L. J. SALADIN

2,306,191

PACKAGE WRAPPING MACHINE

Filed July 28, 1941

9 Sheets-Sheet 1



Dec. 22, 1942.

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2,306,191

PACKAGE WRAPPING MACHINE

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9 Sheets-Sheet 3

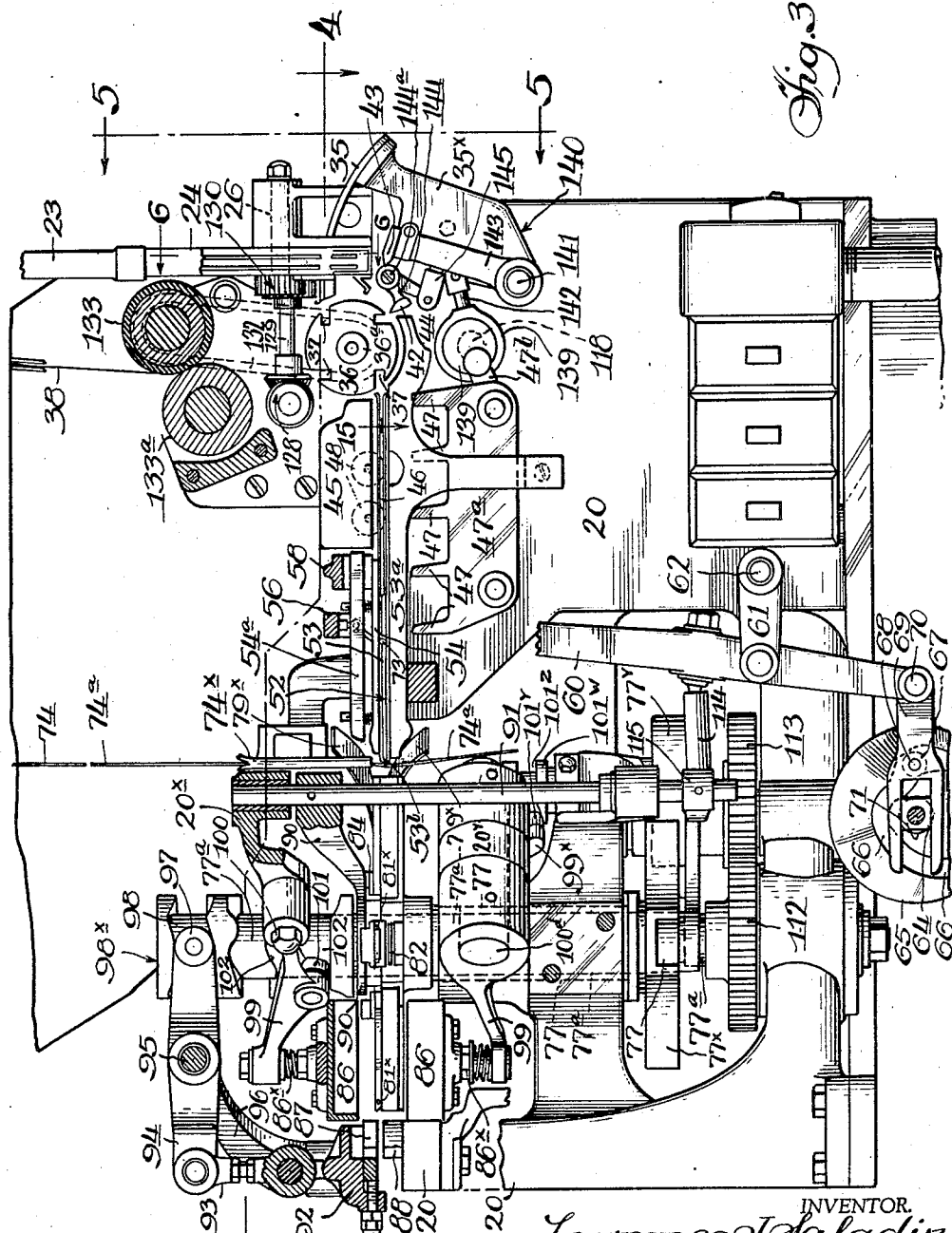


Fig. 3

Witness:
Chas. L. Fournier

INVENTOR,
Lawrence J. Saladin,
BY
Offield Melchrope Scott & Pyle
ATTORNEYS.

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L. J. SALADIN

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PACKAGE WRAPPING MACHINE

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9 Sheets-Sheet 4

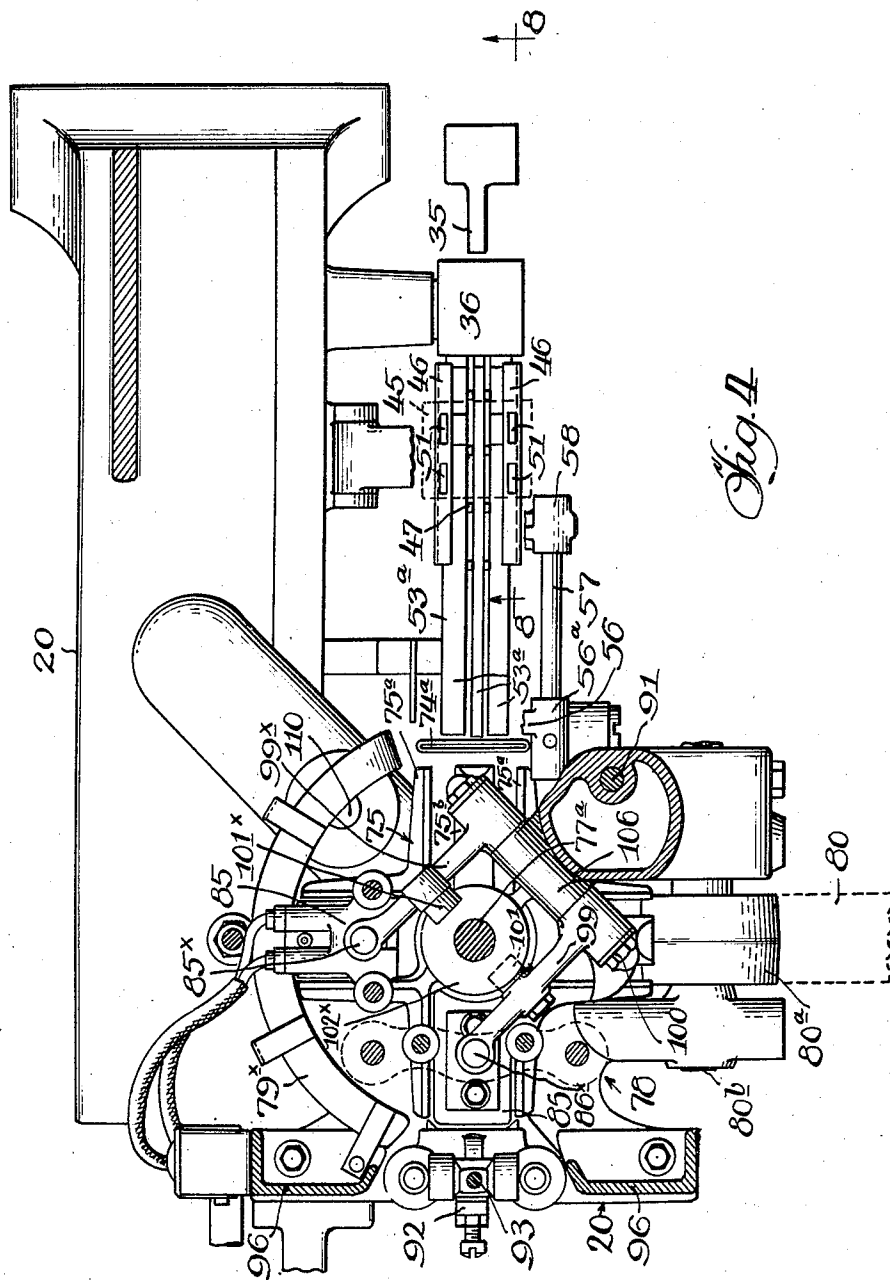


Fig. 4

Witness:
Chas. E. Kirsch

INVENTOR
Lawrence J. Saladin,
BY
Offield Melrose Scott & Poole
ATTORNEYS.

Dec. 22, 1942.

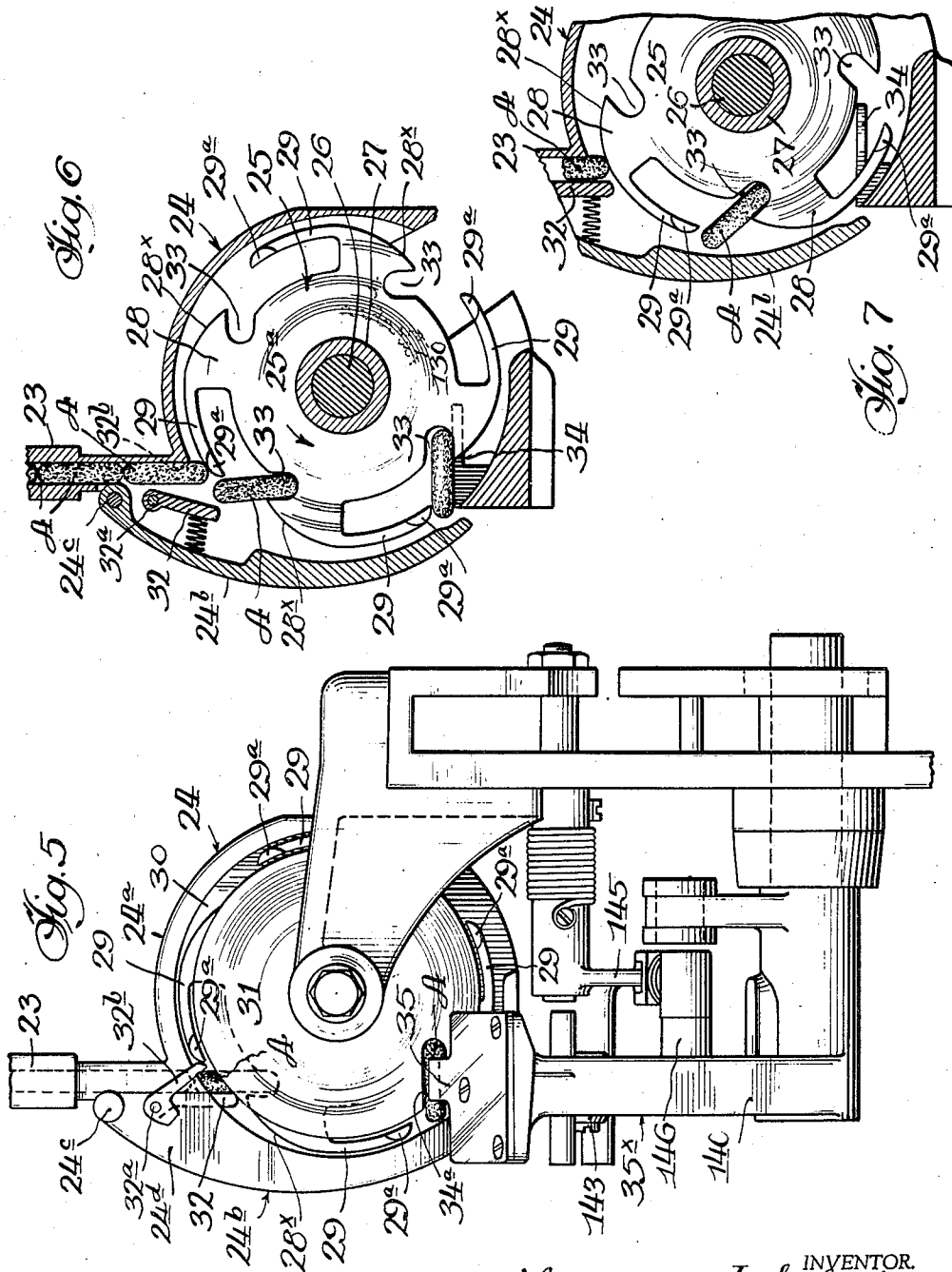
L. J. SALADIN

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PACKAGE WRAPPING MACHINE

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9 Sheets-Sheet 5



Witness:
Chas. H. Kouch

INVENTOR.
Lawrence J. Saladin,
BY *Offield McKelvie Scott & Pook*
ATTORNEYS.

Dec. 22, 1942.

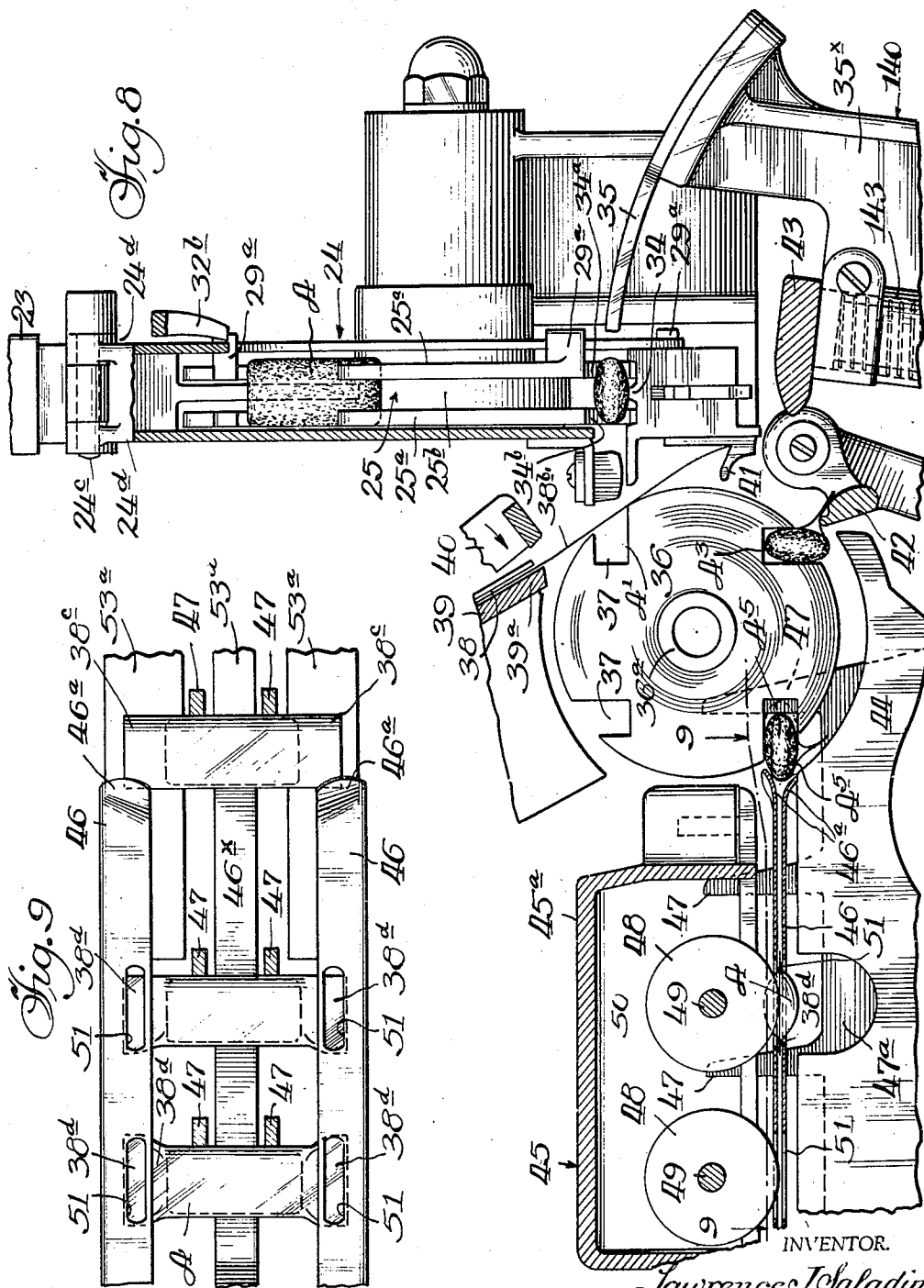
L. J. SALADIN

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PACKAGE WRAPPING MACHINE

Filed July 28, 1941

9 Sheets-Sheet 6



Witness:
 Chas. R. Housh.

INVENTOR.
 Lawrence J. Saladin
 BY *Offield Melchiorre Scott & Pook*
 ATTORNEYS.

Dec. 22, 1942.

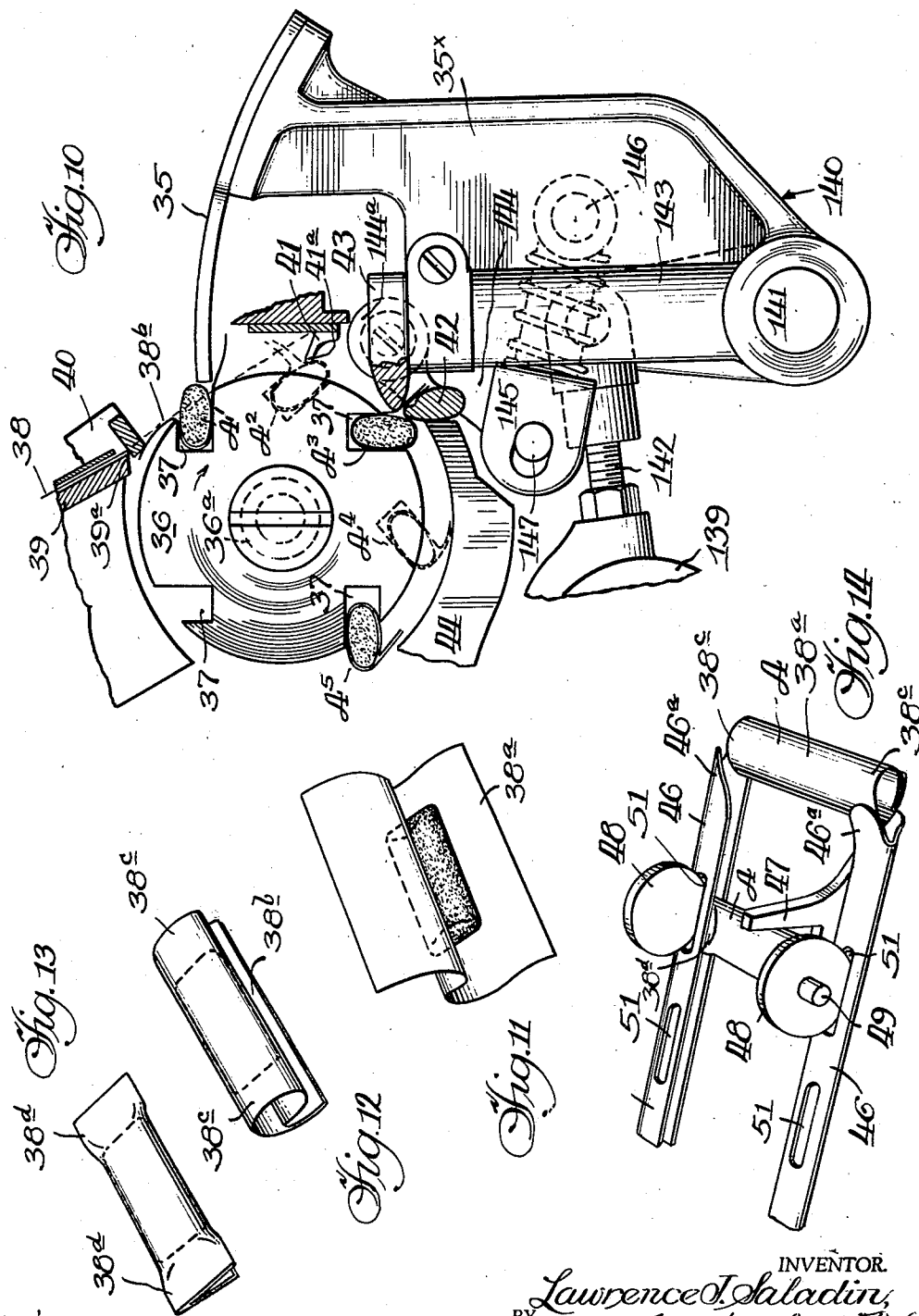
L. J. SALADIN

2,306,191

PACKAGE WRAPPING MACHINE

Filed July 28, 1941

9 Sheets-Sheet 7



Witness:
Chas. L. Louch.

INVENTOR.
Lawrence J. Saladin,
BY *Offield Melbblope Scott & Poole*
ATTORNEYS.

Dec. 22, 1942.

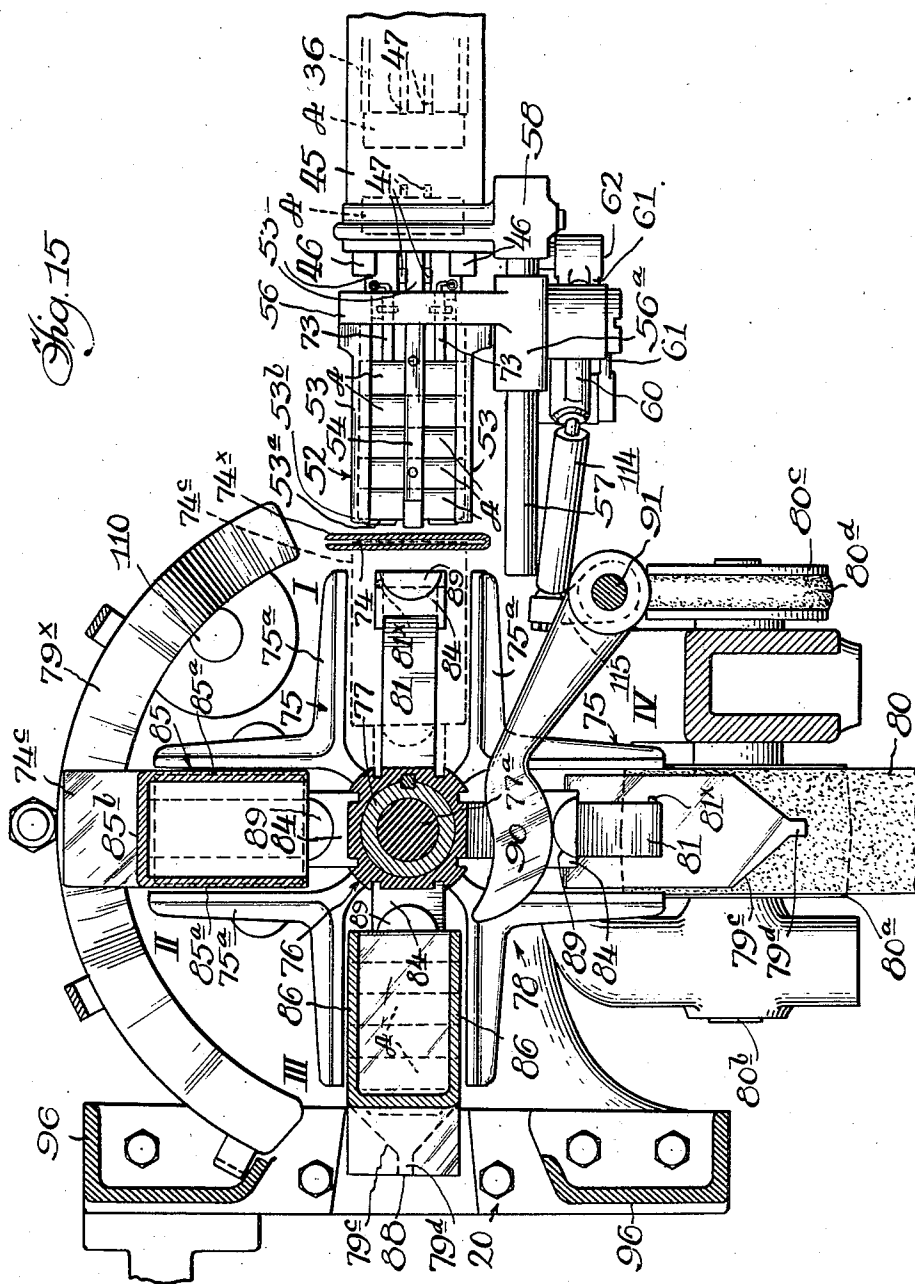
L. J. SALADIN

2,306,191

PACKAGE WRAPPING MACHINE

Filed July 28, 1941

9 Sheets-Sheet 8



Witness:
Chas. L. Tourish.

INVENTOR.
Lawrence J. Saladin
BY
Offield W. H. H. & P. P.
ATTORNEYS.

Dec. 22, 1942.

L. J. SALADIN

2,306,191

PACKAGE WRAPPING MACHINE

Filed July 28, 1941

9 Sheets-Sheet 9

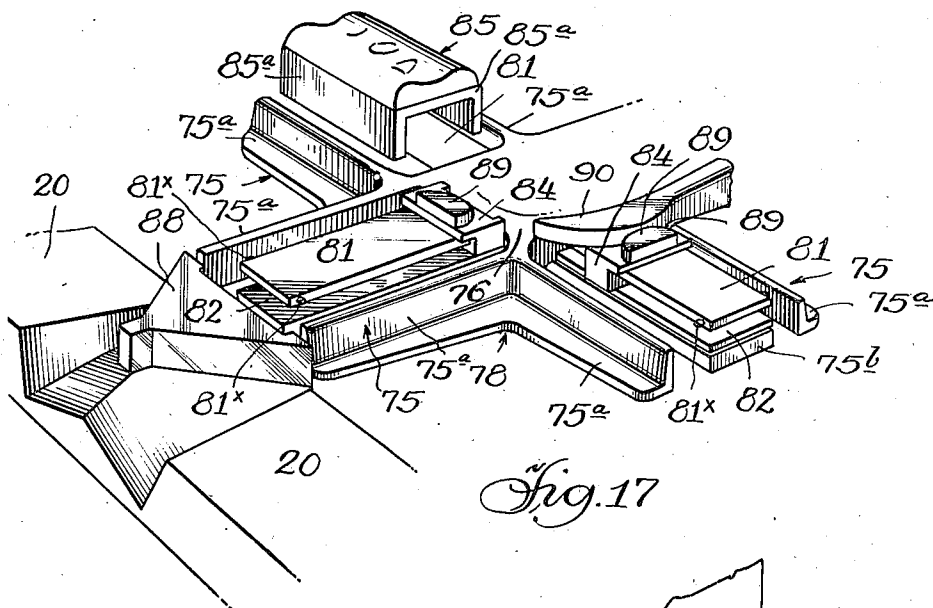


Fig. 17

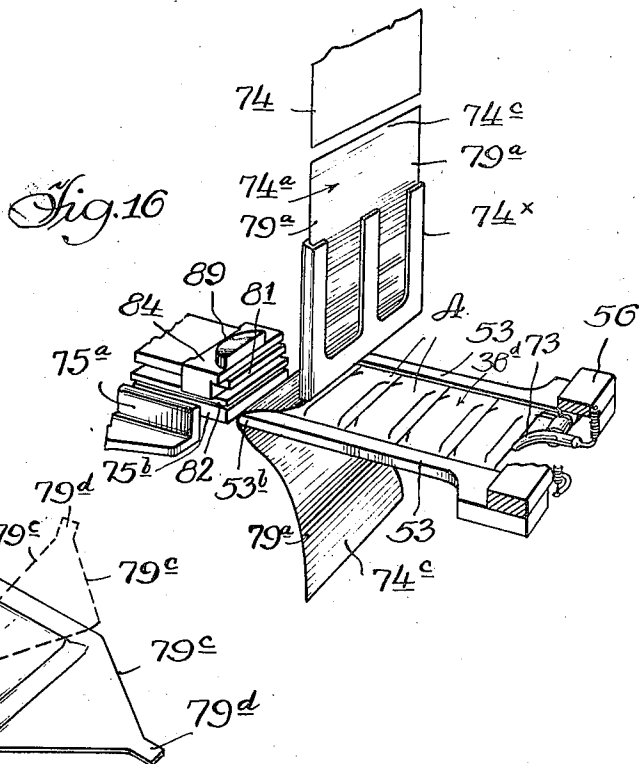
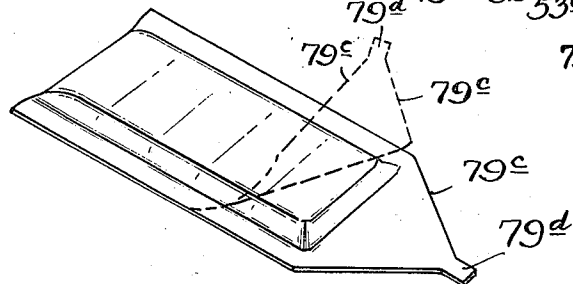


Fig. 16

Fig. 18



Witness:
Chas. E. Townsend.

INVENTOR.
Lawrence J. Saladin,
BY
Offield Melchior Scott & Pook
Attys.

UNITED STATES PATENT OFFICE

2,306,191

PACKAGE WRAPPING MACHINE

Lawrence J. Saladin, Chicago, Ill., assignor to
Wm. Wrigley Jr. Company, Chicago, Ill., a cor-
poration of Delaware

Application July 28, 1941, Serial No. 404,260

22 Claims. (Cl. 93—7)

This invention relates to a novel and improved package wrapping machine and consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The object of the invention is to provide a package wrapping machine for assembling and wrapping pieces of chewing gum, candy or the like, in a flat package with the sticks disposed laterally edge to edge and with their opposite ends in parallel lines.

In an application of Lawrence Saladin and Willet B. Ranney, Serial No. 296,378, filed September 25, 1939, is described a package of the kind which the improved wrapping machine is designed to wrap.

That is a package of pieces enclosed in a wrapper made of an elongated sheet bent transversely upon itself to close one end of the package and form opposed sections of the wrapper. The package contains a plurality of pieces shorter in length than the width of the wrapper. Each piece is enclosed in a tubular wrapper having its ends sealed together to provide flat projecting end fins; and the wrapped pieces are disposed edge to edge in a common plane transversely of the wrapper between the opposed sections thereof. The wrapper sections have lateral sealing margins between which said end fins are sealed and have projecting end flaps sealed together at one end of the package against the edge of the proximate wrapped piece, leaving the said flaps free beyond the seal to be grasped and pulled apart when the package is to be opened.

The machine thus includes means for wrapping the individual pieces of gum or the like, as well as the means for assembling and wrapping the packages of pieces.

These and other objects and advantages of the invention will appear more fully in the following specification.

In the drawings:

Figure 1 is a front elevation of the improved machine.

Figure 2 is a horizontal plan section on an enlarged scale in a plane indicated by the line 2—2 of Figure 1.

Figure 3 is a view representing a vertical section through the machine in a plane indicated by the line 3—3 of Figure 2.

Figure 4 is a view representing a horizontal section of the machine in a plane indicated by the line 4—4 of Figure 3.

Figure 5 is a partial end view on an enlarged scale of the feed end of the machine looked at

from a plane indicated by the line 5—5 of Figure 3.

Figure 6 is a partial vertical sectional view in a plane indicated by the line 6—6 of Figure 3, the scale being the same as that of Figure 5.

Figure 7 is a sectional view like unto Figure 6, with the parts in a different position.

Figure 8 is a partial vertical sectional view of the machine on a still further enlarged scale in a plane indicated by the line 8—8 of Figure 4.

Figure 9 is a partial horizontal sectional view in a plane indicated by the line 9—9 of Figure 8.

Figure 10 is a view similar to Figure 8 showing parts thereof in a different position.

Figures 11, 12 and 13 are perspective views showing successive stages in the wrapping of the individual pieces to be enclosed in the package.

Figure 14 is a perspective view of the part of the apparatus which performs the step between the formation of the wrapper shown in Figure 12 and its completion shown in Figure 13.

Figure 15 is a partial horizontal section of the machine in a plane indicated by the line 15—15 of Figure 3, but with the parts shown on a larger scale.

Figure 16 is a fragmentary perspective view showing in some detail the carriage in which sticks, assembled in flat package array, are on the way to engage a depending package wrapper length to be enfolded by spring members in a receiving arm of a package wrapping and sealing turret.

Figure 17 is a fragmentary perspective view of said turret, including other arms.

Figure 18 is a perspective view of the sealed package, showing in dotted lines how it may be opened to remove an enclosed stick.

Referring now to that embodiment of the invention illustrated in the drawings: 20 indicates the machine frame upon which the various parts now to be described are mounted. The pieces of gum or the like to be wrapped are disposed in a hopper 21 mounted at the top of the frame at the right-hand end thereof, as shown in Figure 1. From the hopper 21 they are fed to a casing 22 containing a device which acts in a familiar manner to direct them endwise, one by one, into a vertical tubular channel member 23. The channel 23 opens at its bottom end into a flat circular casing 24 (see Figures 5, 6, 7 and 8) fixed to the frame in a vertical plane extending at right angles to the length of the machine. From said casing 24 and by mechanism contained therein, the pieces are fed laterally, flatwise (to the left as shown in the drawings) towards the piece-

wrapping and package-wrapping part of the machine.

In the casing 24 and concentric therewith is mounted a rotary feed member 25. It comprises laterally spaced discs 25^a, 25^a (see Figure 8) 5 with an interposed spacing disc 25^b of smaller diameter to which they are fixed. Said rotor is keyed to a horizontal shaft 26 having suitable bearing 27 in the frame. Its spaced discs 25^a, 25^a are each provided with a plurality (four in this instance) of like, equally spaced, radially dis- 10 posed arms 28 with arcuate fingers 29 radially spaced from the disc and extending in the direction in which the rotor is designed to rotate, as indicated by the arrow in Figure 6. The fingers 15 29 of one of said discs 25^a have lateral projections 29^a which extend through a circular space or slot 30 between a circular plate 31, which forms a vertical wall of the casing 24 and the circular wall 24^a of the casing 24.

A spring controlled vertical gate 32 is pivoted within the casing 24 by a horizontal pin 32^a lo- 20 cated forwardly of the vertical path of discharge of the pieces A from the channel 23 into the casing 24. Said gate normally stands as a continuation of the forward wall of the said channel (see Figure 5). The pin 32^a is rotatively 25 mounted in a cover 24^b hinged at 24^c to the casing 24 (see Figures 5, 6 and 8). Said pin 32^a extends beyond the plane of the wall plate 31 30 of the casing as shown in Figure 5. There it has fixed to it a trip arm 32^b, disposed to swing in a vertical plane and depending into the path of travel of the lateral projections 29^a of the fingers 29.

At points spaced in the direction of rotation of the rotor 25 from the said lateral projections 29^a are like, equally spaced pockets 33 formed in its spaced discs 25^a. Said pockets are in- 35 clined rearwardly to a radius of the rotor with respect to the direction of its rotation and are adapted to receive the pieces of gum or the like when a pocket comes into alignment below the channel 23. In the casing 24, in vertical 40 alignment below the channel 23 and in the space between the rotor discs 25^a, 25^a is a horizontal shelf 34 fixed to the casing 24 (see Figures 6, 7 and 8).

The operation of the mechanism in the casing 24 is as follows: By gravity the pieces A are de- 45 livered in succession endwise through the chute 23 to the casing 24. The lowermost piece A is caught in the pocket 33 directly below the chute 23. The gate 32, providing the bottom part of the forward wall 23^a of said chute, guides said 50 piece into said pocket. This position of the parts is illustrated in dotted lines in Figure 5. In said position, an offset 29^a of a finger 29 is near to the end of the trigger 32^b.

In the next operative movement of the rotor 25 the said offset 29^a strikes the trigger 32^b and 55 swings the gate away from the piece A in the pocket 33, permitting said piece to be carried on by the rotor. At the same time the next succeeding piece above is engaged by and rides upon the fingers 29 and arms 28 until the next suc- 60 ceeding pocket 33 is brought to position below the chute 23. Thereupon said piece is guided into said pocket. To facilitate and guide the move- 65 ment of the piece A into said pocket the arm 28 has a heel 28^a which is curved inwardly toward said pocket in manner to reduce the shock of the drop of said piece into the pocket. In the meantime the spring-controlled gate 32 has re- 70 turned to its position of forming the forward wall

of the chute. In this movement of the rotor the piece deposited in the pocket 33 is delivered to the shelf 34 upon which it rests until it is discharged therefrom, as will be now described.

From the shelf 34 in the casing 24 the pieces A are fed intermittently sidewise and trans- 75 versely of said casing by a horizontally reciprocable plunger 35 to a wrapping drum 36 (see Figure 8). To this end, the casing 24 is provided with horizontal aligned openings in the plane of the shelf 34—an opening 34^a for the entrance of said plunger 35 and an outlet opening 34^b for the discharge of a piece A. The 80 wrapping drum 36 is of familiar construction, with pockets 37 equally spaced about its periphery. It is intermittently operated in timed relation to the operation of the said feed rotor 25 and the plunger 35, to bring one of its pockets 37 into horizontal alignment with the shelf 34 85 and the outlet opening 34^b of the casing 24, to receive a piece A when it is propelled by said plunger 35 into said pocket 37. After the retraction of said plunger, the rotor 25 is again operated to deposit another piece A on the shelf 34; 90 after which the first operation is repeated.

A wrapper strip 38, of a width greater than the length of the pieces A, is fed from a roll 38^a supported at the top of the machine (see Figure 1). After passing about suitable tension de- 95 vices it passes through a channel 39 fixed to the frame (see Figure 10) to the wrapping drum 36, which is of length equal to the width of said strip 38. The channel 39 terminates in a transverse shearing blade 39^a, with which is asso- 100 ciated a movable blade 40. The wrapper strip 38 is fed across a pocket 37 (see Figures 8 and 10) and the advancing edge comes to rest against a transverse bar 41.

In proper timed relation to the transfer of 105 the piece A from the shelf 34 to a pocket 37, which has been brought into alignment therewith, a wrapper 38^b of predetermined length is severed from the strip. This occurs just as the advancing edge of a piece A engages said wrap- 110 per length 38^b. The further advancing movement of the plunger 35 drives the piece A with the enfolding wrapper into the pocket as shown at A¹ in Figure 10. In the further advance of 115 the wrapping drum from the full line position of the piece A indicated at A¹ to the dotted line position at A², the lower projecting margin of the wrapper is engaged by the proximate edge of the plate 41 so as to fold said margin about 120 the advancing edge of the piece. In the further advance from the dotted line position shown at A² to the full line position shown at A³, the bot- 125 tom wrapper margin at the advancing edge of the stick is brought into engagement from below with a sealing iron 42, as shown in Figures 8 and 10.

Immediately thereafter a coacting sealing iron 43 engages the top margin of the wrapper length 130 from above, as shown in Figure 10, so as to seal the two margins together near the advancing lateral edge of the piece. At the same time the plunger 35 delivers the next stick from the casing 24 to a pocket 37 which has been ad- 135 vanced to receiving position when the sealing irons above described have functioned.

From the position shown at A³ the partially 140 wrapped stick is carried through the dotted line position shown at A⁴ to the full line position shown at A⁵,—the partially wrapped stick being retained in said pocket in a familiar manner by 145 means not shown. Curved ribs 44 concentric with

and spaced from the curved surfaces of the wrapping drum as shown in Figures 8 and 10, act to wipe the sealed margins of the wrapper towards the body of the stick. In the position A⁵ the pocket opens horizontally to the left.

The operation of thus laterally enclosing the stick with the wrapper when moving from the position shown at A¹ through the position shown at A³ and thence to A⁵ is illustrated, respectively, in Figures 11 and 12.

From the wrapping drum 36 the laterally wrapped sticks are then fed in succession to an end sealing casing 45 (see Figures 3 and 8) wherein the open tubular ends of the wrapper shown in Figure 12 are collapsed beyond the stick upon themselves to form the flat sealed end fins 38^d, 38^d, as shown in Figure 13. The mechanism in said device comprises the following:

Within the casing 45 in horizontal alignment with a pocket 37 in the wrapping drum 36, when the stick is in the position indicated at A⁵, are fixed, laterally spaced, horizontal guide channels 46, 46 (see Figures 3, 8, 9 and 14) adapted to receive the open tubular ends 38^c, 38^c of the wrapper. Said channels are open at their inner edges and at the entrance ends they are flared apart as indicated at 46^a, 46^a to receive the open tubular ends 38^c of the wrapper. 47 indicate the longitudinally spaced upright fingers of the familiar transfer bar 47^a, which operates in proper timed relation with the rotating movement of the wrapping drum 36. One of the fingers 47 (shown in dotted lines in Figure 8) engages back of a wrapped stick when it reaches the position A⁵. Said sticks are fed in succession through the casing 45, with the projecting wrapper ends 38^d (Figure 12) engaged between the flanges of the channels 46.

48, 48 indicate idle discs mounted by studs 49 upon the vertical side walls 50 of said casing 45. Said discs project at their lower peripheries through longitudinal slots 51 in the channels 46 spaced at intervals corresponding to the intervals at which the pieces A are fed. The discs 48 engage the tops of the projecting tubular ends of the wrapper in manner to pinch them together as shown in Figure 13.

Next beyond the casing 45 is located a package assembly carriage 52 (see Figures 3 and 15). The carriage 52 comprises horizontal, laterally spaced channel members 53, 53 disposed in the plane of and in line with the channels 46, 46 in the casing 45; and a cross-head 56 to which said channels are rigidly secured. 53^a indicate three parallel fixed horizontal bars located below the carriage 52 and adapted to support the wrapped pieces A as they pass through the channels 46. 54 indicates a top spring-controlled pressure bar adapted to engage the tops of the wrapped pieces as they are pushed onto the bars 53^a, 53^a as and when they are fed to said carriage. The bar 54 is supported by the bar 54^a above it. The cross-head 56 projects laterally beyond the carriage 52 where it is provided with a sleeve 56^a, which is reciprocally mounted on a horizontal rod 57 extending parallel to the path of travel of the carriage 52 and fixed to a bracket 58.

60 indicates (Figure 1) a lever pivoted intermediate its ends to a link 61 which in turn is itself pivoted at 62 to the frame. The sleeve 56^a has a depending arm 59 which is pivotally connected to the longer upper arm of the lever 60 above the link 61. 63 indicates a casing in which is mounted a horizontal shaft 71 in the neighborhood of the bottom end of the lever 60. On said

shaft is fixed a cam 65 provided with a cam groove 66 (see Figure 3). A roller 67 travels in said cam groove 66 and is mounted on a horizontal stud 68 fixed to a forked arm 69 intermediate the ends of said arm. The forked end of the arm 69 carries a sliding block 64 which is rotatively mounted on the shaft 71. The other end of the arm 69 extends beyond the cam and is pivotally connected at 70 to the bottom end of the lever 60. By this construction the lever 60 will be swung on its pivotal connection through the link 61 to the frame at 62 in such manner as to reciprocate the cross-head 56 and the carriage 52 in a horizontal plane.

As the wrapped sticks are advanced in succession from the casing 45 by the fingers 47 of the transfer bar 47^a, they are moved one by one into the carriage 52 with their end fins 38^d engaged within the channels 53 of said carriage, with the bodies of said sticks supported on the bottom bars 53^a and yieldingly held down thereon by the pressure bar 54. In this movement each package passes under laterally spaced spring-controlled triggers 73, 73 carried by the cross-head 56 (see Figures 15 and 16) which act as an abutment to engage and move the sticks with the carriage when the carriage advances to the left.

The fingers 47, of which there are parallel sets of five, are mounted on a duplex transfer bar 47^a (see Figure 3). Said bar is operated by crank arms 47^b in a familiar manner to bring each set of fingers into operative position to engage a stick, and then depress them below the stick after they have advanced it to a certain position. Thereupon said stick is engaged by the next advancing set of fingers and carried forward again in like manner. This is continued until an assembly of five sticks has been delivered to the carriage 52 with their lateral edges in close engagement as shown in Figure 15.

After the five sticks have been fed to and received by the carriage 52, the lever 60 is operated to advance the carriage 52 and deliver the five sticks into one of four like transfer arms containing an elongated chamber each adapted to receive the assembled wrapped sticks. 75 (see Figure 15) indicates each of the four transfer arms. They are radially mounted in a horizontal plane on a hub 76 keyed to a tubular vertical shaft 77. With the hub 76 the four arms constitute an intermittently rotating turret 78. This is designed in its rotation to shift each arm 75 from an initial or first station I which is in direct horizontal alignment with the movement of the carriage 52, to a second station II at right angles thereto; then to a third station III, and then to a fourth station IV. Thence the wrapped finished package as will hereinafter be described, is ejected horizontally to a discharge belt 80 by means of which the packages are carried to another station to be packed in any desirable manner.

Each of the arms 75 consists of horizontal, laterally spaced members 75^a, 75^a and an intermediate member 75^b. Mounted on said member 75^b are fixed, vertically spaced, radially disposed parallel bars or jaws 81, 82 which are fixed to the hub 76. They are disposed in the first position in radial alignment with the axis of the carriage 52 in position to receive the carriage 52 and the wrapped sticks carried thereby. The bar 82 is a spring bar and acts to yieldingly hold the package when it is brought between the two bars 81, 82.

The forward ends of the channels 53 of the carriage 52 are rounded to form blunt noses 53^b,

53^b. In the advance of the carriage 52 to an arm 75, the noses 53^b, 53^b engage and carry with them a wrapping strip 74^a which hangs down through and below a flat tubular guide 74^a into the path of said carriage. Said strip is intermittently fed and severed to wrapper length 74^a by mechanism indicated at 74^b (see Figure 1) like that which intermittently feeds and severs the stick wrapper lengths as heretofore described.

84 indicates a sliding yoke mounted on the bar 81. It is limited in its outward movement thereon by pins 81^x fixed near the end of said bar (see Figure 17). Said sliding yoke is pushed by the carriage 52 back against the hub 76. Said spring plate 82 yieldingly holds the package against the top bar 81 as the carriage 52 is withdrawn to return to its first position. This spring bar also retains the package in place when the arm 75 is moved from and through positions I, II, III and to IV. In this movement the free ends 74^c of the package wrapper length, which project beyond the ends of the arms 75 with part of the top section still held in the guide 74^a are caught and guided between horizontal arcuate plates 79^x fixed to the frame and flared at their ends adjacent position I to receive and guide said free ends in their movement to position II and position III (see Figure 15). The flat tubular guide 74^a is slotted on the one edge in order to permit such movement and disengagement of the top wrapper section from said tube.

With the package in position I as shown in Figure 15, the five sticks are embraced in the wrapper strip which is folded about the forward edge of the leading end stick, with its lateral margins embracing the fins 38^d of the sticks, and with the free ends 74^c of the wrapper strip 74^a extending beyond the rear end stick as shown in Figures 16 and 18 and in dotted lines in Figure 15.

From position I the arm 75 in proper timed relation is moved to position II. In this position the package is subjected to action between U-shaped upper and lower heating dies 85, the legs 85^a and 85^a of which engage the lateral margins of the wrapper sheet in the neighborhood of the fins 38^d, and the cross members 85^b of which engage between them the wrapper in the neighborhood adjacent the following edge of the rear end stick of the package. Since the wrapper strip is made preferably of a heat sealing paper, these heating dies prepare the paper for sealing together when the arm 75 is shifted to station III. There the lateral edges of the wrapper are subjected to action between clamping pressure dies 86, 86 which engage the margins 79^a of the wrapper sheet in like manner to that of the first named heating dies, as shown in Figure 15.

In addition, at position III the projecting free ends 74^c of the package are subjected to the action of cutter blades 87, 88 (see Figures 3 and 15) by means of which they are cut to angular form 79^c with a projecting tab 79^d to be grasped by the user of package when it is to be opened.

From position III, the turret is rotated to bring the arm 75 to position IV where it is disposed above and in alignment with an endless discharge belt 80. Said belt is mounted on a pulley 80^a (see Figures 1 and 2) which in turn is mounted on a horizontal shaft 80^b having fixed to its other end a pulley 80^c. The latter pulley is driven in proper timed relation by a belt 80^d from a pulley 80^e fixed on the horizontal shaft 71.

It will be understood that in the movement of the turret 78 with its arms 75 in and to the several

positions described, the package is yieldingly held between the bars 81 and 82 with an end in engagement against the yoke 84. Said yoke is provided with an upright centrally facing cam lug 89. This lug comes to position to be engaged by a cam arm 90, mounted on a vertical rock shaft 91, when a turret arm 75 reaches the position IV in alignment with the discharge belt 80. At the instant this happens, said cam arm 90 is operated by the rock shaft 91 to engage the cam lug 89 of the yoke 84, and by said yoke eject the package from between the upper and lower jaws or bars 81, 82 from which it drops to the discharge belt 80.

15 Passing now to the mechanism for operating the turret head 78 and its associated parts above described: The fixed blade 88 associated with the third position of a turret arm 75 (see Figures 3, 15 and 17) is mounted on the frame 20. The movable blade 87 is mounted on a vertically reciprocable head 92 pivotally connected to a link 93 depending from one arm of a lever 94. The lever 94 is mounted on a horizontal shaft 95 having rotative bearing in brackets 96, 96 rising from the frame, as shown in Figures 2 and 3. The other arm of the lever 94 carries a roller 97 engaged in a cam groove 98 of a cam drum 98^x. Said cam drum is fixed to the vertical shaft 77^a, which is continuously rotated.

30 The clamping dies 86, also associated with the third position of the turret arm 75, have fixed to them studs 86^x, 86^x projecting upwardly and downwardly, respectively, from said dies. 99, 99 indicate rock arms attached to said studs 86^x, 86^x with interposed springs to provide for yielding engagement of said dies with the parts of the wrapper engaged thereby. The upper arm 99 is fulcrumed to one end of a horizontal stud 100 fixed to a bracket 20^x of the frame (see Figures 3 and 4). A cam roller 101 carried by the arm 99 is engaged in a cam groove 102 in the aforesaid cam drum 98^x fixed to the shaft 77^a. The bottom arm 99 is fixed to one end of a horizontal rock shaft 100^d (see Figure 3) mounted in a bracket 20^y.

45 Like mechanism is employed for operating the heating dies 85, 85 associated with the second position of a turret arm. Vertically disposed studs 85^x, 85^x are fixed to the heating dies 85, 85. Said studs project upwardly and downwardly, respectively, from said heating dies. 99^x, 99^x indicate rock arms attached to said studs 85^x, 85^x with interposed springs as before (not shown) to provide for yielding engagement of said dies, with the parts of the wrapper engaged between them. 50 The upper rock arm 99^x is fulcrumed to the horizontal stud 100 fixed to the bracket 20^x (see Figures 2, 3 and 4). A cam roller 101^x carried by said arm 99^x is engaged in a third cam groove 102^x in the aforesaid cam 98^x fixed to the vertical shaft 77^a. The lower arm 99^x is fixed to the rock shaft 100^d (see Figure 3) and carries a cam roller 101^y which engages a cam groove 101^z in a cam 101^w fixed to the upright shaft 110 (see Figures 2 and 3).

60 The turret 78 is intermittently rotated to bring the several arms 75 into their successive positions heretofore described by any familiar mechanism, as for example the familiar Geneva gear (Figure 3) including an intermittently rotated member 77^x fixed to the vertical tubular shaft 77 and a continuously rotated member 77^y fixed to a vertical shaft 110 which in turn is driven by beveled gearing 111 (see Figure 2). The shaft 110 is connected by gears 112, 113 (see Figures

2 and 3) to the upright shaft 77^a to which is fixed the barrel cam 98^x.

The vertical rock shaft 91 to which the cam arm 90 which acts to eject a package A is fixed, is rocked by a link 114 which connects an arm 115 fixed to said shaft to the lever arm 60. The connections at the ends of the link are universal to compensate for the angular relation of the link 114, the shaft 91 and the lever 60.

The horizontal shaft 71, suitably mounted in the frame 20, extends back of the frame where it is connected in any suitable manner to a motor 116, (see Figure 2). As shown, the motor is connected by belt and pulley 117 to a horizontal, transverse shaft 118 at the right-hand end of the machine. From said shaft 118, and through a return train of gears 119, 120, 121, and sprocket 122, chain 123 and sprocket 124 on the shaft 71, said shaft 71 is continuously rotated.

The continuously driven shaft 118 is connected by any familiar gearing, as by the familiar Geneva gearing indicated at 125 in Figure 2, to impart an intermittent timed movement to the horizontal shaft 36^a upon which is fixed the wrapping drum 36 (see Figures 3 and 8). By such gearing the intermittent rotation of the wrapping drum 36 in the manner described is brought about.

126 indicates a horizontal shaft extending parallel to the intermittently rotating shaft 36^a and connected by gearing 127 at one end to the shaft 36^a and by miter gearing 128 to a transverse shaft 129 and gearing 130 to operate the intermittently rotated shaft 26 of the rotor 25 in the piece transfer casing 24 (see Figures 2 and 6).

On the intermittently rotating shaft 36^a is a sprocket 131 which, by a chain 132 indicated in dotted lines in Figure 3, is connected by a sprocket and chain to drive, in any familiar manner, the two feed rollers 133, 133^a which act to feed the piece wrapper strip 38 to and through the channel 39, and thence to the wrapping drum 36.

The movable blade 40 is operated in a familiar manner by a rock arm, crank and eccentric 134 on a shaft 135 driven by the train of gearing 120, 121 which is continuously driven from the shaft 118. (See Figure 2.)

A like rock arm, crank and eccentric 136 on a shaft 137 driven by a sprocket and chain 138 from the continuously rotating shaft 71 (see Figure 2) operates the movable cutting member of the severing mechanism 74^b for the package wrapper strip (see Figures 1 and 2), fed by suitable rolls driven by a sprocket and chain (not shown) from a sprocket 150 on the shaft 36^a.

At the front of the machine on the forward end of the continuously rotating shaft 118 (see Figure 3) is mounted an eccentric mechanism 139 connected to the transfer bar 47^a by link 47^b. The plunger 35 which operates to transfer the pieces A from the casing 24 to the wrapping drum 36 is fixed to the top of one arm 35^x of a rocker member 140 mounted on a stud shaft 141 fixed to the frame (see Figures 8 and 10). Said rocker member is connected by a link 142 to the eccentric 139. By this mechanism the transfer bar 47^a is operated in unison with the reciprocating movement of the plunger 35 so as to transfer the pieces A from the casing 24 to the wrapping drum in timed relation to the removal of said piece when partially wrapped, by the transfer bar 47^a.

The upper sealing iron 43 associated with the wrapping drum as shown in Figures 3 and 10 is carried at the upper end of an arm 143 which is fixed to the rocker member 140. The sealing

iron is thus operated in timed unison with the plunger 35. The sealing iron 42 is mounted on a rock arm 144 pivoted on the frame at 144^a. 145 indicates a link yieldingly and pivotally connected to a fixed stud 146 on the frame member 140 at one end and pivotally connected by pin and slot 147 at the other to operate the sealing iron 42. By this construction the sealing irons are brought to engagement with the margins of the wrappers for the pieces as hereinbefore described, with a yielding movement which permits them to remain in contact for a short length of time during the transfer of a piece from the casing 24 to the wrapping drum by the reciprocating plunger 35.

The reciprocation of the carriage 52 and the intermittent rotation of the turret 78, designed to arrest one of its receiving arms 75 in position to receive an assembly of sticks in the forward intermittent movement of said carriage, are as hereinbefore described. The fingers 47 of the transfer bar 47^a are spaced lengthwise of their travel so that when on their upper level of travel they will successively engage and intermittently advance in laterally spaced relation the partially wrapped sticks from the wrapping drum 36. Their continued advance will carry the sticks in laterally spaced relation to the left towards the carriage 52, with the end fins of the wrapped sticks engaged in the channels 46 of the casing 45, which extend into abutting relation with the channels 53 of the carriage 52.

The reciprocating movement of the carriage 52 is preferably timed to arrive at its rearward movement, to the right as shown in Figure 1, when the fingers 47 of the transfer bar 47^a have brought, edge to edge, three wrapped sticks in position forward of the yielding abutments 73. The remaining two sticks to complete the package are moved into edge to edge engagement with each other into the carriage and beyond the yielding abutments 73 by the next following fingers 47 in succession, so that the fifth stick is advanced with its following rear edge beyond and engaged by said fingers as a rear abutment. Then the carriage in its timed relation moves forwardly with its assembly of five wrapped sticks into the arm 75 disposed in alignment therewith, as hereinbefore described.

Upon the return movement of the carriage, the above described operation is repeated. The fingers 47 deliver to the carriage upon its return movement three wrapped sticks; and in the interval before its forward movement, two wrapped sticks to complete the package. And this operation is all in timed relation to the intermittent operation of the feed of the sticks to the stick wrapping drum and to the intermediate reciprocation of the carriage to permit the movement of the laterally spaced wrapped sticks into lateral edge engagement for assembly in the carriage, which delivers said assembly to the package wrapping turret.

As will be understood, the wrapper web 38 for the pieces of chewing gum or the like and the wrapper web 74 for the package, either or both, will generally bear on their respective exposed surfaces longitudinally, equally spaced display panels to appear upon the top and bottom of the wrapped stick and upon the top and bottom of the wrapped package, disposed symmetrically upon the stick or the package, as the case may be. Accordingly, as in the mechanical feed of such webs, they are known to advance or lag under varying conditions and prevent proper register at

all times of the panel with the piece or with the package, suitable familiar mechanism controlled by the electric eye may be provided, as indicated in Figure 1, to compensate for said lag or advance of said webs. As they form no part of the present invention, however, no description thereof is made herein.

While in describing the preferred embodiment of the invention it is shown as applied to the wrapping of gum sticks, it will be understood that it is applicable for wrapping sticks, pieces or other objects of any material. For the sake of brevity the term "sticks" will be used, where necessary, in the claims to refer to the articles which the machine is designed to wrap.

I claim as my invention:

1. A machine for wrapping a plurality of sticks in a flat package, comprising means for wrapping the sticks in tubular wraps projecting beyond the ends of the sticks, means for collapsing the projecting open ends of said wraps to form flat end fins, means for assembling said wrapped sticks in a common plane with their lateral edges engaged and with said end fins in parallel alignment, and means for applying to said stick assembly a wrapper to enclose the top and bottom faces of said assembly, to enclose the outer edge of each end stick thereof, and to embrace between its lateral margins the end fins of said stick wraps.

2. A machine for wrapping a plurality of sticks in a flat package, comprising means for wrapping the sticks in tubular wraps projecting beyond the ends of the sticks, means for collapsing and sealing the projecting open ends of said wraps to form flat end fins, means for assembling said wrapped sticks in a common plane with their lateral edges engaged and with said end fins in parallel alignment, and means for applying to said stick assembly a wrapper length adapted to enclose the top and bottom faces of said assembly, to enclose the outer edge of each end stick thereof, to extend freely beyond one end of said assembly, and to embrace between its lateral margins the end fins of said stick wraps.

3. A machine for wrapping a plurality of sticks in a flat package, comprising means for wrapping the sticks in tubular wraps projecting beyond the ends of the sticks, means for collapsing and sealing the projecting open ends of said wraps to form flat end fins, means for assembling said wrapped sticks in a common plane with their lateral edges engaged and with said end fins in parallel alignment, and means for applying to said stick assembly a wrapper length adapted to enclose the top and bottom faces of said assembly, to enclose the outer edge of each end stick thereof, to extend beyond one end of said assembly and to embrace between its lateral margins the end fins of said stick wraps, and means for cutting overlying free end extensions of said wrapper into angular form.

4. A machine for wrapping a plurality of sticks in a flat package, comprising means for wrapping the sticks in tubular wraps projecting beyond the ends of the sticks, means for collapsing the projecting open ends of said wraps to form flat end fins, means for assembling said wrapped sticks in a common plane with their lateral edges engaged and with said end fins in parallel alignment, and means for applying to said stick assembly and sealing an integral wrapper length adapted to enclose the top and bottom faces of said assembly, to enclose the outer edge of each end stick thereof, and to embrace between its lateral margins the end fins of said stick wraps.

5. A machine for wrapping a plurality of sticks in a flat package, comprising means for wrapping the sticks in tubular wraps projecting beyond the ends of the sticks, means for collapsing the projecting open ends of said wraps to form flat end fins, means for assembling said wrapped sticks in a common plane with their lateral edges engaged and with said end fins in parallel alignment, and means for applying to said stick assembly a wrapper adapted to enclose the top and bottom sides of said assembly, to enclose the outer edge of each end stick thereof, and to embrace and seal between its lateral margins the end fins of said stick wraps.

6. A machine for wrapping a plurality of sticks in a flat package, comprising means for wrapping the sticks in tubular wraps projecting beyond the ends of the sticks, means for collapsing the projecting open ends of said wraps to form flat end fins, means for assembling said wrapped sticks in a common plane with their lateral edges engaged and with said end fins in parallel alignment, and means for applying to said stick assembly and sealing an integral wrapper length adapted to enclose the top and bottom faces of said assembly, to enclose the outer edge of each end stick thereof, and to embrace and seal between its lateral margins the end fins of said stick wraps, and means for cutting the overlying free end extensions of said wrapper into angular form.

7. A machine for wrapping a plurality of sticks in a flat package, comprising means for assembling said sticks in a common plane with their lateral edges engaged and with their ends in parallel alignment, and means for applying and sealing said stick assembly in a wrapper, said wrapper being adapted to enclose the outer lateral edges of the end sticks of said assembly and having lateral margins extending beyond the ends of said sticks to maintain the stick assembly in flat package form.

8. A machine for wrapping a plurality of sticks in a flat package, comprising means for assembling said sticks in a common plane with their lateral edges engaged and with their ends in parallel alignment, and means for applying and sealing said stick assembly in a wrapper length, said wrapper being adapted to enclose the outer lateral edges of the end sticks of said assembly and having lateral margins extending beyond the ends of said sticks to maintain the stick assembly in flat package form.

9. A machine for wrapping a plurality of sticks in a flat package, comprising means for assembling said sticks in a common plane with their lateral edges engaged and with their ends in parallel alignment, and means for applying to said stick assembly a wrapper length adapted to enclose the top and bottom faces of said assembly, to enclose the outer edge of each end stick thereof, to extend beyond one end of said assembly and to embrace between its lateral margins the ends of said sticks, and means for cutting overlying free end extensions of said wrapper into angular form.

10. A machine for wrapping a plurality of wrapped sticks in a flat package, comprising means for wrapping the sticks in tubular wraps collapsed at their ends to form end fins beyond the sticks, means for feeding said wrapped sticks in succession in a common plane, a carriage reciprocable in said plane adapted to receive said wrapped sticks and maintain them in edge engagement, means for feeding a package wrapper

length into the path of said carriage adapted to enfold the advancing end stick of said package assembly, said wrapper length being of a width to embrace between its lateral margins the end fins of said stick wraps and to project beyond the following end of said package assembly, and means for folding and sealing said package wrapper length to enclose said package assembly.

11. A machine for wrapping a plurality of wrapped sticks in a flat package, comprising means for wrapping the sticks in tubular wraps collapsed at their ends to form end fins beyond the sticks, means for feeding said wrapped sticks in succession in a common plane, a carriage reciprocable in said common plane adapted to receive said wrapped sticks and maintain them in edge engagement, means for feeding and severing a package wrapper length having top and bottom sections adapted to enfold the advancing end stick of said package assembly, said sections being of a width to embrace between its lateral margins the end fins of said stick wraps and of a length to project beyond the following end of said package assembly, means for folding and sealing said package wrapper length upon said package assembly upon said fins and adjacent its following end, and means for cutting the free ends of said wrapper sections beyond said end seal.

12. A machine for wrapping a plurality of sticks in a flat package, comprising means for feeding said sticks in succession in a common plane, a carriage reciprocable in said common plane adapted to receive said sticks and maintain them in edge engagement, means for feeding and severing a package wrapper length adapted to enfold the lateral edge of the advancing end stick of said package assembly, said wrapper length being of a width greater than the length of said sticks and having top and bottom sections of a length to project beyond the following end of said stick assembly, means for folding and sealing said package wrapper length upon said stick assembly beyond the ends of the sticks and about the following edge of the following end of said assembly, and means for cutting the free ends of said wrapper sections beyond said end seal to angular form.

13. A machine for wrapping and sealing in a flat package a plurality of sticks enclosed in wraps with projecting end fins comprising means for feeding said wrapped sticks in succession, a reciprocable carriage provided with oppositely disposed channels adapted to receive said end fins, means to yieldingly maintain said sticks in edge engagement in said carriage, a wrapping turret adapted to be intermittently rotated in timed relation to the reciprocation of said carriage, comprising radial arms each including vertically spaced, relatively yielding jaws adapted to receive and retain between them a package assembly, means for feeding and severing a package wrapper length more than double the length of the package assembly and of a width to embrace the end fins of the wraps of said sticks, means for intermittently rotating said turret in timed relation to the reciprocation of said carriage to bring said arms to successive stations, and heating and clamping devices operative at said successive stations of said arms upon the lateral edges of said wrapper and adjacent the following end of said package assembly for sealing said assembly in a flat package.

14. A machine for wrapping and sealing in a

flat package a plurality of sticks enclosed in wraps with projecting end fins comprising means for feeding said wrapped sticks in succession, a reciprocable carriage provided with oppositely disposed channels adapted to receive said end fins, means to yieldingly maintain said sticks in edge engagement in said carriage, a wrapping turret adapted to be intermittently rotated in timed relation to the reciprocation of said carriage, comprising radial arms each including vertically spaced, relatively yielding jaws adapted to receive and retain between them a package assembly, means for feeding and severing a package wrapper length more than double the length of the package assembly and of a width to embrace the end fins of the wraps of said sticks, means for intermittently rotating said turret in timed relation to the reciprocation of said carriage to bring said arms to successive stations, heating and clamping devices operative at said successive stations of said arms upon the lateral edges of said wrapper and adjacent the following end of said package assembly for sealing said assembly in a flat package, and means for ejecting said package from each arm after said sealing.

15. A machine for wrapping and sealing in a flat package a plurality of sticks enclosed in wraps with projecting end fins comprising means for feeding said wrapped sticks in succession, a reciprocable carriage provided with oppositely disposed channels adapted to receive said end fins, means to yieldingly maintain said sticks in edge engagement in said carriage, a wrapping turret adapted to be intermittently rotated in timed relation to the reciprocation of said carriage, comprising radial arms each including vertically spaced, relatively yielding jaws adapted to receive and retain between them a package assembly, means for feeding and severing a package wrapper length more than double the length of the package assembly and of a width to embrace the end fins of the wraps of said sticks, means at the advanced end of said carriage to engage said wrapper length and push it between said jaws as said carriage advances, means for intermittently rotating said turret in timed relation to the reciprocation of said carriage to bring said arms to successive stations, and heating and clamping devices operative at said successive stations of said arms upon the lateral edges of said wrapper and adjacent the following end of said package assembly for sealing said assembly in a flat package.

16. A machine for wrapping and sealing in a flat package a plurality of sticks enclosed in wraps with projecting end fins comprising means for feeding said wrapped sticks in succession, a reciprocable carriage provided with oppositely disposed channels adapted to receive said end fins, means to support and maintain said sticks in edge engagement in the reciprocation of said carriage, a wrapping turret adapted to be intermittently rotated in timed relation to the reciprocation of said carriage, said turret comprising radial arms each consisting of laterally spaced members and of intermediate vertically spaced, relatively yielding jaws adapted to receive and maintain a package assembly, means for feeding and severing a package wrapper length more than double the length of the package assembly and of a width to embrace the end fins of said wrapped sticks, means for intermittently rotating said turret in timed relation to the reciprocation of said carriage to bring said arms to successive

stations, and heating and clamping devices operative at said successive stations of said arms, upon the lateral edges of said wrapper and adjacent the following end of said package assembly.

17. A machine for wrapping and sealing in a flat package a plurality of sticks enclosed in wraps with projecting end fins, comprising means for feeding said wrapped sticks laterally and in succession in a common plane, a carriage reciprocable in said plane provided with oppositely disposed channels to receive said end fins, means providing a yielding abutment at the following end of said carriage adapted to admit wrapped sticks as they are fed thereto and to maintain them in edge engagement when said carriage is advanced, a fixed support for the wrapped sticks in said carriage, yielding means for holding said wrapped sticks upon said support in the reciprocation of said carriage, a wrapping turret adapted to be intermittently rotated in the plane of and in timed relation to the reciprocation of said carriage, said turret comprising radial arms each consisting of laterally spaced members and of intermediate vertically spaced, relatively yielding jaws adapted to receive and retain said package assembly with said end fins in the spaces between said radial arms and said jaws, means for feeding and severing a package wrapper length more than double the length of the package assembly and of a width to embrace the end fins of said wrapped sticks, means for intermittently rotating said turret in timed relation to the reciprocation of said carriage to bring said arms to successive stations, and heating and clamping devices operative at successive stations of said arms upon the lateral edges of said wrapper and adjacent the following end of said package assembly.

18. In a machine for wrapping and sealing in a flat package a plurality of sticks enclosed in wraps with projecting end fins, a wrapping turret comprising a plurality of arms disposed at right angle to each other, said turret being adapted to be rotated intermittently to bring each arm to a receiving station, then in succession to second, third and fourth stations, each arm comprising laterally spaced, horizontal members and a pair of relatively yielding, vertically spaced jaws disposed between said arm members, a reciprocable carriage positioned to deliver to an arm when in the receiving station an assembly of wrapped sticks with the end fins of their wraps projecting laterally beyond said jaws, means for feeding into the path of said carriage and severing a wrapper of a length to provide top and bottom sections of greater length than that of said package assembly and of a width to embrace said end fins, heating and clamping devices adapted to engage said wrapper length when an arm is at the second station to heat the lateral margins of said wrapper sections embracing said fins and the projecting ends of said sections adjacent the following end of the stick assembly, clamping and heating devices adapted to engage and seal said wrapper parts and fins together at the third station, and means for ejecting said wrapped packages from said turret at the fourth station of an arm.

19. In a machine for wrapping and sealing in a flat package a plurality of sticks enclosed in wraps with projecting end fins, a wrapping turret comprising a plurality of arms disposed at right angles to each other, said turret being adapted to be rotated intermittently to bring each arm to a receiving station, then in suc-

5 sion to second, third and fourth stations, each arm including vertically spaced, relatively yielding jaws adapted to receive and retain between them a package assembly, a reciprocable carriage positioned to deliver to an arm when in the receiving station an assembly of wrapped sticks with the end fins of their wraps projecting laterally beyond said jaws, means for feeding into the path of said carriage and severing a wrapper of a length to provide top and bottom sections of greater length than that of said package assembly and of a width to embrace said end fins, heating and clamping devices adapted to engage said wrapper length when an arm is at the second station to heat the lateral margins of said wrapper sections embracing said fins and the projecting ends of said sections adjacent the following end of the stick assembly, clamping and heating devices adapted to engage and seal said wrapper parts and fins together at the third station, and means for ejecting said wrapped packages from said turret at the fourth station of an arm.

20. In a machine for wrapping and sealing in a flat package a plurality of sticks enclosed in wraps with projecting end fins, a wrapping turret comprising a plurality of arms disposed at right angles to each other, said turret being adapted to be rotated intermittently to bring each arm to a receiving station, then in succession to second, third and fourth stations, each arm including vertically spaced, relatively yielding jaws adapted to receive and retain between them a package assembly, a reciprocable carriage positioned to deliver to an arm when in the receiving station an assembly of wrapped sticks with the end fins of their wraps projecting laterally beyond said jaws, a slidable yoke on each arm adapted to be engaged by said carriage, means for feeding into the path of said carriage and severing a wrapper of a length to provide top and bottom sections of greater length than that of said package assembly and of a width to embrace said end fins, heating and clamping devices adapted to engage said wrapper length when an arm is at the second station to heat the lateral margins of said wrapper sections embracing said fins and the projecting ends of said sections adjacent the following end of the stick assembly, clamping devices adapted to engage and seal said wrapper parts and fins together at the third station, and a cam operated at the fourth station of an arm to engage said yoke and move it radially of said arm to eject the package carried thereby.

21. In a wrapping machine, a wrapping turret adapted to be intermittently rotated to successive positions, comprising a plurality of radial duplex arms spaced at angular intervals, each arm including vertically spaced, relatively yielding jaws with their lateral edges spaced within said duplex arms, means for feeding and severing a package wrapper length more than double the length of the package assembly to be wrapped, and of a width to extend into the spaces between said jaws and said duplex arms, means for intermittently rotating said turret from a first position to successive positions, U-shaped clamping devices disposed at one or more successive stations of said arms adjacent the end and lateral edges of said jaws, and means associated with the last position of said arms adapted to discharge a package engaged between said jaws and a conveyor to receive said package when discharged.

22. In a wrapping machine, a wrapping turret adapted to be intermittently rotated to successive

positions, comprising a plurality of radial duplex arms spaced at angular intervals, each arm including vertically spaced, relatively yielding jaws with their lateral edges spaced within said duplex arms, a yoke slidable upon one of said jaws from an outermost position to an innermost position, means for feeding and severing a package wrapper length more than double the length of the package assembly to be wrapped, and of a width to extend into the spaces between said jaws and said duplex arms, means for intermittently ro-

tating said turret from a first position to successive positions, U-shaped clamping devices disposed at one or more successive stations of said arms adjacent the end and lateral edges of said jaws, means associated with the last position of said arms adapted for moving said yoke outwardly to discharge a package engaged between said jaws, and a conveyor to receive said package when discharged.

LAWRENCE J. SALADIN.