

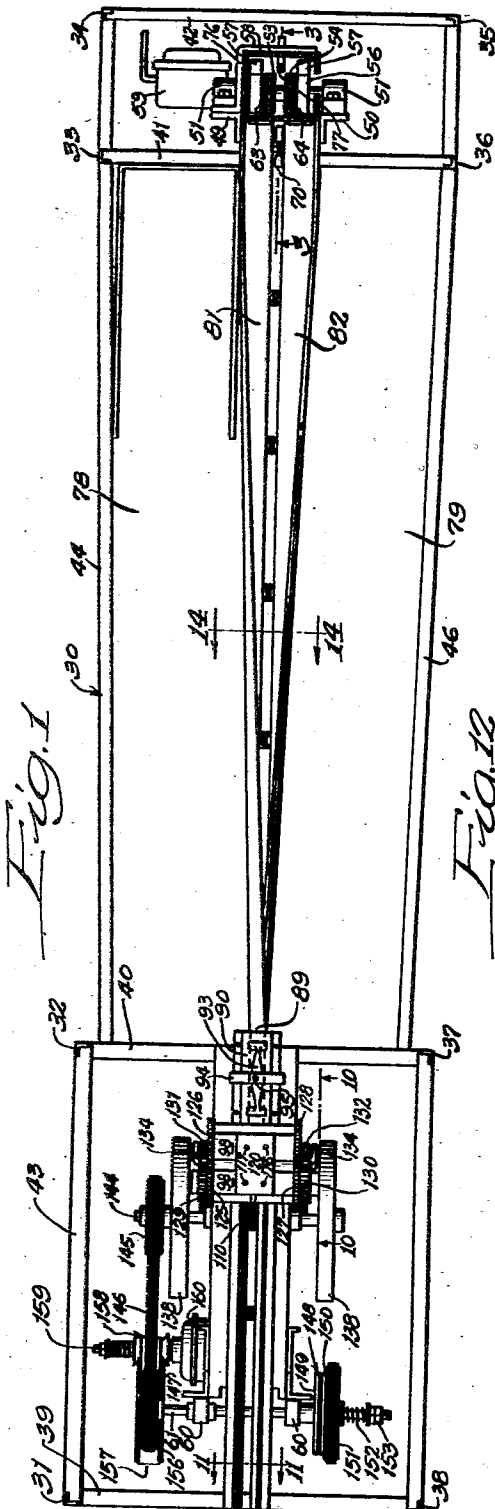
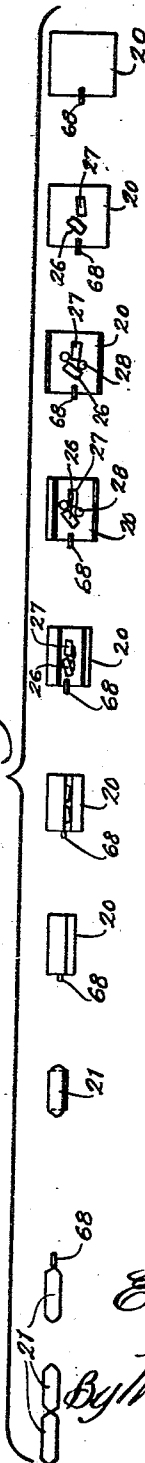
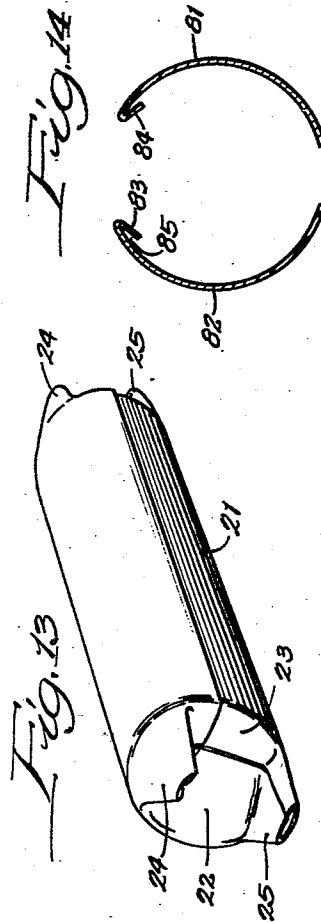
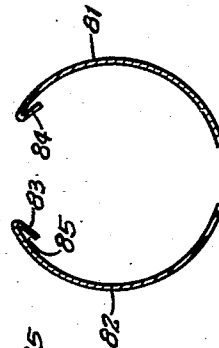
July 3, 1945.

E. D. ANGELL
PACKAGING MACHINE

2,379,407

Filed Aug. 6, 1943

5 Sheets-Sheet 1



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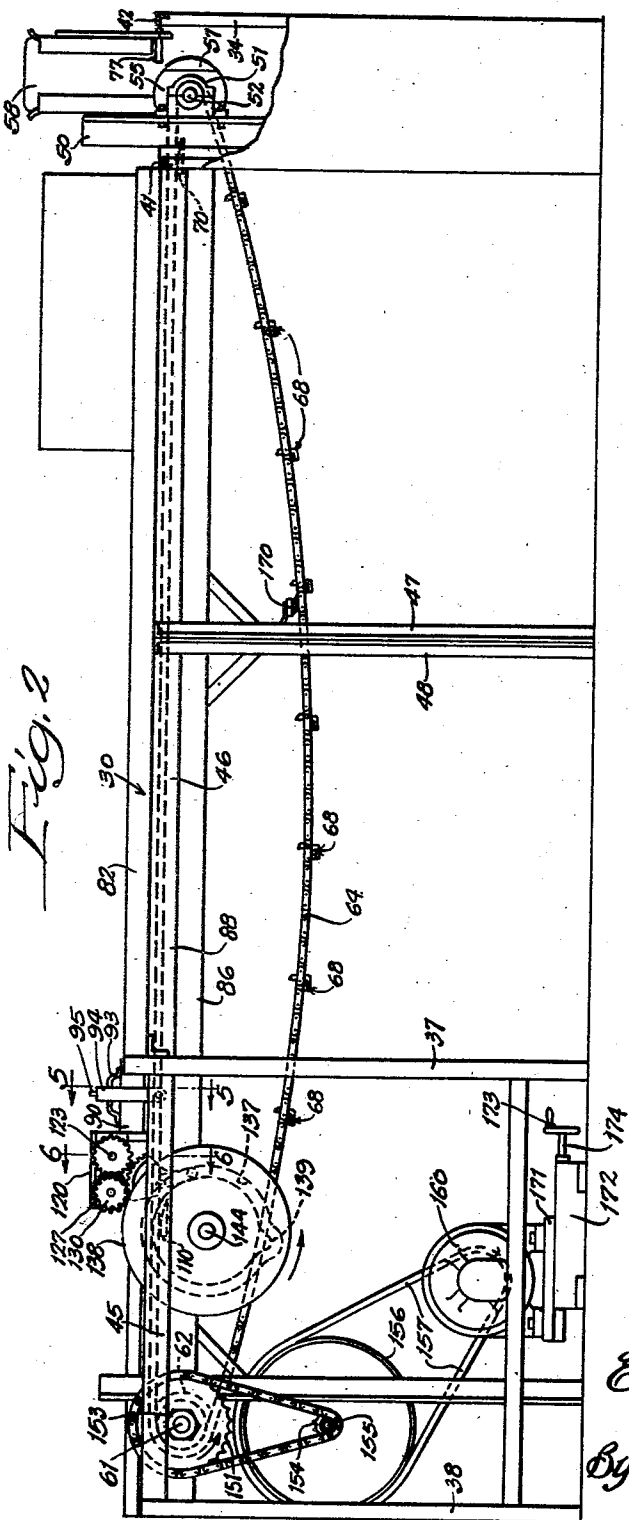
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E. D. ANGELL
PACKAGING MACHINE

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2,379,407

5 Sheets-Sheet 2



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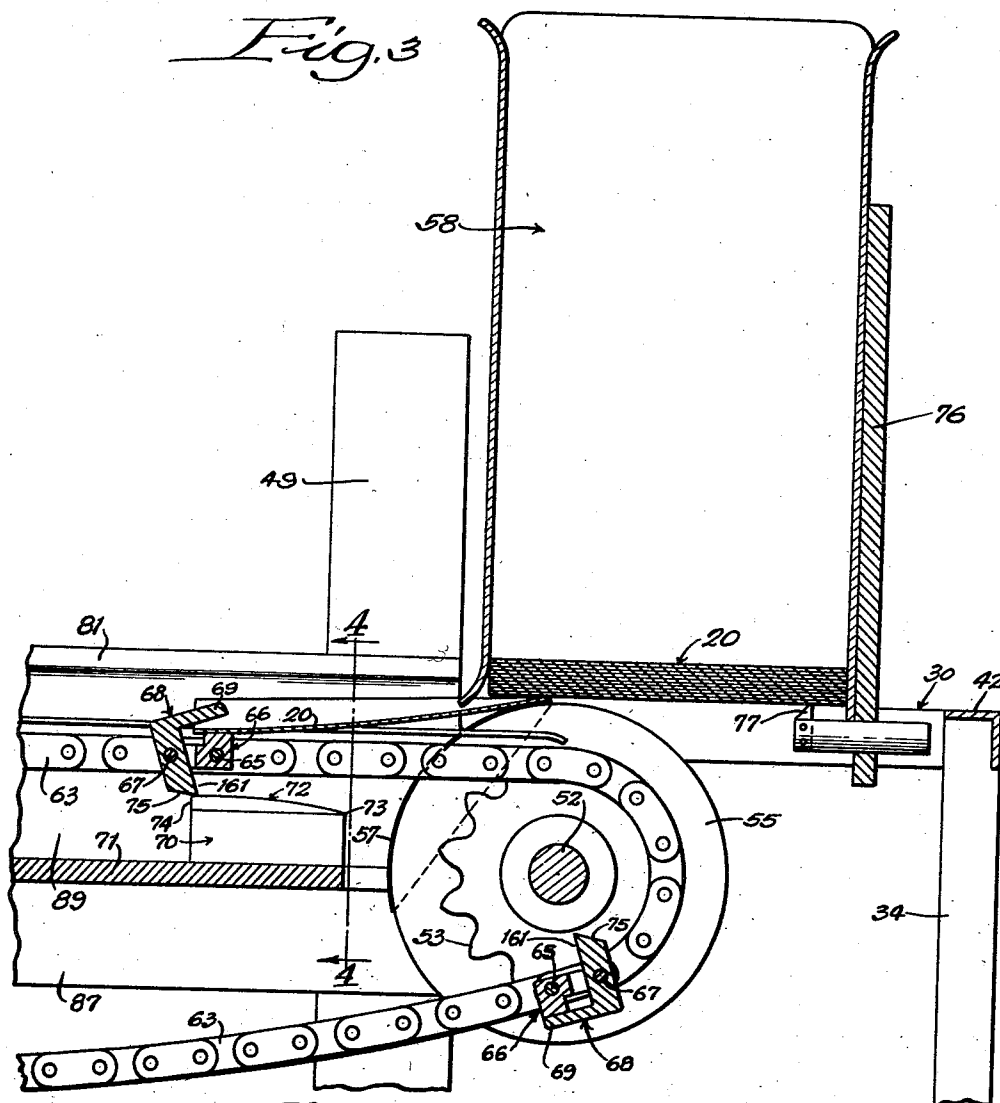
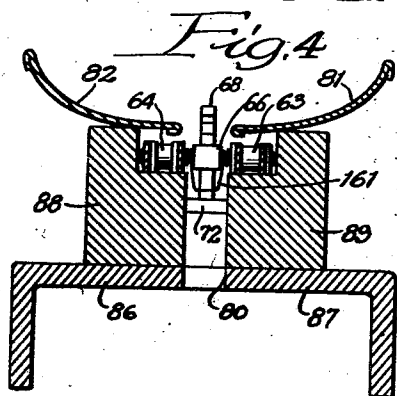
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E. D. ANGELL
PACKAGING MACHINE

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5 Sheets-Sheet 3



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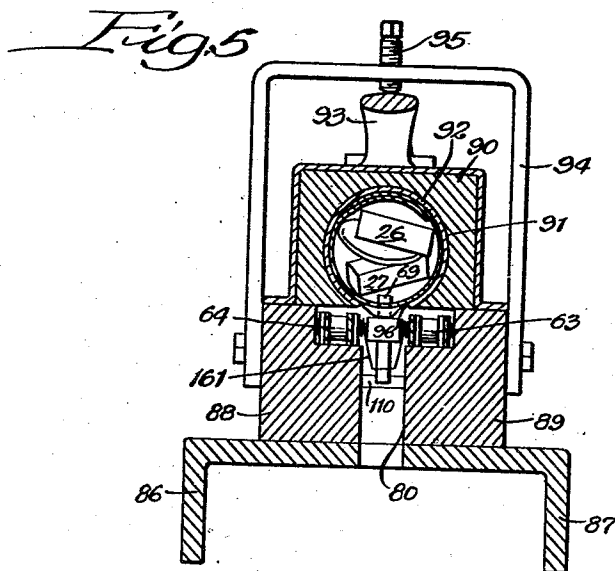
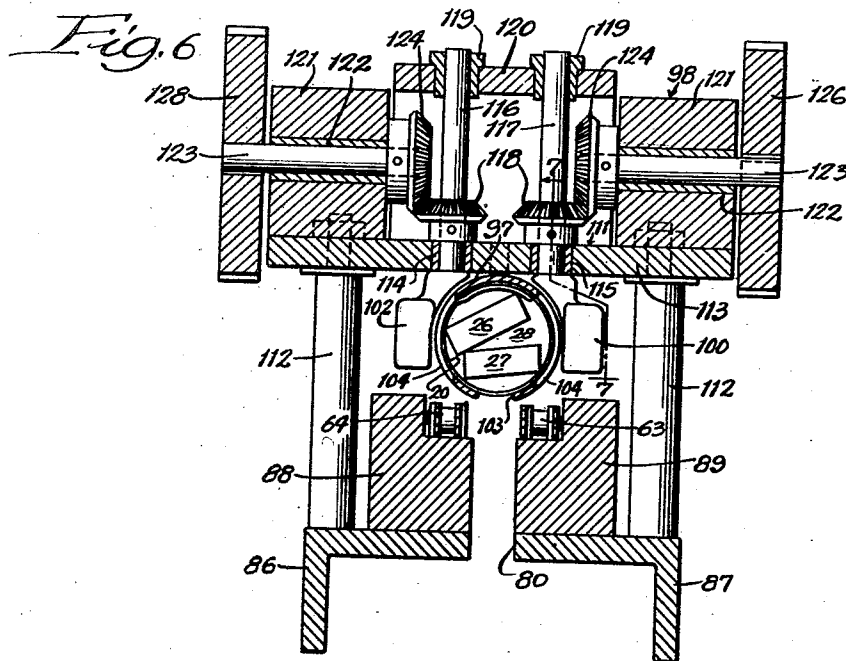
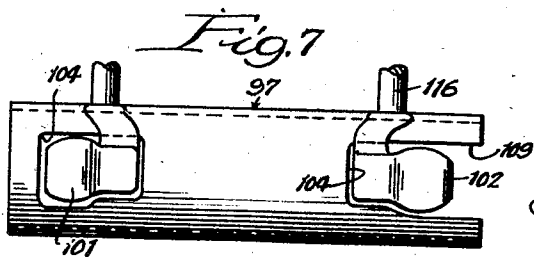
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2,379,407

PACKAGING MACHINE

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5 Sheets-Sheet 4



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July 3, 1945.

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2,379,407

PACKAGING MACHINE

Filed Aug. 6, 1943

5 Sheets-Sheet 5

Fig. 8

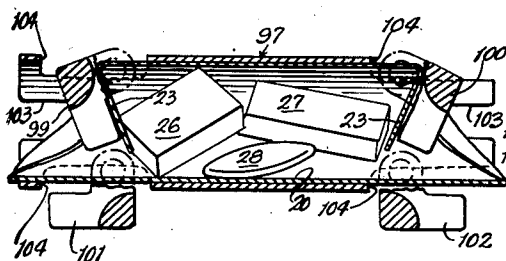


Fig. 9

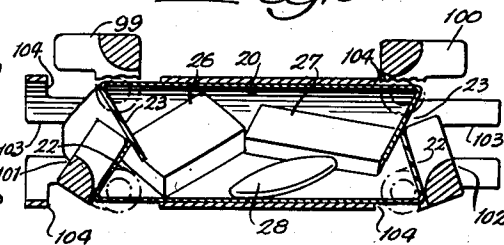


Fig. 10

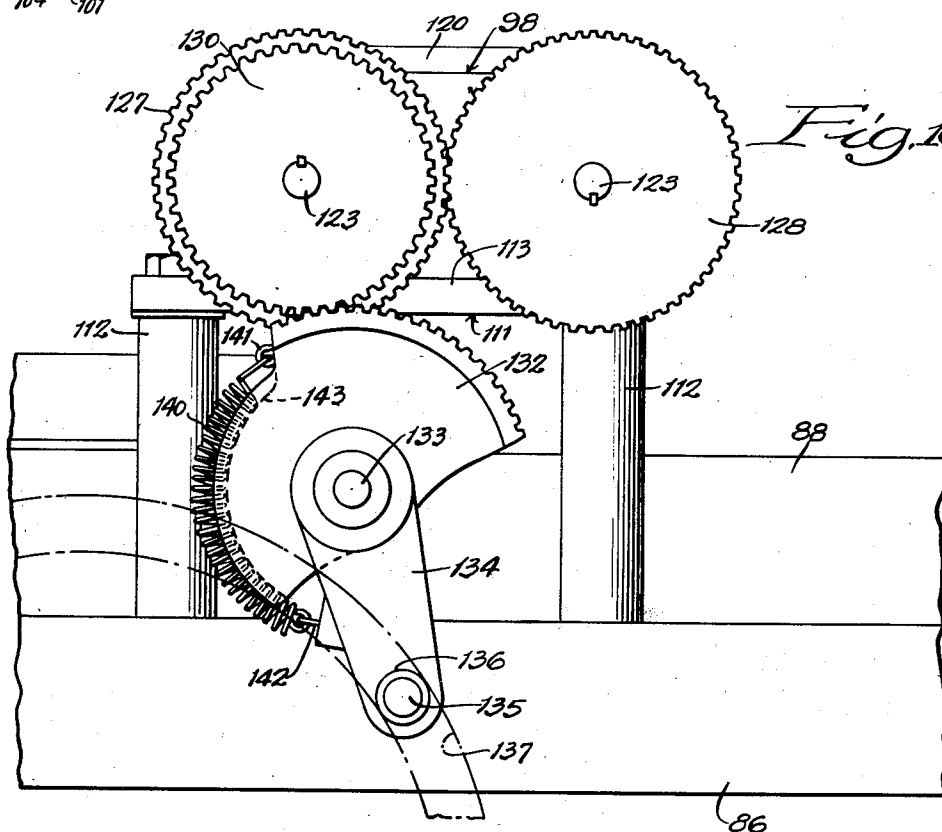
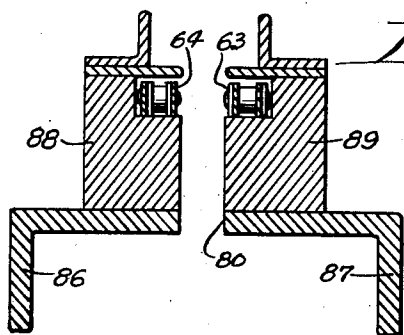


Fig. 11



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UNITED STATES PATENT OFFICE

2,379,407

PACKAGING MACHINE

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Application August 6, 1943, Serial No. 497,618

3 Claims. (Cl. 93—2)

The present invention relates to packaging machines for small articles, such as confections, gum, or tiny toys, and other novelties, and is also concerned with improved methods of packaging such articles.

One of the objects of the invention is the provision of an improved machine which is adapted to make a relatively light package by rolling a small sheet of paper and turning in the ends so that the machine may be used for making these packages of candy, gum, tiny toys, or other light articles capable of being held in such a package.

Another object of the invention is the provision of a machine of the class described, which is adapted to effect an automatic feed of sheets of paper from a stack of such sheets, and which is adapted to cause the sheet to progress along a conveyor where articles to be packaged can be placed upon the sheet while the sheet is being gradually rolled into a tube in one of the steps of the formation of the package.

Another object of the invention is the provision of an improved machine which is adapted to carry out a novel method of packaging, by means of which the rolling of the sheet into tubular form takes place simultaneously with the progress of the sheet from its position in a stack of sheets to a final position where the rolled sheet has its ends turned in by the machine to complete the package.

Another object of the invention is the provision of an improved package which is more regular in its characteristics and shape than the packages which are made by hand, and which is adapted to contain a plurality of relatively small light articles, such as candy, gum, or tiny toys, but which also occupies a relatively large space, as the size and bulk of the package to be sold increases its attractiveness as a salable article.

Another object of the invention is the provision of an improved machine for packaging small articles, which is simple, sturdy, and which has the parts which determine its characteristics of operation adjustable so that it may be made to package such articles automatically at a faster rate, in greater volume, and at a lower cost than can be accomplished by the usual manual methods.

Other objects and advantages of the invention will be apparent from the following description and the accompanying drawings, in which similar characters of reference indicate similar parts throughout the several views.

Referring to the five sheets of drawings which accompany this specification,

Fig. 1 is a top plan view of a machine embodying the invention;

Fig. 2 is a side elevational view of the machine;

Fig. 3 is a fragmentary sectional view, taken on the plane of the line 3—3 of Fig. 1, looking in the direction of the arrows, showing the details of construction of the right end of the machine and the supply of paper sheets with which the packages are made;

Fig. 4 is a fragmentary sectional view, taken on the plane of the line 4—4 of Fig. 3, looking in the direction of the arrows, showing the details of construction of the frame and the guides which support the paper at that point;

Fig. 5 is a fragmentary vertical sectional view, taken on the plane of the line 5—5 of Fig. 2, looking in the direction of the arrows, showing the packages at the time they have progressed to this point and have been rolled into a tube;

Fig. 6 is a similar fragmentary sectional view, taken on the plane of the line 6—6 of Fig. 2, looking in the direction of the arrows, showing the paper with its contents, the paper having been formed into a tube just preliminary to the folding in of the ends of the package;

Fig. 7 is a fragmentary elevational view of the tubular guide adapted to support the paper at the time its ends are folded inward, taken on the plane of the line 7—7 of Fig. 6;

Fig. 8 is a fragmentary horizontal sectional view, showing the same tube and the package at the time two of the end portions on one side of the package have already been folded inward.

Fig. 9 is a similar view, showing the package after the other two end portions have also been folded inward so that the package is practically completed;

Fig. 10 is a fragmentary elevational view, taken on the plane of the line 10—10 of Fig. 1, looking in the direction of the arrows, showing the gears which actuate the folding fingers;

Fig. 11 is a fragmentary sectional view of the guides and conveyor chain of the machine, taken on the plane of the line 11—11 of Fig. 1, looking in the direction of the arrows;

Fig. 12 is a series of views located to correspond to the position of the paper and package on the machine of Fig. 1, showing the formation of the packages as they progress through the machine from the beginning to the end;

Fig. 13 is a view in perspective of one of the packages; and

Fig. 14 is a transverse sectional view taken on the plane of the line 14—14 of Fig. 1, showing the shape of the guides 81, 82 at that point.

Referring to Figs. 8, 9, and 13, these are views which show the characteristics of the package which the present machine is adapted to make. The sheet of paper used for making the package is shown in Fig. 12 and indicated by the numeral 20 at the right as being a rectangular sheet, which may be substantially square. The size and shape of this sheet and its dimensions depend upon the size of the package which it is desired to make, and the machine may have its parts proportioned for making any particular size of package.

The sheet 20 is preferably rolled into substantially cylindrical form, as shown in Fig. 13, to make a package 21, in which a considerable part of the adjacent edge portions of the sheet are overlapped in the cylinder so that the paper will be held in this position when its ends are folded inward.

The amount of overlap is shown in Fig. 5, where it is apparent that the overlapping portions comprise approximately one-fourth of the periphery of the cylinder. In the making of such packages by hand the practice of the employees varies, as some of them fold each end of the package in twice, and some go so far as to fold it in three times; but it is found that if the package or cylinder is folded in twice, that is, inwardly from each of the opposite sides of the cylinder at each end, this is sufficient to hold the paper in the folded position with such light articles in the package as are intended to be used. For example, the package 21 is shown in section in Fig. 9, and a folded portion 22 on one side is preferably folded inward until it wedges against the folded portion 23 from the opposite side. This also draws inward those parts of the paper which are located above and below this end of the package and indicated by numerals 24 and 25, and the two folded portions 22, 23 tend to wedge against each other when the articles engage them, and tend to push them out. The stiffness of these folded portions or flaps 22, 23 and their wedging position tends to preserve the package at this end, and the same is true of similar parts at the other end.

When both ends of the package or tube are folded in, as shown in Fig. 13, in this manner, the tendency for the cylinder to unroll is prevented by the folded portions at each end, and thus the package is preserved in its finished condition.

The materials which are packaged are preferably small and light pieces of confection, indicated at 26, 27, or tiny and light toys 28, which do not actually occupy all of the space in the package, and the package itself is an attractive, salable article because of its large bulk and attractive appearance in comparison with the price for which it may be sold.

Referring now to Figs. 1 and 2, the machine adapted to make such packages is preferably provided with a supporting frame, indicated in its entirety by the numeral 30. This supporting frame may be provided with a plurality of vertically extending legs at 31 to 38, at each of the corners of the machine, and at each point where the frame has transverse upper frame members such as those shown at 39-42.

The transverse frame members, legs, and longitudinal frame members 43-46 are all secured together by welding or bolts, as shown; and they may each consist of one or more angle irons suitably secured together and braced to provide a supporting frame, which is substantially rectangular in elevation and in plan, and which is elongated to support the conveyor belt and other mechanism further to be described.

The said frame members 44 and 46 may be additionally supported by a pair of legs 47, 48, each of which comprises a pair of angle irons.

At the right end of the machine (Fig. 1) a pair of additional vertical frame members 49, 50 are secured to the frame and provided with the oppositely located bearings 51 (Fig. 2) for supporting a shaft 52.

The shaft 52 carries a pair of sprocket wheels 53, 54, which are keyed to the shaft, and the shaft also carries a pair of feed wheels 55, 56, each of which has a rubber feed segment 57 on its periphery for engagement with the sheets of paper contained in the hopper 58.

The shaft 52 may be driven by an electric motor directly or through the intermediary of gears so that the sprockets are driven at a suitable speed for progressing the conveyor belts along the machine. At its opposite end the framework of the machine is provided with suitable bearings 60 for a sprocket shaft 61, which carries another pair of sprockets 62, 62 (Fig. 2).

The sprocket chains, of which there are two, are indicated by the numerals 63, 64, and they may be of the ordinary type usually employed on sprocket wheels of bicycles and other similar devices, except that the chains are long enough to extend twice the full length of the machine, forming a complete closed loop about the sprockets at both ends of the machine.

The two chains are arranged side by side, being carried by the sprockets 53, 54, which are similarly arranged; and at regularly spaced intervals one of the pivot pintles 65 of each of the chains has been removed and replaced by an elongated pintle, which not only provides the pivot for a corresponding link of each chain, but it fixedly supports a jaw member 66 that also serves as a spacer for supporting the two chains in predetermined spaced relation to each other.

The next pivot pintle 67 is employed for holding a second jaw member 68, which takes the form of an angle, so that its upper arm 69 extends over the jaw 66, the top of the jaw 66 and the arm 69 serving to grip the paper as it is being carried along the machine.

The jaw 68 is spring-pressed by means of any suitable spring 161, which urges the jaw 68 into engagement with the block 66 so that ordinarily the two jaws are resiliently pressed together to grip a piece of paper located between them, and the paper is only released when some means is used to move the jaw 68 out of its gripping position.

This releasing means may consist of a fixed cam member 70 carried by a longitudinally extending frame member 71 of the machine and having an upper camming surface 72 which slopes upward from the end 73 to the opposite end 74.

The movable jaw 68 may also be beveled at 75 so that the beveled surface 75 acts as a camming surface, being adapted to engage the leading end 73 of the cam 70 to move the jaw 68 to the position of Fig. 3 at the same time a piece of paper 20 is projected between the jaws by the wheels 55 and 56.

The frame members 49 and 50 also support a suitable bracket 76 (Fig. 1) for supporting the paper hopper 58. This may consist of a box-like metal member, the upper end of which is open for reception of the sheets 20, and the lower end of which is open to permit them to be fed to the conveyor belts.

At the right end of the machine (Fig. 3) the paper hopper 58 is provided with a paper retain-

ing point 77, which is sharp enough to penetrate the lowermost sheet and to extend into the other sheets of the stack of paper. The stack of sheets rests on the point 77 and also upon the two feeding wheels 55, 56.

The operation of these elements is as follows: When the feed wheels rotate, the rubber segment 57 engages the lowermost sheet on its bottom side; and due to the frictional resistance to slipping between the sheet of paper and the rubber segment 57, this lowermost sheet is caused to move with the feeding wheels 55, 56.

The friction between the rubber and the lowermost sheet is sufficient to cause the paper to tear off the point 77, but this does not apply to the next sheet, as the lowermost sheet slips freely with respect to the next sheet above it. Thus the remainder of the stack is retained in the hopper 58, and one sheet is fed from the bottom of the stack each time the feeding wheels 55, 56 rotate and bring the rubber segment 57 into engagement with the paper.

The top of the machine between the transverse frame members 40, 41 may consist of a pair of flat table members 78, 79 suitably supported by the longitudinal frame members 44, 46 and additional longitudinal frame members at the middle of the machine, which are separated sufficiently to provide a continuous slot 80 extending from one end of the machine adjacent the sprockets 53, 54 to the other end of the machine at the sprockets 52.

This slot 80 is of sufficient width to permit the gripping blocks 66 and movable jaws 68 which connect the two chains together to project upward into the slot 80 sufficiently so that the upper surface of the block 66 is flush with the bottom surface of a pair of guide members 81, 82.

The guide members 81, 82 may be made of sheet metal, and they are preferably provided with the inwardly turned guide flanges 83, 84 at their outer edges for guiding the edges of the paper as it slides along the guides 81, 82. These backwardly turned edge portions 83, 84 form grooves 85 in which the edges of the paper sheets 20 slide.

The shape of the guide members 81, 82 varies from the right end of the machine (Fig. 1) to the left end, and the shape at the right end may be substantially flat or slightly concave, as shown in Fig. 4, so that a piece of paper lies substantially flat and open at the right end of the machine, just after it has been fed to the conveyor.

Referring to Fig. 4, the longitudinally extending frame members at the center of the machine are there indicated by the numerals 86, 87. They also have the slot 80 between them, and they are provided with the guide blocks 88, 89 for supporting the sprocket chains 53, 54.

The spring 161 is shown as being coiled about the pintle 67 on both sides of the movable jaw 68, which at that moment is shown in the open position of Fig. 3.

As the guide members 81, 82 for the paper extend toward the left in Fig. 1, they are provided with gradually increasing curvature and gradually overlapped with each other until, at the point 80, these guide members have formed a cylinder out of the paper with the edges overlapping.

The progressive change in shape of the paper 20 as it progresses from the right-hand position in Fig. 12 to a position under the numeral 80 in Fig. 12, shows how it is rolled into a cylinder by these guides as the paper is drawn longitudinally of the machine by the chain conveyor.

The cylindrical end 89 of the guide members

81, 82 projects into a supporting member comprising a block 90 having a cylindrical bore 91 and provided with a tubular metal lining 92, which abuts against the ends of the guides 81, 82.

For convenience in observing the operation of the machine this block 90 may be provided with a handle 93, and the block may be held in place by means of a stirrup 94 and set screw 95 so that the machine can be opened at this point.

The tubular member 92 is likewise provided with a slot 96 extending longitudinally of the tube 92 at its lower side and registering with the slot 80 between the supporting blocks 88, 89 for the conveyor chains.

When the paper has been formed into a tube, as shown in Fig. 5, it progresses onward into a second tubular member 97 (Fig. 6 and Fig. 7), which is carried by the frame members 98, and which is provided with suitable driving arrangements and fingers 99 to 102 (Fig. 8) for folding the ends of the package inward.

Like the tube 92, the tubular member 97 has a slot 103 extending along its lower side for passage of the paper gripping members 66 and 68 so that the paper is drawn into the tube 97 as the conveyor progresses. The tube 97, however, is also provided with four apertures 104 oppositely located in its sides adjacent both of the ends of the tube 97 to permit the fingers 99—102 to operate inside the tube 97.

The apertures 104 for the nearest set of fingers 99—101 are located inwardly of the end of the tube 97, while the apertures 104 for the fingers 100 and 102 take the form of slots, extending inwardly from the right end of the tube 97 (see Fig. 7).

The machine is also provided with a second cam 110 for operating on the jaws 66, 68 and releasing the paper; and this cam 110 is located at such a point that the paper is released with its ends in substantial registry with the ends of the fingers that are to turn in the ends of the package.

The cam 110 works exactly like the cam 70 of Fig. 3 except that at that time the jaws have a piece of paper within their grip, and engagement of the movable jaw 68 by means of its camming surface 75 with the cam 110 serves to open the jaws and release the paper instead of permitting the closure of the jaws on the paper, as is the case at the cam 70.

The gears for actuating the fingers 99—102 are preferably supported by a suitable auxiliary frame 111, which may be carried from the frame members 86, 87 of the machine by means of a plurality of columns 112. The columns 112 support a bearing plate 113, forming a part of the gear frame 111, and the bearing plate 113 may be provided with a pair of bearings 114, 115 for the finger shafts 116, 117.

The shaft 116 supports the finger 102 at its lower end, and the shaft 117 supports the finger 100 at its lower end.

There are similar bearings 114, 115 (not shown in Fig. 6) for supporting similar shafts 116, 117 for the other two fingers 99 and 101. The driving structure for the fingers 99, 101 is substantially the same as that for fingers 100, 102, except as to the timing, which will be further described.

The shafts 116, 117 are each provided above the bearing plate 113 with a bevel gear 118, the gear having its hub pinned to the shaft in each case. At its upper end each shaft is provided with an auxiliary bearing 119 carried by the bearing plate 120. At each side of the machine there are bear-

ing blocks 121, and each bearing block has a pair of bearings 122 extending horizontally so that each block rotatably supports a pair of horizontal shafts 123.

Each of the horizontal shafts 123 is provided on its inner end with a bevel gear 124. In this case also the bevel gears have their hubs geared or keyed to the shafts 123. Those shafts 123 are adapted to drive the fingers 99—102.

In order that they may perform this function, the shafts are provided with spur gears (Fig. 1), indicated by the numerals 125—128. The spur gears on each side of the machine mesh with each other so that gears 125, 126 mesh with each other and are driven together; and the gears 127, 128 mesh with each other, and are driven together.

These gears are also fixedly mounted on the shafts 123. Thus two of the shafts 123, which are located farthest from the right end of the machine, are also provided with a second smaller spur gear 129, 130. Each spur gear 129 meshes with a gear sector 131, 132. The gear sectors 131, 132 are also mounted on suitable auxiliary shafts 133 so that they may be separately actuated by suitable cams to actuate the fingers on the opposite sides of the package at different times.

Due to the extent to which the fingers 99, 100 must project into the tube 97, there would be no room for the fingers 101, 102 at the same time. Therefore, the first fingers, which may be the fingers 99, 100, must perform their functions first and be withdrawn before the fingers 101, 102 can come into play. Each gear sector 131, 132 has its shaft 133 secured to a crank arm 134, which is provided with a crank shaft 135 and roller 136.

The roller 136 and crank shaft 135 is in each case mounted in the groove 137 of a cam wheel 138, and the groove 137 may extend concentrically with respect to the center of the cam wheel 138, except for a hump at 139 on each cam wheel, where the cam is intended to actuate the gear sector.

The gear sectors 131, 132 may be mounted for rotation on their shafts 133, and the connection between the crank arms 134 and the gear sectors 131, 132 may be by way of a coil spring 140, one end of which is attached to a hook 141 on the gear sector, the other end of which is attached to a hook 142 on the crank arm 134.

The spring 140 may be located in an arcuate groove 143 formed on the edge of the gear sector 132. Thus the fingers 99—102 will be resiliently actuated into their operating positions by means of springs 140, and no damage will result in case the cams are not properly timed so that the fingers do not interfere with each other.

The cam wheels 138 may be mounted on the same shaft 144, which is rotatably mounted in suitable bearings 145 carried by the frame 30, but the actuating hump 139 of one cam is angularly or rotatively spaced with respect to the other cam so that the fingers on one side of the folding mechanism will be operated first, and will be withdrawn before the other fingers are operated.

As shown in Fig. 1, the shaft 144 may also carry a sprocket wheel 145 for the chain 146, the chain extending about a sprocket wheel 147 carried by the shaft 61. The shaft 61 may carry at its opposite end a friction clutch 148, one disc 149 of which is pinned to the shaft, and the other disc 150 of which is secured to a sprocket wheel 151, which is mounted for free rotation on the shaft 61.

The clutch discs 149, 150 are urged together by

means of a spring 152 bearing on the side face of the sprocket wheel 151 and reacting against a pair of adjustable lock nuts 153. The sprocket wheel 151 may be driven from a relatively small sprocket 154 carried by a shaft 155 having a large V pulley 156 driven by belt 157.

The belt 157 is driven by a spring-pressed pulley 158 carried by the motor shaft 159, which is driven by the motor 160. The conveyor chains 63, 64 extend about their sprockets, and are supported with the upper part of the conveyor chain loop in plane position on the guide blocks 88, 89. The lower returning portion of the conveyor chains hangs down below the upper part of the frame 30, and is preferably acted upon by a fixed brush 170, which removes any small pieces of merchandise or paper or other foreign matter that might have become caught on the conveyor chain by reason of its being dropped by an operator, or by some other accident.

The bristles of the brush 170 sweep the chain as it passes and make sure that there is nothing on the chain which might clog the mechanism or engage between the chain and sprocket as the chain passes upward about the sprocket at the right end of the machine.

The paper-holding jaws 66, 68 are located at regularly spaced points along the conveyor chains, as shown in Fig. 2, and thus the conveyor chain is adapted to receive and carry the paper along the machine as it is periodically fed to the conveyor by means of the feed wheels.

The operation of the machine may be briefly described as follows: Through the system of sprocket wheels and belts and chains the motor 160 is adapted to drive the conveyor sprockets and chains at a predetermined rate of speed, which is slow enough to permit the operators of the machine to place the merchandise on the paper, after the paper has been ejected from the stack by the feed wheels and placed on the guides 81, 82.

Two operators are usually required for placing the merchandise on the paper for each package at the preferred rate of operation of the machine. Another operator is required at the discharge end of the machine for taking the packages off the conveyor and packing them in suitable boxes.

My machine is capable of replacing about ten women operators who are trained in packaging the material by hand, and such a saving in labor naturally results in a saving in the cost of the packaging of the product.

The motor 160 is preferably mounted on a carriage 171 carried by the bed 172, and the carriage 171 may be adjusted by means of a crank 173 connected to a screw shaft 174 having a follower carried by the carriage 171.

The motor pulley is of the spring type. Increased tension on the belt 157 will cause this pulley to expand, and reduce its effective diameter; and thus the speed of operation may be adjusted by the location of the motor 160.

As the chain conveyor passes up over the sprockets 53, 54 at the right end of the machine, the paper-gripping jaws 68, 66 are so located with respect to the location of the chain on the sprockets and the location of the rubber segment 57 on the feed wheels 55, 56 that a piece of paper is withdrawn from the stack of paper 20 in the hopper 58 at such height that the leading edge of the paper is driven between the jaws 68, 66 at a time when they are open, as shown in Fig. 3.

Immediately after the paper is located between the jaws 66, 68, the jaws' cam surface 75 passes off the cam 70, and the jaws are closed by the

spring 161. The stack of paper is centrally located over the slot 80, which extends longitudinally of the machine, and the width of the guide members 81, 82 is such that the paper may be received with its edges in the grooves 85.

As the conveyor progresses toward the left in Fig. 1, the paper is gradually curved by the guide members 81, 82 until its edges are overlapped, as shown in Fig. 12, below the numeral 89; and the paper has then assumed a cylindrical shape.

While this is going on, the operators have placed the merchandise on the paper, and the gradual curving of the paper to cylindrical form causes the merchandise to center midway between the edges of the paper.

The conveyor with its jaws continues to draw the paper into the tubular members 92 and 97, and when the paper has reached a proper position, with its ends registering substantially with the movable edges of the fingers 99-102, the second cam 110 engages the cam surface 75 on the movable jaw 68 and separates the jaws 66, 68 to release the paper and leave it in the tube 97.

The paper gripping jaws 66, 68 are regularly spaced longitudinally of the conveyor chain, and are located to grip and convey another piece of paper each time the feed wheels 55, 56 make a rotation. Thus there is a constant stream of paper for packaging which moves across the top of the machine and is formed into cylindrical shape.

When a paper tube has reached its stationary position in the tube 97, one of the cam wheels, such as, for example, the cam wheel 138 at the top of Fig. 1, first reaches the position by which the hump 139 (Fig. 2) actuates the roller 136 and crank arm 134 in a counterclockwise direction in Fig. 10.

This causes the spring 140 to exert a pull on the gear sector 132, and the gear sector 132 is rotated counterclockwise through a predetermined arc, which effects a rotation of the gear 128 and the gears 125, 126 on that side of the machine.

Simultaneously with this movement the two shafts 123 on that side of the machine are actuated, driving bevel gears 124 and 118 and shafts 116 through the same arc of movement to cause the fingers 99, 100 to move from the position of Fig. 6 inward to the position of Fig. 8. As this movement of the fingers 99, 100 takes place, the fingers engage that side of the paper tube and fold a portion of the paper wall inward to the position of Fig. 8, after which, as the cam 138 continues its movement, the roller 136 resumes its forward position and the gear sector 132 resumes its former position, moving the fingers back and outward to the position of Fig. 9.

Immediately thereafter, the other pair of fingers 101, 102 are actuated in a similar manner by the cam on that side of the machine; and these fingers 101, 102 move into the position of Fig. 9 to fold the adjacent portion of the paper cylinder wall into the paper tube.

This turning in of the end walls of the paper is carried to such a point that the folded paper portions 22, 23 wedge against each other; and due to their stiffness, they cannot again be forced outward by pressure of the merchandise inside the package because such merchandise is not heavy enough to crumble these portions 22, 23 and force them outward.

At this time the package is finished and it is ejected from the tube 97 by the next oncoming cylindrical member so that the finished package

may be discharged from the left end of the machine or it may be picked up by the operator before it is discharged and the packages are packed in a box.

The method of packaging may be briefly summarized as follows: Sheets of paper are conveyed in a steady stream along a horizontal support, and are exposed in a concave condition for receiving merchandise for a predetermined period of time. During the act of conveying, these sheets of paper are simultaneously curved into a cylindrical tube, with substantial portions overlapping; and thereafter the outside wall portions on one side of the paper cylinder are simultaneously folded into the paper tube to form a part of the end wall. Immediately thereafter the other two opposite end portions of the paper tube are also simultaneously folded inward and past the end portions, which have been previously folded so as to wedge against them to complete the package.

This differs, of course, from the usual manual way of making such a package, in which the operator places the merchandise on a flat sheet, rolls it to cylindrical form, turns in the wall portions of one end with two or three operations, and thereafter turns in wall portions of the other end with two or three operations.

The present machine makes packages of more regular contour and more standard characteristics than the packages which are made by hand; and it also saves a great deal of labor and results in a lower cost of operation.

It will thus be observed that I have invented an improved method of making packages of light cylindrical form for relatively light merchandise, such as small pieces of confection, gum, or tiny toys. The packaged articles made by my machine are regular in shape and attractive to prospective purchasers, and the merchandise can be sold at a lower cost, due to the saving in labor which is effected by means of my method and machine.

While I have illustrated a preferred embodiment of my invention, many modifications may be made without departing from the spirit of the invention, and I do not wish to be limited to the precise details of construction set forth, but desire to avail myself of all changes within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. A machine for packaging comprising a suitable supporting frame, a conveyor and a support for packages, said support having a slot extending in the direction of movement of said conveyor, said conveyor being located to extend longitudinally of the machine below the slot in said package support, said package support comprising a pair of guide members and said guide members being gradually curved from a shallow convex curvature toward each other and overlapping each other to form an overlapping cylindrical guide, and means carried by said conveyor for conveying a sheet of wrapping material longitudinally of said guide members whereby the sheet is formed into a cylinder with overlapping edge portions.

2. A machine for packaging comprising a suitable supporting frame, a conveyor and a support for packages, said support having a slot extending in the direction of movement of said conveyor, said conveyor being located to extend longitudinally of the machine below the slot in said pack-

age support, said package support comprising a pair of guide members and said guide members being gradually curved from a shallow convex curvature toward each other and overlapping each other to form an overlapping cylindrical guide, means carried by said conveyor for conveying a sheet of wrapping material longitudinally of said guide members whereby the sheet is formed into a cylinder with overlapping edge portions, and means for folding in each of the end portions of said cylinder.

3. A machine for packaging comprising a suitable supporting frame, a conveyor and a support for packages, said support having a slot extending in the direction of movement of said conveyor, said conveyor being located to extend longitudinally of the machine below the slot in said package support, said package support comprising a pair of guide members and said guide members being gradually curved from a shallow convex curvature toward each other and overlapping each other to form an overlapping cylindrical guide, means carried by said conveyor for conveying a sheet of wrapping material longitudinally of said guide members whereby the sheet is formed into a cylinder with overlapping edge portions, and means for folding in each of the end portions of said cylinder, said latter means comprising a pair of fingers on each side of the cylinder located to engage a portion of the cylinder which is longer than the radius of the cylinder.

4. A machine for packaging comprising a suitable supporting frame, a conveyor and a support for packages, said support having a slot extending in the direction of movement of said conveyor, said conveyor being located to extend longitudinally of the machine below the slot in said package support, said package support comprising a pair of guide members and said guide members being gradually curved from a shallow convex curvature toward each other and overlapping each other to form an overlapping cylindrical guide, means carried by said conveyor for conveying a sheet of wrapping material longitudinally of said guide members whereby the sheet is formed into a cylinder with overlapping edge portions, and means for folding in each of the end portions of said cylinder, said latter means comprising a pair of fingers on each side of the cylinder located to engage a portion of the cylinder which is longer than the radius of the cylinder, the fingers on one side being actuated and returned before the fingers on the other side are actuated.

5. A machine for packaging, comprising a suitable supporting frame, a conveyor and a support for packages, said support having a slot extending in the direction of movement of said conveyor, said conveyor being located to extend longitudinally of the machine below the slot in said package support, said package support comprising a pair of guide members and said guide members being gradually curved from a shallow convex curvature toward each other and overlapping each other to form an overlapping cylindrical guide, means carried by said conveyor for conveying a sheet of wrapping material longitudinally of said guide members, whereby the sheet is formed into a cylinder with overlapping edge portions, and means for folding in each of the end portions of

said cylinder, said latter means comprising a pair of fingers on each side of the cylinder located to engage a portion of the cylinder which is longer than the radius of the cylinder, and cam means for actuating the fingers on the opposite sides of the cylinder at different times.

6. A machine for packaging comprising a suitable supporting frame, a conveyor and a support for packages, said support having a slot extending in the direction of movement of said conveyor, said conveyor being located to extend longitudinally of the machine below the slot in said package support, said package support comprising a pair of guide members and said guide members being gradually curved from a shallow convex curvature toward each other and overlapping each other to form an overlapping cylindrical guide, and means carried by said conveyor for conveying a sheet of wrapping material longitudinally of said guide members whereby the sheet is formed into a cylinder with overlapping edge portions, said latter means comprising a fixed and a movable jaw carried by said conveyor.

7. A machine for packaging comprising a suitable supporting frame, a conveyor and a support for packages, said support having a slot extending in the direction of movement of said conveyor, said conveyor being located to extend longitudinally of the machine below the slot in said package support, said package support comprising a pair of guide members and said guide members being gradually curved from a shallow convex curvature toward each other and overlapping each other to form an overlapping cylindrical guide, means carried by said conveyor for conveying a sheet of wrapping material longitudinally of said guide members whereby the sheet is formed into a cylinder with overlapping edge portions, said latter means comprising a fixed and a movable jaw carried by said conveyor, said movable jaw being spring-pressed, and cam means carried by said supporting frame for actuating said movable jaw as it passes said cam means to open the jaws.

8. A machine for packaging comprising a suitable supporting frame, a conveyor and a support for packages, said support having a slot extending in the direction of movement of said conveyor, said conveyor being located to extend longitudinally of the machine below the slot in said package support, said package support comprising a pair of guide members and said guide members being gradually curved from a shallow convex curvature toward each other and overlapping each other to form an overlapping cylindrical guide, means carried by said conveyor for conveying a sheet of wrapping material longitudinally of said guide members whereby the sheet is formed into a cylinder with overlapping edge portions, said latter means comprising a fixed and a movable jaw carried by said conveyor, said movable jaw being spring-pressed, cam means carried by said support-frame for actuation said movable jaw as it passes said cam means to open the jaws, means for supporting a supply of paper sheets located at the feeding end of said machine, and feed means for removing sheets consecutively from said supply and for projecting them between said jaws while the jaws are open.

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