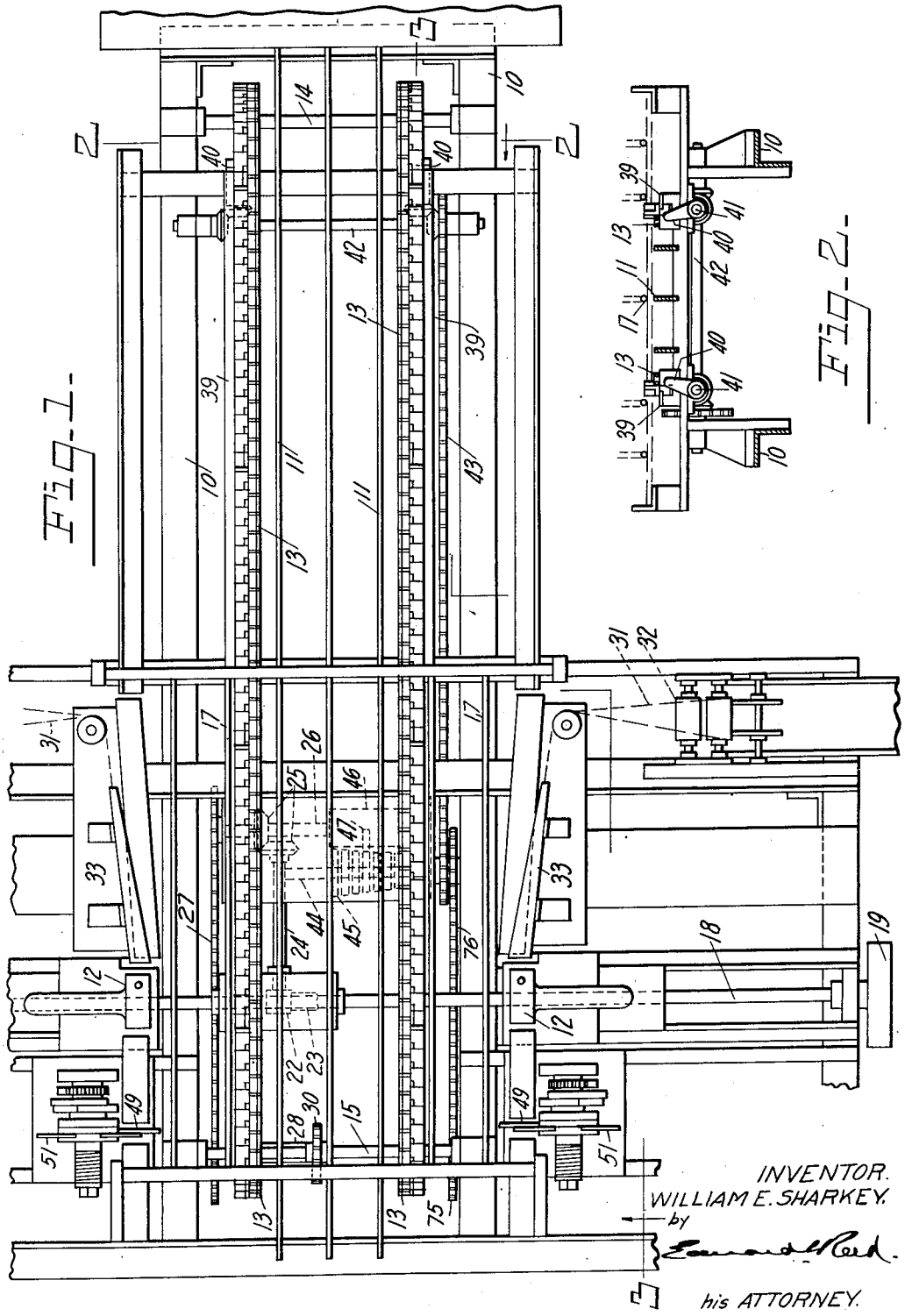
June 27, 1933. W. E. SHARKEY 1,915,765

BAG SEWING MACHINE

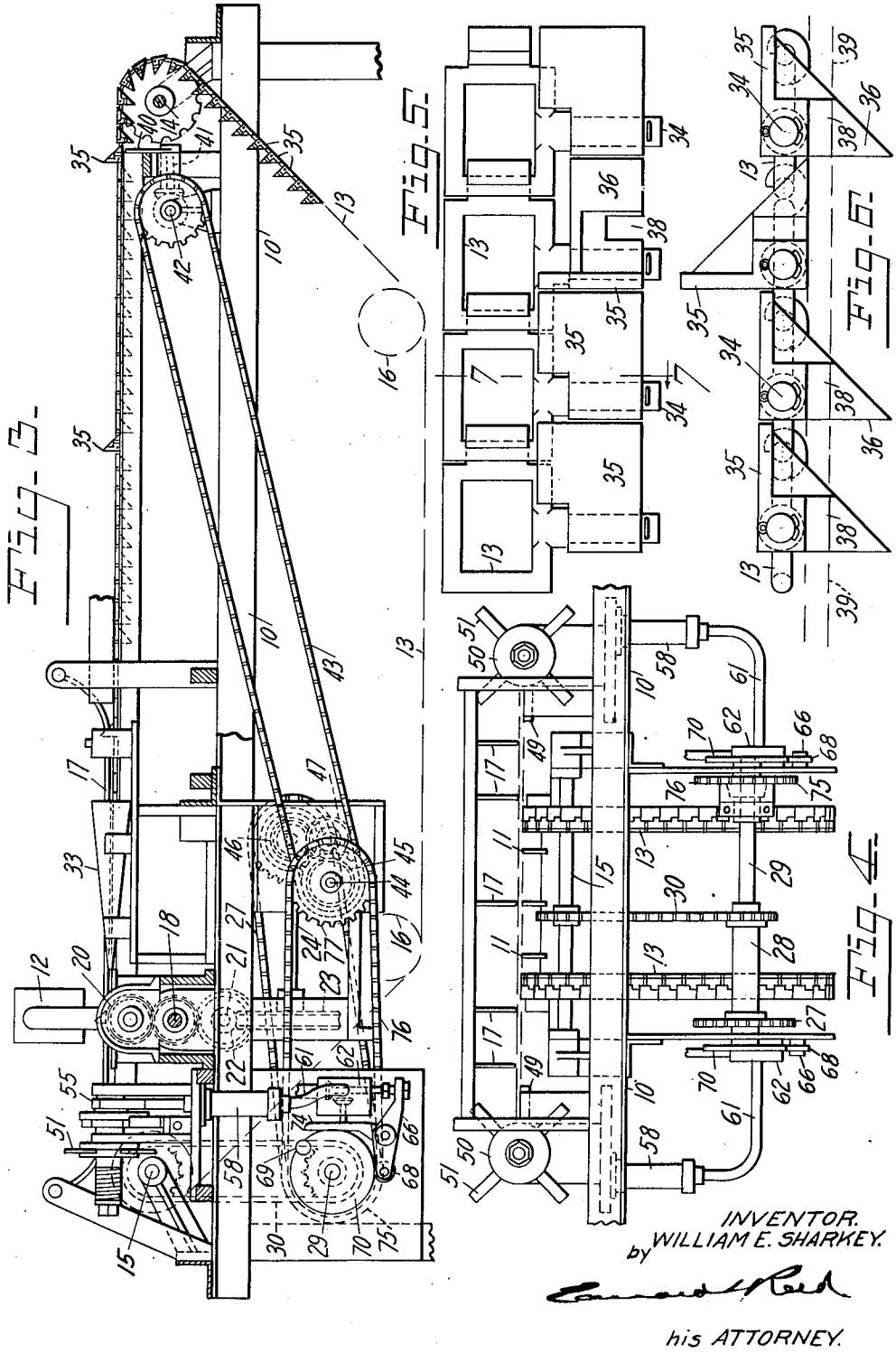
Filed Dec. 17, 1930 3 Sheets-Sheet 1



June 27, 1933. W. E. SHARKEY 1,915,765

BAG SEWING MACHINE

Filed Dec. 17, 1930 3 Sheets-Sheet 2



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BAG SEWING MACHINE

Filed Dec. 17, 1930 3 Sheets-Sheet 3

Fig. 7.

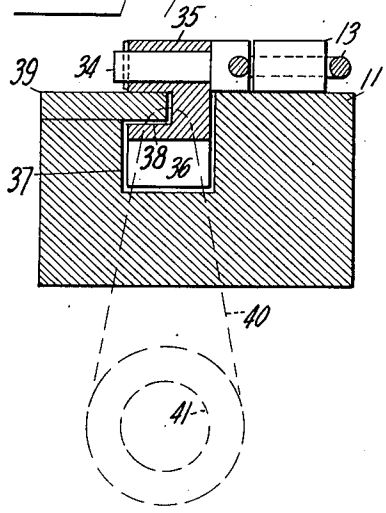
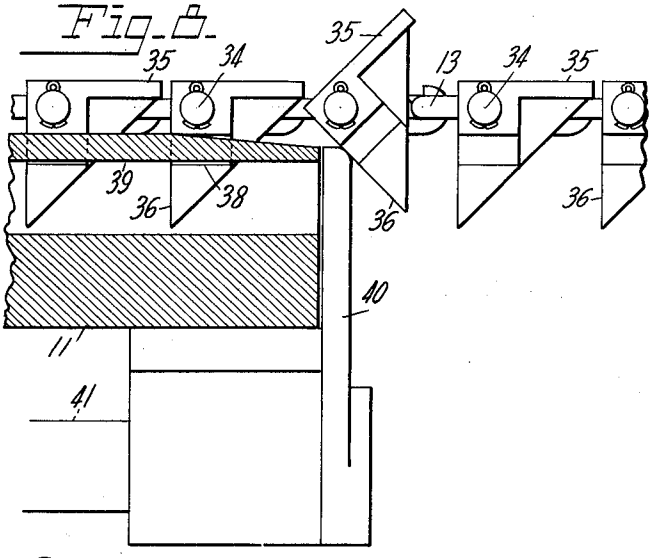
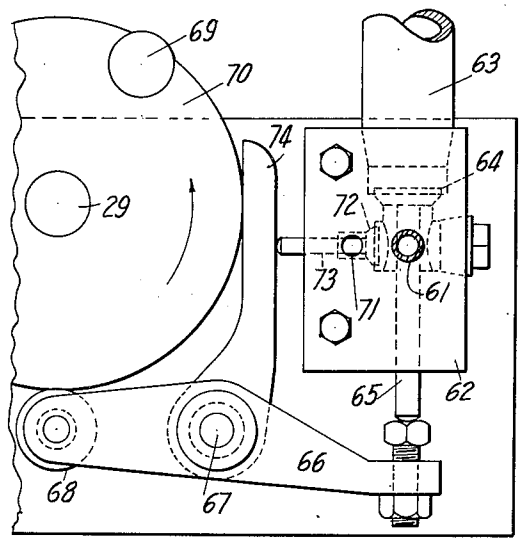


Fig. 8.





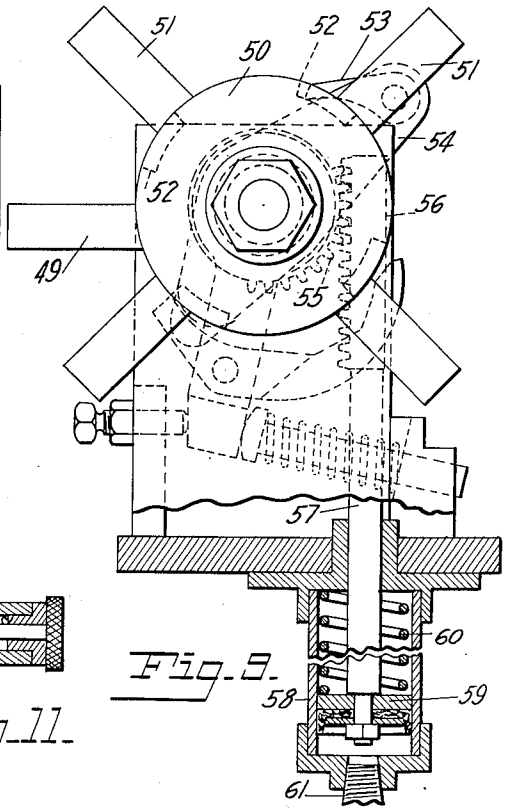


Fig. 10.

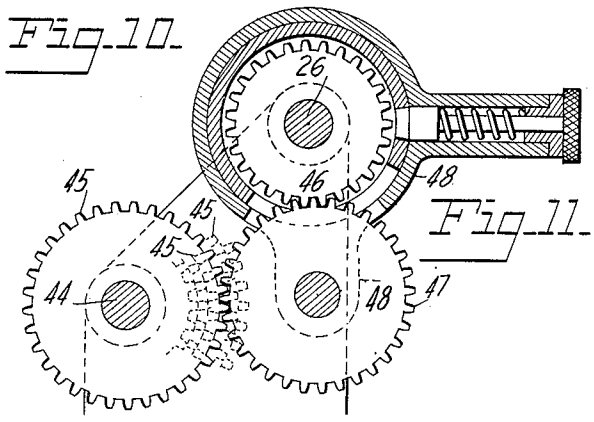


Fig. 11.

Fig. 9.

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UNITED STATES PATENT OFFICE

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BAG SEWING MACHINE

Application filed December 17, 1930. Serial No. 503,033.

This invention relates primarily to a bag sewing machine but is applicable to various machines of a more or less similar character.

In the manufacture of certain types of paper bags a plurality of webs of paper are folded longitudinally, one about the other, into tubular form and the nested tubes are cut into bag lengths or bag sections. The bag sections are then delivered one at a time and in spaced relation to a sewing machine which stitches both ends of each bag section to completely close the bag with the exception of a filling opening or valve at one end thereof. Usually continuous binding tapes are folded about the respective ends of the bag section and sewed thereto simultaneously with the sewing of the ends of the bag section and after the bag has been sewed the binding tapes are severed between adjacent bags to separate the bags one from the other.

In the ordinary bag sewing machine the bag sections are delivered to the sewing heads by a conveyor having a series of lugs arranged to engage the bag sections and deliver the same in proper spaced relation to the sewing heads. The bags are made in different widths and a conveyor having its lugs arranged to handle bag sections of one width will not deliver bag sections of another width to the sewing heads in proper spaced relation. Therefore, when bag sections of a different width are to be sewed it is necessary either to remove one conveyor and substitute another conveyor therefor or to rearrange the lugs on the conyeyor. Further, it is necessary to so time the operation of the tape cutter that it will operate in proper relation to the lugs on the conveyor.

One object of the present invention is to provide a machine of this character with means for quickly and easily varying the spacing of the lugs on the conveyor.

A further object of the invention is to provide such a machine in which the changing of the spacing of the lugs on the conveyor will cause a corresponding change in the timing of the tape cutter.

A further object of the invention is to provide such a machine with a conveyor having a series of normally inoperative lugs and means for moving selected lugs into operative positions during the movement of the conveyor.

Other objects of the invention will appear as the mechanism is described in detail.

In the accompanying drawings Fig. 1 is a top plan view, partly broken away, of a sewing machine embodying my invention; Fig. 2 is a section taken on the line 2—2 of Fig. 1; Fig. 3 is a longitudinal section taken on the line 3—3 of Fig. 1; Fig. 4 is a front end elevation of a machine; Fig. 5 is a plan view of a section of the conveyor; Fig. 6 is a side elevation of a section of the conveyor; Fig. 7 is a section taken on the line 7—7 of Fig. 5; Fig. 8 is a detail view showing the actuating device in operative engagement with one of the lugs; Fig. 9 is a front elevation, partly in section, of the tape cutter and its operating device; Fig. 10 is a side elevation, partly broken away, of the mechanism for controlling the operation of the cutter; and Fig. 11 is a detail view, partly in section, of the variable speed mechanism.

In these drawings I have illustrated one embodiment of my invention but it will be understood that this particular embodiment has been chosen for the purposes of illustration only and that the invention may take various forms and may be utilized in connection with machines of various kinds.

The invention is here illustrated in connection with the bag sewing machine which comprises a supporting structure or main frame 10 which includes a table 11 over which the bag sections are moved to the sewing heads 12, there being in the present instance two of these sewing heads located on opposite sides of the table near the forward end thereof and so arranged that they will operate simultaneously on the respective ends of each bag section as it is moved past the same. The bag sections are deposited on the table one at a time and are moved over the table to the sewing heads by means of a conveyor which, in the present construction, comprises endless members or chains 13 mounted on sprocket wheels carried by shafts 14 and 15 at the rear and front ends, respectively, of the table. The upper or opera-

tive stretch of this conveyor rests upon the table and moves over the same, from right to left, as shown in the drawings. The lower stretch of the conveyor extends downwardly about one or more guides 16 which maintain a proper tension thereon. As the bag sections pass the sewing heads they are held in firm engagement with the table by pressure bars 17.

A main driving shaft 18 extends transversely to the main frame near its forward end and is provided at one end with suitable means for connecting the same with a source of power, such as a belt pulley 19. This driving shaft 18 is operatively connected with the respective sewing heads by gears, one of which is shown at 20, and it also has geared connection with a shaft 21 arranged beneath the same and having thereon a worm 22 which meshes with a worm wheel 23 on a rearwardly extending shaft 24. The shaft 24 is connected at its rear end by beveled gears 25 with a shaft 26 which is thus driven at a constant speed from the source of power. The shaft 26 is connected by means of a sprocket chain 27 with a sleeve 28 which is rotatably mounted on a shaft 29 near the forward end of the machine, and this sleeve is connected by a sprocket chain 30 with the forward conveyor shaft 15, which conveyor shaft thus constitutes the driving shaft for the conveyor. Continuous binding tapes 31 are drawn from a suitable source of supply at the respective sides of the machine, about paste applying rollers 32 and through folding devices 33 which fold the same about the ends of the bag sections just in advance of the sewing heads, so that the binding tapes are sewed to the bag as the latter passes through the sewing heads, and the bags when delivered from the sewing heads are connected one to the other by the intermediate portions of these binding tapes.

The conveyor comprises a series of normally inoperative lugs, that is, these lugs normally occupy positions in which they will not act upon bag sections or other articles resting on the table above the conveyor chain, but each lug is individually movable into an operative position in which it will engage such a bag section or other article and cause the same to move with the conveyor over the table. Associated with the conveyor are means for acting on selected lugs, as the conveyor advances, to move the same into their operative positions, this actuating means being so controlled that the lugs which are moved into operative position will be spaced apart equal distances. Preferably the lugs are pivotally mounted on the endless member or chain 13 of the conveyor and, as here shown, links of that chain are provided with laterally extending pintles 34 upon which the lugs are pivotally mounted. In the present instance each link of the chain is provided with such a pintle and the lugs are of a length approximately equal to the length of the respective links of the chain but the number of lugs employed and their arrangement may vary in different conveyors. In the present conveyor the lugs, which are shown at 35, are pivotally mounted near their forward ends upon the respective pintles 34, so as to move about horizontal axes transverse to the conveyor chain, and when in their normal or inoperative positions they have their operative faces substantially parallel with the adjacent portion of the chain but when moved upwardly and forwardly about their axes these lugs will assume upright or operative positions, as shown in Fig. 6. Each lug is provided with a projection 36 which extends downwardly from the axis thereof when the lug is in its inoperative position and, in the present instance, the forward edges of these projections are at substantially right angles to the operative faces of the lugs. The rear edges of the lugs are so shaped as to provide a substantial space between the projections of adjacent lugs and in the arrangement illustrated the rear edges of the projections are inclined from the lower ends thereof to points near the rear end of the lug. The table 11 over which the conveyor moves has a channel 37 extending lengthwise thereof alongside of and adjacent to the position occupied by the operative stretch of the conveyor chain and the projections 36 of the several lugs which are in their inoperative positions travel in this channel. The projection for each lug has on its outer side a groove 38 which extends lengthwise of the conveyor when the lug is in its inoperative position. A guide bar or flange 39 carried by the table 11 overhangs a portion of the channel 37 and extends into the grooves 38 in the projections of those lugs which are in their inoperative positions and serves to hold the lugs in their inoperative positions as they move along the table. As here shown, the channel 37 and the guide bar or flange 39 extend for the full length of the table.

The actuating means for moving the lugs into operative position may take various forms but preferably it comprises a part which may move into the path of the projection of that lug which is to be actuated and which will so retard the movement of the projection that the continued travel of the conveyor will rock the lug about its axis and into an upright position. This actuating device is shown as arranged adjacent to the rear ends of the channel 37 and guide bar or flange 39 so that as the lug is moved into its upright position the forward edge of the projection, which then assumes a horizontal position, will be brought into engagement with and will ride upon the upper surface of the flange 39 and will thus firmly

hold the lug in its operative position. In the present machine the actuating device or tripping member is shown in the form of a finger 40, it being understood that there is one of these actuating devices for each endless member of the conveyor. This finger is rotatably mounted at the rear end of the table below the channel 37 and is of such a length that, when rotated, the end thereof will pass across the end of the channel in the path of the projections on the lugs. The rotation of the finger is so timed that it will enter the space between two projections and will remain in that space long enough to permit the projection to engage the same and to be tripped over into its operative position, after which the finger is withdrawn from the path of the lugs by its continued rotation. It will be obvious that by varying the speed at which the finger or actuating device is rotated, with relation to the movement of the conveyor, the frequency with which it engages and actuates one of the lugs may be varied, thus varying the distance between adjacent operative lugs. The actuating finger 40 is rigidly secured to a short shaft 41 having geared connection at its forward end with a transverse shaft 42 and this transverse shaft is connected by a sprocket chain 43 with a shaft 44 arranged adjacent to and adapted to be driven from the constantly operated shaft 26. In order that the speed at which the lug actuating device is operated may be varied with relation to the speed of operation of the conveyor the shaft 44 is connected with the shaft 26 through variable speed mechanism. This mechanism may take any suitable form but, in the present construction, the shaft 44 has mounted thereon a series of gears 45, of different diameters, and the shaft 26 is provided with a long gear 46 of uniform diameter. An intermediate pinion 47 is mounted on a swinging support 48, which is movable lengthwise of and about the axis of the elongated gear 46 so that it can be adjusted to mesh simultaneously with the elongated gear 46 and with any one of the gears 45, thereby enabling the speed at which the actuating device is driven to be varied and to thereby cause the lugs on the conveyor to be moved into operative position at different intervals along the length of the conveyor.

As has been stated, the bags as they leave the sewing heads are connected one to the other by the binding tape and this tape must be severed in order to separate the bags. To accomplish this a cutter is mounted a short distance beyond each sewing head and is operated in timed relation to the movement of the conveyor to sever the tape between adjacent bags. The cutter and its operating mechanism here shown constitute the subject matter of a separate application for patent and therefore need be described only to such an extent which will enable the combination thereof for the conveyor mechanism to be understood. Briefly the cutter comprises a cutter bar 49 arranged beneath the line of travel of the binding tape. The cutting element comprises a rotatable disk 50 having a series of blades 51, in the present instance four, and provided with peripheral notches 52 which constitute in effect ratchet teeth and which are adapted to be engaged by a pawl 53 carried by a pawl arm 54 pivotally mounted at the axis of the disk 50 and having rigidly secured thereto a gear 55. Meshing with the gear 55 is a toothed rack 56 which serves to impart sufficient movement to the pawl 53 to cause the cutter disk to move through a quarter rotation. As here shown, the lower end of the rack 56 is connected with a piston rod 57 which projects into a cylinder 58 where it is secured to a piston 59. A spring 60 serves to hold the rack normally in its lowermost or idle position and fluid under pressure, preferably air, is admitted to the cylinder through a pipe 61 to impart operative movement to the piston and the rack. The pipe 61 leads to a valve casing 62 which is connected by a pipe 63 with the source of supply for air under pressure. The connection between the valve casing and the air supply is controlled by a valve 64 the stem 65 of which projects beneath the valve casing into the path of an operating arm 66 which is pivotally mounted on a stud 67 and has at its other end a roller 68 arranged to be engaged by a cam projection 69 on a disk 70, which disk is rigidly secured to the shaft 29. Hence upon each complete rotation of the shaft and disk the arm 66 will be caused to open the valve and admit air through the pipe 61 to the cylinder and thereby impart operative movement to the cutter. The valve casing also has an exhaust port 71 which is controlled by a valve 72, the stem 73 of which projects laterally beyond the valve casing and into the path of an arm 74 also pivotally mounted on the stud 67 and arranged to be engaged by the cam projection 69 after the latter has passed beyond the actuating arm 66, thus opening the exhaust valve and relieving the pressure to permit the rack 56 to return to its normal position. A sprocket wheel 75 is rigidly secured to the shaft 29 and is connected by a sprocket chain 76 with a sprocket wheel 77 secured to the shaft 44, which shaft is also operatively connected with the lug actuating device. Consequently the cutter operating mechanism will be driven in unison with the lug actuating device and will be controlled by the variable speed mechanism which controls the speed of operation of the lug actuating device. Thus the lug actuating device and the cutter are at all times operated in definitely timed relation but the speed of operation of these parts may be varied with relation to the speed of

the conveyor so as to permit the spacing between the conveyor lugs to be varied and to cause the operation of the cutter to be correspondingly varied.

While I have shown and described one embodiment of my invention I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a mechanism of the character described, a conveyor comprising an endless member and a series of lugs pivotally mounted on said endless member on axes transverse thereto and each having an operative face which normally extends lengthwise of said endless member, means for imparting continuous movement to said conveyor, and means operated separately from said conveyor and in timed relation thereto for moving selected lugs about their axes while said conveyor is in motion to cause their operative faces to extend transversely to and beyond said endless member.

2. In a mechanism of the character described, a conveyor comprising an endless member, a series of lugs pivotally mounted on said endless member on axes transverse thereto and each having an operative face which normally extends lengthwise of said endless member, means for actuating said conveyor, continuously operated means driven separately from said conveyor for moving selected lugs about their axes while said conveyor is in motion to cause their operative faces to extend transversely to and beyond said endless member, and means for varying the speed of said continuously operated means to vary the distance between selected lugs.

3. In a mechanism of the character described, a conveyor comprising an endless member and a series of lugs pivotally mounted on said endless member and each having an operative face which normally extends substantially parallel to said endless member and each having a part arranged at an angle to said operative face, an actuating device mounted on a fixed axis for rotatory movement transversely to the operative stretch of said conveyor into the path of said parts of said lugs to cause selected lugs to be moved about their axes to locate their operative faces in positions transverse to and above said endless member, and means for imparting continuous movement to said conveyor and for operating said actuating device in timed relation thereto.

4. In a mechanism of the character described, a conveyor comprising an endless member and a series of lugs pivotally mounted on said endless member and each having an operative face which normally extends substantially parallel to said endless member and each having a part extending at an angle to said operative face, an actuating device having a part rotatable in one direction into and out of the path of said parts of said lugs to cause a selected lug to move about its axis to a position in which its operative face will extend transversely to said endless member, means for operating said conveyor, and means for imparting a single rotation to said actuating device during a predetermined travel of said conveyor.

5. In a mechanism of the character described, a conveyor comprising an endless member and a series of lugs pivotally mounted on said endless member, each having an operative face which normally extends substantially parallel with said endless member and also having a projection extending therefrom at an angle to said operative face, means for driving said conveyor, an actuating device movable across the path of the projections on said lugs from one side thereof to the other, and means for operating said actuating device in timed relation to said conveyor to move the same into the path of a projection on a selected lug and cause said selected lug to move about its axis to position its operative face transversely to said endless member and to then move said actuating device out of the path of the projection on the succeeding lug.

6. In a mechanism of the character described, a conveyor comprising an endless member, and a series of lugs pivotally mounted on said endless member, each lug having an operative face which normally extends substantially parallel with said endless member and also having a projection extending therefrom at an angle to said operative face, means for driving said conveyor, an actuating device mounted for rotation about a fixed axis into and out of the path of the projections on said lugs, and means operating in timed relation to said conveyor to move said actuating device into the path of said projections in advance of the projection on a selected lug to cause said selected lug to move about its axis to position its operative face transversely to said endless member.

7. In a mechanism of the character described, a conveyor comprising an endless member and a series of lugs pivotally mounted on said endless member, each lug having an operative face which normally extends substantially parallel with said endless member and also having a projection extending therefrom at an angle to said operative face, means for driving said conveyor, an actuating device mounted for rotation about a fixed axis extending lengthwise of said endless member and having a part movable into and out of the path of the projections on said lugs, and means operated in timed relation to said conveyor to move said part of said ac-

tuating device into the path of the projections on said selected lugs, whereby the continued movement of said conveyor will cause selected lugs to move about their axes and position their operative faces transversely to said endless member.

8. In a mechanism of the character described, a conveyor comprising an endless member, a series of lugs pivotally mounted on said endless member and each having an operative face which normally extends substantially parallel with said endless member and each having a projection, means for driving said conveyor, an actuating device rotatable through a complete circle which intersects the path of said projections, and means for rotating said actuating device in timed relation to said conveyor to move the same into the path of the projection of a selected lug, to retain the same in said path until said lug has been moved about its axis to cause the operative face thereof to extend transversely to and beyond the adjacent portion of said endless member and to then move said actuating device beyond the path of said projections.

9. In a mechanism of the character described, a conveyor comprising an endless member, a series of lugs pivotally mounted on said endless member and each having an operative face which normally extends substantially parallel with said endless member and each having a projection, means for driving said conveyor, an actuating device rotatable through a complete circle which intersects the path of said projections, and means for rotating said actuating device in timed relation to said conveyor to move the same into the path of the projection of a selected lug, to retain the same in said path until said lug has been moved about its axis to cause the operative face thereof to extend transversely to and beyond the adjacent portion of said endless member and to then move said actuating device beyond the path of said projections, and speed varying mechanism connected with said rotating means to vary the speed of rotation of said actuating device.

10. In a mechanism of the character described, a conveyor comprising an endless member, a series of lugs pivotally mounted on said endless member and each having an operative face which normally extends substantially parallel with said endless member and each having a projection, means for driving said conveyor, an actuating device rotatable through a complete circle which intersects the path of said projections, and means for rotating said actuating device in timed relation to said conveyor to move the same into the path of the projection of a selected lug, to retain the same in said path until said lug has been moved about its axis to cause the operative face thereof to extend transversely to and beyond the adjacent portion of said endless member and to then move said actuating device beyond the path of said projections, and a part extending lengthwise of the operative stretch of said endless member to engage the projection of said selected lug and retain said lug in the position to which it has been moved.

11. In a mechanism of the character described, a supporting structure having a longitudinal flange, a conveyor comprising an endless member having its operative stretch arranged to move lengthwise of said supporting structure, and a plurality of lugs pivotally mounted on said endless member on axes transverse thereto, each lug having an operative face which normally extends lengthwise of said endless member and also having a part arranged to travel in engagement with one side of said flange when said lug is in its normal position and retain said lug in said position, and means arranged in advance of and adjacent to said flange to act on selected lugs and move said lugs about their axes and cause said operative faces to extend transversely to said endless member and to cause said parts of said selected lugs to engage the other side of said flange and retain said selected lugs in the positions to which they have been moved.

12. In a mechanism of the character described, a supporting structure, a conveyor comprising an endless member having its operative stretch arranged to move lengthwise of said supporting structure and a plurality of normally inoperative lugs pivotally mounted on said endless member on axes transverse thereto for movement into operative positions, each of said lugs having an operative face which extends lengthwise of said endless member when said lug is in its inoperative position and also having a part provided with a groove, means for driving said endless member, and means to act on selected lugs to cause the same to be moved about their axes to operative positions with said operative faces transverse to said endless member, said supporting structure having a flange arranged to enter the grooves in said parts of those lugs which are in inoperative positions and to engage the edges of said parts of said selected lugs and retain the same in their operative positions.

13. In a mechanism of the character described, a supporting structure, a conveyor comprising an endless member having its operative stretch arranged to move lengthwise of said supporting structure, and a plurality of lugs pivotally mounted on said endless member on transverse axes, each lug having an operative face arranged normally lengthwise of and substantially parallel with the adjacent portion of said endless member and also having a projection provided with a groove, means for driving said endless

member, an actuating device movable into the path of the projections on selected lugs to cause said selected lugs to be moved about their axes to positions in which their operative faces extend transversely to and beyond the adjacent portion of said endless member, and means for operating said actuating device in timed relation to said endless member, said supporting structure having a flange arranged to enter the grooves in the projections of those lugs which are in their normal positions and to engage the projections of said selected lugs and support the latter in the positions to which they have been moved.

14. In a mechanism of the character described, a supporting structure having a channel extending lengthwise thereof and having a guide bar overhanging said channel, an endless member mounted for movement over said structure with its upper stretch adjacent to said channel, a plurality of lugs pivotally connected with said endless member on transverse axes and arranged at one side thereof, each of said lugs having an operative face which normally extends lengthwise of and substantially parallel with the adjacent portion of said endless member and also having a projection arranged to travel in said channel and provided with a groove to receive said guide bar, an actuating device mounted in advance of said channel to act on the projection of a selected lug to cause the operative face of that lug to be moved to an upright position transverse to said endless member and to cause said projection to engage the upper surface of said guide bar, and means for operating said endless member and said actuating device in timed relation.

In testimony whereof, I affix my signature hereto.

WILLIAM E. SHARKEY.