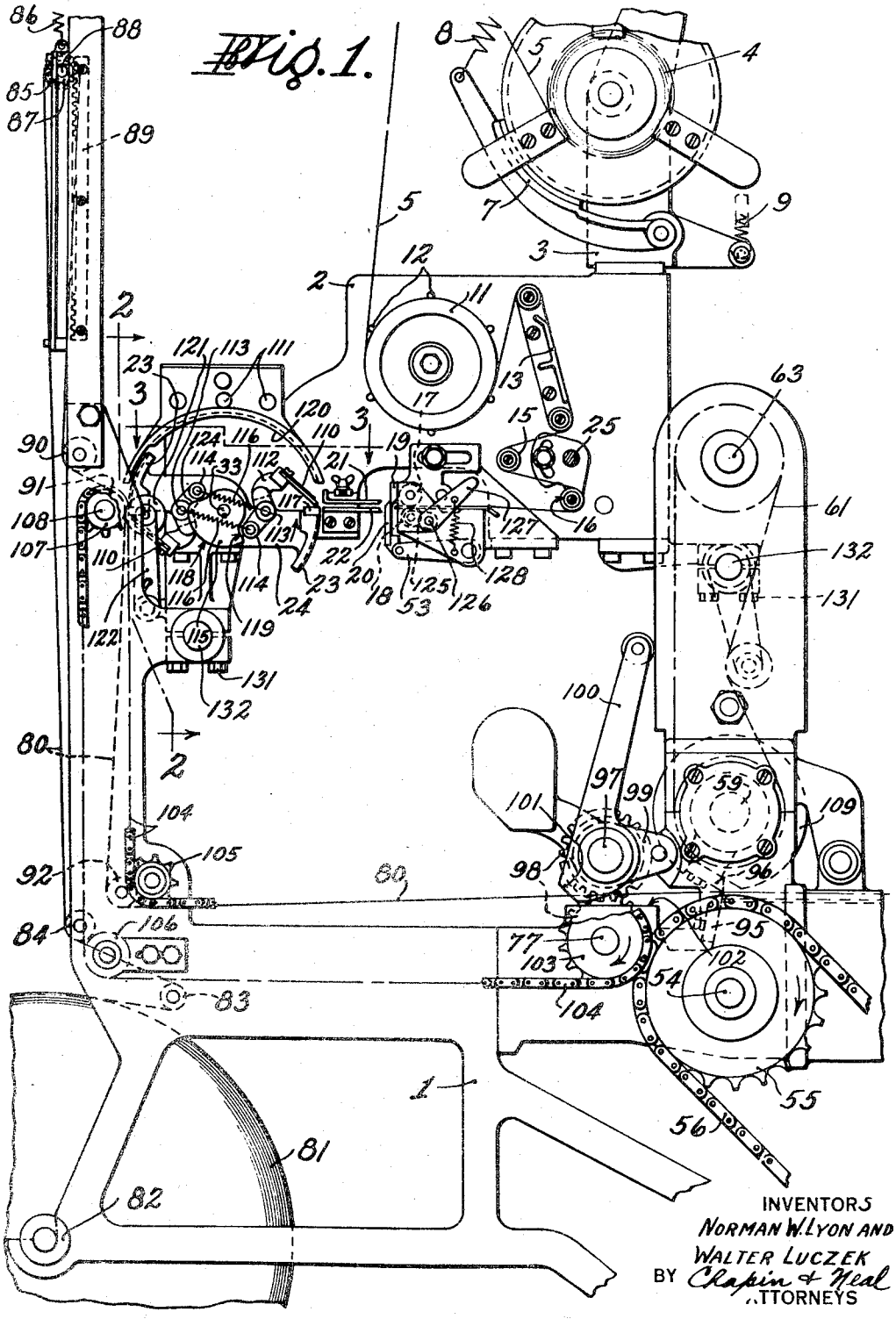
Oct. 24, 1950 N. W. LYON ET AL 2,527,272

MACHINE FOR APPLYING LABELS TO MOVING WEBS

Filed June 29, 1949 4 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

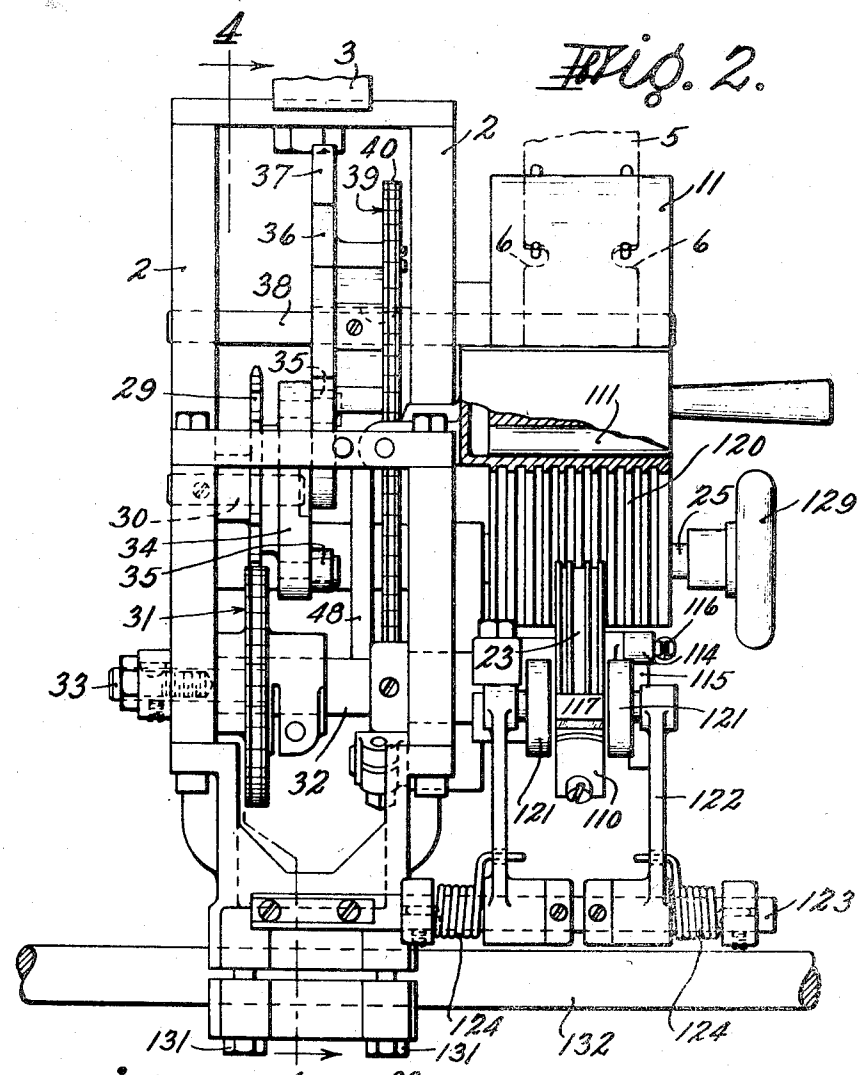
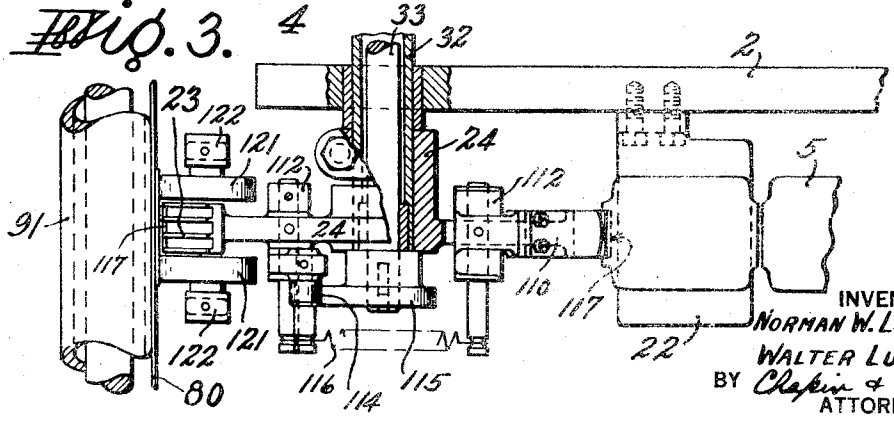


Fig. 3.



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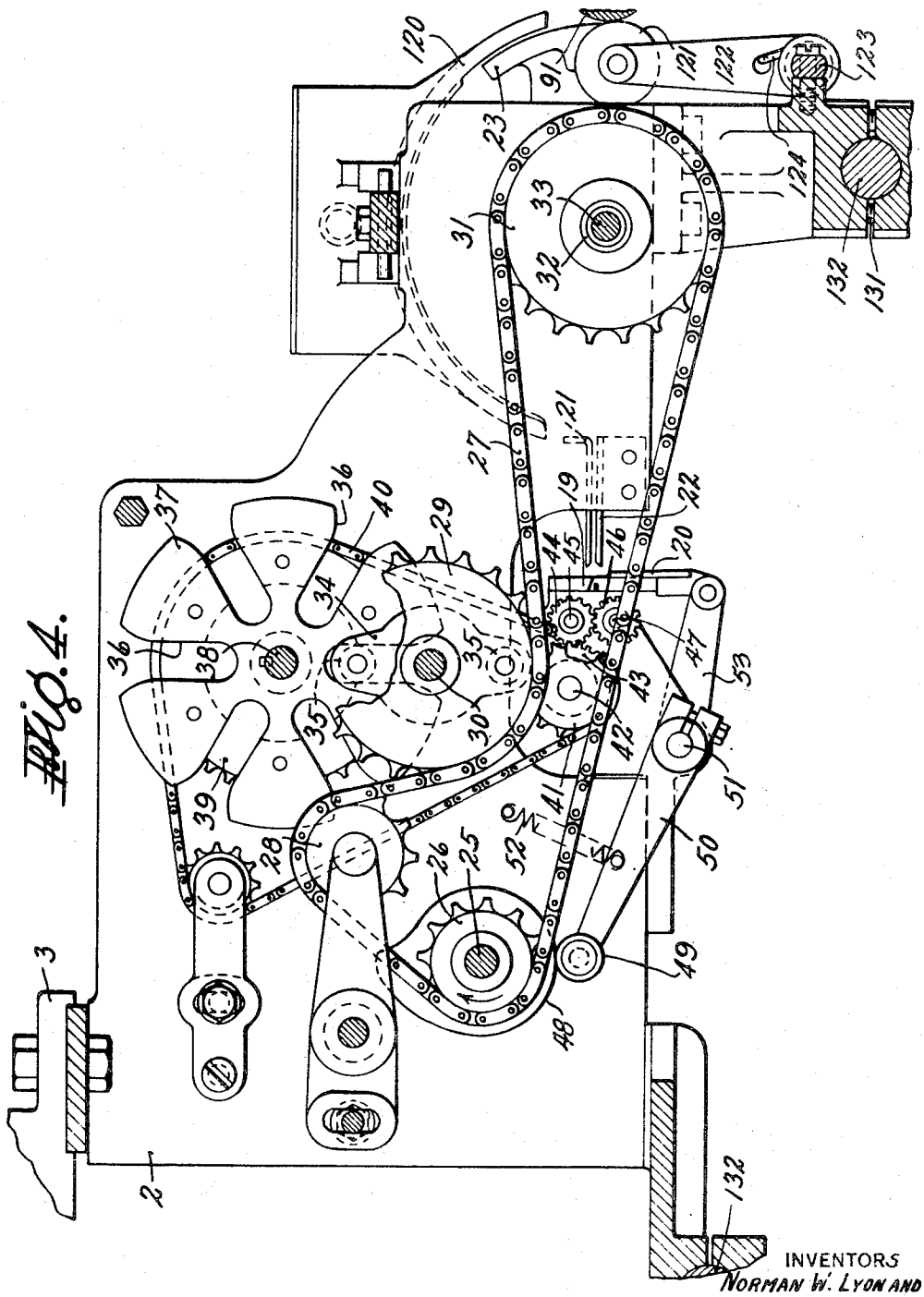


Fig. 4.

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Fig. 6.

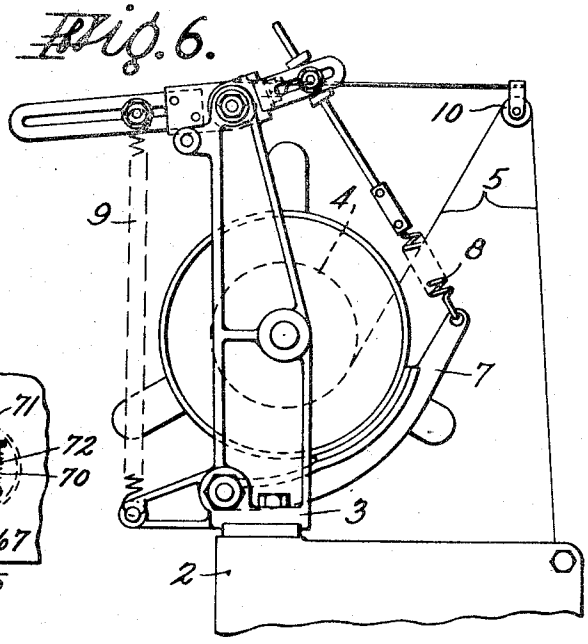
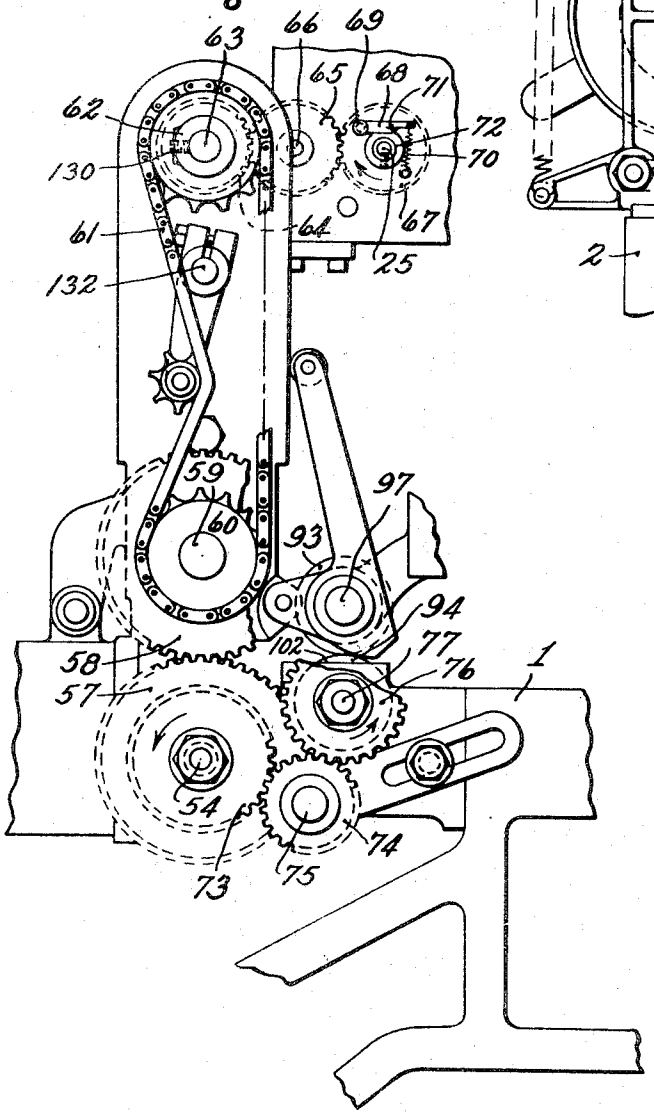


Fig. 5.



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UNITED STATES PATENT OFFICE

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MACHINE FOR APPLYING LABELS TO MOVING WEBS

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Application June 29, 1949, Serial No. 101,976

5 Claims. (Cl. 216—29)

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This invention relates to an improvement in label applying devices, and more particularly to devices for applying labels to a moving web.

The principal object of the invention is to provide a device operable in combination with the feeding mechanism which supplies a wrapper web to a wrapping machine, which will apply a label to the web, before the individual wrappers are severed from the web, in such fashion that the label will appear in the desired position on the wrapped package, and which will operate satisfactorily regardless of slight changes in the speed of travel of the web or changes in the tension thereof.

A further object is to provide a device, having the above characteristics, which may be associated with various types of wrapping machines and which can be adjusted to provide a range of operational speeds in conformity with the speed of the wrapping machine which is being supplied.

Other and further objects residing in the details of the construction will be made apparent in the following specification and claims.

In the drawings:

Fig. 1 is a side elevational view of a label applying device embodying the invention, parts being broken away;

Fig. 2 is a view substantially on line 2—2 of Fig. 1, parts being broken away;

Fig. 3 is a detail view, partly in section substantially on line 3—3 of Fig. 1;

Fig. 4 is a longitudinal section on line 4—4 of Fig. 2 showing the main driving mechanism;

Fig. 5 is a detail view showing the drive for the label and web feeds; and

Fig. 6 is a detail view showing the web supply.

Referring to Fig. 1 of the drawings, the parts are shown supported by a suitable frame structure generally indicated at 1 and including spaced vertical plate members 2 which carry a standard 3 for supporting a roll 4 of labels in web form from which individual labels are subsequently severed. Preferably the label web, indicated at 5, is provided (see Fig. 2) with notches 6 at its edges, the notches being positioned between the labels and at the line along which the web is subsequently cut. Standard 3 is provided with brake means 7, actuated by adjustable springs 8 and 9, which bears against the flange of the web reel to control the web tension.

From the roll 4 the label web passes over a spring supported tension roll 10 (see Fig. 6) to an intermittently operated web control drum 11, which is provided with pins 12 that engage in the notches 6 of the label web. As best shown in

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Fig. 1 the label web 5 passes from drum 11 over the bed 13 which cooperates with a printing device, not shown. From bed 13 the web passes around a fixed guide roll 15, an adjustable guide roll 16 and between intermittently operated drawing rolls 17 and 18. From the drawing rolls 17—18 the end of the web is projected between knives 19 and 20 and between spaced guide plates 21 and 22 so that when the portion within the guides 21—22 is severed by knives 19 and 20 to form a label the leading end edge of the label will lie in the path of the leading edge of label applying platens 23 carried by a constantly rotating member 24.

The drum 11, drawing rolls 17 and 18, cutter 19—20 and member 24 are driven in synchronism from a constantly rotating drive shaft 25, Fig. 4. Referring to Fig. 4 shaft 25 carries a sprocket 26 which drives a sprocket chain 27. Chain 27 passes over an adjustable tensioning idler 28, into driving relation with a sprocket 29 secured to a stub shaft 30, around sprocket 31 secured to a sleeve 32 rotatably mounted on a stationary shaft 33, and back to sprocket 25.

To the sleeve 32 is secured the previously mentioned member 24 which carries the label applying platens 23.

Shaft 30 carries a double arm crank 34 provided with anti-friction rolls 35 adapted to engage in radial slots 36 formed in disc 37 which is fixed to shaft 38 which carries the drum 11. Crank 34 with its antifriction rolls 35, and the disc 37 in effect form a two toothed pinion driving a six toothed pinion. Shaft 38 also carries a sprocket 39 driving a sprocket chain 40 passing around a sprocket 41 secured to a stub shaft 42. Shaft 42 carries a gear 43 meshing with a gear 44 secured to shaft 45 of the upper drawing roll 17. Gear 44 meshes with a gear 46 secured on shaft 47 of the lower drawing roll 18, whereby both drawing rolls are intermittently driven.

Secured to shaft 25 is a cam 48 engaging a roller 49 on an arm 50 secured to a pivot shaft 51. A spring 52 maintains the roll 49 in operative contact with the cam 48. Also secured to the pivot shaft 51 and therefor operated by cam 48 are arms 53 carrying the movable knife blade 20 which cooperate with the fixed blade 19 to sever labels from the label web.

As will be apparent from the above arrangement, the label web control drum 11, the label web drawing rolls 17—18 and the shears 19—20 are intermittently operated in timed relation, while the platens 23 constantly rotate in synchronism therewith, all from the drive shaft 25.

As best shown in Figs. 1 and 5 the label drive shaft 25 is driven from a main drive shaft 54 to which is secured a sprocket 55 driven by a chain 56 from the wrapping machine (not shown) to which the labeled wrappers are supplied. As shown in Fig. 5, shaft 54 carries a gear 57 meshing with a gear 58 secured to a shaft 59. Shaft 59 is provided with a sprocket 60 connected by chain 61 to a sprocket 62 adjustably secured to a shaft 63. Shaft 63 carries a gear 64 meshing with an intermediate gear 65 carried by stub shaft 66. Gear 65 meshes with a gear 67 connected to the label drive shaft 25, previously described, by an overload clutch which as shown comprises a driving dog 68 pivoted to gear 67 at 69 and normally held by a spring 70 in driving engagement with a recess 71 formed in a collar 72 fixed to the shaft 25. As will be understood the angle of engagement of the dog 68 and recess 71 is such that in the event of an excessive load on shaft 25 the dog 68 will be forced out of the recess against the action of spring 70.

The wrapper web feed, later described, is also driven from shaft 54 through a set of change gears comprising a changeable drive gear 73 releasably secured to shaft 54 and meshing with an idler 74 mounted on an adjustable stub shaft 75. Idler 74 meshes with a gear 76 secured to a shaft 77 which carries the lowermost wrapper web feed roll 94.

Referring again to Fig. 1 the wrapper web 80 is shown as supplied from a roll 81 rotatably mounted in a bracket 82 supported by frame 1. From the roll 81 the web is drawn over successive fixed guide rolls 83 and 84 and over a roll 85 supported by springs 86 to maintain suitable tension on the web. Preferably roll 85 is maintained in parallel relation with the other guide rolls by means of gears 87, secured to the outer ends of the shaft 88 of guide roll 85, and meshing with fixed parallel racks 89, roll 85 being free on the shaft. From the tension roll 85 the web passes around a fixed guide roll 90, over a support shown in the form of a backing roll 91, around a fixed guide roll 92 and between drawing rolls 93 and 94 (Fig. 5). From the drawing rolls the web passes over a fixed cutting knife 95 which cooperates with a rotary knife 96 to sever individual wrappers from the web. The lower drawing roll 94 is carried on the shaft 77 which carries gear 76 and is driven as previously described from the main drive shaft 54.

Shafts 97 and 77 of the drawing rolls carry meshing gears 98 whereby upper drawing roll 93 is driven from lower drawing roll 94. As will be obvious, by employing an appropriate size for gear 73 the speed at which the web is advanced past the constantly rotating knife 96 by rolls 93—94 may be varied to supply the desired length of wrapper to the wrapping machine.

Shaft 97 of upper drawing roll 93 is journaled in a weighted bracket 99 pivoted to the frame and which may be raised to separate the drawing rolls, for convenience in threading the wrapper web, by a lever 100 pivoted on the end of shaft 97 and carrying a cam lug 101 engageable with a boss 102 to force the rolls apart.

Shaft 77 also carries a sprocket 103 which drives a sprocket chain 104 which passes around fixed guide sprocket 105 and adjustable guide sprocket 106 and around a sprocket 107 secured to the shaft 108 of backing roll 91.

The rotary knife 96 is carried by a rotary member 109 secured to shaft 59 constantly driven as previously described from the main driving shaft 54.

It will be apparent from the above that the wrapper web is constantly drawn over the backing roll 91 and severed into individual wrappers which are advanced to the wrapping machine by any suitable means (not shown).

As the wrapper web passes over the backing roll, labels are applied thereto in spaced relation by the constantly revolving platens 23 and the mechanism associated therewith which will now be described with particular reference to Figs. 1, 2 and 3. As shown the member 24 carries two diametrically opposite platens 23 adjacent each of which is pivotally mounted a gripping finger 110. The fingers 110 are carried by a bellcrank 112 pivoted to member 24 at 113. The opposite end of each bellcrank is provided with a roller 114 which engages the cam 115 secured to the end of the fixed shaft 33 previously described and about which the sleeve which carries member 24 rotates. Springs 116 maintain the rolls 114 in operative relation with cam 115 and also keep the fingers 110 closed except when rollers 114 are on the high spot of the cam 115. As shown in Figs. 1 and 3 the forward end of the label web which is projected over the plate 22 by the drawing rolls 17—18 extends beyond the forward edge of the plate 22 so that the leading end of the label lies in the path of gripping blocks 117 which form the leading edge of each platen 23, the leading face of blocks 117 extending radially of the arcuate face of the platen. The cam 115 is formed with a high 118 which maintains the gripper finger 110 of each platen out of the path of the leading end of the label and in open position until the leading edge of the platen comes in contact with the latter. The high 118 terminates in an abrupt drop 119 which causes the finger 110 to engage the leading edge of the label web and clamp it to the platen. As this occurs the leading portion of the web is severed from the web 5 by the knives 19—20 to form a label. As the gripped label is advanced by the member 24 its trailing portion is bent against the face of the platen 23 by the edge portion of the upper plate 21 and the label is carried beneath and in contact with an arcuate member 120 which is heated in any suitable manner as by electric heating elements diagrammatically indicated at 111. The rear faces of the labels are coated with a heat softenable adhesive which is softened as it is moved over and in contact with the arcuate surface of member 120 which is preferably lengthwise corrugated. The platens 23 are narrower than the label and as the leading edge of the label is brought opposite the wrapper web traveling over the backing roll 91, the side edge portions of the label are engaged by applying rolls 121 positioned one at either side of the path of the platens. Rolls 121 are independently carried by arms 122 (Figs. 2, 3 and 4) which are pivotally mounted on a cantilever shaft 123 and are spring pressed in the direction of the backing roll by torsion springs 124. As the label is engaged by the rolls 121 the cam roll 114 of the finger 110 engages an abrupt rise 124 of the cam 115 to release the label from the platen. As best shown in Fig. 3, the surface of the platens, which are preferably corrugated, is spaced slightly from the backing roll 91 so that as the cam roll 114 engages the rise 124 to release the fingers 110, the control of the label is taken over by the freely rotatable pressure rolls 121 which roll the edge portions of the label into adhering engagement

with the wrapper web to be carried along therewith. The intermediate portions of the label are rolled into contact with the wrapper web as the latter passes around the fixed guide roll 92 and subsequently between the drawing rolls 93 and 94.

As will be apparent from the above description the labels are advanced, severed from the web and clamped to the platens by mechanisms which can be and are closely synchronized together so that the labels are accurately formed and accurately positioned on the platens 23. In the meantime the wrapper web is being advanced by its own feeding means which is generally synchronized with the label forming means through their common drive from the shaft 54. However, there may be and frequently is a slight variation in the surface speed of the wrapper web and the surface speed of the platens 23. By structure above described such slight differences are prevented from affecting the accuracy of the application of the label to the web by the fact that the control of the label is transferred from the platen to the rolls 121 as the labels are brought into engagement with the wrapper web. The rolls 121 being freely rotatable, the label is applied at the speed of the wrapper web and the platen if traveling at a slightly different speed than the web merely slides relative to the label.

For convenience in threading, the lower label drawing roll 18 is journaled in arms 125 secured to a pivoted shaft 126 to which is fixed an arm 127. A spring 128 normally maintains roll 18 in feeding relation with roll 17 but the rolls may be separated by manipulation of arm 127 in an obvious manner. Preferably also as an aid to threading and adjusting, the shaft 25 is provided with a hand wheel 129 for manual operation.

To enable the label to be placed in any desired position on the wrapper the sprocket 62, as previously mentioned, is made adjustable on shaft 63. This adjustment may be secured in any suitable manner as by a set screw 130 threaded through the hub of the sprocket. With sprocket 62 temporarily released from its shaft 63 the shaft 25 may be rotated by hand wheel 129 to change the position of the cycle of operation of the label feeding and applying mechanisms driven by shaft 25 relative to the cycle of the wrapper feed and cutting mechanisms so that the label may be applied in any position longitudinally of the wrapper web relative to the line of cut of the wrapper. The position of the label longitudinally on the cut wrapper may thus be predetermined.

To provide adjustment of the point of application of the label transversely of the wrapper web, and therefore transversely of the cut wrapper the supporting frame plates 2 (Fig. 1) are adjustably mounted as by bolts 131 on cross rods 132 of the main frame, the various gears and sprockets through which the parts carried by the frame plates 2 are driven being secured to their respective shafts by long splines (not shown) to accommodate the transverse adjustment of the frame plates.

What is claimed is:

1. A machine for forming labeled wrappers which comprises means for advancing a web of wrapper material, a cutting member to sever a predetermined length of material from the web to form a wrapper, a supporting member over which the web passes in its travel to the cutting member, a freely rotatable spring pressed roll engaging the web as it passes over said supporting member, a rotatable platen, means to supply individual labels to said platen, a releasable gripper releasably securing the labels to the platen to be advanced thereby between said spring pressed roll and the portion of the wrapper web traveling over the supporting member and means to release the gripper to free the label from the platen as the leading end of the label is engaged by said freely rotatable spring pressed roll to permit the label to be applied to the web, at the speed of travel of the latter, by said roll.

2. A machine for forming labeled wrappers which comprises means for advancing a web of wrapper material, a cutting member to sever a predetermined length of material from the web to form a wrapper, a supporting member over which the web passes in its travel to the cutting member, a freely rotatable spring pressed roll engaging the web as it passes over said supporting member, a rotatable platen, means to supply individual labels to said platen, a releasable gripper releasably securing the labels to the platen to be advanced thereby between said spring pressed roll and the portion of the wrapper web traveling over the supporting member, means to release the gripper to free the label from the platen as the leading end of the label is engaged by said freely rotatable spring pressed roll to permit the label to be applied to the web at the speed of travel of the latter, by said roll, a common drive for the wrapper web advancing means and said cutting means, a common drive for the label supply means and said platen, and means to shift the time cycle of said common drives relative to each other to adjust the longitudinal position of the label on the completed wrapper.

3. A machine for forming labeled wrappers which comprises means for advancing a web of wrapper material including a pair of drawing rolls, a backing roll over which said web is drawn by the drawing rolls, means to rotate said backing roll, label applying means including a pair of spaced freely rotatable spring pressed rolls engaging the web as it passes over said backing roll, a member carrying an arcuate label receiving platen and mounted to rotate between said spring pressed rolls, means to supply individual labels to said platen, a releasable gripper releasably securing the central portion of the leading edge of the labels to the leading edge of the platen, means to rotate said member and platen to carry the unsecured leading edge portions of the label between said freely rotatable spring pressed rolls and the portion of the wrapper web traveling over the backing roll, means to release the gripper member to free the label from the platen as the label is engaged by the spring pressed rolls to permit the latter to apply the label to the wrapped web at the speed imparted to the web by said drawing rolls.

4. A machine for applying labels coated with a thermoplastic adhesive to a traveling wrapper web which comprises a rotatable member carrying an arcuate, label receiving platen, a spring pressed label engaging finger pivotally mounted on said member adjacent the leading edge of the platen, spring means normally holding said finger in engagement with the leading edge of the platen, means to constantly rotate said member, means to intermittently advance a label web to position its leading end in the path of the leading edge of the platen, a cam having a high dwell for moving said finger out of the path of the leading end of the label to permit the latter to be engaged by the leading edge of the platen, said cam having a sharp drop to cause the finger to clamp the

leading end of the label against said edge of the platen as the latter engages said end of the label, means to sever a label from the label web substantially simultaneously with the engagement of the platen edge with the label, stationary guide means to bend the non-adhesive side of the trailing portion of the label against the platen as the latter advances, a stationary heated member having an arcuate surface in contact with which the label is moved by the platen, a backing roll, positioned closely adjacent the terminal end of the arcuate surface, over which backing roll a web of wrapping material is advanced and between which and the platen the label is pressed against the web, means to drive the backing roll, spaced spring pressed rollers positioned on opposite sides of the path of the platen and cooperating with said backing roll to press the side edge portions of the label against the wrapper web independently of the pressure applied by the platen to the center portion of the label, said cam including a sharp rise to raise the finger and release the label as the latter engages between the spring pressed rolls and the backing roll, the pressure of the spring pressed rolls on the edge portions of the label exceeding that of the platen on the center portion of the label.

5. In a machine for applying labels coated with a thermoplastic adhesive, a rotatable member carrying an arcuate label securing platen having

a leading edge face in a plane extending substantially radially of the center of rotation of said member, a spring pressed label engaging finger pivotally mounted on said member, spring means normally holding said finger in engagement with said leading face of the platen, means to constantly advance a label to position its leading end edge in the path of said leading edge face of the platen, cam means including a high for moving said finger out of engagement with said leading face of the platen to permit the latter to engage the label said cam including a drop to cause the finger to clamp the leading edge portion of the label against said leading face of the platen as the latter engages the label and stationary means to bend the non-adhesive side of the trailing portion of the label against the platen as the latter advances past said last-named means.

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