

May 21, 1963

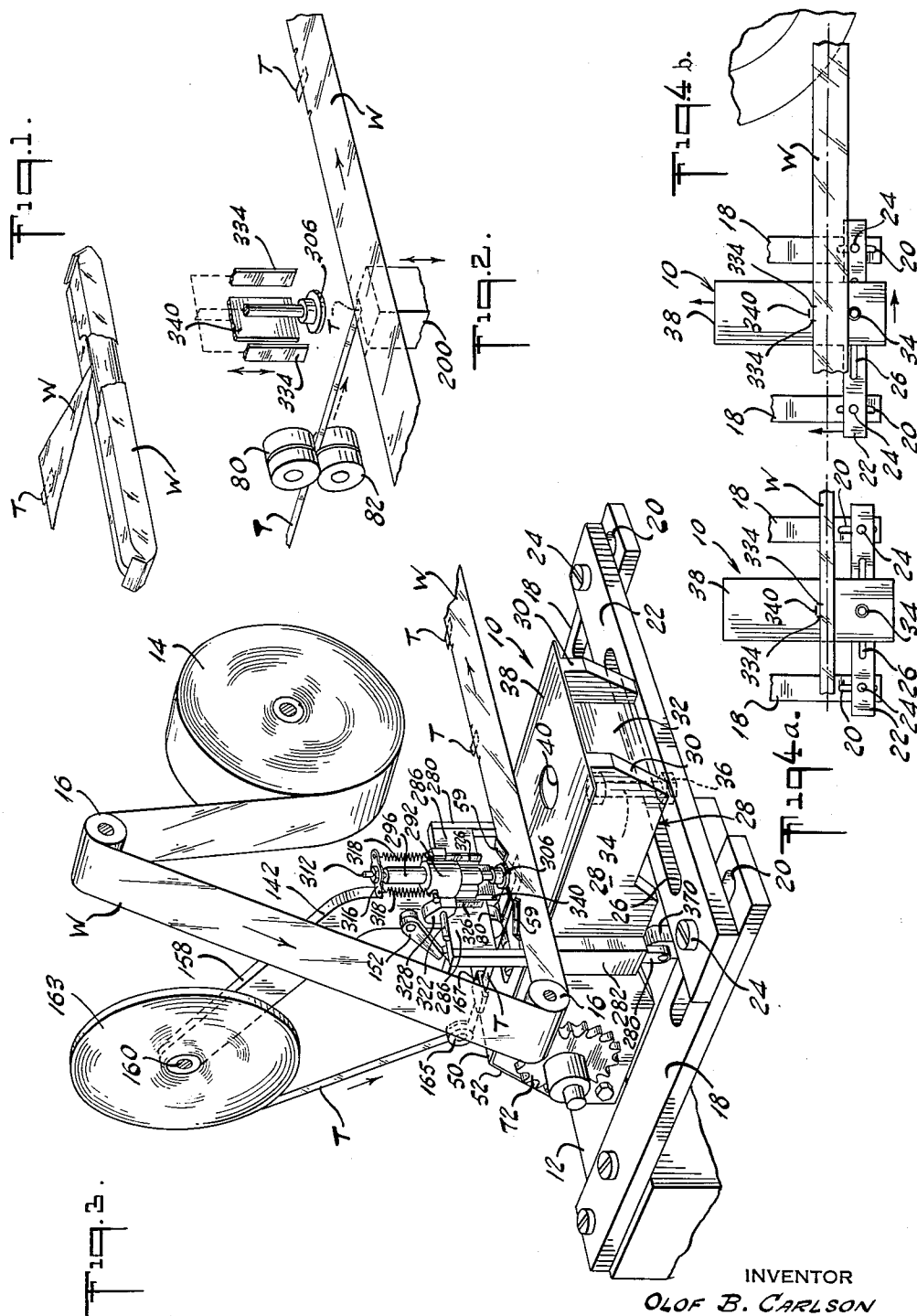
O. B. CARLSON

3,090,285

APPARATUS FOR APPLYING TEAR TAB TO A WEB

Filed Feb. 20, 1959

7 Sheets-Sheet 1



INVENTOR
OLOF B. CARLSON
BY
William R. Liberman
ATTORNEY

May 21, 1963

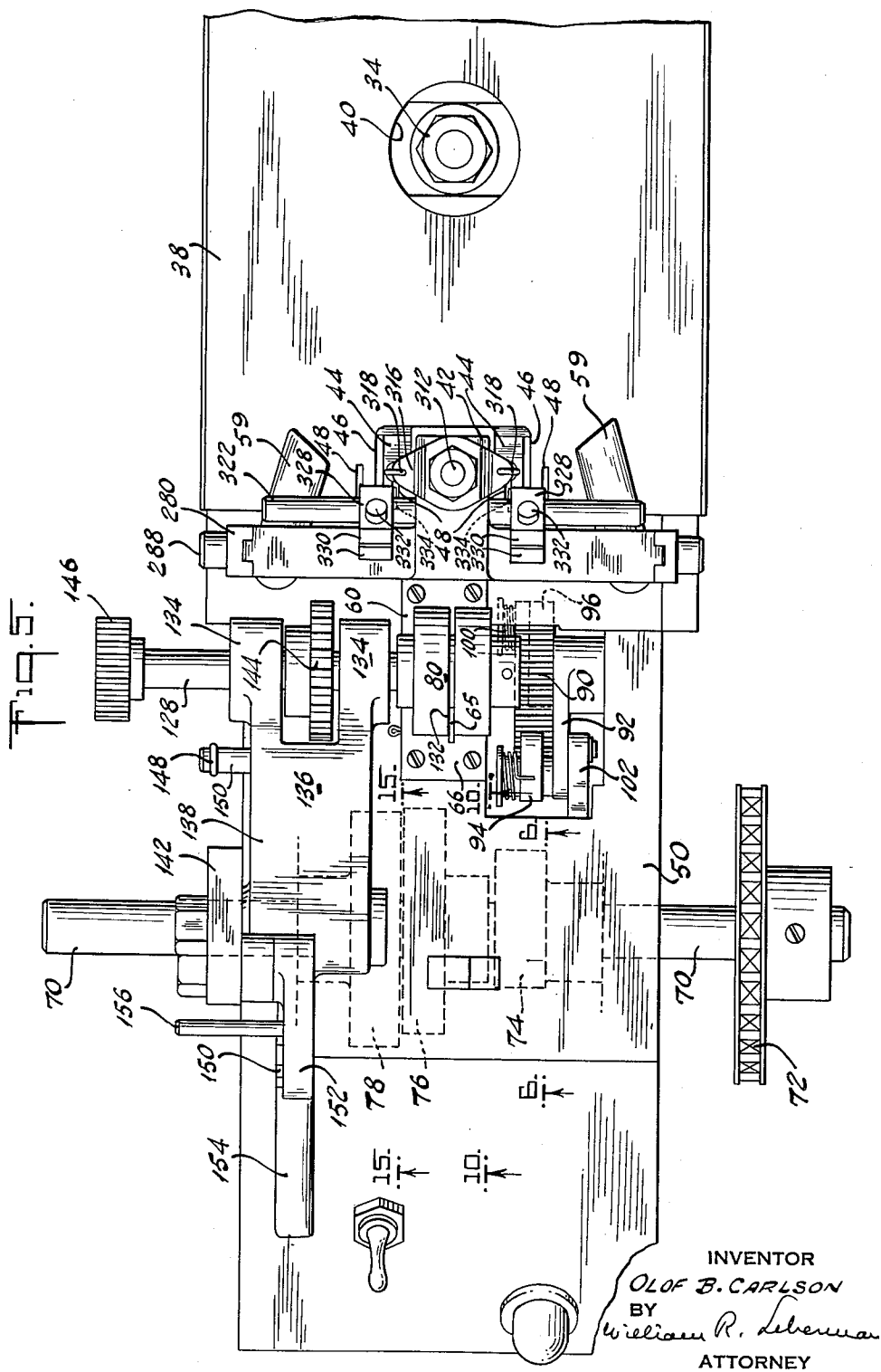
O. B. CARLSON

3,090,285

APPARATUS FOR APPLYING TEAR TAB TO A WEB

Filed Feb. 20, 1959

7 Sheets-Sheet 2



May 21, 1963

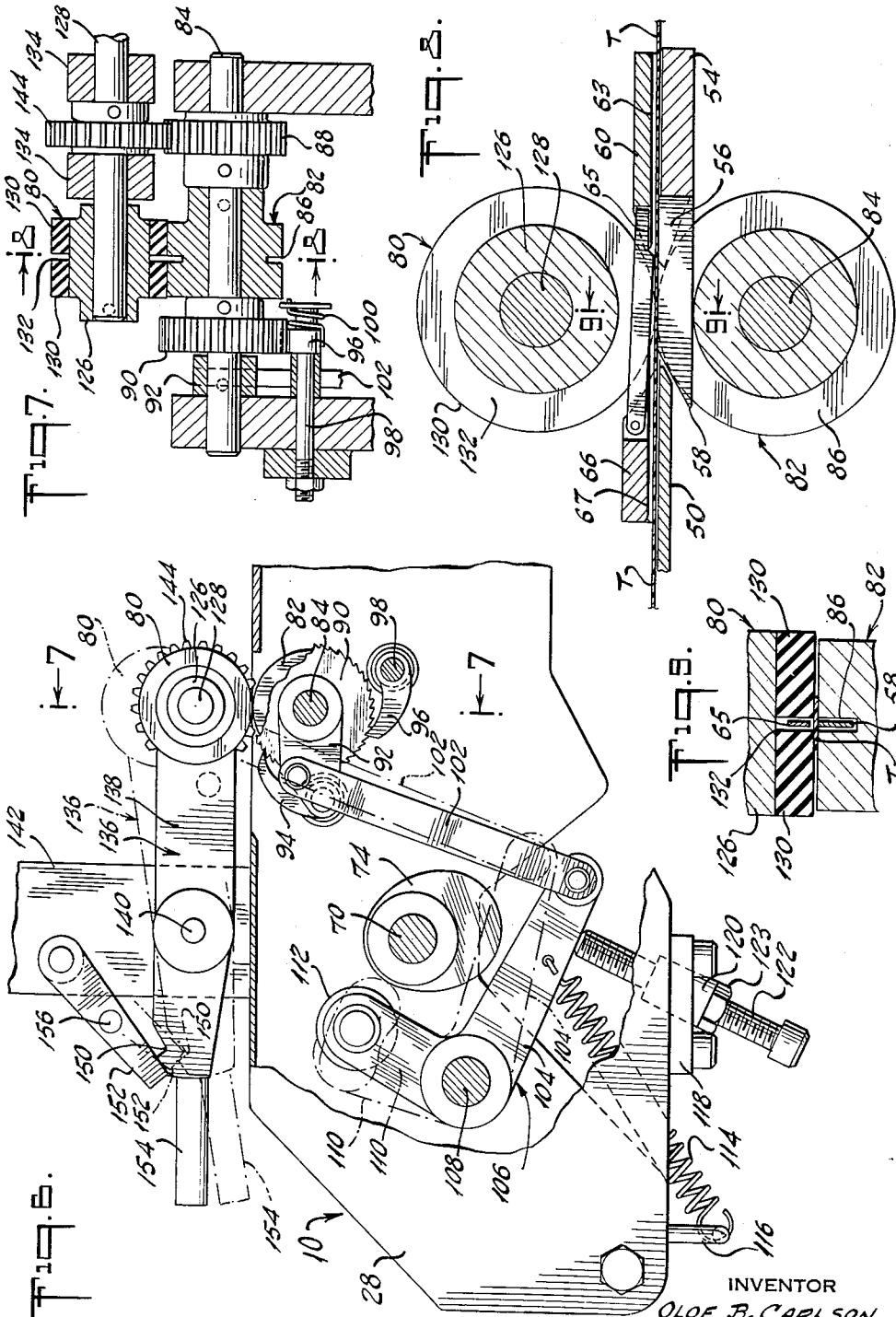
O. B. CARLSON

3,090,285

APPARATUS FOR APPLYING TEAR TAB TO A WEB

Filed Feb. 20, 1959

7 Sheets-Sheet 3



INVENTOR
OLOF B. CARLSON
BY
William R. Leberman
ATTORNEY

May 21, 1963

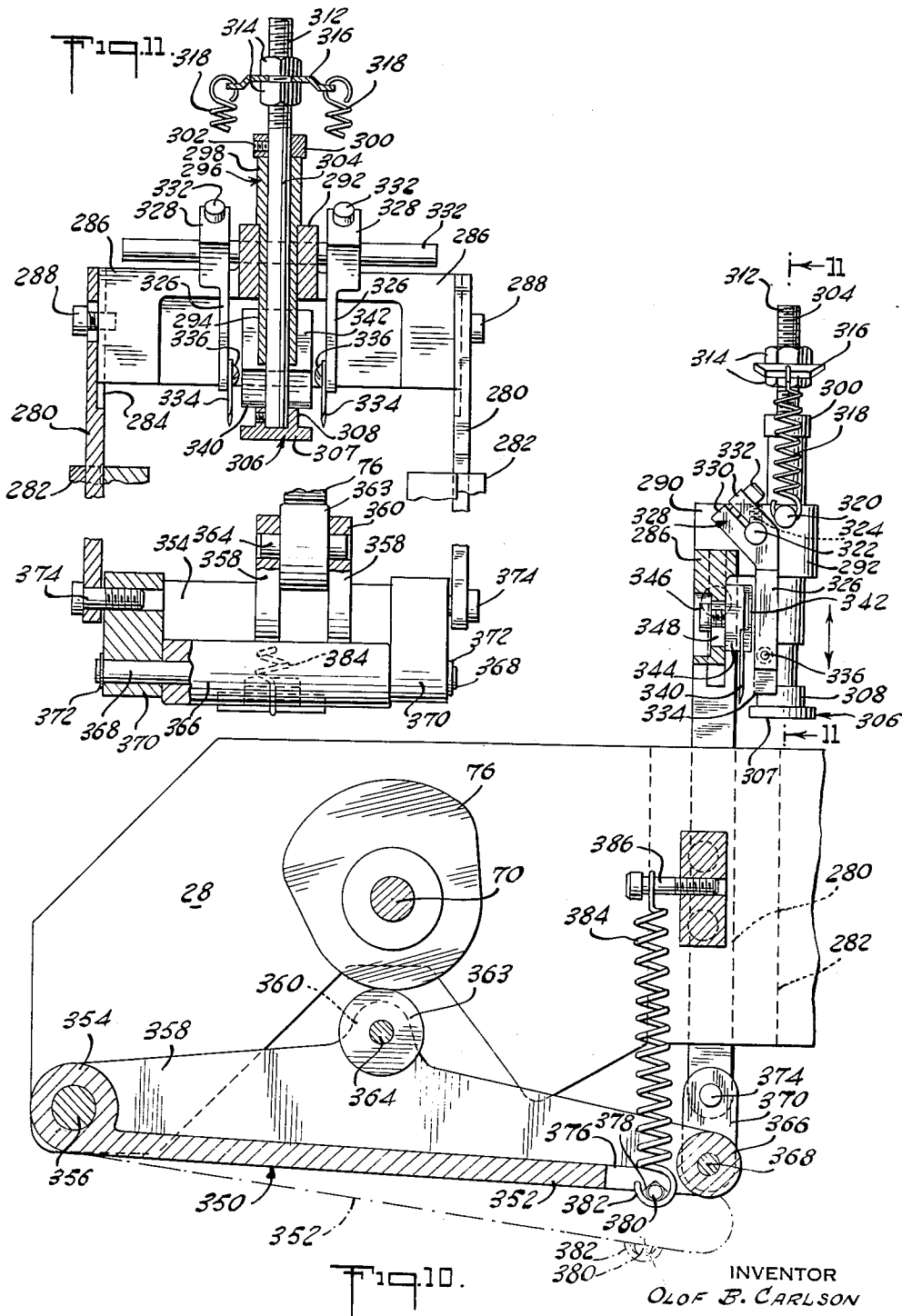
O. B. CARLSON

3,090,285

APPARATUS FOR APPLYING TEAR TAB TO A WEB

Filed Feb. 20, 1959

7 Sheets-Sheet 4



INVENTOR
OLOF B. CARLSON
BY
William C. Liberman
ATTORNEY

May 21, 1963

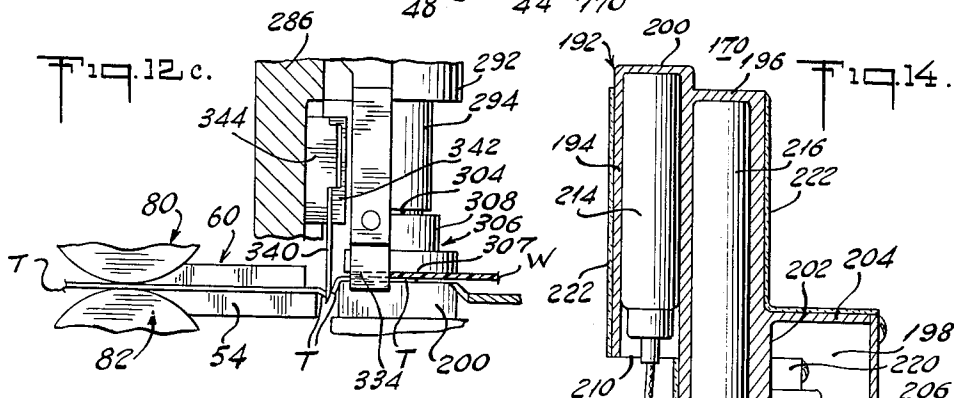
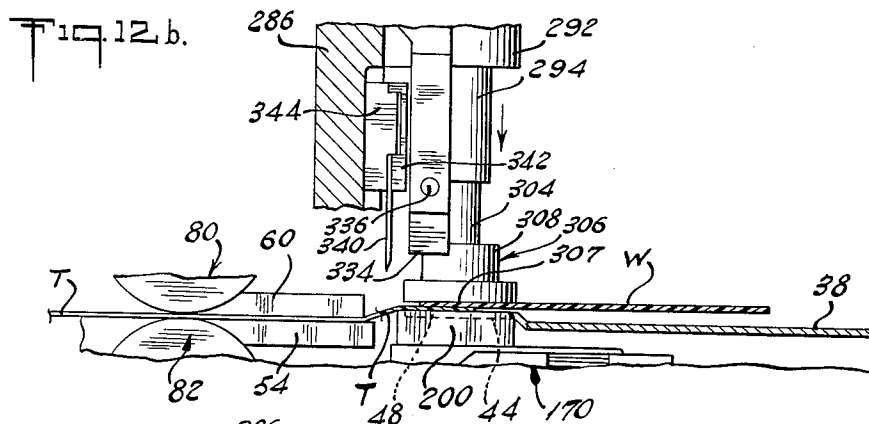
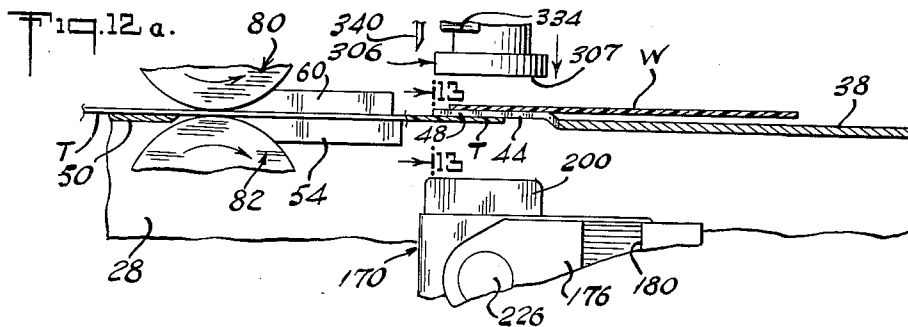
O. B. CARLSON

3,090,285

APPARATUS FOR APPLYING TEAR TAB TO A WEB

Filed Feb. 20, 1959

7 Sheets-Sheet 5

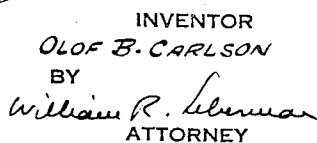


O. B. CARLSON

APPARATUS FOR APPLYING TEAR TAB TO A WEB

Filed Feb. 20, 1959

7 Sheets-Sheet 6



May 21, 1963

O. B. CARLSON

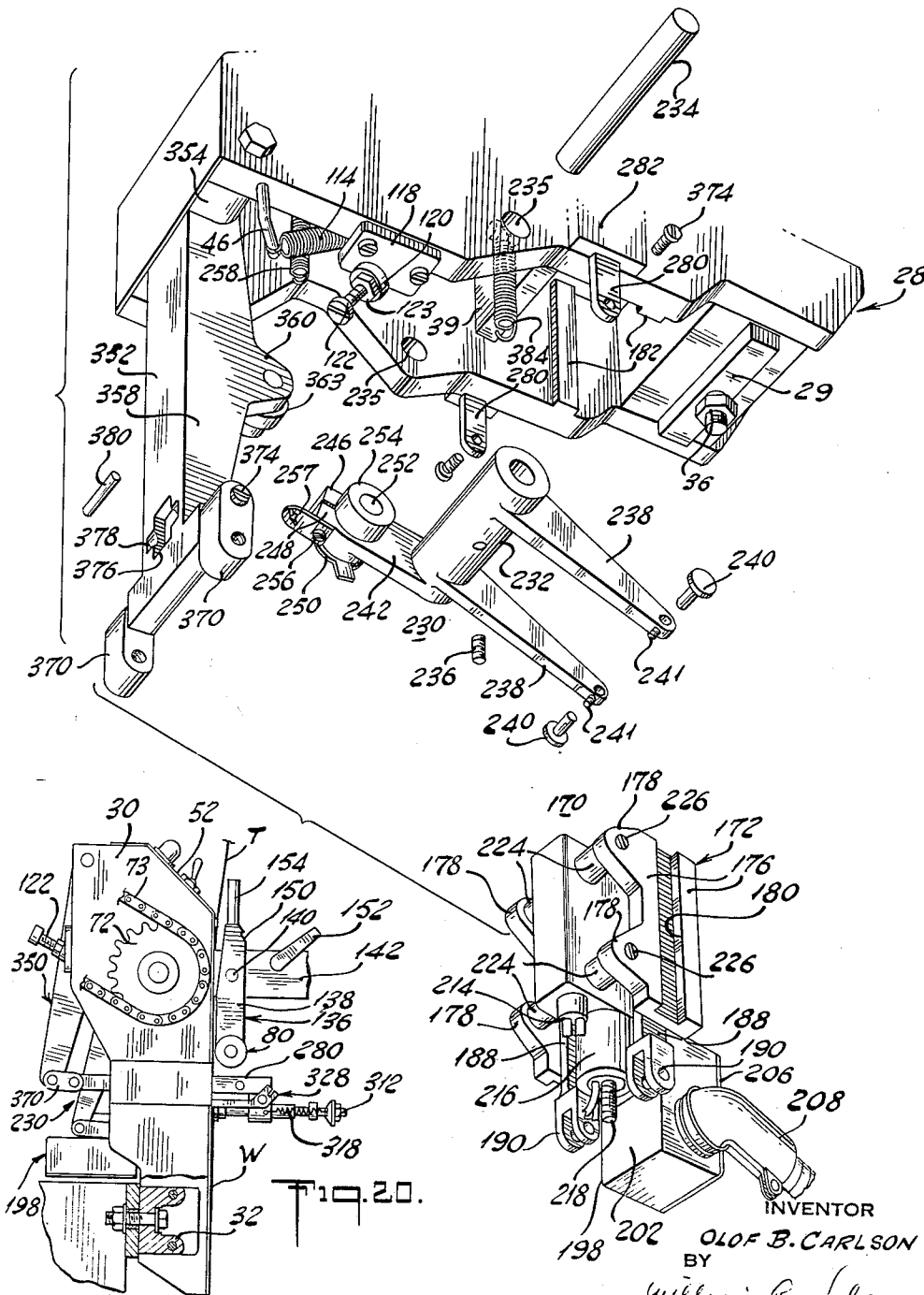
3,090,285

APPARATUS FOR APPLYING TEAR TAB TO A WEB

Filed Feb. 20, 1959

7 Sheets-Sheet 7

719.19.



1

3,090,285

APPARATUS FOR APPLYING TEAR TAB TO A WEB
Olof B. Carlson, Berwick, Pa., assignor to Consolidated
Cigar Corporation, New York, N.Y., a corporation of
New York

Filed Feb. 20, 1959, Ser. No. 794,570
1 Claim. (Cl. 93—1)

The present invention relates generally to improvements in packaging equipment, and it relates in particular to an improved machine for applying a succession of tear tabs and slitting the edge of a web of wrapping material.

Many types of machines and equipment have been proposed and employed for applying these tear tabs to a wrapping web and for slitting an edge of the wrapping web to facilitate the tearing of the web attendant the removal of the web from the package or article. One such machine is described in U.S. Patent No. 2,757,584, issued August 7, 1954, to A. Clemente. These slitting and tear tab applying machines, while generally operative, possess numerous drawbacks and disadvantages. They are subject to frequent malfunctioning and breakdowns and require frequent servicing. The various components of the machine which require adjustment, repair and replacement are usually accessible only with great difficulty, so that the servicing of such machines is expensive and time consuming. Another drawback to the use of these machines is their lack of flexibility and versatility, being applicable only to limited materials and within a narrow range of dimensions.

It is thus a principal object of the present invention to provide an improved accessory device for use with packaging equipment.

Another object of the present invention is to provide an improved mechanism for applying a succession of tear tabs at regularly spaced intervals along the edge of a packaging web.

Still another object of the present invention is to provide an improved tear tab applying mechanism which simultaneously slits the edges of the wrapping web along opposite sides of the tear tab to initiate and guide the tearing of the web.

A further object of the present invention is to provide an improved tear tab applying and slitting machine which is of simple and rugged construction, and is readily assembled and disassembled to facilitate the easy servicing thereof.

Still a further object of the present invention is to provide an improved tear tab applying and slitting machine which may be employed with webs of indefinite widths.

Another object of the present invention is to provide an improved tear tab applying and slitting machine which is highly flexible and versatile and in which various operating components may be independently adjusted.

Still another object of the present invention is to provide an improved tear tab applying and slitting machine which is subject to a minimum of malfunctioning.

The above and other objects of the present invention will become apparent from a reading of the following description taken in conjunction with the accompanying drawings, wherein

FIGURE 1 is a perspective view of a cigar wrapped in a web, tabbed and slit by the machine constructed according to and embodying the present invention, the wrapper being illustrated in open condition;

2

FIGURE 2 is a perspective diagrammatic view of the tab feeding and attaching arrangement and slitting mechanism;

FIGURE 3 is a perspective view of the improved machine;

FIGURES 4a and 4b are diagrammatic plan, partial views of the improved machine processing narrow and wide wrapping webs respectively;

FIGURE 5 is a top plan view of the improved machine shown partially broken away for convenience of illustration;

FIGURE 6 is a fragmentary side elevational view of the tear tab tape advancing mechanism shown partially broken away, the feed mechanism being illustrated in broken line in advance position;

FIGURE 7 is a sectional view through line 7—7 of FIGURE 6;

FIGURE 8 is an enlarged detailed sectional view taken through line 8—8 of FIGURE 7;

FIGURE 9 is a sectional view taken through line 9—9 of FIGURE 8;

FIGURE 10 is a fragmentary side elevational view of the slitter and presser foot actuating mechanism;

FIGURE 11 is a sectional view taken through line 11—11 of FIGURE 10;

FIGURES 12a, 12b and 12c are fragmentary side elevational views of the tape feeding rolls, heat securing elements and slitting knives illustrated tape advancing, tape securing and tape and web slitting positions respectively;

FIGURE 13 is a sectional view taken through line 13—13 of FIGURE 12a;

FIGURE 14 is a vertical longitudinal sectional view of the heating pad unit;

FIGURE 15 is a fragmentary side elevational view of the heating pad and its actuating mechanism in retracted position and illustrated by broken line in advanced raised position;

FIGURE 16 is a sectional view taken through line 16—16 of FIGURE 15;

FIGURE 17 is a perspective view of the heating pad actuating bell crank;

FIGURE 18 is a perspective exploded view of a modified form of heating pad actuating bell crank;

FIGURE 19 is an exploded bottom perspective view of the heating pad and its actuating mechanism illustrating the disassembly of part of the machine for servicing; and

FIGURE 20 is a side elevational view of the improved machine shown mounted for vertical operation.

Important features of the present improved machine are its great flexibility, simplicity, ruggedness and ease of servicing. This is, in a sense, accomplished by providing a support frame having two pairs of vertical guides, one of the pairs of vertical guides engaging slideable rods which support at their upper ends a bridging bracket member. The bracket member carries a downwardly-directed presser foot and a pair of laterally spaced web slitting knives and also a laterally extending tape severing knife. A heating pad unit has an upper surface confronting the bottom surface of the presser foot and is provided with members which slideably engage the other pair of vertical guides. Disposed posteriorly of the presser foot and heater pad unit are a pair of cooperating tape feed rolls which have a bite directed toward the space between the presser foot and the heater pad.

The driving means for the feed rolls, presser foot and heater pad includes a main shaft journaled to the support frame and having adjustably mounted thereon three separate actuating cams. Also mounted on the support frame are three rocker arms; each of the rocker arms having a cam follower engaging a respective cam. One of the rocker arms is separably linked to the bracket supported slide rods. Another rocker arm is separably linked to the heater pad unit and the third rocker arm is connected by way of a pawl and ratchet arrangement to the feed rolls. The above structure is such that the machine may be readily disassembled, providing ready access to the various components and permitting the replacement or servicing thereof.

Among the important structural characteristics of the improved machine is the provision of aligned grooves in the feed rolls and fingers registering with each of the grooves and extending across the bite between the rolls. A tape guide member extends longitudinally from the feed roll bite to a point spaced posteriorly of the heater pad upper surface, and the tape severing knife traverses a path between the leading edge of the tape guide member and the trailing edge of the heater upper surface and spaced therefrom so as to effect a severing of the tab bridging the gap between these edges.

Referring now to the drawings, and more particularly to FIGURES 2 through 17, and 19 thereof, which illustrate a preferred embodiment of the present invention, the numeral 10 generally designates the improved tear tab applying and web slitting machine which is associated with a conventional cigar wrapping machine 12 upon which the tear tab applying mechanism is mounted. Associated with the wrapping machine 12 is a wrapping web feed mechanism of well known construction, which periodically draws a predetermined length of wrapper web W from a suitably mounted roll 14 thereof, the web W travelling about a pair of vertically and laterally spaced idler rollers 16, 16 across the operating area of the tear tab applying mechanism 10 in the manner hereinafter set forth.

The tear tab applying mechanism 10 is mounted on the wrapping machine 12 by means of a pair of laterally spaced, forwardly projecting arms 18, 18 affixed by means of screws to the wrapping machine 12 and having longitudinal slots 20 formed adjacent their leading ends. a cross bar 22 rests atop arms 18 and is provided with bolts 24 at the ends thereof which engage slots 20 and permit the longitudinal adjustment of cross bar 22. A longitudinally extending slot 26 is formed in cross bar 22.

Carried on cross bar 22 and on the frame of the wrapping machine 12 is a mounting or support frame 28, which includes a pair of laterally spaced, longitudinally extending side walls 30, the under face of the trailing ends of which rest on the frame of wrapping machine 12 and the underfaces of the leading ends of which rest on cross bar 22. A transverse vertically extending front cross member 32 extends between and is secured to the confronting faces of the side walls 30 and is provided with a bottom rectangular ridge 29 (see FIGURE XIX) which registers with slot 26. Support frame 28 is adjustably secured in position by a bolt 34 passing through a vertical bore formed in cross member 32 and through slot 26, and is secured in position by means of a nut 36 engaging the lower threaded end of the bolt 34. Also located between the frame walls 30 is an intermediate narrow cross wall 39 (see FIGURE XIX).

A support plate 38 is secured in a suitable manner to and extends between the upper faces of side walls 30, extending rearwardly from the leading ends thereof to about their midpoints and having an opening 40 formed therein providing access to bolt 34. Formed in the trailing edge of the plate 38 is a medially located rectangular recess 42 (see FIGURE 5) bordered by a pair of laterally spaced, rearwardly directed fingers 44, the outer

edges of which are delineated by longitudinal slots 46 reaching the transverse extension of the base line of recess 42. The free ends of fingers 44 are shouldered above the level of the plate 38, substantially parallel thereto, their inner ends being downwardly inclined and joining the plate 38, as seen in FIGURE 12a. Parallel longitudinal slots 48 are formed in fingers 44 and in plate 38 adjacent to slots 46, the slots 48 and 46 accommodating the web slitting knives, as will be hereinafter set forth.

Covering the rear upper section of mounting frame 28 is a plate 50 extending to a point rearwardly of the trailing edge of the plate 38, and having component clearing recesses formed in its leading edge. A switch and indicator light-carrying plate 52 covers the trailing downwardly inclined end of the frame 28. A bridge plate member 54 located between the plates 38 and 50 is mounted on frame walls 30. As seen in FIGURE 8, bridge plate 54 is provided with a rearwardly directed transversely extending tongue section 56 having an upper face coplanar with the upper faces of bridge plate 54 and plate 38, and with a rearwardly upwardly tapered underface. Projecting rearwardly and medially from tongue section 56 is an elongated horizontal finger 58 lying in a vertical plane and having an upper edge coplanar with the plate 54 and terminating in a downwardly tapered trailing edge.

Mounted on bridge plate 54 is a bracket 60 having a medially, longitudinally extending horizontally lying groove 63 formed in its underface and defining a tab tape guide. A medially located, rearwardly projecting finger 65, vertically coplanar with the finger 58 projects rearwardly from bracket 60, the free end of finger 65 being connected by a cotter pin to a block 66 mounted on the leading section of cover plate 50. Block 66 has a tear tape guide groove 67 formed in its underface in alignment with groove 63 in block 60. The confronting edges of block 66 and bracket 60 have upper tapered surfaces. As will be later described, the fingers 58 and 65 and the associated elements serve to guide and strip the tab tape from the feed rolls thereof. A pair of laterally spaced forwardly and inwardly directed fingers 59 are mounted on the sides of the bridge plate 54, the leading portions thereof being disposed above and parallel to plate 38 and serving to position the advancing web W.

The principal motivating mechanism of the present device includes a main drive shaft 70 journaled between and extending beyond the frame walls 30 at their rear sections and having a sprocket wheel 72 fixed to an outer end thereof. Sprocket wheel 72 is connected by a sprocket chain 73 (see FIGURE 20) to the wrapping mechanism drive so that the machine 10 is driven in synchronism therewith. Mounted on drive shaft 70 and angularly adjustable relative thereto are cams 74, 76 and 78 which periodically actuate the tab tape feed mechanism, the cutter and presser foot mechanism and the heater pad unit respectively (see FIGURES 5, 6, 10 and 15).

The tear tab tape advancing mechanism, as illustrated in FIGURES 5 to 9 of the drawing, includes upper and lower complementary feed rolls 80 and 82 respectively, disposed rearwardly of bridge plate 54. The lower roll 82 is preferably formed of steel and is affixed to a shaft 84 journaled between the frame plates 30 adjacent their upper edges (FIGURE 7). Formed in the surface of the roll 82 is a peripheral groove 86 which registers with the stripping finger 58, the upper edge of which is immediately below the upper peripheral surface of roll 82. Also affixed to the shaft 84 on opposite sides of roll 82 are a spur gear 88 and a ratchet wheel 90. A rocker arm 92 is swingably mounted on shaft 84 adjacent ratchet wheel 90 and carries on its free end an advancing pawl 94 which is spring-urged into engagement with ratchet wheel 90. Also engaging the ratchet wheel 90 is a retaining pawl 96 which is mounted on the frame wall 30 by means of a bolt axle 98 and is urged toward the

5

ratchet wheel 90 by an axle-carried spring 100, as illustrated in FIGURES 6 and 7.

Rocker arm 92 is connected by a link 102 to the free end of a leg 104 of a bell crank 106, the knuckle of which is rotatably engaged by a stub axle 108 projecting inwardly from and preferably mounted on one of the frame walls 30. The other leg 110 of bell crank 106 carries a cam follower 112 at its free end which rides on the surface of cam 74. Urging cam follower 112 toward engagement with cam 74 is a helical tension spring 114 connected between leg 104 of bell crank 106 and a finger 116 depending from the rear of the frame 28, thereby to urge bell crank 106 in a clockwise direction about axle 108 as viewed in FIGURE 6. In order to adjust the throw of bell crank 106 and hence to regulate the circumferential advance of feed roll 82, there is provided a plate 118 screw-fastened to the underface of frame wall 30 and carrying an inclined tapped tubular member 120. An elongated screw bolt 122 engages the tapped member 120 and carries a nut 123 whereby to lock screw 122 in any desired position. The upper end of screw 122 extends in the path of arm 104 of bell crank 106, and by adjustment of screw 122 the limit of the clockwise movement of the crank 106 and hence its throw and the periodic advance of the feed roll 82 may be adjusted as desired; see also FIGURE 19.

Upper roll 80 includes a rigid core member 126 affixed to the inner free end of a cantilevered shaft 128 and a pair of laterally spaced resilient collars 130 mounted on the core member 126 and separated by an annular peripheral groove 132 aligned with groove 86 in lower roll 82 and registering with stripping finger 65. As seen in FIGURE 9, finger 65 is so positioned within groove 132 and its lower edge does not extend beyond the periphery of the collars 130. Shaft 128 is journaled between and extends laterally beyond the forwardly directed arms 134 of a yoke member 136 having a rearwardly projecting arm 138. Yoke member 136 is rockably mounted on an axle 140 engaging a transverse opening in arm 138, and projecting inwardly from an upwardly directed standard 142 secured to a frame wall 30.

A gear 144 is affixed to shaft 128 between yoke arms 134 and mates with lower gear 88 on shaft 84. A knob 146 is affixed to the outer free end of shaft 128.

A helical tension spring 148 has its upper end attached to a pin 150 projecting laterally from the yoke end of the arm 138 and its lower end suitably fastened to frame wall 30 thereby to urge yoke arms 134 and shaft 128 downwardly, gear 144 into mesh with gear 88, and the tear tab feed rolls 80 and 82 into contacting rolling engagement. In order to lock yoke member 136 releasably in raised position, wherein rolls 80 and 82 and gears 144 and 88 are out of engagement, the upper face of the section of arm 138 rearward of axle 40 has an angular notch or recess 150 formed therein. Swingably mounted on the inner face of standard 142 above axle 140 is a rearwardly downwardly directed latching element 152 which releasably registers with recess 150 when the yoke member is in raised position. A rearwardly directed finger piece 154 is carried by yoke member 136, and a laterally projecting finger piece 156 is carried by latching element 152 to facilitate manipulation and unlatching of the yoke member assembly.

Standard 142 terminates in an upwardly rearwardly directed arm 158 which bears at its free end a laterally extending spindle 160 on which is rotatably mounted a spool 163 of tear tab tape T. Between spool 163 and feed rolls 80, 82 are a suitably mounted tape idler guide roll 165, and a guide channel 167 mounted on cover plate 50.

The heater pad assembly comprises a heater pad unit 170 mounted on a slide block 172. Block 172 is saddle shaped and includes a laterally extending vertical front 174 and a pair of laterally spaced parallel vertical side walls 176, each provided with a pair of vertically spaced rear-

6

wardly directed lugs 178 having formed therein bolt-accommodating, countersunk transverse bores. Vertical grooves 180 of rectangular transverse cross-section are formed in the inner faces of walls 176, and slidably engage vertical tracks 182 located on the inner faces of frame walls 30, see FIGURE 19. A pair of ears 184 project rearwardly from front wall 174, on the upper portion thereof, and adjacent side walls 176. A pin 186 is supported by and between each of ears 184 and adjacent side wall 176, registering with apertures formed therein. Depending from each of the pins 186 is a link 188 terminating in a lower yoke portion 190.

Heat pad unit 170 comprises a body member 192 including a rear upper section 194, an intermediate control section 196 and a front lower junction box 198, sections 194 and 196 and junction box 198 being integrally formed of any suitable, highly heat conducting metal such as aluminum or the like. Heat pad sections 194 and 196 are compositely of rectangular transverse cross-section, the top surface of the rear section 194 extending above that of intermediate section 196, being substantially flat and rectangular in outline, and defining a heated pressure plate 200. The intermediate pad section 196 extends below section 194 and is provided with a laterally extending, rectangular lower front wall 202 which forms a wall of junction box 198. Projecting forwardly from the edge of wall 202 are the peripheral walls 204 which carry a readily removable lid 206 permitting access to and closing of junction box 198. Communication with the interior of junction box 198 is afforded by way of an opening formed in its base 202, and by way of an elbow 208 extending through the box wall 204.

Formed in body member sections 194 and 196 are deep cylindrical wells 210 and 212 respectively, which are open at the bottom and extend substantially to the top thereof, leaving relatively thin upper and side walls. A cartridge type, cylindrical electrical heating unit is snugly nested in well 210 contacting the faces thereof and a switch type thermostat cartridge 216 of cylindrical shape nests snugly in well 212. Thermostat 216 is provided with a temperature response adjusting screw 218, and is of the type which is electrically open above the preset temperature and closed below said temperature. A terminal strip 220 is located within junction box 198 and secured to base 202 thereof. The heating cartridge 214, thermostatic switch 216, and the switch and indicator light carried on the cover plate 52 are connected by way of the terminal strip 220 in the well known manner to a source of current. As is conventional, the heating cartridge 214, thermostatic switch 216 and the power switch are connected in series with the source of current. It should be noted that the external surfaces of the heating pad unit 192 not requiring access are covered by a layer of heat insulating material 222 to reduce to a minimum heat dissipation and heat transfer from unit 170 to the remaining mechanism.

Heat pad sections 194 and 196 are disposed between slide block walls 176, and the junction box is located below the slide block front wall 174 and extends forwardly thereof. Projecting laterally from the side walls of the pad rear section 194 and in alignment with the slide block lugs 178 are stand-off bosses 224. Bosses 224 are formed integrally with the pad body member 192 and have longitudinally tapped bores aligned with the openings in lugs 178. Connecting screws 226 engage the tapped bores in bosses 224 and register with the lug openings, the screw heads nesting in the countersunk portions of the lug openings. Engaging screws 226 and disposed between the confronting faces of the bosses and lugs are heat insulating washers 226.

The mechanism for motivating the heating pad assembly, illustrated in FIGURES 17 and 19, comprises a rocker lever 230, including an elongated cylindrical knuckle or hub 232 mounted on a shaft 234 journaled between the frame walls 30, in openings 235, at the lower portions thereof rearwardly of tracks 182. Hub 232 is locked on shaft 234 by means of set screw 236 register-

ing with a tapped opening in hub 232, engaging shaft 234. Projecting forwardly from adjacent the ends of hub 232 are a pair of laterally spaced, parallel arms 233, the ends 231 of which extend to and between the legs of the respective yokes 190, connected thereto by pins 240 which register with aligned openings formed in yokes 190 and arms 238. Pins 240 are releasably retained by means of set screws 241 registering with tapped radial bores communicating with the end openings in arms 238.

An arm 242 is directed rearwardly from one end of hub 232 and terminates in a split collar 244, provided with a pair of separated, confronting legs 246 and 248. An eccentric bushing 250 provided with an adjusting arm registers with collar 244 and carries an inwardly directed axle 252 on which is rotatably mounted a cam follower 254. Split collar 244 is tightened about bushing 250 by means of a screw 256 which registers with an opening in lower collar leg 248 and engages an aligned tapped bore in upper leg 246. A rearwardly directed finger piece 257 is secured to the underface of lower collar leg 248 also by means of screw 256. A helical tension spring 258 has its lower end connected to the ear 257 by means of a cotter pin and its upper end connected to a pin 260 mounted on frame wall 30, whereby to urge lever 230 clockwise as viewed in FIGURE 15 and follower 254 into rolling engagement with the cam 78. By adjustment of the eccentric bushing 250, the path of travel of the heating pad unit 170 along tracks or guides 182 may be vertically adjusted.

In FIGURE 18 of the drawing, there is illustrated an alternative construction of the rocking lever, differing from rocking lever 230 only in the form of the hub and the forwardly directed arms, and which also may be advantageously employed. The hub in the latter construction includes a pair of end sections 263 and an intermediate section 265. The confronting faces of the end sections 263 and intermediate section 265 are respectively provided with separably mating radial rectangular grooves 266 and ridges 267 to interlock the hub sections against relative rotation. Projecting forwardly from each of the hub end sections 263 is an arm 268 having a longitudinal groove 270 formed in its outer face and extending to the end thereof. Arm extensions 272 have their trailing ends nesting in grooves 270 and are removably secured therein by means of screws 274 passing through openings in the extensions 272 engaging tapped bores in arms 268. The leading ends of the extensions 272 are provided with apertures which engage the pins 240 in the manner of the lever arms 238. The structure of the above described lever further facilitates the disassembly of the present mechanism.

The mechanism, supporting and motivating the tab tape severing and web slitting knives and the upper presser foot, includes a pair of laterally spaced vertical bars 280 of rectangular cross-section slidably registering with correspondingly shaped vertical bores formed in ridges 282 disposed on the outer faces of frame walls 30. Vertically extending grooves 284 are formed in the upper inner faces of bars 280 and engage the ends of a bridge member 286. Adjustably securing bridge member 286 to bars 280 are screws 288 passing through slots formed in the bars 280, engaging tapped bores formed in the bridge member 286, as illustrated in FIGURE 11.

A forwardly directed bracket 290 is medially located on the top of bridge 286, and it includes a vertical sleeve 292 which slidably registers with the lower section 294 of a vertical bushing 296. The upper section 298 of bushing 296 is of greater outer diameter than the lower section 294, as seen in FIGURE 11, and is separated therefrom by a peripheral shoulder which is adapted to rest atop the upper face of sleeve 292 thereby to limit the downward movement of bushing 296. A collar 300 is affixed to the top of bushing 296 and is provided with a tapped radial bore carrying a set screw 302. An elongated rod 304 is adjustably located in the bushing 296,

extending above and below bushing 296 and is releasably fixed in a preset position relative thereto by means of set screw 302. Attached to the lower end of rod 304 is a presser foot 306 having a bottom disc shaped pressure plate 307 with a flat underface and an upwardly directed collar 308 which engages rod 304 and is secured thereto by a set screw carried by the collar 308. Presser foot 306 is in vertical alignment with and confronts the upper face of heated pressure plate 200, the trailing edge of presser foot pressure plate 307 being slightly forward of the trailing edge of the pressure plate 200, as illustrated in FIGURES 12a, 12b and 12c.

The upper end of the rod 304 is threaded as at 312 and is engaged by a pair of nuts 314 between which is disposed a laterally extending plate 316, of diamond outline, provided with a central aperture which registers with the threaded portion 312 of rod 304, which plate is vertically adjustably fixed on the rod by means of nuts 314. A pair of laterally spaced, vertical helical tension springs 318 have their upper ends secured to the ends of plate 316 and their lower ends to bolts 320 projecting outwardly from sleeve 292, normally to urge the assembly of the rod 304, bushing 298 and presser foot 306 to their preset lowermost position wherein the shoulder of bushing 296 abuts the upper face of the sleeve 292.

A laterally extending horizontal rod 322 passes through a similarly oriented bore formed in bracket 290 rearward of sleeve 292, and is adjustably fixed in position by a set screw 324 carried by bracket 290. Mounted on rod 322 and straddling sleeve 292, are a pair of laterally spaced depending knife support arms 326 provided at their upper ends with split collars 328 engaging rod 322. Extending radially from split collars 328 are normally separated legs 330 which may be urged toward each other by suitably mounted screws 332 to permit the adjustment and securing of arms 326 along rods 322. A web slitting knife 334 depends from each of arms 326 and is separably secured to the inner face thereof by a screw 336, the bottom sharp edge of the knife 334 being substantially horizontal. It should be noted that the arms 326 are so adjusted that knives 334 straddle presser foot 306 and are aligned either with selected slots 48 or 46 formed in plate 38.

A downwardly directed tab tape severing knife 340 lying in a transverse vertical plane and having a bottom severing edge has its upper border separably clamped between a pair of front and rear jaw members 342 and 344 respectively. The rear jaw member 344 is fastened to the bridge member 286 and is vertically adjustable thereon by means of a screw 346 passing through a medially located vertical slot 348 in bridge member 286 and engaging a tapped bore in the rear jaw 344. The confronting faces of jaws 342 and 344 have mating horizontal grooves and ridges formed therein and are urged into clamped position by means of a pair of screws registering with laterally spaced openings in the front jaw 344 and engaging aligned tapped bores in the rear jaw 342. The tab tape severing knife 340 extends in a vertical plane and traverses a vertical path lying substantially midway between the leading edge of the bridge plate 54 and the trailing edge of heated pressure plate 200.

A longitudinally extending rocker arm 350 is located at the bottom of frame 28 and includes a base plate 352 carrying at its rear end a laterally extending hub 354 swingably engaging an axle 356 suitably separably supported between the lower rear corners of frame walls 30. Extending along the sides of base plate 352 are upwardly directed flanges 358 which are provided with laterally aligned, aperture ears 360. A cam follower 363 is supported between the ears 360 by an axle 364 and is normally in registry with cam 76. Mounted at the forward end of base plate 352 is a laterally extending sleeve 366 which engages a rod 368 projecting beyond the opposite ends of the sleeve 366. A pair of links 370 are mounted on the ends of the rod 368 and are removably maintained

thereon by split rings 372 and are separably pin connected to the lower ends of corresponding slide bars 280 by means of threaded bolt members 374.

A rectangular aperture 376 is located in the rocker arm base plate 352 adjacent its leading end, and a pair of angular recesses 378 are formed in the underface of plate 352 and extend laterally from aperture 376. Registering with recesses 378 are the ends of a pin 380 which extend across the bottom of aperture 376 and engage the lower hooked end 382 of a helical tension spring 384. The upper end of the spring 384 engages a threaded bolt 386 carried by the intermediate wall 39. Spring 384 urges the forward end of the rocker arm 350 upwardly to maintain follower 363 in engagement with the cam 76, and to urge the knife and presser foot assembly toward its upper position, as illustrated in FIGURES 10 and 11.

Considering now the operation of the improved tear tab applying machine, it is first loaded and laced up by mounting a roll 163 of tear tab tape T on the spindle 160. The upper feed roll 80 is raised by depressing the finger piece 154 until the latching elements 152 falls into engagement with the arm notch 150 to lock the feed roll 80 in raised position, FIGURE 6. The free end of the tape T is drawn from roll 163 and passed about idler 165, through guide 167 and guide grooves 67 and 63, over the lower feed roll 82 and then disposed between fingers 58 and 65. Latch element 152 is then swung upwardly out of engagement with notch 150, permitting upper feed roll 80 to drop into engagement with the lower feed roll 82 and atop the tape T. The wrapping web W is guided across the plate 38, the trailing longitudinal border thereof passing under the guide fingers 59 and over the plate fingers 44. The packaging machine, for example a cigar wrapping machine, is started to simultaneously motivate the tear tab applying mechanism as aforesaid.

The cycle of the tab applying mechanism starts with the advance of a predetermined length of tape T with its leading portion disposed below the trailing border of the web W raised by the fingers 44, FIGURE 2. Cam 74 rocks bell crank 106 to reciprocate link 102 which, on its upward stroke, rotates bottom feed roll 82 one increment by way of pawl and ratchet 94 and 90. The upper feed roll is similarly advanced by way of meshing gears 88 and 144, FIGURES 6 and 7. Upon the return of the bell crank, link and pawl, under the influence of spring 114, the latching pawl 96 prevents retrogression of ratchet wheel 90. The increment of advance of draw-off feed rolls 80 and 82 and of the tape T may be varied by adjusting the stroke of the bell crank 106 by way of the screw 122 as previously described.

As tape T passes between the feed rolls, it is aligned with the feed roll grooves 86 and 132 and prevented from adhering to the surface of the feed rolls by being continuously stripped therefrom by groove-registering fingers 58 and 65, FIGURES 8 and 9.

Following the advance of tape T (FIGURES 12a to 13), and while the web W is stationary, heat pad unit 170 is raised until the upper heated surface 200 thereof is substantially coplanar with the upper faces of fingers 44. The elevation of unit 70 is effected by way of the cam 78 and the associated follower, rocker arm and linkage mechanism, FIGURE 15. The severing and slitting knives and pressure foot assembly are depressed so that they reach their lower positions subsequent to the heat pad unit reaching its topmost position. Presser foot 306 reaches pressure plate 200 first, to press and heat the coinciding overlapped portions of tape T and web W. As the knife and pressure foot assembly is further depressed, the pressure exerted by presser foot 306 upon the tape, web and heated surface 200 is increased by reason of the stress of springs 318 consequent to the relative raising of the rod 304 to effect the heat sealing of tape T to web W.

The knives 334 are carried into registry with aligned slots 46 or 48, as desired, to form slits in web W on op-

posite sides of the attached tape T. Similarly, the knife 340 is carried through that portion of the tape T which bridges the gap between the leading edge of the plate 54 and the trailing edge of the heated surface 200 to sever the tape T and from the tab. It is important to note that knife 340, during its travel and tape severing action, is disposed between and substantially intermediate the leading edge of the surface 200 and does not contact these members; the tape T, during its severing, being firmly held by rolls 80 and 82 and the engaging presser foot and heated pressure surface. The heater pad unit and the knife and presser foot assembly are then lowered and raised respectively, and the packaging machine thereafter takes up a predetermined length of the web containing the attached tear tab and the starting slits. The above cycle is then periodically repeated. In FIGURE 1 there is illustrated a cigar which has been enclosed in a wrapping produced by the present mechanism, the opening of the wrapper having been facilitated by the tab. A detailed explanation of the packaged cigar is set forth in U.S. Patent No. 2,337,741, granted December 28, 1943.

The timing of the various operations may be regulated by angularly adjusting the cams 74, 76 and 78 on shaft 70. The pressure exerted by the presser foot 306 and the height reached by the heated surface 200 may be regulated respectively by adjusting the position of plate 316 on the rod 304 and the position of the eccentric bushing 250. Furthermore, the relative position of the severing knife 340 may be independently vertically adjusted by moving the supporting clamp on the bridge 286. By reason of the absence of any obstructions or impediments in the face of the plate 38 forward of slide bars 280, the width of the wrapping web W which may be employed is practically limitless, as seen in FIGURES 4a and 4b. Moreover, the improved mechanism may be employed in any convenient position, for example, vertically, as illustrated in FIGURE 20 of the drawings.

In addition to the great flexibility, versatility and adjustability of the improved tear tab applying and web slitting mechanism herein disclosed, it is characterized by ease of disassembly and assembly, thereby facilitating its servicing, repair and replacement of parts. By unhooking the spring 384 from the pin 380 and removing the screws 374 from the links 370 and the bars 280, the front end of the rocker arm is freed and may be dropped to the position illustrated in FIGURE 19, and the slide bars 280 and the supported presser foot and knife assembly slid upwardly and separated from the mounting frame 28, if desired. Rocking lever 230 can then be detached simply by releasing spring 258 from tongue 256, loosening set screws 239 and removing pins 240 which couple arms 238 and links 188, loosening set screw 236 and removing shaft 234. The heat pad unit assembly may then be slid downwardly out of engagement with the frame 28 and the heat pad unit 170 separated therefrom by loosening of screws 226. The unit 170 may be readily replaced by detaching the respective wire leads from the terminal strip 220, connecting the leads from another unit 170 thereto and mounting the new unit on the carriage 172. The various elements and components of the mechanism are completely accessible for replacement and repair and the reassembly thereof may be readily and simply achieved. Moreover, it should be noted that the above disassembly is not necessary in adjusting or replacing the severing and slitting knives, the presser foot, in adjusting the thermostat, etc.

While there have been described and illustrated preferred embodiments of the present invention, it is apparent that numerous alterations, additions and omissions may be made without departing from the spirit of the appended claim.

I claim:

An improved tear tab applying mechanism of the character described for use with a wrapping machine, comprising a support frame including a pair of laterally

11

spaced parallel walls and having parallel confronting vertical tracks located in the inner faces thereof; a heating pad unit disposed between said walls and slidable along said tracks and separable from said support frame through the bottom thereof and having a body member and a pair of guide members engaging said tracks and mounted on and separated from said body member by standoff elements; a drive shaft journaled between said walls; an actuating cam mounted on and rotatable with said drive shaft; a rocking member rotatably and separably supported between said frame walls and including a pair of lat-

12

erally spaced arms engaging opposite sides of said pad unit; and a cam follower carried by said rocking member and engaging said actuating cam.

References Cited in the file of this patent

UNITED STATES PATENTS

1,990,958	Roberts	Feb. 12, 1935
2,757,584	Clemente	Aug. 7, 1956
2,758,517	Brightwell	Aug. 14, 1956
2,768,561	Clemente et al.	Oct. 30, 1956