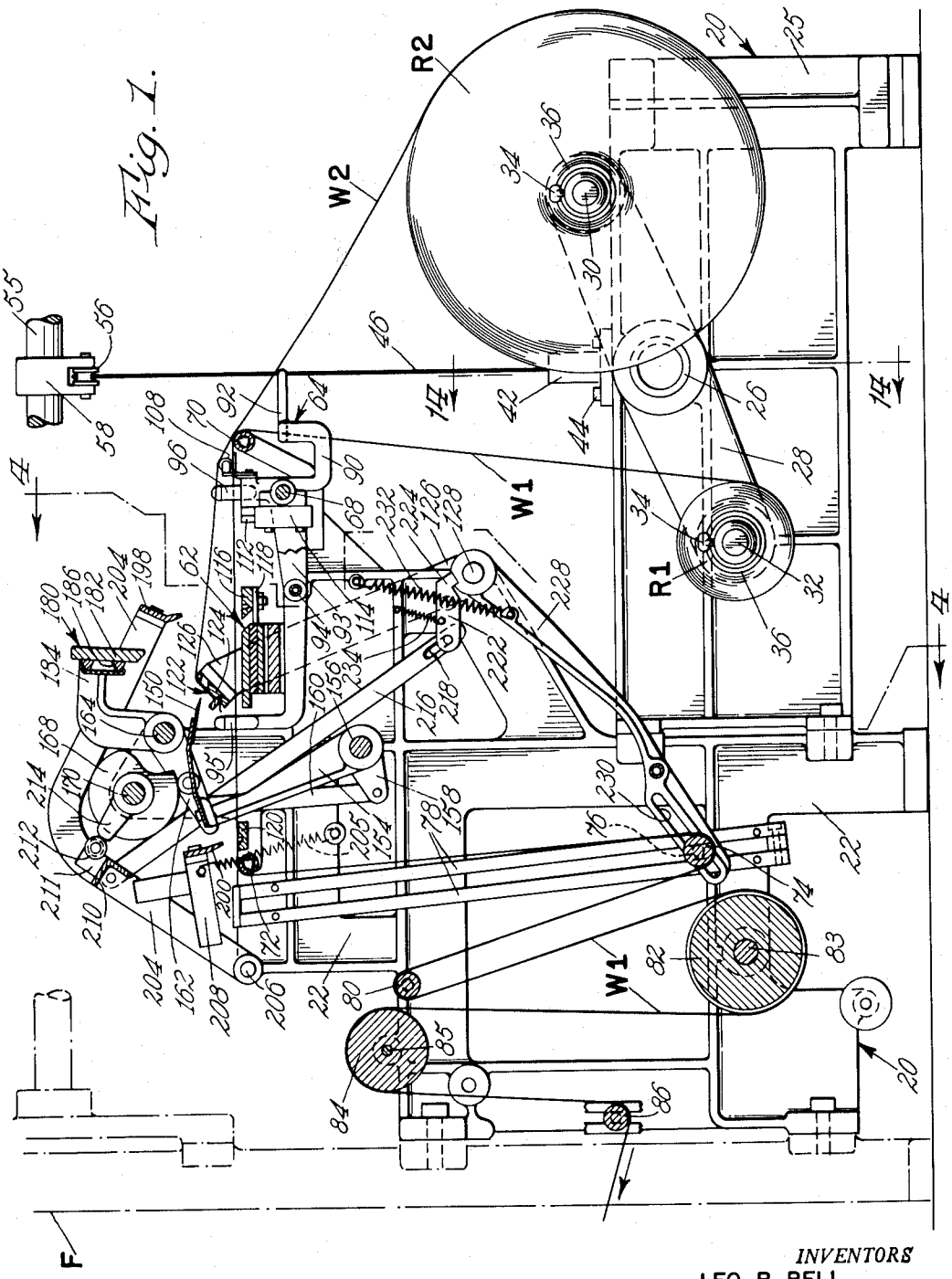
Nov. 22, 1955 L. R. BELL ET AL 2,724,426

WEB SPLICING MECHANISM FOR WRAPPING MACHINES

Filed July 26, 1952 9 Sheets-Sheet 1

Fig. 1.



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Nov. 22, 1955 L. R. BELL ET AL 2,724,426

WEB SPLICING MECHANISM FOR WRAPPING MACHINES

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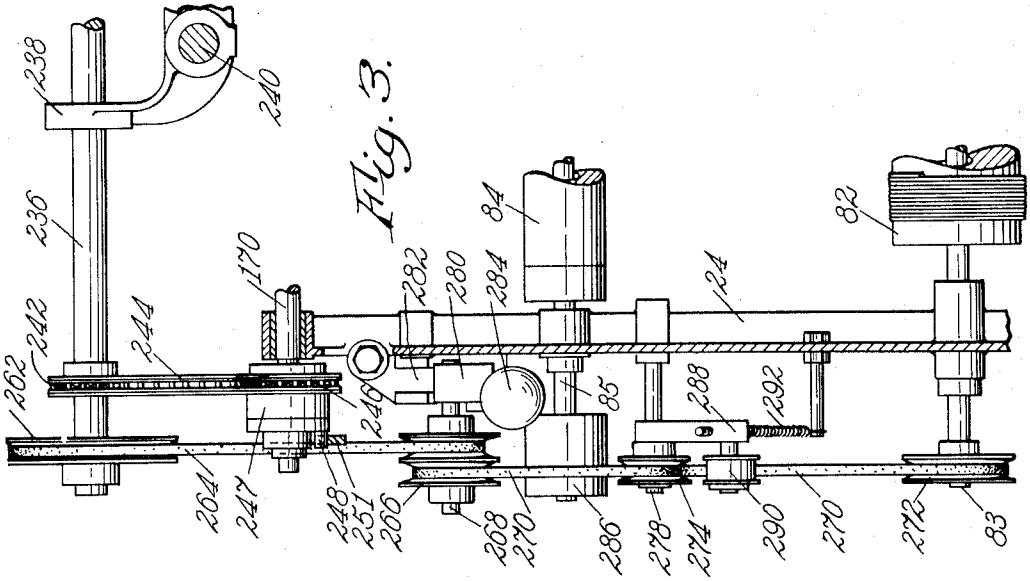

Fig. 3.

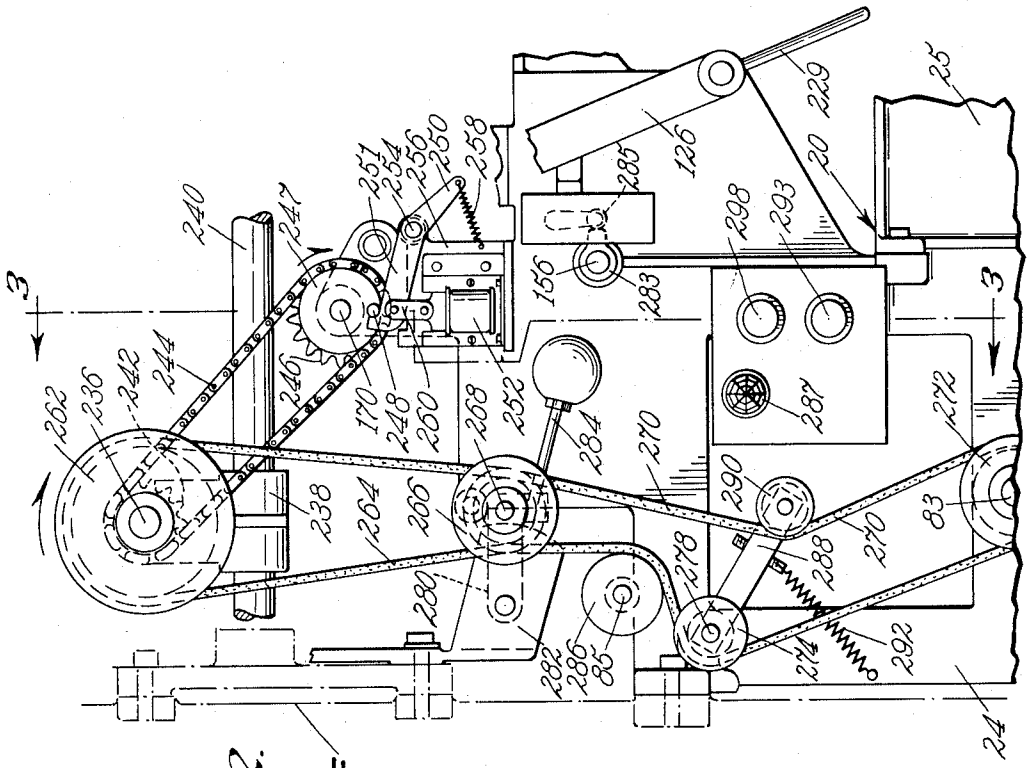

Fig. 2.

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Nov. 22, 1955 L. R. BELL ET AL 2,724,426

WEB SPLICING MECHANISM FOR WRAPPING MACHINES

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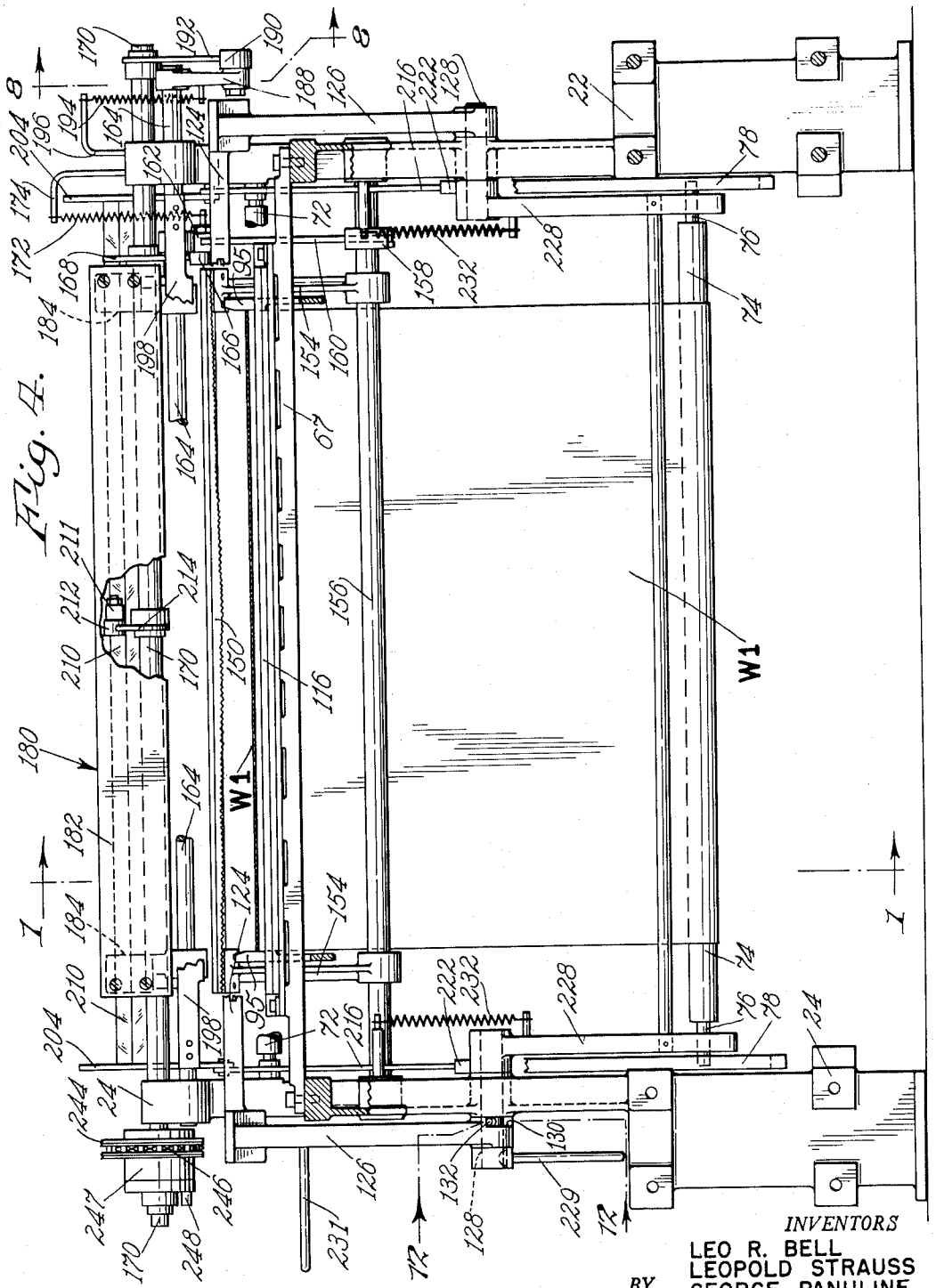

Fig. 4.

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WEB SPLICING MECHANISM FOR WRAPPING MACHINES

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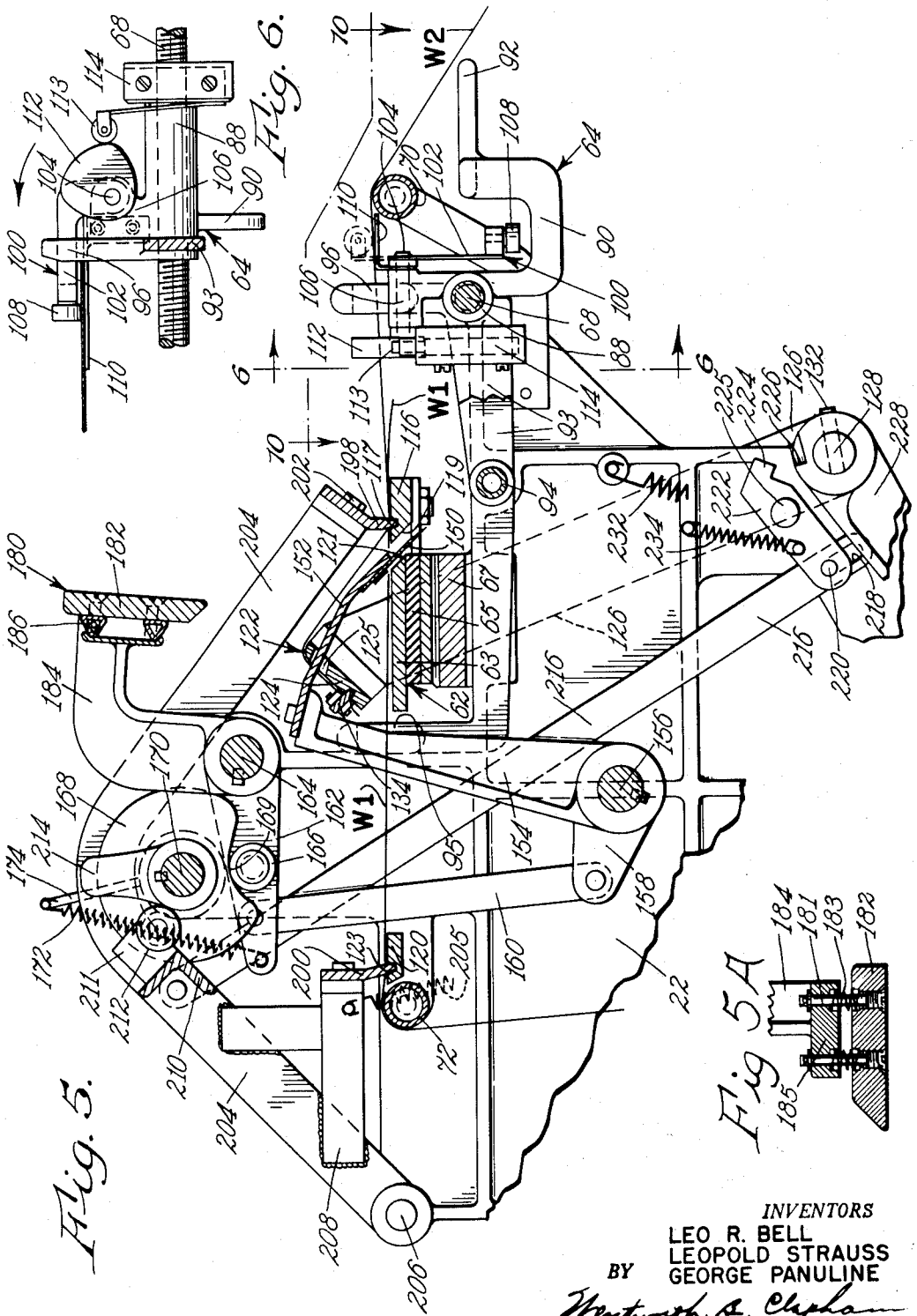

Fig. 5.

Fig. 6.

Fig. 5A

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WEB SPLICING MECHANISM FOR WRAPPING MACHINES

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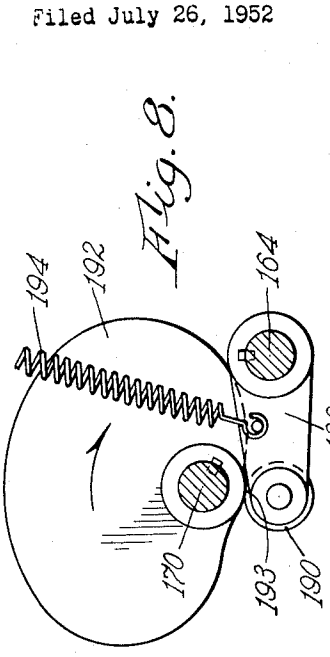

Fig. 8.

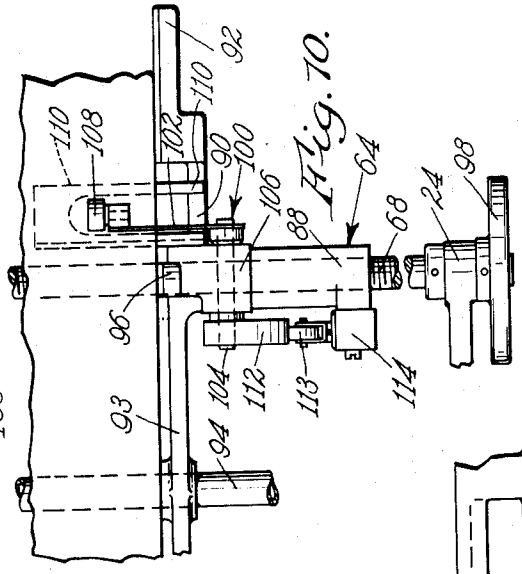

Fig. 10.

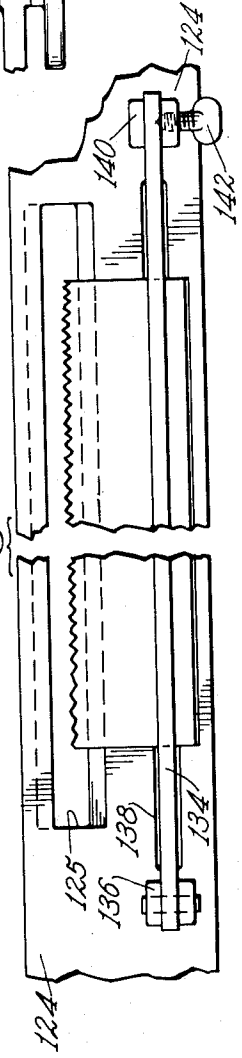

Fig. 9.

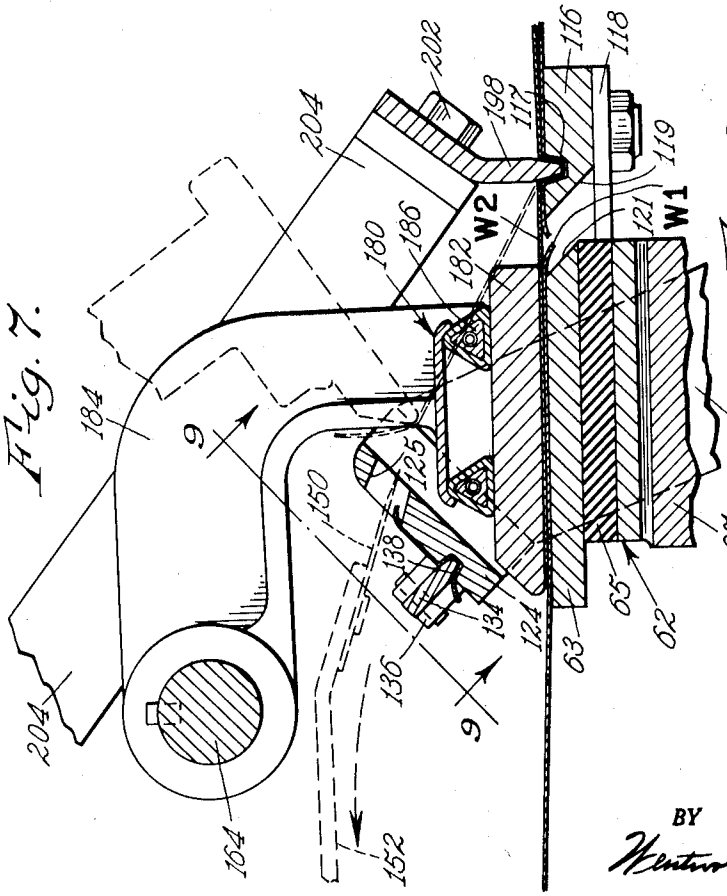

Fig. 7.

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Nov. 22, 1955 L. R. BELL ET AL 2,724,426

WEB SPLICING MECHANISM FOR WRAPPING MACHINES

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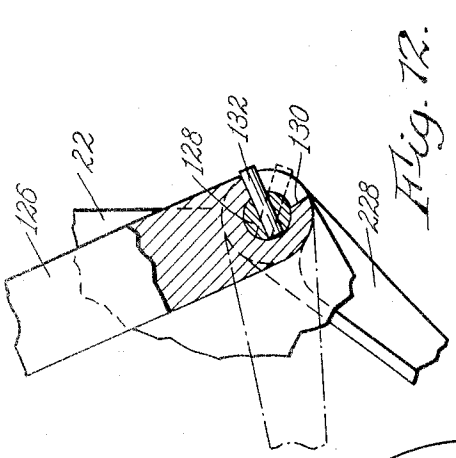

Fig. 12.

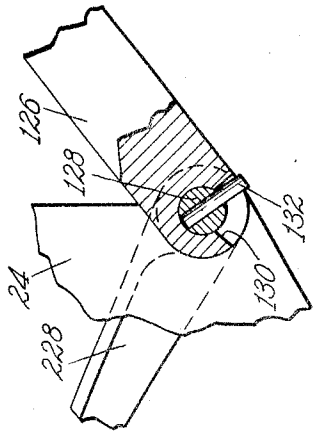

Fig. 13.

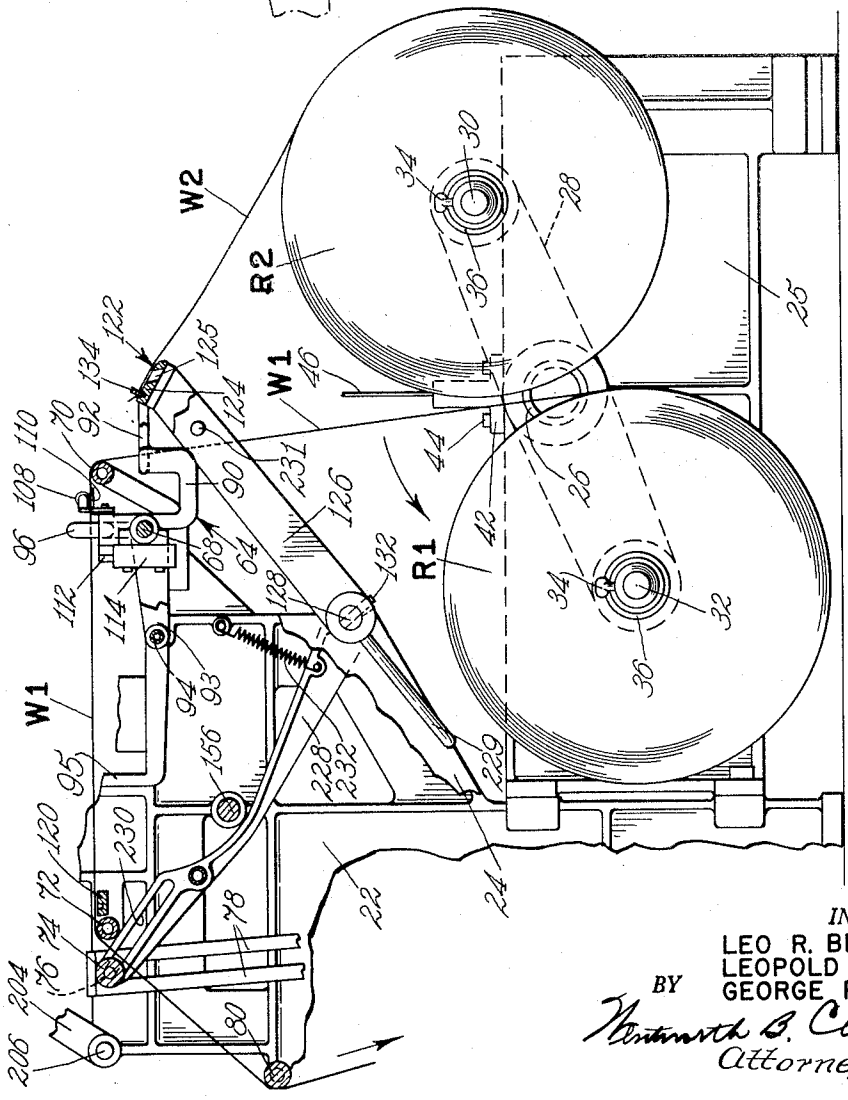

Fig. 11.

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WEB SPLICING MECHANISM FOR WRAPPING MACHINES

Filed July 26, 1952 9 Sheets-Sheet 7

Fig. 14.

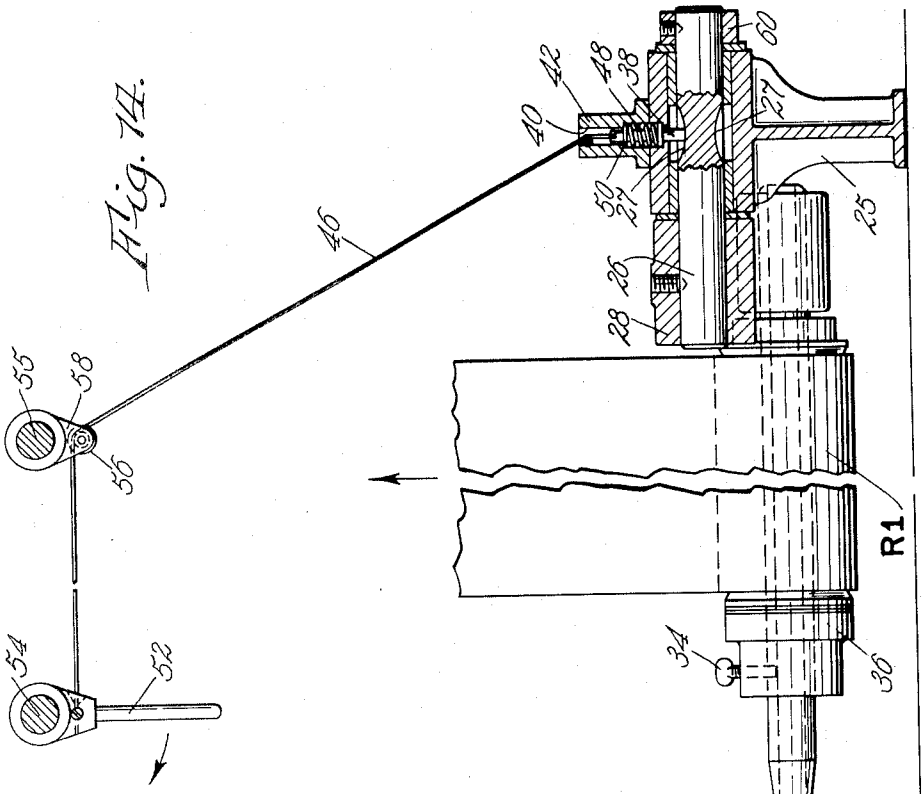
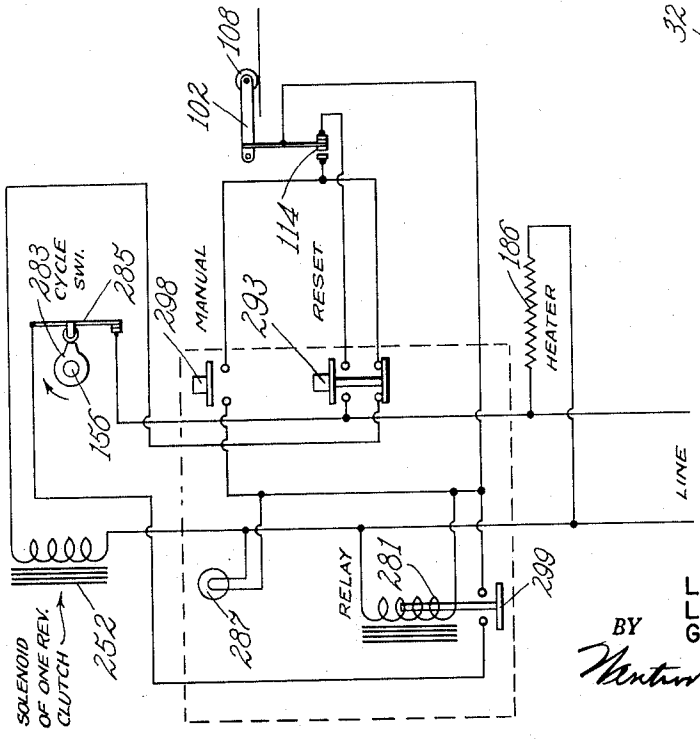


Fig. 15.



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WEB SPLICING MECHANISM FOR WRAPPING MACHINES

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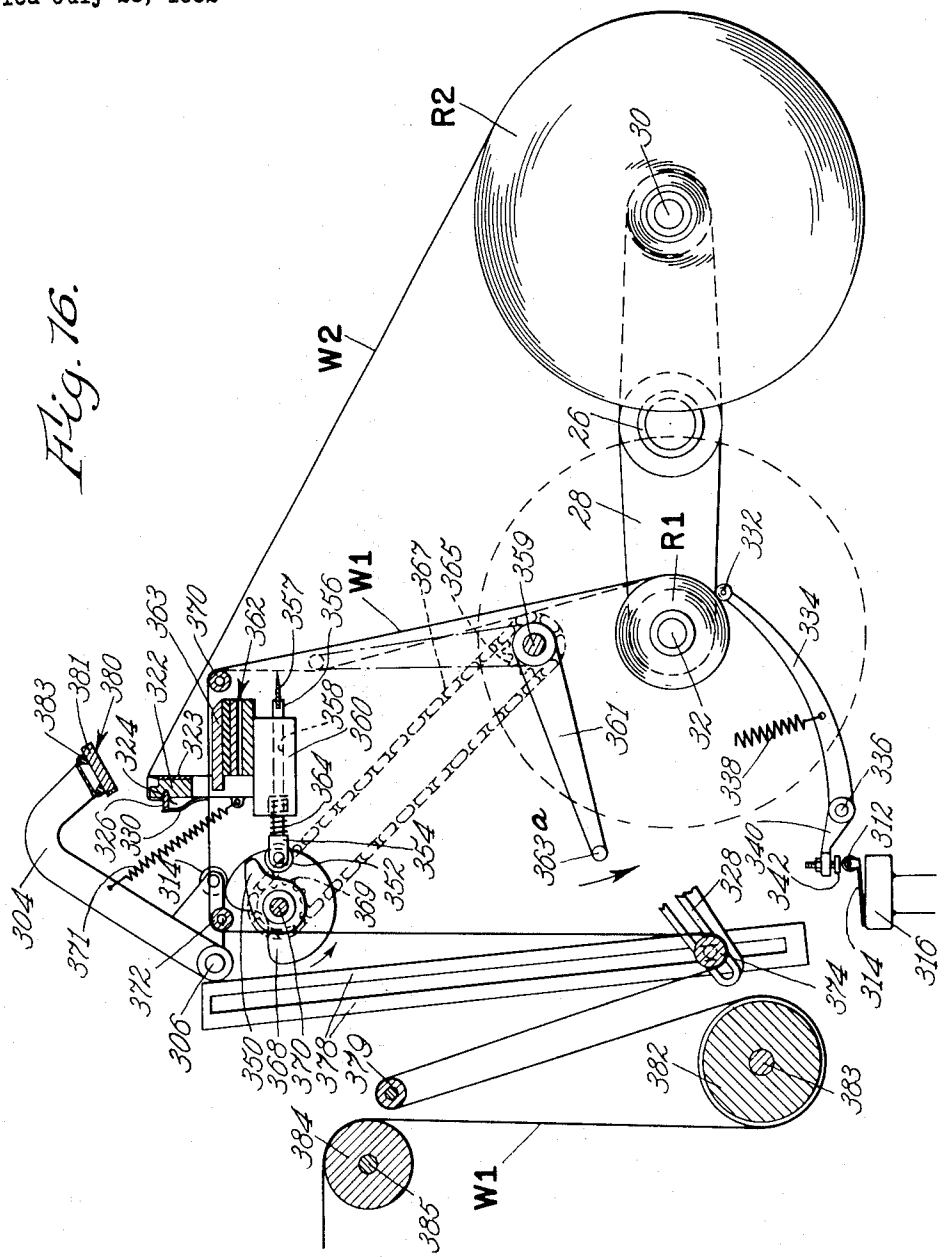
Fig. 16.



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WEB SPLICING MECHANISM FOR WRAPPING MACHINES

Filed July 26, 1952 9 Sheets-Sheet 9

Fig. 18.

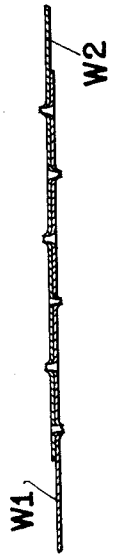


Fig. 20.

Fig. 21.

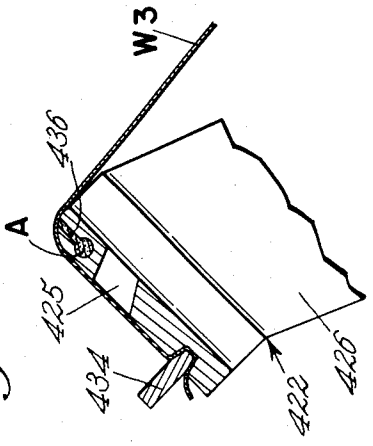


Fig. 17.

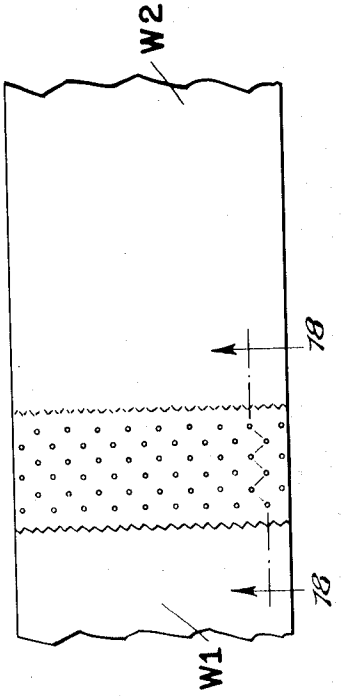
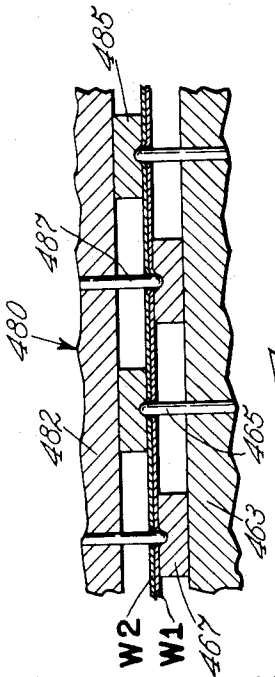


Fig. 19.



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United States Patent Office 2,724,426 Patented Nov. 22, 1955

2,724,426

WEB SPLICING MECHANISM FOR WRAPPING MACHINES

Leo R. Bell, Williamsville, George Panuline, Buffalo, and Leopold Strauss, East Rockaway, N. Y., assignors to American Machine & Foundry Company, a corporation of New Jersey

Application July 26, 1952, Serial No. 301,047

24 Claims. (Cl. 154—42)

This invention relates to web splicing apparatus, and more particularly to mechanism for automatically splicing the leading end of one roll of web to the trailing end of a diminishing or an exhausted web supply. The invention is especially adapted for use in machines such as a wrapping machine. A wrapping machine equipped with mechanism made in accordance with the invention can be operated substantially continuously because it is unnecessary to stop the machine for replenishing the web supply or for rethreading the web of wrapping material.

Heretofore in the wrapping machine art, whenever a roll of wrapping material became exhausted, it was necessary to stop the machine, remove the exhausted roll supports, place a new roll supply in position, and then thread the wrapping material web through the machine preparatory to starting the machine again. These operations obviously were time consuming and resulted in decreased production, and loss to the owner of the business operating the machine.

The present invention solves the problem of rapidly splicing the leading end of a new roll of wrapping material and the trailing end of the diminishing roll from which wrapping web is being fed. The mechanism preferably is provided with a sensing device which makes it unnecessary for manual intervention to accomplish the desired results.

In wrapping machines which envelop articles such as loaves of bread, which are articles varying in size, splices are made so cleanly by mechanism constructed in accordance with the invention that, in a group of wrapped loaves, it is quite difficult to find the loaf package which has been wrapped in the spliced portion of the wrapping material web. The principal reason for this important advantage is believed to be due to the fact that both ends of the wrapping material to be spliced are cleanly cut transversely before a splice is effected.

The invention also solves the problem of continuous operation of the machine with which it is used because of the provision of means for storing a web supply available to the machine to which the web is being fed. Thus the machine is not stopped or slowed down during the splicing operation.

While reference is made to the use of the invention in connection with wrapping machines, its use is not necessarily restricted thereto, and such use is to be considered as exemplary only.

In the preferred embodiment illustrated herein and selected for purposes of illustration, the invention is shown as forming a part of a wrapping machine web feeding mechanism, such for example as a wrapping machine which may be of the type shown in Schmitt Patent 1,851,295, or Arelt 2,356,644. This machine is employed primarily for wrapping loaves of bread in wrapping material, preferably provided with a heat energizable coating. The splicing apparatus is provided with a sensing device which detects the depletion of the exhausted roll of paper, and transmits an electrical signal

to a control system which sets into operation means for effecting the rotation of a cam shaft through one revolution to cause the various operating mechanisms to function in proper sequence.

The motion of the exhausting web is first arrested by web clamping mechanism. Simultaneously therewith, a slack providing mechanism releases and makes available for use in the wrapping machine a previously stored quantity of web, sufficient in length to supply the wrapping machine demand during the splicing cycle. The clamping mechanism clamps both the trailing end of the almost exhausted web and the leading end of the reserve or new web, and maintains sufficient tension in them so that a clean cut is effected by a knife provided for that purpose. This knife cuts the trailing edge of the almost exhausted web and the forward edge of the reserve web and rapidly retracts. As the knife is retracted, an upper sealer plate descends causing the two webs to overlap. The sealing mechanism then applies heat and pressure to the two overlapped web ends. After a short period of heat application, the sealer plate is retracted and the splice is allowed to cool. The clamps are then retracted before the stored web supply is depleted, and the wrapping machine begins drawing paper from the reserve roll.

The first operation in the reloading procedure, which takes place without stopping the machine or slowing it down, consists in manually rotating the reserve paper roll into the position formerly occupied by the depleted roll. A new roll of paper is then placed on the reserve roll arbor. A loading arm is then manually retracted and the end of the new web is clamped in this loading arm clamp. Rotating the loading arm back to the operating position brings the new web into the proper position for the next splice to be made and causes the slack providing device to be returned to its operating position, thereby storing and making available extra web for the next splicing cycle. The last operation consists in pressing a reset or start button which readies the mechanism and lights the warning light signifying that the mechanism is ready to splice. Adjustable paper guides are provided to properly guide the paper through the splicer and to facilitate centering the paper when loading.

It is an object of the invention to provide a splicing apparatus for use in splicing the trailing end of a diminishing web supply and the leading end of a reserve web supply without stopping or slowing down the machine to which the web is being supplied.

It is a further object of the invention to provide splicing apparatus for a wrapping machine which is capable of adhering two webs together in such manner that the wrapping machine may continue in uninterrupted operation not only during normal feed of web from a source of supply, but also when the trailing end of one supply roll is being spliced to the leading end of a reserve supply roll.

It is a further object of the invention to provide a web splicing device for splicing two webs and to employ sensing means such that when one web supply becomes exhausted, mechanism is set into operation automatically to effect the joinder of the exhausted web trailing end to the leading end of a new web supply.

The invention is further characterized by the provision of means for forming clean transverse cuts in the trailing and leading ends of two webs fed from sources of supply such that when the two ends of such webs are joined together, an almost undetectable splice results. This is a feature which is of considerable value when the spliced portion of the webs is wrapped about an article since it makes possible the formation of a saleable package instead of one which must be rejected or rewrapped.

It is a further object of the invention to provide a

novel method of splicing and novel splicing apparatus having means for providing sufficient slack web or storage in the diminishing web supply available for use in the machine to which such web is being fed during the time a splice is being effected by joining the trailing end of the diminishing web supply to the leading end of a new web supply.

It is an added object of the invention to provide novel mechanism for placing a reserve roll or supply of web material in a machine for reloading and thus providing a source of web material available when a web material supply, from which web material is being fed, becomes exhausted. In accordance with the invention, the operations of replenishing and reloading are effected rapidly in a simple and convenient manner, thus making possible a great saving in time and effort.

With these and other objects not specifically mentioned in view, the invention consists in certain combinations and constructions which will be described fully hereinafter, and then set forth in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification, and in which like characters of reference indicate the same or like parts:

Fig. 1 is a side view, in section, of a preferred embodiment of paper splicer constituting the invention;

Fig. 2 is a side view illustrating the variable speed paper drive and paper splicer drive mechanism;

Fig. 3 is an end view taken on line **3—3** in Fig. 2;

Fig. 4 is a front view of the paper splicer taken on line **4—4** in Fig. 1;

Fig. 5 is an enlarged side view of the splicing mechanism showing the operative position of the parts thereof during the splicing cycle;

Fig. 5A is a sectional view of a detail of the presser device;

Fig. 6 is an end view on line **6—6** in Fig. 5 showing sensing device in operating position;

Fig. 7 is an enlarged view of a detail of the preferred form of the invention showing the paper splicing devices in operating positions;

Fig. 8 is a detail of the heater cam and the heater actuator arm;

Fig. 9 is an enlarged plan view of the clamp in the loading arm showing the cut-off on the new web;

Fig. 10 is a plan view of the sensing mechanism in operating position;

Fig. 11 is an enlarged view showing the loading position for a new roll of wrapping material and the relative slack roll position after splice has been completed;

Figs. 12 and 13 are enlarged views showing the relative positions of the slack roll arm to the loading arm in different states of operation;

Fig. 14 is a front view showing the paper roll support release mechanism in locked position;

Fig. 15 is a view of a suitable wiring diagram;

Fig. 16 is a front view of a modified form of paper splicer embodying the invention;

Fig. 17 is a plan view of a splice made by the mechanism shown in Fig. 19;

Fig. 18 is a view taken on line **18—18** in Fig. 17;

Fig. 19 is a partial front sectional view showing means for making the splice shown in Figs. 17 and 18;

Fig. 20 is a side sectional view showing a splice made by the device shown in Fig. 21;

Fig. 21 is a side sectional view of a device for forming the splice shown in Fig. 20.

Referring to Figures 1, 2, 3, 4, 5 and 11, which illustrate a preferred embodiment of the invention as used with a wrapping machine, there is provided a frame designated generally **20** which includes two spaced apart side frame members **22** and **24** attached in any conventional manner to the frame of a wrapping machine designated generally F. (Figs. 1 and 2.) As shown in Figures 11 and 14, frame member **25** supports a shaft **26** to which is secured the hub of a double arm member **28**

which at its ends supports arbors **30** and **32** on which are carried the rolls of paper which are to be fed to the wrapping machine. The arbors **30** and **32** may be the same in construction as disclosed in Farmer Patent 2,148,065, and are so constructed and arranged that by unscrewing set screws **34**, the blocks **36** can be pulled off either arbor **30** or **32** to remove the core of an empty roll of paper and slide on a new roll when this is desired. Since the specific arbor constitutes no part of the present invention, further details and description therefore are deemed unnecessary.

As indicated in Figure 11, paper is being fed from roll **R1** mounted on arbor **32** to the wrapping machine. Roll **R2**, mounted on arbor **30**, is in reserve and the leading end thereof is held clamped by clamp bar **134**.

Shaft **26** is provided with two milled out portions **27** or radial openings 180° apart in which is adapted to be seated a spring urged pin **38** slidably mounted in a bore **40** in bracket **42** attached by screws **44** to frame **25**, as shown in Fig. 14. When roll **R1** has been depleted, and it is desired to locate roll **R2** in feeding position, pin **38** is pulled upwardly in bore **40** by cable **46**, whereupon spring **48** encircling pin **38**, is compressed against washer **50** in bore **40** as a result of the pulling of cable **46** when lever **52**, mounted upon frame rod **54**, is swung in the direction of the arrow as illustrated in Fig. 14. Cable **46** is guided over an idler pulley **56** rotatably mounted in a bracket **58** fixed to frame rod **55** which is parallel to and laterally spaced from frame rod **54**. A collar **60**, attached to shaft **26**, maintains this shaft properly supported in frame **25**. After arm **28** has been turned 180° to locate roll **R2** in proper feeding position, lever **52** is released and spring **48** presses pin **38** into locking engagement with the other of the two milled slots **27** in shaft **26**. So also lever **52** can be released immediately upon beginning of rotation of shaft **26**, and pin **38** will automatically drop into next slot. The core of the depleted roll of paper **R1** is then removed and a new roll **R1** is placed upon arbor **32**. Block **36** is then repositioned and secured in locked relationship with the core of the new roll **R2** by tightening set screw **34** against arbor **32**.

As shown in Figures 1, 4, 5, 7 and 11, the web of wrapping material is being fed from roll **R1** and roll **R2** is in reserve. Web **W1** is fed upwardly from roll **R1** (Figs. 1 and 11) over a substantially horizontal table designated generally **62**, suitably supported in side frame members **22, 24** of the machine. Web **W1** is positioned between two laterally, adjustable guides **64**, mounted adjacent the ends of right-left handed threaded shaft **68**, the ends of which are rotatably supported in bearings in side frame members **22, 24**. Web **W1** then passes over guide rollers **70** and **72** rotatably mounted in frame **22, 24** and positioned at opposite sides of table **62**, and over slack roller **74** rotatably mounted on shaft **76**, the ends of which are slidably supported for substantially vertical movement between spaced guides **78** secured to side frame members **22, 24**. After passing over roller **74**, web **W1** is guided over idler roller **80**, driven feed rollers **82** and **84** and idler roller **86**, all of which are rotatably mounted in known manner in side frames **22, 24**, and thence into the wrapping machine (not shown) which may be of the type disclosed in Schmitt Patent 1,851,295, or Arelt 2,356,644.

Spaced adjustable web material guides **64** are substantially identical in construction, except one is right and the other left-handed. A description of one is therefore deemed sufficient to a complete understanding of their construction and operation. As illustrated in Figures 1, 5, 6 and 11, guide **64** is formed with an elongated, threaded hub **88**, supported on threaded shaft **68**. Extending outwardly and projecting forwardly from hub **88** is a generally U-shaped portion **90** having at its free end a substantially horizontal arm **92**. As indicated in Figure 1 and 11, web **W1** being fed from roll **R1**, is held

by portions **90**, arms **92** and vertical guide members **95** and **96** of guides **64** against "wandering" as it is fed therebetween.

Each guide **64** (Figs. 6 and 10) supports a sensing device normally resting upon the web W1 which is being fed. When the end of the web is reached, this sensing device automatically sets into operation the mechanism for splicing the new web W1 to exhausted web W1. In the illustrated embodiment, the sensing device designated generally **100**, comprises a gravity biased arm **102** fixed to a shaft **104** rotatably supported in lug **106** formed on hub **88**. Arm **102** carries at its free end a roller **108** adapted to rest upon the upper surface of web W1. As described herein, web W1 is always the web that is being fed. Sensing devices **100** are not reset until shaft **26** has been rotated, as described above, whereupon the web indicated above as W2 becomes W1. It will be evident that the web is supported adjacent its edge portions by slotted plates **110** which are attached to and extend outwardly from lugs **106** beneath the web of wrapping material. Also attached to shaft **104** is a cam **112** which is tracked by a follower **113** on switch **114** secured to hub **88**. When the end of the web W1 passes from beneath roller **108**, arm **102** drops through the slot in plate **110**. This causes cam **112** to move follower **113**, thereby actuating switch **114** which makes an operating circuit setting the splicing mechanism in operation to splice the leading end of web W2 to the end of web W1, as described in detail hereinbelow.

As indicated in Figures 1, 5 and 7, the web of wrapping material being fed, i. e. web W1, passes from guide roller **70** over transverse clamp plate **116**, the ends of which are secured by bolts to plates **118** carried by the upper portions of frame members **22** and **24** and extending outwardly therefrom. Clamping plate **116** is provided on its upper face with a transverse groove **117**, the purpose of which will be described hereinafter. As shown herein, the groove is substantially U-shape in cross section, although if desired, any other cross sectional shape could be used provided that it would serve to properly secure and clamp the paper against slipping during the splicing operations. Web **1** also passes above splicing table **62** and transverse web holding plate **120**, the ends of which are suitably attached to frame members **22** or **24**.

As indicated in Figures 1, 5 and 7, in order to provide space for movement of knife **150**, plate **116** is provided with a longitudinally beveled face **119** spaced from the substantially parallel with a similar beveled face **121** on plate **63**.

The leading end of the web of wrapping material W2 which is to be spliced to the end of web W1 is held supported in position to be spliced, as shown in Fig. 1, by means of a loading device designated generally **122**. Loading device **122** consists of a transverse plate **124** having its ends secured to the free ends of levers **126** which are mounted for free rotation on shaft **128** supported in suitable bearings in side frame members **22** and **24**.

As illustrated in Figures 1, 5, 7, 9 and 11, plate **124** is provided with a longitudinal slot **125**, the longitudinal side walls of which are tapered from the top downwardly in order to accommodate the knife which cuts the leading end of the web W2 in order to provide it with a straight edge for proper splicing to the diminishing end of web W1. As illustrated in Figures 12 and 13, the hubs of levers **126** are provided with radial slots **130** which coact with radial pins **132** held in shaft **128**. In this way, the limits of movement of levers **126** are confined to the extent of the radial slots **130**, the purpose of which will be described hereinafter.

The leading end of web W2 which is to be spliced to web W1 is held on plate **124** of loading device **122** by means of a clamp bar **134** having one end pivotally mounted in bracket **136** carried on plate **124**. As shown in Figures 1, 5, 7 and 9, clamp bar **134** holds the end of the paper snugly in a transverse groove **138** formed in plate **124**. The free end of clamp bar **134** is held in web clamping position in a bracket **140** by means of a thumb screw **142**. Bracket **140** is mounted on plate **124**.

Knife **150** is attached to a transverse plate **152**, the ends of which are secured to levers **154**. Levers **154** are keyed to shaft **156** which is rotatably supported in suitable bearings in frame members **22** and **24**. As illustrated in Figs. 1 and 5, plate **152** to which knife **150** is attached, is so shaped that knife **150** can be moved without obstruction through slot **125** in loading plate **122** and between faces **119** and **121**. Also attached to shaft **156** is a lever **158** to which is connected one end of a link **160**, the other end of which is pivotally attached to lever **162** loosely mounted on shaft **164**, the ends of which are suitably journaled in side frame members **22** and **24**. Lever **162** is provided with a cam follower **166** which is held in tracking engagement with cam **168** secured to cam shaft **170** by means of a spring **172** having one end connected to lever **162** and the other end to a pin **174** secured in side frame member **22**.

In the preferred embodiment of our invention, the leading end of a new web of material W2 is spliced to the trailing end of the exhausted web W1 by heat sealing. For this reason webs W1 and W2 may be waxed paper, or any material which is provided with a heat energizable coating, such for example, as moisture proof type "cellophane," or material which is capable of being fused by application of heat, such for example as a wrapping material known and sold in the trade as "Pliofilm."

The mechanism for heat sealing or splicing one web to the other includes a combined pressing and heat sealing device designated generally **180**. This device consists of a transverse presser-heat sealing member **182**, the ends of which are attached to the free ends of spaced arms **184** fixed to shaft **164**. Attached to the upper surface of heat sealing member **182** is an electrical heater **186**, which is connected in a suitable circuit (see Fig. 15) which maintains the proper temperature for heat sealing or splicing of the webs. Heater **186** may be of any conventional type. One form which has proven to be satisfactory is a "Chromalox" tubular heater unit which is made and sold by Edwin L. Wiegand, Pittsburgh 8, Pennsylvania.

As shown in Fig. 5A, plate **182** preferably is mounted for resilient substantially vertical floating movement. This allows a resilient pressing engagement between webs W1 and W2 during the splicing operation. Springs **181** encircling screws **183** are compressed when plate **182** is pressed downwardly against the overlapped web ends on table **62**. The upper ends of screws are pinned in any suitable manner above lateral extensions **185** of arms **184**. Thus when springs **181** are compressed, the upper ends of screws **183** extend above extensions **185**.

Because of the novel manner in which knife **150**, slot **125** and sealer **182** coact, both webs W1 and W2 are cut positively and cleanly by a single knife, **150**. Thus when the two cut end portions of webs W1 and W2 are sealed and spliced, the forward edge of the lapped slice is completely sealed, and all but a very small area of the rearward edge is sealed. The action of knife **150** also has an additional novel action in that together with securing a clean edge of reserve web W2, it also frees it from the clamping mechanism **124** by cutting it free at the proper moment.

In Figs. 4 and 8, a lever **188** secured to shaft **164** is provided with a cam follower **190** tracking cam **192** on shaft **170**. Spring **194** having one end secured to lever **188** and the other attached to a bracket **196** in frame member **22**, maintains cam follower **190** in engagement with cam **192**. In this way when cam follower **190** engages low portion **193** of cam **192**, as shown in Fig. 8, heater **186** will be held by spring **194** in resilient engagement with the overlapped portion of webs W1 and W2 to be spliced, and will press them against table mem-

ber 63 attached to rubber sheet 65 which in turn is secured to table cross frame 67.

In order to hold webs W1 and W2 properly during cutting and splicing operations, there are provided clamp bars 198 and 200 which coact with groove 117 in clamping plate 116, and groove 123 in holding plate 120, respectively. Bar 198 is secured by bolts 202 to the free ends of arcuately shaped spaced levers 204 fulcrumed on shaft 206 supported in side frame members 22 and 24. The ends of bar 200 are attached in any suitable manner to brackets 208 carried by arms 204. A stiffening transverse angle bar 210 is attached at its ends to arms 204. A bracket 211 on bar 210 supports a cam follower 212 tracking cam 214 on shaft 170. By means of cam 214 and follower 212, whenever shaft 170 is rotated, arms 204 are lowered and raised to move clamp bars 198 and 200 into and out of operative positions. Springs 205 cause cam follower 212 to remain in contact with cam 214 and supply clamping force for clamps 198 and 200 when cam follower 212 is opposite low portion of cam 214.

Attached to each arm 204 is one end of a link 216. The other end of each link is formed with a slot 218 in which is slidably connected a pin 220 mounted on a latch arm 222 pivotally supported at 225 on frame members 22 and 24, respectively. The free ends of latch arm 222 are formed with noses 224 adapted to seat in notches 226 in the hubs of levers 228 fixed to shaft 128. As shown in Figures 1 and 4, the free ends of levers 228 are provided with elongated slots 230 in which are slidably mounted the ends of slack roller 74, the latter also being confined between guides 78, as stated hereinbefore.

Springs 232 connected to levers 228 and to frame members 22 and 24, tend to urge slack roller lever arms 228 upwardly and locate notches 226 in coacting position relative to noses 224 of latch arms 222 which, during normal web feeding operations, are held as shown in Fig. 1 against the tension of springs 234 attached to latch arms 222 and to frame members 22 and 24, respectively.

Figures 2 and 3 disclose the means for driving the several parts of the splicing mechanism described above. Shaft 236 is rotatably supported in brackets 238 mounted on spaced longitudinal frame rods 240 attached to the frame F and to suitable cross frame members on side frames 22 and 24. Shaft 236 is driven from the main drive shaft (not shown) of the wrapping machine (not shown), or by a conventional motor drive (not shown). A sprocket 242 on shaft 236 by means of a sprocket chain 244 drives a sprocket 246 attached to the freely rotatable driving part of clutch 247. The driven member of clutch 247, which is connected to shaft 170, is provided with a pin 248 engaged by arm 251 of lever 250 pivotally mounted at 254 on bracket 256 secured to frame member 24. A spring 258 attached to the other arm of lever 250, maintains arm 251 in engagement with pin 248. Therefore so long as this condition is maintained, shaft 170 will remain at rest. However, when solenoid 252 is energized, as described hereinafter, the downward movement of this armature, which is connected by link 260 to arm 251 of lever 250, moves it out of engagement with pin 248, whereupon the driving and driven members of the clutch are coupled and shaft 170 is driven through one revolution. Clutch 247 may be of any suitable type of one revolution clutch, such for example as a well-known Hilliard or Bliss clutch. Pulley 262 fixed to shaft 236, is tracked by an endless belt 264 which drives variable speed jack 266 on shaft 268. Belt 270 driven from variable speed jack 266, drives sheave 272 mounted on shaft 83 suitably rotatably supported in bearings in side frame members 22 and 24. Pulley 274 is an idler pulley for securing adequate wrap around of belt 270 around flat wooden pulley 286. The variable speed jack 266 is mounted on an arm 280 pivotally supported in a bracket 282 fixed to frame F. The position of arm 280 can be varied up or down in a well known manner through a lever 284 connected to arm 280. The back of belt 270 engages a flat surface pulley 286 secured to shaft 85 on which feed roller 84 is mounted. Pivotally mounted on shaft 278 is a lever 288 which on its free end is provided with a slack take-up pulley 290 held in resilient pressing engagement with the back of belt 270 by a spring 292 having one end connected to lever 288 and the other end attached to frame 24.

The mechanism described above operates in the following manner: Referring to Figure 11, loading plate 122 is swung by handle 229 from loading position to operative supporting position shown in Figures 1 and 5. The leading edge of web W2 of roll R2 is threaded under and held by clamp bar 134. When handle 229, which is fixed to one of the shafts 128, is moved counterclockwise from the position shown in Figure 11, levers 228 move downwardly, thereby locating slack roller 74 in its operative position.

Referring to Figures 1 and 11 as noted above, slack roller supporting levers 228 to which are attached springs 232, and which are fastened to shafts 128, are free to travel from the position shown in Figure 1 to the limit shown in Fig. 11 without rotating or moving arms 126 which support loading plate 122. When the parts are in the positions shown in Figure 1, sensing device roller 108 rests upon the web being fed from roll R1, which as shown in the drawings above referred to, is web W1. While the web is being fed from roll R1, roll R2 occupies the position shown in Figures 1 and 11. As illustrated in Figures 2 and 15, the electrical system is energized by pressing reset button 293. In order for the system to be energized, switch 114 must be in the position corresponding to having roller 108 resting on web W1. When reset button 293 is pressed, current flows through the normally open contact of switch 293, through the normally closed contacts of switch 114, and through the coils of the relay 281. When current passes through relay 281, the relay plunger causes contacts 299 to close. With contacts 299 closed, current can flow through switch 285, contacts 299, and thence through relay 281. Thus, once relay 281 is energized by pressing button 293, it will remain energized until the current through the relay is interrupted. The only way in which current can be interrupted is to open cycle switch 285 or to turn off the power to the unit. In order for clutch operating solenoid 252 to be energized, contacts 299 must be closed or current cannot reach the solenoid portion of the circuit. Red light 287 is in parallel with relay 281 and the light will be lit as long as relay 281 is energized, indicating that the mechanism is ready to splice. The normally closed contacts on button 293 are in series with solenoid 252 and prevent accidentally energizing the solenoid while the mechanism is being reset if the manual button 298 is accidentally simultaneously depressed. An additional safety feature is provided by the fact that pressing reset button 293 cannot energize the circuit unless switch 114 is in the position shown in Fig. 15. Thus, if the reset button 293 is depressed before the sensing device 102 has been reset, nothing will occur since the circuit cannot be energized.

As the end of the web fed from roll R1 moves past the slot in plate 110, roller 108 and arm 102 which supports it, drop through the slot and assume the positions shown in Fig. 5. As the result of this movement of arm 102, cam 112 on shaft 104 closes switch 114. Current is then allowed to flow through switch 285, through contacts 299, through switch 114, through normally closed contacts of button 293 and thence energizes solenoid 252, which pulls arm 251 downwardly out of engagement with clutch pin 248. This operation allows the free running side of one revolution clutch 247 to engage and rotate cam shaft 170. Cam 214 allows arms 204 pulled by springs 205 to position clamping bars 198 and 200 in operative engagement with clamp plates 116 and 120, respec-

tively, thereby holding the traveling web W1, which is fed from roll R1, and the fixed web W2, the end of which is secured in loading device 122. At the same time, the force acting through links 216 connected to arms 204, releases latch arms 222 and unlocks slack levers 228. Springs 232 substantially simultaneously with the unlocking of slack levers 228, pull them upwardly and hence slack roller 74 is moved upwardly in guides 78, thereby releasing the stored length of web or wrapping material which is available for feeding into the wrapping machine during the paper splicing cycle without stopping the wrapping machine. Cam follower 166, fixed to arm 162, is pulled against cam 168 by spring 172. Link 160, attached to arm 158, is pulled upwardly by spring 172 when follower 166 drops into low portion 169 in cam 168. The upward movement of link 160 swings lever 154 in a clockwise direction and thereby causes knife 150 (Fig. 5) to travel clockwise, whereupon knife 150 passes through slot 125 in loading device 122 and between beveled faces 119 and 121 of plate 116 and table 62, respectively. This operation of knife 150 cuts the leading edge of web W2 in loading device 122, as illustrated in Fig. 9 and the trailing edge of exhausted web W1, which results in the overlapping of webs W1 and W2, shown in Fig. 7, which is caused by the descent of the heater 180.

While knife 150 is being moved rearwardly to its inoperative position, as shown in dotted lines in Fig. 7, cam 192 has rotated and allowed spring 194 to move lever 188 into engagement with the low portion 193 of cam 192. This movement of lever 188 results in heater 180 moving downwardly from the position shown in Figs. 1 and 5 into the pressing and heat sealing position shown in Fig. 7, where it remains for a period of time sufficient to energize the sealing constituents on the film, and press them resiliently together to form the necessary splice. Cam 192 can be so shaped that any desired period of time can be allowed for effecting the necessary sealing and pressing operations by pressing member and heater 180. After the sealing operation is completed, heater 180 is raised by lever 188 through cam 192 to insure a sufficient amount of cooling time for the splice before completion of the splicing cycle. As noted above, table plate 63 is bonded to a soft rubber cushion 65 on table support plate 67. Table plate 63 is of such size and shape as will provide a complete contact area with respect to the size and shape of heater plate 182 for effecting a satisfactory splice.

When the web splicing mechanism described forms a part of a wrapping machine, such as a bread wrapping machine, it is found that a loaf of bread wrapped with the spliced portion of webs W1 and W2 need not be rejected because of the splice. This is due to the fact that the splices are made so cleanly that it is very difficult to detect in a group of wrapped loaves, the loaf which is wrapped in the spliced web portion. One reason for this is thought to be due to the clean transverse cutting of the trailing end of the exhausted web W1.

Knife 150 mounted on arms 154, and cam 283 are fixed to shaft 156. During the cutting cycle, cam 283 trips cycle switch 285. (See Figs. 2 and 15.) Cycle switch 285 de-energizes relay 281, which causes red light 287 to extinguish and results in de-energization of solenoid 252, whereupon spring 258 pulls arm 251 into position to engage pin 248 of clutch 247 which throws out the clutch upon the completion of one cycle of 360° rotation of cam shaft 170. The spliced section of webs W1 and W2 remains fixed and clamped by clamp bars 198 and 200 until cam 214 during the one revolution of shaft 170 raises clamp arms 204 upon completion of one cycle. This being done, the web of wrapping material from new roll R2 is available for use in the wrapping machine.

At the conclusion of operations, loading device 122 is still as shown in Fig. 1. It is not moved back until reloading is begun, when it is moved back at the start of reloading operations by pulling on handle 231. When a new roll of web material is placed upon arbor 32, as described hereinabove, the end of the web fed from the new roll is positioned on plate 124 of loading device 122; clamping bar 134 is moved down to depress it into slot 138, after which clamping bar 134 is secured in clamping position by thumb nut 142. This being done, handle 229 is swung counter-clockwise from the position shown in Fig. 11. As the result of this movement of handle 229, loading device 122 is located in operative web supporting position and lever arms 228 are restored to proper slack roller supporting position, as shown in Figs. 1 and 4.

Fig. 16 discloses a modified mechanism embodying the invention in which rolls R1 and R2 of web material are mounted on arbors 32 and 30 respectively projecting outwardly from arbor supporting arm 28 secured to shaft 26 rotatably supported in the frame of the machine (not shown). In the structure disclosed in Fig. 16, side frame members are provided somewhat similar to side frame members 22 and 24 described hereinabove in connection with the mechanism disclosed in Figs. 1–14 inclusive. So also the means for securing shaft 26 against turning are the same as disclosed in Fig. 14.

Web material W1 is guided upwardly over guide roller 370 and thence over sealing table 363 which forms a part of splicing table designated generally 362. Table 362 is generally the same in construction as table 62 described hereinabove. After passing over table member 363, web W1 is guided over 372, thence downwardly over slack roller 374, the ends of which are supported in slack roller supporting arms 328, which are of the same construction as levers 228 shown in Fig. 1. The ends of slack roller 374 are also located between spaced guides 378 suitably attached to the side frame members of the machine (not shown) so that when arms 328 move upwardly, slack roller 374 is guided properly for substantial vertical movement to provide slack wrapping material for use in the wrapping machine (not shown) while the splicing operating is taking place. From slack roller 374, the web W1 passes over guide roller 379, driving roller 382 on driven shaft 383 and driving roller 384 on shaft 385, both of which shafts are driven in any suitable manner by means (not shown) but which may be the same as shown in Fig. 2 and described hereinabove. Rollers 370, 372 and 379 are mounted on cross shafts suitably supported in the side frames of the machine (not shown). A clamp bar 322 provided with a horizontal groove 324, extends transversely across and above table member 363 and has its ends secured to the side frames of the machine. A clamp bar 326 mounted on spring 330 attached to clamp bar 322, holds the end of web W2 securely in clamp bar 322 ready for splicing during the feed of web W1 from roll R1. Resting on roll R1 is a roller 332 rotatably supported in a cantilever fashion on the free end of lever 334 pivotally mounted at 336 in one of the side frames of the machine (not shown). A spring 338 having one end attached to lever 334 and its other end (not shown) secured to one of the side frame members, holds roller 322 in constant engagement with roll R1. Lever 334 is also provided with an arm 340 which supports an adjustable switch actuating member 342 adapted to engage a roller 312 on a switch operating arm 314 of switch 316, similar in construction and operation to switch 114 disclosed in Figures 6 and 15. The adjusted position of switch actuating member 342 is set such that when roller R1 is depleted, spring 338 will cause lever 334 to move upwardly and actuating member 342 will operate switch 316 closing a circuit which energizes a solenoid (not shown) similar in construction and operation to solenoid 252 which in turn operates a clutch (not shown) similar in construction and operation to clutch 247, whereupon shaft 370 is driven through one revolution. On shaft 370 is mounted a cam 368 which is tracked by a follower 314 secured to one of a pair of arms 304, which arms are fulcrumed on shaft 306 suitably mounted in the side frame members of the ma-

chine. Tension spring **371** maintains cam follower **314** constantly in tracking relationship with cam **368** and as the latter rotates, insures that arms **304** will move downwardly, and in so doing, the rear edge of heat sealing and pressing plate **381** of heater **380** will coact with a vertical knife **323** fixed to plate **322** and cut the web **W2** transversely and press it resiliently upon the cut off end of depleted web **W1**.

An electrical heater **383** of conventional design similar in construction to heater **186** is secured to the upper face of plate **331** for heating plate **381** to the temperature desired or necessary to energize the coating on the webs of material or fuse the webs, depending upon the type or types of web material being spliced, as in the case of the preferred embodiment described hereinabove.

Also mounted on shaft **370** is a cam **350** which is adapted to engage a cam follower **352** mounted in a yoke **354** attached to a spring pressed knife support **356** slidably mounted in a bore **358** in a block **360** attached to table **362**. Spring **364** normally tends to maintain cam follower **352** in engagement with cam **350**. Transverse knife **357** of a width equal to the width of webs **W1** and **W2** is supported in knife supports **356**, as shown in Fig. 16. An arm **361** mounted on shaft **359** supports a transverse rod **363***a* in a cantilever fashion. Mounted on shaft **359** is a sprocket **365** which is driven by a chain **367** from sprocket **369** on cam shaft **370**. Arm **361** is so mounted on shaft **359** that when this shaft is driven by shaft **370**, rod **363** backs up **W1**, as shown in dotted lines in Fig. 16, and holds it in a substantially vertical position so that when cam **350** moves into engagement with cam follower **352**, knife **357** moves through a vertical portion of web **W1** and severs it. Substantially simultaneously with the severing of web **W2**, cam follower **314** moves off the high portion of cam **368**, and by gravity and the urging of spring **369**, plate **381** cuts web **W2** and presses it downwardly into superimposed relation with the cut-off end of web **W1** and effects the desired heat sealing splice.

In setting the mechanism for the next splicing operation, arm **28** is rotated 180° to locate roll **R2** in the position formerly occupied by roll **R1**. A new roll of web material is spaced on arbor **32**. The end is secured in clamping plate **322** and the mechanism remains in this condition until roll **R2** is depleted, whereupon the automatic splicing cycle proceeds as above.

Figures 17, 18 and 19 disclose a modified type of splicing device and two webs spliced together by this device. Splicing device designated generally **480** includes a plate **482** which is adapted to be mounted on arms **184** of the preferred embodiment in a manner similar to plate **182**, or on arms **304** as in the case of plate **381** of the modification shown in Fig. 16. In this way, splicing device **480** can be moved to and from splicing table **463** which can be mounted in a manner similar to that disclosed above in the case of table **63**. Supported on the operative face of plate **482** are resilient strips **485** which preferably are formed from rubber. These strips in the splicing device shown in Fig. 19, extend transversely across plate **482** for the width of the widest webs to be spliced and coact with pins **465** in spaced transverse rows in table **463** and projecting upwardly therefrom for engagement with strips **485** as shown in Fig. 19. So also table **463** is provided with transverse elongated resilient strips **467** similar to strips **485** with which coact pins **487** mounted in and extending downwardly from plate **482**. Pins **487** are also arranged in spaced transverse rows. When the splicing device shown in Fig. 19 is used, the webs **W1** and **W2** are fed, held and cut in the same manner as described hereinabove in connection with the preferred embodiment and the modification disclosed in Fig. 16, except that instead of being heat sealed together, the overlapping webs are provided with a plurality of rows of punches as the result of the movement of pins **465** and **487**, respectively, through the overlapped webs **W2** and **W1** as indicated in Fig. 19. The resulting splice is shown in Figs. 17 and 18. As pins **465** and **487** move substantially simultaneously through webs **W1** and **W2**, they punch and in effect "rivet" the two webs together as indicated clearly in Fig. 18, thereby forming a permanent splice which enables web **W2** to be fed through the machine without stoppage or manual rethreading.

Figs. 20 and 21 disclose a modified form of web holding device which may be used in connection with webs having thermoplastic constituents and capable of being heat sealed as in the modification shown in Figs. 1, 4, 5 and 7, and in Fig. 16. This modified form of web loading device can also be used in making a splice in which adhesive is used. In the case of webs having thermoplastic sealings or coats or constituents, a substance suitable for energizing the coating of a web would be used and applied to duct **436**. For example, in splicing moisture proof cellophane, ethylene glycol would be applied, this substance having the capacity of energizing the coating on such cellophane, whereupon when pressing and heat sealing members **180** or **380** move into operative position with respect to table **62** or **362** respectively, the desired splice is made. If sufficient time is allowed by the cam which operates arms **204** or arms **304**, the heating element can be eliminated and the energized coating on the web will set the constituents energized thereby and effect the desired splice. In the case of splicing an uncoated web, such as **W3**, to another web of similar type, **W4**, the adhesive A can be of a mucilaginous type such that when the knife moves through slot **425** in loading device supported on arms **426**, the end of the web **W3** is cut from the tip portion, held by clamp **434** similar in construction and operation to that shown in Fig. 9, and as cut off end of web **W3** is moved downwardly by the pressing member which may be similar in construction and operation to that of pressing plate **180**, adhesive from duct **436** will be applied over the end of the web, and when this end is pressed against the end of the web **W4** for splicing thereto, the adhesive coated end will adhere and form the desired splice.

The invention above described may be varied in construction within the scope of the claims, for the particular embodiment selected to illustrate the invention are but a few of the possible concrete forms which our invention may assume. The invention, therefore, is not to be restricted to the precise details of the structures shown and described.

What we claim is:

1. A web splicing device for use in splicing the leading end of a reserve supply web to the trailing end of a supply of web being fed, comprising web feeding means for feeding said last-named web, a movable support for said leading end of said reserve supply web, means for moving said support to juxtapose said end of said reserve supply web with and above said trailing end of said web being fed, means for substantially simultaneously cutting the trailing end of said web being fed and the leading end of said reserve supply web and forming clean cut ends, and means for joining said juxtaposed ends of said webs and form a lap splice.

2. Web splicing apparatus for splicing the leading end of a reserve supply web of material having a thermoplastic coating and the trailing end of a supply web of material having a thermoplastic coating being fed, comprising web feeding means for feeding said last-named web, a detector engaging said last-named web, a support holding said leading end of said web of said reserve supply web above said web being fed, a splicing member, means mounting said member for movement to and from splicing position relative to said webs, means operative in response to the operation of said detector and the movement of the end of said web being fed past said detector for moving said member into splicing position relative to said webs, and means coacting with said member to lap splice the trail-

ing end of said web being fed to the leading end of said reserve supply web.

3. The apparatus defined in claim 2 wherein said member includes a heat sealing unit, and a table beneath said web being fed upon which said webs being spliced are pressed together by said member.

4. The apparatus defined in claim 2 including a knife for cutting each of said webs transversely to form clean cut edges, and means operative in response to the operation of said detecting means for actuating said knife.

5. Web splicing mechanism comprising a diminishable source of supply of web being fed, a reserve web source of supply, guide means for guiding said web being fed, a table over which said last-named web is fed, a support for the leading end of said reserve web, said support including movable arms mounting said support for movement to and from said table, clamp means for clamping said webs together for splicing, a splicing member movable to and from said table, and means for moving said member towards said table to press said leading end of said reserve web into juxtaposition with the trailing end of said web being fed to splice said ends of said webs together.

6. A web splicing device for use in splicing the leading end of a reserve web supply to the trailing end of an exhausted web supply, comprising web feeding means for feeding said web of said last-named supply, a detecting element engaging said last-named web, a movable loading device adapted to hold the leading end of said web of said reserve supply, means for moving said movable loading device from a web loading position to a position locating said leading end of said web of said reserve supply above and in position for splicing to said web being fed, and means operative in response to the operation of said detecting element when said web being fed is substantially exhausted for pressing said ends of said webs into engagement with each other and joining said ends of said webs together.

7. A web splicing device for splicing the trailing end of an exhausted web supply to the leading end of a reserve web supply comprising a table, means for feeding the web from said first-named web supply over said table, a movable device for holding said leading end of said reserve web above said table, a splicing station, means for moving said holding device from a web loading position to locate said leading end of said web of reserve supply at said splicing station above said table and above and in close proximity to said web being fed, clamp means for clamping portions of both of said webs against substantial movement, a splicing tool mounted above said table, and automatically actuated mechanism for actuating said clamps and for moving said tool to press the leading end of said web of said reserve supply and said trailing end of said web being fed together on said table and splice said ends of said webs.

8. A web splicing device for use in splicing the leading end of a web of a reserve web supply to the trailing end of a web fed from a substantially exhausted web supply, comprising web feeding means for feeding said last-named web, a detecting element adapted to engage said last-named web, a movable loading device, means positioning said device to locate said leading end of said first-named web above said last-named web being fed, a splicing member, mechanism operative in response to the operation of said detecting element when said last-named web being fed is substantially exhausted for moving said splicing member into splicing engagement with said leading end of said first-named web and the trailing end of said web being fed, clamp means also movable into engagement with said webs, means for cutting both of said webs, and means for splicing said cut ends together.

9. Web splicing apparatus for splicing two webs together comprising means for feeding one web, a splicing station, means for supporting the leading end of the other web at said station and above said web being fed, a selectively operated heat sealing web splicing element, a movable feeler adapted to rest upon said web being fed, and means operated in response to the movement of said feeler from its rest position as the end of said web engaged by said feeler moves out of engagment with said feeler for moving said splicing element into engagement with both webs at said station to heat seal the leading end of said second-named web to said web being fed.

10. Web feeding and splicing apparatus for a wrapping machine comprising web feeding means for feeding a web in said machine, a detecting element adapted to engage said web, a source of supply of reserve web, a movable loading device adapted to support the leading end of said reserve web, a splicing station, means for moving said loading device from a web loading position to said splicing station to locate the leading end of said web supported by said loading device above and adjacent a portion of said web being fed, a splicing device at said splicing station, mechanism operative in response to the operation of said detecting element when said web being fed is substantially exhausted for moving said splicing device into splicing position relative to said leading end and the trailing end of said web being fed, clamp means movable into engagement with portions of said webs to clamp both webs for splicing at said splicing station, means providing slack web in said web being fed while said portions of said webs are clamped against substantial movement for splicing whereby the feed of said web being fed into said machine continues uninterruptedly, and means operating said splicing device for splicing said webs together.

11. Web feeding and splicing apparatus for a wrapping machine, comprising a plurality of web feeding rollers and means for operating said rollers to feed a continuous web into said machine, a source of supply of reserve web, a loading device adapted to support the leading end of said reserve web adjacent said web being fed, a slack roller for providing slack in said web being fed, arms supporting said slack roller, means normally locking said arms with said slack roller located in slack forming position, a web clamp device, a link connecting said locking means and said clamp device, means for moving said clamp device into clamping position to clamp said webs together and for releasing said locking means, means for moving said arms upwardly to make said slack web available for feed into said machine while said webs are clamped together, and means for splicing said clamped webs together.

12. The apparatus defined in claim 11, including a knife for cutting said leading end of said reserve web and said web being fed, to form clean cut overlapped ends to be spliced, and wherein said splicing means includes a device adapted to press and unite together said overlapped ends of said webs.

13. The apparatus defined in claim 12 wherein said webs being spliced become tacky upon subjection to heat, and wherein said splicing means comprises a pressing member for pressing said ends of said webs together, and a heat sealing element carried by said pressing member for heat sealing said overlapped ends of said webs firmly together.

14. The apparatus defined in claim 2 wherein said support is provided with a transverse slot, a heat sealing unit, a table beneath said web being fed, said table having a transverse slot, a knife, and means for moving said knife through said slot in said support and said slot in said table to cut both webs.

15. The method of splicing the leading end of a reserve supply web to a web being fed continuously comprising supporting said leading end of said reserve supply web above said web being fed at a splicing station, pulling slack in said web being fed continuously, clamping at spaced points on opposite sides of said splicing station portions of said web being fed and said reserve supply web together at points remote from said slack, feeding said slack and during said feeding of said slack securing at said

splicing station said leading end of said reserve supply web to said clamped portion of said web being fed.

16. The method of splicing the leading end of a reserve supply web to the trailing end of a web being fed continuously, comprising positioning the leading end of said reserve supply web adjacent said web being fed at a splicing station, providing a substantial supply of slack in said web being fed, immobilizing portions of web being continuously fed and said reserve supply web, cutting at said splicing station said leading end of said reserve supply web and said trailing end of said web being fed to form clean cut web ends, bringing said ends of said webs into overlapped relationship, continuing the feed of said web being fed from said slack supply, and then splicing at said splicing station said overlapped ends of said webs securely together.

17. The apparatus defined in claim 10 wherein said loading device includes a transverse slot and means for securing said end of said reserve web on said loading device above said slot, a table over which said web being fed is moved, said table having a transverse slot, a knife, means for moving said knife through both of said slots to cut said webs, and means for moving said cut ends of said webs into overlapped relation on said table for splicing.

18. A web splicing apparatus for splicing the trailing end of a web being fed continuously and the leading end of a reserve supply web together comprising a splicing table, a loading device for holding the leading end of the last-named web above said other web, a knife for cutting both of said webs, means for positioning said cut ends of said webs in overlapped engagement on said table, and means for splicing said overlapped ends of said webs together.

19. The apparatus defined in claim 18 wherein said webs are capable of being united by heat, said apparatus including a heat sealing and pressing member, and means for moving said member into engagement with said cut end of said first-named web to press it into heat sealing relationship with said cut end of said second-named web on said table and for heat sealing said ends of said webs together.

20. The apparatus defined in claim 5 wherein said splicing member includes devices for crimping said ends of said webs together.

21. The apparatus defined in claim 12, wherein said webs are capable of being united by heat, and wherein said splicing means comprises a pressing member for pressing said ends of said webs together, said member including a floatingly mounted plate, and a heat sealing element for heat sealing together overlapped ends of said webs pressed firmly together by said plate.

22. Web feeding and splicing apparatus for use in a wrapping machine comprising means for feeding a continuous web to said machine, means for providing slack in said web being fed, said means including a pair of spaced pivoted arms, and a slack roller supported by said arms, for forming slack in said web being fed, means for holding said slack web under tension, a source of supply of reserve web, a splicing station, a web splicing tool, means mounting said tool for movement to and from said webs at said station, means operatively connected to said arms for releasing tension on said slack web whereby said slack web becomes available for uninterrupted feed into said machine during splicing operations, means for moving said holding device from a web loading position into splicing position at said splicing station, and means operative during the feed of said first-named web by said first-named means into said wrapping machine for operating said splicing tool to splice the trailing end of said web being fed, and the leading end of said web of said reserve supply together.

23. The apparatus defined in claim 22 including means for relocating said device above said spliced webs and for substantially simultaneously with the relocation of said device for repositioning said slack roller supporting arms to relocate said slack roller in slack take-up position.

24. The apparatus defined in claim 22 wherein said device includes a clamp for holding said leading end of said reserve supply web, a knife for cutting said leading end of said last-named web and said web being fed, and means operative prior to the operation of said splicing tool for actuating said knife to cut said webs, whereupon said splicing tool moves said cut leading end of said reserve supply web into engagement with and splices said webs together.

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