Feb. 24, 1953 P. L. TOLLISON 2,629,562

REPLACEMENT ROLL ACCELERATING MECHANISM FOR WEB SPLICING DEVICE

Filed June 13, 1950 3 Sheets-Sheet 1

Fig. 1,

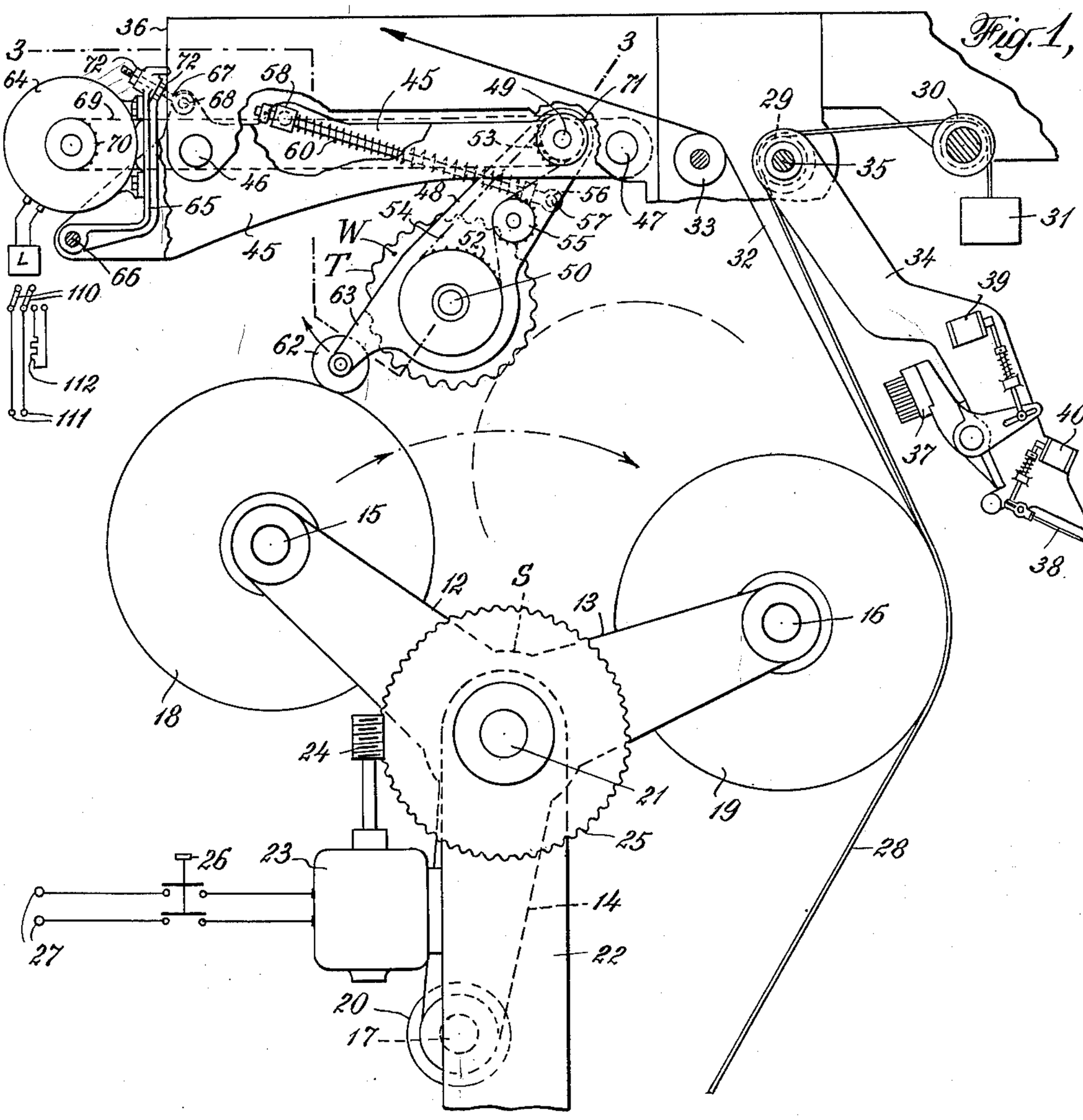
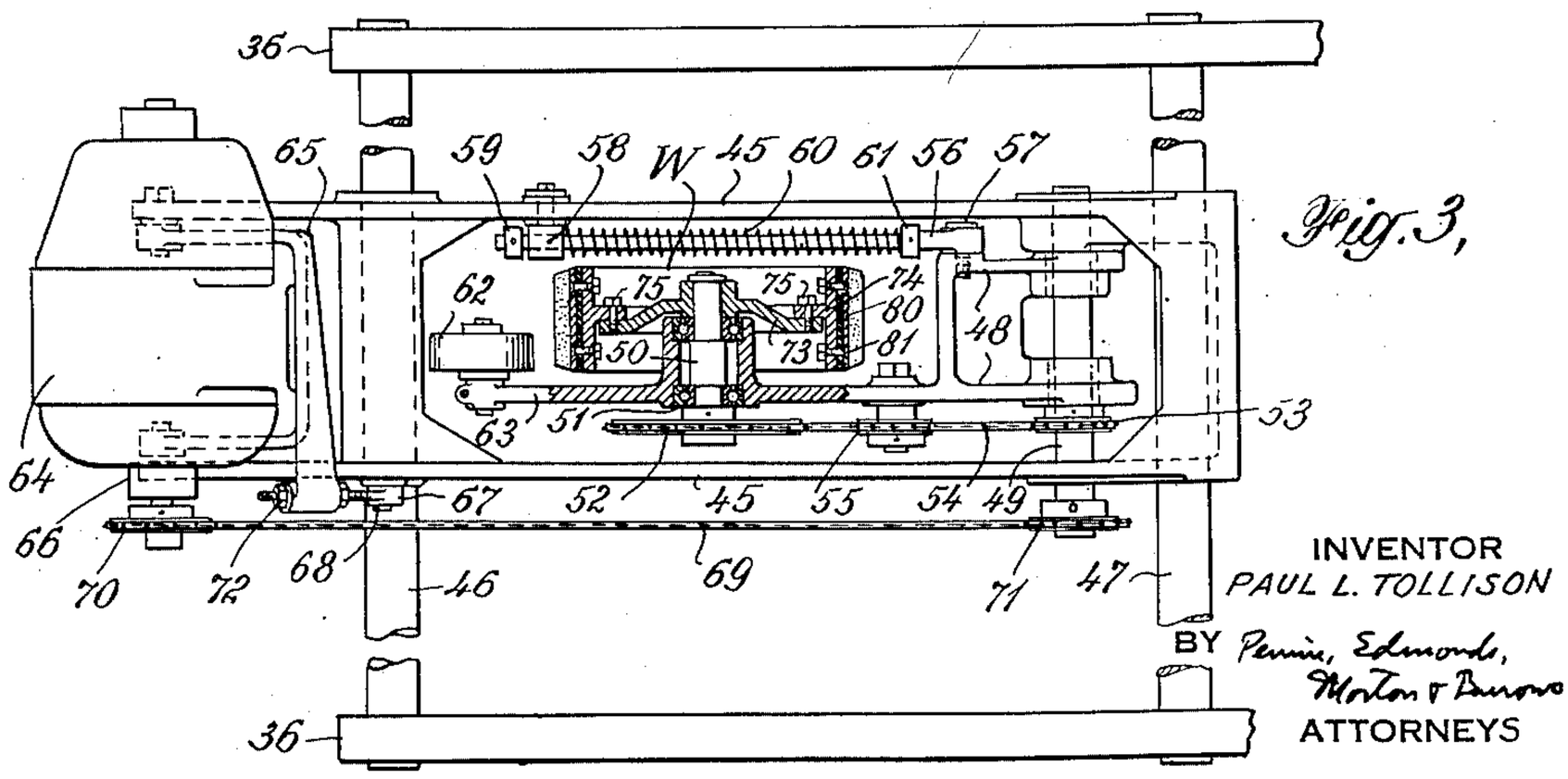


Fig. 3,



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REPLACEMENT ROLL ACCELERATING MECHANISM FOR WEB SPLICING DEVICE

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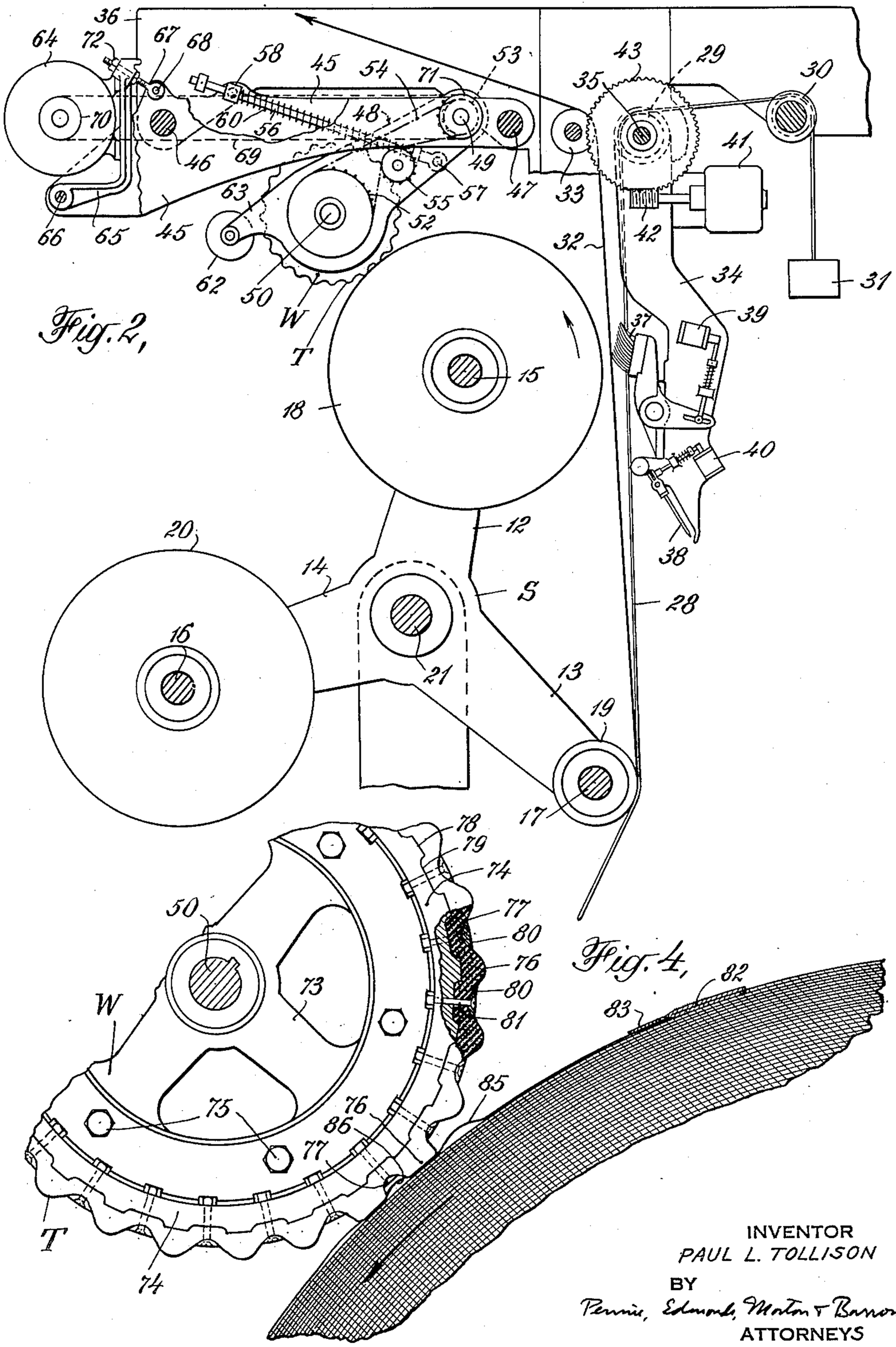

Fig. 2,

Fig. 4,

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Filed June 13, 1950 3 Sheets-Sheet 3

Fig. 5,

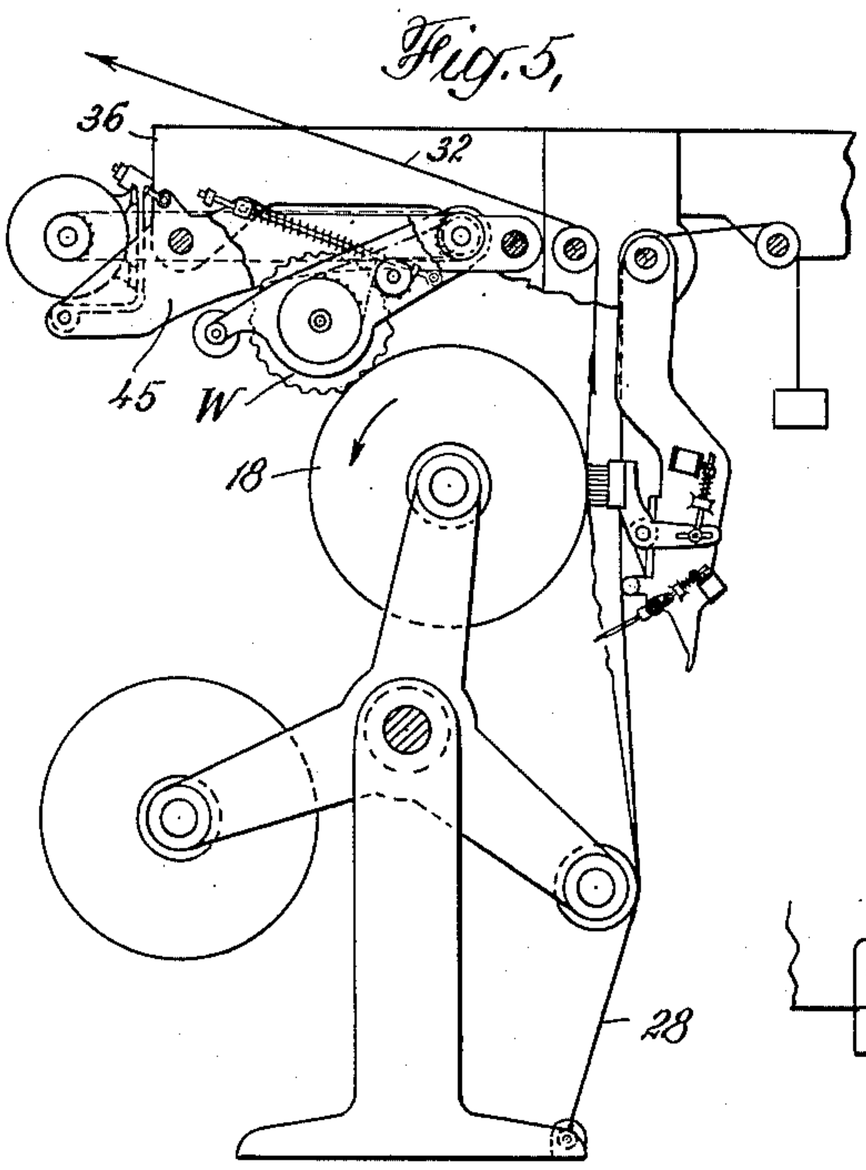


Fig. 6,

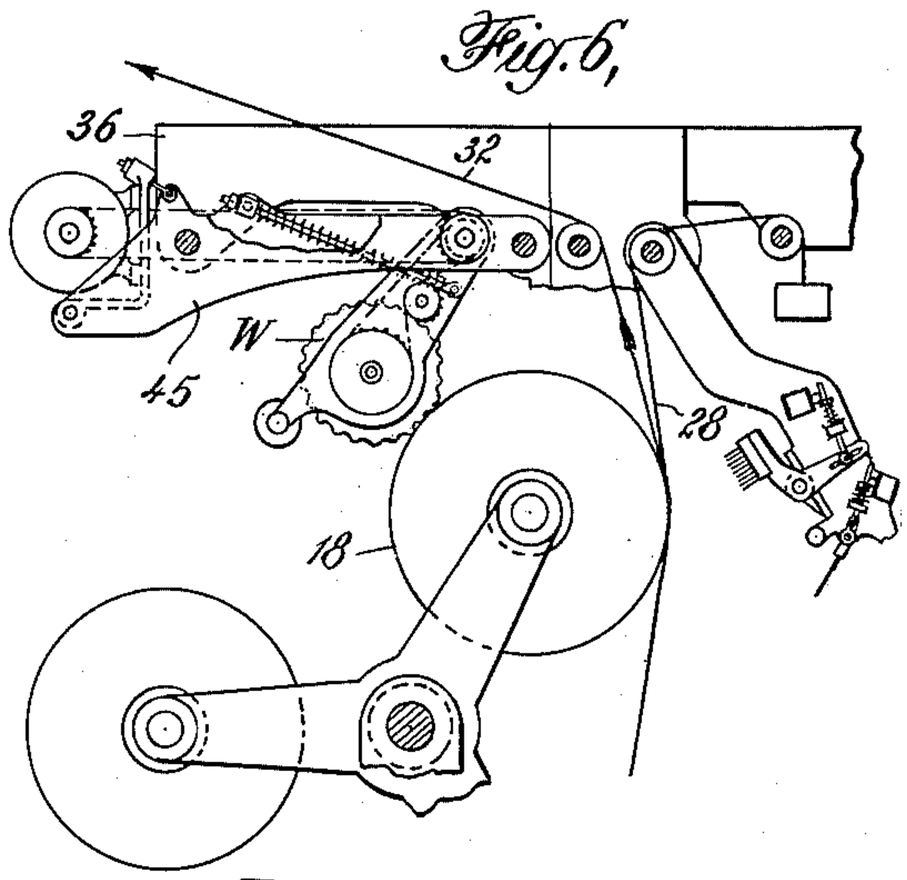


Fig. 10,

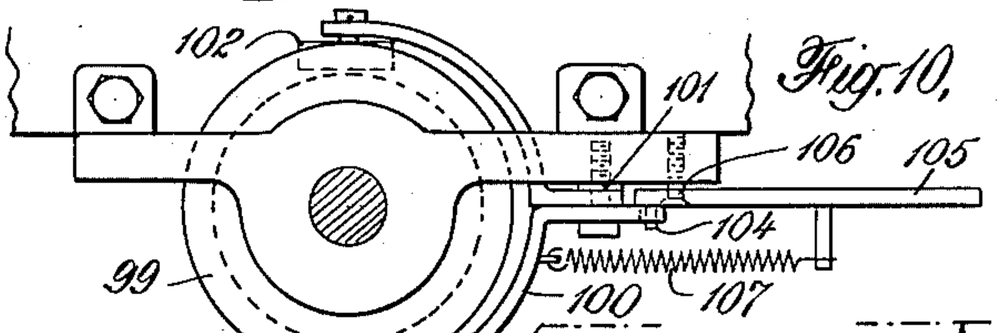


Fig. 7,

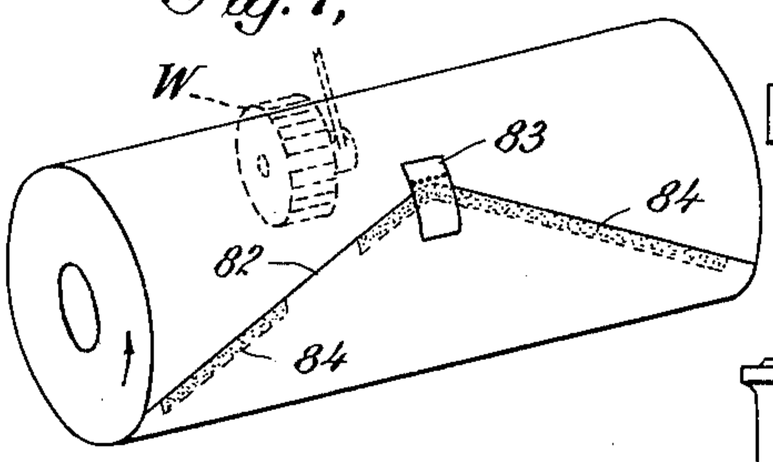


Fig. 8,

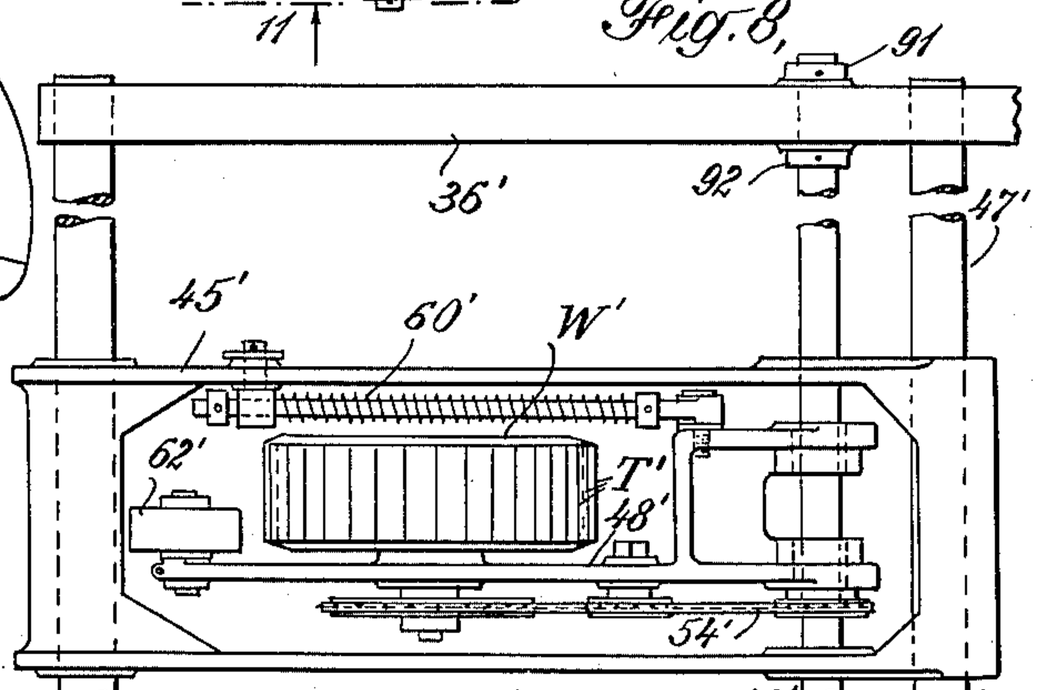


Fig. 9,

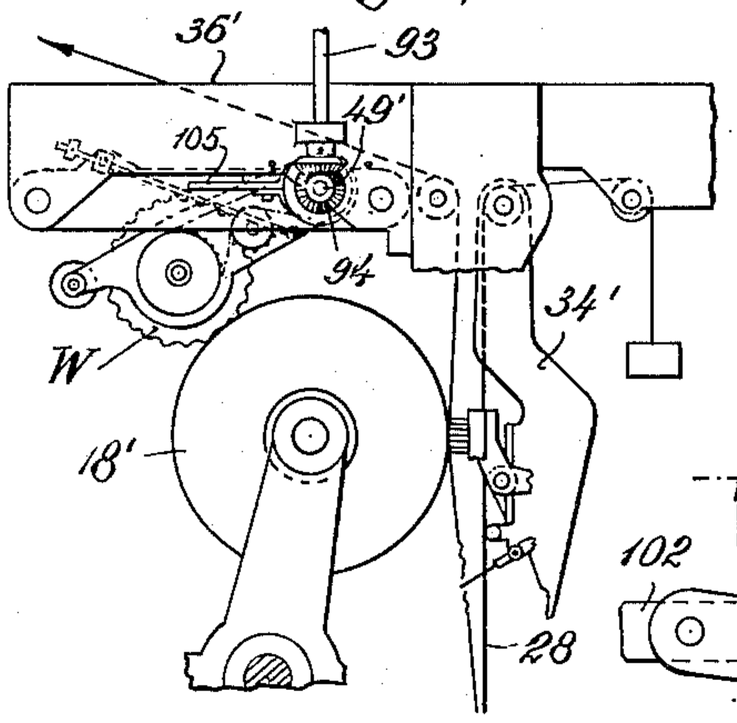
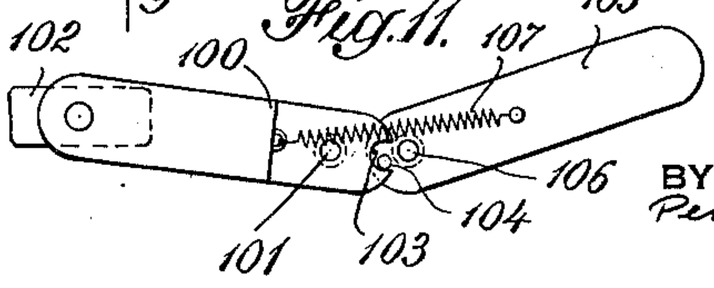


Fig. 11.



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UNITED STATES PATENT OFFICE

2,629,562

REPLACEMENT ROLL ACCELERATING MECHANISM FOR WEB SPLICING DEVICE

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Application June 13, 1950, Serial No. 167,905

12 Claims. (Cl. 242—58)

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This invention relates to web splicing, and more particularly concerns improved apparatus for accelerating a fresh web roll to running web speed in preparation for splicing the web from the fresh roll to the running web. The apparatus is also useful in maintaining tension on the new web after the splice is made.

The paper or other flexible web that is fed to printing presses or other web-consuming apparatus runs from web rolls which must be replaced periodically as they are consumed. High speed web roll replacement as presently practiced involves apparatus in which a fresh roll bearing a layer of adhesive at the leading end of its web is brought to a position adjacent the web running to the web-consuming apparatus. The fresh roll is then accelerated to a speed such that its peripheral velocity approximates the linear velocity of the running web, and the leading end of the fresh roll web is then spliced to the running web which is thereafter severed behind the splice. The fresh and running web rolls are customarily rotatably carried by movable supports, such as the spider arms of a multi-armed reel which is rotatable to bring successive fresh rolls to accelerating and splicing position.

The fresh web roll may be accelerated by means of a center drive in which driving power is applied through the roll axis or spindle, or by a surface drive in which power is applied to the cylindrical surface of the roll. Of the two, center drive has heretofore produced the best operating results, but it requires the provision of fresh roll diameter measuring means and a variable speed drive governed by roll measurement in order that fresh rolls of different diameter may be accelerated to the required peripheral velocity approximating the linear velocity of the running web. Surface drives avoid the necessity for speed changers to compensate for varying fresh roll diameters, but previously known surface drives have been unsatisfactory in certain respects. In order that the roll surface engaging driving member may continuously engage the roll surface and avoid bouncing on out of round rolls, which would scuff and tear the web, the driving member must be pressed against the roll surface with considerable force. There is inevitably some slack in the outer layer or layers of the web on the fresh roll, and the pressure of the driving member on the rotating roll surface rolls or irons this slack back along the web into the roll and so either loosens a considerable number of layers of the web, causing the roll to spew out on one end of the roll, or breaks the releasable means

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that holds down the leading web end. In some cases, the roll is first spewed out and then the web end is torn loose.

In accordance with the present invention, it is proposed to provide improved surface drive web roll accelerating mechanism incorporating a surface driving member or wheel of novel construction which effectively accelerates the web roll without bouncing or scuffing the web and without rolling or ironing back the slack in the surface layer or layers of the web. My improved surface drive accelerating member is also effective to apply tension to the newly-spliced-in web immediately after the splice is made and during the interval when the freshly spliced-in web roll is being moved into the conventional tension applying straps or belts.

I have discovered that by employing a roll surface driving wheel provided with a tread or roll surface engaging periphery that is corrugated transversely of the tread and is preferably partially compressible, fresh rolls may be accelerated to web speed without rolling or ironing back any looseness or slack in the outer layer or layers of the web, whereby spewing of the roll or premature breaking of the web end holding means is avoided. Since the roll surface engaging wheel is relatively small and light, it readily follows the roll surface even if the roll is out of round. After the fresh roll has been accelerated and its web spliced to the running web, the transversely corrugated compressible surface of my improved driving wheel imposes a drag opposing the rotation of the roll and so applies, or aids in applying, tension to the web running from the roll, which tension may be continued until the conventional tension straps or belts become effective.

In describing the invention in detail, reference will be made to the accompanying drawings in which certain embodiments thereof are illustrated.

In the drawings—

Fig. 1 is an end elevation of web roll accelerating and splicing apparatus embodying the invention, showing the web roll reel in the position in which one roll is in running position and a fresh roll is being moved up to accelerating and splicing position;

Fig. 2 is an end elevation similar to Fig. 1, showing a fresh web roll in accelerating and splicing position;

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 1;

Fig. 4 is an enlarged elevation, partly in section, showing the engagement between my im-

proved roll accelerating wheel and the surface of a fresh web roll;

Fig. 5 is an elevation on a reduced scale of the apparatus of Fig. 1, showing the splicing in of a fresh web roll;

Fig. 6 is an elevation similar to Fig. 5, showing the freshly spliced-in roll in the position it occupies immediately after the splice is made;

Fig. 7 is a perspective view of a fresh web roll prepared for splicing, with the position of my improved roll driving wheel in relation to the roll indicated in broken lines;

Fig. 8 is a top plan view of my improved mechanism showing a modified form of drive for the roll driving wheel;

Fig. 9 is an end elevation of the apparatus of Fig. 8 taken along the line 9—9 of Fig. 8;

Fig. 10 is an enlarged end view of the clutch mechanism taken along the line 10—10 of Fig. 8; and

Fig. 11 is an enlarged plan view of the toggle mechanism of the clutch, taken along the line 11—11 of Fig. 10.

Referring to Fig. 1, there is shown a three-roll reel comprising a spider S having three radially extending arms 12, 13 and 14, respectively, carrying spindles 15, 16 and 17 which rotatably support the web rolls 18, 19 and 20. It will be understood that another spider is provided at the opposite end of the rolls and that the spiders are carried by a central reel shaft 21 journalled in end stands, one of which is shown at 22. Power means of known construction may be provided for turning the reel and is here illustrated as a motor 23 connected through a worm 24 and a worm wheel 25 to the reel shaft 21, and energizable by a switch 26 from a source of electrical energy represented by the terminals 27.

Adjacent the reel is disposed tension mechanism of known construction, here exemplified by tension straps 28 secured at their lower ends to fixed supports, such as the floor (Fig. 5) and passing over pulleys 29 and 30 journalled on the overhead structure, suitable weights 31 being secured to the free ends of the straps. The straps 28 are disposed parallel to the cylindrical surfaces of the rolls on the reel and adjacent one side of the reel, so that when a roll is moved to running position, as is the roll 19 in Fig. 1, its cylindrical surface is engaged by the straps 28 along a considerable arc and tension is applied to the web 32 running from the roll 19 over the guide roller 33 to the press or other web consuming apparatus. Suitable web splicing means is provided and is here illustrated as the brush arm 34 pivotally supported on a cross shaft 35 carried by the overhead frame members 36. The brush arm 34 is of known construction. It carries a web pressing brush 37 suitably subdivided to pass between the tension straps 28 and a similarly subdivided web severing knife 38. The brush 37 is swung outward to operating position by the energization of a solenoid 39 and the knife 38 is swung outward to sever a web by energizing the solenoid 40. The brush arm 34 may be raised or lowered by hand or by suitable known power means, such as a motor 41, connected to a worm 42 and worm wheel 43 fixed to the brush arm shaft 35 (Fig. 2).

Referring now particularly to the fresh web roll drive of the invention, this essentially includes a power driven wheel W having a transversely corrugated tread T for driving engagement with the surface of a web roll. A sub-

frame 45 is carried on parallel tie rods 46 and 47 that extend between the main frame members 36 (Fig. 3). The sub-frame 45 may be adjustably moved laterally of the reel along the rods 46 and 47 so as to position the wheel W to engage web rolls of different width at any desired point. An arm 48 is pivotally secured to the sub-frame 45 by a shaft 49 which is rotatably journalled in the sub-frame. A wheel shaft 50 is journalled in the arm 48 by suitable means, such as the anti-friction bearings 51. A sprocket 52 on the wheel shaft 50 is connected to a sprocket 53 on the shaft 49 by a chain 54 passing over an idler sprocket 55. The arm 48 tends to fall by gravity. Its downward pivotal movement about the shaft 49 is limited by an eye bolt 56 pivotally secured to the arm 48 at 57, passing through a poppet 58 that is pivotally connected to the sub-frame 48 and carrying a stop collar 59 beyond the poppet. A coiled spring 60 surrounds the eye bolt 56 and is compressed between the poppet 58 and a collar 61 fixed to the eye bolt, the spring thus acting to force the arm 48 downward about its pivot and thus to press the tread T of the wheel W firmly against a web roll. A guide roller 62 is rotatably secured to an extension 63 that forms the free lower end of the arm 48 beyond the wheel W.

The drive wheel arm 48 is mounted above the reel with the wheel shaft 50 parallel to the web roll axes and in a position such that the wheel tread T is continuously and firmly pressed against the surface of a fresh roll as it moves to the accelerating and pasting position illustrated by the roll 18 in Figs. 2 and 5 and beyond that position as the roll moves into the tension straps 28 as illustrated by the roll 18 in Fig. 6. When the wheel W is in its lowest position, after the newly spliced-in web roll (19 in Fig. 1) has moved out of contact with the wheel tread T and before the fresh roll (18 in Fig. 1) has moved into contact with the wheel, the axis of the wheel shaft 50 is below a line between the axis of the roll spindle 15 and the axis of the wheel arm journal shaft 49. This relation is necessary in order that the driving wheel W may continue to engage the newly spliced-in roll and apply retarding tension thereto as the roll moves into web tensioning engagement with the straps 28. To avoid blocking rotation of the reel by the driving wheel, the guide roller 62 is disposed at the free depending end of the wheel arm 48 above a line between the axis of the shaft 49 and the roll axis of the spindle 15. When so disposed, the guide roller 62 is engaged by the surface of the oncoming fresh roll 18 and the arm 48 is thereby lifted to permit the roll 18 to move under and into engagement with the driving wheel W.

The wheel W may be driven by any suitable source of power. In the form illustrated in Figs. 1–6, an electric motor 64 is provided for this purpose. As shown, the motor 64 is mounted on a bracket 65 pivotally connected at 66 to the sub-frame 45 and adjustably held in position by an eye bolt 67 pivotally connected to the sub-frame at 68. A chain 69 engaging the motor sprocket 70 and the sprocket 71 on the shaft 49 transmits driving power from the motor 64 to the wheel W and adjustment of the lock nuts 72 on the eye bolt 67 variably adjusts the tension of the chain 69.

Referring now to the roll driving wheel W, it essentially includes a transversely corrugated tread T formed of partially compressible and preferably resilient material. The wheel itself

may take various forms and, as shown, comprises a hub and disc portion 73 fixed to the shaft 50 and a rim 74 demountably secured to the portion by the cap screws 75.

The tread T is characterized by transverse corrugation, that is, it presents a succession of lands 76 separated by intervening valleys 77 that run across the tread substantially parallel to the wheel axis. This corrugated contour may be conveniently produced by forming corresponding lands 78 and valleys 79 in the peripheral face of the rim 74, applying the flexible and partially compressible tread over and surrounding this rim face and then compressing and clamping down those portions of the tread that overlie the rim valleys 79 so that the tread generally follows the contour of the rim face. As shown, the tread T is compressed and clamped down into the rim face valleys 79 by bars 80 secured to the rim 74 by bolts 81, as shown in Fig. 4.

The relative peripheral extent of the lands and valleys of the tread is not critical, and I have obtained satisfactory results in the acceleration of web rolls of newsprint paper using valleys in the range of ¼ to 2" in peripheral extent. In a satisfactory embodiment of the invention when the tread T was compressed by driving contact with the web roll, the valleys were about ⅝ to ¾" and the lands were about ¾ to ⅞" in peripheral extent. The thickness of the tread is not critical, and sponge rubber treads ½ to ¾" thick when uncompressed are satisfactory. A soft sponge rubber tread ½" thick when uncompressed may be compressed to about $\frac{3}{16}$" thickness in the valleys 77 beneath the bars 80 and will then have a thickness of about $\frac{7}{16}$" at the peaks of the lands 76 when not in compressive contact with the driven web roll.

The tread T may be formed of natural or synthetic rubber and a preferred tread material that I have discovered produces excellent operating results is sponge rubber and preferably sponge rubber of the grade known as soft. I have found that sponge rubber made from synthetic rubber such as neoprene and other synthetic rubbers derived by the polymerization of chloroprene and butadiene are somewhat more durable and therefore more economical to use than natural sponge rubber, although natural rubber is wholly operative for my purpose. The word "rubber" as used herein includes both natural rubber and synthetic rubbers.

In the operation of the disclosed embodiment of my invention, each fresh roll is prepared for splicing in a known manner by releasably securing its leading web end 82 to the underlying layer, as by the frangible tab 83, and applying adhesive 84 to the outer surface of the leading end of the web except along the portion thereof lying in the path of the driving wheel W, as shown in Fig. 7. The tab 83 may be of the type disclosed in United States Patents Nos. 1,996,497 or 2,039,696. Other known means for releasably securing the leading end of the web to the underlying web layer may, of course, be employed. When a running web roll has become depleted to the point where replacement will soon be necessary, the reel is turned in the direction of the arrow in Fig. 1 to a point to bring a fresh roll 18 to the roll accelerating and splicing position, as shown in Fig. 2. Before the roll reaches this position, it is engaged by the tread T of the driving wheel W. When this engagement is effected, energy is supplied to the motor 64 to drive the roll in a direction as indicated by arrows in Figs. 2, 4, 5 and 7 such that the roll web would be unwound if its leading end were not secured as described, and to accelerate it to a peripheral velocity equal to or closely approximating the linear velocity of the running web 32. The direction in which the web roll is thus accelerated will be referred to in the claims as the web unwinding direction. Energy may be applied to the motor 64 by moving the switch 110 to the left to connect the motor to a source of electrical energy indicated by the terminals 111 (Fig. 1). The speed to which the fresh roll 18 is accelerated may be controlled by any suitable known means, such as a tachometer generator control, an embodiment of which is described in my copending application Serial No. 71,896, filed January 21, 1949, now Patent No. 2,601,071.

The tread T of the wheel W engages the roll surface securely and drives it without slipping. To prevent tearing of the outer layer of the web on the driven roll, power is applied gradually to the motor 64 and the fresh roll 18 is started and accelerated at a rate low enough to prevent the transmission from the wheel to the roll of sufficient power to tear the web. When an electric motor drive is employed, suitable known current limiting means diagrammatically illustrated at L is employed in the energizing circuit of the motor to so limit the driving power applied. One known form of such current limiting means is disclosed in my aforesaid application Serial No. 71,896, now Patent No. 2,601,071.

Due to the use of my improved corrugated tread driving wheel, whatever slack may be present in the outer layer of web on the roll 18 is not rolled or ironed back to the underlying web layers and there is no tendency for the outer web layers to spew out at an end of the roll or for the web end holding means 83 to be broken. It is my belief that this improved operation results from the passage of any ridges or bubbles of slack in the outer web layer through the nip between the driving wheel tread T and the roll surface in the gaps or valleys 77 between the lands 76 of the tread T. Thus, as illustrated in Fig. 4, I believe that any ridge or bubble 85 of web slack that may form in the outer web layer in advance of the nip passes through the nip in a tread valley 77, as is illustrated at 86, and so is not rolled or ironed back into the underlying web layers of the roll to produce a tendency to spew or to result in parting of the web end holding means. The invention is not limited to or dependent upon the correctness of my above-explained belief as to the manner of operation.

When the fresh roll 18 has been accelerated to web speed, the leading end of its web is spliced to the running web 32 in a known manner, the brush 37 pressing the running web 32 against the fresh roll surface, and the layer of adhesive 84 effecting the splice. The knife 38 severs the old web behind the splice. It will be understood by those skilled in the art that the action of the brush 37 and knife 38 is timed by suitable known means such as roll driven cams or roll carried control actuators to insure that the running web first contacts the roll surface at a part thereof other than that carrying the adhesive 84, and further to insure that the old web is not severed until after the splice is made. One form of means for this purpose is disclosed in Patent No. 2,386,346.

After the web of the fresh roll 18 has been spliced in and becomes the running web, the

brush arm 34 is raised to the position shown in Figs. 1 and 6, out of the path of the roll 18, and the reel is turned to advance the newly spliced-in roll into engagement with the tension straps 28, the reel being stopped when the roll has advanced to the running position approximately illustrated by the position of the roll 19 in Fig. 1. From the time that the old web is severed in splicing until the newly spliced-in roll is moved into effective engagement with the straps 28, the straps do not provide effective tension on the web running to the press or other web consuming apparatus. However, the driving wheel W continues to contact the surface of the roll 18, as illustrated in Fig. 6, and tension is applied by deenergizing the drive motor 64 at the instant the old web is severed and, if necessary or desirable, applying dynamic braking to the motor 64 by suitable known means, as by moving the switch 110 to the right to connect the dynamic braking resistor 112 across the motor windings. Suitable dynamic braking means for roll driving motors is disclosed in my aforesaid copending application Serial No. 71,896, now Patent No. 2,601,071. I have discovered that even without dynamic braking the corrugated partially compressible tread T of my improved driving wheel W imposes sufficient resistance to roll rotation to provide the necessary web tension for the indicated interval in many instances, so that it is merely necessary to deenergize the driving motor 64 at the time the splice is made.

My improved roll driving wheel may be powered by a source other than an electric motor and in Figs. 8, 9, 10 and 11 I have illustrated a press drive for this purpose. By driving the wheel W from the press or other web consuming apparatus through a suitable friction clutch to permit gradual application of power during roll acceleration, the speed of the driving wheel may be so related to the press speed that the fresh roll is accelerated to the web speed regardless of the speed at which the press or other web consuming apparatus is running.

As shown in Figs. 8 and 9, the mechanism for supporting the roll driving wheel W' is of the same construction as that described above and the corresponding parts thereof are designated by like reference characters having distinctive exponents. The wheel drive shaft 49' is extended through the frame members 36' and 36'' and is journalled in a sleeve 90 which, in turn, is rotatably journalled in the frame member 36''. Collars 91 and 92 fixed to the shaft 49' on opposite sides of the frame member 36' prevent axial movement of the shaft 49'. A shaft 93 driven from the press or other web consuming apparatus drives the sleeve 90 through the bevel gears 94. A clutch plate 95 carrying a friction disc 96 is fixed to the inner end of the sleeve 90. A bracket 97 fixed to the frame member 36'' carries a stationary friction disc 98. A clutch spool 99 is splined to the shaft 49' between the friction discs and is selectively movable to contact the stationary friction disc 98 or the rotating driven friction disc 96. A yoke 100 is pivotally connected to the bracket 97 by a stud 101, and the bifurcated ends of the yoke carry trunnions 102 that engage the groove of the clutch spool 99. The free end of the yoke 100 is provided with a slot 103 in which loosely fits a pin 104 carried on a lever 105 pivotally mounted on the bracket 97 by the stud 106. A tensioned spring 107 is connected between the yoke 100 and the lever 105 and yieldingly holds the clutch

spool 99 against either the driven friction disc 96 or the stationary friction disc 98.

When a fresh web roll is to be accelerated, the lever 105 is thrown to the clutch engaging position shown in Fig. 8. The strength of the spring 107 is so chosen that the clutch slips sufficiently to permit the fresh roll to be brought up to speed without tearing or scuffing of the roll web. After the splice is made and preferably at the instant the old web is severed behind the splice, the operator throws the lever 105 clockwise, as viewed in Fig. 8, and so engages the clutch spool 99 against the stationary friction disc 98, thus applying a retarding force to the roll driving wheel W' to maintain tension on the newly spliced-in web during the interval that the spliced-in roll is moved into effective engagement with the tension straps.

I claim:

1. Web roll accelerating mechanism comprising in combination a movable support for rotatably supporting a web roll, an arm pivotally supported above the path of movement of said roll support and having a depending end, a web roll driving wheel rotatably secured to said arm adjacent the depending end thereof, said wheel having a web roll surface engaging tread formed of partially compressible resilient material corrugated transversely of the tread, means for driving said roll driving wheel, and a guide roller at the depending end of said arm for engagement with the surface of a web roll on said support to guide said wheel into overlying engagement with a roll moved beneath said arm on said support.

2. Web roll accelerating mechanism comprising in combination a rotatably web roll reel including spaced arms for rotatably supporting web rolls, an arm pivotally supported above said reel on an axis parallel to the axis of rotation of said reel and having a depending free end, a web roll driving wheel rotatably secured to said arm adjacent the free end thereof and having a web roll surface engaging tread formed of sponge rubber and corrugated transversely of the tread, means for driving said roll driving wheel, and a guide roller rotatably secured to said arm at the depending end thereof for engagement with the surface of a web roll on said reel to guide said wheel into overlying engagement with such roll when the roll is moved on said reel to a position beneath said arm.

3. In a web-splicing mechanism, a web roll support for rotatably supporting a web roll from which a web is to be fed, a second web roll support for rotatably supporting a second web roll, the leading end of the web of which is to be spliced to a web being fed from a web roll on said first web roll support, means for rotating a web roll supported on said second web roll support in an unwinding direction and for accelerating such rotation in preparation for a splicing operation including a driving wheel having a tread formed of partially compressible resilient material with transverse corrugations therein substantially parallel to the wheel axis, means for rotatably supporting said wheel with the axis thereof parallel to the axis of a web roll on said second web roll support, means for moving said wheel support toward said second web roll support to directly engage said wheel tread with a web roll on said second web roll support and means for driving said wheel in a direction to rotate a web roll on said second web roll support in an unwinding direction, and means for causing

relative movement between said second web roll support and a web being fed from a web roll on said first web roll support to permit a splicing operation to be performed.

4. In a web-splicing mechanism, a web roll support for rotatably supporting a web roll from which a web is to be fed, a second web roll support for rotatably supporting a second web roll, the leading end of the web of which is to be spliced to a web being fed from a web roll on said first web roll support, means for rotating a web roll supported on said second web roll support in an unwinding direction and for accelerating such rotation in preparation for a splicing operation including a driving wheel having a tread formed of rubber with transverse corrugations therein substantially parallel to the wheel axis, means movable with respect to the second web roll support for rotatably supporting said wheel with its axis parallel to the axis of a web roll on said second web roll support, means for moving said wheel support towards said second web roll support to directly engage said wheel tread with a web roll on said second web roll support and means for driving said wheel in a direction to rotate a web roll on said second web roll support in a web unwinding direction, and means for causing relative movement between said second web roll support and a web being fed from a web roll on said first web roll support to permit a splicing operation to be performed.

5. In a web-splicing mechanism, a web roll support for rotatably supporting a web roll from which a web is to be fed, a second web roll support for rotatably supporting a second web roll, the leading end of the web of which is to be spliced to a web being fed from a web roll on said first web roll support, means for rotating a web roll supported on said second web roll support in an unwinding direction and for accelerating such rotation in preparation for a splicing operation including a driving wheel having a tread directly engageable with the cylindrical surface of a web roll on said second web roll support, said tread comprising a succession of lands and intervening valleys extending transversely of the tread substantially parallel to the wheel axis, the lands of said tread being formed of partially compressible resilient material, means movable with respect to the second web roll support for rotatably supporting said wheel with its axis parallel to the axis of a web roll on said second web roll support, means for moving said wheel support to engage said wheel tread directly with a web roll on said second web roll support and means for driving said wheel in a direction to rotate a web roll on said second web roll support in a web unwinding direction, and means for causing relative movement between said second web roll support and a web being fed from a web roll on said first web roll support to permit a splicing operation to be performed.

6. In a web-splicing mechanism, a web roll support for rotatably supporting a web roll from which a web is to be fed, a second web roll support for rotatably supporting a second web roll, the leading end of the web of which is to be spliced to a web being fed from a web roll on said first web roll support, means for rotating a web roll supported on said second web roll support in an unwinding direction and for accelerating such rotation in preparation for a splicing operation including a driving wheel having a tread directly engageable with the cylindrical surface of a web

roll on said second web roll support, said tread comprising a succession of lands and intervening valleys extending transversely of the tread substantially parallel to the wheel axis, the lands of said tread being of sponge rubber, means movable with respect to the second web roll support for rotatably supporting said wheel with its axis parallel to the axis of a web roll on said second web roll support, means for moving said wheel support to engage said wheel tread directly with a web roll on said second web roll support and means for driving said wheel in a direction to rotate a web roll on said second web roll support in a web unwinding direction, and means for causing relative movement between said second web roll support and a web being fed from a web roll on said first web roll support to permit a splicing operation to be performed.

7. In a web-splicing mechanism, a web roll support for rotatably supporting a web roll from which a web is to be fed, a second web roll support for rotatably supporting a second web roll, the leading end of the web of which is to be spliced to a web being fed from a web roll on said first web roll support, means for rotating a web roll supported on said second web roll support in an unwinding direction and for accelerating such rotation in preparation for a splicing operation including a driving wheel having a tread directly engageable with the cylindrical surface of a web roll on said second web roll support, said tread comprising a succession of lands and intervening valleys extending transversely of the tread substantially parallel to the wheel axis, the lands of said tread being formed of partially compressible resilient material, means movable with respect to the second web roll support for rotatably supporting said wheel with its axis parallel to the axis of a web roll on said second web roll support, means for moving said wheel support to engage said wheel tread directly with a web roll on said second web roll support and means for selectively applying driving power to turn the wheel in a direction to rotate a web roll on said second web roll support in a web unwinding direction and applying a retarding force to the wheel, and means for causing relative movement between said second web roll support and a web being fed from a web roll on said first web roll support to permit a splicing operation to be performed.

8. In web-splicing mechanism, a movable member having first and second supporting means for first and second web rolls, respectively, the first of said web rolls to have the web thereon fed therefrom and the second web roll to have the leading end of the web thereof spliced to the web being fed from the first web roll, an arm pivotally supported above the path of movement of said movable member, a driving wheel for a web roll on said second web roll supporting means rotatably secured to said arm, said wheel having a web-roll surface-engaging tread formed of partially compressible resilient material having corrugations thereon extending transversely of the tread and substantially parallel to the wheel axis, means for moving said arm to bring the tread of said wheel into direct engagement with a web roll supported on said second web roll supporting means, means for driving said wheel in a direction to rotate a web roll on said second web roll supporting means in a web unwinding direction, and means for causing relative movement between the support for the second web roll and a web being fed from a web roll on the

first web roll support to permit a splicing operation to be performed.

9. The mechanism of claim 8 in which the tread of the driving wheel is sponge rubber and means are provided for resiliently pressing the arm downwardly to press the tread of the driving wheel against the surface of the web roll on said second web roll supporting means.

10. In a web-splicing mechanism, the combination with a web roll support for rotatably supporting a web roll from which a web is to be fed, of a web roll surface driving wheel movably supported adjacent said web roll support comprising a rim having a transversely corrugated peripheral face substantially parallel to the wheel axis, a tread of partially compressible resilient material surrounding and overlying said rim face, and members extending over the valleys of the rim face outside of the tread and compressively clamping said tread to said rim face along the valleys of said rim face corrugations whereby said tread is formed to a transversely corrugated contour.

11. In a web-splicing mechanism, the combination with a web roll support for rotatably supporting a web roll from which a web is to be fed, of a web roll surface driving wheel movably supported adjacent said web roll support comprising a rim having a peripheral face substantially parallel to the wheel axis and formed into a succession of lands and intervening valleys extending transversely of said rim face substantially parallel to the wheel axis, a tread of sponge rubber surrounding and overlying said rim face, and means compressively clamping said tread to the valleys of said rim face whereby said tread is formed to a transversely corrugated contour.

12. In a web-splicing mechanism, the combination with a web roll support for rotatably supporting a web roll from which a web is to be fed, of a web roll surface driving wheel movably supported adjacent said web roll support comprising a substantially flat peripheral face of solid material with a succession of lands and intervening valleys thereon extending transversely of the rim parallel to the wheel axis, a tread comprising a layer of partially compressible resilient material overlying and surrounding said peripheral rim face, bars overlying said rim face valleys and engaging the outer surface of said tread, and clamping means securing said bars to said rim whereby said tread is formed into a succession of valleys corresponding to said rim face valleys with intervening upstanding lands therebetween.

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