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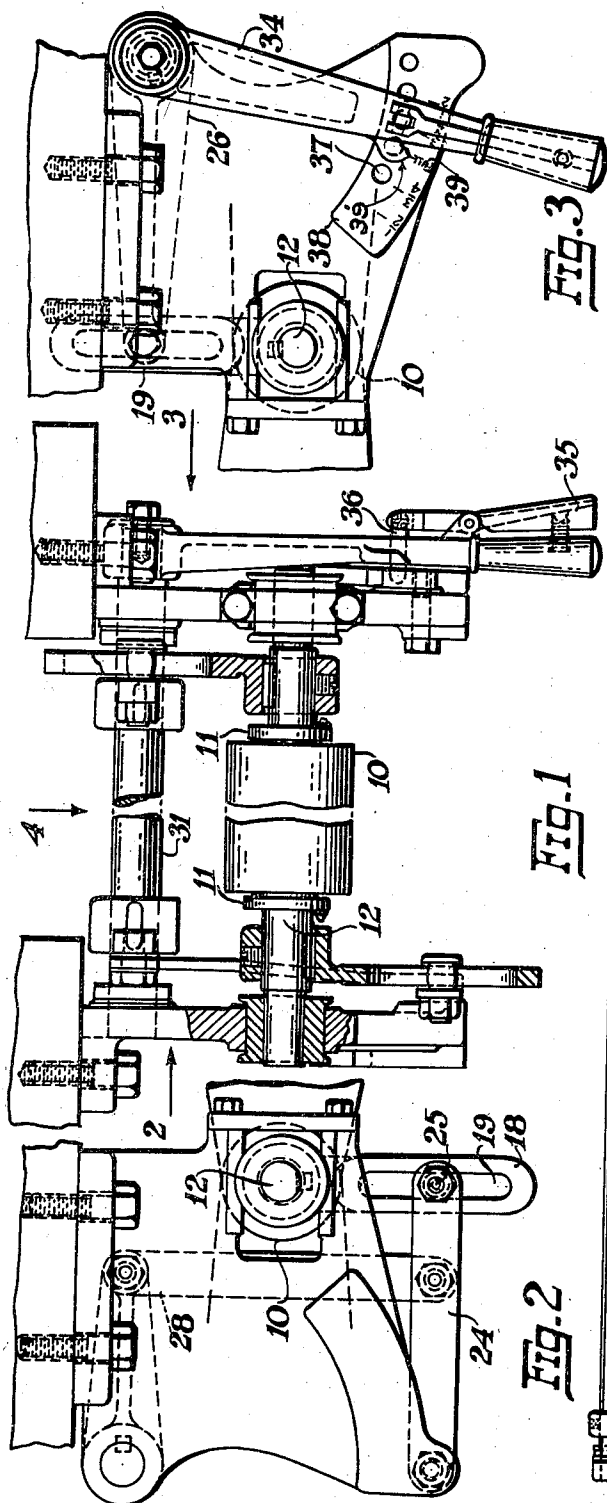
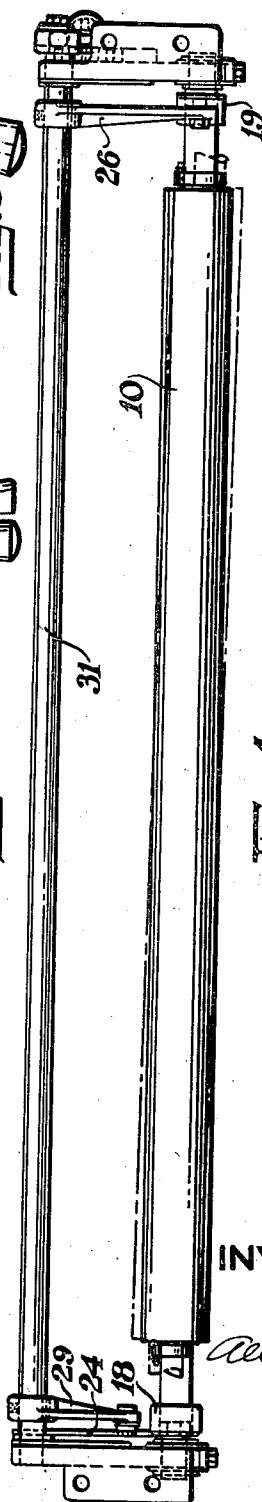
A. J. HORTON

2,066,306

WEB GUIDING ROLLER SUPPORT

Filed May 21, 1932

6 Sheets-Sheet 1

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Dec. 29, 1936.

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6 Sheets-Sheet 2

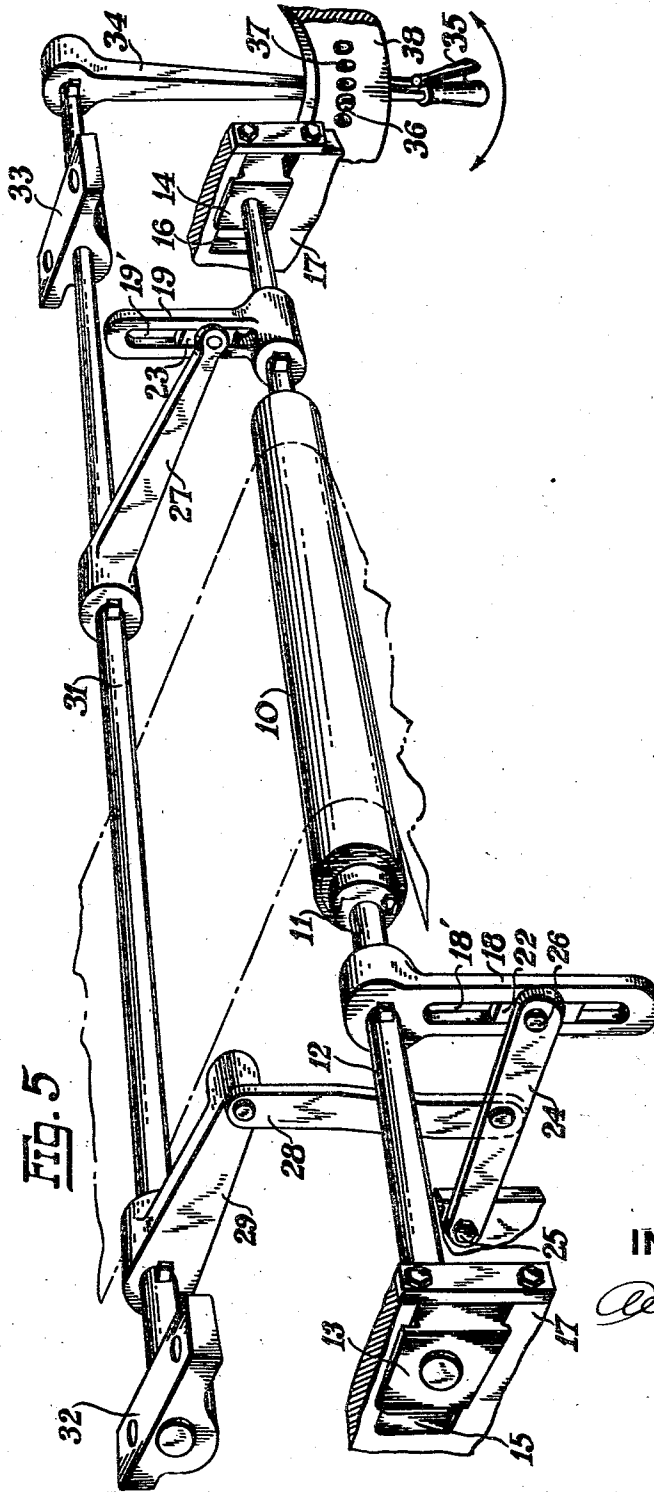


Fig. 5

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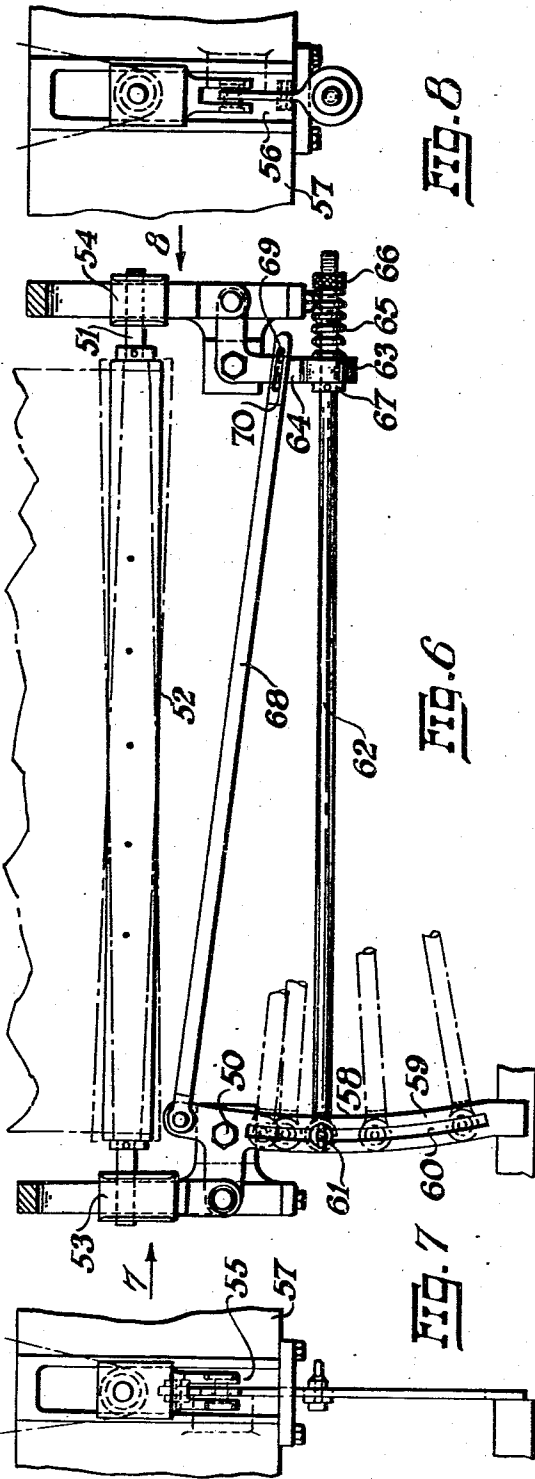
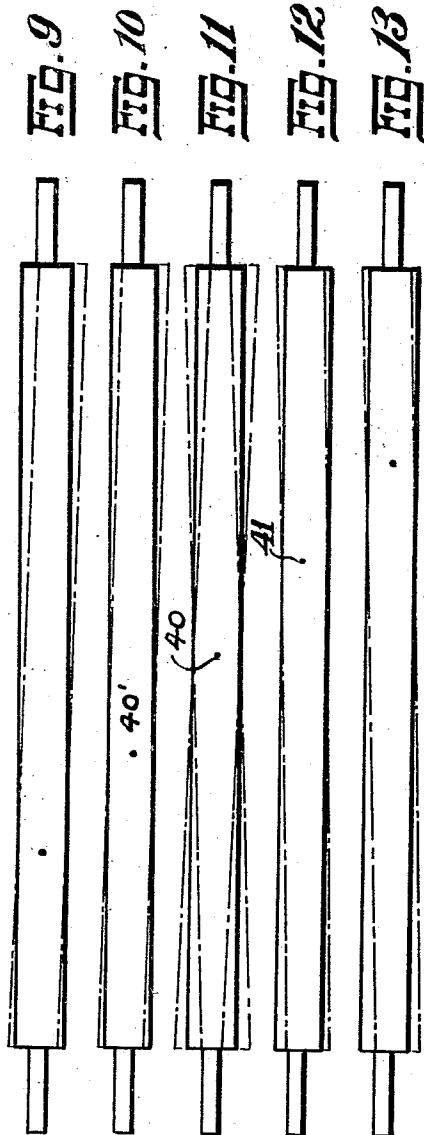
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6 Sheets-Sheet 4

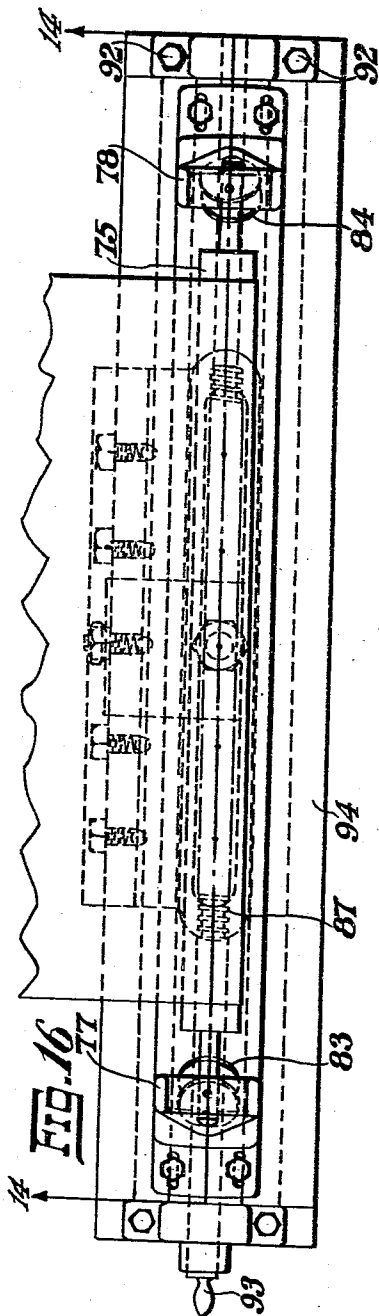


FIG. 15

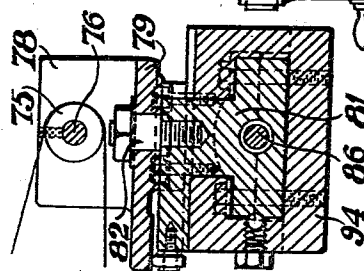
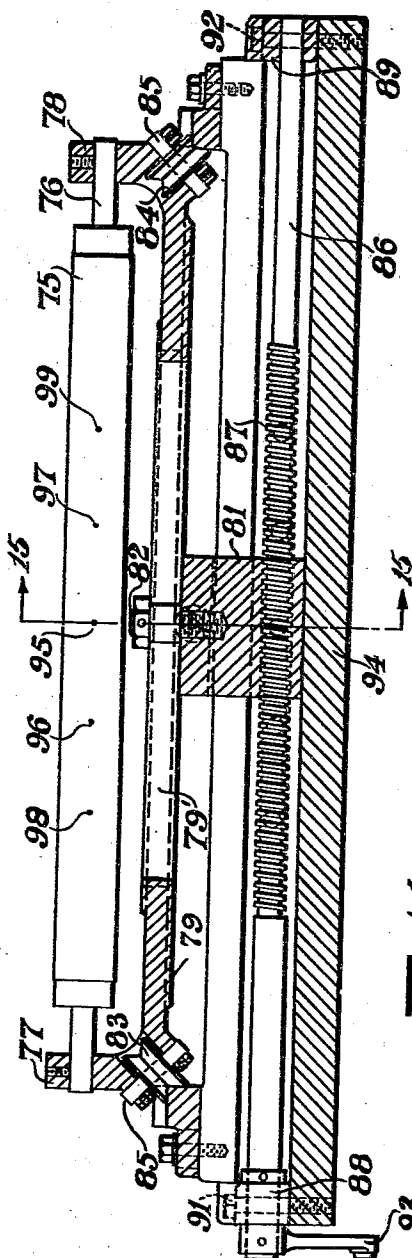


FIG. 14

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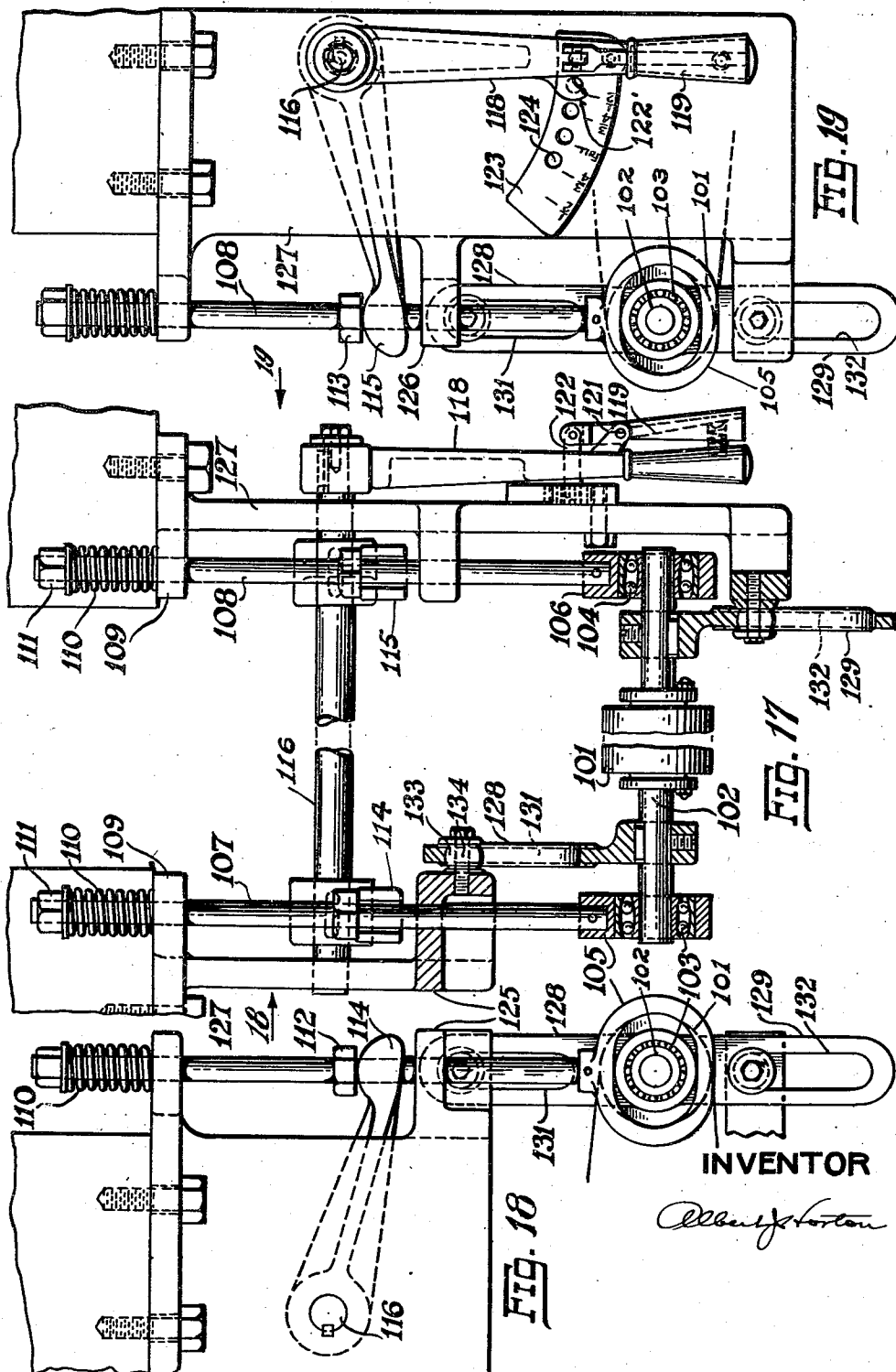
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WEB GUIDING ROLLER SUPPORT

Filed May 21, 1932

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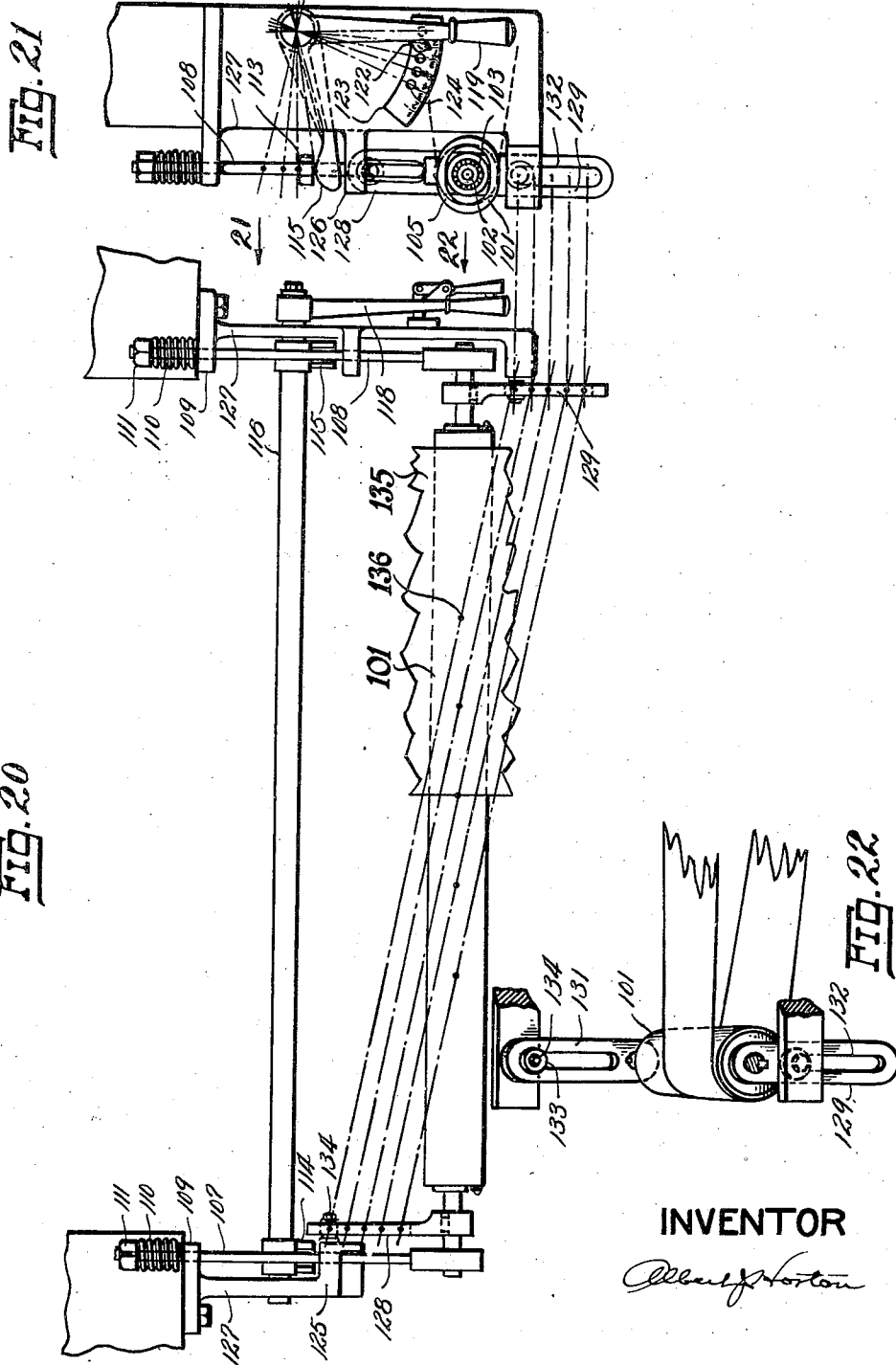
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WEB GUIDING ROLLER SUPPORT

Filed May 21, 1932

6 Sheets-Sheet 6



UNITED STATES PATENT OFFICE

2,066,306

WEB GUIDING ROLLER SUPPORT

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Application May 21, 1932, Serial No. 612,699

27 Claims. (Cl. 271—2.1)

This invention in general relates to improvements in printing machines, and more particularly to a novel method and means for supporting a web guiding roller, so that the tension on both edges of a web running thereover will be uniform.

Another object is to provide an equalizing support for a web guiding roller that will equalize the tension on either full or fractional width webs, and which will prevent any tendency in the roller itself towards vibration, the development of critical frequencies, and those irregularities in the web guiding mechanism which are due to a misalignment of the center of the axis of rotation of the roller relatively to the travelling web supported thereon.

Another object is to provide an equalizing support for a web guiding roller that will automatically align itself with a web feeding thereover whether of full or fractional width in such wise that all portions of the web adjacent thereto will be under equal tension.

Another object is to provide an equalizing support of the kind indicated with manually adjustable means for selectively prearranging the support to handle full and fractional width rolls as desired.

A further object is to provide a novel equalizing support of the kind described with coacting indicating means that will enable the operator of a printing machine to conveniently and expeditiously adjust a web guiding roller to accommodate with equal efficiency a web of full width or one of fractional width.

It is also an object of the invention to provide an equalizing support of generally improved construction, whereby the device will be simple, durable and inexpensive in construction, as well as convenient, practical, serviceable and efficient in its use.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts, and in the details of construction hereinafter described and claimed, it being understood that various changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

The preferred embodiments of the invention are illustrated in the accompanying drawings, wherein:

Figure 1 is a fragmentary elevational view,

partly in section, of an embodiment of the invention;

Figure 2 is a fragmentary elevational view, as seen in the direction of arrow 2 of Figure 1;

Figure 3 is a fragmentary elevational view as seen in the direction of the arrow 3 of Figure 1;

Figure 4 is a view as seen in the direction of the arrow 4 of Figure 1;

Figure 5 is a perspective view of the invention, with certain parts broken away;

Figure 6 is a plan elevational view of another modified form of the invention;

Figure 7 is a fragmentary elevational view as seen in the direction of the arrow 7 of Figure 6;

Figure 8 is a fragmentary elevational view as seen in the direction of the arrow 8 of Figure 6;

Figures 9 to 13 inclusive are diagrammatic views of the roller shown in Figure 6, illustrating by way of example different transverse axes of rotation of same which may be brought selectively into play by the means incorporated in the present invention, and showing the relative amount of motion of the opposite ends of a roller under certain operating conditions.

Figure 14 is a longitudinal sectional view, partly in elevation, as seen in the direction of the arrows 14 of Figure 16, of another modified form of the invention;

Figure 15 is a transverse sectional view taken on line 15—15 of Figure 14, looking in the direction of the arrows;

Figure 16 is a plan elevational view of the device shown in Figures 14 and 15;

Figure 17 is a fragmentary elevational view of another modified form of the invention;

Figure 18 is a view looking in the direction of the arrow 18 of Figure 17;

Figure 19 is a view similar to Figure 18, looking in the direction of the arrow 19 of Figure 17;

Figure 20 is a fragmentary elevational view of the invention shown in Figures 17 to 19 inclusive;

Figure 21 is a view looking in the direction of the arrow 21 of Figure 20; and

Figure 22 is a perspective view looking in the direction of the arrow 22 of Figure 20, certain manually operated members being omitted to better show parts concealed in Figure 21.

As is well known to those skilled in the art, a roller used as a guide for a web engaged therewith is subjected to wide variations of pressure and stresses and particularly is this the case when web rolls of different widths are used. For example, a half width web running over a roller ordinarily employed with full width webs, will impose unbalanced stresses or unequal pressures

on the opposite ends of said roller as is well known, unless compensated for.

Various means have been employed in the past with a view to adjustably supporting a web guiding roller in which, for example, resiliently supported bearings have been employed. This method, however, does not equalize the pressure or strain at each end of the shaft since if the web is applying more pressure on one side than another, the resilient means will react with an equal and opposite pressure at that point while at the other end of the same roller shaft, the resilient means will be under less tension or compression. The web, therefore, under the last-mentioned conditions is engaged by the roller with an unequal pressure at the ends thereof, with the same operating disadvantages and dangers to the web as pointed out above. In Figures 1 to 5 inclusive and 14 to 22, three forms of the invention are shown wherein a web guiding roller is supported by non-resilient means which provide an absolute equalization of tension over the entire periphery of the web adjacent the guiding roller.

In Figures 6, 7, 8, another form of the invention is disclosed which actually employs resilient means for supporting a web guiding roller, but under circumstances where equalization of the tension or pressure over the periphery of the feeding web or at the margins thereof is achieved.

In the drawings wherein similar characters of reference indicate corresponding parts in the form of the invention, shown in Figures 1 to 5 inclusive, 10 designates a roller which may be of any desired design or construction. The roller 10 is rotatably supported on bearing members 11 suitably arranged on a shaft 12, the extended ends of which as best shown in Figure 5, are secured to blocks or shoes 13, 14 slidably positioned in slots 15, 16 provided in a portion of the frame 17 of the printing machine. Keyed or otherwise secured to the shaft 12 at either side of the roller 10 are a pair of oppositely directed links or arms 18, 19 whose relative position on the shaft ends differs approximately by 180°. The links 18, 19 are provided respectively with slots 18', 19' wherein slidably ride shoes or blocks 22, 23.

To the block 22 one end of a link 24 which is rockably mounted on a portion of the frame 17 by a pin or stud 25, is hingedly connected by a pin 26, while to the block 23 an arm 27 is pivotally connected. Hingedly secured at one end to the link 24 is a second link 28, the other end of which is pivotally secured to an arm or member 29 keyed or otherwise fastened to a rock shaft 31 on which the arm 27 is fastened, the said rock shaft being mounted in bearing brackets 32, 33 fastened to any convenient portion of the printing machine. To one end of the rock shaft 31 an operating handle 34 is secured, the said operating handle 34 having a manually controlled latch 35 provided with a pin 36 one end of which is adapted to be received in a plurality of holes 37 arranged in series on a plate 38 with suitable indicating means 39, as shown in Figures 3 and 19, placed adjacent said holes, and an indicator or pointer 39' secured to or forming a part of the handle 34 to denote the roller adjustment desired, which as shown may be for a full width roll, $\frac{3}{4}$ roll or $\frac{1}{2}$ roll, it being observed, as indicated on the means 39 that the $\frac{3}{4}$ or $\frac{1}{2}$ sized roll may be positioned on either the left or right hand side of the roller 10, the reason for which will be explained hereinafter. The pointer 39',

it will be observed by inspection of Figure 3, is one hole or position ahead or to the left of the pin 36.

The present invention provides means in the form shown in Figures 1 to 5 inclusive, and in other manually adjusted forms hereinafter described, for equalizing the tension of a web passing over or engaged with a roller by shifting a transverse axis of the said roller when a web of one width, for example, a half width web is substituted for a web of full width. The actual shifting of the axis of rotation of the roller 10 from one pivot point to another is indicated by the different positions of the dots in Figures 9 to 13 inclusive, the point 40 denoting the transverse axis of rotation for a full width roll, while the other dots denote the transverse axes of rotation for $\frac{1}{2}$ and $\frac{3}{4}$ rolls when positioned to left or right of the center of the roller.

When the pin 36 as shown in Figure 3 is, for example, placed in one of the series of holes 37 and the pointer 39' thereon opposite the notation "full", the transverse axis of rotation of the roller 10 will be substantially at the center of the roller 10, as indicated by the centrally-positioned dot 40 in Figure 11. When the pointer 39' is placed opposite the left hand $\frac{3}{4}$ notation, as shown in Figure 3, the transverse axis of rotation will be positioned at the dot 40' of Figure 10. Should the pointer or indicator 39' be placed opposite the right hand notation " $\frac{1}{2}$ ", the axis of rotation will be positioned at the dot 41 (Figure 12). The shifting of the transverse axis of the roller to accommodate webs of other than full widths, generally $\frac{3}{4}$ and $\frac{1}{2}$ width webs, by the manually operable means shown in Figures 1 to 5 may be best understood by a comparison of the relative position of the shoes 22, 23 in the equally dimensioned slots 18', 19' of the equal and oppositely arranged links or arms 18, 19. When both shoes 22, 23 are at the center of their respective slots 18', 19' with the pin 36 of the operating handle 34 in the center hole of the series of holes 37, the transverse axis of the roller 10 will be positioned at its own center since the arcs described by the links 18, 19 will be equal.

When, however, by the operating means illustrated, one of the blocks 22, is positioned at the outer portion of one slot 18' and the other block 23 at the inner portion of the other slot 19', then the arcs described by the links will be unequal and the transverse axis of the roller will be shifted, this action being more fully described in connection with Figure 20. The net result of this when the form shown in Figures 1 to 5 inclusive is employed, will be to predetermine the transverse axis of the roller for a web of given width so that same will be aligned with the roller.

It will be observed that by the means herein described and illustrated that any variations in the tension of a web engaged with a roller supported as now indicated, will be compensated for by the said roller assuming an axis of rotation that will be in alignment with the web thereon and having a transverse axis conforming with the center of the travelling web.

Figures 6 to 8 inclusive illustrate another form of the invention which provides an automatic adjustment for a web guiding roller so that same may be predeterminedly arranged to compensate or equalize the stresses on webs of various widths as they pass over same. In the form shown, the ends of a shaft 51 on which the body portion of a roller 52 is rotatably supported, are secured in blocks 53, 54 slidably mounted in slots or sockets 75

55, 56 arranged in the frame 57 of the printing machine. The block 53 is hingedly connected to a bell crank lever 58 pivotally mounted on a fulcrum pin or stud 50 secured to a portion of the said frame. The lever 58 has an extension or arm 59 provided with a slot 60 which slidably accommodates a locking pin or thumb screw 61 on a bar 62 to allow for various adjustments desired, as hereinafter described. The bar 62 passes through an opening in a lug 63 of another bell crank lever 64 and is provided at an end adjacent to the lever 64 with a spring 65, the latter being confined on the bar by a nut 65 which forces the spring against the lug 63 of the bell crank lever. A sleeve or collar 67 limits in one direction the longitudinal movement of the bar relatively to the lug 63, while the spring 65 opposes a resistance to its longitudinal movement in the other. The axial shifting of the roller 52, as hereinafter explained, is confined within restricted limits by a link 68 which is pivoted at one end to the bell crank lever 58 and is slotted as at 69 to receive a pin 70 secured to the crank lever 64.

It will be observed that when the thumb screw 61 in the slot 60 has been tightened to secure the adjustable end of the bar 62 in a horizontal position on the extension 59 of lever 58, as shown in full line in Figure 6, swinging movement of the bell crank levers 58, 64 in response to movements of the ends of the roller 52 will cause equal and opposite movements of the blocks 53, 54 within the limits afforded by the movement of the pin 70 within the slot 69 of the link 68. The above movement of the blocks 53, 54 to which the roller 52 is attached, permits the latter to automatically align itself as variations in the tension of the web thereon occur, such as a fullness or slackness on either edge.

It will also be noted that movements communicated to the two bell crank levers 58 and 64 by the bar 62, if not horizontally positioned, will cause disproportionate movements of the blocks supporting the roller 52 thereby positioning or angling same in alignment with a web running thereover for equalizing the tension of any one of different webs in the manner above indicated, the transverse axis of the roller being shifted from the middle point for a full width web to a point removed therefrom, as illustrated.

While the roller 52 as shown in Figure 6 is resiliently or yieldingly supported relatively to the frame on the blocks 53, 54 and spring 65 and its connections thereto, as described above, the said connections are such as to maintain an aligned position of the roller with the web thereon under uniform tension in contra-distinction to conventional resilient supports for web guiding rollers whereon feeding webs with widely differing pressures at the opposite margins or sides thereof in case of fullness or slackness of the web at either edge.

In the form of the invention shown in Figures 14 to 16 inclusive, 75 designates a roller supported in accordance with the present invention. The roller 75 is rotatably mounted on a shaft 76, the ends of which are secured in arms or brackets 77, 78 formed integrally with or secured to a bar or member 79 which is pivotally supported on a block 81 by a bolt 82, slidable in a slot 79' in the bar 79. The member 79 is braced by sheaves 83, 84 mounted on pins 85 arranged at the opposite ends of the bar 79. A rod or bar 86 provided with a thread 87 engaged in a hole formed in the block 81 is rotatably mounted in bearing

blocks 88, 89 fastened by screws 91, 92 and has an operating handle 93 secured thereto. It will be understood that the block 81 which is slidably mounted on a base or frame member 94 may be moved to vary the transverse axis of the roller 75 from a mid-point as indicated by the dot 95 to other points removed therefrom as indicated by the other dots on the roller 75 shown in Figure 14 without causing any unbalanced stress or tension at one side of the web not compensated for at another side of the web. The present form of the invention is particularly adapted for regulating or equalizing tension of the web engaged over a roller approximately as best shown in Figure 15.

In Figures 17 to 22 another modified form of the invention is shown which accomplishes the purpose of the present invention by means somewhat different than the other forms of the invention. In the instant form of the invention, it will be noted that the shaft of the web engaging roller 101 is fastened to links and bars whose connection to the frame of the printing machine is such that when the latter are moved vertically, thereby bodily lifting the roller 101, the links will be angled disproportionately and the roller consequently shifted to other and different transverse axes. In the form shown in Figures 1 to 5 inclusive, the adjustment of the roller 101 is effected by angling the roller through the intermediary of the links 18, 19 together with the other associated parts whereby manipulation of the operating lever will result in an adjustment or shifting of the transverse axis of the roller to another transverse axis. In both cases, it is to be understood the actual movement or shifting of the rollers is preferably quite limited and only sufficient for achieving the purpose desired.

Referring to the form shown in Figures 17 to 22 the roller 101 is provided with a shaft 102 which is fastened on self-aligning bearings 103, 104 arranged in blocks 105, 106. The blocks 105, 106 are secured to resiliently-supported depending arms or bars 107, 108 respectively, each of which is slidable through an opening in a plate or portion of the frame 109 of the associated mechanism, the said bars 107, 108 being engaged by springs 110 retained by nuts 111 threaded on the upper ends of the bars. The springs 110, which are seated on the top surface of the plate or frame 109 serve to partially support the weight of the roller 101 when the sides of the said roller are shifted by lifting same, thereby moving the arms hereinafter described attached thereto.

The bars 107, 108 are provided with nuts or abutments 112, 113 which are engaged by forked ends on each of the arms 114, 115 secured or keyed to shaft 116 on which shaft an operating handle 118 is fastened. The operating handle or member 118 has a latch grip 119, which is hinged or fulcrumed as at 121 to the operating member 118. The latch grip 119 is provided with a pin 122 and the arm 118 is provided with an indicator or pointer 122', the said pointer coacting with a dial or indicator means 123 having a series of holes 124 which receive the said pin 122 for the purpose of adjusting the roller 101 to receive full or fractional width webs. It will be observed in the present form of the invention, as in the form shown in Figures 1 to 5 inclusive, the pointer 122' is positioned one notch or hole 124 in advance of the pin 122.

The bars 107 and 108 which are raised and maintained in adjusted position by the arms 114, 115 reciprocate in ledges or projections 125 and

126 formed on or secured to the frame 127 of the machine. Portions of the shaft 102 on opposite sides of the roller 101 have connected thereto links or arms 128, 129 projecting from the shaft in opposite directions which are formed respectively with slots 131, 132, the said slots slidably receiving elements 133 through which pins or studs 134 secured in the frame 127, are inserted. It will now be understood that when the operating handle 118 is swung to lift the arms 115, the rods or bars 107, 108 carrying the roller 101 will be raised upwardly in the direction of the lift of the springs 110 mounted on the said rods 107, 108 and confined thereon against the frame or plate 109 by the nuts 111. As the bars or rods 107, 108 are lifted, the links or arms 128, 129 which are adjustably locked or keyed to the shaft 102 will be raised on their pivot studs 134 to a limited degree, thereby shifting the transverse axis of the roller in the manner described above in connection with the form shown in Figures 1 to 5.

By inspection of Figures 20 to 22 inclusive, the shifting of the axis of the roller 101 from the middle point to points on either side thereof, as the operating handle is manipulated will be understood. In the actual position shown, and as denoted by the uppermost of the transverse dot and dash lines of Figure 20, the roller is set for accommodating a half width web 135 positioned on the right hand side of the roller, the point or dot 136 indicating the transverse axis of the roller in the position indicated. A similar explanation holds true for the other points or dots shown on the roller 101 of Figure 20 which will serve as transverse axes of rotation for the roller when the operating handle has been manipulated to shift the pivotal point of the roller from one transverse axis to another. The mechanical advantages obtained by shifting the axis of the roller from the center to a point removed therefrom as a fractional width web is substituted for a full width web have been fully explained.

The above method and means may be applied advantageously under analogous conditions; i. e., wherever a roller or cylinder is employed to guide a web and in fact the invention can be associated with mechanism widely removed from printing mechanism or in various machines operating on or employed with webs.

It will be understood that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired the present embodiment be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

What I claim is:

1. In a printing machine, in combination, a roller and a supporting device for said roller adjustable to permit its axis to pivot at a plurality of points and under the center of a web variably positionable thereon and maintain equal tension on both edges of said web.
2. In a printing machine, in combination, a roller, means for supporting said roller and adjustable for permitting it to swing about a plurality of transverse axes, each of said axes being located at the center of a web variably positionable thereon while maintaining equal tension at both edges of said web.
3. In a device for equalizing the tension on both edges of a web of paper being fed to a printing machine, in combination, a roller and a supporting device for pivotally supporting said roller

said supporting device being adjustable to one position to permit the roller to swing on a central transverse axis and to another position to permit the roller to swing on a transverse axis at the center of a narrow web constantly running near one end of the roller.

4. In a device for equalizing the tension on both edges of a web of paper being fed to a printing machine, in combination, a roller and a supporting device for pivotally supporting said roller; said supporting device being adjustable to one position to permit the roller to swing on a transverse axis at the center of a web running near one end of the roller and to another position to permit the roller to swing on a transverse axis at the center of a web constantly running near the other end of the roller.

5. In a device for equalizing the tension on both edges of a web of paper being fed to a printing machine, in combination, a roller and a supporting device pivotally supporting said roller; said supporting device being adjustable to a plurality of positions whereby the roller may swing on a transverse axis at the center of a web that is centrally positioned with respect to the roller or positioned adjacent and running constantly over either end thereof.

6. In a device of the kind described, a roller having extending shaft ends, shoes secured to said shafts and slidably received in sockets, arms arranged on opposite ends of said shafts at positions differing by approximately 180°, members slidably secured to said arms and connected to manually controlled means, whereby when said manually controlled means are actuated, said members will be moved and said roller shifted from one position suitable for equalizing tension over a full width web to another position suitable for equalizing tension over a fractional width web.

7. In a device of the kind described, a roller rotatably mounted on a shaft having ends secured to non-resilient slidable members, a pair of arms arranged on said ends and projecting therefrom in opposite directions, links slidably connected to said arms, one of said links being hingedly secured to a portion of a printing machine, another link connected at one end to said last mentioned link and to an arm on a manually controlled shaft, a second member secured to said shaft and connected to the other of said arms by a link pivotally connected to another link slidably secured in the last mentioned arm.

8. In a mounting for a web roller for a printing machine, end supports movable oppositely to each other by variations in length of opposite edges of a web, said supports being so moved as to pivot the roller about an axis substantially in line with the center of a web running nearer one end of the roller than the other, whereby equal tension is maintained on both edges of the web.

9. A roller, a bearing for each end of said roller, means for supporting the bearings to permit one bearing to move transversely to the roller axis in one direction, and the other bearing to move transversely to the roller axis in the opposite direction a greater distance, whereby the transverse axis of the roller may be moved from a given position and fixedly secured in another position in order to equalize the tension on opposite edges of a web running around said roller and located nearer one end thereof than the other.

10. In a device of the character described, a roller rotatably mounted on supports and movable with said supports about a first transverse axis midway of the length of the roller and at the

center of a web running thereover, and means to pivot the roller about a second transverse axis, said second axis coinciding with the center of a web positioned nearer one end of the roller than the other.

11. In a device of the character described, a roller, and movable supports for said roller adapted to locate a transverse axis of oscillation of said roller so that it may pivot at the center of a narrow web running continuously upon and adjacent one end of the roller, whereby the said web may be maintained constantly at the end of the roller and the tension at the edges of said web equalized.

12. In a mounting for a web roller, end supports movable oppositely to each other by the pull of a web, and a resilient connection including a spring between the supports whereby the roller is moved bodily by variation in tension over the entire web, and swung to maintain equal tension on both edges of the web.

13. In a mounting for a web roller, end supports movable oppositely to each other by the pull of a web, and a yielding connection between the supports whereby the roller is moved bodily by variation in tension over the entire web, and swung on a transverse axis by unequal tension on opposite edges of the web.

14. In combination, two movable end supports, a web roller rotatable relatively to said supports, and a yielding connection between the supports whereby the roller is resiliently supported to maintain substantially constant web tension and equal tension on both edges of the web.

15. In combination, two movable end supports, a web roller rotatable relatively to said supports, and a yielding connection between the supports whereby the roller is resiliently supported to maintain substantially constant web tension and equal tension on both edges of the web; said connection being adjustable to increase the motion of one support relative to the motion of the other support.

16. In a mounting for a web roller, means movably and resiliently mounted for supporting said web roller, pivoted lever means secured to said first mentioned means, and other means including a spring adjustably secured on a bar joining the lever means for supporting the roller with variable resilience and maintaining equal tension on both edges of the web.

17. In a mounting for a web roller having shaft ends held in blocks fastened to rockingly mounted levers, a member joining the levers, means for angling and adjusting the member relatively to at least one of said levers, and resilient means adjustably secured to the member for varying the degree of resilience with which the roller is supported.

18. In a mounting for a web roller having shaft ends held to members movable in guide ways formed in a frame, said members being connected to pivoted levers joined by a bar adjustable relatively to one of said levers, and variable resilient means mounted on the bar, whereby said roller may be moved bodily by variations in tension in a web arranged on the roller, and swung to maintain equal tension on both edges of the web.

19. In a mounting for a web roller having a shaft, members supporting said shaft, said members being reciprocatingly mounted in guide ways and fastened to bell cranks pivoted to a frame, and resilient means mounted on a member connecting said bell cranks, whereby said first-mentioned members will move oppositely to each other by the pull of a web arranged on the roller for

maintaining equal tension on both edges of the web.

20. In a mounting for a web roller, the combination of end supports for the roller which are connected to lever means pivoted on a frame and joined by a bar, a spring adjustably secured at one end of said bar, and a stop connecting the lever means, whereby the end supports move oppositely to each other as the said roller swings on a transverse axis in response to variations in a web engaging same, and equal tension is maintained on both edges of the web, said spring being adjustable to vary the degree of yield of the roller bodily in response to the pull of the web.

21. In a device for equalizing tension on both edges of a web of paper being fed to a machine, in combination, a shaft, means for supporting the shaft, a roller rotatable on the shaft, an arm secured to the shaft beyond each end of the roller, said arms being oppositely disposed in relation to each other, pivot members about which said arms swing, and means for producing relative motion between the pivot members and the shaft, whereby the distance between one pivot member and the shaft may be increased, and simultaneously the distance between the other pivot member and the shaft will be decreased.

22. In a device for equalizing tension on both edges of a web of paper being fed to a machine having a frame, in combination, a roller rotatably supported in a supporting member, a pivot member adjustably secured to the frame and on which the supporting member swings to pivot the roller selectively about a plurality of transverse axes, and means for moving the pivot member relatively to the supporting member and parallel to the axis of the roller.

23. In a device for equalizing the tension on both the edges of a web of paper being fed to a printing machine, in combination, a web guiding roller, supporting means for the roller adapted to permit it to swing about a transverse axis, other means to which the supporting means is pivotally connected, and threaded means for moving said other means, whereby the transverse axis of rotation of the roller may be shifted from one position to another.

24. In a device for equalizing tension on both edges of a web of paper being fed to a machine having a frame, in combination, a roller about which the web is led, a supporting member having bearings for rotatably supporting the roller, said member having an arm beyond one end of the roller and an oppositely disposed arm beyond the other end of the roller, and pivot members connected to the frame and about which the said arms are arranged to swing, and thereby swing the roller bodily on a transverse axis.

25. In a device for equalizing the tension on both edges of a web of paper being fed to a machine having a frame, in combination, a shaft, a roller rotatable on the shaft, a pair of arms, said arms being secured to the shaft in oppositely disposed relation and beyond each end of the roller, and pivot members about which the arms swing and that are connected to the frame.

26. In a machine having a web running there-to, in combination, a roller adapted to have a web run thereover, a supporting device for the roller adjustable to cause one end of the roller to move a greater amount than the other end, to permit the roller to pivot selectively at a plurality of points substantially under the center of a web variably positionable thereon, and to maintain substantially equal tension on both edges of

said web, and means to adjust said supporting device.

27. In a device for equalizing the tension on both edges of a web being fed into a machine
5 operating thereon, in combination, a roller having a web running over an off-center portion thereof, a supporting device for rotatably supporting said roller and being adjustable to cause

the end of said roller that is nearer the web running thereover to move a lesser amount than the other end of said roller, to swing said roller on a transverse axis disposed substantially at the center of the web, and means to adjust said supporting device. 5

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