April 6, 1937. H. A. W. WOOD 2,076,421

TENSION ROLL DEVICE

Original Filed March 22, 1932 2 Sheets-Sheet 1

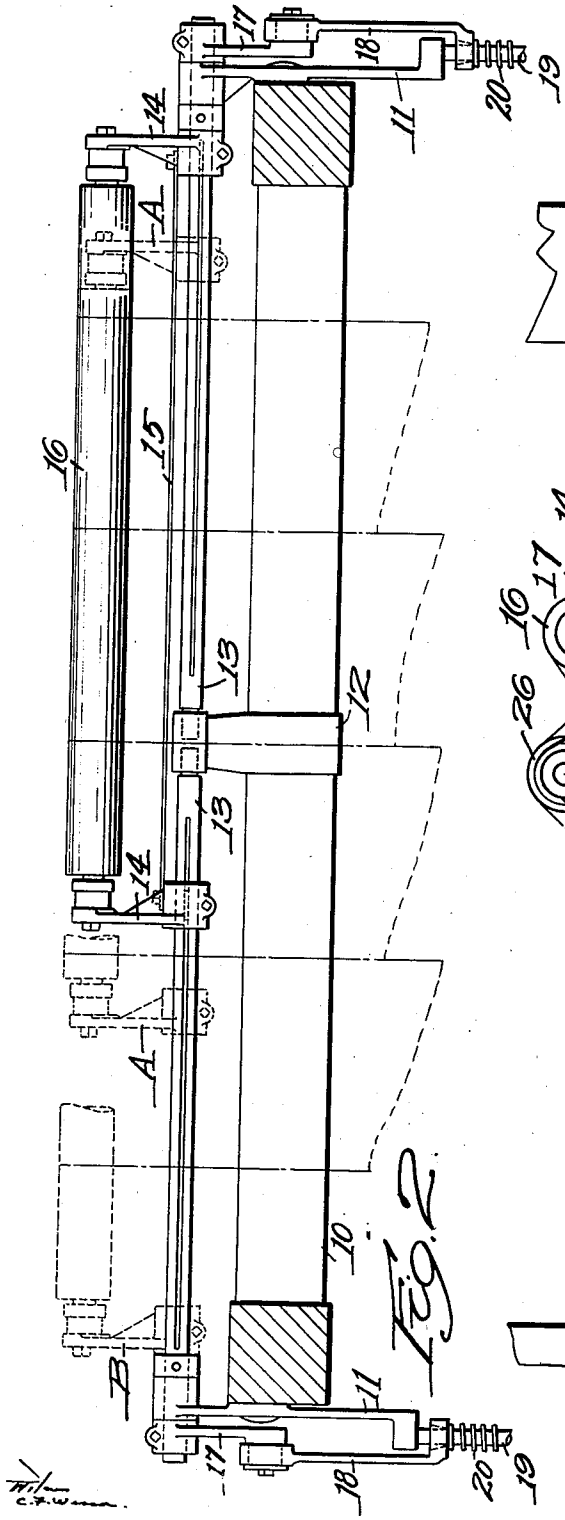


Fig. 2

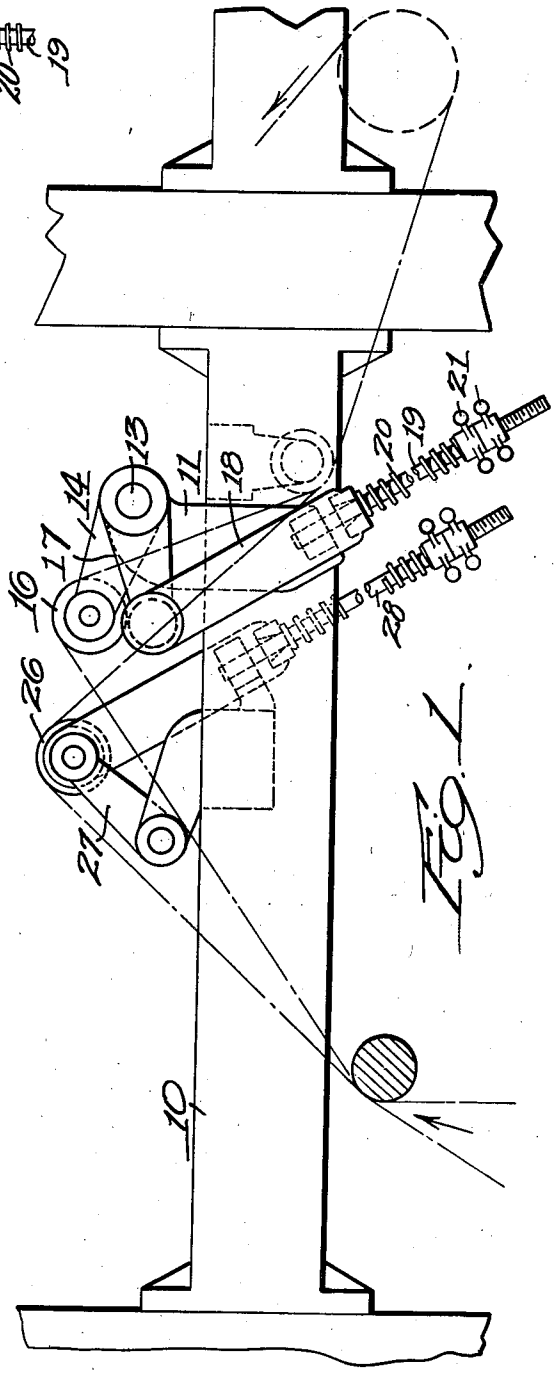


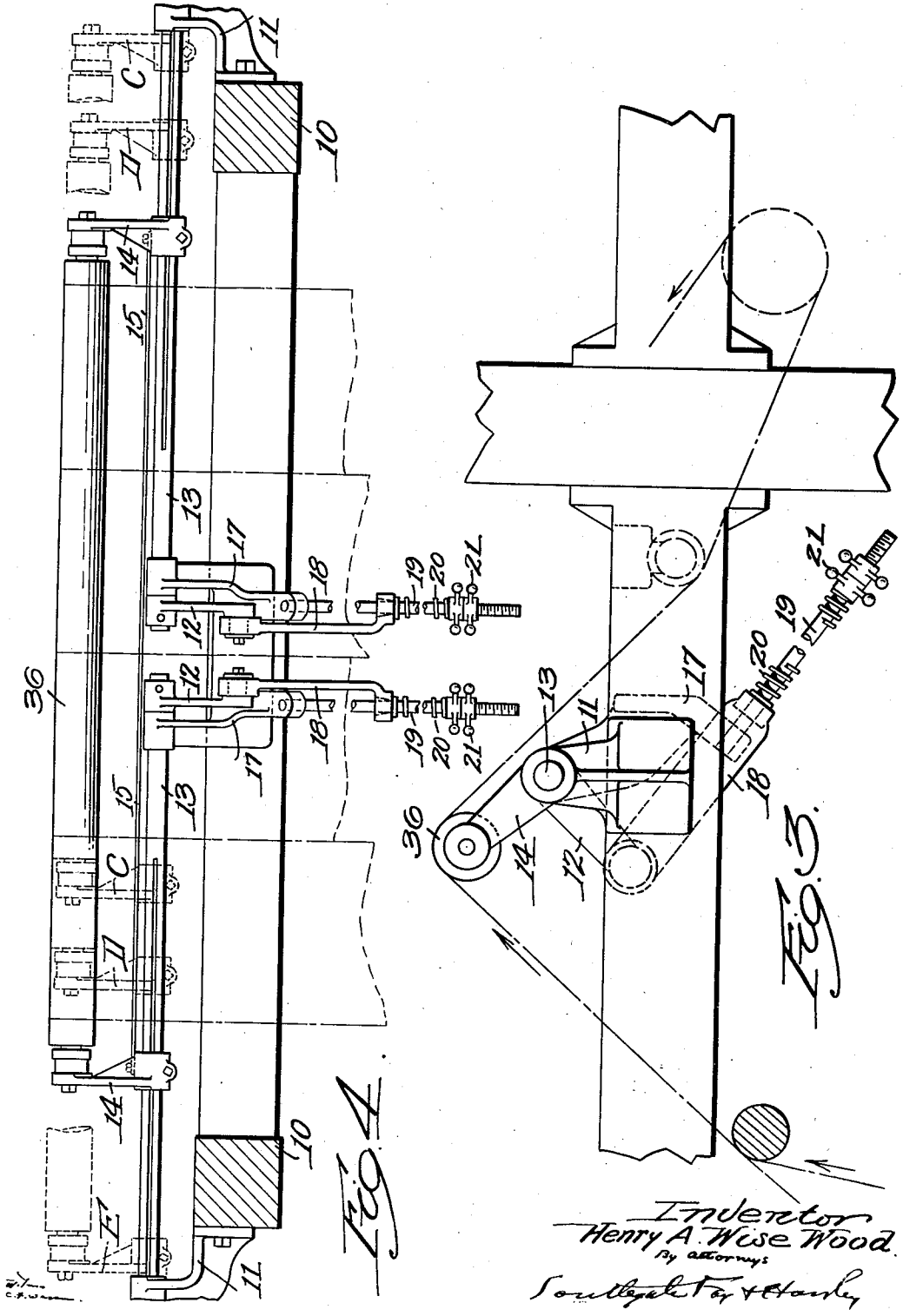
Fig. 1

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TENSION ROLL DEVICE

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4 Claims. (Cl. 271—2.1)

This invention relates to tension rolls of printing presses particularly but of course is capable of application to tension rolls of other kinds of machines feeding webs of paper or textile material.

The principal object of this invention is to provide a tension arrangement whereby webs of different widths can be carried over a tension roller in such a way that the center line of the web will pass over the middle of the roller to insure an even pull by equally regulated springs at both ends of the roller.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is an end view of a tension arrangement constructed in accordance with this invention;

Fig. 2 is a side elevation of the same;

Fig. 3 is a view similar to Fig. 1 but showing a modification, and

Fig. 4 is an elevation of that form of the invention.

Spring-pressed rollers are used ordinarily for guiding a wide web of paper to a printing press for the purpose of smoothing out unevenness of the web and irregularity of pull so as to minimize the chances of breakage. Webs of varying widths, that is full widths, half widths or three-quarter widths are used commonly. Heretofore it has been common to pass these narrow webs over the same tension rollers as are used for the full width webs. The narrow width webs are usually run at one end of this roller so that, with a roller having springs at both ends, an uneven pressure is brought to bear on the springs at the two ends. As far as I am aware the only practical attempt that has been made to equalize the tension on the web roller is made by weakening the spring on the side opposite to which the narrow web is run. This works fairly well under ordinary circumstances but not under heavy strain. Paper breaks result from this cause frequently.

This invention is designed to provide a tension arrangement whereby each width of web is carried over a tension roller arranged so that the center line of the web coincides with the middle of the roller to insure an equal pull with equally regulated springs at both ends.

In the form shown in Figs. 1 and 2, the frame 10 of the machine is provided with a pair of tension brackets 11 and with a center bracket 12 fixed in position. These brackets provide suitable mountings for two splined shafts 13. On these shafts are mounted arms 14, one arm on each shaft and these arms can be loosened up and moved along their respective shafts for the purpose of this invention. The two arms are shown as connected together by a tie-strap 15 to hold them the right distance apart and avoid the necessity of independently adjusting them.

The arms 14 carry bearings for a tension roller 16, which is of a short length capable of accommodating a three-quarter web. Fixed on the extreme ends of both of the shafts 13 are arms 17 whose free ends are pivotally secured to spring brackets 18. The other end of each spring bracket encircles a spring rod 19 provided with a spring 20. These springs abut against the bottom end of the spring brackets and are adjustably supported at the other end by internally threaded hand wheels 21 adjustable along the screw with which each spring rod 19 is provided.

The adjustment of each spring may be provided for by the operation of these hand wheels and the adjustments are independent at each end, of course. However, it is intended to get these adjustments alike. When force is to be used on these springs, it will be applied by the arms 14 and through the shafts 13 and eventually to the springs 20. This provides a yielding support for the spring roller at each end. The lower portions of the spring brackets abut against the ends of the brackets 11, thus constituting a stop to limit the upward motion of the tension roller 16.

In the full line position in Fig. 2, the tension roller 16 is suspended in a position to accommodate a half width web at the right side, that is a two page web for a printing press. In the dotted line position marked A the same roller is located to serve a three-quarter width web on the right-hand side. In the dotted line position marked B this roller accommodates a half width web on the left side. In each case the centers of the web and roller coincide. It is seldom that a single width web, that is a single page web, is employed as is well understood in the art, but adjustment can be made for it.

In this case the roller 16 is not used for a full width web but a separate roller 26 is used for that purpose having a pivoted frame 27 for supporting it and an adjustable spring construction 28 similar to that described or of any other type for adjusting it. When the full width web is used, the roller 26 acts as the tension roller and is so placed that the roller 16 will not interfere with the paper and vice versa.

In Figs. 3 and 4, the arrangement is according to the same general scheme, but somewhat different. In this case a single tension roller 36

is employed which is long enough to accommodate a full width web, as indicated by full lines in Fig. 4 and no second roller is employed. In this case the two shafts 13 are used supported in brackets 11 and 17 as before but, of course, the arrangement has to be much wider and overhangs both frames a little. Two brackets are used at the center instead of one. Furthermore, the adjusting mechanism 12, 18, 19, etc. is located at the center of the machine instead of on the sides. By placing the adjusting nuts 21 inside the roller arms 14 near the center line of the press, the adjustment of the tension on the two ends of the tension roller is facilitated and this adjusting mechanism is not located outside the press frame.

In the full line position in Fig. 4 the device is set to accommodate a full width web. In the dotted line position C a half width web on the right-hand side is accommodated. In the dotted line position D a three-quarter web on the right-hand side and in the position E a half width web on the left side can be accommodated. Of course, in both cases a three-quarter width web may be accommodated on the left side.

This arrangement is also capable of handling other width webs including a single width, that is, a width of one page, or widths of irregular sizes which is necessitated by the printing of narrow widths for special purposes. The positions shown in dotted lines are only arbitrarily taken and it is possible to shift the tension roller different distances so as to get accurate settings so that any width may be used, as is the case in all the conditions shown in both sheets, both in full and dotted lines.

A very flexible device is provided which will take care of a web of any width within its capacity and is capable of being set so that a web of all such widths will run concentrically with the roller and be subjected to an even pull at the two ends. This prevents paper breaks due to these tension rollers and provides for any desired adjustment in the resistance.

Although I have illustrated and described only two forms of the invention I am aware of the fact that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited in this respect but what I do claim is:—

1. In a web tensioning device, the combination of a web tension roller and a pair of arms on which the roller has bearings, of a pair of splined shafts, said arms being adapted to be fixed at any desired point along said shafts, one on each shaft, whereby the roller can be moved to a position to center it with the web being run, and yielding means connected with each of said shafts for applying tension to the web through the roller.

2. In a web tension device, the combination of a pair of spring brackets, a pair of longitudinal splined shafts in axial alignment with each other, an arm fixed to each shaft and each pivotally connected with one of said brackets, and a second arm adjustable along the spline of each shaft, the last two arms having bearings for a tension roller.

3. In a web tension device for a printing machine, the combination of a tension roller with two independently adjustable tension means, one for each end of the roller, both centrally placed with respect to the length of the roller in close proximity with each other.

4. In a web tension device for a printing machine, the combination with a tension roller whose length is longer than the width of a full width web used by the printing machine, of means by which the roller can be replaced longitudinally and held so that the middle of the roller substantially coincides with the center of the web, shafts in alignment and brackets splined to said shafts and movable therealong for supporting the two ends of the roller and adapted to be fixed in positions in which the center line of the roller will coincide either with the center line of a full width web or with the center line of a narrower width web.

HENRY A. WISE WOOD.