July 6, 1926. 1,591,547

M. PARIDON

WEB CONTROLLING MECHANISM

Filed Feb. 23, 1923 2 Sheets-Sheet 1

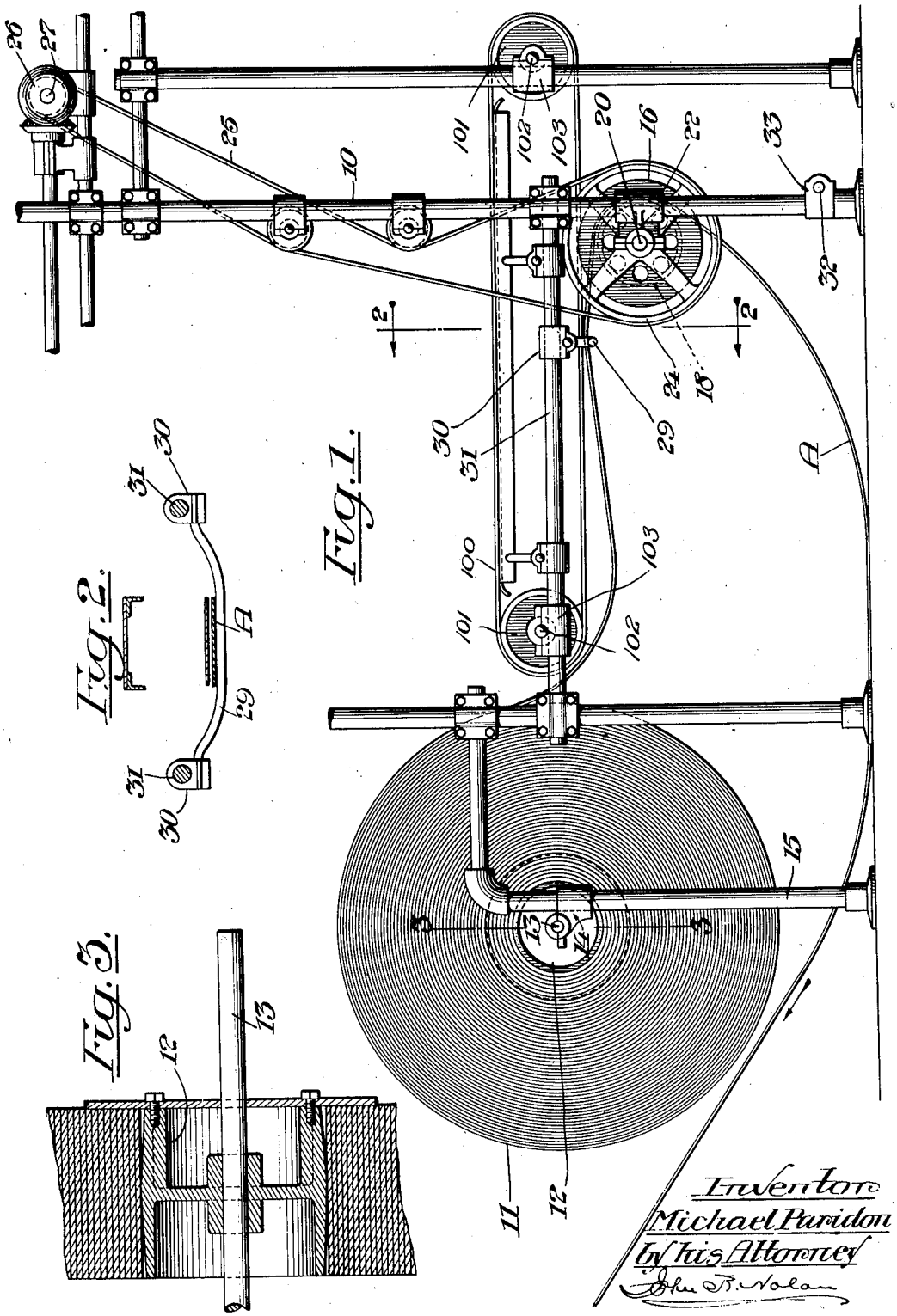


Fig. 1.

Fig. 2.

Fig. 3.

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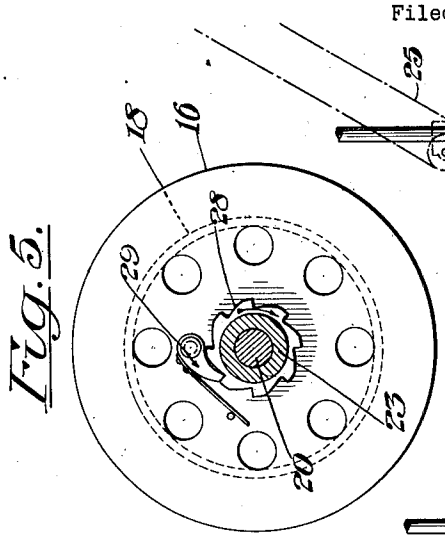


Fig. 5.

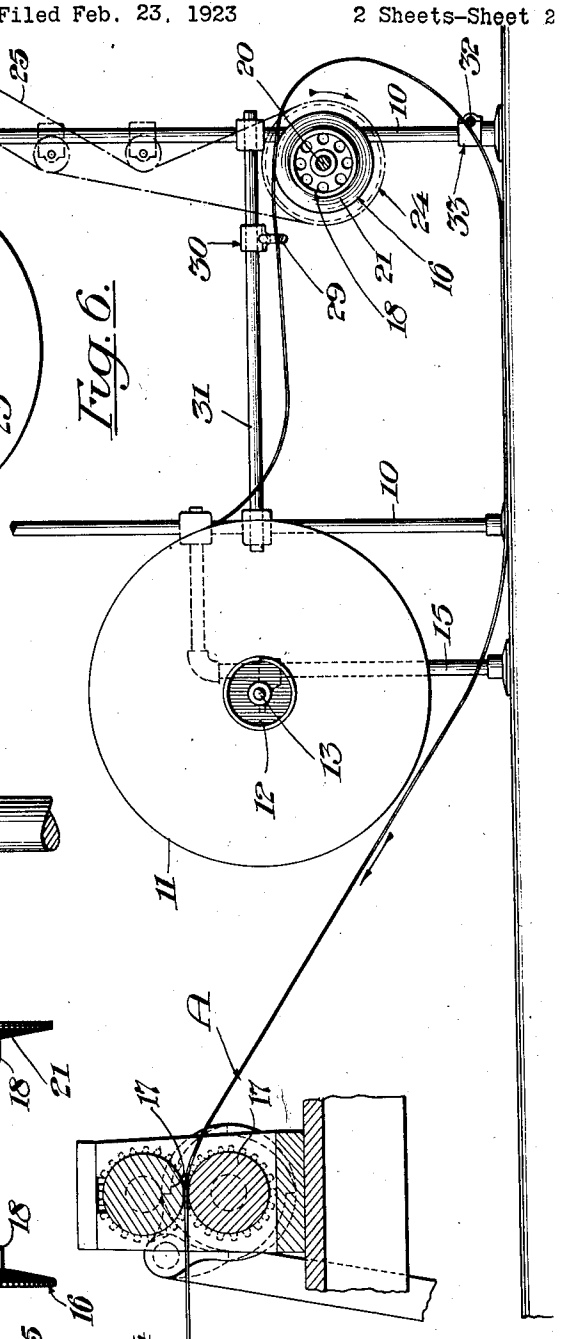


Fig. 6.

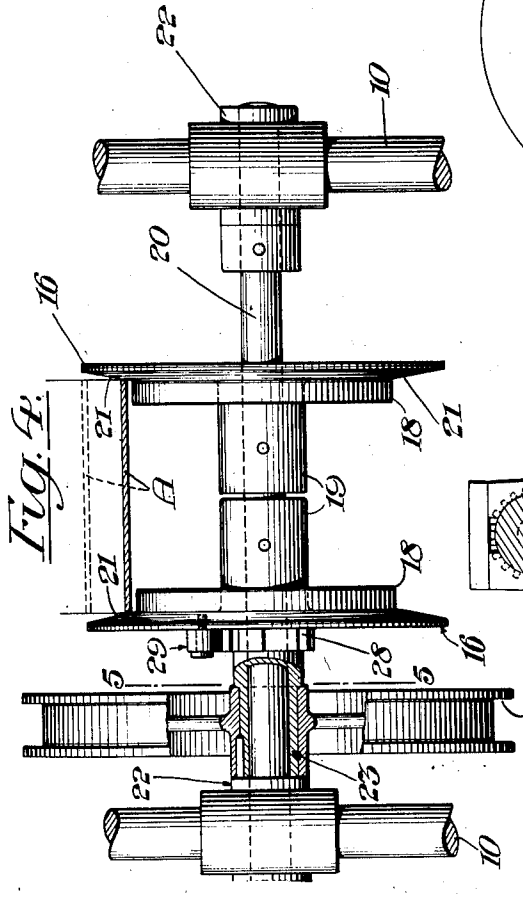


Fig. 4.

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UNITED STATES PATENT OFFICE.

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WEB-CONTROLLING MECHANISM.

Application filed February 23, 1923. Serial No. 620,585.

This invention relates to mechanism for controlling a web of paper in its travel from a supply roll to the intermittent feed mechanism of a paper working machine; such, for example, as a machine for making matches from heavy paper or cardboard. In such machines the web of paper is directed in a loop-like path from the roll to the feed mechanism, so as to provide a slack portion which permits the intermittent advancement of the paper without undue tension; but such slack portion, owing to the size and weight of the supply roll and its variable rotation as the relatively stiff paper is intermittently unwound therefrom, is frequently extended to an unnecessary and objectionable extent beyond the supply roll. In fact, the prolongation of the loop may continue during the succeeding impulses of the feeding mechanism until it becomes necessary to stop the machine and rewind the overrun material on the roll.

The object of my invention is to overcome the objection mentioned, and, accordingly, the invention comprises automatic web-controlling means of simple and efficient construction and operation, as will be hereinafter described and claimed.

In the drawings—

Figure 1 is a side elevation of a portion of a paper-match machine equipped with a form of web-controlling mechanism embodying the principle of my invention.

Fig. 2 is a transverse section adjacent a cross-bar upon which the web is supported after it leaves the supply roll, as on the line 2—2 of Fig. 1.

Fig. 3 is a transverse section through the rotary hub upon which the supply roll is mounted, as on the line 3—3 of Fig. 1.

Fig. 4 is a sectional elevation of the web take-off wheel, and its adjuncts.

Fig. 5 is a vertical section through the hub of the said wheel, as on the line 5—5 of Fig. 4.

Fig. 6 is a sectional elevation of the web-controlling mechanism, illustrating the loop in its inactive position in respect to the take-off wheel.

Referring to the drawings, 10 designates the standards of a portion of the supporting framework of a paper working machine, such, for example, as the delivery end of a match machine wherein a web of stiff paper or cardboard is operated upon. The usual take-off belt 100 of the match machine passes about pulleys 101 mounted on shafts 102 having their bearings in suitably-disposed brackets 103 on the supporting framework. 11 designates a roll of paper stock supported axially on a flanged hub 12 which is carried by a horizontal shaft 13 having its bearings in brackets 14 on suitably-disposed frame standards 15. Mounted in suitable bearings on the standards 10, which are located forwardly of the supply roll, is a wheel 16 about which the web of paper A from the roll is drawn; thence directed backward and under the supply roll, and thence upward to the bite of a pair of feed rolls 17 of the paper working machine; which rolls are geared together and intermittently actuated in the usual manner to advance succeeding uniform lengths of the web into the machine. Thus there is formed between the supply roll and the feed rolls a loop or slack portion of the web that tends to prevent undue tension of the paper as it is being intermittently advanced by the feed rolls. Heretofore the wheel comprised an idler roller about which the web was flexed. In consequence of the weight and size of the supply roll the paper as it was intermittently drawn therefrom, frequently over-ran the roll and produced an undue elongation of the loop as previously mentioned; particularly when the machine was running at relatively high speed. In pursuance of my invention the wheel 16 is so constructed and actuated in respect to the path of the web that said wheel co-operates with the web and its associated parts in such a manner as to prevent undue prolongation of the loop or slack portion under the varying conditions of service.

By reference more especially to Fig. 4 it will be observed that the wheel 16, in the form illustrated, comprises two peripherally-flanged heads 18 having central hubs 19 which are separately pinned to a transverse shaft 20 so that they may be nicely adjusted toward or from each other to ensure a predetermined distance between the inner faces of the flanges of the respective heads, which faces are oppositely beveled as shown at 21. The heads are so adjusted in spaced relation to each other that the web, when it is withdrawn from the supply roll, passes between the flanges, immediately above the periph-

eries of the heads and with the edges of the web in contact with the inclined faces of the flanges, for a purpose hereinafter explained. The shaft 20, which is mounted to rotate freely in bearings 22 supported by the standards 10, has loosely mounted thereon, adjacent one of the flanged heads, a sleeve 23 that is continuously rotated in any suitable manner. In the present instance the sleeve has fast thereon the hub of a pulley 24 that is continuously driven through a belt 25 from a pulley 26 on a driven shaft 27 of the match machine. The pulley 24 is driven in clockwise direction, as viewed in Figs. 1 and 6, that is, in the direction the paper roll 11 rotates when the web is being unwound therefrom. Fast on the sleeve 23 is a ratchet wheel 28 with the teeth of which engages a pawl 29 on the adjacent head 18, the angular relation of the ratchet teeth and pawl being such that the wheel, together with the shaft 20, is continuously rotated with the hub.

Adjacent the flanged wheel 16 is a cross-rod 29 supported by brackets 30 on horizontal bars 31 of the supporting frame of the match machine; the top of said rod being in a plane below the tops of the wheel flanges. A cross-rod 32 is supported in brackets 33 on the standards 10 and in proximity to the floor.

The free end of the paper web is drawn from the supply roll through a path above the rod 29 and between the upper portions of the beveled flanges of the continuously rotating wheel 16; thence the web is flexed downwardly about said wheel and drawn rearwardly therefrom beneath the supply roll; thence into engagement with the bite of the feed rolls 17 of the match machine. The pawl and ratchet connection between the wheel 16 and the actuating sleeve 23, permits free and independent rotation of the wheel as the web is being pulled around the same and towards the feed rolls preparatory to engagement with the latter. During the operation of the machine the beveled flanges of the continuously rotating wheel effectively grip the edges of the web and draw it progressively from the supply roll at such a speed in relation to the operation of the feed rolls as to produce a substantially uniform slack portion between the wheel and the feed rolls, which portion sags upon and in frictional contact with a suitable supporting surface that is conveniently afforded by the floor. The wheel thus constitutes a take-off element for the web and the floor a frictional retarding element therefor. The pressure of the edges of the web against the inclined flanges of the take-off wheel, and the drag of the web on the floor effectually prevent the too rapid withdrawal of the web from the supply roll during the normal operation of the machine, which result is also contributed to by the contact of the web with the cross-rod 29. If, at any time, an excess of material should be withdrawn from the supply roll, the resulting extended lower portion of the loop, bearing against the floor, will be retarded in its progress and the loop thus be bodily projected to the right and against the lower cross-rod 32 in such a manner that the upper portion of the loop, by virtue of the inherent flexibility of the material, will be raised from contact with the inclined faces of the flanges of the wheel and thereby be disengaged from the latter. Such portion will thus be supported adjacent the wheel by the cross-rod 29, while the cross-rod 32 will act as an abutment to prevent the undue projection of the curved portion of the loop, as seen in Fig. 6. Hence in the next succeeding impulses of the feed rolls, the web will be advanced in a manner to take up the surplus of the loop projection and position the web in contact with the inclined faces of the flanges of the take-off wheel, as seen in Fig. 1. This done, the uniform feeding of the web will be resumed and continued, but in the event of an overrun of the material from the supply roll the resulting undue projection of the loop will be prevented, and the irregularity automatically corrected, as previously described; and so on.

It is to be noted that the face of the web does not bear upon the peripheries of the heads 18 of the take-off wheel, but that the edges of the web contact with, and are acted upon by the beveled surfaces only of the flanges, which surfaces, at their web engaging portions, travel at a speed proportionate to the advancing action of the feed rolls on the web. Consequently an effective contact between the wheel and the web to accomplish the advancement of the latter from the supply roll is ensured, and yet the web can be quickly disengaged from or as readily reengaged with the wheel to meet the varying requirements hereinbefore mentioned.

It is to be understood that my invention is not limited to the particular construction herein disclosed, as the mechanism may be modified within the principle of the invention and the scope of the appended claims.

I claim—

1. In a machine having means for feeding a web of material in successive lengths, and means for supporting a roll of said material in such position that it can be directed in a loop-like path to the feeding means, the combination with said feeding and supporting means, of a take-off wheel having spaced flanges with oppositely inclined acting surfaces between which the web is adapted to be positioned in its loop-like path, means for continuously rotating said wheel to unwind the material progres-

sively from the roll and produce a slack portion of the loop between the wheel and the feeding means, and means for retarding the travel of said slack portion to effect the automatic raising of the web above the acting surfaces of the wheel flanges when excess material is unwound from the roll.

2. In a machine having means for feeding a web of material in successive lengths, and means for supporting a roll of said material in such position that it can be directed in a loop-like path to the feeding means, the combination with said feeding and supporting means, of a take-off wheel having spaced flanges with oppositely inclined acting surfaces between which the web is adapted to be positioned in its loop-like path, means for continuously rotating said wheel to unwind the material progressively from the roll and produce a slack portion of the loop between the wheel and the feeding means, means for retarding the travel of said slack portion to effect the automatic raising of the web above the acting surfaces of the wheel flanges when excess material is unwound from the roll, and an abutment member for the loop during its disengaging movement.

3. In a machine having means for feeding a web of material in successive lengths, and means for supporting a roll of said material in such position that it can be directed in a loop-like path to the feeding means, the combination with said feeding and supporting means, of a take-off wheel having spaced flanges with oppositely inclined acting surfaces between which the web is adapted to be positioned in its loop-like path, means for continuously rotating said wheel to unwind the material progressively from the roll and produce a slack portion of the loop between the wheel and the feeding means, means for retarding the travel of said slack portion to effect the automatic raising of the web above the acting surfaces of the wheel flanges when excess material is unwound from the roll, a supporting member for the web adjacent the take-off wheel, and an abutment member for the loop during its disengaging movement.

4. In a machine having means for feeding a web of material in successive lengths, and means for supporting a roll of said material in such position that it can be directed in a loop-like path to the feeding means, the combination with said feeding and supporting means, of a take-off wheel having spaced flanges with oppositely inclined acting surfaces between which the web is adapted to be positioned in its loop-like path, means for continuously rotating said wheel to unwind the material progressively from the roll and produce a slack portion of the loop between the wheel and the feeding means, said last-named means permitting free rotation of the wheel relatively thereto, and means for retarding the travel of said slack portion to effect the automatic raising of the web above the acting surfaces of the wheel flanges when excess material is unwound from the roll.

Signed at Barberton, in the county of Summit and State of Ohio, this 19th day of February A. D. 1923.

MICHAEL PARIDON.