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EMBOSSING, PERFORATING, AND REWINDING MACHINE

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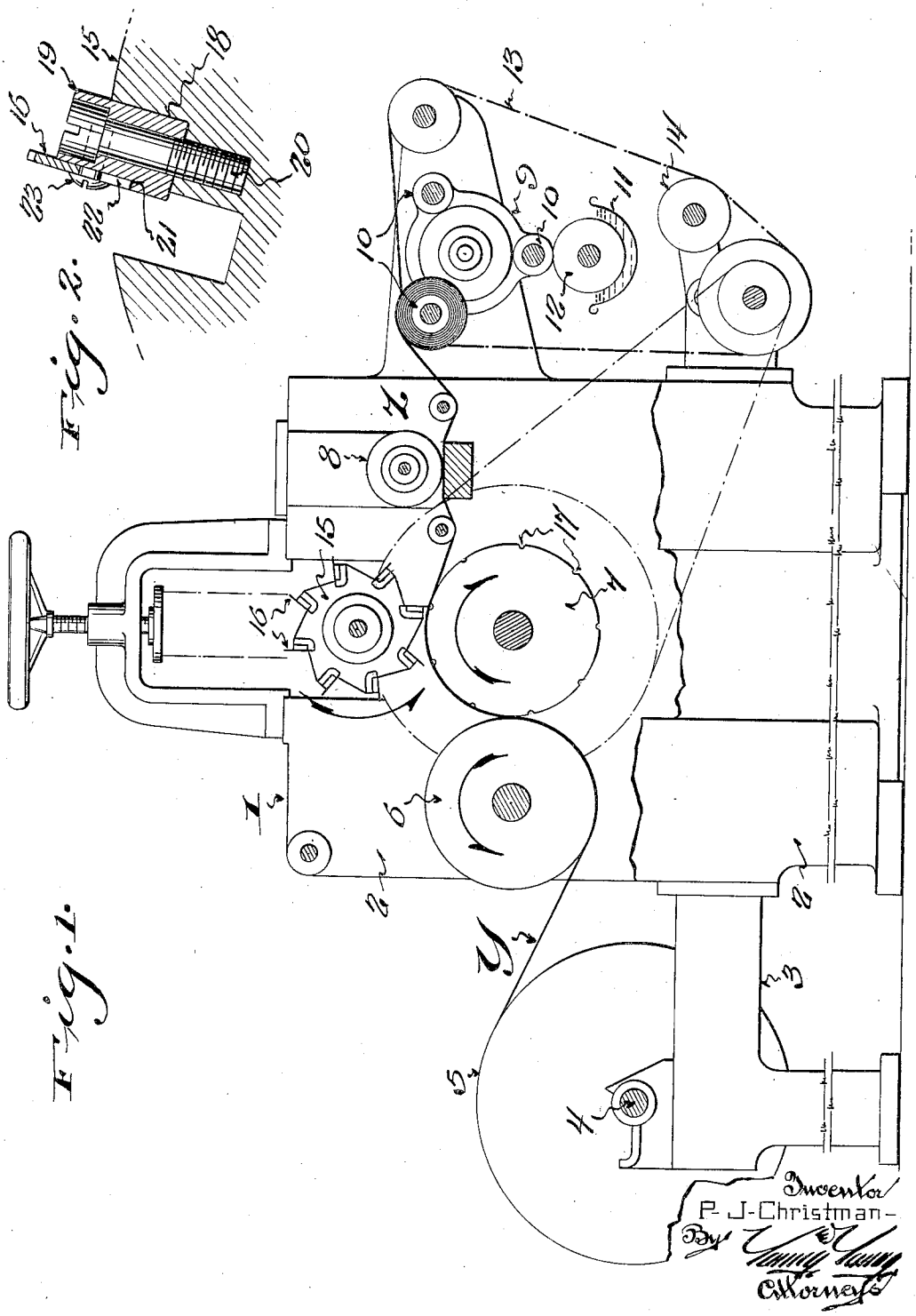


Fig. 2.

Fig. 1.

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EMBOSSING, PERFORATING, AND REWINDING MACHINE

Peter J. Christman, Green Bay, Wis.

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2 Claims. (Cl. 101—23)

This invention pertains to improvements in embossing, perforating, and re-winding machines employed in converting a web of paper to rolls of toilet paper, paper towels, or the like.

Heretofore machines of the foregoing type have utilized a steel embossing roll provided with spaced perforating knives for both embossing and perforating the web. The objection to the foregoing machine resides in the fact that the perforated web must always be embossed, whereas in some instances it is desired to eliminate embossing, thus requiring either a separate machine, or removing the embossing roll.

Another serious objection resides in the difficulty encountered in attaching the perforating knives in the steel embossing roll, inasmuch as the only practical way in which this can be accomplished is to weld or caulk the knives into narrow slots in the embossing roll, in order that the embossing can be brought into close proximity to the perforations. Different grades of paper require different forms of perforation, and obviously the foregoing arrangement will not permit changing of the perforating knives. Others run the web through an embossing machine placed ahead of a conventional perforating and re-winding machine.

It is, therefore, a primary object of the present invention to overcome the foregoing objections by the provision of a comparatively simple and inexpensive re-winding machine, incorporating in a unitary structure independent embossing and perforating means, whereby both operations may be performed, or merely perforated when desired, and in which the perforating knives may be easily changed to compensate for different grades of papers.

Incidental to the foregoing, a more specific object of the present invention resides in the provision of a re-winding machine, having a bed roll over which the web of paper is run, and an embossing roll and perforating head independently cooperating with the bed roll for performing their respective operations.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the novel construction, combination and arrangement of parts, substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

In the accompanying drawing is illustrated one complete example of the physical embodiment of the present invention constructed according to the best mode so far devised for the practical application of the principles thereof.

In the drawing:

Figure 1 is a more or less diagrammatic view, comprising a partial side elevation and section of a machine constructed in accordance with one form of the present invention, and

Figure 2 is an enlarged fragmentary detail section, illustrating the manner in which the perforating knives are mounted on the perforating head.

Referring now more particularly to the accompanying drawing, the numeral 1 designates generally a frame comprising side members 2, and having secured to their forward ends suitable standards 3, in which the arbor 4 of a parent roll 5 is journaled. From the parent roll 5 the web Y is passed under a steel embossing roll 6 journaled in the side frames 2, and then trained over a bed roll 7, also journaled in the side frames, from which it passes through a slitting mechanism Z, comprising one or more circular knives 8 for slitting the web longitudinally. From the slitting mechanism the web goes to a re-winding device of conventional structure, comprising a rotatable head 9 having a plurality of arbors 10 journaled therein.

Below the head 9 is a glue reservoir 11 having a transfer roll 12 partially submerged therein, for applying glue to the arbors 10 as the head 9 is rotated. As is customary in re-winding mechanisms of this type after an arbor has received its roll, the head 9 is rotated, and the web is taken by the succeeding arbor, after being severed by a conventional chopping mechanism. As each arbor moves into its receptive position, the same is rotated by means of a belt drive 13, the tension of which is maintained at all times by a floating idler pulley 14.

The foregoing is more or less conventional practise in various types of converting machines, and therefore comprises no specific part of the present invention other than in the general combination, as hereinafter set forth in the claims.

Positioned above the bed roll 7, which is usually formed of paper, or similar soft material, is a perforating head 15, which carries a plurality of perforating knives 16, detachably secured to the head, as will be hereinafter described in detail, and cooperating with notches 17 formed in the bed roll.

As best shown in Figure 2, the cutter head 15 is provided with transverse recesses 18 for the reception of the bars 19 secured to the head by

screws 20, or any other suitable attaching means. The forward faces of the bars are cut away at 21 for reception of the perforating knives 16, which are provided with slots 22 in their lower edges for straddling the attaching screws 23. Obviously, in order to change or replace the perforating blade 16, it is merely necessary to loosen the screws 23 sufficiently to release the blades, which operation can be readily accomplished with little effort and a minimum loss of time.

No attempt has been made to illustrate the drive for the various rolls, inasmuch as it will be obvious to any one skilled in this particular art that the same can be readily accomplished in various ways by means of belts or gearing, the drive being so timed as to effect the desired cooperation between the various elements.

While the operation of the present invention will undoubtedly be apparent from the foregoing explanation, it is pointed out that as the web passes between the rolls 6 and 7, the embossing operation takes place, after which the perforating head 15, cooperating with the bed roll 7, performs the perforating operation. In machines of the present type it is customary to run a wide web, in order to increase production, and therefore the slitting mechanism Z is employed for severing the web longitudinally into a plurality of completed rolls of the desired width, the completed rolls being wound in desired lengths, in the manner heretofore described.

From the foregoing explanation, it will be apparent that a comparatively simple, inexpensive, and unitary machine has been provided, in which the embossing and perforating mechanisms function independently of each other, thus enabling the operator to eliminate embossing, if desired, by merely shifting or removing the embossing roll, so that it will not function in cooperation with the bed roll, and in which replacement of the perforating knives for various grades of paper is materially facilitated.

It is to be understood that the invention contemplates various modifications, as for instance, the perforating operation may take place ahead of the embossing, the salient feature residing in the provision in a unitary mechanism of independent embossing and perforating means.

I claim:

1. In a machine of the character described, a bed roll upon which a web of paper is embossed, a steel embossing roll working against said bed roll and a rotary head spaced from said bed roll and provided with detachable knives cooperating with said bed roll to transversely perforate said embossed web.

2. In a machine of the character described, a bed roll upon which a web of paper is embossed, said bed roll being provided with spaced longitudinal notches, a steel embossing roll working against said bed roll and a perforating mechanism cooperating with said bed roll and comprising, a rotary head spaced from said bed roll, and a plurality of knives detachably connected to said head for projection into said notches to transversely perforate said embossed web.

PETER J. CHRISTMAN.