Sept. 22, 1931. W. H. CANNARD 1,823,877

WEB CONVERTING APPARATUS

Original Filed May 7, 1926

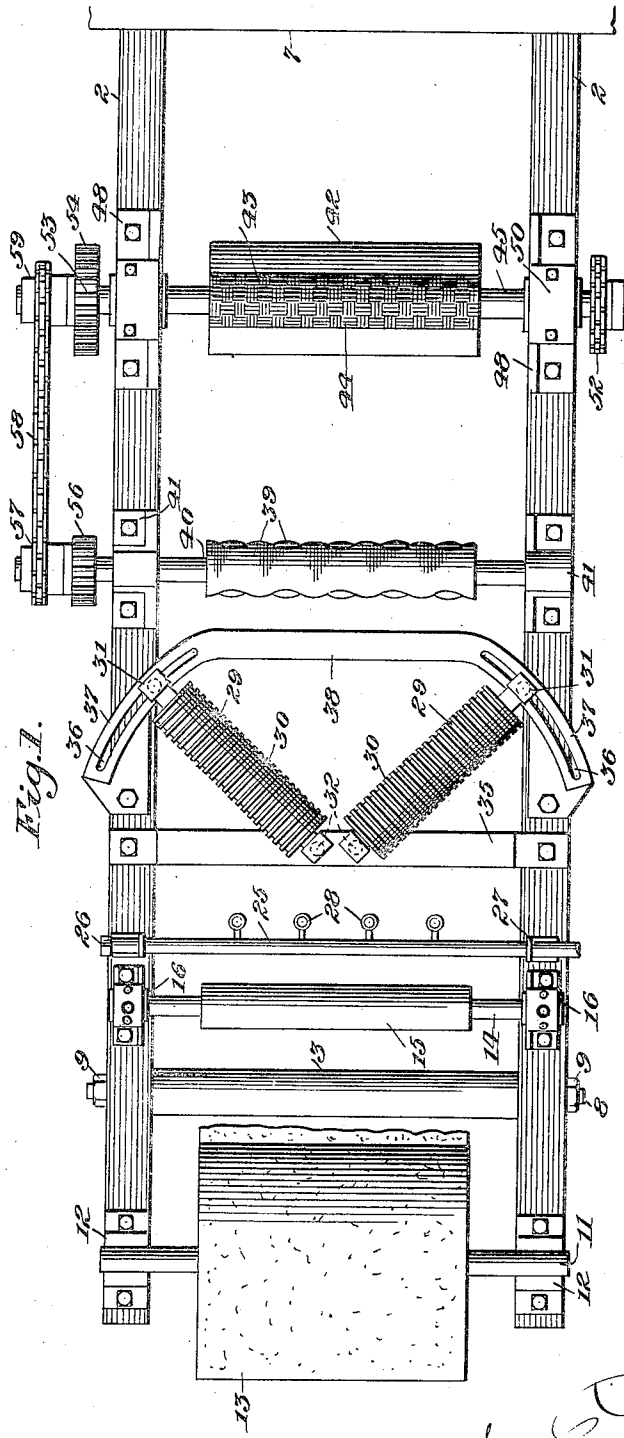


Fig. 1.

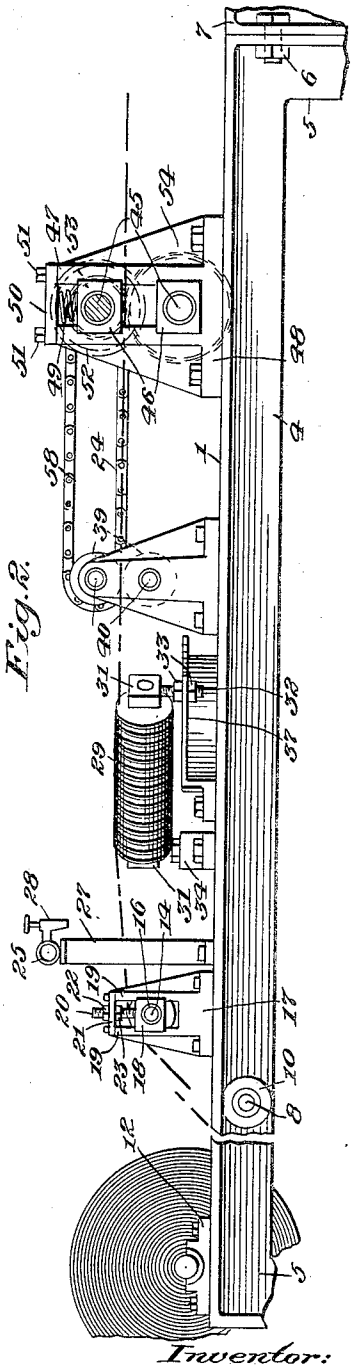


Fig. 2.

Inventor:
Wm. H. Cannard,
by Emmas H. Lamm
Atty.

Patented Sept. 22, 1931

1,823,877

UNITED STATES PATENT OFFICE

WILLIAM H. CANNARD, OF GREEN BAY, WISCONSIN

WEB CONVERTING APPARATUS

Original application filed May 7, 1926, Serial No. 107,474. Divided and this application filed January 31, 1928. Serial No. 250,866.

This invention relates to web converting apparatus and, in its more specific aspect, involves mechanism for and a method of creasing, crinkling or embossing a web of paper or the like material to render it elastic in one or more directions.

The present application is a division of application 107,474 web handling apparatus, filed by me on May 7, 1926, issued as Patent No. 1,692,720, dated May 20, 1928.

An object of the invention is the provision of a mechanism of this character which may be directly mounted upon a folding, interfolding, or other form of web-converting machine and, when so mounted, is capable of drawing a web of material from a supply roll, then in turn spreading, moistening, narrowing, corrugating and embossing the web and finally feeding it to the associated converting machine.

A further object of the invention is to provide a web embossing apparatus including adjustable means for crinkling and simultaneously transversely narrowing a traveling web prior to the embossing operation to prevent tearing or breaking of the fibers thereof by the embossing instrumentalities.

A still further object of the invention is to provide a web crinkling, creasing or embossing machine in the nature of an attachment for a web-converting machine which will constitute therewith a unitary apparatus whereby the preparing of the web for the converting machine and the converting of the prepared web may all be accomplished by a single continuous operation in much less time and with less labor than would be possible with a plurality of separately operating machines.

My inventive-concept also involves a unique method of crinkling and embossing paper or the like, in the practice of which said apparatus may be employed.

With these and other objects in view, as will become apparent as the description proceeds, the invention consists of the novel features of construction, combinations of elements, and arrangements of parts hereinafter to be fully described and pointed out in the claims.

My inventive-concept is susceptible of embodiment in a variety of instrumentalities; but I have, in the accompanying drawings, shown the same in a preferred embodiment and one which I have demonstrated as highly practical, efficient and satisfactory. It is to be understood, however, that these drawings are, and are intended to be, merely illustrative and that the machine as herein revealed is capable of a wide range of modification and variation without departing from the underlying principles or salient features of the invention; and, likewise, that other embodiments may be resorted to and yet be within the spirit thereof.

In these drawings:

Figure 1 is a view in plan of an apparatus constructed in accordance with said preferred embodiment thereof associated with a web-converting machine, a fragmentary portion only of the frame of the converting machine being shown; and

Figure 2 is a view in side elevation thereof.

Referring to the particular embodiment of the invention illustrated in the accompanying drawings, the reference-character 1 designates, generally, a supporting frame upon which are mounted the several instrumentalities of the apparatus. This frame preferably comprises a pair of similar flanged side-members 2 which are spaced apart by one or more (one only being shown) tubes or pipes 3, the opposite ends of which engage the depending flanges 4 of the respective members. As shown, each member 2 is provided at each of its ends with an integral portion 5 extending at right angles thereto to constitute supporting standards or legs for the frame and, if the apparatus is to be operatively associated with a converting machine or the like, one portion 5 of each of the side-members may be bolted, as at 6, directly to the frame 7 of said converting machine. A rod 8, passing through the tube 3 and at opposite points through the flanges 4 of the respective members 2, and nuts 9 mounted on opposite ends thereof and in engagement with integral strengthening bosses 10 on the respective members, serve to maintain the relative positions of the tube and the

frame members fixed and the latter in spaced parallel relation.

A transverse shaft 11, removably mounted in suitable bearings 12 fast to the respective side members 2 adjacent one end of the frame, serves rotatably to support a supply roll 13 of paper or the like material with its longitudinal axis slightly above the upper surface of the frame. It will be observed that the bearings 12 do not overlie the shaft 11, which makes it possible quickly to lift out a shaft from which all of the material has been drawn and substitute therefor another shaft upon which a new roll of material has already been mounted.

A transverse shaft 14 carrying a spreader roll 15 is rotatably mounted in bearings 16 adjustably carried by pedestals 17 fast to the respective frame members 2. As shown, each bearing 16 is fast within a block 18 slidably mounted on one of the pedestals 17 between the spaced portions 19 of the bifurcated upper end thereof and a threaded bolt-member 20 fast to and extending upwardly from the block 18 passes through a top cross-piece 21 of the pedestal and may be secured in adjusted positions by means of nuts 22 and 23 mounted thereon above and below the cross-piece, respectively. The function of this spreader roll is to insure that a web of material passing from the supply roll through the machine (as indicated by broken line 24 in Fig. 2) may be fully spread out for effective action thereon by the moistening instrumentalities about to be described.

A pipe 25, closed at one end, as at 26, and adapted to have its other end connected in any suitable manner to a source of water supply, is supported by a pair of L-shaped standards 27 adjacent the spreader roll at a height above the plane of travel of the web and is provided with a plurality of valved outlet nozzles 28 for applying any desired quantity of moisture to the web as it travels thereunder.

Means for crinkling and simultaneously narrowing the moistened web prior to action thereon by the embossing instrumentalities is provided in order that there may be a sufficient quantity of material, crosswise thereof, in the web when it is presented to said instrumentalities to insure against tearing of the web or breaking of the fibers of the web thereby.

Preferably and as shown, this means comprises a pair of freely rotatable rolls 29 having their outer surfaces transversely corrugated as at 30 and mounted in diverging relation above the plane of the frame 1 in position to engage the web 24 as it is drawn thereover. Bearing blocks 31 which support the ends of the rolls 29 are provided with integral depending bolts 32, upon each of which is mounted a pair of nuts 33 for locking the blocks in adjusted positions with respect to their supports. The blocks 31 which support the inner ends of the rolls 29 are thus secured, in adjacency, to a central offset portion 34 of a fixed transverse supporting members 35 and their bolts 32 constitute pivots about which the respective rolls may be moved to vary the angular relation thereof. The bolts 32 of the blocks 31 which support the outer ends of the rolls 29 are positioned in slots 36 provided in arcuate portions 37 of a substantially C-shaped supporting-member 38 fast at its ends to the respective side-members 2 of the frame. This construction makes it possible to lock the rolls 29 in a plurality of different positions both with respect to each other and with respect to the plane of the frame 1 without affecting the easy rotation thereof. As the positions of the rolls affect the action thereof upon the web traveling thereover, it will be seen that the characteristics of the web produced by the apparatus may be widely varied by the adjusting means provided.

While the above-described means for crinkling and transversely narrowing the web or webs being fed through the apparatus is preferred by reason of its simplicity and efficiency, it is to be understood that my inventive-concept contemplates the possible substitution of other means in this apparatus for this purpose. For instance, each of my pending applications, Serial No. 704,867 "crepe and method of and apparatus for making the same", filed April 7, 1924, issued as Patent No. 1,680,203, dated Aug. 7, 1928; Serial No. 704,868 "crepe paper or the like material and method of and apparatus for producing the same"; filed April 7, 1924, issued as Patent No. 1,595,991 dated Aug. 17, 1926; and Serial No. 15,515 "crepe and the like", filed March 14, 1925, issued as Patent No. 1,716,260 dated June 4, 1929, discloses means for creping and transversely narrowing as well as for corrugating a web of material, which may be readily substituted in this apparatus for the structure shown and described above.

A pair of juxtaposed corrugating-rolls 39, the shafts 40 of which have suitable bearing in standards 41 fast to and upstanding from the respective frame members 2 and between which the web 24 is fed after its passage over the crinkling and narrowing rolls 29, serve to further narrow the web preparatory to the the embossing thereof.

Preferably and as shown, the embossing mechanism comprises a comparatively large smooth-surfaced roll 42 and a smaller cooperating roll 43 having its outer surface embossed with any desired design 44 which is to be impressed upon the web. Shafts 45 of the rolls 42 and 43 are journaled in bearing blocks 46 slidably mounted between spaced arms 47 of pedestals 48 made fast to the respective side-members 2. The roll 43 is disposed above the roll 42 and is forced down thereupon, not only by its own weight, but

also by the force of coiled springs 49, the opposite ends of the latter bearing, respectively, against the upper bearing blocks 46 and a cross-bar 50 secured to and connecting the spaced arms 47. The effective pressure of the springs 49 may be varied as desired by adjustment of the machine-screws 51.

Roll 42 has mounted on its shaft 45 a gear 52 by which it may be driven, either by an independent source of power, such as a motor (not shown) or, when the apparatus is to be associated with a converting machine to constitute a unitary apparatus therewith, by intervening gearing or belting (not shown) from the source of power driving the converting machine. In the latter case, the gearing or ratio of the pulley diameters must be such as to cause the rolls 42 and 43 to draw the web 24 from the supply roll and feed it to the converting machine at the speed required by the latter. Preferably and as shown, coacting gears 53 and 54, fast, respectively, to the shafts 45 of rolls 43 and 42 and varying as to diameter in proportion to the diameters of these rolls, serve to cause the latter to rotate in opposite directions with equal peripheral speed.

The web will contain a certain amount of moisture therein when it is fed from the embossing rolls and in order to take this moisture out and leave the web in a suitable dry state to be packed or converted, either of the rolls 42 or 43 may be internally heated or one or more of the pull or feed rolls, common to all web-converting machines, may be heated for the same purpose.

What I claim is:

1. An attachment for web-converting machines comprising a frame adapted to be secured to a converting machine; a supply roll of material rotatably carried by the frame; a pair of rolls, one of which has an embossed surface, mounted in coactive operative relation upon the frame; means whereby the pair of rolls may be driven at equal peripheral speed and in opposite directions to draw a web of material from the supply roll therebetween; and means carried by the frame intermediate the supply roll and said pair of rolls for simultaneously crinkling and narrowing the web preparatory to action thereon by said embossed roll.

2. An attachment for web-converting machines comprising a frame, means for rotatably supporting a supply roll of material upon the frame, means carried by the frame and including a pair of coacting embossing rolls for drawing a web of material from the supply roll and between the embossing rolls, and means mounted intermediate the supply roll and the embossing rolls for simultaneously crinkling and transversely narrowing the web as it passes thereover.

3. An attachment for web-converting machines comprising a frame adapted to be secured to a converting machine; a supply roll of material rotatably carried by the frame; a pair of rolls, one of which has an embossed surface, mounted in coactive operative relation upon the frame; means whereby the pair of rolls may be driven at equal peripheral speed and in opposite directions to draw a web of material from the supply roll therebetween; means carried by the frame intermediate the supply roll and said pair of rolls for simultaneously crinkling and narrowing the web; and means intermediate the crinkling and narrowing means and the pair of rolls for corrugating the web further to narrow it.

4. A device of the character described comprising a frame; a supply roll of material to be treated rotatably mounted thereon; a pair of coacting embossing rolls mounted in operative position upon the frame; means whereby the embossing rolls may be driven in opposite directions to draw a web of material from the supply roll therebetween; means for spreading the web as it is drawn from the supply roll; means for moistening the spread web; means for simultaneously crinkling and transversely narrowing the moist web; and means for corrugating the web further to narrow it prior to action thereon by the embossing rolls.

5. The combination with a web-embossing apparatus including a frame, a web supply roll mounted thereon, a pair of coacting embossing rolls and means for driving the embossing rolls to draw the web from the supply roll and between the embossing rolls, of means for simultaneously crinkling and narrowing the web including a pair of diverging and freely rotatable rolls disposed on the frame to underlie the web and to be rotated thereby.

6. The combination with a web-embossing apparatus including a frame, a web supply roll mounted thereon, a pair of coacting embossing rolls and means for driving the embossing rolls to draw the web from the supply roll and between the embossing rolls, of means for simultaneously crinkling and narrowing the web including a pair of adjustably diverging and freely rotatable rolls disposed on the frame to underlie the web and to be rotated thereby.

7. In a machine for forming embossed crepe, a frame, means for drawing a web of material over the frame in spaced relation thereto, and means including a pair of rolls mounted in diverging relation above the frame and in contact with the web for transversely narrowing the web as it passes thereover.

8. In a machine for forming embossed crepe, a frame, means for drawng a web of material over the frame in spaced relation thereto, and means including a pair of freely rotatable rolls mounted in diverging

relation above the frame and in contact with the web for transversely narrowing the web as it passes thereover.

9. In a machine for forming embossed crepe, a frame, means for drawing a web of material over the frame in spaced relation thereto, and means including a pair of rolls adjustably mounted in diverging relation above the frame and in contact with the web for transversely narrowing the web as it passes thereover.

10. In a machine for forming embossed crepe, a frame; means, including a pair of coacting embossing rolls, for drawing a web of material over the frame in spaced relation thereto; and means mounted on the frame and engageable with the web for transversely narrowing the web prior to its passage between the embossing rolls.

11. The herein-described method of producing embossed crepe from a traveling web of material which includes the steps of spreading the web, moistening the spread web, subjecting the web to pressure against one of its surfaces to transversely narrow it, subjecting the web to pressure upon both surfaces to corrugate and further narrow it, and subjecting portions of the web to unequal pressures to emboss it.

12. The herein-described method of producing embossed crepe which includes the step of subjecting a traveling web to pressure upon one only of its surfaces to crinkle and transversely narrow it.

13. The herein-described method of producing embossed crepe which includes the steps of subjecting a traveling web to pressure upon one only of its surfaces to crinkle and transversely narrow it preparatory to an embossing operation, and subsequently subjecting portions of the web to unequal pressures to emboss it.

In testimony whereof I affix my signature.

WILLIAM H. CANNARD.