

June 4, 1929.

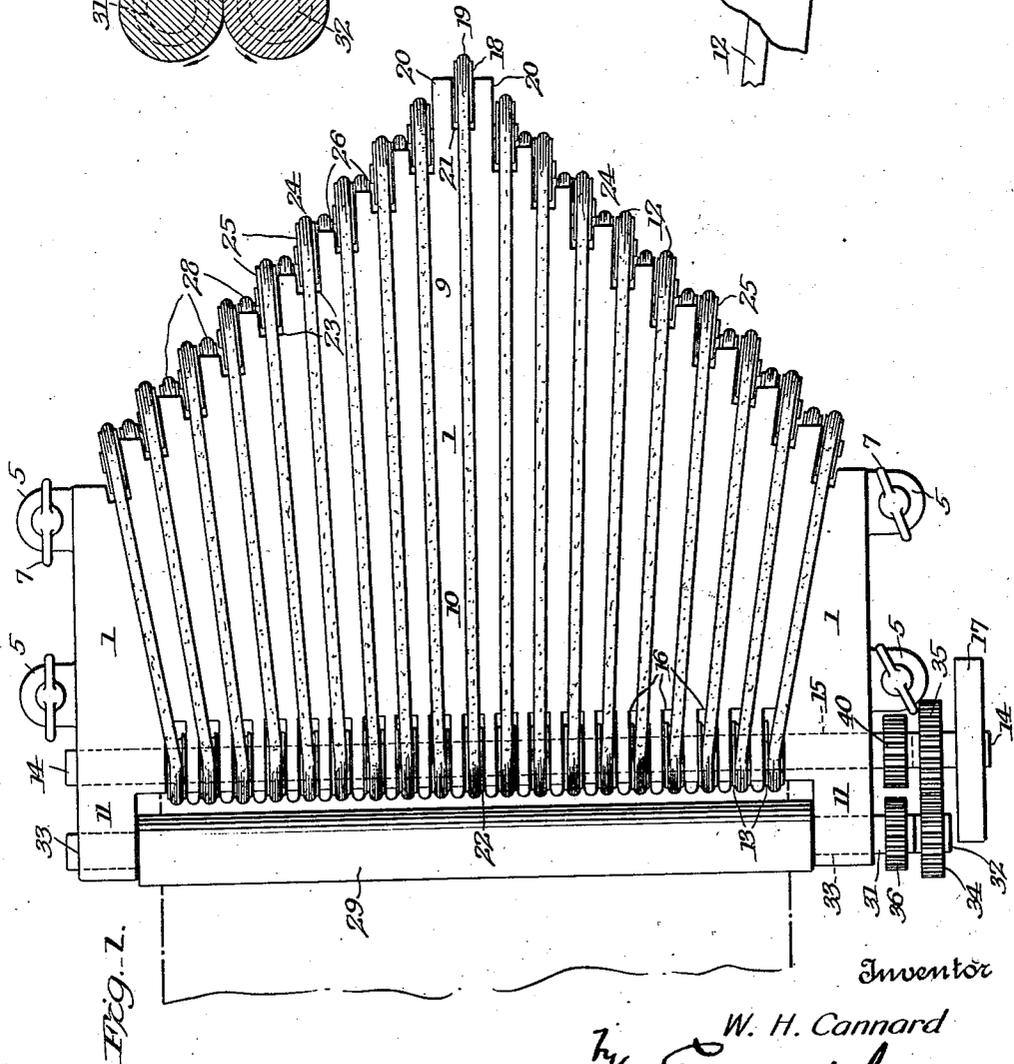
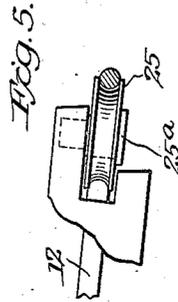
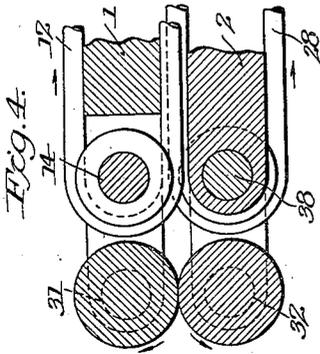
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1,716,260

APPARATUS FOR PRODUCING CRÉPE PAPER

Filed March 14, 1925

2 Sheets-Sheet 1



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June 4, 1929.

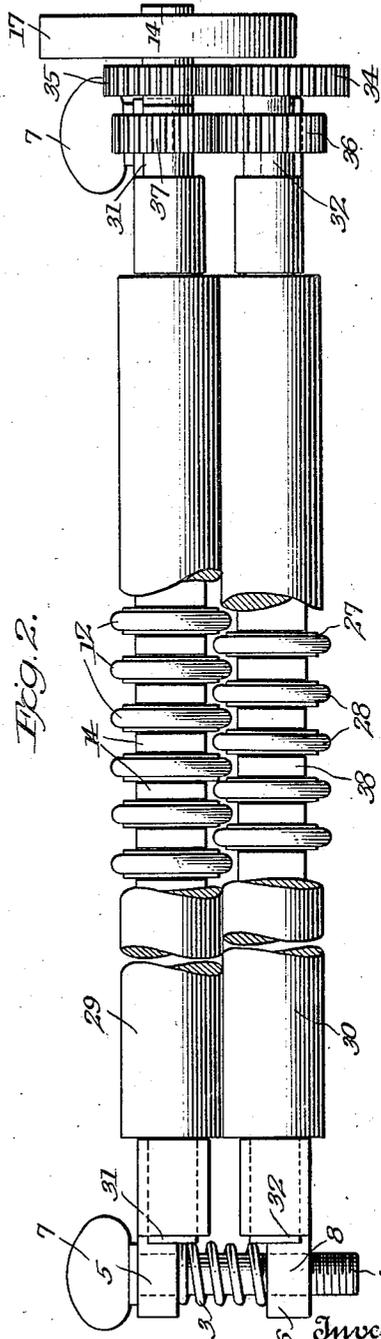
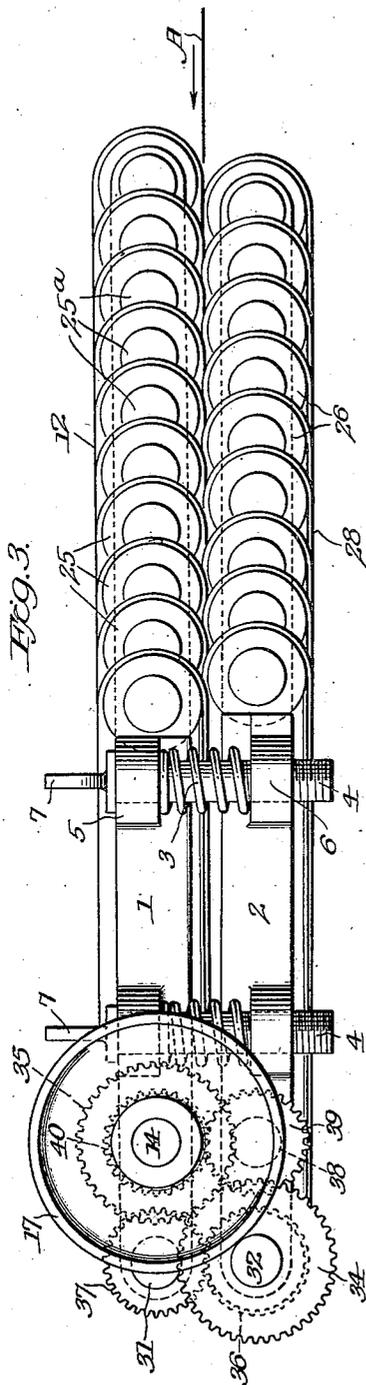
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APPARATUS FOR PRODUCING CRÉPE PAPER

Filed March 14, 1925

2 Sheets-Sheet 2



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Patented June 4, 1929.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR PRODUCING CREPE PAPER.

Application filed March 14, 1925. Serial No. 15,515.

This invention relates to apparatus for producing crepe paper and involves it as a product and also the method of and apparatus for making the same.

5 In commercial practice, it has been found desirable to make crepe elastic in a plurality of directions. In other words, for practical purposes, I have discovered that it is of considerable advantage to provide for elasticity in the crepe, or the like, in a plurality of directions where such crepe is used for bags, containers, liners for cartons, and the like.

15 To that end, the present invention has for one of its primary objects the production of an apparatus for longitudinally pleating and crinkling a web of paper, fabric or other material either prior to or after said material has had cross-crinkles formed therein.

20 The apparatus includes instrumentalities for feeding and pleating the web, for effecting a crowding of the pleats as the web travels through the apparatus, and for finally pressing the pleats into crinkles as the web passes from the apparatus.

The invention also involves a unique method of creping paper or the like, in the practice of which said apparatus may be employed.

30 The invention further involves the product resulting from the practice of my improved method.

35 The apparatus contemplates action upon the web either while dry or wet, and is capable of use in connection with either or both of the principles disclosed in my pending applications Serial Nos. 704,867 and 704,868, filed April 7, 1924.

40 The method may be practiced with various types of apparatus, but I prefer to utilize that which is herein disclosed, it being understood that even this apparatus is susceptible of a wide range of modification and variation without sacrificing any of the salient features of my inventive-concept.

45 Other objects and features characterize the apparatus, and they will in part be apparent and in part be made to appear in the description hereinafter set forth.

In the drawing:

50 Figure 1 is a fragmentary view in top plan of a machine constructed in accordance with my invention;

55 Fig. 2 is an enlarged view in rear elevation, also fragmentary, showing the relation of the upper and lower pleating instrumen-

talities and the mechanism for driving the same, and means for varying such relation;

Fig. 3 is an enlarged fragmentary view in side elevation of the structure;

Fig. 4 is a fragmentary enlarged detail sectional view illustrating the relative positions occupied by the pleating and the crinkling instrumentalities; and

Fig. 5 is an enlarged detail view showing the manner of mounting of certain of the belt-carrying shives on the apparatus.

Referring to the practical embodiment of the invention illustrated in the accompanying drawing, the reference-characters 1 and 2 designate, respectively, upper and lower frame members or plates of a machine adapted to function for the production of a crepe product. The lower plate 2 is designed to be mounted, preferably, in a horizontal position, upon suitable standards (not shown), and the upper plate 1 is adjustably supported in spaced relation thereto by resilient elements, such as springs 3, mounted on bolts 4 and disposed between laterally-extending lugs 5 and 6 on the respective plates.

60 The bolts 4, which are preferably provided with winged heads 7 to permit easy manipulation thereof, traverse the lugs 5 on the upper plate 1 and are threaded to engage within threaded apertures 8 in the alining lugs 6 on the lower plate 2. It will be observed that the construction permits tightening of the bolts in opposition to the pressure exerted by the springs 3 to move the plates nearer together and vice versa, and, in addition, to vary the pressure on the web A of the instrumentalities supported by the plates, and also to provide means for predetermining the depth of pleat produced in the web by said instrumentalities. The arrangement of the bolts and springs in spaced pairs also makes it possible to yieldingly maintain plate 1 parallel with or at an angle to plate 2 and thereby vary the action of the pleating instrumentalities carried by these plates.

65 The frame members 1 and 2 are similar, each comprising a substantially rectangular portion 9 and a triangular portion 10, the rectangular portion being cut out at its edge remote from the portion 9 to provide spaced supporting arms 11.

70 Preferably and as shown, means are provided for drawing or feeding the material through between the plates and pleating said material during its passage therebetween;

such means including (in the present instance) a plurality of round endless belts 12 traveling around the upper and lower plates and so arranged that the belts traveling around one plate pass between adjacent belts traveling about the other plate.

The belts 12 of the upper plate 1 preferably pass over and are driven by a series of uniformly spaced shives 13 fixed to a common shaft 14 having suitable bearing, as at 15, in the plate 1. Portions of the plate are cut away, as at 16, to accommodate the shives 13, and the shaft 14 is extended past the frame and has mounted thereon a driving pulley 17 which may be driven from any suitable source of power.

The shives 18, over which the central belt 19 of the upper portion of the apparatus passes, is rotatably supported between spaced forwardly-projecting arms 20 on the plate 1 and revolves within the cut-out portion 21 at the apex of the latter. This belt 19 passes about shive 18 and the central shive 22 on the shaft 14 and its path of travel is therefore along a central line of the apparatus throughout.

Similar cut-out portions 23 are provided at regular intervals in the front rearwardly-sloping edges 24 of plate 1 to accommodate a series of shives 25, which are rotatably mounted on stub-shafts 25^a fixed to the plate. It is to be noted, in this connection, that the shives 25 are spaced a greater distance apart than are the shives 13 on the shaft 14, which construction causes the belts 12 to travel in an angular direction with respect to the line of travel of the belt 19 and to gradually converge toward the rear of the apparatus for a purpose presently to be explained. The cut-out portions 23 are accordingly provided at the necessary angle to the central line of the machine to dispose the shives 25 in working relation with the respective shives 13.

The lower plate 2 supports front and rear series of shives 26 and 27, respectively, about which travel belts 28 corresponding to the belts 12 and similarly traveling in a direction slightly angular to the plane of travel of the belt 19. The two sets of belts 12 and 28 are so disposed relatively as to bear a working relation toward and a coaction between each other. That is to say, the plane of the lower portions of the belts 12 may coincide with the plane of the upper portions of the belts 28, the two sets of belts thus running side by side and preferably in the same direction and at the same speed. By reason of the adjustability afforded between plates 1 and 2 by the bolts 4, the horizontal relation of the two sets of belts 12 and 28 may be varied at the will of the operator; the pressure of the spring 3 between the plates permitting more or less of a yielding action of the belts on the web as it passes through the machine between the belts.

As the web of material is started into the apparatus it is first engaged by the longitudinally moving belt 19 and then, in turn, by the respective pairs of belts 12 and 28 which, by their engagement, carry the web onward through the apparatus, the upward and downward pressure of the belts on the web together with the lateral pressure thereon due to the convergence of the belts acting to gradually form longitudinal pleats in the web and to gradually decrease the total width of the web as the material thereof is consumed in the formation of the pleats. If desired, in some instances, it may be desirable to omit the crinkling operation (about to be described) and merely accomplish the pleating alone.

Preferably and as shown, means are provided for applying pressure to the product produced by the apparatus and method thus far described to compress the pleats in the web into permanent crinkles, this means (in the present instance) comprising a pair of cooperating rolls 29 and 30 mounted on shafts 31 and 32, respectively, having suitable bearing, as at 33, in the spaced arms 11 of the respective plates 1 and 2. The shaft 32, as shown, extends at one end past the frame of the apparatus and has mounted thereon a pinion 34 for cooperation with a like pinion 35 fixed to the shaft 14, and a second pinion 36 for cooperation with a like pinion 37 fixed to the shaft 31 to drive the latter. Shives 27 in rear of the lower frame member 2 are fixed to a shaft 38, corresponding to shaft 14 in the upper portion of the apparatus, which has suitable bearing in the supporting arms 11 of said member, and this shaft is driven through the agency of cooperating pinions 39 and 40 carried by shafts 38 and 14, respectively.

The rolls 29 and 30 being carried by the respective plates 1 and 2, the pressure with which they engage the web A passing therebetween is adjustable by bolts 4 and is of a yielding character due to the springs 3 disposed between said plates. It will be observed that the rolls 29 and 30 are so positioned that the meeting-line thereof is in the plane of travel of the web, with the result that the latter is fed therebetween directly after the pleating operation is completed.

From the foregoing, it is clear that the paper or like material, which may or may not have been previously cross-crinkled, and may be either wet or dry, is secured centrally between the plates 1 and 2, is first engaged by the centrally located belt 19 and, in turn, by the bolts 12 and 28 more remote from the center of the apparatus.

The web is carried forward and gradually pleated by the belts in transit, and, as it passes from the pleating instrumentalities, is drawn between the revolving rolls 29 and 30 which compress the pleats into permanent

crinkles, the driving instrumentalities being so arranged that the shafts of each pair imparting movement respectively to the pleating and crinkling mechanisms are caused to revolve in opposite directions upon application of power from a suitable source to the driving pulley 17.

What I claim is:

1. A creping machine including a plurality of spaced apart supports, a set of traveling material-sustaining and pleating elements on each support, the elements of one set traveling side-by-side and coacting with those of the other to pleat material carried by and between the elements, means for effecting movement of said elements, and means for varying the relation of one set to the other.

2. A creping machine including a plurality of spaced apart supports, a set of traveling material-sustaining and pleating elements on each support, the elements of one set coacting with those of the other to pleat material carried by and between the elements, and means for effecting movement of said elements, some of the elements of each set traveling in a direction angular to the direction of travel of others of that set.

3. A creping machine including a plurality of spaced apart supports, a set of traveling material-sustaining and pleating elements on each support, the elements of one set coacting with those of the other to pleat material carried by and between the elements, means for effecting movement of said elements, some of the elements of each set traveling in a direction angular to the direction of travel of others of that set, and cooperating means carried by the respective supports for crinkling the pleats.

4. An apparatus of the character described including adjustably spaced plates and means carried by said plates for feeding a web of material and for longitudinally pleating the latter in its passage between said plates.

5. A machine for producing crepe including adjustably spaced frame members, means for feeding a web of material between said members and for longitudinally pleating said material during its passage through the machine, and means for compressing the pleats into permanent crinkles.

6. A machine for producing crepe including spaced frame members, means for feeding a web of material through the machine and for longitudinally pleating said material in its passage therethrough, said means comprising a plurality of spaced endless belts adapted to travel about each of said frame members.

7. A machine for producing crepe including spaced frame members, means for feeding a web of material through the machine and for longitudinally pleating said material in its passage therethrough, said means comprising a plurality of spaced endless belts

adapted to travel about each of said frame members, and means carried by the respective frame members for compressing the pleats thus formed into permanent crinkles.

8. A machine for producing crepe including spaced frame members, a plurality of shives rotatably mounted at the front and rear of each of the frame members, endless belts on said shives so arranged that portions of the belts carried by the respective members normally lie in the same horizontal plane between said members, means for driving said belt portions all in the same general direction, and cooperating rolls carried by the respective members.

9. A machine for producing crepe including spaced frame members, a plurality of shives rotatably mounted at the front and rear of each of the frame members, the shives at the front of said members being spaced apart a greater distance than those at the rear of each member, a plurality of endless belts on said shives so arranged that portions of the belts carried by the respective members normally lie in the same horizontal plane between said members, and means for driving said belt portions in the same general direction whereby said belts serve to feed a web of material through the machine and pleat said material as it passes therethrough.

10. A machine for producing crepe including frame members, adjustable means for maintaining said members in spaced relation, and cooperating means carried by the respective members for feeding a web of material between said members and for pleating the material in its passage through the machine, and cooperating means carried by the respective members for compressing the pleats thus formed into permanent crinkles.

11. A creping machine including a plurality of spaced apart supports, a set of traveling material-sustaining and pleating elements on each support, the elements of one set coacting with those of the other to pleat material carried by and between the elements, and means for effecting movement of said elements, the elements at the front of said supports being spaced apart a greater distance than those at the rear to cause said elements to converge toward the rear of said machine.

12. A creping machine including a plurality of spaced apart supports, a set of traveling material-sustaining and pleating elements on each support, the elements of one set coacting with those of the other to pleat material carried by and between the elements, means for effecting movement of said elements, the elements at the front of said supports being spaced apart a greater distance than those at the rear to cause said elements to converge toward the rear of said machine, and cooperating rolls carried by the respective supports.

13. A creping machine including a plurality of spaced apart supports, a set of traveling material-sustaining and pleating elements on each support, the elements of one set coacting with those of the other to pleat material carried by and between the elements, means for effecting movement of said elements, the elements at the front of said supports being spaced apart a greater distance than those at the rear to cause said elements to converge toward the rear of said machine, cooperating rolls carried by the respective supports, and means for driving said elements and rolls from a common source of power.

In testimony whereof I affix my signature.

WILLIAM H. CANNARD.