

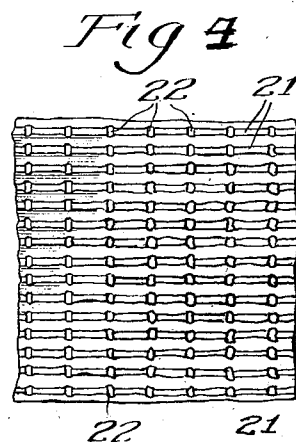
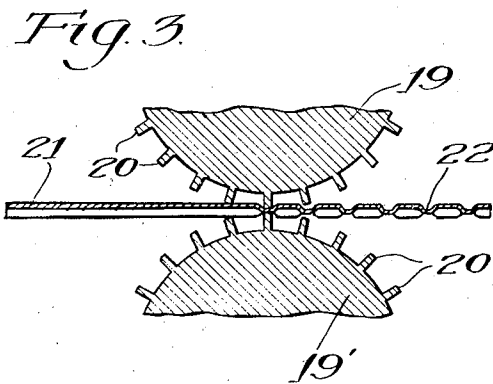
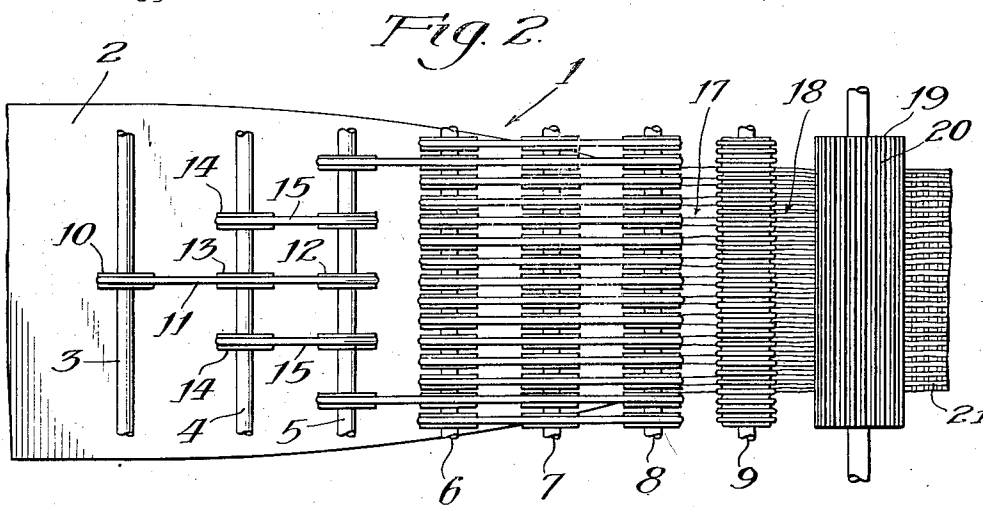
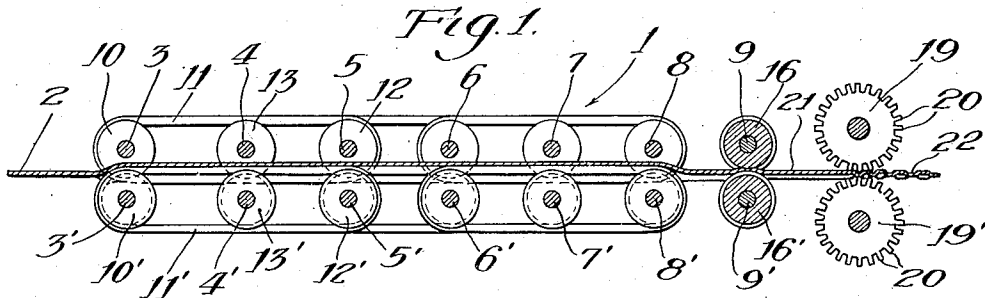
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C. C. SHERMAN

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METHOD FOR MAKING STRETCHABLE PAPER

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Inventor:
Clayton Carr Sherman
By: Lee J. Gary
Attorney:

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METHOD FOR MAKING STRETCHABLE
PAPER

Clayton Carr Sherman, Chicago, Ill., assignor to
H. P. Smith Paper Company, Chicago, Ill., a
corporation of Illinois

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2 Claims. (Cl. 154—33)

This invention relates to improvements in longitudinally corrugated, creped or crinkled paper and a method of making the same, and refers specifically to a paper of the type described wherein the corrugations or crinkles are effectively locked or ironed at spaced areas along the length of said corrugations or crinkles and a method of making such paper.

Paper having longitudinal substantially parallel corrugations or crinkles, and methods and machines for making such paper are well known in the art. However, the art has recognized that paper which is merely corrugated, creped or crinkled is limited in use because of the instability of the corrugations or crinkles, that is, the inability of the corrugations or crinkles to return to their original shape when the sheet is stretched transverse to the corrugations or crinkles. To impart body and resiliency or elasticity to the crinkles or corrugations the corrugated or crinkled sheet has heretofore been passed between two opposed "ironing" rolls, which are plain surfaced rolls, whereby the corrugations have been flattened or pressed to fold or crease the side walls of the corrugations. This expedient increases the elasticity or resiliency of the sheet but is accompanied by another deficiency, that is, the creasing in order to be effective, is at times so intense that it cracks the fibres of the sheet weakening the sheet along continuous lines of crease. When the sheet is thereafter subjected to the least stress the same tears along said weakened lines.

In carrying out my invention the corrugations or crinkles are pressed or ironed at spaced areas along the length of the corrugations or crinkles. In this manner the corrugations or crinkles are effectively locked or made more resilient or elastic with respect to transverse stretching forces and yet no continuous crease lines are provided to weaken the structure. Further, by providing such pressed or ironed areas, particularly when the spaced areas upon the corrugations are in transverse alignment, the sheet is rendered more pliable or more readily foldable or bendable in a direction transverse to said corrugations or crinkles.

Other objects and advantages of my invention will be apparent from the accompanying drawing and following detailed description.

In the drawing, Fig. 1 is a diagrammatic side elevational view of suitable apparatus for carrying out my invention.

Fig. 2 is a top plan view of the device shown in Fig. 1.

Fig. 3 is a fragmentary sectional view of juxtaposed fluted rolls, illustrating their action in making my product.

Fig. 4 is a fragmentary top plan view of my product.

Referring in detail to the drawing, 1 indicates generally a paper corrugating or creping machine of conventional construction, which is adapted to longitudinally corrugate or crepe a continuously moving web 2 of paper.

In this type of corrugating or creping machine a plurality of transversely disposed shafts 3, 4, 5, 6, 7, 8 and 9 are spaced from each other along the direction of travel of the web 2. There are two of each of said shafts, one disposed above the traveling web and one disposed below the web, the corresponding lower shafts being indicated by primed numerals, corresponding to those of the upper shafts.

Pulleys 10 and 10' are respectively mounted upon shafts 3 and 3' adjacent the longitudinal center of the web 2. Belts 11 and 11', respectively, pass around pulleys 10 and 10', said belts being also trained around pulleys 12 and 12' mounted upon shafts 5 and 5' respectively. The pulleys 10 and 12 are disposed in interdigitating relationship with respect to pulleys 10' and 12' and by means of pulleys 13 and 13' respectively mounted upon shafts 4 and 4' and the interdigitating relationship of pulleys 10 and 10' and 12 and 12', belts 11 and 11' are maintained in interdigitating relationship. In this manner a central corrugation or crinkle is formed and maintained in the web 2.

On shafts 4 and 4' two additional pair of pulleys 14 are mounted, the lower interdigitating pulleys not being shown. Belts 15 pass around pulleys 14 and a similar pair of belts (not shown) pass around the corresponding pulleys on shaft 4'; said belts being respectively trained around pulleys mounted on shafts 5 and 5'. In this manner two additional corrugations are formed in the web 2.

The remaining portion of the machine comprises pulleys and belts arranged in an increasing ratio to longitudinally corrugate the entire width of the web 2. Mounted upon shafts 9 and 9' respectively are two interdigitating grooved rolls 16 and 16' which subdivide corrugations 17 into smaller corrugations 18.

The mechanism hereinbefore described is conventional and forms no part of my present invention, it being understood that any device may be used to produce the corrugated web 18.

The corrugated web 18 possesses desirable

properties of transverse stretchability, but is characterized by its inability to return to corrugated condition when once stretched, that is, it lacks elasticity, resiliency or springiness. The art recognizing this deficiency has heretofore passed the web between a pair of ironing rolls which crushed or creased the corrugations thereby increasing the resistance of the web to transverse stretch. This expedient, however, is also accompanied by a decided disadvantage which resides in the fact that the ironing rolls must be set relatively close together and consequently the corrugations are frequently crushed excessively resulting in longitudinal continuous lines of rupture. Obviously, since this type of paper is frequently used where structural strength is requisite, large quantities of the paper have been wasted.

In practicing my invention, I press or iron spaced areas along the length of the corrugations, the intermediate areas being unpressed. This procedure effectively locks the corrugations rendering them springy and elastic. However, in view of the fact that the areas are spaced, no continuous lines of rupture are obtained and a stronger, more durable product results. In addition, the resulting product is of better appearance and is a more salable paper.

To carry out my invention I pass the corrugated web 18 between a pair of rolls 19 and 19' being the upper and lower rolls respectively. Each of the rolls is provided with ribs or flutes

20 which are disposed in opposed relationship at the line of oscillation. By so disposing the rolls each corrugation 21 is pressed or ironed at spaced areas 22 which in effect lock the corrugations. Yet, unlike the corrugations which have been ironed by flat surfaced rolls, the corrugations do not lose their identity as corrugations. In addition, even though the corrugations still remain as such in the web, the web is rendered pliable or easily foldable transverse to the length of the corrugations. The web is therefore capable of being more easily handled in subsequent operations such as passing the same through cutters or sewing machines to make bag or barrel liners.

I claim as my invention:

1. A method of setting the corrugations of a longitudinally corrugated web which comprises, passing a corrugated web forwardly in a direction parallel to said corrugations, and ironing said corrugations to a plane intermediate the planes of the crests of said longitudinal corrugations at areas spaced longitudinally along each of said corrugations.

2. A method of setting the corrugations of a longitudinally corrugated web which comprises, passing a corrugated web forwardly in a direction parallel to said corrugations, and ironing said corrugations to a plane intermediate the planes of the crests of said longitudinal corrugations on opposite sides of the web along spaced lines transversely disposed with respect to said corrugations.

CLAYTON CARR SHERMAN.