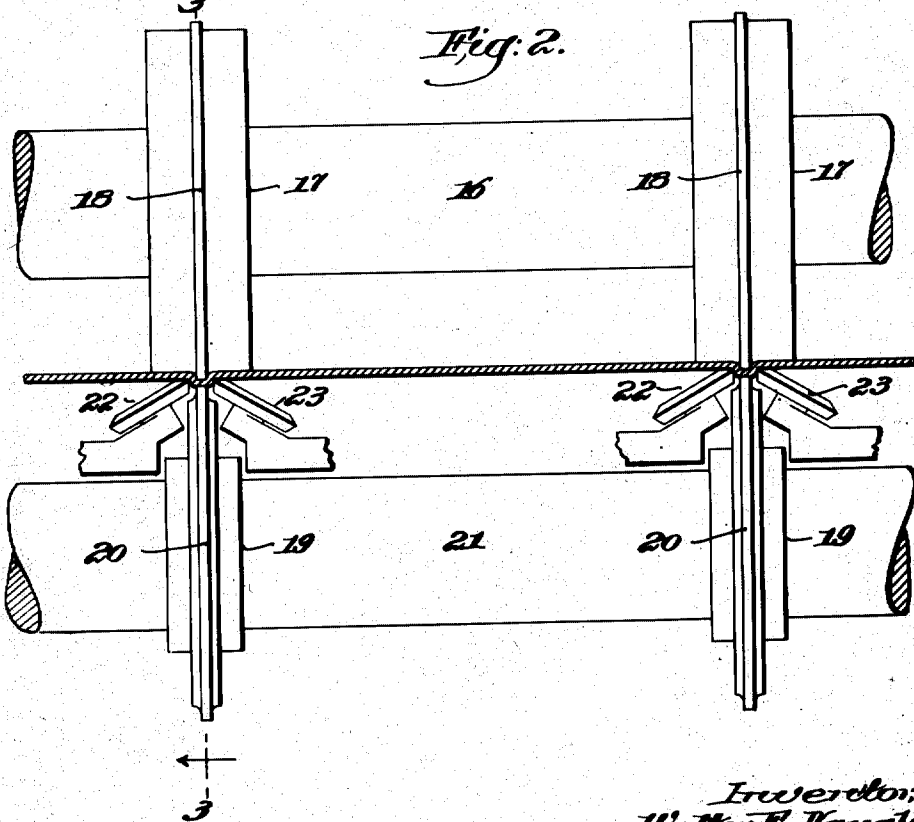
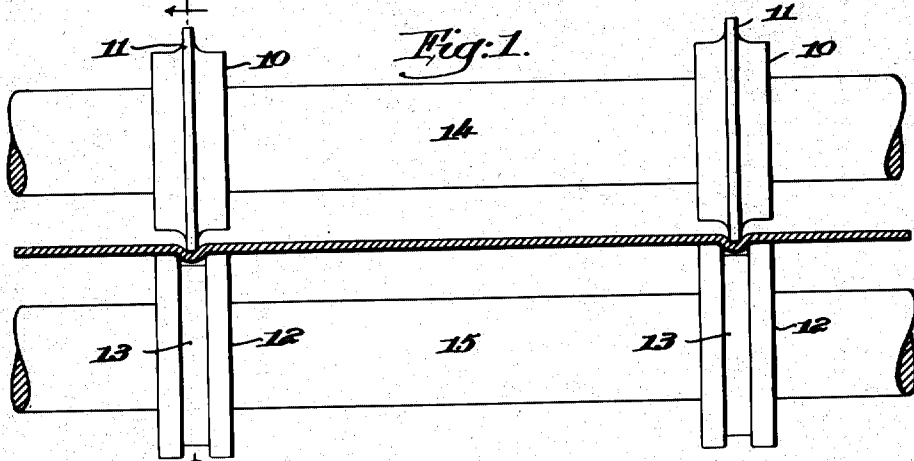


W. E. NAUGLER.
METHOD OF CREASING PAPER BOARD AND THE LIKE.
APPLICATION FILED DEC. 1, 1916.

1,302,831

Patented May 6, 1919.

2 SHEETS—SHEET 1.



Inwitness:
Walter E. Naugler,
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Fig. 3.

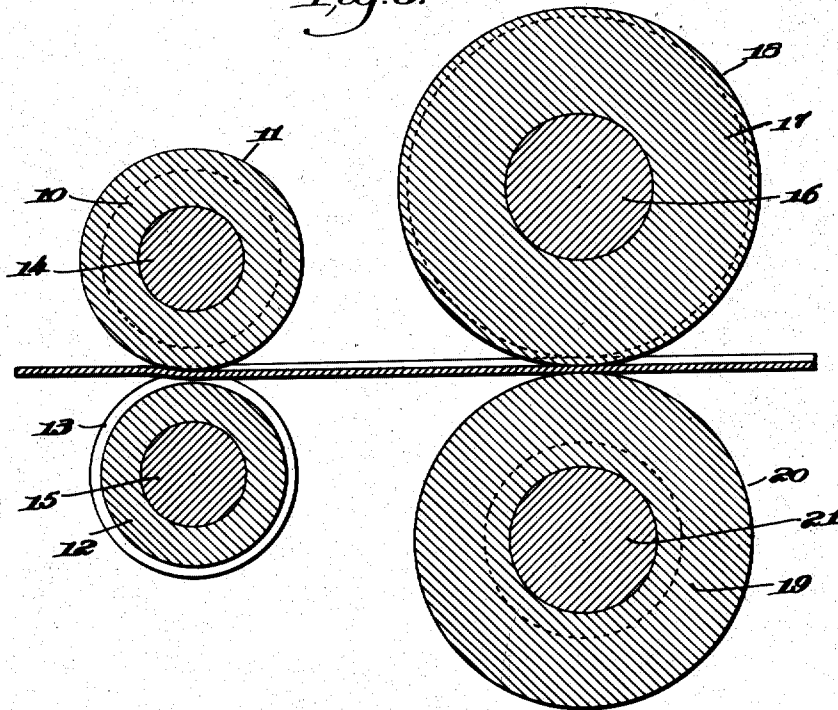
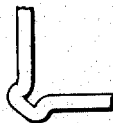


Fig. 4.



Fig. 5.



Inventor:
Walter E. Naugler.
by Edward P. Allen

His Atty.

UNITED STATES PATENT OFFICE.

WALTER E. NAUGLER, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-FOURTH TO
EDWARD F. ALLEN, OF MEDFORD, MASSACHUSETTS.

METHOD OF CREASING PAPER-BOARD AND THE LIKE.

1,302,831.

Specification of Letters Patent.

Patented May 6, 1919.

Application filed December 1, 1916. Serial No. 134,522.

To all whom it may concern:

Be it known that I, WALTER E. NAUGLER, a subject of the King of England, and a resident of Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Methods of Creasing Paper-Board and the like, of which the following is a specification.

This invention relates to the method of creasing paper board and the like, and has for its object the production of a crease that combines flexibility and strength heretofore unattainable by the rotary creasing methods at present employed.

Attempts have been made to crease paper board by the use of opposed rotating implements or disks, and in some instances a series of opposed disks have been used, each pair of a series performing a portion of the work.

In all the rotary creasing methods at present in use the board is fed to the first set of rolls for its initial or preliminary creasing, between which it is tightly gripped and compressed, and thereafter it is fed to succeeding sets of rolls for the final creasings. This method has proved to be a failure because of the harsh treatment the board received during its passage between the several sets of rolls, due to the fact that in its passage it was so gripped between the first set of rolls that it was not bent to form a preliminary crease but was stretched.

The fibrous material of which the board is composed was strained and consequently weakened, and the succeeding creasing operations each added its quota of compression and stretch. This additional stretching and compressing added nothing to the strength of the fibrous material, but in fact detracted therefrom, as the material became extremely brittle.

The crease thus formed had to be handled with great care and was easily broken, and being unreliable, was not a commercial success.

An object of this invention is to produce a crease or a plurality of creases in a given length of paper board that retains all the

original strength of the board without straining it, and to add just sufficient compression to the creased part to give it its final shape and insure the permanency of it.

To the attainment of the above this invention consists in the employment of at least two sets of coacting revoluble members, including a preliminary bending set, and a final creasing set.

The preliminary bending set is so arranged as to bend and not stretch the board and furthermore does not compress it. The final set of creasing rolls in this instance is composed of four rolls or disks so constructed and arranged as to give the desired size, shape, and permanency to the crease.

Of the drawings:

Figure 1 in front elevation shows two sets of preliminary bending rolls in the act of bending a strip of paper board prior to the final creasing thereof, the board being shown in section in the form it assumes when between the rolls.

Fig. 2 is a view similar to Fig. 1, showing the final creasing rolls adapted to complete the work started by the preliminary bending rolls, the board being likewise shown in section at the point where the rolls contact with it.

Fig. 3 is a section on the lines 3—3, Figs. 1 and 2 showing the preliminary bending and final creasing rolls in their preferred relative positions, in the act of bending and creasing a strip of paper board.

Fig. 4 is an enlarged view of the preferred form of crease produced by this method.

Fig. 5 is a similar view showing the position and shape assumed by the crease after the board has been bent at right angles to itself along the line of the crease.

Similar characters designate like parts throughout the several figures of the drawings.

Referring to the drawings:

The set of preliminary bending rolls is composed of an upper roll 10 having a central rib 11, and a lower roll 12 having the groove 13.

These rolls 10—12 are preferably adjustably secured to the positively driven shafts

14—15, which are capable of adjustment toward and from each other to compensate for various thicknesses of paper board and to graduate the bend to be given to the board.

The disposition of the rolls 10 and 12 is such that the board is not compressed as it passes between them, but is free to be drawn laterally toward them as it is being bent, and therefore the material at the bend will not be stretched and torn.

Since the object of the preliminary bend is to prepare the board for the final creasing, it is an object of this invention to draw enough material into the preliminary bend so that the function of the final creasing rolls will be merely to give the required form and permanency to the crease. In this instance the final creasing rolls consist of four coacting adjustable rolls, two of which, 17—19 are provided with the ribs 18—20. For the best results these ribs will be separated a trifle less than the thickness of the board, and as it passes between the ribs it will receive a slight compression. It will be understood, however, that good results can be obtained without resorting to the compression just referred to.

The ribbed rolls 17—19 would not of themselves be sufficient to form the final crease, hence the use of the smaller inclined rolls or disks 22—23. As before mentioned, these rolls 22—23 are adjustable toward and from each other as well as being adjustable toward or from the roll 17.

These rolls 22—23 are so arranged as to force the material in the bend inwardly toward the rib 18 and upwardly against the roll 17 at either side of the rib 18. Preferably a slight compression of the material by these rolls would be advisable and yet not absolutely necessary, as it has been found by experiment that good results are obtained without it.

While it is desirable to use rolls such as 22—23 to form the sides of the crease, it will be obvious that other devices might be used in place thereof, such, for instance, as stationary guide members that would force the material toward the roll 17 and rib 18.

The final crease or channel herein shown is the preferred form, but it is obvious that the same may be made with parallel flat sides or with converging flat sides and not depart from the spirit and scope of this invention.

From the foregoing it will be seen that it is an essential feature of this invention to first bend the material without stretching or compressing it and to gather enough material in said bend to form all the material necessary for the finished crease.

It is believed that the operation and many advantages of this invention will be fully understood from the foregoing description.

Having thus described my invention, I claim:

1. The method of creasing paper board consisting in first bending said board without compressing the material to form a depression therein and then feeding the depressed portion between the oppositely disposed flanges of two rollers and subjecting to roller pressure the portions of material in said depression on opposite sides of said flanges and thereby forming a substantially rectangular crease.

2. The method of creasing paper board, consisting in first forming two parallel depressions therein by sets of rollers arranged to permit movement of said board toward a point intermediate said sets while said depressions are being formed and then feeding the material in each depression between another set of rollers and subjecting the outer portions of each depression to side roller pressure while the central portion of each depression is disposed between said second set of rollers thereby forming rectangular channels from said depressed portions.

3. The method of creasing paper board, consisting in first forming two parallel depressions therein by sets of rollers arranged to permit movement of said board toward a point intermediate said sets while said depressions are being formed and then feeding the material in each depression between another set of rollers and subjecting the outer portions of each depression to side roller pressure while the central portion of each depression is disposed between said second set of rollers thereby forming rectangular channels from said depressed portions said channels having flat sides separated a distance at least equal to the thickness of said paper board.

4. Means for creasing paper board consisting of a pair of coacting revoluble rolls, one of which has an annular flange coacting with an annular groove of the other; two revoluble pressure members provided with coacting annular flanges; and means for forcing the material over the edge of one of said pressure flanges.

5. Means for creasing paper board consisting of a pair of coacting revoluble rolls, one of which has an annular flange coacting with an annular groove of the other, the peripheries of said rolls being separated a distance greater than the thickness of said board; two revoluble pressure members provided with coacting annular flanges; and means for forcing the material over the edge of one of said pressure flanges.

6. Means for creasing paper board consisting of a pair of coacting revoluble rolls, one of which has an annular flange coacting with an annular groove of the other; two revoluble pressure members provided with coacting annular flanges; and rollers on op-

posite sides of said pressure flanges adapted to force the material against the sides of one of said flanges.

5 7. Means for creasing paper board consisting of a pair of coating revoluble rolls, one of which has an annular flange coating with an annular groove of the other; two revoluble pressure members provided with

coating annular flanges; and rollers on opposite sides of said pressure flanges adapted 10 to force the material against the periphery of one of the pressure rolls and the sides of its annular flange.

Signed by me at 4 Post Office Sq., Boston, Mass., this 25th day of November, 1916.

WALTER E. NAUGLER.