F. H. BITHER.

METHOD OF CONNECTING AND CORRUGATING PAPER.

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1,410,879. Patented Mar. 28, 1922.

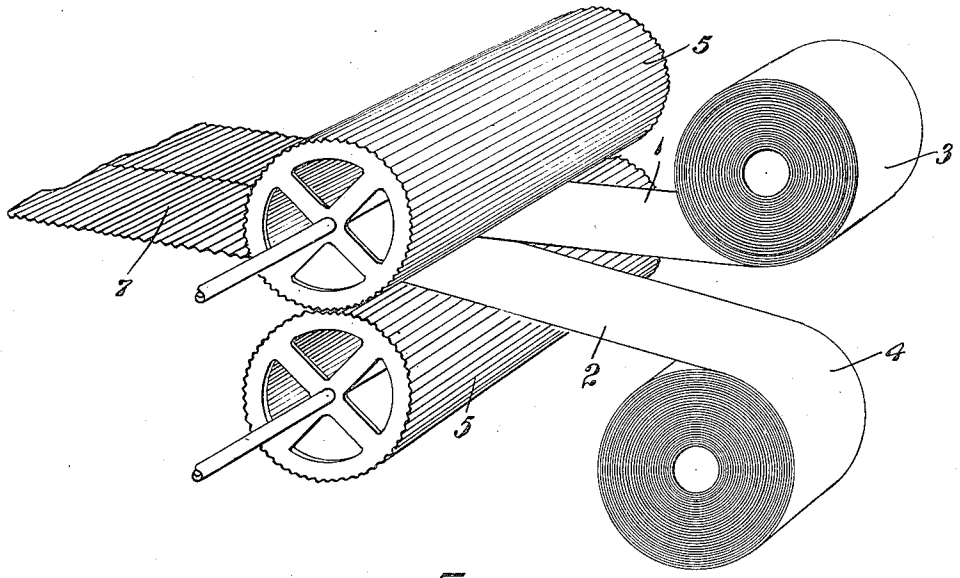

Fig. 1.

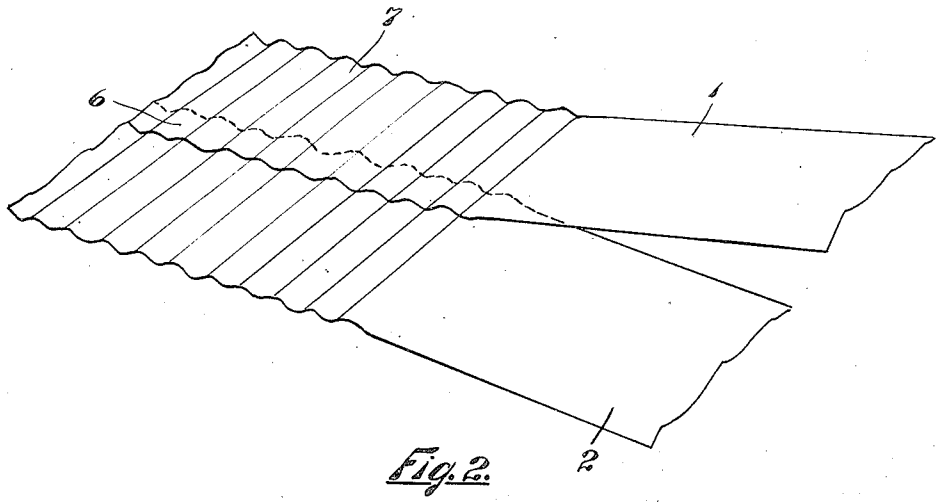

Fig. 2.

Inventor

Frederick H. Bither

By Frank E. Liverance Jr

Attorney

UNITED STATES PATENT OFFICE.

FREDERICK H. BITHER, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR TO AMERICAN BOX BOARD COMPANY, OF GRAND RAPIDS, MICHIGAN, A CORPORATION OF MICHIGAN.

METHOD OF CONNECTING AND CORRUGATING PAPER.

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To all whom it may concern:

Be it known that I, FREDERICK H. BITHER, a citizen of the United States of America, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Methods of Connecting and Corrugating Paper; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a method of securing two strips of paper together, the paper being of the kind used in making corrugated paper board, and while corrugating the connected strips to make a width of corrugated paper which may be used in the making of paper board of the corrugated type. The paper used in making corrugated paper is made up in relatively large rolls and when an order for corrugated paper board is to be filled, the board being of a certain width, such width is cut from the roll and passed through corrugating rollers. In a great many instances, when a roll of paper is worked up, there is left a narrow strip of paper, not wide enough for use thereafter in making up any order for corrugated paper board and the same, heretofore, has been waste. This amounts to a considerable percentage substantially with each roll of paper used. It is a primary object and purpose of the present invention to utilize the paper heretofore going into the waste by connecting two or more of the strips together at their edges to thereby make a sheet of paper sufficiently wide that it can be used in practice for filling orders for widths of paper board such as have to be filled. It is a further object of the invention to connect while corrugating the paper at one and the same time without the addition of any cementing material between the adjacent parts of the paper strips, there being no additional expense of any kind involved in connecting and corrugating strips of paper too narrow for use previously over the simple corrugation of a piece of paper of the desired width. The invention, accordingly, permits the utilization of the waste strips of paper in the manufacture of corrugated paper with the entire saving of the value of the strips, no deduction having to be made for cementing material, or for additional labor cost or machinery cost, the only item of additional expense or loss coming from the overlapping of the strips at their edges, which is practically negligible and much less than the cost of disintegrating the waste strips of paper to pulp and again making it into paper by a regular paper making process. It is to be understood that while the invention is of particular utility with relation to corrugated paper used in the manufacture of corrugated paper board, the invention is not to be considered as limited thereto but is also directed to the connection of separate pieces of paper at their edges in whatever form desired either corrugated or plain.

For an understanding of the invention and the method followed, reference may be had to the following description taken in connection with the accompanying drawing, in which—

Fig. 1 is a diagrammatic perspective showing two strips of paper being run through corrugating rollers to simultaneously weld while corrugating the same, and

Fig. 2 is a perspective, showing a fragment of the product and the way that the strips are overlapped at their edges in carrying out the method.

Like reference characters refer to like parts in the two figures of the drawing.

As shown in Fig. 1, two strips of paper 1 and 2, of indefinite length are wound into rolls 3 and 4 and fed into and between corrugating rollers 5, an edge of the strip 1 overlapping an adjacent edge of the strip 2. The rollers are set very closely together, so close in fact that one thickness of paper barely separates them, and it is obvious that at the overlapping parts of the strips, an enormous pressure is exerted on the paper practically crushing the two thicknesses of paper to the thickness of one. At the same time the rollers are heated to a high degree of temperature, at least two hundred and fifty degrees Fahrenheit. The combination of pressure and heat serves to weld the paper together at its overlapping portions making a substantially homogeneous weld as at 6 where the adjacent portions of the strips overlap and the strips come from the rollers securely welded together and corrugated transversely, the product 7 having all the qualities of the single piece corrugated paper of the same width.

It will be noted that there is no additional expense in carrying out the method and that

it costs practically nothing to weld the strips of paper together at their adjacent edges, inasmuch as the rollers must be heated the same and driven the same for corrugating single widths of paper. While I have shown two strips of paper being welded together and corrugated, the invention is not in any sense limited thereto as any number of the strips may be fed through simultaneously and welded together while corrugating within the limits prescribed by the length of the corrugating rollers. And while the rollers have been shown as corrugating rollers and the product coming therefrom is corrugated paper, the invention is not limited thereto as the welding by very heavy pressure accompanied by heat to the desired degree may be accomplished with other types of rollers with a resultant variation in the shape of the product. No cementing material of any kind is used, the connection between the strips of paper at adjacent edges being a true weld coming from high heat and enormous pressure.

The utilization of waste in the manner described is a particularly valuable feature of the invention. The scarcity of paper and high cost thereof make this utilization of waste very valuable; and the invention is further increased in value by reason of the fact that its practice is without expense in any particular.

I claim:

1. The herein described method of connecting elongated strips of paper together which consists in overlapping adjacent edges of the strips and subjecting the same to a high degree of heat and heavy pressure sufficient to weld the contacting portions of the strips.

2. The herein described method of connecting and corrugating elongated strips of paper together which consists in feeding said strips between heated corrugating rollers with the edges of the strips overlapped to thereby weld the strips together and corrugate the same at the time of welding.

3. The herein described method of connecting elongated strips of paper together which consists in feeding the strips with adjacent edges overlapped through heated rollers heated to a high degree of temperature and spaced closely together to thereby subject the overlapped portions of the strips to very heavy pressure to thereby weld the strips together.

4. The herein described method of welding pieces of paper together which consists in overlapping adjacent edges of the paper and subjecting the same to a high degree of temperature and crushing pressure.

5. The herein described method of connecting elongated strips of paper which consists in continuously feeding said strips between rollers heated to a high degree of temperature with the edges of the strips overlapped and with the rollers located apart substantially a distance equal to the thickness of the paper, whereby the overlapped edges of the strips are subjected to crushing pressure and heated simultaneously, serving to weld the paper strips together at contacting portions.

6. The herein described method of welding pieces of paper together which consists in feeding the pieces of paper lengthwise between rollers heated to at least two hundred and fifty degrees Fahrenheit with the edges of the pieces of paper overlapped and with the adjacent sides of the rollers located apart a distance equal substantially to one thickness of paper, whereby the overlapping edges of the paper are subjected to a crushing pressure and heated simultaneously to thereby make an inseparable weld.

In testimony whereof I affix my signature.

FREDERICK H. BITHER.