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A. R. RIDDERSTROM

2,285,356

MANUFACTURE OF CARTONS

Original Filed Jan. 13, 1940

Fig. 1.

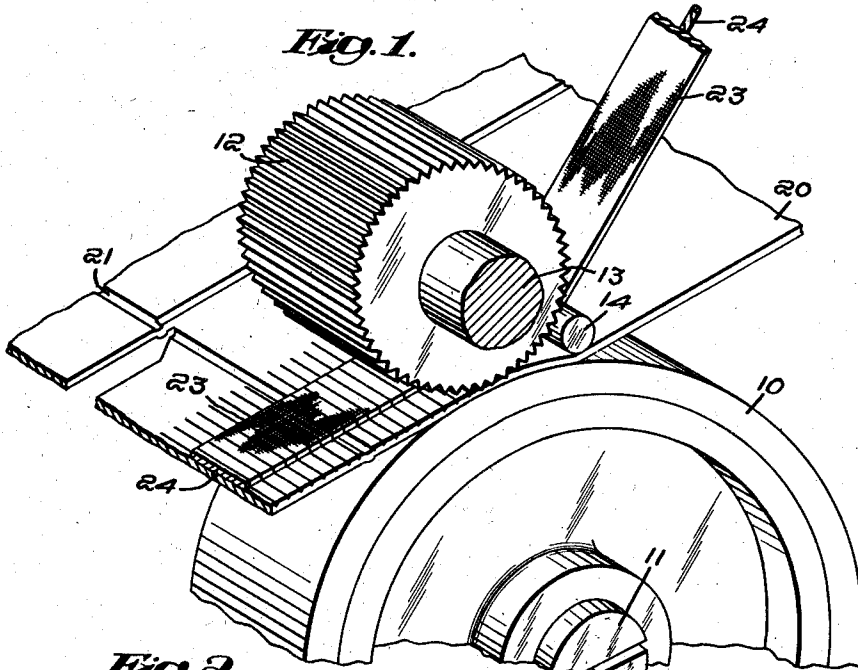


Fig. 2.

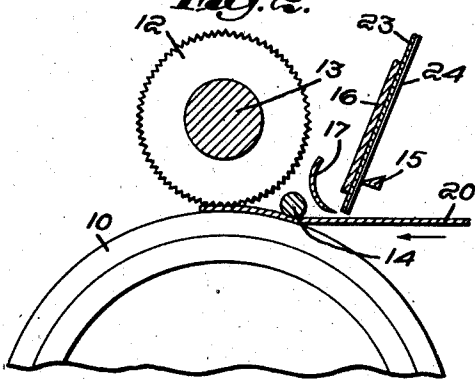


Fig. 3.

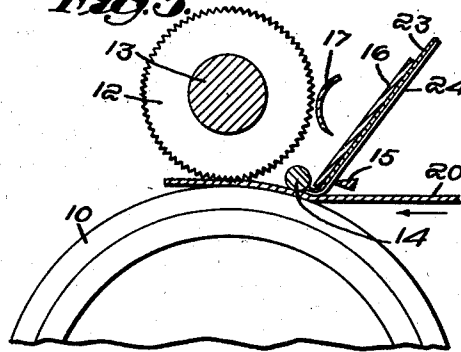


Fig. 4.

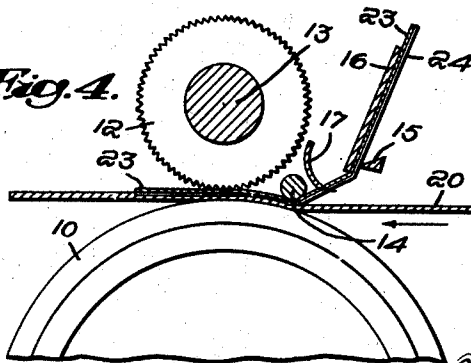


Fig. 5.



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UNITED STATES PATENT OFFICE

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MANUFACTURE OF CARTONS

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Original application January 13, 1940, Serial No.
313,709. Divided and this application June 10,
1940, Serial No. 339,618

4 Claims. (Cl. 229-49)

This invention relates to the manufacture of cartons, such as shoe boxes, from scored blanks of cardboard or similar fibrous sheet material. The invention consists in an improved box blank reinforced with tape and cord. The present application is a division of my co-pending application Ser. No. 313,709, filed January 13, 1940, patented December 24, 1940, No. 2,226,181, in which I claim an improved process of applying the tape and cord to a blank.

It has been the practice heretofore to apply strips of adhesive tape to those parts of the blank which are to be included in the corners or fold lines of the cartons, and in some instances to enclose a cord or thread within or beneath the tape. I have discovered that improved results can be secured by pressing the adhesive tape and cord together upon the surface of the blank by means of a corrugating tool, thus at the same time forming a longitudinal corrugation in the blank beneath the tape in which the cord is embedded, and flattening the tape upon the blank and embedding its fibres therein by producing a series of closely arranged transverse corrugations. In the first place, I find that by using a corrugating tool or roll the adhesive gum of the tape is actually squeezed into the body of the underlying blank and a particularly secure adhesive bond is thus secured. In the second place, the tape is flattened and ironed upon the blank so that its apparent thickness is reduced and it lies so closely upon the surface of the blank that it causes no obstruction to the manipulation of blanks at high speed in an automatic machine. In the third place, I find that a corrugated roll does not tend to pick up and pack with adhesive gum from the tape as is the case when a smooth roll is employed. The further advantage which flows from this condition is that in automatic machines the roll pressure may be substantially reduced, as compared to the pressure heretofore required when smooth rolls have been used, and still produce an improved adhesive bond.

Furthermore, by impressing into the adhesive tape a series of closely arranged transverse corrugations the presence of the cord beneath the tape is masked and a somewhat ornamental effect is imparted to the exposed face of the tape.

These and other advantages of the invention will be best understood and appreciated from the following description of a preferred manner of putting it into practice as illustrated in the accompanying drawing in which,

Fig. 1 is a view in perspective showing portions of a box blank having a cord and overlying tape applied thereto by a corrugating roll,

Figs. 2, 3 and 4 are views in side elevation illustrating successive steps of the process,

Fig. 5 is an enlarged fragmentary sectional view of the bond produced.

The process of my invention may be carried out by suitably modifying any commercial tape applying machine now available, such, for example, as that shown in my prior Patent No. 2,175,618, granted October 10, 1939. Reference may be had to that patent for further description of the organization of the entire machine. Only so much of it is herein shown as is required for an understanding of the process of the present invention.

The carton blank 20 to be reinforced or a portion thereof is arranged to be fed over the circumference of a smooth supporting roll 10 which may be mounted for free rotation upon a stud 11. Above the smooth roll 10 is provided a roll 12 mounted on a driven shaft 13 and provided on its circumference with a series of closely arranged transverse corrugating ribs 12. These ribs have a fairly sharp vertex line, sharp enough to indent substantially the material but not sharp enough to cut it. Provision, not herein shown, is made for adjustably regulating the relative position of the rolls 10 and 12 to control pressure exerted upon the work.

The reinforcing member which, as herein shown is to be applied to the surface of a box blank 20, comprises an adhesive tape 23 which in practice may be about 1/4" wide and which has secured to its adhesive surface a reinforcing cord or thread 24. This cord is laid upon the tape as a separate operation and the combined tape and cord is supplied to the manufacturer wound in its assembled relation upon a reel which may contain 1,000 yards. The thread carrying tape is guided to the bite of the rolls 10 and 12 by a small feed roll 14 which is arranged to direct the box blank 20 against the surface of the smooth roll 10 along a line a short distance behind the ribbed roll 12. A pair of fingers 15 and 16 are arranged, at the proper time in the cycle of the machine, to engage the end of the cord-carrying tape, as shown in Fig. 2, and advance it to the position shown in Fig. 3 whereupon the end of the tape is caught by the feed roller 14 and carried forwardly on the blank 20 beneath the ribbed roll 12. In this operation, as already explained, the ribs of the roll 12 iron the tape firmly upon the surface of the

blank 20, forcing it into the body of the blank in a series of transverse corrugations, and also forcing the cord 24 to make a groove for itself beneath the tape 23 so that it becomes substantially embedded in the body of the blank. When a sufficient length of cord-carrying tape has been applied in the manner thus explained, a cutting-off knife 17 is operated as shown in Fig. 4 to sever the tape and cord. This occurs after the fingers 15 and 16 have been moved upwardly and rearwardly out of the path of the knife 17. The parts of the machine are then returned to initial position in readiness for a new cycle.

The cord-carrying tape may be applied to any desired part of the blanks for the carton or carton cover. As shown in Fig. 1 it spans a crease 21 which is formed in the blank to determine the fold line of one of its side walls. The cord-carrying tape does not, of course, in any way interfere with the subsequent folding of the carton blank but does reinforce the blank at the fold line against any danger of breakage.

The process and the resulting product will be better understood by reference to Fig. 5 of the drawing wherein the cord 24 is illustrated on an enlarged scale as embedded into the material of the blank 20 longitudinally of the tape, and the fibres of the tape are embedded into the blank along closely arranged lines extending transversely of the tape and resulting from the corrugating pressure of the roll 12 thereon.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States is:

1. A reinforced box blank comprising a creased cardboard body, a tape adhesively secured to said body across the crease line and corrugated into the cardboard body along closely spaced indented lines extending transversely of the tape, and a cord confined by said tape longitudinally beneath it and substantially completely embedded into the cardboard body.

2. A reinforced box blank comprising a creased body of fibrous material, a cord spanning the crease line and substantially embedded in the body, and a tape covering the cord and provided with transverse corrugations, the tape in the valleys of the corrugations being substantially embedded in the fibrous body.

3. A reinforced box blank comprising a creased cardboard body with a tape adhering thereto across its crease line, a cord substantially completely embedded in the cardboard body beneath the tape and the tape being pressed into the cardboard body in closely arranged transverse corrugations.

4. A reinforced box blank comprising a fibrous body, a cord substantially completely embedded in the body, a tape covering said cord and adhesively secured to said body, said tape being corrugated transversely of the cord and deeply enough to embed spaced portions of the tape in the body.

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