Sept. 22, 1931. F. R. STELLING 1,824,241

APPARATUS FOR THE MANUFACTURE OF BOXES OF CARDBOARD AND THE LIKE

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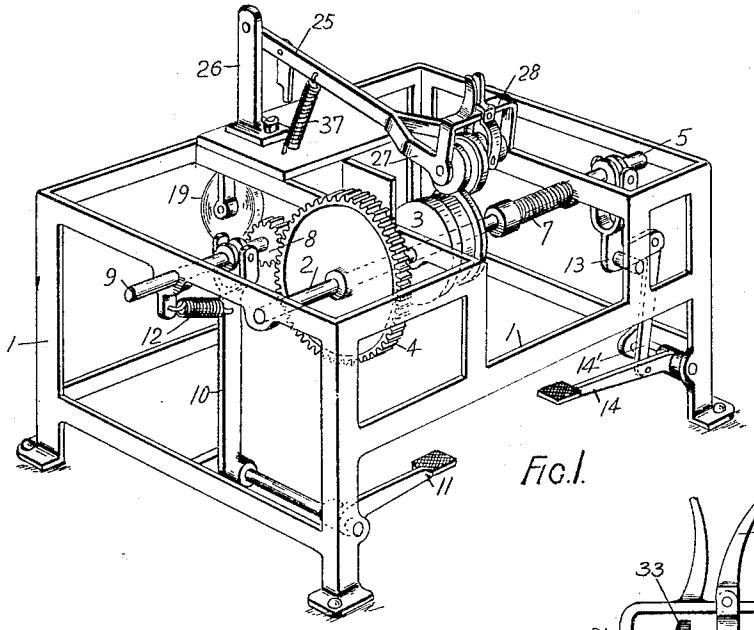


FIG. 1.

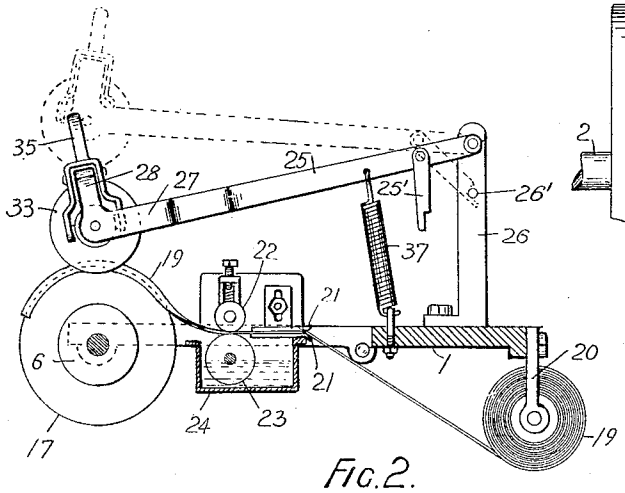


FIG. 2.

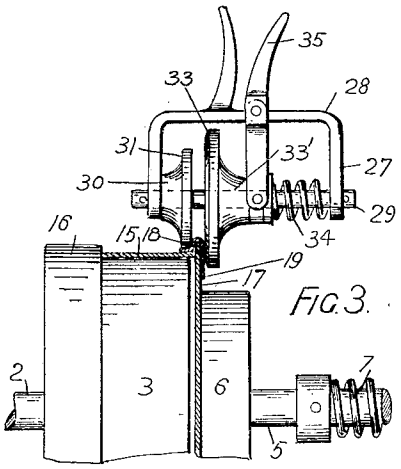


FIG. 3.

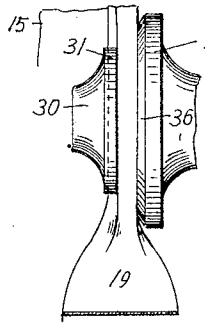


FIG. 4.

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UNITED STATES PATENT OFFICE

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APPARATUS FOR THE MANUFACTURE OF BOXES OF CARDBOARD AND THE LIKE

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The invention relates to the manufacture of cardboard or like boxes such as are commonly employed for retailing confectionery and of the type which includes a short body portion (termed a rim) of an exteriorly convex shape, and a bottom to conform to the shape of the rim but of slightly larger dimensions to provide a flange around the rim.

The invention relates to the manufacture of both the lid portion and the box proper, which are complementary, and to avoid repetition will be described in its application to the manufacture of the box only.

In the manufacture of boxes of the type referred to, the conjoining of the rim to the bottom is effected by means of a strip of paper adhesively attached to the lower portion of the rim, to the upper surface of the flange, and, being turned over the edge, to the underside of the latter. This operation has hitherto been performed by hand and, in the case of boxes of circular, oval or elliptical form or of other form including one or more curved sides, requires the employment of more or less skilled labour and great care in working the damp paper round the curve and stretching it.

The invention is commercially applicable to an exteriorly convex surface of a box, and although it could be utilized upon an exteriorly concave surface the application thereto presents difficulties not met in the former application.

The invention consists in apparatus for the manufacture of boxes of cardboard or the like, said apparatus comprising a block rotatably mounted in a frame and upon which the rim and base, or lid, are to be mounted in the required juxtaposition, roller-means adjustably mounted in the frame to contact with and apply an adhesive strip to the rim and base, or lid, and means for rotating said block.

The invention also consists in apparatus as hereinafter set out.

The block referred to is of such shape to neatly fit within the rim to maintain the shape thereof, and if the rim is in the form of a cylinder the block is drum shaped, but if the rim is otherwise shaped, such as an oval, the block is accordingly modified to suit that particular shape, as will be understood.

The invention is hereinafter described as applied to the formation of the lower half of a box having a cylindrical rim and a disc base, but it is to be understood that the invention may be applied to the manufacture of other shapes as hereinbefore explained.

Reference is now had to the accompanying drawings which depict a preferred form of apparatus in accordance therewith and in which

Fig. 1 is a perspective view of the complete apparatus,

Fig. 2 a fragmentary and substantially central-cross-sectional elevation thereof,

Fig. 3 a fragmentary detail elevation of a block with a box thereon and the roller in operative position and pressing the strip into contact with the rim and base, and

Fig. 4 is a fragmentary plan view of the strip being folded to the correct shape by the roller.

The apparatus comprises a substantially rectangular framing 1, in one side of which is rotatably mounted a transverse shaft 2, carrying at its inner end, adjacent the centre of the framing, a drum 3 and, at a point remote from the drum, a spur gear wheel 4.

In axial alignment with shaft 2, and rotatably and slidably carried in the other side of the framing, is a shaft 5 carrying at its inner end a disc 6 (Fig. 3), the shaft being loaded with a spring 7 and the disc urged thereby towards the inner end of drum 3.

Spur wheel 4 and shaft 2 are rotated by a pinion gear wheel 8 carried on a shaft 9 rotatably and slidably mounted in the framing and driven from an external source of power (not shown), the shaft 9 being slid in the framing to bring the pinion into mesh with the spur by means of a rocker arm 10 rotatably engaging the shaft 9 and operated by a pedal lever 11. A spring 12 normally maintains the rocker lever 10 in the inoperative position in which the pinion is out of engagement with the spur wheel,

in which position no motion of shaft 2 occurs.

Disc 6 is retracted, against the pressure of spring 7, from its position in contact with the inner face of drum 3 by means of a rocker lever 13 rotatably engaging its shaft 5 and actuated by a pedal lever 14 through a link 14^1.

Drum 3 is of such diameter that a rim 15 of the box to be formed fits neatly over it (Fig. 3), and is provided at its outer end with a collar 16 with which the upper end of the rim contacts so as to maintain the lower end of the rim just over the end of the drum, thus preserving clearance between the drum and a disc 17 which is to form the base of the box and which is held in juxtaposition on, and in contact with, the rim by the pressure of disc 6 under the influence of spring 7. This clearance ensures intimate contact and the correct relative dispositions between the base and the rim of the box.

It is to be noted that the base 17 is of slightly larger diameter than the rim 15 so that a flange 18 (Fig. 3) is formed thereby and it is to this flange and to the adjacent portion of the rim that the adhesive strip is applied to unite the two integers.

A roll of adhesive strip 19 is rotatably mounted by a bracket 20 to the framing, and the strip is taken through guides 21, 21 and between a spring loaded roller 22 and an underlying roller 23. The lower roller 23 is immersed in a tank 24 of water or gum to be applied to the strip by the roller during its progress between the rollers (in known manner). From the tank the strip is taken to the flange 18 to which it is applied as now described.

A lever 25 is at one end pivoted, to move in a vertical plane, on a post 26 on the framing, and extends forwardly to overlie the drum 3 and disc 6, where it is formed with a fork-end 27 and a bridge-piece 28.

Rotatably mounted on a shaft 29 carried in the fork end 27, is a boss 30 having a roller 31 formed thereon, the roller 31 overlying the lower end of rim 15 when in the operative position and being adapted to press the strip 19 into contact therewith.

Slidably and rotatably mounted on shaft 29 is a second roller 33 which is urged by a spring 34 towards roller 31, but which is retractable from this position by means of a rocker hand lever 35 pivoted on bridge-piece 28 and rotatably engaging the boss 33^1 of the roller. Roller 33 is of larger diameter than roller 31 and has a chamfered edge 36 (Fig. 4), so that the strip is pressed tightly on to either side of the flange by these opposed faces of the rollers 31 and 33 under the influence of spring 34, and is stretched over the edge of the flange 18.

The lever 25 is urged towards the operative position in which the rollers 31 and 33 are in engagement with the box on the drum by means of a spring 37, but the lever may be lifted clear thereof to an inoperative position (shewn in dotted lines in Fig. 2) wherein it is retained by a suitable detent catch 25^1 which engages a pin 26^1 on post 26.

The operation of the apparatus is as follows:—

The lever 14 is actuated to draw disc 6 clear of drum 3, and the box rim 15 is placed on the latter (Fig. 3) and the base disc 17 carefully juxtaposed on the rim as shewn, when the pedal is released and the two units held in this position by the pressure of disc 6 against the base 17, under the influence of spring 7.

The strip 19 is drawn between the moistening rollers 22 and 23 and its end is applied to the junction of the rim and base disc in a position where it contacts with the lower edge of rim and overlies flange 18. The lever 25 is then lowered to bring the rollers 31 and 33 into contact with the strip on the box units, the roller 31 pressing the strip into intimate contact with the lower edge of the rim, and the opposed faces of rollers 31 and 33 pressing it into contact with either side of the flange.

The machine is then started by operation of pedal lever 11, which causes the drum 3, disc 6 and the box parts mounted thereon to rotate, and the rollers 31 and 33 to roll on the latter. The strip is drawn from the roll and as it approaches the drum is first engaged by the chamfered edge 36 of roller 33, on account of the large diameter thereof, (Fig. 4) and is pressed into contact with the under (or outer) face of flange 18, after which the roller 31 engages the strip and turns same over flange 18 and presses it into contact with the sides of the flange and the lower end of the rim 15. The application of the strip to the outer edge of the flange prior to the other parts prevents the splitting or tearing of the strip which would occur were it applied to all the surfaces simultaneously.

When the box parts have been rotated through one revolution and the juncture of the two effected, pedal lever 11 is released and the motion ceases, after which hand rocker lever 35 is actuated to release the pressure on either side of flange 18, and the lever 25 is lifted to clear the rollers from the box. Pedal lever 14 is then actuated to clear disc 6 of the base of the box, the latter being then drawn from the drum 3 in the assembled state.

The operation is then repeated on other box parts as required.

It is to be understood that in the appended claims the use of the word "base" includes a lid, as the processes of forming the base or lid upon the rim are analogous.

What I claim and desire to secure by Letters Patent is:—

1. Apparatus for the manufacture of boxes of cardboard or the like, comprising a framing in which is rotatably mounted a block to neatly receive the rim of a portion of a box, a plate rotatably mounted in the framing to contact with, and hold in juxtaposition on the rim, a base of such size as to form a flange about the rim, and two rollers mounted in the framing to apply to the box parts an adhesive strip for the purpose of joining them, one of said rollers being adapted to register with and bear upon the rim and the adjacent surface of the flange, and the second roller, of larger diameter than the former roller and spring pressed there-toward, being adapted to overlie the surface of the flange remote from the rim, so that pressure is applied by these rollers to the faces of the flange under the influence of the spring pressure when the rollers are in operative position upon the box parts.

2. Apparatus according to claim 1, in which the larger roller has a chamfered edge on that surface adjacent the smaller roller.

3. Apparatus according to claim 1, in which the rollers are mounted in one end of a lever pivoted in the framing, and the larger roller has a chamfered edge on that surface adjacent the smaller roller.

4. Apparatus according to claim 1 and including means for retracting the larger roller from the smaller against the spring pressure.

5. Apparatus for the manufacture of boxes of cardboard or the like, comprising a framing, mounted in the framing a horizontally disposed spindle carrying a block to neatly fit a rim of a portion of a box to be formed, driving means for intermittently rotating the spindle from a source of power, mounted in the framing in alignment with the said spindle a second spindle on which is mounted a disc spring-pressed towards the block to hold a base in juxtaposition on said rim and means for retracting the disc from the block, a mounting on the framing for a roll of adhesive strip to be applied to the adjacent portions of the rim and base to effect a juncture thereof, a device for applying moisture to the strip, a lever pivotally mounted in the framing to move in a vertical plane and carrying at one end two rollers to apply the strip to the portions of the box, one of said rollers being adapted to bear upon the rim and the adjacent flange formed by the base with the rim, and the second roller being spring-pressed towards the former roller and having a chamfered edge to overlie the face of the flange remote from the rim, said rollers being so arranged that pressure is applied thereby to press the adhesive strip against both faces of the flange under the influence of the spring pressure when the rollers are in operative position upon the box parts, and means for retracting the second roller from the first roller to clear the rollers from the box parts.

Signed at Sydney this 4th day of September, A. D., 1930.

FRANZ RIEDL STELLING.