Oct. 31, 1939. W. LOCKHART 2,178,121

APPARATUS FOR SHAPING PAPER

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FIG.1.

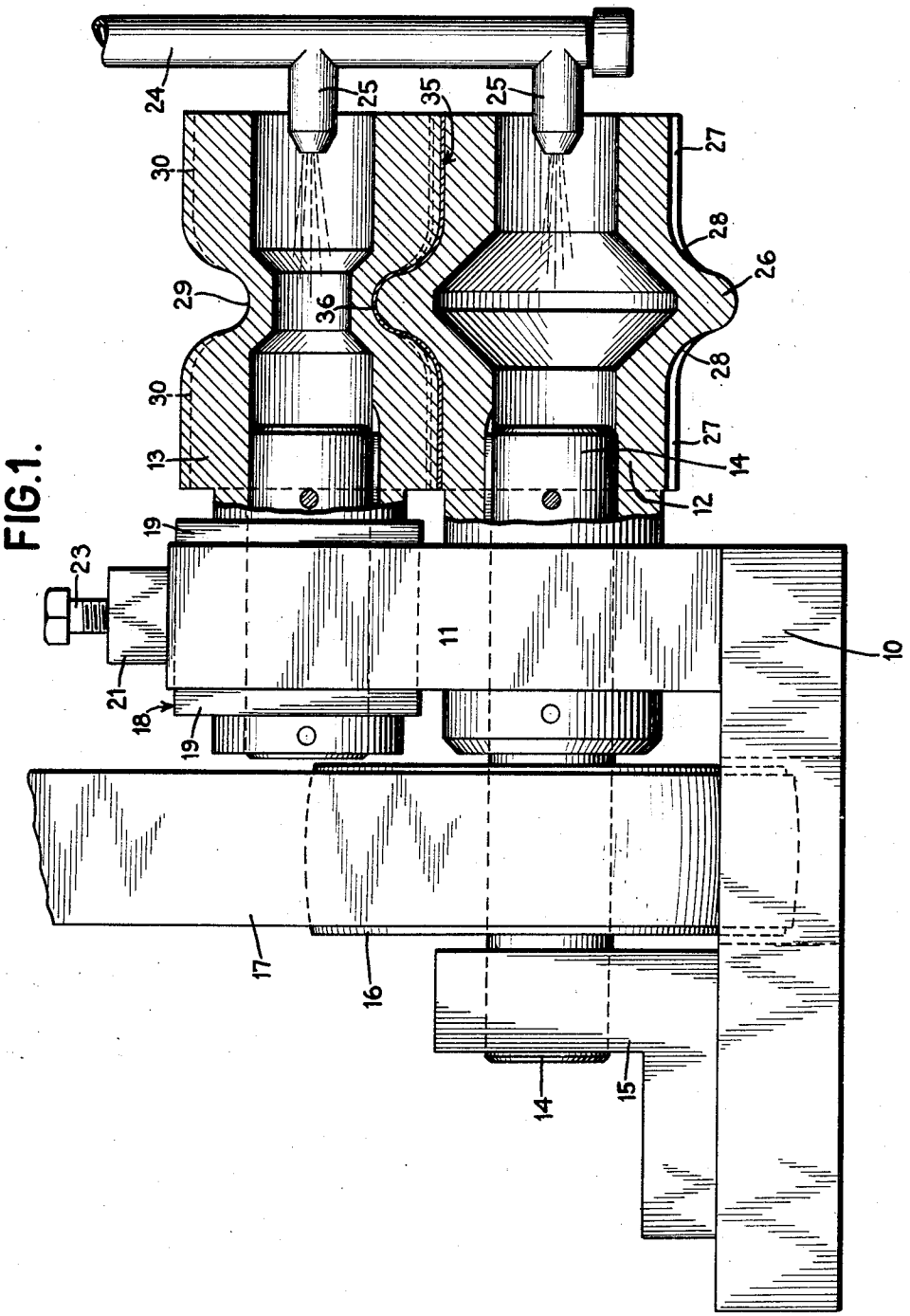

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FIG. 3.

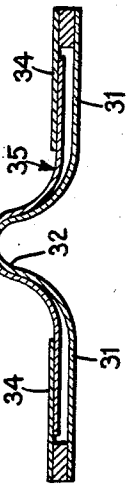

FIG. 4.

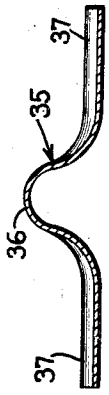

FIG. 2.

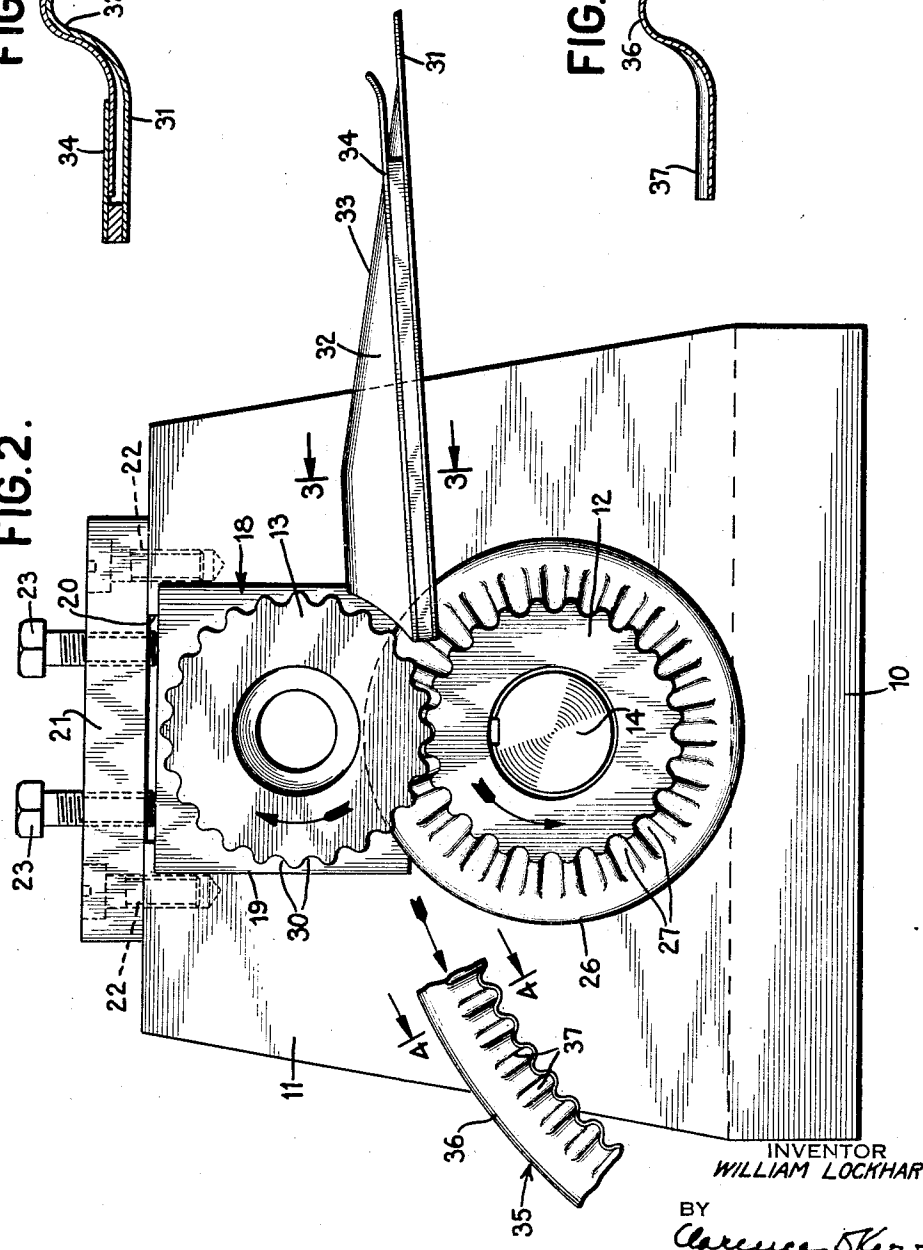

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FIG.5.

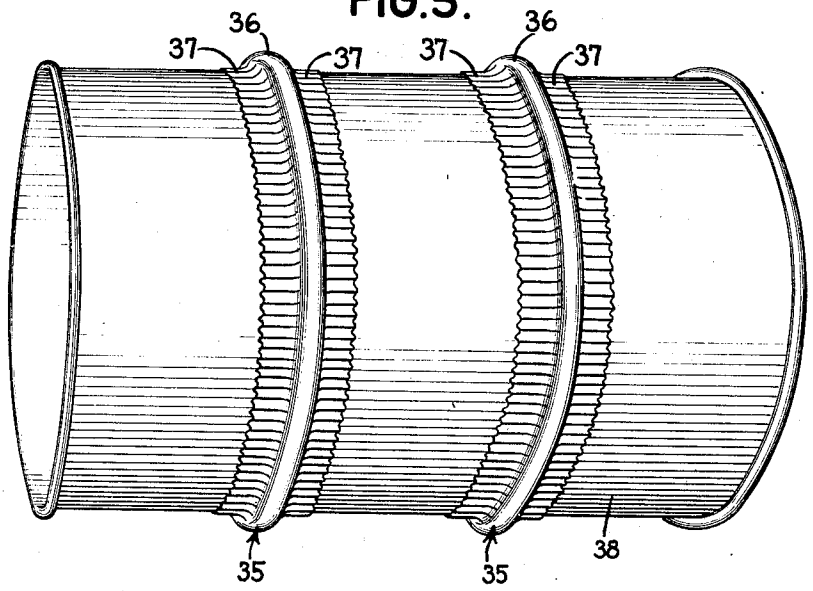

FIG.6.

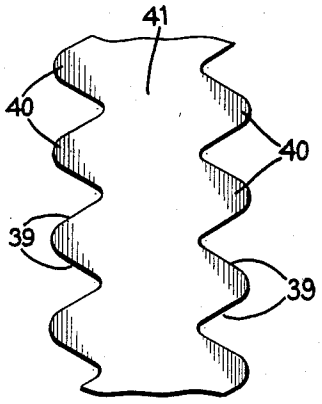

FIG.7.

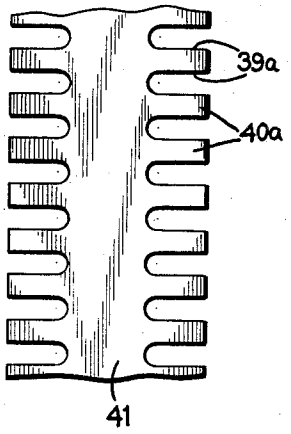

FIG.8.

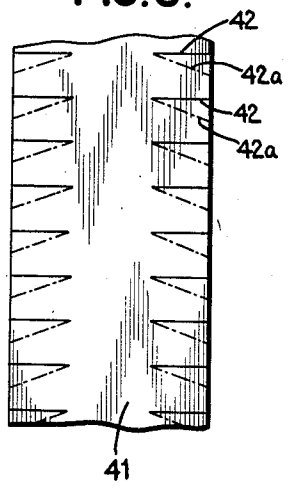

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FIG.9.

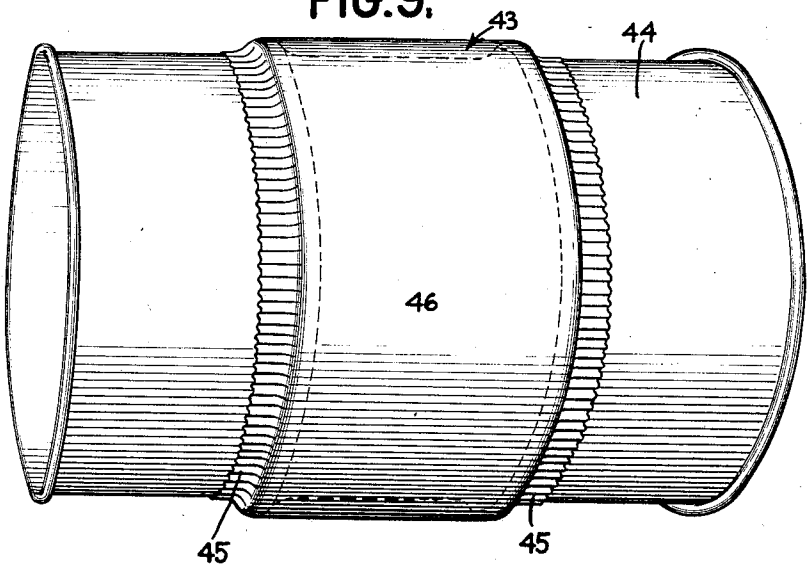


FIG.10.

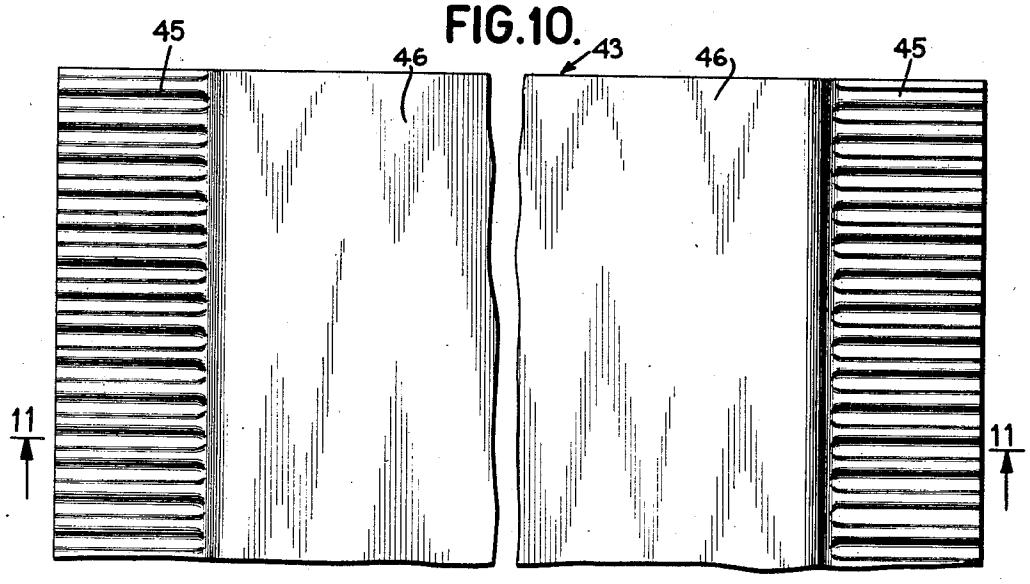
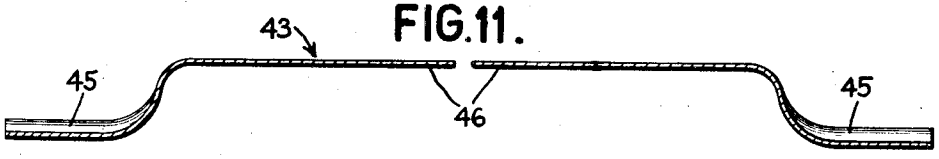


FIG.11.



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Patented Oct. 31, 1939 2,178,121

UNITED STATES PATENT OFFICE

2,178,121

APPARATUS FOR SHAPING PAPER

William Lockhart, Northfield, Ohio, assignor to The National Steel Barrel Company, a corporation of Ohio

Application October 29, 1935, Serial No. 47,220

4 Claims. (Cl. 154—30)

This invention relates to a strip of material for use in protecting beads, flanges, or the like, of containers such as barrels and drums during shipping and handling of the same.

Steel barrels are frequently manufactured with integral beads extending circumferentially thereof to lend added strength and rigidity. These beads have been found to rub against each other since the barrels or drums shift relative to each other during shipment. A considerable amount of wear thus takes place on these projections and the containers are apt to arrive at their destination in an unsightly condition.

One object of my invention is to protect these exposed beads by applying thereover a strip of material in the form of a band. Such a band also lends itself to decoration and advertising and may be very readily removed or renewed, if desired.

A further object of my invention is to provide a simple and efficient method and apparatus for shaping paper-like material such as cardboard or paperboard so that it may be formed into a band as above described.

Further objects of my invention will be apparent from the detailed description of the embodiments thereof illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of apparatus for shaping a protector strip in accordance with one embodiment of my invention and broken away to show the shaping rolls in section.

Figure 2 is an end elevation of the apparatus shown in Figure 1, as viewed from the right hand of said Figure 1.

Figure 3 is a vertical sectional view through the guiding means and taken on the line 3—3 Figure 2.

Figure 4 is a vertical sectional view of the shaped paper strip taken on the line 4—4 of Figure 2.

Figure 5 is a perspective view of a barrel having a preferred form of my improved protector strip in place.

Figures 6, 7 and 8 illustrate blanks for forming strips in accordance with further embodiments of my invention.

Figure 9 is a perspective view of a barrel provided with a modified protector strip.

Figure 10 is an enlarged top plan view of this modified protector strip, and

Figure 11 is a sectional view of this protector strip taken on the line 11—11 of Figure 10.

In the drawings the numeral 10 designates a base having a vertical frame portion 11 adapted to rotatably support the male roll 12 and the female roll 13. Roll 12 is carried directly in a bearing formed in the vertical frame 11 and is connected to an axle 14, the other end of which is carried in the bearing 15 attached to base 10. A pulley 16, or other driving means, may be mounted on this axle and driven by a belt 17, or in any other suitable manner. Roll 13 may be mounted in a pillow block 18 which is formed with shoulders 19 and adapted to slide vertically in the slot 20 formed in the frame portion 11 above the bearing carrying roll 12. Upward movement of this pillow block 18 is limited by a bar 21 fastened across the top of slot 20 by means of bolts 22, 22. Bar 21 carries set screws 23, 23, or other suitable means, for positively forcing the roll 13 into contact with the roll 12 and regulating the pressure therebetween.

Heating means are preferably provided for the rolls and may comprise a supply pipe 24 connected to any suitable source of gas or other fuel (not shown) to which the burners 25, 25 are connected. These burners are arranged to direct a flame into the interior of the rolls 12, 13 to heat the same to the proper temperature. Electrical, steam, or other suitable heating means may be employed instead of the burners described.

Roll 12 as illustrated is formed with a centrally disposed circumferential flange 26 having a smooth surface. The ends of this roll are provided with corrugations 27 extending longitudinally of the roll and decreasing in depth as they approach the flange 26 at the curved portions 28. Roll 13 is formed with a circumferential groove 29 corresponding to the flange 26 and is provided with corrugations 30 at the ends similar to the corrugations 27 of roll 12. The corresponding corrugations of these two rolls thus intermesh to act as gear teeth and only one of the rolls needs to be driven.

A guiding device may be provided to preliminarily shape and feed the paper-like material to the rolls. This guiding device may comprise a base 31 having an upwardly curved portion 32 sloping upwardly towards the rolls as illustrated at 33.

The edges of the paper-like material fed to the rolls are caught underneath the plates 34 which are attached to and extend inwardly from the sides of the base 31. Sufficient clearance should be provided between base 31 and plates 34 to allow the paper material 35 to feed freely towards the rolls. It will be understood that this preliminary shaping and guiding device bends the paper-like material to form a longi-

tudinal rib corresponding approximately to the shape of the bead 26 on roll 12, as the material is fed to the rolls 12 and 13. This strip material 35, after it has been finally shaped by rolls 12 and 13, has an upwardly curved central portion 36 and corrugated marginal portions 37, 37.

As the strip material is fed to the shaping rolls, it should be in a moist condition so that the heat and pressure of the rolls will perform their work to the best advantage. This may be readily accomplished by sprinkling, or spraying the flat strip as it is fed to the guiding device or in any other convenient manner.

In applying the shaped strips to the beads of a container, strips 35 may be fitted around the beads of a barrel 38 and the ends pasted together or secured in any other desirable manner. These bands will then be securely held in place due to their shape and may remain on the barrel until it reaches the ultimate consumer. If the strips should become torn or damaged they may be readily ripped off and replaced with fresh ones. Such strips add materially to the appearance of containers such as barrels and drums, as well as serve to prevent wear and preserve the surface of said containers. Such protection is an especially important feature when the containers are coated on the outside as with enamel or paint.

Figures 6 to 8 illustrate blanks which may be readily formed into strips and bands for application to barrel beads and the like, as described above. The blank shown in Figure 6 has the marginal portions cut out as at 39 to produce a scalloped edge leaving tongues 40 extending outwardly from the central portion 41 of the strip. This blank may be applied to a barrel bead directly or may be first shaped by rolls as desired. In either case the central portion 41 will be curved longitudinally of the strip drawing in the tongues 40 towards each other.

Figure 7 illustrates another embodiment of my invention in which the marginal portions of the strip may be cut as at 39*a*, leaving a plurality of spaced transversely extending tongues 40*a*. As the central portion 41 of the strip is curved these tongues will likewise be drawn in together to substantially close the openings 39*a*.

According to a further embodiment illustrated in Figure 8, the marginal portions of this strip may be folded along the lines 42 and 42*a* so that when the strip is shaped these sections will form pleats taking up the excess material. The marginal portions of the strip may also, if desired, be slit transversely along the lines 42 to provide for overlapping sections to effect a similar result.

Reference to Figures 9–11 indicates a different application of my improved protector strip, in which a single strip 43 is used to cover two or more beads on a barrel 44. In this form of my invention, the strip 43 may comprise a relatively wide band having marginal portions 45 which are preferably corrugated, although they may be varied in accordance with the marginal portions of the strips shown in Figures 6–8, if desired. The central or main portion 46 of this strip covers the space or spaces between two or more of the rolling hoops on the barrel and provides adequate space for advertisement or decoration. In addition such a wide strip may be readily made by a single operation in accordance with the method and by employing apparatus similar to that described above.

The terms used in describing the invention are used as terms of description and not as terms of limitation and it is intended that all equivalents of these terms be included within the scope of the invention claimed.

I claim:

1. Apparatus for shaping paper and the like comprising a roll having a circumferential flange and corrugations on each side of said flange extending longitudinally of the roll substantially parallel to the axis thereof, a second roll mounted in contact with said first roll and having a groove adapted to receive the flange of said first roll and corrugations on each side of said groove constructed and arranged to mesh with the corrugations on the first roll, and means for driving only one of said rolls.

2. Apparatus for shaping paper and the like comprising a roll having a circumferential flange and corrugations on each side of said flange extending substantially parallel to the axis of said roll, a second roll mounted in contact with said first roll and having a groove adapted to receive the flange of said first roll and corrugations on each side of said groove constructed and arranged to mesh with the corrugations on the first roll, and adjustable means for varying the pressure between said rolls, said rolls being constructed and arranged so that one roll drives the other by means of said corrugations.

3. Apparatus for shaping paper and the like comprising a roll having a circumferential flange and corrugations on each side of said flange substantially parallel to the roll axis, a second roll mounted in contact with said first roll and having a groove adapted to receive the flange of said first roll and corrugations on each side of said groove constructed and arranged to mesh with the corrugations on the first roll, and means for preliminary shaping and guiding a strip of paper-like material as it is fed to said rolls, said means having a curved portion sloping upwardly in the direction of feed of said material.

4. Apparatus for shaping paper and the like comprising a roll having a circumferential flange and corrugations on each side of said flange extending longitudinally of the roll and substantially parallel to the axis thereof, a second roll mounted in contact with said first roll and having a groove adapted to receive the flange of said first roll and corrugations on each side of said groove constructed and arranged to mesh with the corrugations on the first roll, internal means for heating at least one of said rolls, and means in advance of said rolls for bending the paper to form a longitudinal rib corresponding to said flange and to feed the paper to the rolls while thus bent.

WILLIAM LOCKHART.