R. S. BOLGER.

METHOD OF MANUFACTURING PAPER BARRELS.

APPLICATION FILED MAY 9, 1918. RENEWED OCT. 31, 1919.

1,340,110. Patented May 11, 1920.

4 SHEETS—SHEET 1.

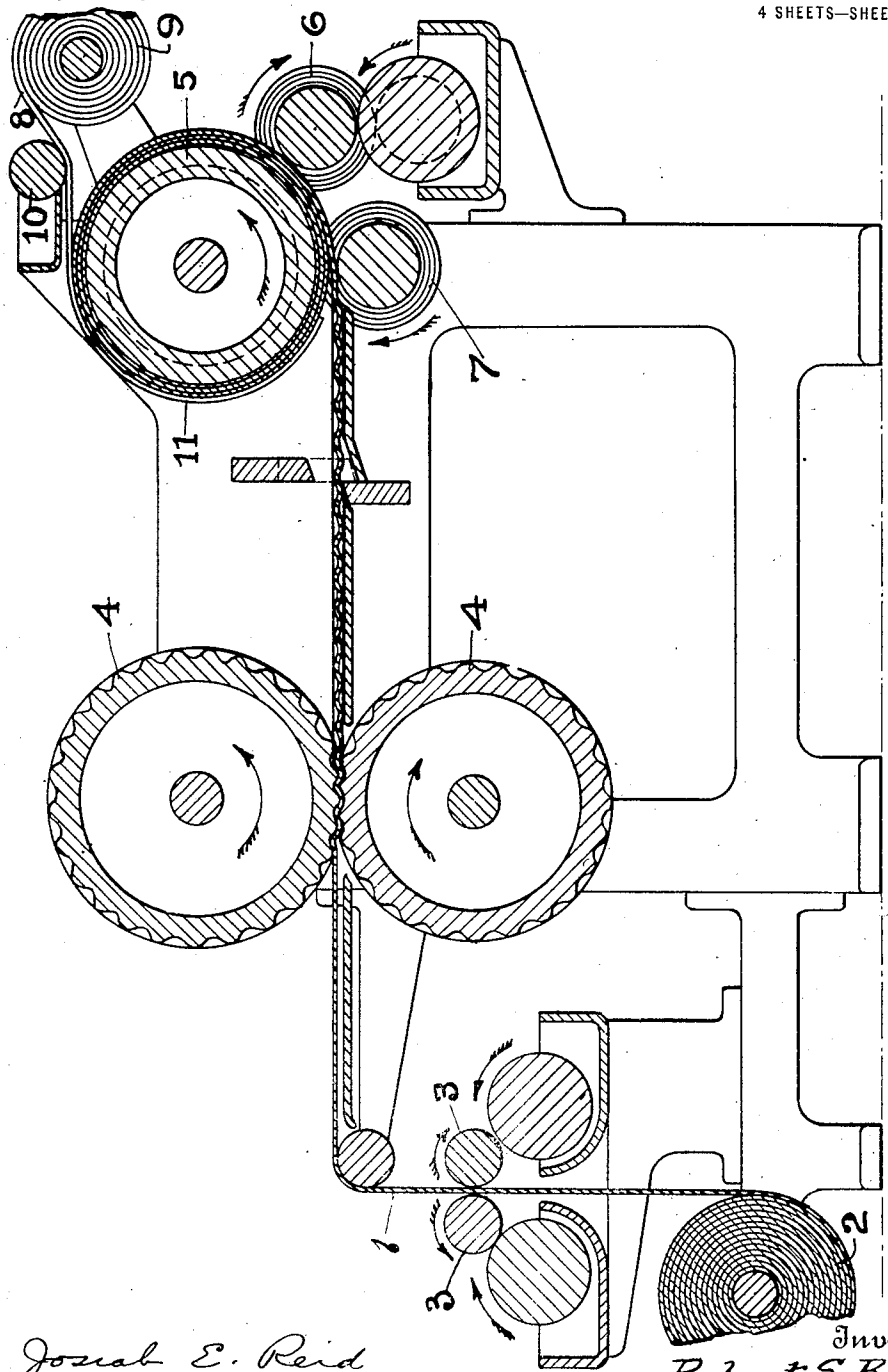


Fig. 1

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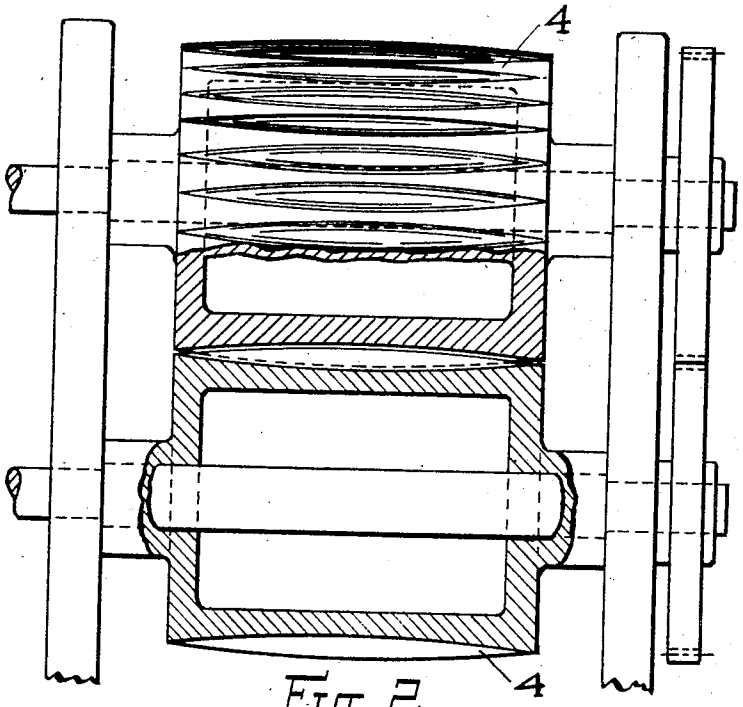


Fig. 2

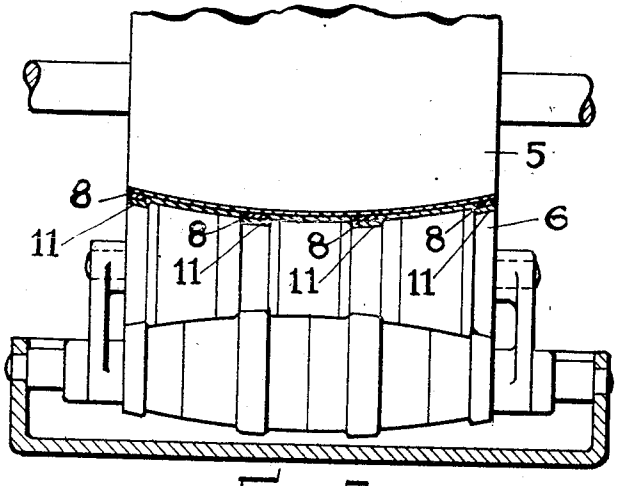


Fig. 3

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4 SHEETS—SHEET 3.

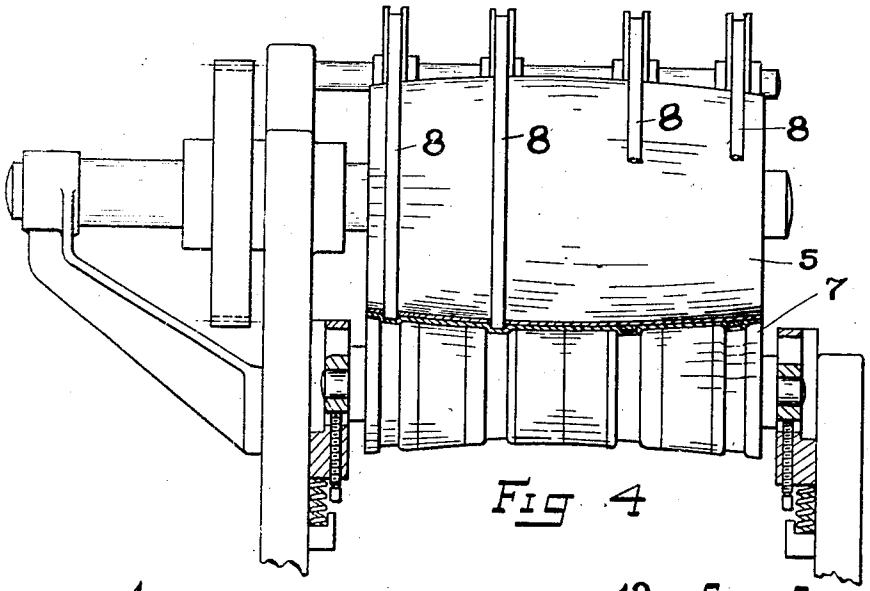


FIG 4

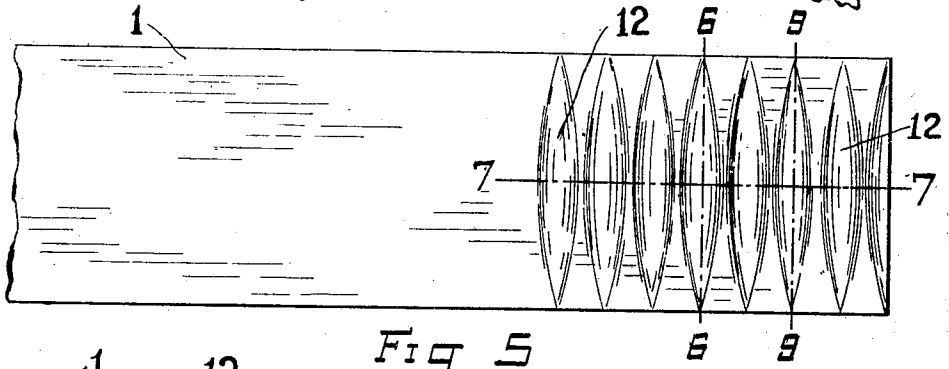


FIG 5


FIG 7

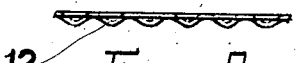


FIG 8

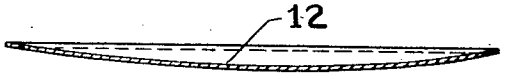


FIG 6

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4 SHEETS—SHEET 4.

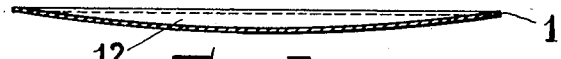


Fig. 9

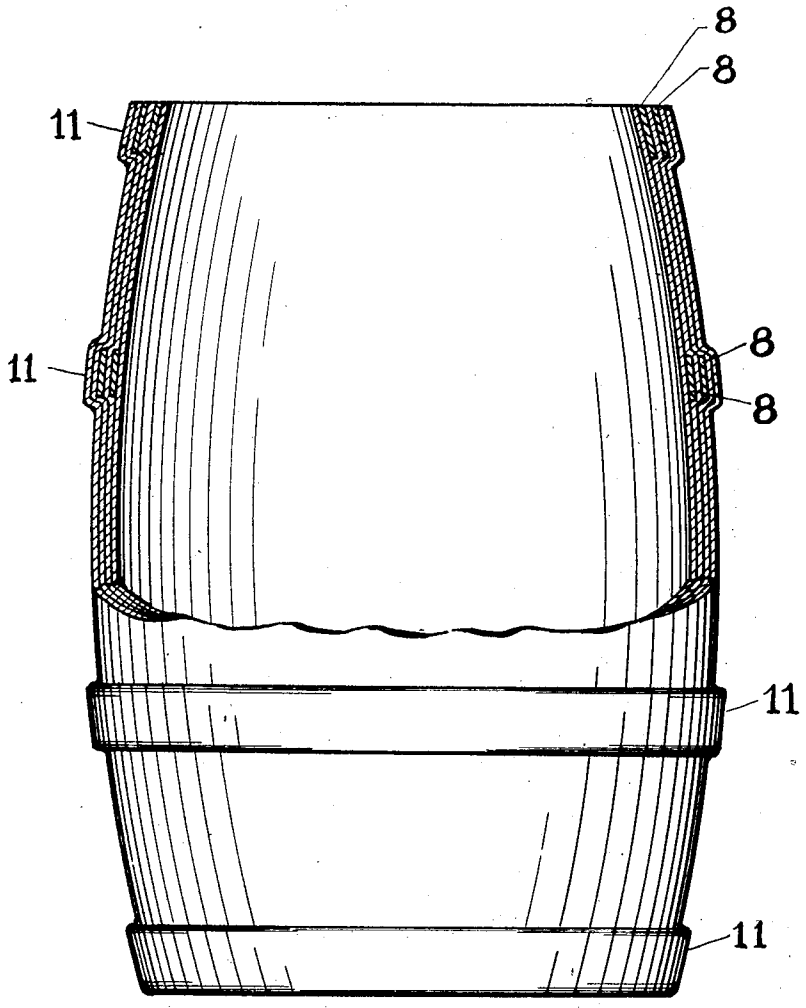


Fig. 10

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# UNITED STATES PATENT OFFICE.

ROBERT S. BOLGER, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO GEORGE F. WHISTLER, OF BROOKLYN, NEW YORK.

## METHOD OF MANUFACTURING PAPER BARRELS.

1,340,110. Specification of Letters Patent. Patented May 11, 1920.

Application filed May 9, 1918, Serial No. 233,461. Renewed October 31, 1919. Serial No. 334,884.

*To all whom it may concern:*

Be it known that I, ROBERT S. BOLGER, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented new and useful Improvements in Methods of Manufacturing Paper Barrels, of which the following is a specification.

This invention relates to paper barrels and the object in view is to utilize a method of producing such barrels which consists in dampening or moistening a web of finished paper from which the barrel body is to be formed, stretching a portion or portions of said web between the side or longitudinal margins thereof, leaving said margins shorter than the stretched portions of the web, reeling or wrapping the dampened and stretched web around a bilged form or mandrel, applying an adhesive substance to the web as it is wrapped upon and around the mandrel, and applying a rolling pressure to the initial and subsequent convolutions of the web as they are wrapped around the mandrel and subsequently thereto. The method of producing the barrel also involves certain novel steps in a novel relation to each other as will hereinafter appear.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of parts, as herein described, illustrated and claimed.

In the accompanying drawings:

Figure 1 is a diagrammatic elevation showing the method of manufacturing a paper barrel in accordance with the present invention.

Fig. 2 is a diagrammatic elevation of the stretching rolls.

Fig. 3 is a diagrammatic elevation of the adhesive applying rolls.

Fig. 4 is a diagrammatic elevation of the mandrel and pressure rolls.

Fig. 5 is a fragmentary plan view of the paper web showing stretched and unstretched portions thereof.

Fig. 6 is a section on the line 6—6 of Fig. 5.

Fig. 7 is a section on the line 7—7 of Fig. 5.

Fig. 8 is a fragmentary edge view of a stretched portion of the web.

Fig. 9 is a cross section through the web on the line 9—9 of Fig. 5.

Fig. 10 is a view partly in elevation and partly in diametrical section of the complete barrel.

In producing a barrel in accordance with the present invention, a web of paper indicated at 1 and drawn from a supply roll 2 is carried against or between one or more dampening or moistening rolls 3 preparatory to the stretching of the web. It is then passed between a pair of stretching rolls 4 which are so designed as to longitudinally stretch the web between the side margins thereof, the central or medial portions of the web being stretched to the greatest extent and the stretching preferably diminishing toward the side or marginal edges thereof, the latter remaining shorter than the remaining portions of the web after the stretching operation has been completed. The web, after being dampened or moistened and stretched in the manner referred to, is wrapped around a form or mandrel 5 of bilged formation and just as the web is being wound upon the mandrel, an adhesive material or substance is applied to the web by means of an adhesive applying roll 6. The adhesive material is applied to the web as long as it is being wrapped around the mandrel and upon itself to form superimposed plies or layers. At the same time, a rolling pressure is applied to the initial and subsequent convolutions of the web, by means of one or more rollers 7 so that the convolutions of the barrel body are caused to adhere and unite firmly and closely.

Simultaneously with the wrapping of the web around the mandrel and the wrapping of the convolutions one upon the other, hoop forming relatively narrow strips 8 are wound around the mandrel and interposed between the convolutions of said web, strip supplying rolls 9 being provided for that purpose. Adhesive material is applied to said strips 8 by means of adhesive applying rollers 10, as said strips are fed to the mandrel and between the convolutions of the web. This results in producing annular external offsets 11 around the barrel body, resembling the ordinary reinforcing hoops of a barrel. The reinforcing bands or hoops add to the strength and durability of the barrel and especially adapt the same for heavy duty purposes.

In Figs. 5 to 9 inclusive of the drawings, the web 1 is shown as having portions thereof stretched to provide lenticular offsets or

stretched portions 12 elongated transversely of the web and gradually contracting in width from the longitudinal center of the web in opposite directions toward the longitudinal edges or margins of the web. In using a stretched portion of such form, it will be understood that the web is stretched to the greatest extent along the longitudinal center of the web, the stretching operation progressively reducing toward the side or marginal edges thereof, so that when the web is being wrapped around the mandrel, the web will stretch in accordance with the bilge of the mandrel and will therefore conform to the form of the mandrel, producing a barrel body of bilged formation having smooth inner and outer surfaces. The rolling pressure applied to the initial and subsequent convolutions of the web, as it is wrapped around the mandrel, by means of the roller 7 also assists in the operation and insures the formation of a smooth barrel body, both as to the interior and exterior thereof.

I do not desire to be limited to the particular form of offsets or stretched portions, as illustrated in Figs. 5 to 9 inclusive, it being apparent that the number of stretched portions of the web may be increased or diminished according to requirements and the degree of bilge in the mandrel and the thickness of the web of paper used in the formation of the barrel body. I, therefore reserve the right to make such changes in the formation and proportion of such parts as properly fall within the scope and spirit of the appended claims.

I claim:—

1. The method of making a paper barrel of a web of dry finished paper, which consists in longitudinally stretching said web between the side edges thereof, the latter remaining relatively shorter than the stretched portions, and then wrapping the same upon itself into bilged barrel formation.

2. The method of making a paper barrel, which consists in dampening a web of dry finished paper, then stretching the portion between the longitudinal edges thereof, the latter remaining relatively shorter than the stretched portion, and then wrapping the web upon itself into bilged barrel formation.

3. The method of making a paper barrel of a web of dry finished paper, which consists in longitudinally stretching said web between the side edges thereof, the latter remaining relatively shorter than the stretched portions, and then longitudinally wrapping the same in superimposed convolutions upon itself into bilged barrel formation, and uniting such convolutions by an adhesive.

4. The method of making a paper barrel of a web of dry finished paper, which consists in dampening said web, then stretching said web between the side edges thereof, the latter remaining relatively shorter than the stretched portion, then wrapping the same upon itself into bilged barrel formation, and then subjecting the web and body to compacting pressure.

5. The method of making a paper barrel which consists in dampening a web of dry finished paper, then stretching said web between the side edges thereof, the latter remaining relatively shorter than the stretched portion, then wrapping the same upon itself into bilged barrel formation, and interposing reinforcing means between the convolutions thereof during the wrapping operation.

6. The method of making a paper barrel of a web of dry finished paper, which consists in dampening and longitudinally stretching said web between the side edges thereof, the latter remaining relatively shorter than the stretched portion, then longitudinally wrapping the same in superimposed convolutions upon itself into bilged barrel formation, applying an adhesive to the web to cause the convolutions to adhere to each other, and subjecting the web and the convolutions thereof to pressure during the wrapping operation.

7. The method of manufacturing bilged barrel bodies of a continuous unbroken web of paper, which consists in longitudinally stretching said web between the side edges thereof, the latter remaining relatively shorter than the stretched portions, then longitudinally wrapping the same upon itself into bilged barrel formation, and interposing relatively narrow strips of flexible material between the convolutions of the web during the wrapping of the web around the mandrel.

8. The method of manufacturing bilged barrel bodies of a continuous unbroken web of paper, which consists in longitudinally stretching said web between the side edges thereof, the latter remaining relatively shorter than the stretched portions, then longitudinally wrapping the same upon itself into bilged barrel formation, interposing relatively narrow strips of flexible material between the convolutions of the web during the wrapping of the web around the mandrel, and applying an adhesive substance to said strips as they are fed to the mandrel.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT S. BOLGER.

Witnesses:
STANLEY C. FALLON,
RILEY G. CASTLEMAN,