July 16, 1935. LE ROY Q. PRESBY 2,008,313

ARTIFICIAL REED, RATTAN AND THE LIKE

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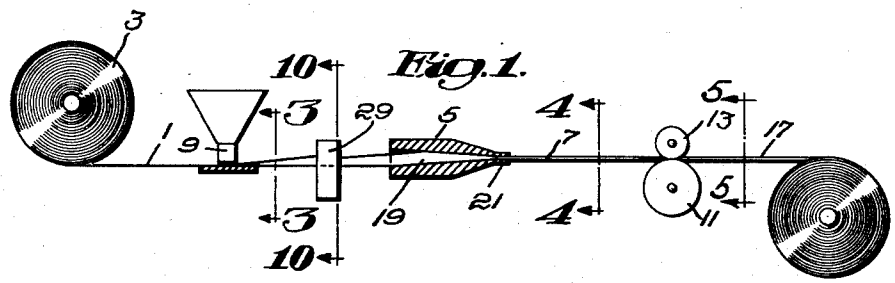


Fig. 1.

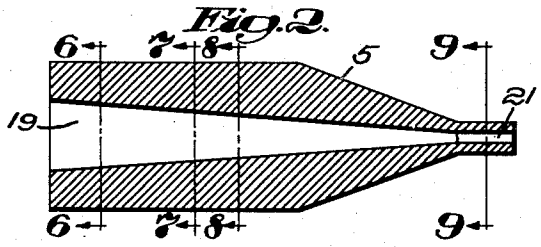


Fig. 2.

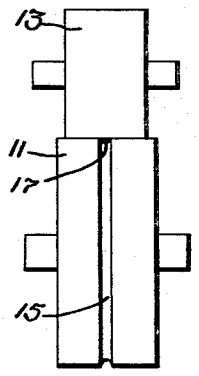
Fig. 3.



Fig. 4.



Fig. 5.



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Fig. 6.

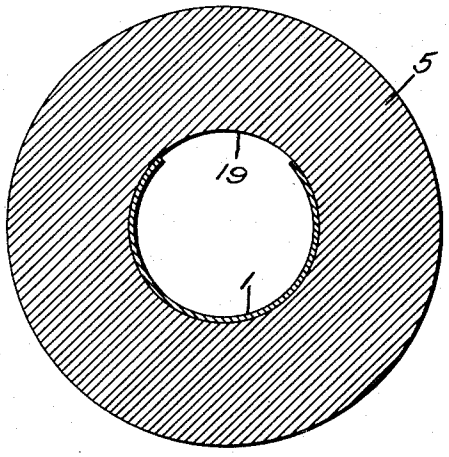


Fig. 7.

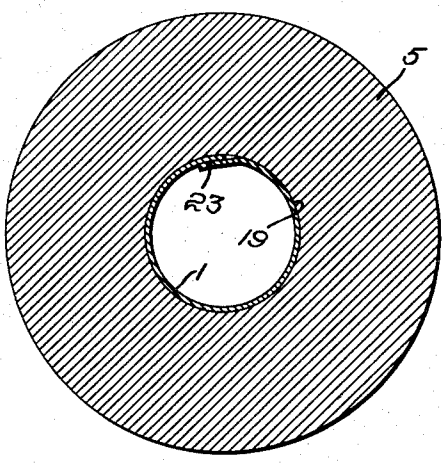


Fig. 8.

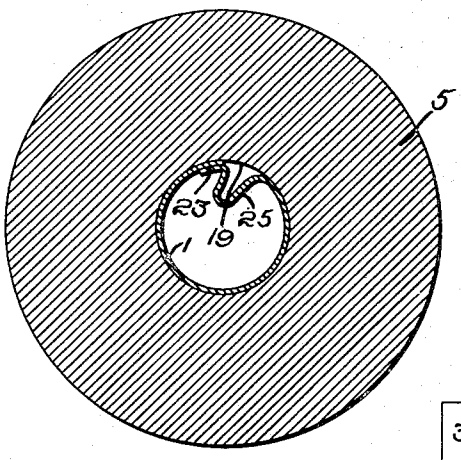


Fig. 9.

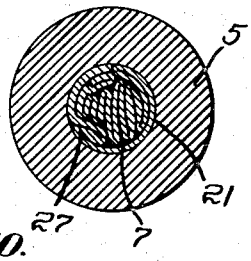
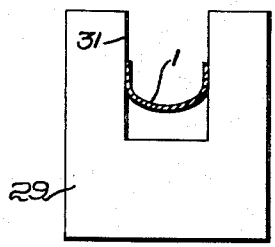


Fig. 10.



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ARTIFICIAL REED, RATTAN, AND THE LIKE

Leroy Q. Presby, Melrose, Mass., assignor to American Stay Company, Boston, Mass., a corporation of Massachusetts

Application February 3, 1932, Serial No. 590,648

12 Claims. (Cl. 93—84)

My invention, which relates to artificial rattan or weed and to methods of and apparatus for producing the same, will be best understood from the following description when read in the light of the accompanying drawings, while the scope of the invention will be more particularly pointed out in the appended claims.

In the drawings:—

Fig. 1 schematically shows an arrangement of apparatus for producing artificial rattan or reed from a strip of paper;

Fig. 2 is a longitudinal section of the tube forming and crumpling and reed compacting device;

Figs. 3, 4 and 5 are respectively sections on the lines 3—3, 4—4 and 5—5 of Fig. 1;

Figs. 6, 7, 8 and 9 diagrammatically show the action of the device according to Fig. 2 on the strip of paper, these figures representing sections on the lines 6—6, 7—7, 8—8 and 9—9 of Fig. 2 as the work is fed through the device; and

Fig. 10 is a section on the line 10—10 of Fig. 1.

Referring to the drawings, a strip 1 of paper is fed from a roll 3, and passed through a device 5, which latter bends the strip transversely to form a tube, and then crumples the tube transversely and compacts it to form a substantially solid reed 7 of circular cross-section. Prior to the passage of the strip through the device 5, the upper side of the strip is made adhesive, conveniently by presenting the strip to a fountain 9 which applies air drying liquid adhesive to the upper side of the strip. As shown, the strip is drawn through the device 5 by a pair of rollers 11 and 13 through which the reed 7 passes. If desired, one of the rollers, say the lower roller 11, may be formed with a rounded groove 15 which causes the reed 7 to be further compacted and compressed to a so-called half-round cross-section as indicated at 17 (Fig. 5).

The device 5 for forming a tube, and compacting the latter to form the solid reed, as best illustrated in Fig. 2, comprises a block of metal provided with a frusto-conical passage 19 communicating at its small end with a short small diameter passage 21 of circular cross-section, which passage 21 forms a die through which the reed is drawn. It has been found that by suitably proportioning the frusto-conical passage with relation to the width of the strip 1 the latter in its travel through the passage is progressively bent transversely, as indicated in Fig. 6, until the opposite edges of the strip are brought together, whereupon they move into slightly overlapping relation, as indicated at 23 in Fig. 7, and adhere due to the adhesive on the inner side of the sheet. No further slippage between the edge portions being possible, the strip, due to the progressively decreasing diameter of the passage 19, begins to buckle, the latter occurring usually at one side or the other of the overlapping edges, as indicated at 25 in Fig. 8, but sometimes occurring simultaneously at both sides of said edges to force the latter away from the walls of said passage. As the strip is drawn through the passage this buckling continues until a condition such, for example, as that illustrated by Fig. 9 occurs as the strip passes through the smaller end of the passage 19. In its condition illustrated by Fig. 9 it will be observed that the tube has been crumpled by directly folding the major portion of the walls thereof upon itself as distinguished from compacting the tube by twisting or rolling it.

No attempt has been made to illustrate the cross-section of the reed with strict accuracy, but that shown by Fig. 9 represents a typical cross-section, the reed on its exterior presenting a surface which wholly or predominately is unfolded, there being usually no more than one fold 27 on the exterior surface. This apparently results from the excess circumferential portion of the tube, as the tube diameter is decreased, feeding inward toward the interior of the tube at the place where the tube first begins to buckle.

Wide deviations may be made in the proportions of the passage 19, and as an example of suitable proportions, but without limitation thereto, it has been found that satisfactory results will be secured with a strip 1.2 inches wide if the passage 19 is about $3\frac{3}{16}$ inches long and tapers from about $\frac{9}{16}$ of an inch to $\frac{3}{32}$ of an inch.

Under some conditions of operation, particularly where the paper is much softened by the adhesive, the strip has a tendency, when placed under tension, to bend in the opposite direction to that indicated by Fig. 6, which bending, when it occurs, causes the glue to be on the outer, instead of the inner, surface of the tube. To insure against this, convenient means, such as the guide or folder 29, are employed. As shown, the folder 29 consists of a plate having a relatively narrow, deep slot 31 through which passes the portion of the strip between the fountain 9 and tube forming and crumpling device 5. The opposite side walls of the slot engage with opposite edge portions of the strip and bend it to a U-shape effective to prevent accidental reverse curvature of the strip when placed under tension.

It will be observed that the tube formed as illus-

trated in Fig. 7 completely encloses the adhesive and prevents the escape thereof to the outer side of the reed being formed, with the result that all the glue is retained inside the body of the reed to hold the folds together and prevent the undesirable feature of having glue on the exterior surface of the reed. Also, if the glue were permitted to escape to the outer surface of the sheet of paper the passage 19 would soon become filled with glue, which would harden if hot glue were applied at the fountain 9 and seriously interfere if not wholly prevent operation of the device. This feature thus permits the use of a hot, readily flowable glue having sufficient liquid properties to soften the paper enough to cause it to buckle and be compacted with facility.

It will be understood that wide deviations may be made from the embodiments of the invention described without departing from the spirit of the invention.

I claim:

1. The method of producing an artificial reed which comprises laterally crumpling a tube of paper by directly folding the walls thereof, the inner surface of which is coated with adhesive, and compressing it to form a substantially solid reed.

2. The method of producing an artificial reed which comprises applying adhesive to one side of a strip of paper, bending said strip transversely to form a tube enclosing said adhesive, transversely crumpling said tube by directly folding the walls thereof, and compressing the crumpled tube for forming a substantially solid reed.

3. The method of producing an artificial reed which comprises applying adhesive to one side of a strip of paper, bending said strip transversely to form a tube enclosing said adhesive, transversely crumpling said tube by directly folding the walls thereof, and compressing the crumpled tube by subjecting it to a drawing operation for forming a substantially solid reed.

4. The method of producing an artificial reed which comprises applying adhesive to one side of a strip of paper, bending said strip transversely to bring opposite edges thereof into slightly overlapping contacting relation to form a tube enclosing said adhesive, transversely crumpling said tube by directly folding the walls thereof, and compressing the crumpled tube to form a substantially solid reed.

5. The method of producing an artificial reed which comprises applying adhesive to one side of a strip of paper, bending said strip transversely to bring opposite edges thereof into slightly overlapping contacting relation to form a tube enclosing said adhesive, transversely crumpling said tube by folding the walls interiorly of said tube, and subjecting the crumpled tube to a drawing operation for forming a substantially solid reed.

6. An artificial reed comprising a strip of material opposite edges of which are cemented together and which is bent and folded transversely to present a predominantly continuous unfolded outer surface surrounding a mass of compacted folds.

7. An artificial reed of so-called half-round cross-section comprising a strip of material opposite edges of which are cemented together and which is bent and folded transversely to present a predominantly continuous unfolded outer surface surrounding a mass of compacted folds.

8. The method of producing an artificial reed which comprises crumpling a tube of paper by folding its walls interiorly of the tube, and compressing the crumpled tube to form a substantially solid reed.

9. The method of producing an artificial reed which comprises crumpling a tube of paper interiorly coated with adhesive by folding its walls interiorly of the tube, and compressing the crumpled tube to form a substantially solid reed.

10. The method of producing an artificial reed which comprises laterally folding a portion of a strip of paper to form a core, and bending another portion of said strip to form a predominantly uncrumpled envelope intimately contacting with said core.

11. The method of producing an artificial reed which comprises laterally folding one portion of a strip of paper coated on one side thereof with adhesive to form a core, and bending the remaining portion of said strip to form a predominantly uncrumpled continuous envelope intimately contacting with said core and cemented thereto.

12. An artificial reed comprising a strip of material opposite edge portions of which are cemented together and which has portions folded in pleated fashion to form a core and other portions which present predominantly continuous unfolded surfaces forming an envelope for said core.

LEROY Q. PRESBY.