

Jan. 8, 1935.

W. F. RICHTER

1,986,979

PRODUCTION OF ARTIFICIAL STRAW

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Fig. 1.

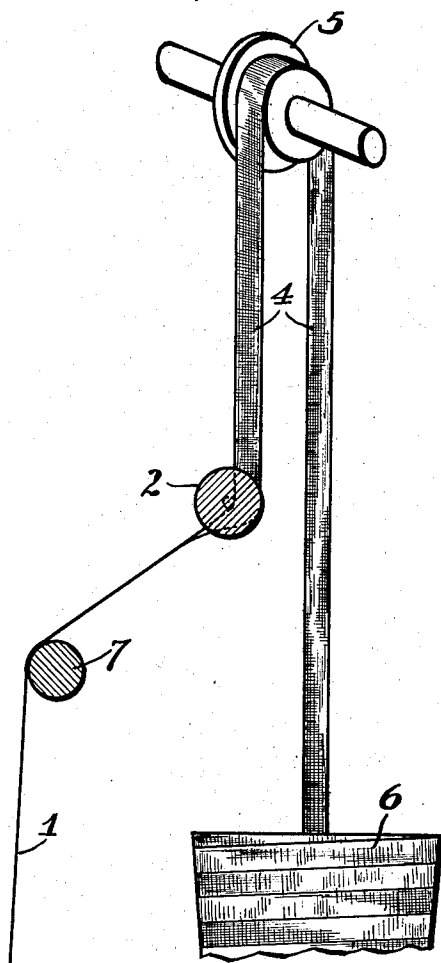


Fig. 2.

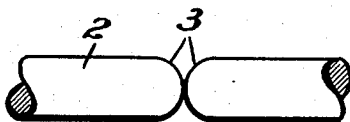
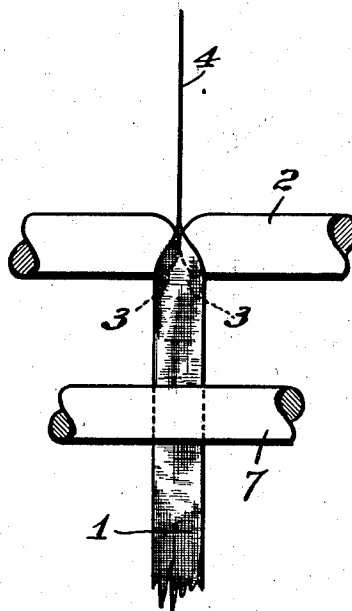


Fig. 3.

WITNESSES

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UNITED STATES PATENT OFFICE

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PRODUCTION OF ARTIFICIAL STRAW

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5 Claims. (Cl. 18—57)

This invention relates to the production of artificial straw.

Artificial straw, or raffia, is commonly made by precipitation of a cellulose solution, for example viscose, in the form of a flat tape or ribbon, which is then treated in the manner known in the art. Straw prepared in this manner is commonly characterized by irregularities in width and strength. The freshly precipitated bands are weak, and in drawing them from the precipitating bath there is a tendency for the band to fold in an irregular manner. This is objectionable because it renders the straw irregular in width and strength, and thus makes it of inferior quality. No means of which I am aware has been devised, prior to my invention, for forming artificial straw which is of uniform quality.

The objects of this invention are to produce artificial straw which is characterized by uniform width and strength, is of improved quality and stronger than that made heretofore, and which may be produced by a method and apparatus which are simple, require no material modification of existing practice, and do not increase the cost of the product.

The invention may be described in connection with the accompanying drawing, in which Fig. 1 is a side view of an apparatus which may be used in the preferred practice of the invention; Fig. 2 a fragmentary front view of the guide shown in Fig. 1; and Fig. 3 a front view of the preferred embodiment of the guide.

The invention is predicated upon my discovery that artificial straw of satisfactory quality and strength may be made by converting a cellulose solution into a flat band having substantially uninterrupted faces, and mechanically folding the freshly formed band along its longitudinal axis. In this manner the band is doubled to provide a narrower band of increased thickness. The folding may be, and preferably is, accomplished by means also provided by the invention, comprising a folder guide provided with a groove into which the freshly formed band is drawn with its longitudinal axis aligned with the root of the groove.

Having reference now to the accompanying drawing, which shows the preferred embodiment of the invention, a cellulosic band is formed by passing a cellulose solution, such as viscose, continuously through a spinneret into a suitable precipitating bath. In the case of viscose the bath may comprise a solution of about 6 per cent of sulfuric acid, 2 per cent of bismuth sulfate, and 1 per cent of zinc sulfate, as described and

claimed in my co-pending application Serial No. 487,026, filed October 7, 1930. The orifice of the spinneret, not shown, is in the form of an elongate slit whose opening is of substantially uniform section. The apparatus used in precipitating such cellulose solutions, including the spinnerets, are so well known in the art as to require no further illustration or description.

In this manner there is formed a band having substantially flat uninterrupted faces, and of substantially uniform cross section. The band, indicated by the numeral 1, is drawn from the precipitating bath and folded mechanically along its longitudinal axis by any suitable mechanism. Preferably this is accomplished by means of a folder guide 2 provided with a groove 3, the longitudinal axis of band 1 being aligned with the root of the groove, as shown in Fig. 2.

The folder guide is preferably of cylindrical section, with the folding groove formed peripherally therein, and most suitably the groove is deep. In the preferred embodiment of the invention these guides are formed from glass, by butt sealing two pieces of rounded end glass rod, as may be understood from Fig. 3. In making such seals the area of butt contact is preferably kept as small as possible, in order to provide the deep groove referred to.

The tension on band 1 as it is drawn over the guide causes the band to be drawn into and conform to the groove. This creates a folding pressure which causes the band to be doubled, the fold following the longitudinal axis. This may be seen from Figs. 1 and 2, in which band 1 is doubled as it leaves guide 2 to form a narrower doubled band 4. In the preferred embodiment of the invention the doubled band is then passed over a godet 5 to a spinning pot 6, driven in any suitable manner, where it is collected in the manner customary in the art. The cakes thus collected are then subjected to appropriate finishing treatments, such as desulfurizing, bleaching, dyeing, or washing, as the case may be.

In general it is preferable to so dispose guide 2 that an obtuse angle is formed between the freshly formed band passing to and the folded band leaving it, as seen in Fig. 1. To this end band 1 as it leaves the precipitating bath may be, and preferably is, passed over an ordinary cylindrical guide 7, Figs. 1 and 2, which increases the tension on the band and thus assists in producing folding in guide 2. The folding pressure due to forcing the band into the groove may be increased or decreased by shifting the position of guide 7 to vary the angle thus formed.

Straw formed in accordance with this invention is of superior quality, as compared with prior products. There is no tendency for the band to be broken or weakened mechanically at the fold so that the folded edge has full strength. Also, since the folding takes place while the band is freshly formed and before it has fully hardened, the edges folded together seal themselves. Consequently edge continuity is obtained. Also, folding prior to full penetration of the precipitating bath encloses a certain amount of the bath within the band, so that hardening or coagulation then takes place from the center outwardly, and vice versa. Since the folded bands are of heavier section than it has been possible to produce satisfactorily by direct precipitation, they possess markedly improved strength. In consequence of these and other factors, the artificial straw thus produced is of superior quality, not only as regards strength, but also in respect to uniformity. Furthermore, the folding action is mechanical and controlled, which assures a product of uniform width.

According to the provisions of the patent statutes, I have explained the principle and mode of operation of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. In an apparatus for making artificial straw the combination with means for forming a cellulose solution into a continuous cellulosic band, a spinning pot for collecting said band, driving means operatively connected to said spinning pot, and a godet, of a guide for said band disposed between said forming means and godet, said guide having a band-receiving folding groove adapted to fold a band passed thereover.

2. In an apparatus for making artificial straw the combination with means for forming a cellulose

solution into a continuous cellulosic band, a godet, a spinning pot for collecting said band, and driving means operatively connected to said spinning pot, of a circular guide for said band between said forming means and godet, the guide being provided with a deep peripherally formed band-receiving folding groove having rounded side walls and being adapted to fold a band passed thereover.

3. In an apparatus for making artificial straw the combination of a spinneret having a slit of substantially uniform section, a godet mounted above said spinneret, a spinning pot, driving means operatively connected to said spinning pot, and a glass guide supported between said spinneret and godet and provided with a deep peripherally formed folding groove having rounded side walls.

4. A method of making artificial straw, comprising precipitating viscose in the form of a continuous flat band of substantially uniform thickness from edge to edge and having substantially flat plane surfaces, drawing said band continuously from the precipitating bath, and while still freshly precipitated mechanically doubling the band uniformly along its longitudinal axis to form a narrower band of substantially uniform width and of substantially uniform thickness from edge to edge.

5. In an apparatus for making artificial straw, the combination with means for forming a cellulose solution into a continuous cellulosic band having substantially flat plane surfaces and of substantially uniform cross-section from edge to edge, and means for collecting said band including a godet, of a guide supported between said forming means and godet and having a folding groove formed between converging curved side walls for receiving and folding said band, said guide receiving the band in said groove, and said groove acting to fold the band uniformly along its longitudinal axis as it passes from the forming means to the godet.

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