

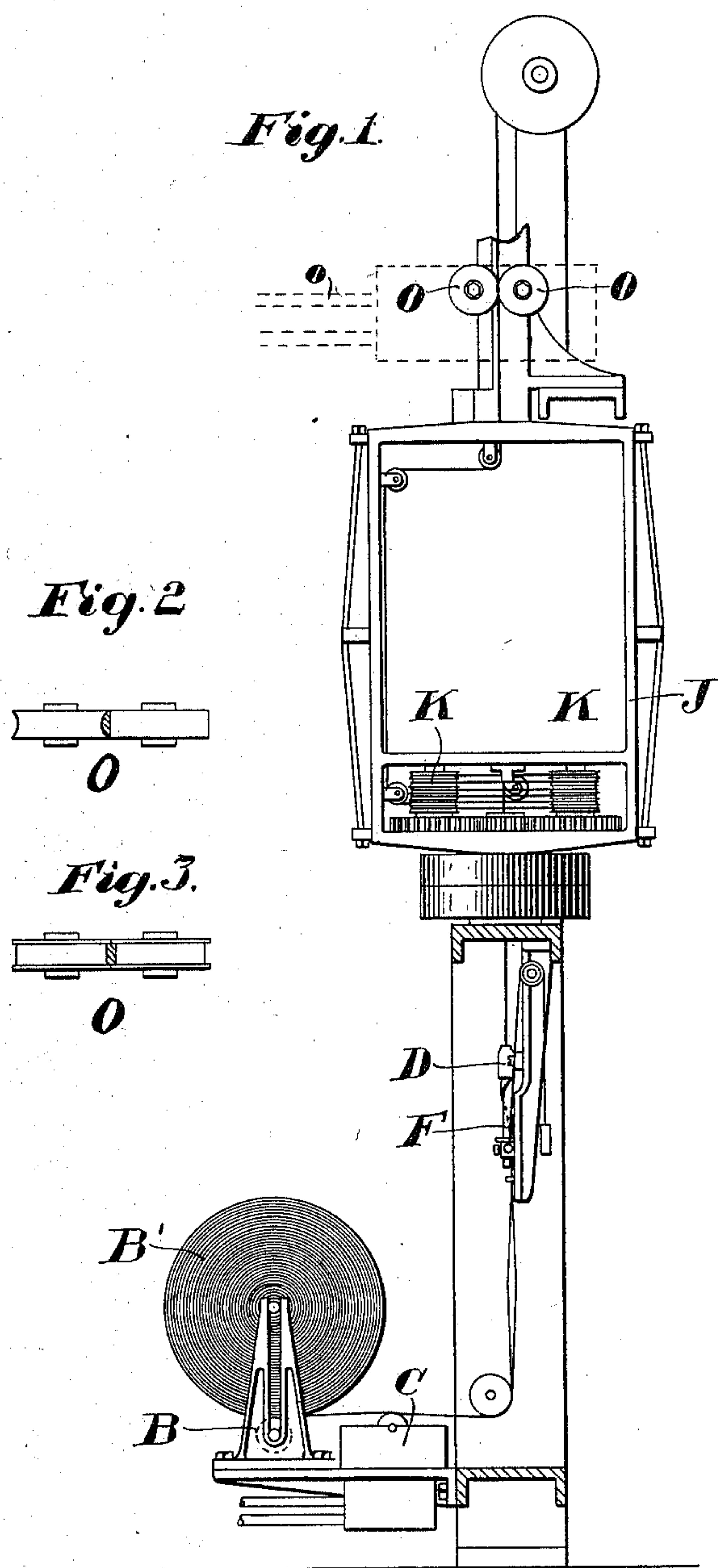
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F. J. SHAW.
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SPECIMENS.



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UNITED STATES PATENT OFFICE.

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PAPER REED.

SPECIFICATION forming part of Letters Patent No. 731,715, dated June 23, 1903.

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To all whom it may concern:

Be it known that I, FRANK J. SHAW, a citizen of the United States, residing at Leominster, in the county of Worcester and State of Massachusetts, have invented an Improvement in Paper Reeds, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The object of my invention is to provide a novel reed made from paper to be used as a substitute for the ordinary natural reed commonly used in basket and chair work.

My invention is particularly applicable to or useful in connection with reeds having an irregular or non-circular cross-section—such, for instance, as flat and half-round reeds.

An objection to the natural reed, whether of circular or irregular cross-section, is its liability to break or splinter easily, making it difficult to weave into the various forms of basket-work. The natural reed also is lacking in uniformity of color, and when woven in basket or ornamental work presents a lack of uniformity of color which is objectionable from the artistic standpoint.

My invention comprehends a reed made from a paper strip or band, first twisted while in a dampened preferably sized or glued condition into cylindrical or cord-like form and then and before it dries or sets subjecting it to compression, either to render it more dense and solid in the cylindrical or cord-like form in which it issues from the twisting operation or to change its circular cross-sectional shape into a flattened, half-round, or other irregular or non-circular cross-sectional shape.

My invention will be best understood from a description of one or more embodiments thereof in connection with the accompanying drawings.

In the drawings, Figure 1 illustrates diagrammatically one form of apparatus for producing paper reeds in accordance with my invention, and Figs. 2 and 3 details illustrating different shapes into which the twisted reed may be compressed and set to enable it to be employed in various kinds of work.

Referring to the drawings, the strip or band of paper, preferably a low grade of Manila paper, is conveniently wound into the form of a coil B', carried by a holder B. The strip

or band drawn from this coil during and by the twisting operation is caused to pass first to and through a suitable dampening device at C, which serves to dampen one or both faces, preferably one face of the strip, to facilitate the twisting thereof and to cause it when set to remain permanently in the position or condition in which it may be left by the operating mechanism.

For the best results the strip of paper should be dampened with a liquid or semiliquid stiffening material or substance, such as glue, which may be placed in the device C, instead of water, I having found that glue thus applied to the strip produces a more satisfactory reed than the mere dampening with water.

From the dampening or glue-applying device C the strip is conducted to and about the spindle F, about which it is wrapped in a generally spiral tubular form, and is drawn upwardly through the shell or die D, which crimps and compresses it, after which it is subjected to a rapid and suitable twisting action by the rapid rotation of the flier J, carrying the series of pulleys or sheaves K K, about which the twisted reed is conducted. From the flier J the reed, still in a softened cylindrical and twisted condition, is conducted to and between suitable compressing means, as the rollers O O, thence to the spool or reel, upon which it is wound.

The mechanism for twisting the tube forms no part of my invention and may be of any suitable or desired type, I having herein shown the same as substantially like that shown in United States Patent to G. L. Brownell, No. 551,615, dated December 17, 1895.

I am aware that it is old to subject a twisted paper, cord, or twine to a size applied to the exterior thereof as an enveloping coating; but any stiffening so applied, while sufficient, perhaps, for some of the uses to which a string or cord may be used—as, for instance, a dress-piping—is wholly inadequate for the purposes of a reed. A reed must possess a permanent inherently resilient or elastic stiffness, such as will enable it to be conveniently manipulated during the process of weaving, and which also will, because of this same resilient stiffness, bind upon the reeds with which it is interwoven in such a manner as to cause it to retain its position and shape even when the

weave is quite open with the reeds separated one from another. In other words, a string or cord must possess inherent pliability, and an absence of resilient stiffness is essential, while a reed, on the contrary, must possess inherent resilient stiffness.

By applying the stiffening substance to the untwisted strip the same is carried by the twisting operation into the midst of and throughout the twisted reed. In fact, the twisting of the strip causes this stiffening substance thoroughly to impregnate throughout the twisted reed, so that when set the resiliency and stiffness permeates or is characteristic of the entire body of the reed and is not confined to an exterior coating therefor merely.

The compressing device O may preserve the cylindrical twisted condition of the reed and by its compression add to the resilient stiffness thereof, or the said compressing device may have rollers, shaped, for instance, as indicated in Fig. 2, for changing the cross-sectional shape of the reed to leave it semi-circular in cross-section or, as in Fig. 3, with a flat or rectangular cross-section, or the said compressing device may give to the reed any other desired cross-sectional shape determined by the shapes of the devices caused to act thereupon. By thus compressing the twisted reed while the stiffening substance has not yet become set and permitting such stiffening substance to set in the changed shape or condition of the reed I am enabled to retain the new or changed shape of the reed while still retaining the resilient stiffness, which is always essential.

To insure immediate set of the stiffening substance upon change in cross-sectional shape of the reed by the compressing device, the latter may be heated—as, for instance, by steam conducted thereto through a pipe or from a suitable source of supply, or the said device may be otherwise heated, as desired.

By employing paper strips of different colorings reeds of corresponding color may be obtained to vary the artistic effect produced by the reed.

A paper reed possesses many important commercial advantages over the natural reed. For example, the natural reed deteriorates with age, breaking more easily the older it becomes, whether or not it is in actual use. Again, the natural reed is quite porous in its structure and ordinarily requires a coating or size of glue to fill the pores before the shellac, varnish, or finishing material is applied

thereto, and it is recognized among those who handle natural reeds that the latter will break much more easily after having been coated with size or glue than before. The paper reed, on the other hand, is so thoroughly compact and condensed by the operation of twisting that it needs no filling whatsoever to support the finishing coats of shellac or varnish, thus not only saving materially in the cost of finishing the paper-reed work, but retaining to the fullest the inherent and characteristic life and resiliency of the reed itself, even after it is finished.

The paper reed is much cheaper than the natural reed, presenting at the same time a superior effect in the work, thus making it a desirable reed to use.

In the above disclosure of my invention I have referred to the reed as formed from a single strip of paper. Obviously, however, if a single strip does not produce sufficient body for the reed my invention comprehends the use of a plurality of strips, which are twisted together to constitute the reed. In such event the stiffening substance might be applied to each separately or to the built-up band composed of the soft strips, the invention remaining the same whether one or more strips or bands are employed.

My invention is not limited to the particular embodiment thereof or means for carrying it out hereinbefore described, but may be varied within the spirit and scope of the invention.

Having described my invention and without limiting myself in the matter of details, what I claim, and desire to secure by Letters Patent, is—

1. As a new article of manufacture, a compressed twisted paper reed having a non-circular cross-sectional shape.

2. As a new article of manufacture a tightly-twisted compressed paper reed having a stiffening substance twisted into and throughout the same to thoroughly impregnate said reed and permeating the interstices thereof, said stiffening substance being initially set in the twisted condition of the reed, whereby the entire reed is rendered a homogeneous, hard, resilient body.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK J. SHAW.

Witnesses:

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