Feb. 14, 1933. J. E. MILLETT 1,897,671

ARTIFICIAL REED FABRIC

Filed April 8, 1931 2 Sheets-Sheet 1

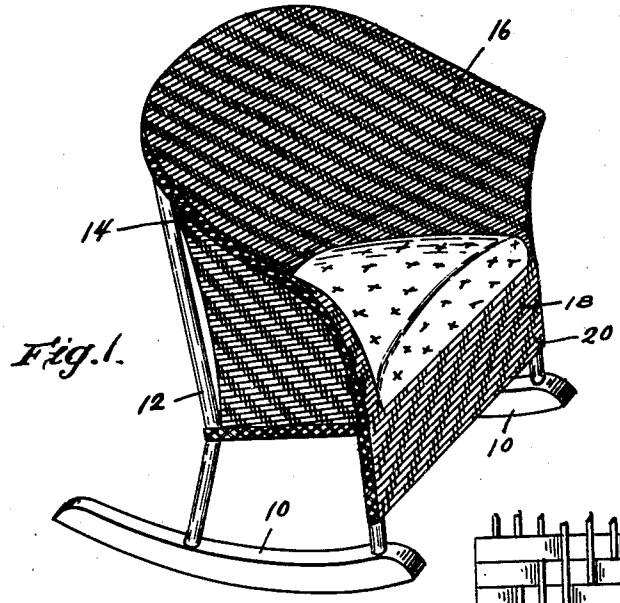

Fig. 1.

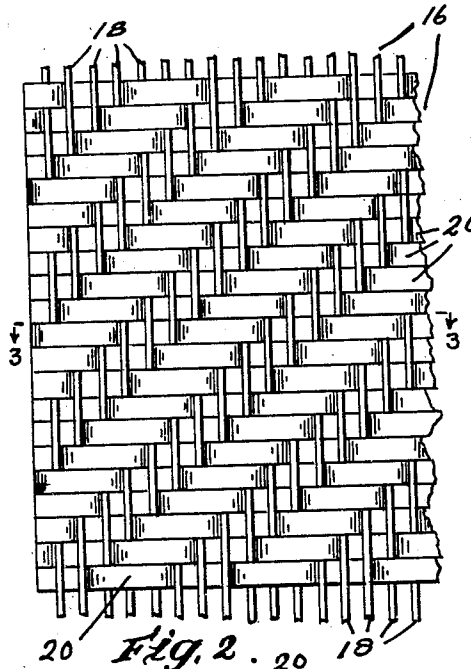

Fig. 2.

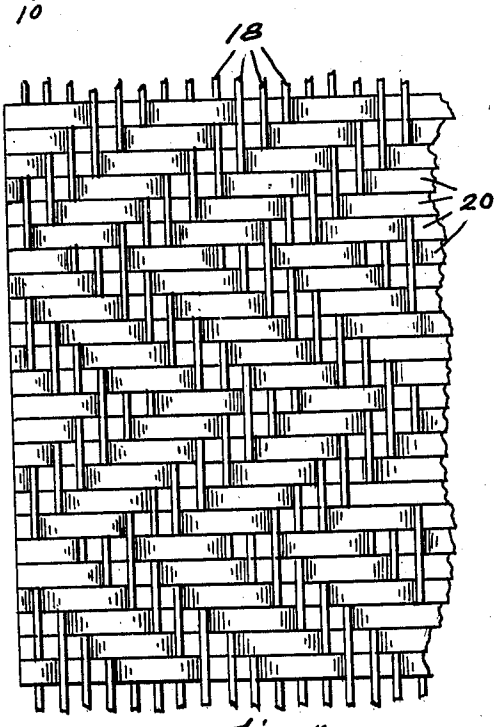

Fig. 4.

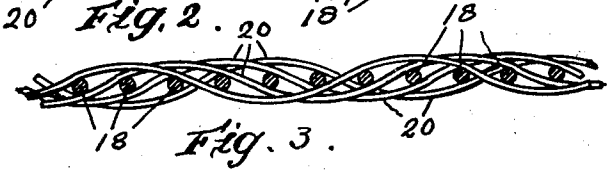

Fig. 3.

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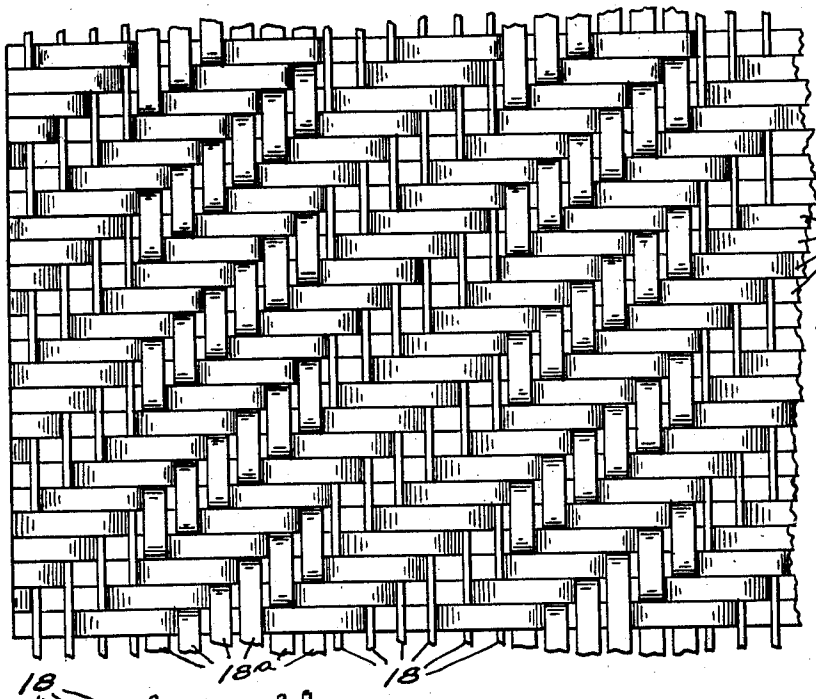

Fig. 6.

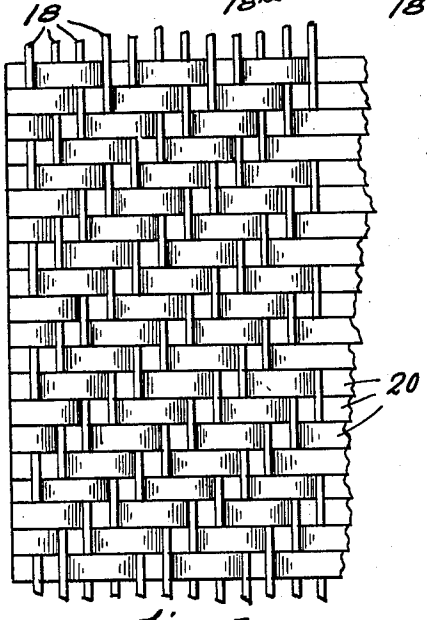

Fig. 5.

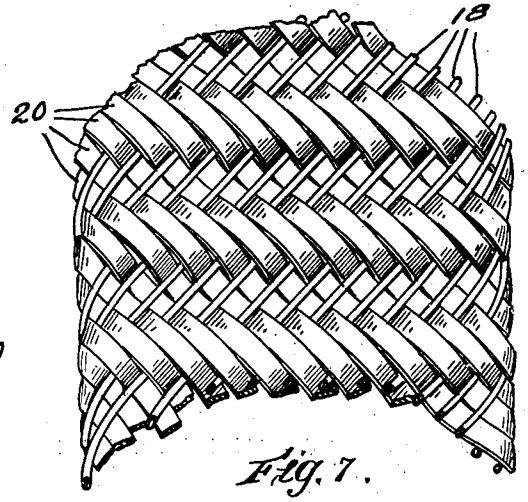

Fig. 7.

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Patented Feb. 14, 1933 1,897,671

UNITED STATES PATENT OFFICE

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ARTIFICIAL REED FABRIC

Application filed April 8, 1931. Serial No. 528,641.

This invention relates to an improved artificial reed fabric and to an article of furniture embodying the improved fabric.

An artificial reed fabric is a fabric which is woven in the web or in long lengths in a power-operated loom and is composed of interwoven warp and filler strands that are made from materials simulating natural reed, and usually of paper twisted into cylindrical form to simulate a natural reed.

An artificial reed fabric as heretofore constructed is commonly known as a stake and strand construction, wherein the stakes are spaced much farther apart than the strands. A stake and strand fabric is characterized by the relative displacement of the stakes and the strands, one over the other, when the fabric is bent into a curvilinear shape, or out of its normally flat plane of weave, as for instance, when a piece of the fabric is stretched over and secured to a curved frame. The stake and strand construction also is characterized by being unequally flexible, as most flexible in one direction, as transverse the stakes of the fabric and relatively rigid and inflexible at right angles thereto as transverse the strands, and also as being relatively inflexible along and diagonally of the stakes and strands. This unidirectional flexibility of the fabric restricts to a considerable extent entire freedom in working the fabric and especially in shaping the fabric in various directions over a curved surface, and necessitates the shifting of the stakes and the strands from their originally woven position to a greater extent than is desired in order to cause the fabric to lie smoothly in the desired curvilinear outline. It will be appreciated that an undue displacement of the stakes and strands results in the opening of the weave of the fabric at the curved localities and thereby detracts from the uniformly woven appearance in plane portions of the fabric.

The fabric constructed in accordance with the present invention lacks the stake and strand construction which characterizes the heretofore common artificial reed fabric. The present fabric is constructed of interwoven warp and filler strands of artificial reed and particularly of strands that consist of ribbons formed usually, but not necessarily, of prepared paper. It is a characteristic of the present fabric that it has what is essentially a "balanced" construction in that there are approximately as many warp strands as there are filler strands per unit of length and the warp and filler strands have approximately equal resistance to bending. Consequently, the fabric is practically equally flexible transverse both the warp and the filler strands. It is also approximately equally as flexible when bent on a diagonal to both the warp and filler strands. While the warp and filler strands can be displaced in position when flexing the fabric, the tightness of the weave is such that the relative displacement of the strands is substantially less than the displacement that must be provided in the heretofore common stake and strand fabric. The substantially uniform flexibility of the fabric in all directions transverse its plane permits the weave to be tighter than in the common stake and strand fabric since, with the increased flexibility provided with the balanced construction, a large amount of displacement is unnecessary. Such a balanced and uniformly flexible fabric comprises one of the objects of the present invention.

The balanced construction of the fabric, wherein the number of the warp and the filler strands are approximately equal per unit of length, permits a large variety of designs and patterns to be incorporated in the weave of the fabric since the warp strands can be passed over a relatively large number of filler strands without producing an undue looseness of weave. The designs that can be produced in the usual stake and strand fabric are decidedly limited by reason of the wide spacing of the stakes.

It is a further object of the present invention to provide a balanced fabric so arranged that certain of the strands shall be raised substantially above the general surface of the fabric in the immediate vicinity of the raised strands whereby to accentuate the pattern of the fabric; and it is a yet further object of the invention to produce

this result by constructing the fabric of the present invention with thin flat, or ribbon, strands that may constitute the filler and by using warp strands that are materially thicker than the filler strands so that the thin flat strands are caused to be elevated substantially above the general plane of the fabric where they pass over the thick strands.

Preferably the thick strands are cylindrical in form and are considerably greater in diameter than the thickness of the thin filler strands. The warp strands can all be cylindrical or but part of the warp strands can be cylindrical and the remainder can be flat for instance.

While the cylindrical strands can be thicker than the flat strands, the diameter thereof preferably is so chosen that the resistance to flexing of the same number of cylindrical and flat strands is approximately the same, so that the fabric is equally flexible when bent either across the filler strands or the warp strands. Such a construction constitutes a further object of the present invention.

A yet further object of the present invention is generally to improve the construction of artificial reed fabric.

Fig. 1 is a perspective view of a chair in which is incorporated the balanced artificial reed fabric embodying the present invention.

Fig. 2 is a fragmentary plan view of the artificial reed fabric of Fig. 1, the fabric being composed of thick cylindrical warp strands and thin flat filler strands, both the warp and the filler strands being approximately equal in numbers per unit of length.

Fig. 3 is a section taken along line 3—3 of Fig. 2.

Fig. 4 is a plan detail constructed essentially as illustrated in Fig. 2, woven in a different manner to produce a different pattern.

Fig. 5 illustrates the fabric of the invention woven to produce a still further modified pattern.

Fig. 6 is a fragmentary plan view wherein the warp strands consist in part of cylindrical strands and in part of flat thin strands or ribbons.

Fig. 7 is a section of the fabric of Fig. 2 cut into shape to be applied to a portion of the chair of Fig. 1.

Fig. 1 illustrates the article of furniture embodying the fabric of the present invention with the fabric shaped to conform to the configuration provided by the frame of the chair. The chair herein illustrated is a child's rocking chair and comprises the rockers 10, the back posts 12, one of which is here shown, and the curved top back member 14 which also extends forwardly and downwardly to form the arms of the chair. The fabric 16 which embodies the present invention comprises a single integral sheet of originally flat form which is bent into shape to form the sides and back of the chair and is also bent over the top member 14 of the frame in parts transverse to the warp strands, in parts transverse to the filler strands, and in parts diagonal to both parts, and is secured in its desired configuration to the frame of the chair.

The fabric 16 is or can be constructed essentially as is illustrated in Fig. 2. The fabric of this figure comprises a plurality of thick round or cylindrical warp strands 18 which are relatively closely disposed in parallel relation. The filler strands 20 are in flat or ribbon form and are thin as compared with the diameter of the round warp strands. The filler strands are interwoven with the warp strands to produce a desired pattern, three different patterns being illustrated in Figs. 3, 4 and 5, respectively, from the same types of warp and filler strands. The fabric here shown is woven in an automatic power loom in continuous flat lengths or in a web. The fabric is characterized by having approximately as many warp strands per unit of length as there are filler strands per unit of length. The fabric is thus practically equally flexible across either one set of strands and also across diagonal to the sets of strands. In weaving the fabric, the warp strands are under sufficient tension to cause the filler strands in the woven fabric to bend as they pass over and under the warp strands while the warp strands remain straight and unbent. The fabric thus constructed can be woven considerably tighter than the usual stake and strand fabric and thus, while the warp and filler strands can be displaced upon each other at points where the fabric is sharply bent out of its configuration, the amount of displacement is materially less than in the usual stake and strand construction because of the approximately equal flexibility of the fabric in any direction transverse its woven plane provided by the balanced construction of the fabric.

As heretofore stated, the thickness of the warp strands 18 of the fabric of Fig. 2 is considerably greater than the thickness of the flat filler strands 20. The flat filler strands, where they pass over the warp strands, are thus raised considerably higher than the adjacent warp strands so that the woven pattern is prominently displayed. This construction permits surface ornamentation to a distinctive degree in that the raised filler strands, by an inexpensive painting operation, can be provided with a color that is distinctively different from that of the body of the fabric. For instance, the entire fabric of Fig. 2 can be uniformly covered with a paint of a desired color and the paint when wiped off the elevated parts of the surface of the fabric thus leaving the elevated parts exposed in their natural color.

In the fabric of Fig. 6 all of the filler strands 20 are of the same character and are

here shown as flat ribbons. Two sets of warp strands are used, however. The warp strands 18 are round or cylindrical as has been heretofore described. Other warp strands 18*a* are thin ribbons similar to the filler strands 20. The two sets of warp strands are arranged in consecutive groups in the manner shown thus producing a pattern which is distinctive over the patterns illustrated in Figs. 2, 4 and 5. In this case, the filler strands 20 are raised higher where they pass over the thick round warp strands 18 than where they pass over the thin flat warp strands 18*a*, thereby accentuating the pattern of the fabric. In all instances, however, the number of warp strands per unit of length, and the number of filler strands per unit of length is intended to be approximately the same except that where one set of strands, as the warp strands, is thicker than the filler strands, the thicker strands can be spaced more widely apart and to such an extent that the flexibility of the fabric is about the same across the filler strands as across the warp strands, thereby to produce a fabric which is approximately equally flexible when bent in any direction transverse the normal plane of the fabric. It is a contributory result of the present construction that the fabric is lighter than the heretofore common stake and strand fabric since the major portion of the strands is thin. The fabric thus is cheaper to manufacture than the usual stake and strand fabric, yet at the same time, when applied to an article of furniture, the fabric is much more rigid than the stake and strand fabric since, because it is more flexible it can be drawn more tightly into conformity with the configuration of the frame of the article of furniture to which the article is applied. The balanced construction also provides increased rigidity to the applied fabric since there are a large number of taut strands that support the stretched fabric.

In applying the fabric to a designated article of furniture, a section of the flat fabric of suitable outline is cut from the web of fabric and is applied to the frame of the furniture in the manner above described. In Fig. 7, the fabric section illustrated has approximately the outline required for application to the frame of the chair of Fig. 1. After the fabric has been tightly stretched to the frame and secured thereto, excess marginal portions of the fabric can be trimmed off. By reason of the balanced construction, and uniform flexibility, it is not necessary to arrange the fabric on the article of furniture with the stakes and strands lying in approximately the major axes of the frame as has been necessitated in the common stake and strand fabric. With the fabric of the present invention, by reason of its balanced construction and uniform flexibility, it can be applied with the warp running it any desired angle with respect to the major axes of the frame, thereby, due to the run of the pattern, producing a distinctive appearance that ordinarily could not be provided in the same article of furniture by the use of the usual stake and strand fabric. Due also to the balanced construction, wherein the warp and filler strands are approximately equal in number per unit of length, and the weave is tight, a great variety of patterns may be incorporated in the fabric by changing the weave in well known ways and without danger of loose strands.

The strands of one set, as the warp strands, can be spaced apart some small distance, as shown, so that there can be some shifting of the strands if the fabric is to be bent sharply in applying it to a frame; and this spacing is ordinarily desirable in a fabric intended for general use. The filler strands can be spaced apart, instead of the warp strands, or the strands of both sets can be spaced. Preferably, however, only one set of strands is spaced apart, so as to provide a tight fabric.

I claim:

1. An artificial reed fabric consisting of tightly and immovably interwoven stiff and resilient, free warp and filler strands of artificial reed, the number of warp strands per unit of length and the number of filler strands per unit of length being so proportioned in the fabric that the fabric is approximately as flexible across the filler strands as across the warp strands and wherein the number of warp strands per unit of length is practically the same as the number of filler strands per unit of length, and the strands of one set, as the warp strands, are round and are spaced apart and the strands of the other set, as the filler strands, are close together.

2. An artificial reed fabric consisting of tightly and immovably interwoven stiff and resilient, free warp and filler strands of artificial reed, the number of warp strands per unit of length and the number of filler strands per unit of length being so proportioned in the fabric that the fabric is approximately as flexible across the filler strands as across the warp strands, and wherein the number of warp strands per unit of length is practically the same as the number of filler strands per unit of length, and wherein at least a part of the strands of one set, as the warp strands, are thick and are spaced apart and at least a part of the strands of the other set, as the filler strands, are close together.

3. An artificial reed fabric consisting of tightly and immovably interwoven stiff and resilient, free warp and filler strands of artificial reed, the number of warp strands per unit of length and the number of filler strands per unit of length being so proportioned in the fabric that the fabric is ap-

proximately as flexible across the filler strands as across the warp strands, and wherein the number of warp strands per unit of length is practically the same as the number of filler strands per unit of length, and wherein the strands of one set are thick and cylindrical and are spaced apart and at least a part of the strands of the other set, as the filler strands, are thin and flat and are close together.

In testimony whereof, I have signed my name to this specification.

JOHN E. MILLETT.