Oct. 18, 1927. 1,645,951

A. C. HOUGH

WOVEN SLAT SHADE

Filed April 16, 1926 2 Sheets-Sheet 1

FIG. 2

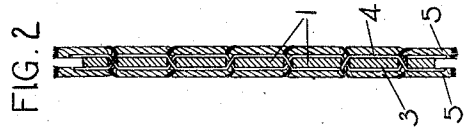
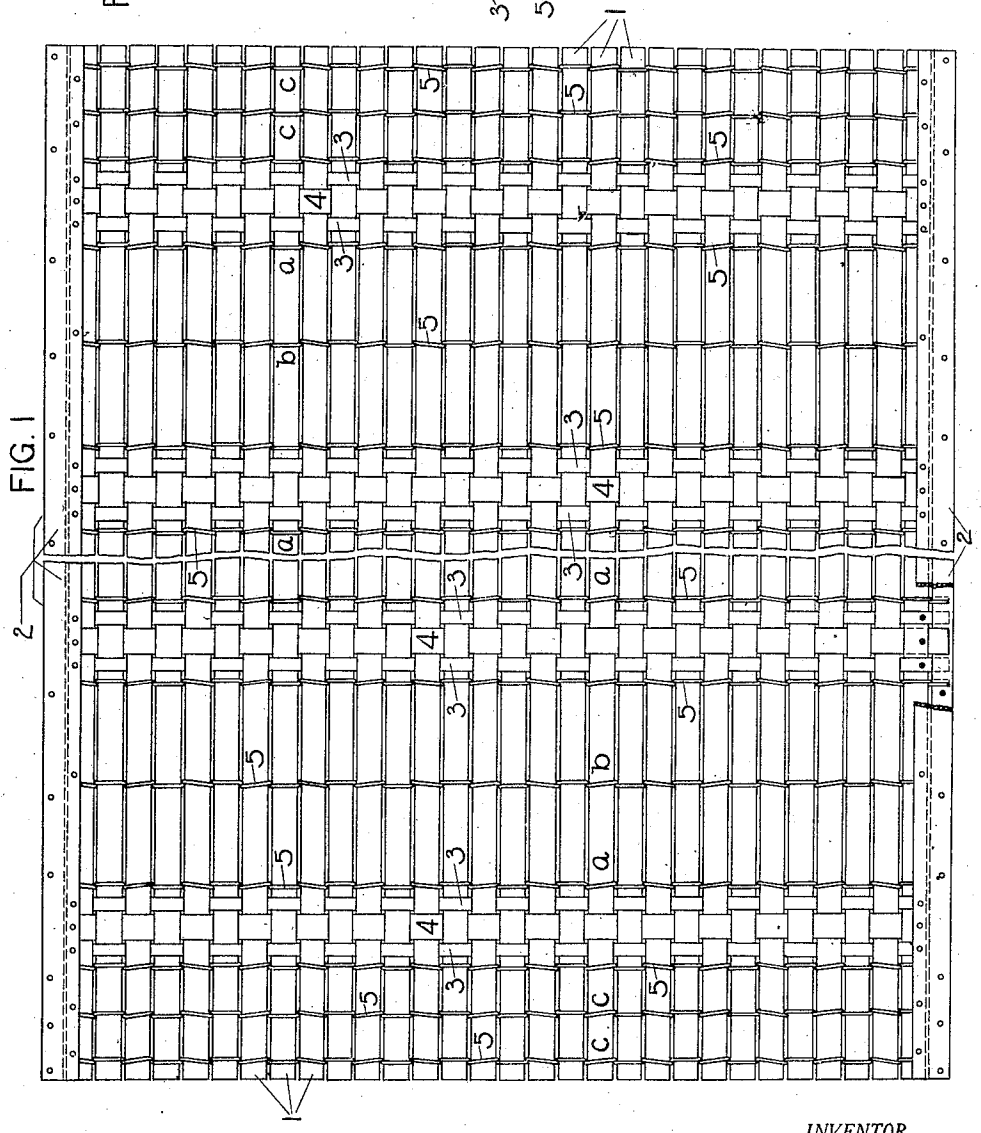


FIG. 1



INVENTOR.

Azel C. Hough,

BY

Frank A. Cutter,

ATTORNEY.

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A. C. HOUGH

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FIG. 3

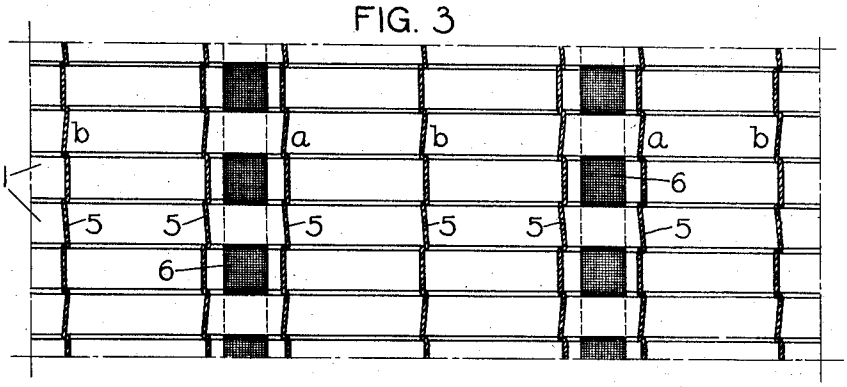
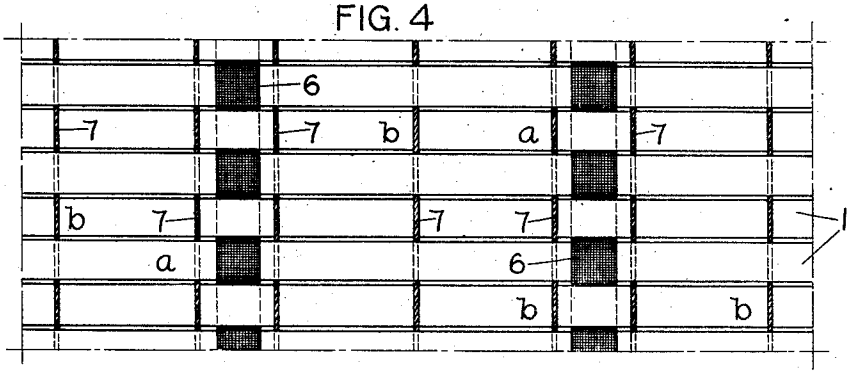


FIG. 4



INVENTOR.
Axel C. Hough,
BY
Frank A. Cutter,
ATTORNEY.

Patented Oct. 18, 1927. 1,645,951

UNITED STATES PATENT OFFICE.

AZEL C. HOUGH, OF JANESVILLE, WISCONSIN, ASSIGNOR TO HOUGH SHADE CORPORATION, OF JANESVILLE, WISCONSIN, A CORPORATION OF CONNECTICUT.

WOVEN-SLAT SHADE.

Application filed April 16, 1926. Serial No. 102,451.

My invention relates to improvements in woven shades wherein the weft consists of splints, strips, or slats, of wood or other material having some degree of stability, and the warp consists of fabric or textile material, and resides in a plurality of interwoven slat wefts and a plurality of tape and cord warps, there being, in the preferred construction, combination tape and cord warp units, cord warp units between said combination warp units, and cord warp units between the longitudinal edges or ends of the shade and the two outer combination warp units, together with such other parts and members as may be necessary or desirable in order to render the shade complete and serviceable in every respect, all as hereinafter set forth.

At the present time, the appearance of a shade of this character is almost as important a feature as the utility of the shade as a screen or barrier against sunlight and for the purpose of preserving privacy, hence the desirability of utilizing tapes in place of twine or cord for the warp in shade construction. It has been found, however, that dependence can not be placed on tape warp alone, for the reason that such warp causes alternate slats to "spring" in the same direction, or one slat to bow out beyond the slat immediately above or below the same, such deflection being brought about by the unequal or uneven "pull" of the tapes on the slats, and especially of the outside tapes in a group. Even if very narrow tapes be used for the warp, they cause the slats to be distorted, something which never results from the use of cord or twine warp, and especially that of the interlocking type, such as forms the subject matter of Letters Patent of the United States, No. 748,734, dated January 5, 1904, and which is preferably used in the present shade. These warp cords are used in pairs, and such cords cross on opposite sides of alternate slats, and alternately pass on opposite sides of the slats between, whereby is produced a weave or web that is sufficiently tight to prevent end-chase and for all other purposes. It is impracticable, of course, to cross warp tapes, but the frictional engagement between such tapes and the slats is relatively so great, as compared with warp cords, that the tapes hold the slats against endwise movement and permanently in place.

The tape warp is relatively very expensive, and, if it were practicable, from a mechanical standpoint, to use said warp without the cord warp in shades, the cost of the shades would be increased to an extent that would be almost if not absolutely prohibitive, but, by combining these two warps, I am able to separate the tape warp to such an extent as materially to reduce the amount used and proportionately the expense, and at the same time obtain both the mechanical and decorative effects produced by the tape. Thus is obtained a shade of both the required strength and effectiveness and at a reasonable cost. Inasmuch as the tape warp is a substitute for a considerable amount of cord warp, and the latter may be smaller or lighter in weight than the former, there is an additional saving to the credit of the former.

On some accounts the tape warp is to be preferred for utilitarian as well as ornamental purposes, but, owing to its excessive cost, in connection with the fact that it is difficult to weave with tape warp alone without throwing the weft out of line, because of the "draw" of the two outside tapes in each group, where three or more tapes in a group are employed, it is necessary to employ some cord warp, as I have explained.

The cord warp is used on each side of each warp tape or group of warp tapes, and also at such intervals as may be deemed necessary between the combination warp units (tape and cord groups), to obtain the required strength and stability.

One object of my invention is, therefore, to produce woven-slat shades with the aid of tape warp, which shades are strong and durable and free from end-chase, in which the slats do not become deflected or bowed, and wherein it is possible to reduce the expense of the tape warp by separating the same to an extent that would not be practicable if such warp were employed alone; in short, to produce commercially shades having tape warp incorporated in their texteure.

A further object is to provide means, in a shade of this character, for cutting it down to different widths without impairment of the same, thus enabling the shade to be fitted to a porch of some particular width less than that of the shade as originally manufactured. Thus is avoided the necessity of weaving shades in special widths, which can not easily be done. I attain this object by weaving into the shade one or more addi-

tional cord warps between the longitudinal edges (defined by the ends of the slats) of the shade and the outermost combination weft unit.

It would be difficult to make shades of special widths, a great many of which are required, since to do this would require changing the location of the tape warp. The machinery which handles the tape warp is very complicated and not adapted to be moved or changed easily or readily, for the purpose of weaving said warp into different shades at different distances apart. The extra amount of cord warp, adjacent to the longitudinal edges of the shade, makes it possible to cut down the shade in width several inches at each of such edges, depending upon the number of extra or additional cord warp units introduced into the fabric, and thus to cut down the shade without necessitating any change of location of the end combination warp units.

Other objects and advantages will appear in the course of the following description.

I attain the objects and secure the advantages of my invention, by the means illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a woven-slat shade which embodies a practical and preferred form of my invention, intermediate portions thereof vertically being broken out, and a portion of the bottom moulding broken out; Fig. 2, an enlarged, vertical section through a portion of said shade, illustrating the manner in which the combination warp units are interwoven with the weft units; Fig. 3, a fragmentary portion of a modified shade, in side elevation; and Fig. 4, a similar view illustrating another modification.

Similar reference characters designate similar parts throughout the several views.

In the preferred construction groups of two or more warp tapes are used. In Fig. 1 each group of warp tape consists of two narrow tapes and an intermediate wide tape. It is to be understood, however, that the number and width of the tapes may vary to a considerable extent, and that there may be only one tape in a combination warp unit, as illustrated in Figs. 3 and 4. It is to be understood, furthermore, that each cord warp unit, whether independent or as a part of a combination warp unit, should consist of two cords, if the necessary strength and rigidity are to be imparted thereby to the shade, although it is possible to construct a shade with single instead of double or twin cord warp units, as will subsequently be explained.

The woven portion of the shade shown in the first view consists of a plurality of thin, flat, strips or weft units 1, with which are interwoven a plurality of combination warp units, as *a*, a plurality of simple, reinforcing warp units, as *b*, and a plurality of simple, extra warp units, as *c*, hereinafter described in detail. The aforesaid woven portion of the shade is provided at the top and bottom with mouldings 2—2 of any suitable construction, such mouldings as those shown in the aforesaid patent being the type most commonly employed.

Each combination warp unit *a* consists of two cord warp units and a group of two or more tapes between said cord warp units, and each cord warp unit consists of two cords. There are three of the tapes in each group in the present example, two of them being narrow and indicated by the numeral 3 and the other being wide and indicated by the numeral 4. The wide tape is between the narrow tapes in each group. Here adjacent tapes pass on opposite sides of each weft unit 1, in opposite directions between said weft unit and the next adjacent weft unit either above or below the first, on opposite sides but in interchanged relationship, of the second weft unit, and so on, whereby a strong and effective web is produced. Two cords, indicated by the numeral 5, are ordinarily used for each simple warp unit, and, like the tapes, pass on opposite sides of a weft unit 1, in opposite directions between said weft unit and the next adjacent weft unit either above or below the first, and on opposite sides of the second weft unit, but in changed relationship relatively. On opposite sides of every alternate weft unit 1 the two cords cross each other to produce the "lock stitch" to which reference has been inferentially made. The tapes 3 and 4 and the cords 5 securely grasp and hold the slats 1, the tapes supplying what the cords fail to supply, and vice versa. End-chase and lateral deflection of the slats at and adjacent to the combination warp units are absolutely prevented.

Actually these combination warp units are quite widely spaced apart. Due to the wide spacing it is ordinarily advisable to introduce into the fabric a simple cord warp unit between each adjacent pair of combination warp units, as clearly shown at *b*. These supplementary warp units materially strengthen and stabilize the fabric, and prevent deflection on the part of the weft units between the combination warp units.

Outside of the outer combination warp units, or between such units and the adjacent edges of the shade, are additional, simple, cord warp units *c*, there being two at each end portion of the shade in the present example, although there may be more or less than that number. Obviously, the shade can be cut the whole length at either end between the pair of extra cord warp units *c* at that end, or between the inner one of such units and the outer cord warp unit of the

adjacent combination warp unit *a*. Thus the shade is capable of being cut to different widths.

From the foregoing it will be understood that *a* designates a combination warp unit which consists of both tape and cord, while *b* designates a simple warp unit which consists of cord and is located at some distance from a combination warp unit (*a*), and *c* also designates a simple warp unit that consists of cord, but which is used with one or more similar warp units or cords and located adjacent to one side edge of the shade. The simple warp units *b*, which are generally used singly, are for reenforcing purposes, while the single warp units *c* several of which are used adjacent to one or both side edges of the shade, are for the purpose of providing said shade with a selvage edge or edges of a character that permits of trimming to narrow the shade by decreasing the distance between said edges.

Each of the top and bottom mouldings usually consists of a pair of strips secured by any suitable means on opposite sides of the lowermost weft unit or units 1, and the ends of tapes 3 and 4 and cords 5 are passed between said strips and said weft units and secured in place with the contiguous members.

A single cord may be looped at the top or bottom of the shade to produce a twin cord warp unit, instead of actually using two cords which are separate at both ends.

Seine twine has been found to be especially well adapted for the cord warp units.

In the Fig. 3 shade, there is but one warp tape 6 in each combination warp unit *a*, the rest of said unit consisting of twin warp cords 5 on opposite sides of said tape, as in the first example. This is the simplest type of combination warp unit, and is entirely practicable.

A single, instead of double or twin, simple cord warp unit 7 is illustrated in the Fig. 4 shade. This is used in the combination warp units *a*, and for the reinforcing warp units *b*. A single tape 6 between two cords 7 on the outside make up each combination warp unit *a* in the illustration, but it is obvious that there might be two or more tapes grouped with the two single cords 7. Both single cords 7 and twin cords 5 might be woven into the same shade.

That my shade is susceptible to considerable modification or change is plainly to be seen, and this without departing from the spirit of my invention or exceeding the scope of what is claimed.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a woven-slat shade, a web comprising a plurality of slats, two or more tapes interwoven with said slats next adjacent tapes always alternating with each other on the same side of any given slat, and cords interwoven with said slats adjacent to the outermost edges of said tapes.

2. In a woven-slat shade, a web comprising a plurality of slats, two or more tapes passing between said slats and alternately on opposite sides thereof, so that no two tapes which are next adjacent to each other are on the same side of the same slat, and cords passing between said slats and alternately on opposite sides thereof with one cord on one side and another cord on the opposite side of the same slat in each case.

3. As an improved article of manufacture, a woven-slat shade comprising interwoven slats and tapes and cords, said tapes and cords being arranged in groups and spaced apart, and each of such groups including both a tape and cords, and reinforcing cords interwoven with said slats between said groups.

4. As an improved article of manufacture, a woven-slat shade comprising interwoven slats and tapes and cords, certain of said cords being interwoven with said slats between the ends thereof and the outer tapes, whereby portions of the shade may be cut off without impairing the remaining portion of the same.

5. As an improved article of manufacture, a woven-slat shade comprising interwoven slats and tapes and cords, said tapes and cords being arranged in groups spaced apart, and each of such groups including both a tape or tapes and cords, and additional cords interwoven with said slats between the ends thereof and the outer groups of tapes and cords, whereby portions of the shade may be cut off without impairing the remaining portion of the same.

6. As an improved article of manufacture, a woven-slat shade comprising interwoven slats and tapes and cords, certain of said cords being interwoven with said slats between at points remote from said tapes, for reinforcing purposes, and certain others of said cords being interwoven with said slats between the ends thereof and the outer tapes, whereby portions of the same may be cut off without impairing the remaining portion of the same.

7. As an improved article of manufacture, a woven-slat shade comprising interwoven slats and tapes and cords, said tapes and cords being arranged in groups spaced apart, and each of such groups including both a tape or tapes and cords, reinforcing cords interwoven with said slats between said groups, and additional cords interwoven with said slats between the ends thereof and the outer groups of tapes and cords, whereby portions of the same may be cut off without impairing the remaining portion of the same.

8. As an improved article of manufacture,

a woven-slat shade comprising a plurality of weft units, and a plurality of combination warp units each consisting of associated tapes and cords arranged with the next adjacent tapes always alternating with each other on the same side of any given slat, and with one cord on one side and another cord on the opposite side of said slat.

9. As an improved article of manufacture, a woven-slat shade comprising a plurality of weft units, a plurality of combination warp units each consisting of associated tapes and cords arranged with the tapes between the cords, and reinforcing cord warp units between said combination warp units.

10. As an improved article of manufacture, a woven-slat shade comprising a pluraility of weft units, and a plurality of combination warp units each consisting of associated tapes and cords arranged with the tapes between the cords, and additional cord warp units between the ends of said weft units and the outer combination warp units, whereby provision is made for cutting off portions of the shade at the ends without impairing the remaining portion of the same.

11. As an improved article of manufacture, a woven-slat shade comprising a plurality of weft units, a plurality of combination warp units each consisting of associated tapes and cords, arranged with the tapes between the cords, reinforcing cord warp units between said combination warp units, and additional cord warp units between the ends of said weft units and the outer combination warp units, whereby provision is made for cutting off portions of the shade at the ends without impairing the remaining portion of the same.

AZEL C. HOUGH.