Dec. 28, 1948. G. F. BRENT 2,457,442

LADDER TAPE

Filed July 14, 1945

Fig. 1.

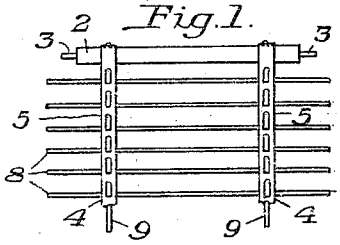


Fig. 2.

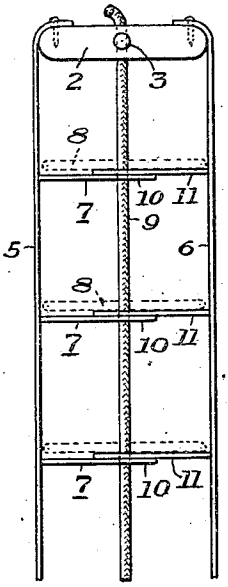


Fig. 3.

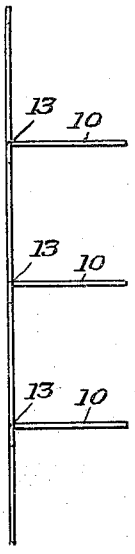


Fig. 4.

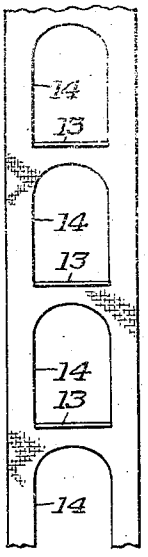


Fig. 5.

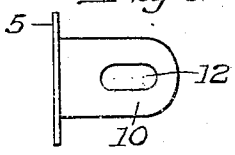


Fig. 6.

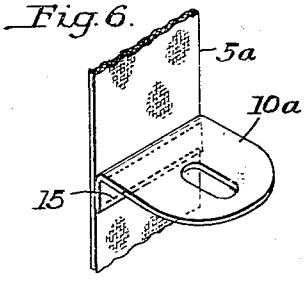


Fig. 10.

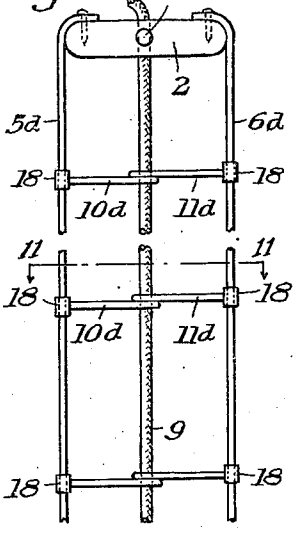


Fig. 7.

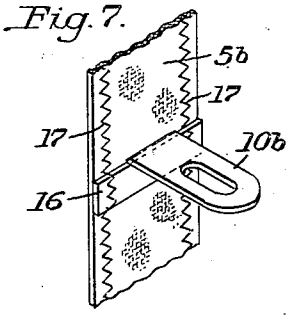


Fig. 8.

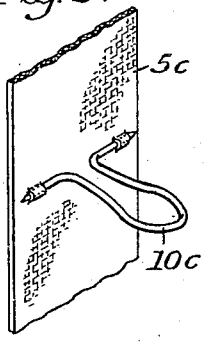


Fig. 9.

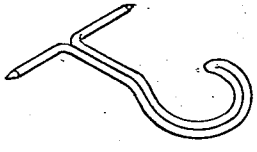


Fig. 11.



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his attorneys

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LADDER TAPE

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Application July 14, 1945, Serial No. 605,074

10 Claims. (Cl. 160—178)

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My invention relates to Venetian blinds, and particularly to the flexible hangers or ladder tapes for supporting the slats of the blinds in suspended position within the area of the window or other opening to be screened.

The conventional hanger or ladder tape of a Venetian blind comprises a pair of elongate, relatively narrow, flexible side tapes or hanger members that are transversely interconnected by a series of cross members. The cross members are spaced apart at uniform intervals longitudinally of the pair of hanger members. In service two or more hangers are secured in horizontally spaced relation to a supporting bar pivoted on a horizontal axis at the top of the window or other opening to be screened, and such hangers extend in parallelism vertically downward from such bar, with the cross members of the several hangers aligned horizontally, to provide support for the vertical series of slats of the blind structure.

The usual hanger or ladder tape is constructed of woven fabric, and the integration of the cross members is effected by interweaving the ends of the cross members of tape into the bodies of the pair of hanger members. The hangers as so constructed are of neat and pleasing appearance, and when new they serve well in their intended capacity. However, hangers of this type are relatively expensive, and additionally such hangers, being formed of fabric, tend to shrink and become distorted when they are washed, as in fact they must be from time to time in service.

The object of my invention is to provide a hanger that may be more economically constructed and supplied to the public. I aim to provide a hanger which may be readily cleaned without shrinking and distortion, or in some cases may be so inexpensive as to justify the discarding of soiled hangers, and the replacement thereof with new hangers.

The invention will be understood upon reference to the accompanying drawings, in which:

Figure 1 is a fragmentary view in front elevation of a Venetian blind in which a hanger of my invention is embodied;

Figure 2 is a fragmentary view, showing the blind to larger scale, as seen from the right of Figure 1;

Figures 3, 4 and 5 are views on the same scale as Figure 2, showing fragmentarily in side, front and top elevation, respectively, the fabricated article of manufacture, that is, the novel material, of which the hangers or ladder tapes of this invention are constructed;

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Figure 6 is a fragmentary view in perspective of a modified form of the material of which the hangers may be constructed;

Figures 7 and 8 are views comparable with Figure 6, illustrating still other modifications;

Figure 9 is a view in perspective of a variant in the form of a certain element included in the structure of Figure 8;

Figure 10 is a fragmentary view generally similar to Figure 2, illustrating a hanger of the invention in still further modified form; and

Figure 11 is a view of the last-mentioned hanger, as seen in cross section on the plane XI—XI of Figure 10.

The showing of Figure 1 will be understood to be diagrammatic, illustrating only so much of a simplified form of Venetian blind structure as is necessary to an understanding of the invention. The blind will be seen to consist of a supporting bar **2** which carries pins **3** at its two ends, by means of which the bar is mounted in suitable brackets at the top of the opening to be screened. Two flexible hangers **4**, arranged in horizontally spaced relation, are suspended from the bar **2**, and it will be understood that these hangers comprise each two flexible hanger members **5** and **6** which are spaced one behind the other in the line of sight in Figure 1. Between such hanger members cross members or arms **7** (Figure 2) extend to support in vertically spaced relation a series of slats **8**, the slats being shown in full lines in Figure 1 and dotted lines in Figure 2. It will further be understood that the hanger members will be secured at their lower ends to a basal bar (not shown), and that the blind structure may include means for tilting the supporting bar **2** on the horizontal axis of its aligned pivots **3**, whereby the front and back hanger members **5** and **6** are shifted vertically, the front hanger members **5** upward and the back hanger members **6** downward, or vice versa, with the effect that the cross arms **7** and the slats borne thereby are tilted in usual manner.

The conventional Venetian blind includes at least two vertical adjusting cords **9**. These cords are anchored at their lower ends to the lowermost slat or basal bar of the blind structure, and extend upward through perforations or openings provided therefor in the slats **8** and supporting bar **2**, whence they are trained over pulleys and led to one side of the blind structure to provide pull-cords for vertically drawing the slats together, progressively from the bottom slat or

basal bar upward, to regulate the effective vertical extent of the blind structure. As the slats are thus drawn together the intervening portions of the flexible hanger members 5 and 6 buckle or flex in known way. For further detail of a Venetian blind structure of the sort here alluded to and in order to exemplify the various types of blinds in which the flexible hanger of my invention may be used, reference is made to Letters Patent No. 2,012,034, granted to me on August 20, 1935.

In the hanger of my invention the cross arms 7 are formed in two parts or elements 10 and 11, which, extending inward between the hangers 5 and 6, are interengaged by one of the cords 9, and as thus interengaged are caused to provide the cross arms 7 for the support of the slats 8. The cross arm elements 10 are secured at their outer ends to the flexible hanger member 5, and at their inner or distal ends are perforated, as at 12, to receive the cord 9 in sliding engagement, wherefore there is no interference with the operation of the cord when it is drawn upward between the hanger members 5 and 6 to effect the vertical drawing together of the slats. The inner or distal end of each of the cross arm elements 11 on the hanger member 6 are similarly formed, so that when the two hanger members 5 and 6 are secured to the supporting bar 2, as shown in Figure 2, the elements 10 and 11 are paired, with the perforations 12 in the pairs in registry to permit the threading through of a cord 9, as shown. Thus, the paired elements 10 and 11 are united to form the cross arms 7 of the hanger or ladder tape structure.

Referring to Figures 3 to 5, the hanger member 5 and its cross arm elements 10 are shown in a presently preferred form of construction, and it is to be noted that the showing of these figures indicates not only the hanger member 5 and its cross arm elements, but serves to illustrate also the novel article of manufacture or product which may be provided in continuous lengths, from which sections of desired length may be cut to form not only the hanger member 5 and its elements 10, but the hanger member 6 and its elements 11, it being merely necessary to arrange the two sections so cut in sections from the continuous length in facing relation with the cross arm elements of the two sections overlapped (Figure 2) for union by means of a cord threaded vertically through the perforations in the cross arm elements and in the slats. With the foregoing references as to the manner in which both hanger members 5 and 6 (with their cross arm elements 10 and 11, respectively) may be formed of sections cut to length from one and the same material or article of manufacture, I shall use the reference numerals 5 and 10 in describing the material or article of manufacture.

The material of which the hanger member 5 (or 6) is formed comprises a flexible band or web of plastic, metal, or fabric. I have found that a finely woven cotton fabric impregnated with pyroxylin or other suitable plastic integrating substance, provides an excellent material of which to construct the hanger. From the body of such band, strap portions are severed, and are bent or deflected along the lines 13 where the material remains unsevered, to provide the cross arm elements 10, the resulting openings 14 which remain in the band serving to augment, rather than detract from, the attractive appearance desired in the ultimate product. And from the bodies of such straps the perforations 12 may be cut in the same punch or die operation as severs or stamps the straps from the band. It may be noted that impregnated fabric of the sort mentioned does not unravel in consequence of the punching or shearing operation. And, of course, if the band (5) is formed of a very thin metal, plastic, or other strip material of adequate flexibility, there will be no problem of fraying or unravelling along the sheared edges.

If desired, metal or plastic eyelets may be secured in the perforations 12, to provide smooth edges therefor, and to improve the slideability of the cord 9 through the perforations. The use of such eyelets will be understood without illustration herein.

Whereas, the presently preferred form of the material is shown in Figures 1 to 5, it will be understood that the cross arm elements may be independently formed. Such independently formed elements are indicated by the showing 10*a* in Figure 6. They are united to a band portion 5*a*, by means of cross stitching 15. Alternately, the independently formed cross arm elements may be fashioned, as shown in 10*b* in Figure 7, and provided with laterally extending flaps 16, whereby all of the cross arm elements may be united to the band 5*b* by means of longitudinal lines 17 of stitching, in accordance with the teaching of Letters Patent No. 2,052,379, granted to me August 25, 1936. Instead of the lines of stitching 15 or 17, it will be understood that rivets of one form or another may be used to secure the cross arm elements to the band portions.

In still further modification, the cross arm elements may consist in loops 10*c* of wire or plastic material, as shown in Figure 8. The members 10*c* may be provided with pointed ends that are "pinned" into the body of the band 5*c*. In yet another variant, the cross arm elements may comprise hook shaped members as shown in perspective in Figure 9, and these hook shaped members may be provided with pointed ends to be secured in the bodies of the vertical bands in the same manner as the loops 10*c*, Figure 8. The hook form of the cross arm element permits such elements to be readily hooked to or unhooked from the cord 9, and avoids the necessity of pulling the cords out of the blind structure to remove the hangers.

Figures 10 and 11 serve to illustrate that the members 5*d* and 6*d* of the hanger may be formed of flexible cord, to which loops 10*d* and 11*d* of cord are severally united by means of metal clips or ferrules 18.

From the foregoing description, the artisan will perceive that a great variety of modifications may be made in the form of the hanger members. Instead of the cords 5*d* and 6*d*, flexible chain may be used, and instead of the band 5 and 6, a series of articulated links or plates of metal or other material may prove serviceable. It is needless to illustrate all of the various modifications that lie within the ambit of the appended claims. The important feature of the invention consists in the provision of slat-supporting cross members that are formed of elements carried some by the front hanger member and some by the back hanger member, and detachably interengaged to complete a slat-supporting hanger for a Venetian blind. The advantages of such construction are manifold, and will be self-evident to those skilled in the art.

1. In a Venetian blind including a supporting bar, two horizontally spaced flexible ladder-like hangers suspended from said bar, a series of slats supported in vertical spaced relation by the cross

arms of said ladder-like hangers, and a cord extending downward from the supporting bar at each hanger and extending through openings in the slats; the invention herein described wherein said ladder-like hangers each comprise two flexible hanger members extending vertically upon the front and rear edges of the series of slats, and a series of spaced cross arm elements secured to each hanger member and extending between said slats, the cross arm elements of one hanger member being paired with the cross arm elements of the other hanger member and being interengaged by said cord associated with the hanger to provide slat-supporting cross arms.

2. A hanger for the slats of a Venetian blind having a cord extending vertically of the slats, said hanger comprising two flexible vertical hanger members each provided with a vertical series of spaced laterally extending elements, said elements being perforate adjacent their distal ends, whereby said hanger members may be arranged with their laterally extending elements paired for interengagement by said cord to provide supports for said slats.

3. A hanger for the slats of a Venetian blind having a cord extending vertically of the slats, said hanger comprising two flexible vertical hanger members each formed of a band of fabric impregnated with pyroxylin and provided with a vertical series of spaced laterally extending straps formed of the same material, said straps being perforate adjacent their distal ends, whereby said hanger members may be arranged with their straps paired for interengagement by said cord to provide supports for said slats.

4. A hanger for the slats of a Venetian blind having a cord extending vertically of the slats, said hanger comprising two flexible vertical hanger members each formed of a band of flexible material having portions struck and deflected from the body of the band to provide a vertical series of spaced laterally extending perforated straps, whereby said hanger members may be arranged with their straps paired for interengagement by said cord to provide supports for said slats.

5. A hanger for the slats of a Venetian blind having a cord extending vertically of the slats, said hanger comprising two flexible vertical hanger members each formed of a band of fabric impregnated with pyroxylin having perforated portions struck and deflected from the body of the band to provide a vertical series of spaced laterally extending elements, whereby said hanger members may be arranged with their laterally extending elements paired for interengagement by said cord to provide supports for said slats.

6. An article of manufacture comprising an elongate flexible member having an aligned series of spaced-apart transverse elements secured each at one end thereto, the distal ends of said elements including openings to receive a cord threaded therethrough, whereby a hanger for the slats of a Ventian blind may be constructed, substantially as described.

7. An article of manufacture comprising an elongate flexible tape having struck and deflected from its body an aligned series of spaced-apart transverse elements, the distal end portions of

said elements including perforations to receive a cord threaded therethrough, whereby a hanger for the slats of a Venetian blind may be constructed, substantially as described.

8. In a Venetian blind including a supporting bar, two horizontally spaced flexible ladder-like hangers suspended from said bar, a series of slats supported in vertical spaced relation by the cross-members of said ladder-like hangers, and a cord extending downward from the supporting bar at each hanger and extending through openings in the slats; the invention herein described wherein each of said ladder-like hangers comprises two flexible hanger members extending vertically upon the front and rear edges of the series of slats, and a series of spaced cross elements secured to each hanger member and extending between said slats, the cross elements of one hanger member being paired with the cross elements of the other hanger member and being recessed for slideably receiving said cord associated with the hanger, the engagement of said cord with the paired cross elements uniting such elements to slat-supporting cross members.

9. In a Venetian blind including a supporting bar, two horizontally spaced flexible ladder-like hangers suspended from said bar, a series of slats supported in vertical spaced relation by the cross members of said ladder-like hangers, and a cord extending downward from the supporting bar at each hanger and extending through openings in the slats; the invention herein described wherein each of said ladder-like hangers comprises two flexible hanger members extending vertically upon the front and rear edges of the series of slats, and a series of spaced cross elements on each hanger member extending between said slats, each cross element being secured at its outer end to the associate hanger member and being perforate adjacent to its inner end, the cross elements of one hanger member being paired with the cross elements of the other hanger member, and the cord associated with the hanger extending through the perforated inner ends of the cross elements, whereby the paired cross elements are united to provide slat-supporting cross members.

10. A hanger for the slats of a Venetian blind having a cord extending vertically of the slats, said hanger comprising two flexible vertical hanger members each provided with a vertical series of spaced laterally extending elements, said elements being provided adjacent their distal ends with cord-engaging portions, whereby said hanger members may be arranged with the laterally extending elements of one hanger member engaged by said cord to the laterally extending elements of the other hanger member to provide supports for said slats.

GEORGE F. BRENT.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,103,394	Wade	Dec. 28, 1937