Aug. 29, 1944. E. G. HELLYAR 2,356,787

FRAME FOR TRANSPORTING FABRICS

Filed June 19, 1943

Fig: 1.

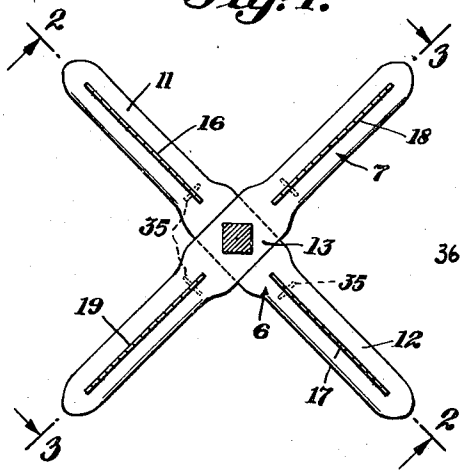


Fig: 2.

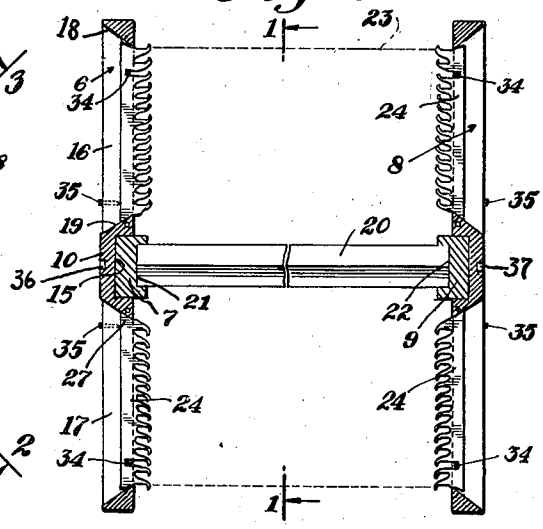


Fig: 3.

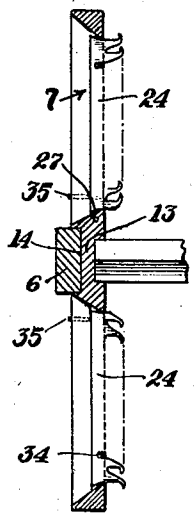


Fig: 4.

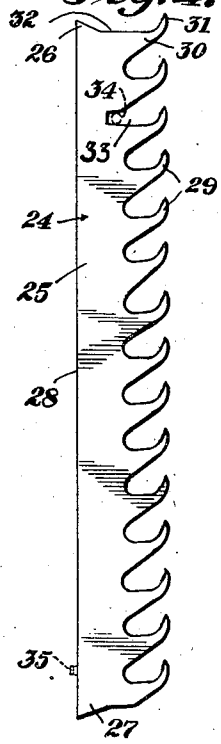
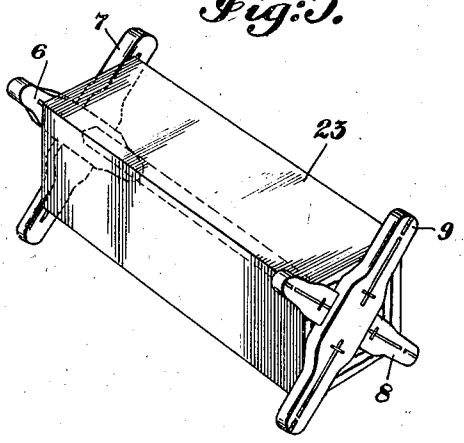


Fig: 5.



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2,356,787

FRAME FOR TRANSPORTING FABRICS

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Application June 19, 1943, Serial No. 491,465

9 Claims. (Cl. 206—51)

This invention relates to supports or frames used in transporting fabrics, particularly velvet.

The United States Patent No. 2,315,532 of April 6, 1943, to Louis V. Lucia and Eric W. Horndahl, describes a cloth frame formed of a pair of cross-shaped members mounted upon an intermediate bar and having slots extending longitudinally through the arms of the cross-shaped members and containing hooks which project out of these slots and which carry the cloth that is wound upon them.

My copending patent application Serial No. 364,909, filed November 8, 1940, describes a cloth frame of this type, wherein the hooks are movable within the slots and are located entirely within the slots in their retracted positions, thereby facilitating transportation. The hooks are movable by gravity into their operative positions in which they are located outside the slots and are used to carry the cloth which is framed upon them.

My copending patent application Serial No. 424,416, filed December 26, 1941, relates to a further improvement in these cloth frames, which consists in that the slots in the arms of the cross-shaped members are provided with converging walls which are engaged by angular end portions of plates carrying the cloth-supporting hooks.

Practical experience with fabric frames of this type and other rigid types has shown that they present various drawbacks and disadvantages. In order to prepare them for the framing of the fabric thereon, it is necessary to assemble the frames in rigid form; since this rigid assembly requires a great deal of space, it must be carried out at a distance from the machines from which the fabric issues ready for framing. This assembly at a distance from the machines makes it necessary to carry the assembled rigid frames, a few at a time, to the location wherein the framing is to take place.

Due to the shrinkage and expansion of the wood, the fitting of a bar with a rounded end into an arm with a round hole in order to achieve a rigid fit, must be aided by the use of cheese cloth or other suitable material as a tightening material in case of a loose fit; or by shaving off or other treatment of the rod or of the arm in case of no fit. The rigid fitting, when round holes are used, is to prevent uncompensated turning of either of the cross-members on the bar during framing. Such uncompensated turning would produce uneven framing, while compensation is difficult and time-consuming.

The recipient of the fabrics upon the frames often finds it profitable and/or is often required to return them to the shipper, in order that the latter may utilize them again in making shipments to another customer. Since the frames have the form of crosses joined by a long rod, all held rigidly in position, even when not carrying cloth, they occupy a great deal of space, so that the shipping of the frames is inconvenient and expensive.

The movable hook-carrying plates of this type of frames often damage the wood of the frames by lengthening the slot by a sawing action of the plate edges acting on the ends of the slots. Such lengthening of the slots is often enough to provide for an escape of a hook-carrying plate from the slot, thereby entailing the loss of the valuable hook-carrying plate. Hence a comparatively large number of nails and staples in the cross-shaped members is required to prevent such escapes.

The winding of the fabric upon hooks of the type illustrated in the aforesaid patent is often a cumbersome and difficult procedure, particularly on account of the heavy weight of fabric which is to be mounted upon the frames and which must be stretched manually lengthwise and widthwise in order to reach the tips of the inwardly bent hooks and retain sufficient tension when the pierced part settles upon the hook.

An object of the present invention is to improve the structure and operation of fabric frames of the described type, through the provision of frames of simplified structure lending themselves to being conveniently stacked or stored, and knocked down at the place of framing, and to being very rapidly assembled by the actual framing operators, thus eliminating the necessity of a preliminary assembly, and providing an adequate support for the fabrics framed upon them, and which will at the same time require the least possible amount of space before and after actual use.

Another object is the provision of a fabric-carrying frame which is supported in proper position by the natural tension of the fabric wound upon it and which collapses into its component parts as soon as the frame is removed from the unframing machine of the recipient of the fabric.

A further object is the provision of a fabric frame the hook-carrying plates of which are so mounted in the slots of the arms that the sawing action of the plates and any possibility of an escape of the plates are effectively eliminated while the number of nails and staples required to hold the plates within the slots is reduced to a minimum.

Yet another object is the provision of a fabric frame the hooks of which are so shaped that the task of framing the fabric, i. e., of winding it upon the hooks, is greatly facilitated and that the force necessary for stretching the fabric during the framing is reduced to a considerable extent, by the utilization of the natural widthwise and lengthwise tensions of the framed fabrics and through the use of a forwardly pitched hook, thus holding the fabric in the framed position.

Other objects of the present invention will become apparent in the course of the following specification.

In accomplishing the objects of the present invention it was found desirable to provide a fabric-carrying frame or fabric frame each of the cross-shaped members of which is formed of two elements having central recessed interembracing portions, the outwardly facing central portion having a recess which is less deep than the recess of the other portion. The bar joining the cross-shaped members is preferably square in cross-section and fits into a comparatively shallow hole drilled in one of the two elements constituting each cross-shaped member. The elements of the cross-shaped members, and the bar joining them are held in their proper positions by the tension of the cloth mounted upon the frame and fall apart as soon as the frame is released from the unframing machine. Then the elements and the bar may be packed side by side, so that they will occupy the least possible amount of space.

In accordance with the present invention a single comparatively deep recess is provided between two hooks located comparatively closely to the outer end of the hook-carrying plate and a nail or pin is driven across the slot of the element so as to pass through this recess. This arrangement prevents the sawing action of the plate by preventing any lateral movement of the plate. A single staple extending across the rear of the slot close to its inner end, will prevent jointly with said nail or pin the escape of the plate in any direction.

Furthermore, in accordance with the present invention, the hooks of the hook-shaped plates are pitched at an angle which will utilize the two natural tensions of the framed fabric and are provided with short straight portions which penetrate deeply into the fabric by the natural lengthwise tension of the fabric itself.

The invention will appear more clearly from the following detailed description when taken in connection with the accompanying drawing showing, by way of example, a preferred embodiment of the inventive idea.

In the drawing:

Figure 1 illustrates one of the cross-shaped end members and is a view taken along the line 1—1 of Figure 2.

Figure 2 is a section through a rack along the line 2—2 of Figure 1.

Figure 3 is a section through one of the end members along the line 3—3 of Figure 1.

Figure 4 shows a hook-carrying plate on an enlarged scale.

Figure 5 is a perspective view illustrating the cloth rack when it is mounted.

The fabric frame shown in the drawing is formed of two cross-shaped members consisting of elements 6, 7, 8 and 9, which may be made of wood or any other suitable material.

The element 6 may be elongated in form and has a central portion 10 which is somewhat wider than the two arms 11 and 12.

The central portion 10 is provided with a recess 15 which is adapted to receive the central portion 13 of the element 7. The central portion 13 has a recess 14 which receives the central portion 10.

As shown in Figures 2 and 3, the outer central portion 10 is narrower than the inner central portion 13, and the recess 15 of the element 6 is deeper than the recess 14 of the element 7. The element 6 is situated in a different plane than that of the element 7 when the two elements are fitted together.

This arrangement is most advantageous, since the elements 6 and 7, while subject to substantially equal forces and strains, all inward toward the framed fabric, are subject to unequal possibilities of damage from these forces and strains. The outer element 6 tends to bend inwardly against the uncut section of the inner element 7, thus receiving support under strain; this bending is also in a direction to prevent the outer member from splitting along the grain from its cut section. The inner element 7 tends to bend inwardly and away from its own cut section, and since it has no such support as the outer one has, this member tends to split along the grain beginning at the cut section when strain is present or applied.

Since the danger of splitting the outer element 6 is practically nil, while the corresponding danger to the inner element 7 is great, the inner element 7 may be strengthened at the expense of the outer element 6 by cutting out for fitting less than one half of the thickness of the inner element 7 and more than one half of the thickness of the outer element 6 to provide a fitting close enough to a single plane for all practical use and purposes for which the frame is intended.

The arms 11 and 12 of the element 6 are provided with transverse slots 16 and 17, respectively.

The slot 16 usually extends across the entire arm 11. Upon the outer surface of the arm 11, the slot 16 extends from the outer end of the arm to a point located close to the adjacent side wall of the recess 15. The slot 16 is shorter at both ends upon the inner surface of the arm 11, so that it has converging side walls 18 and 19, which may be somewhat curved and which may be conveniently formed by the round blade of a rotary saw.

The slot 17 of the arm 12 is similar in shape to the slot 16. The element 7 is provided with similar slots 18 and 19.

The elements 8 and 9 are similar in shape to the elements 6 and 7, so that further description of these elements is deemed unnecessary.

The two cross-shaped members formed by the elements 6 to 9 are held apart at a distance corresponding to the width of the cloth by a rod 20 which is preferably square in cross-section, so that an easy and quick fitting may be provided which will keep the cross-shaped members at either end of the bar in fixed relation to each other, thus avoiding the turning of the members relatively to each other. The rod 20 is made of wood or other suitable material, and its ends fit into comparatively shallow holes 21 and 22 provided in the elements 7 and 9.

As indicated in Figure 1, the square holes 21 and 22 may be drilled diamond-fashion, so that the fabric framed upon the frame will touch only the flat sides of the rod 20 on the innermost

winding. A square rod of this type is much less expensive than the dowels and/or shafts of varied diameters used heretofore, and has the added advantage that it can be conveniently cut to adjust the frame to any desired length to accommodate varying widths of fabrics.

The shallowness of the holes 21 and 22 conserve the strength of the inner elements 7 and 9, while the outer elements 6 and 8 are in no way weakened by this arrangement.

Figure 5 of the drawing illustrates the frame when the cloth 23 is wound upon it. It is apparent that the various parts of the frame, such as the elements 6 to 9, as well as the intermediate rod 20 are held in the illustrated positions by the natural tensions of the cloth. All these parts collapse as soon as the empty frame is removed from the unframing machine.

Thus the elements of the cross-shaped members need not be nailed together, thereby saving scarce material and labor. For transportation purposes, the elements 6 to 9 and the rod 20 may be packed side by side, thereby saving a very large amount of space.

The elongated slots of the four elements contain hook-carrying plates 24 one of which is shown in detail in Figure 4. The plate 24 is made of steel or other suitable material and includes an elongated strip 25 having angular edges 26 and 27.

The hooks 29 are located one beside the other upon the plate 24. Each of the hooks has a widening portion 30 adjacent the strip 25, and a short point 31 extending practically at right angles to the inner edge 32 of the hook. This arrangement makes it possible to place a fabric upon a hook without exerting considerable effort, and the point 31 of the hook will penetrate and firmly hold the fabric due to the natural lengthwise tension of the fabric.

Throughout this specification, the term "lengthwise tension" is used to describe the stretch tension in the fabric between one hook and the next hook in the order of winding at the same end of the bar. The term "widthwise tension" designates the stretch tension in the fabric between one hook at one end of the bar and the corresponding hook in order of winding at the opposite end of the bar.

It is the utilization of the combined lengthwise tension and widthwise tension by a forwardly pitched hook that permits the use of a hook with comparatively little up-turn, thus eliminating the difficulties in framing and unframing on upturned hooks.

By eliminating inwardly bent hooks, the necessity of pulling heavy fabrics backwards over such hooks is eliminated and the labor of winding a fabric upon the hooks is facilitated to a considerable extent.

The plate 24 has a single recess 33 which is deeper than the recesses between the other hooks. While the recess 33 is illustrated as being located between the second hook and the third hook (counting from the outer edge of the plate), it may be provided between other hooks. However, the recess 33 should be located close to one of the ends of the plate, since it is used to receive a nail or a pin 34 which is driven across the plate-containing slot and is embedded in the arm close to the inner surface thereof. The nail 34 serves as a guide facilitating the movement of a plate 24 from its inoperative withdrawn position within the slot to an operative position in which the hooks 29 project out of the slot. This position is one exactly parallel to the surface of the containing element, thus providing that the angled ends of the hook-carrying plates rest on the angled ends of the slots. The nail serves to guide the plate when the latter drops by gravity from an inoperative position into an operative position, causing the plate to assume the above mentioned parallel position and preventing it from assuming an oblique operating position. Such an oblique operating position would cause the plate to rest unequally on the walls forwardly and rearwardly and would tend to cause the plate to break through a too thin resting place; or to escape from the slot and be lost, even without breaking the wood, if the oblique angle in dropping should be sufficient. The nail also serves the purpose of preventing any lateral movement of the plate when it rests in its operative position, thus preventing the widening of the groove to any extent that would permit the plate to escape in any direction not prevented by the nail itself.

A single staple 35 is used to prevent the plate 24 from falling out of the opposite side of the slot rearwardly. The location of the nail prevents the plate from receding rearwardly enough to permit the plate to escape on the opposite side forwardly, as the nail prevents the outermost hook from clearing the forward end of the sawed slot to permit such escape. The staple 35 extends across the slot close to the inner end thereof upon the outer surface of the arm.

This arrangement is repeated in all eight arms of the rack.

It is apparent that in accordance with the present invention, a single nail and a single staple are used to hold each hook-carrying plate within a slot. In prior art, it was considered necessary to use twice that number and to select most carefully the position of the rear staples since it was possible for the plate to escape forwardly and inwardly if the rear staple were carelessly placed too far in the direction of the extremities. This would permit the hook-carrying plate to fall from an inoperative position into an operative position at an angle oblique enough to permit such escape.

The cross-shaped members are provided with holes 36 and 37 adapted to receive pivots for turning the frame on framing machines at the factory manufacturing the fabric, and on unframing machines of the recipients of the fabric.

The mode of using the frame is apparent from the above. The parts of the frame are assembled and held in the proper fixed and rigid positions while a fabric is framed upon the hooks of the frame by being wound in an outwardly direction upon the hooks. Then the frame is removed from the framing machine; at that time the parts of the frame will be held together by the tension of the fabric.

The frame and the fabric carried thereby are shipped to a recipient who places the frame upon his unframing machine to remove the fabric from the frame.

When after the removal of the fabric, the frame is released from the unframing machine, the component parts of the frame will fall apart and can be stacked conveniently side by side and one part upon the other for return shipping to the manufacturer.

It is apparent that the illustration shown above has been given by way of illustration and not by way of limitation and that the above-described frame is subject to wide variation and modifica-

tion without departing from the scope or intent of the resent invention; all of such variations and modifications are to be included within the scope of the present invention.

What is claimed is:

1. In a frame for transporting fabrics, said frame comprising two members including cross-shaped arms having longitudinal slots formed therein, hook-carrying plates in said slots, and a rod extending between said members, wherein each of said members comprises two separate elements centrally loosely embracing each other and wherein said rod is square in cross-section and loosely fits into comparatively shallow square holes formed diamond fashion only in the inner element of each member.

2. In a frame for transporting fabrics, said frame comprising two members including cross-shaped arms having longitudinal slots formed therein, hook-carrying plates in said slots, and a a rod extending between said members, wherein each of said members comprises two separate elongated elements, each of said elements having a recessed central portion receiving the recessed central portion of the other element, whereby the two elements loosely embrace each other, and wherein said rod loosely fits into comparatively shallow holes formed only in the inner element of each member.

3. In a frame for transporting fabrics, said frame comprising two members including cross-shaped arms having longitudinal slots formed therein, hook-carrying plates in said slots, and a rod extending between said members, wherein each of said members comprises two separate elements, each of said elements having a recessed central portion receiving the recessed central portion of the other element, whereby the two elements loosely embrace each other, the outwardly facing central portion having a recess which is less deep than the recess of the inwardly facing central portion, and wherein said rod loosely fits into comparatively shallow holes formed only in said inwardly facing central portion.

4. In a frame for transporting fabrics, said frame comprising two members including cross-shaped arms having longitudinal slots formed therein, hook-carrying plates in said slots, and a rod extending between said members, wherein each of said hook-carrying plates comprises hooks having comparatively wide converging side portions and comparatively short straight points extending in alinement with each other and substantially parallel to the longitudinal direction of the slot wherein the plate is located, said hooks being pitched forwardly, whereby the natural lengthwise and widthwise tensions of the framed cloth are utilized to hold the cloth in the framed position.

5. In a frame for transporting fabrics, said frame comprising two members including cross-shaped arms having longitudinal slots formed therein and extending across the arms, hook-carrying plates in said slots, and a rod extending between said members, wherein each of said hook-carrying plates comprises a single recess formed between two hooks and extending substantially transversely to the longitudinal direction of the plate, and a separate guide in each of said longitudinal slots, said guides being carried by said arms and fitting into said recesses.

6. In a frame for transporting fabrics, said frame comprising two members including cross-shaped arms having longitudinal slots formed therein and extending across the arms, hook-carrying plates in said slots, and a rod extending between said members, wherein each of said hook-carrying plates comprises a single recess formed between two hooks located substantially close to one end of the plate, said recess extending substantially transversely to the longitudinal direction of the plate, and a separate guide in each of said longitudinal slots, said guides being carried by said arms and fitting into said recesses.

7. In a frame for transporting fabrics, said frame comprising two members including cross-shaped arms having longitudinal slots formed therein and extending across the arms, hook-carrying plates in said slots, and a rod extending between said members, wherein each of said hook-carrying plates comprises a single recess formed between two hooks located substantially close to one end of the plate, said recess extending substantially transversely to the longitudinal direction of the plate, a separate guide in each of longitudinal slots, said guides being carried by said arms close to the inner surfaces thereof and fitting into said recesses, and a separate staple extending across each slot upon the outer surface of the arm carrying the slot, said staples being adapted to engage said plates substantially close to the opposite ends thereof.

8. In a frame for transporting fabrics, said frame comprising two members including cross-shaped arms having longitudinal slots formed therein and extending across the arms, hook-carrying plates in said slots and a rod extending between said members, wherein each of said hook-carrying plates comprises a single recess formed between two hooks located substantially close to one end of the plate, said recess extending substantially transversely to the longitudinal direction of the plate, a separate guide in each of said longitudinal slots close to the outer end thereof, said guides being carried by said arms and fitting into said recesses, and a separate staple extending across each slot close to the inner end thereof upon the outer surface of the arm carrying the slot, said staples being adapted to engage said plates substantially close to the opposite ends thereof.

9. In a frame for transporting fabrics, said frame comprising two members including cross-shaped arms having longitudinal slots formed therein and extending across the arms, said slots having curved inwardly converging end walls, hook-carrying plates in said slots, and a rod extending between said members, wherein each of said hook-carrying plates comprises a row of hooks and end portions situated on opposite sides of said row and having edges forming acute angles with the adjacent end walls of the slots, a single recess being formed between two hooks which extends substantially transversely to the longitudinal direction of the plate, and a separate guide in each of said longitudinal slots, said guides being carried by said arms and fitting into said recesses.

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