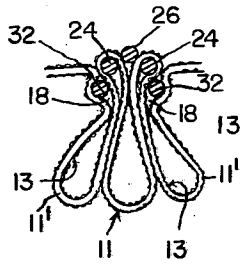
Nov. 6, 1962 B. P. SOLOMON 3,062,281

PLEATING DEVICE

Filed Aug. 12, 1957

FIG. 3.



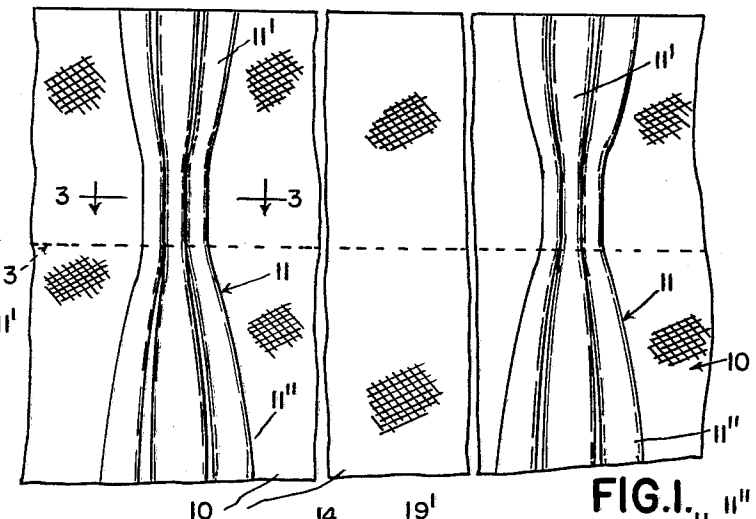
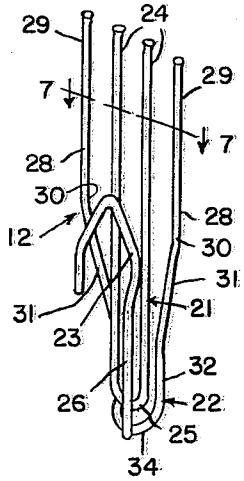


FIG. 1.

FIG. 4.



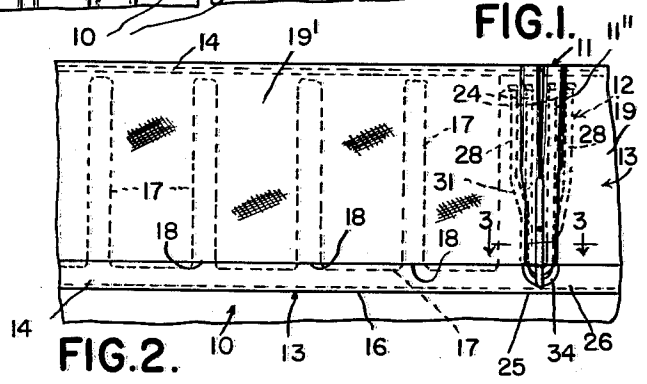


FIG. 2.

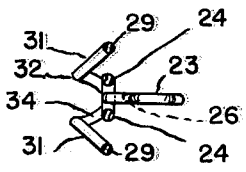


FIG. 7.

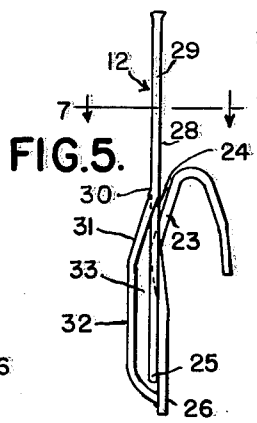


FIG. 5.

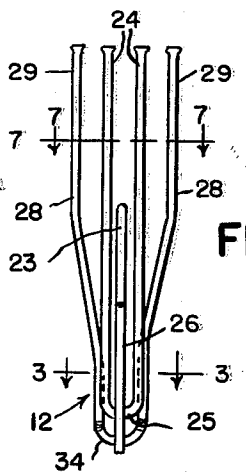


FIG. 6.

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3,062,281

PLEATING DEVICE

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7 Claims. (Cl. 160—348)

The present invention relates to improvements in a simple, inexpensive and easily manipulated device for pleating draperies and like hangings, the device being generally of the type shown and described in my Letters Patent No. 2,558,467 of June 26, 1951.

This basic pleater, as shown in my above identified Letters Patent, features a series of four upright, longitudinally spaced and aligned pleating fingers of resilient wire stock wherein the four fingers are provided by two U-shaped members, one nested within the other and welded at their bights to one leg of an inverted U-shaped member, comprising the hook, whereby each of the four fingers is anchored at its bottom on a central vertical line extending through the middle of the device. These fingers, when making a triple pinch or French pleat, are adapted to be individually threaded into individually narrow longitudinally spaced, vertical pockets of a fabric tape stitched along the top hem of the hanging to be pleated. The pockets are of substantially the same length as are the fingers. So inserted in the pockets, the fingers gather the drapery material together in pleats of a desired contour.

Some users of my basic invention have felt that in order to achieve a more pronounced pinch or nip of the pleats thus formed, whether they be of the so-called pinch or French type, the action of the pleating fingers of such devices should be supplemented by sewing or other means. This is done by tacking or stitching the pleats at the bottom thereof.

Others have proposed to build into the pleater additional mechanical provisions to the same end. In some pleaters this provision takes the form of an additional fixed wire pinch or nip member or members adapted to project forwardly into a gathered pleat or pleats and thus exert a degree of mechanical control of the form of the pleat at its base. It is necessary to furnish the user with detailed instructions regarding the manner of manipulating these devices in pleating and successful results are not accomplished even then.

In other proposed pleaters separate pinching devices, not a part of the pleater itself, are introduced between the arms of the pleater. This involves extra parts which may be lost. Again, detailed instructions as to how to use the parts must be furnished, and the pincher will not operate satisfactorily if they are not followed to the letter as to placement of the pleat folds.

Still others have mounted movable supplemental nipping or pinching elements on my basic pleating device, for either sliding or swinging manipulation thereon by the user, once the fingers have formed the pleat. The nippers enter the pleat formations from the rear thereof if the manufacturer's instructions are carefully followed in guiding the pleats manually, and frictionally pinch the material against the pleating fingers. So engaged, the supplemental nipper retains the shape of the pleat and creates a nip. In order to remove the pleater the nipper must first be pulled to a neutral position.

In other proposed pleaters resort is had to a combination of both the fixed and movable supplemental nipping means described.

In any of these pleaters the addition of the supplemental nipping device, regardless of type, naturally increases materially the production cost of the entire device, as compared with the very simple basic pleater of my prior patent. A materially greater amount of wire

stock is required, in addition to the substantially increased labor of assembly. An indicated above, the proper placement of a drape on all such pleater requires that pains be taken in guiding the drapery folds onto the pleating fingers, prior to the manipulation of the supplemental pinch means, if proper pleats are to be obtained. My basic pleater device, equipped with the added nipping means incorporated by others, is considerably harder and slower to use, particularly for an untrained operator, than the simple draw-on type pleater of my patent, which requires no particular skill or dexterity on the part of the operator.

It is also obvious that in a simple, mass-produced wire unit of the type in question, any added auxiliary movable nipping means will frequently be imperfectly mounted on the device, tending to bind and resist manual movement. It thus often occurs that when force is exerted to lock it in place the hand of the operator is accidentally pinched or cut, or the material of the drape is damaged.

It is therefore a general object of the invention to provide a drapery pleating and hanging device having all the structural simplicity, low cost of production, and ease, convenience and safety in use of my previously patented device, yet which permits the formation and anchoring of closely nipped pleats of uniformly attractive appearance without the aid of added mechanical nip or pinch provisions.

Another object is to provide a pleater having these advantages, in the use of which it is unnecessary to tack or finish stitch the base of the pleat.

Yet another object is to provide a pleating device having pleating fingers of special outline, by which attractive pleats are formed by simplying inserting the fingers upwardly in upright pockets laterally spaced along the top hem zone of the drape to be pleated (these pockets preferably being formed in a fabric tape pre-stitched along the drape top), and then drawing the drape downwardly in a single stroke to fully and firmly seat it on the fingers. Thus engaged, the resultant formed pleats on the drape are closely and uniformly nipped along their vertical length as well as securely held in place due to the special improved outline of the pleating fingers. The possibility of the pleater falling out of or being readily dislodged accidentally from the pockets is also eliminated.

More specifically, an object is to attain the nipping results mentioned above by the provision of a pleating device of a simplified resilient wire or equivalent construction throughout, characterized, in common with the pleater of my patent, by a plurality of spaced upstanding pleating fingers having their free outer portions arranged generally parallel and coplanar, with a suspending hook integrally bonded to the fingers adjacent their bottoms and facing rearwardly of their plane.

Although the fingers of my improved device are provided by two U-shaped members of resilient wire stock, one nested within the other, and each U-shaped member united at its bight to a leg of the suspending hook, as disclosed in my basic patent, the fingers are formed according to the improvement in outer and inner sets of substantially different outline, respectively, arranged in offset relation to one another. The effect is to create a tighter or narrower appearance along the length of the pleat by virtue of the offset portions of the fingers.

In further specific accordance with the improvement, the two outer pleating fingers are vertically coplanar at their top ends with the two inner fingers and bent in a compound offset relation to the latter adjacent their bottom. This offset is, in the illustrated embodiment of the device, downwardly divergent, in relation to or away from the plane of the upper finger portions, as well as from the suspending hook, and laterally convergent angularly in a vertical plane established by the first offset,

which vertical plane generally parallels the upper finger portions.

The formation of the fingers in sets of this kind results in the gathers of the pleating being guided toward one another as the pleating fingers are moved upwardly into the pockets, due to the angularly offset relation of the fingers, so as to bring the pleats into a compact relation all along their full vertical dimension and tightly pinched at the bottoms of the pleats.

Other objects and features of the invention will become apparent as the description proceeds, especially when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a fragmentary front elevational view of a drapery or like hanging as pleated by the improved device of the invention;

FIG. 2 is a fragmentary smaller scale rear elevation of the drape, showing a pre-stitched fabric pleating tape as applied thereto, with a pleater according to the invention applied to one portion of the drape and tape;

FIG. 3 is a fragmentary horizontal section on line 3—3 of FIGS. 1 and 2;

FIGS. 4, 5 and 6 are, respectively, views in rear perspective, side elevation and front elevation of the pleating device; and

FIG. 7 is a horizontal sectional view along line 7—7 of FIGS. 4, 5 and 6.

Referring to FIGS. 1, 2 and 3, a decorative window drape or like pleated window or wall hanging **10** is shown having pleat formations, generally designated **11**, produced by the use of the hanger device **12** of the invention. The pleating operation is preferably performed with the aid of a pre-formed fabric pocket tape **13** secured along vertically spaced, horizontal stitch lines **14** (FIG. 2) to the rear or concealed side of the drape **10**, i.e., across the top hem zone of the latter.

Structural features of the fabric tape **13** are known, since it is a type heretofore used in connection with pleaters heretofore devised, including that of my above identified patent. It is constituted by a length of fabric lapped upon itself about a top fold, with horizontally extending bottom margins **15**, **16** in vertically spaced relation to one another. So disposed, the folded tape plies are secured together by stitching **17** to form narrow vertical pleating pockets **18**, which open downwardly at the tape margin **15**.

Structural details of the improved pleater are shown best in FIGS. 4–7, from which it appears that, like the prior patented device, it may, in general, be formed of a pair of nested inner and outer, upwardly opening U-shaped members **21**, **22**, respectively, of a suitable resilient steel wire stock, and a centrally disposed, rearwardly extending suspending hook **23** of the same type stock.

The inner or central wire pleating U-shaped member **21** provides a pair of upwardly extending, straight parallel pleating fingers **24** of substantial length, approximating that of the pleat portions. The inner U-shaped member is centrally welded or otherwise secured at its bight **25** to the forward surface of the upright shank **26** of the hook **23**. Thus, it is seen that the inner U-shaped pleating member **21** is simply in the form of an elongated straight armed hairpin occupying a single upright plane.

The outer pleating U-shaped member **22** is specially formed in a manner to be described for coaction with the straight inner fingered U-shaped member in order to accomplish the desired pleating action. However, it is in order to point out the alternative possibility of specially forming the inner U-shaped member **22** instead, or of shaping both U-shaped members specially, in a way to obtain the desired unassisted pinching of the pleats **11**, as contemplated by the invention.

As shown, the outer U-shaped member **22** includes pleating fingers **28**, the upper pleating portions **29** of which lie coplanar with the fingers **24** of the inner U-shaped member **21**. They are spaced on opposite sides of those fingers an amount substantially equal to the spacing of the fingers **24** from one another. The fingers **24**, **28** co-terminate upward at a straight horizontal line, at which termini they are preferably provided with smoothly rounded heads to eliminate snagging in inserting the same in the individual pleating pockets **18**.

Approximately midway of their vertical dimension each of the fingers **28** is given a compound angular offset at **30**. This includes the downward angling of the same, along the length **31**, forwardly or laterally outwardly (i.e., away from the hook **23** and the common plane of the tops of the fingers **24**, **28**), as well as inwardly of and in convergent relation toward the respective adjacent fingers **24**.

Lower portions **32** of the fingers **28** beneath the angled offset lengths **31** are brought downward in parallelism (FIG. 5) with the fingers **24**, in regard to which they are now disposed in a slightly overlapped relation, in the front-to-rear sense (FIGS. 6 and 7). Yet adequate lateral space **33** exists between the lower offsets of the outer fingers **28** and the inner fingers **24** to receive frictionally and guide the material of the drape **10** and pleating tape **13** as it moves inwardly and downwardly on the fingers.

The outer U-shaped member consists of the outer pleating fingers **28** and the bight **34**, which bight preferably lies beneath the corresponding bight **24** of the inner U-shaped member. At this point the bight **34** is turned rearwardly and centrally secured, by welding or otherwise, to the adjacent surface of the hook shank **26**. That is, the fingers **28** extend outwardly or forwardly, in relation to the shank **26** of the hook, from their point of direct securement to the latter and at an angle to the shank. This results in the presence of ample clearance for a continuous guided flow of the material of the drape to the base of the pleater, upon arrival at which it is securely nipped and held as intended. The fingers thus wedge the drape in place in two direction, i.e., inwardly and laterally in the general plane of the fingers, and also forwardly of the drape; and this wedging action keeps the device from falling out of place.

Any incremental element along the length of one of the offset portions **32** will, with the corresponding element of the other portion, define a theoretical line paralleling the general plane of the upper end of the fingers. The offsets are thus preferably of the same contour.

In use, with the pleating fingers **24**, **28** inserted upwardly into a succession of the pockets **18** of the tape **13**, a downward pull of the drape, preferably applied at or just below the tape **13**, will cause the fingers to thread at a uniform rate into the pockets. Encountering the initial offset at **30** of the outer fingers **28**, the material of the pockets receiving the same (along with the drape material) is moved inwardly and forwardly toward and somewhat in front of the material receiving the inner fingers **24**, as shown in FIG. 3.

Thus, with the pleater fingers inserted about half way in the pockets, the offsets **30** commence a funneling or gathering action around the outside of the two inner pleats, this funneling creating a narrow pinch pleat in the zone in question. The pinching action extends from the base of the pleat about on-half the way upwardly thereof, locking the pleats and the pleater hook securely to one another.

As the pleated material comes to a halt in bottom edge engagement with the bight **25** of the inner set of pleating fingers **24**, it is held and uniformly nipped securely between the four coplanar finger tops **24**, **28**, and at its intermediate portion and between the approximately equally spaced but forwardly and inwardly offset lower portions of the fingers **28** and the adjacent fingers **24**. This nipping action also prevents the pleating device from falling out of the drape prior to suspending the same.

The device **12** is illustrated as conventionally formed

of spring wire lengths, preferably assembled by welds, but it is evident that a similarly functioning and equally successful unit may be fabricated as readily and inexpensively by other operations, for example die stamping, casting, etc. Thus, no particular claim is made in regard to considerations of this sort, as to which the invention is to be broadly construed.

Similiarly, unless so limited in the claims to follow, the invention is contemplated as embracing equivalent variants of the illustrated and described arrangement of pleating fingers and suspending hook, or sub-combination thereof, so long as they accomplish the forming of the pleats into the desired uniformly pinched and nipped position, as typically depicted in the drawings.

What I claim as my invention is:

1. A pleating device for draperies and the like, comprising a pair of inner upright drapery engaging fingers, the upper ends of which lie in a first plane, and a pair of outer upright drapery engaging fingers, the upper ends of which lie substantially coplanar with the upper ends of the inner fingers, said outer fingers being offset adjacent the bottom thereof transversely from the general plane of said upper ends and having elements of their respective offset portions lying in a plane generally paralleling said first plane, the lateral spacing of said elements of said offset portions being substantially the same as that of the inner fingers, and a hook member to which said fingers are secured adjacent the bottoms thereof substantially in said first plane with the portions of said outer fingers below said offset portions extending below the point of securement of said inner fingers and disposed at an angle to said first plane substantially at the point of securement, whereby drapery material engaged by and drawn onto said inner and outer fingers is funneled into place to form nipped pleats therein.

2. A pleating device for use with a drape comprising a hook having a shank and a loop at the upper end of the shank and a series of two upright inner fingers connected to the lower end portion of the shank and two upright outer fingers connected to the shank below the point of securement of the inner fingers, the upper end portions of all four fingers lying in the same generally vertical plane, the lower portions of the two outer fingers extending downwardly toward each other and forwardly from said plane to offset portions which are spaced apart laterally a distance substantially equal to the lateral spacing of the inner fingers, the lower ends of said offset portions converging inwardly toward each other and rearwardly to their point of securement to the lower end of said shank whereby drapery material engaged by and drawn onto said inner and outer fingers is funneled into place to form nipped pleats therein.

3. A pleating device for use with a drape comprising a rearwardly extending hook having an upright shank, and a series of pleating fingers secured on said shank, including two upright inner fingers and two upright outer fingers connected in fixed relation to one another and to the shank adjacent the lower portion of the latter, the upper end portions of all four fingers lying in the same generally vertical plane, the two outer fingers being formed to extend downwardly toward each other and said inner fingers and forwardly from said plane in transversely offset portions, parts of which are spaced laterally from one another a distance substantially less than the finger spacing at their upper portions, the lower ends of said offset portions extending rearwardly to their connection to one another and to said shank, the respective pairs of inner and outer fingers causing drapery material engaged thereby and drawn onto the same to be funneled into place to form nipped pleats therein.

4. A device for pleating a drape, comprising a pair of U-shaped members respectively providing a pair of inner upright fingers and a pair of outer upright fingers, each pair connected by a bottom bight, the upper ends of said fingers lying substantially in an upright plane, an upright, rearwardly facing hook, said outer fingers being connected in fixed relation to said inner fingers and to said hook adjacent said bight thereof, portions of the outer fingers beneath the upper ends thereof being inclined toward one another and said inner fingers and being offset forwardly of said plane above said bight thereof, said outer fingers returning rearwardly at said bight to the point of said fixed connection, the inclination of said outer fingers producing a minimum spacing of the same from one another approximating the spacing of said inner fingers from one another.

5. A pleating device comprising an upright suspending hook, an inner pair and an outer pair of upright drapery engaging and pleating fingers in a fixedly secured relation to one another and to said hook adjacent the bottom of the latter, said fingers being in laterally spaced, generally coplanar relation to one another at the upper ends thereof, the fingers of the outer pair, adjacent their point of securement to the hook, being disposed forwardly of those of the inner pair in a direction transversely of the plane of their upper ends, said fingers of the outer pair being more narrowly spaced adjacent said point of securement than at their upper end portions and extending angularly in said direction from said point of securement.

6. A pleating device for draperies and the like comprising an upright suspending hook, a pair of inner upright drapery engaging fingers the upper ends of which lie substantially in an upright plane, a pair of outer upright drapery engaging fingers, the upper ends of which lie substantially in said plane, said inner and outer fingers and said hook being in fixed relation to one another adjacent the lower ends thereof and said outer fingers having portions intermediate their upper and lower ends offset from said plane and more narrowly spaced at said portions than at the upper ends of said outer fingers, the arrangement of fingers causing a drape having upwardly extending laterally spaced pockets engaged by said fingers to be shaped to form nipped pleats.

7. A pleating device for draperies and the like, comprising a pair of inner upright drapery engaging fingers, the upper ends of which lie in an upright plane, and a pair of outer upright drapery engaging fingers, the upper ends of which are substantially in said plane and spaced from and in substantial alignment with the upper ends of said inner fingers, said outer fingers being offset adjacent the bottom thereof from the plane of their upper ends and said outer fingers being more closely spaced adjacent to the bottom thereof than at the tops thereof whereby drapery material engaged by and drawn onto said inner and outer fingers is funneled into place to form nipped pleats therein, and a hook member to which said fingers are secured adjacent the bottoms thereof.

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