Oct. 23, 1951 H. B. SCHNEIDER ET AL 2,572,204

CLOTH SPREADING HOLDER

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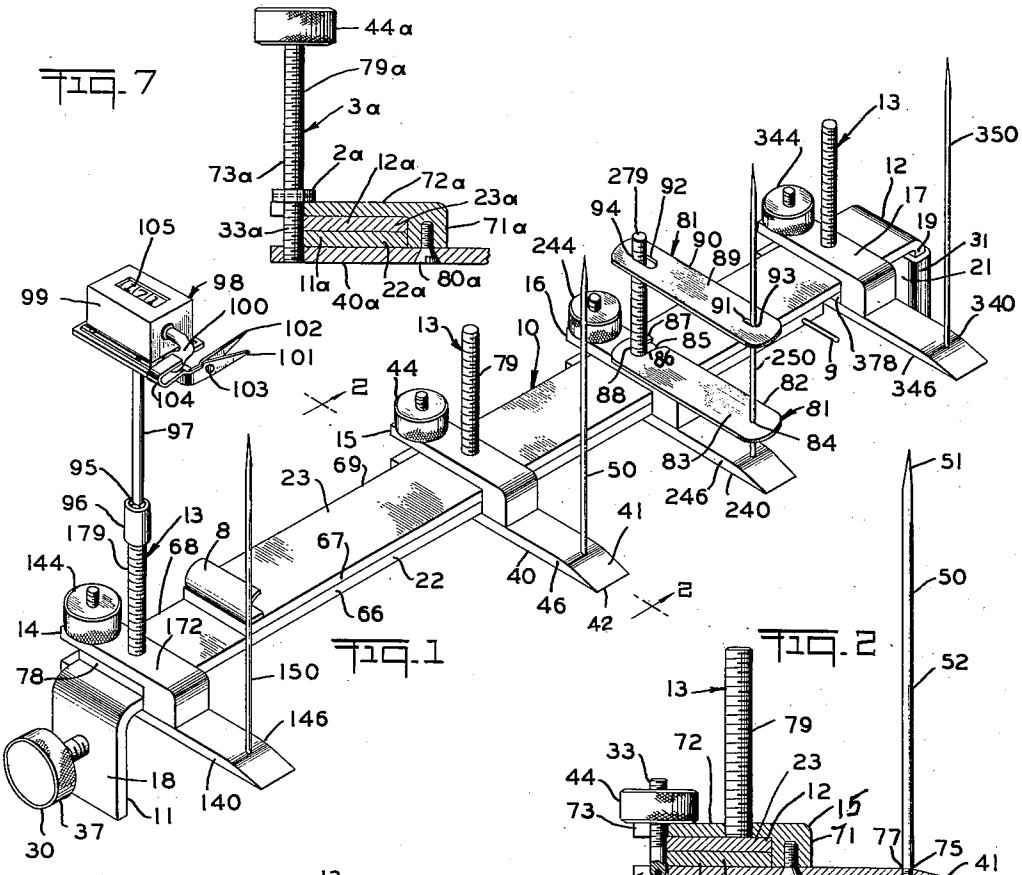


FIG. 1

FIG. 2

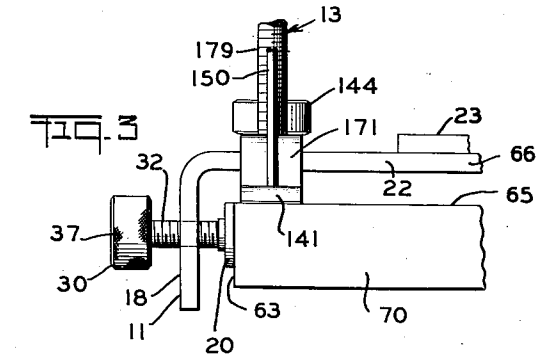


FIG. 3

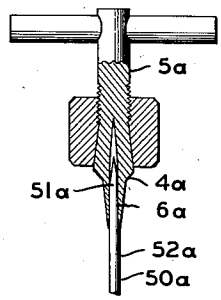


FIG. 4

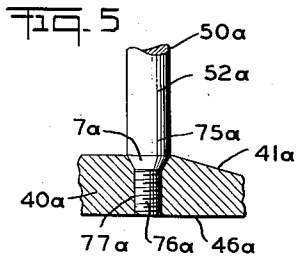


FIG. 5

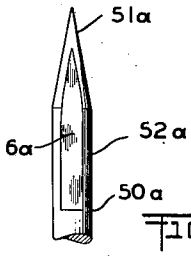


FIG. 6

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CLOTH-SPREADING HOLDER

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9 Claims. (Cl. 164—79)

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This invention relates generally to cloth spreading holders and more particularly to a cloth spreading holder which is adjustable in operation.

In the placing of cloth or similar sheet material in a plurality of layers upon a working surface for the purpose of cutting through the pile or stack, it is desirable that the several plies of cloth or the like be anchored substantially with respect to each other and to the working surface. In this manner oscillating or vertically reciprocating knives may be used to cut through the laminated pile and thereby produce a large number of identically patterned pieces by a single cutting operation.

While in certain fields, adhesive or clamping means may be utilized, where the materials are thin or have a low coefficient of surface friction, it is desirable that the ends of the material as well as the bights, when the pile is formed by folding, be positively secured.

It is therefore among the objects of the present invention to provide cloth spreading holder constructions by the use of which the portions of the material being spread are impaled and securely anchored to prevent undesired movement thereof during the laying and cutting operations.

Another object herein lies in the provision of construction of the class described which is adjustable so as to conform to the width and thickness of the cutting table surface with which it is used.

Another object herein lies in the provision of cloth spreading holders which may be adjusted to accommodate continuous webs of cloth or similar planar material of different widths.

A feature of the invention lies in the fact that the various adjustments may be made without the use of special tools or skill.

Another feature of the invention lies in the fact that the impaling elements may engage the planar material in such a manner as to facilitate the cutting thereof with a minimum amount of wastage.

A still further object of the invention lies in the provision of impaling elements which are so shiftable that different sizes may be substituted to accommodate different cloth thicknesses.

Another object of the invention lies in the provision of means for the removal of the impaling elements where their absence is desired during the cutting operation on the material stack.

Another object herein lies in the provision of

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structure of the class described having means for the severing of each ply of material as it is laid and for automatically counting the number of plies in a given lay of planar material.

Another object herein lies in the provision of adjustable and detachable bracing means for the impaling elements so as to reduce distortion thereof with a consequent loss of material being cut.

A still further object herein lies in the provision of cloth spreading holders which are simple and fool-proof in construction, are low in weight and cost and may therefore have a consequent wide sale and use.

These objects and other incidental ends and advantages will more fully appear in the progress of this disclosure and be pointed out in the appended claims.

In the drawings in which similar reference characters designate corresponding parts throughout the several views:

Fig. 1 is a view in perspective showing an embodiment of the invention.

Fig. 2 is an enlarged vertical sectional view as seen from the plane 2—2 on Fig. 1.

Fig. 3 is an enlarged fragmentary front elevational view of the left hand end of the device shown in Fig. 1.

Fig. 4 is a fragmentary elevational view partly in central section showing a means for removing the impaling elements.

Fig. 5 is an enlarged fragmentary view partly in section showing an alternate form of a lower end of an impaling element and its engagement with a base plate.

Fig. 6 is an enlarged fragmentary elevational view of a modified form of the upper end of an impaling element.

Fig. 7 is a fragmentary vertical sectional view of a modified form of clamping element.

In accordance with the invention the device, generally indicated by reference character 10, includes broadly first and second frame members 11 and 12 and a plurality of clamping and impaling elements, generally indicated by reference character 13. In Fig. 1 we have shown four of said last mentioned elements indicated by reference characters 14, 15, 16 and 17. As will become apparent from this disclosure, the number of elements 13 may be varied to suit the particular laying and cutting operation.

The first and second frame members are substantially identical in construction and include vertical edge engaging portions 18 and 19, and elongated top portions 22 and 23. The frame

members 11 and 12 are preferably formed from long bar stock of uniform cross section having front edges 66 and 67 and rear edges 68 and 69, respectively. The portion 18 is provided with working surface clamping means 30 including a threaded shaft 32 and a handle 37. The shaft 32 penetrates a threaded hole in the portion 18. The portion 19 is provided with a resilient friction member 31 which may be in the nature of a piece of rubber tubing stretched over the portion 19. Thus, when the frame members 11 and 12 are clamped together by the elements 14 and 15, the member 31 engages one edge (not shown) of the working surface 70 while the means 30 is screwed up against the other.

Since the clamping and impaling elements, generally indicated by reference character 13, are generally the same, a detailed description of one will suffice for all. The element 15 (see Fig. 2) includes a base plate 40, the forward upper surface of which tapers downwardly and outwardly at 41 to the forward edge 42. The rear portion of the base 40 is slotted to form the lower bifurcated rear guide 43. Projecting perpendicularly upwardly from the base 40 is a front vertical wall 71, and extending rearwardly therefrom is a top wall 72. The wall 72 at the rear end thereof is slotted to form the upper bifurcated rear guide 73, and disposed between the said upper and lower guides is the threaded post 33 which is fitted with a knurled nut 44. The threaded post may have a lower end 45 which may be pivotally connected with the base plate 40 in any suitable manner, as for example, by a pin 74 which penetrates the end 45 and is journaled in the opposed legs of the bifurcated guide 43. By this structure the threaded post 33 may be swung about the pin 74 in a counter clockwise direction as shown in Fig. 2 (after the knurled nut 44 has been loosened) so that a clear passage is afforded for the rearward movement and removal of the elongated top portions 22 and 23. When the knurled nut 44 is tightened, it compresses the portions 22 and 23 between the base 40 and the top wall 72 so as to frictionally prevent movement of the frame members 11 and 12 longitudinally with respect to each other and also fixes the particular clamping and impaling element thereon.

The forward portion 46 of the base 40 has detachably secured thereto the impaling member 50. The member 50 includes a pointed upper end 51 and a body 52. The body 52 at the lower end 75 thereof is provided with threads 76 which engage a correspondingly threaded orifice 77 in said base. The member 50 is substantially parallel with the retainer member 79 and projects generally upwardly from the forward portion 46.

For the purpose of avoiding repetition, the clamping and impaling element 14, as shown in Fig. 3 has parts corresponding to the element 15 given the same reference characters with the addition of "1" as a prefix. It will be noted in connection with the clamping and impaling element 14 (see the left hand end of Fig. 1) that this differs somewhat from the others in two principal respects. First, a spacer 78 is provided which takes the place of the portion 23 which is absent so that proper clamping pressure upon and positioning of the portion 22 engaged by the element 14 is obtained. The spacer 78 may be secured in place in any suitable manner, as by soldering, or may be integral with the top wall 172.

Returning to Fig. 2, the clamping and impaling element 15 is provided with an upstanding retainer member 79 which may take the form of a post having a roughened or serrated surface. We have found that such surface serrations have been economically obtained by forming threads in the outer surface of the member 79. The member 79 is maintained in a rigid position during operation by virtue of the fact that the front wall 71 is rigidly secured in place in a suitable manner as by the screw 80 and the rear portion of the top wall 72 is clamped in position by the nut 44 against the parts therebelow.

Each of the clamping and impaling elements 13 is provided with a plurality of support members, generally indicated by reference character 81, only two of which are shown in the drawings. The lower one 82 (see Fig. 1) includes a body 83 having an orifice 84 in the forward end thereof and an open ended arcuately arranged slot 85 in the rear end thereof. The slot 85 is so arranged that the forward edge 86 thereof is arcuate with respect to the axis of the impaling member 50 or the hole 84. The rear edge 87 is similarly arcuate with respect to the hole 84 at the outer portions thereof, but is provided with a notch 88. The upper support member 89 has a body 90 and is provided at the forward end thereof with an orifice 91 and at the rear end thereof with an orifice 92. The orifices 91 and 92 are elongated in a front to rear direction, and the portion 93 of the orifice 91 is disposed at a distance from the portion 94 of the orifice 92 a distance substantially equal to the distance between the forward surface of the impaling member 50 and the retainer member 279.

The clamping and impaling element 17 is generally similar to the others with the exception that it is provided with a spacer 378. For purposes of avoiding repetition, the elements 16 and 17 have some of the parts given the same reference characters as the prior described ones, with the additions of the prefixes "2" and "3," respectively.

The first frame member 11 is provided with a handle 9, while the second frame member 12 is provided with a handle 8. The handles 8 and 9, by manipulation, enable the frame members 11 and 12 to be shifted longitudinally with respect to each other when the knurled nuts 44, 144, 244 and 344 are loosened.

The upper end of the retainer member 179 has a central bore 95, the edges of which are slotted to form, together with the threaded collar 96, the latter having an internal upwardly tapering surface, a chuck. Adjustably positioned for longitudinal movement up and down within the bore 95 is a rod 97 on the upper end of which is secured the counting and cutting element 98. The element 98 includes a counter member 99 which may be of a well known type having actuating handle 100 and coacting cutting members 101 and 102 which are pivotally interconnected at 103. The member 101 has an extension 104 which overlies the handle 100 so that downward pressure upon the extension 104 will result in a downward movement of the handle 100, causing an advancement of the numbers in the counter 99 in the usual manner. As will more fully appear, the position of the element 98 may be vertically adjusted by actuation of the collar 96 and the rod 97.

In view of the fact that the members 50, may be unscrewed where higher or lower lays of cloth or other planar material are desired, different lengths and/or diameters may be substituted.

Operation

Operation of the present device is a simple and convenient matter. Preferably a pair of the devices 10 are used, one at each end of the cloth or planar material lay. Assuming that the device 10 of Fig. 1 is to be placed at the left portion of a cutting table 70, all of the nuts 44, 144, 244 and 344 are released and the portions 18 and 19 are separated, utilizing the handles 8 and 9 so that their lower edges may pass downwardly about the longitudinal edges of the table 70. Following this, the portions 18 and 19 are moved toward each other, again using the handles until the inner surfaces 20 and 21 engage the longitudinal edges of the table. In Fig. 3 the engagement of the inner surface of the shaft end portion against the table edge 63 is shown. Next, the elements 14, 15, 16 and 17 or a lesser or greater number of them are shifted along the frame members which they engage, preferably to such positions that the impaling members on the endmost elements 13 may engage the selvage or outer longitudinal edges of the material (not shown) with which the device is used. The inner impaling members are shifted so as to equally distribute the stress of the planar material. When the elements 14–17 are properly located, the knurled nuts corresponding to the nut 44 are all tightened. This fixes the position of the elements 14–17 inclusive as well as the effective length of the device 10. After this, the handle 37 may be manipulated so as to securely clamp the device 10 against longitudinal shifting with respect to the table 70. The frame members 11 and 12 are preferably substantially rigid so that because of the spacers 78 and 378 the lower surfaces of the elements 13 will contact the surface 65 of the table 70. In view of the fact that the forward surfaces 41 on the respective elements 13 taper downwardly and forwardly, the bottom layer of cloth or similar material may be brought very close to the actual top surface 65 of the table 60. As will be readily understood by those skilled in the art to which the present invention relates, another complete device substantially identical with the device 10 may be placed at the opposite end of the cutting table with the forward portions thereof facing the forward portions of the device 10 shown. With the parts so adjusted and established, long bolts of cloth or similar material in web form may be oscillated to and fro above the cutting table and at each reversing direction, the web of the cloth is placed between the cutting members 101 and 102, the extension 104 is depressed and this notches the cloth and raises the counter dial 105 one digit indicating the number of plies in the lay. After notching, as described, the cloth may be torn along a weft thread to produce uniform ends. Actuation of the chuck collar 96 permits adjustment in height of the element 98 to approximate the height of the lay or cloth pile. Each cloth end, as it is formed may be manually impaled upon the member 50 and other members corresponding thereto.

As the cloth pile increases in height, there is a tendency for it to pull the members 50, 150, 250 and 350 forwardly, which is because said members are relatively long and slender. As this bending of said members occurs or tends to occur, the support members 81 may be put in place. In the case of the member 82, it is slid downwardly so that its forward end lies on the cloth, and it is rotated (clockwise as viewed in Fig. 1) until the slot or notch 85 engages the post 279.

After more plies are put on the impaling members, other members 81 can be put in place. The upper support member 89, as slid downwardly, has a ratchet-like action on the post 279. This construction transmits the cloth lay pull load to the posts 79, 179, 279 and 379, the tension of said cloth plies holding the members 81 in place.

Cutting of the lay or ply pile may take place while it is still engaged by the members 50 and others alike, or the said members may be removed. This may be accomplished by disengaging their lower ends from the bases (like 40) and pushing the cloth, several layers at a time, down off them, or by releasing the nuts 44, swinging the posts 33 to their open position, loosening the handle 37 so that the frame elements 11 and 12 may be pulled clear away. Following this, the elements 50 may be pulled down and out of engagement with the lay of cloth. Either way, the cloth in laminated arrangement is restrained from shifting undesirably during the ensuing cutting or similar operations.

Turning now to the modified form in Figs. 4–7 inclusive, in Fig. 5, the lower end of an impaling member of modified form is shown (parts corresponding to the first embodiment are given the same reference characters with the suffix "*a*"). Here the lower end 75*a* of the body 52*a* of the member 50*a* has the threaded portion 76*a* reduced in section and has a taper 7*a*, the hole 77*a* being correspondingly formed. This assures a tight fit even when the threads become worn from frequent removal and replacement.

The pointed upper end 51*a* and a portion of the body 52*a* are provided with a flat land 6*a* upon which a wrench such as the wrench 5*a* may obtain purchase. This wrench has a chuck 4*a* with long slim tapering outer jaws so that said jaws may go down through the holes in the cloth (not shown) to make a good engagement with the impaling member. The wrench 5*a* thus not only assists in unscrewing the lower end of the body 52*a* from its seat but furnishes a handle by which the member 50*a* may be pulled up out through the impaled cloth.

In Fig. 7, some of the functions of the threaded post 33 and the retainer member 79 of the first embodiment, are combined. The retainer and clamping element 3*a* is a long threaded post having a handle 44*a* at its upper end, a retainer portion 79*a*, a fixed flange 2*a* and a threaded portion 33*a*. The lower end of the portion 33*a* engages a threaded hole in the rear of the base 40*a*, the flange 2*a* serving as a compression member upon the guide 73*a* while the rear ends of the support members 81 engage the portion 79*a* in a manner similar to that previously described.

We wish it to be understood that we do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

We claim:

1. A cloth or similar web spreading holder, for use with a table top, comprising: first and second frame members having elongated top portions; said members at the outer ends thereof, having means for engaging said table top; and a plurality of clamping and impaling elements engageable with at least one of said frame members and shiftable therealong.

2. A cloth or web spreading holder for use with a working surface having substantial thickness, comprising: first and second frame members having elongated top portions, said top portions being adapted to be placed in lapped position so that

the effective length of the device may be regulated; clamping and impaling means shiftably mounted on said frame members; and said means being adapted to clamp said frame members to each other in adjusted positions thereof and having an impaling member upwardly projecting therefrom.

3. Cloth spreading holder construction comprising: first and second frame members including elongated top portions, and substantially vertical portions at the outer ends of said top portions, said top portions being adjustably positioned with respect to each other; and means to interengage said frame members in a plurality of adjusted positions thereof and an impaling member connected to said last mentioned means.

4. A cloth spreading holder, comprising: first and second frame members having elongated edges, one of said frame members superposing the other so that said edges are alined; a plurality of clamping and impaling means, each having a portion engaging one of the edges on each of said frame members; and said means having an impaling member projecting upwardly therefrom upon which the cloth being spread may be hooked.

5. A cloth spreading holder comprising: a pair of frame members shiftable with respect to each other; a first clamping and impaling element adapted to fix said frame members with respect to each other and having a first impaling member; a second clamping and impaling element having a recess sufficient only to receive one of said frame members.

6. A cloth spreading holder for use with a web of material on a working surface having substantial thickness, comprising: first and second frame members; a plurality of clamping and impaling elements each including a base, upper and lower guides, an impaling member extending upwardly from said base, and adjustable means for moving said guides toward each other; said elements engaging longitudinal edges of said frame members; said adjustable means acting to prevent said frame members from shifting longitudinally with respect to each other.

7. In a cloth or similar web spreading holder having a frame member, a cloth securing element comprising: a base; an elongated impaling member projecting from said base; a retainer member projecting from said base and spaced from the said impaling member; and a support member detachably engageable upon said impaling member and said retainer member.

8. In a cloth or similar web spreading holder having a frame member, a cloth securing element comprising: a base, means to clamp the base on said frame member; an elongated impaling member projecting from said base; a retainer member projecting from said base and spaced from the said impaling member; and a support member detachably engageable upon said impaling member and said retainer member.

9. In a cloth or similar web spreading holder having a frame member, a cloth securing element comprising: a base; an elongated impaling member projecting from said base; an elongated retainer and clamping element projecting from said base and spaced from said impaling member; said last mentioned element including a retainer portion and clamping portion; said clamping portion acting to fix said base on said frame; and means to connect said impaling member and retainer portion.

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