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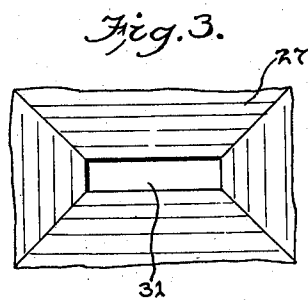
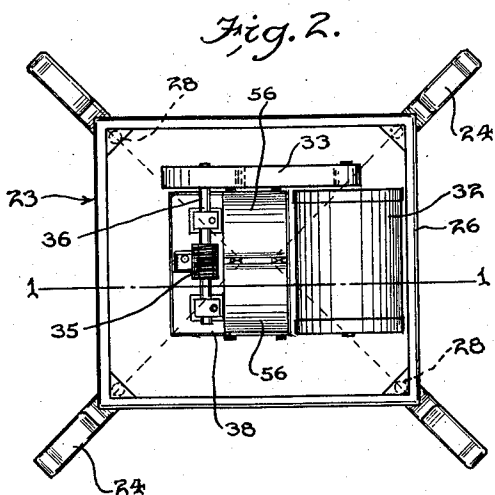
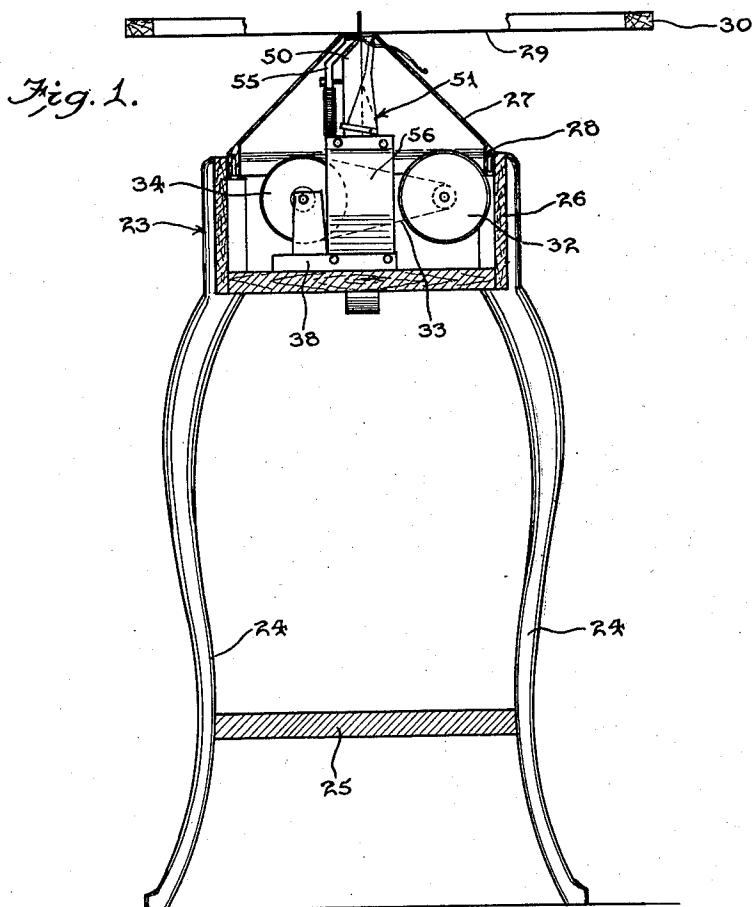
F. X. DOUBLER

1,960,100

ART STITCHER

Filed March 2, 1932

3 Sheets-Sheet 1



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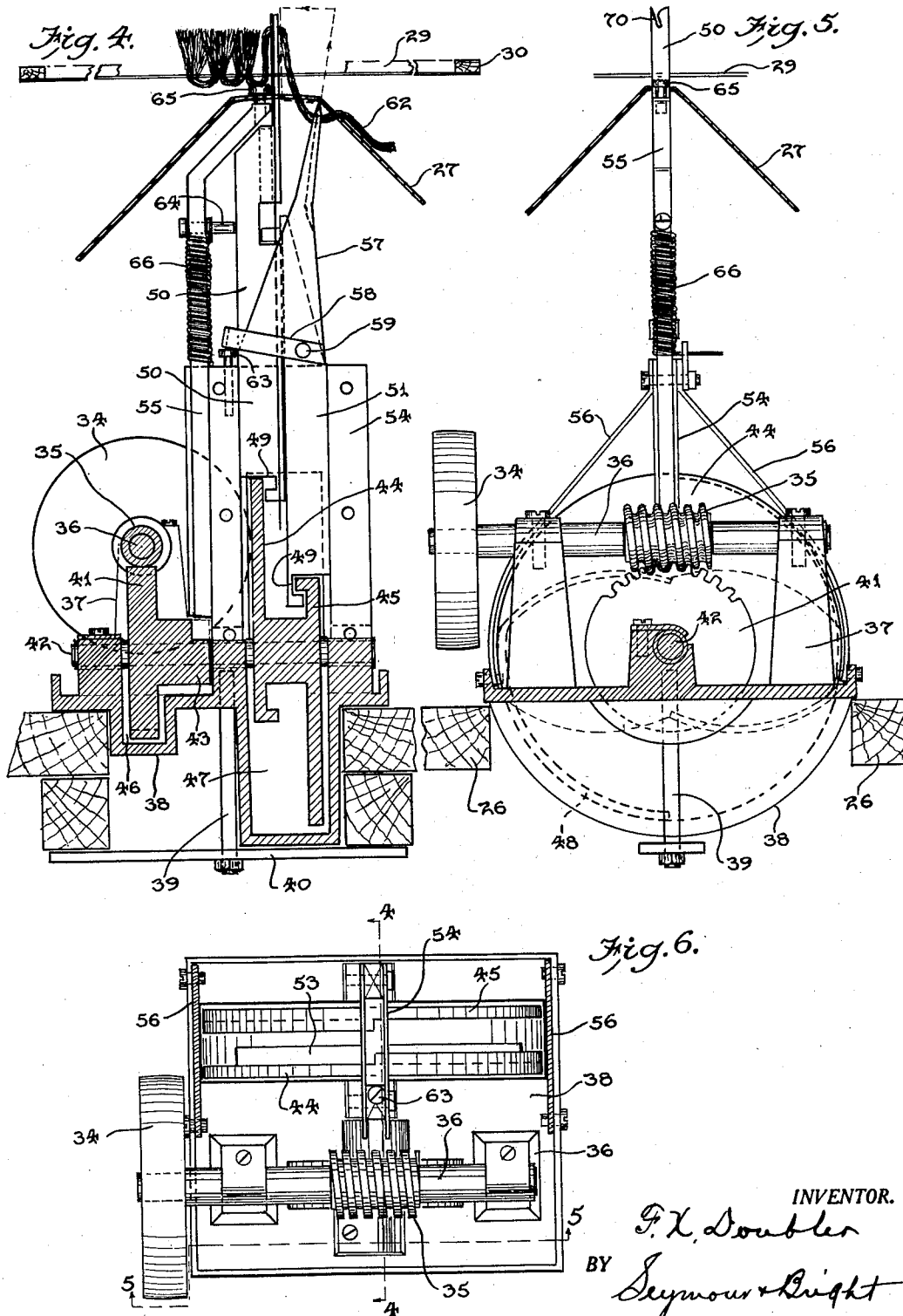
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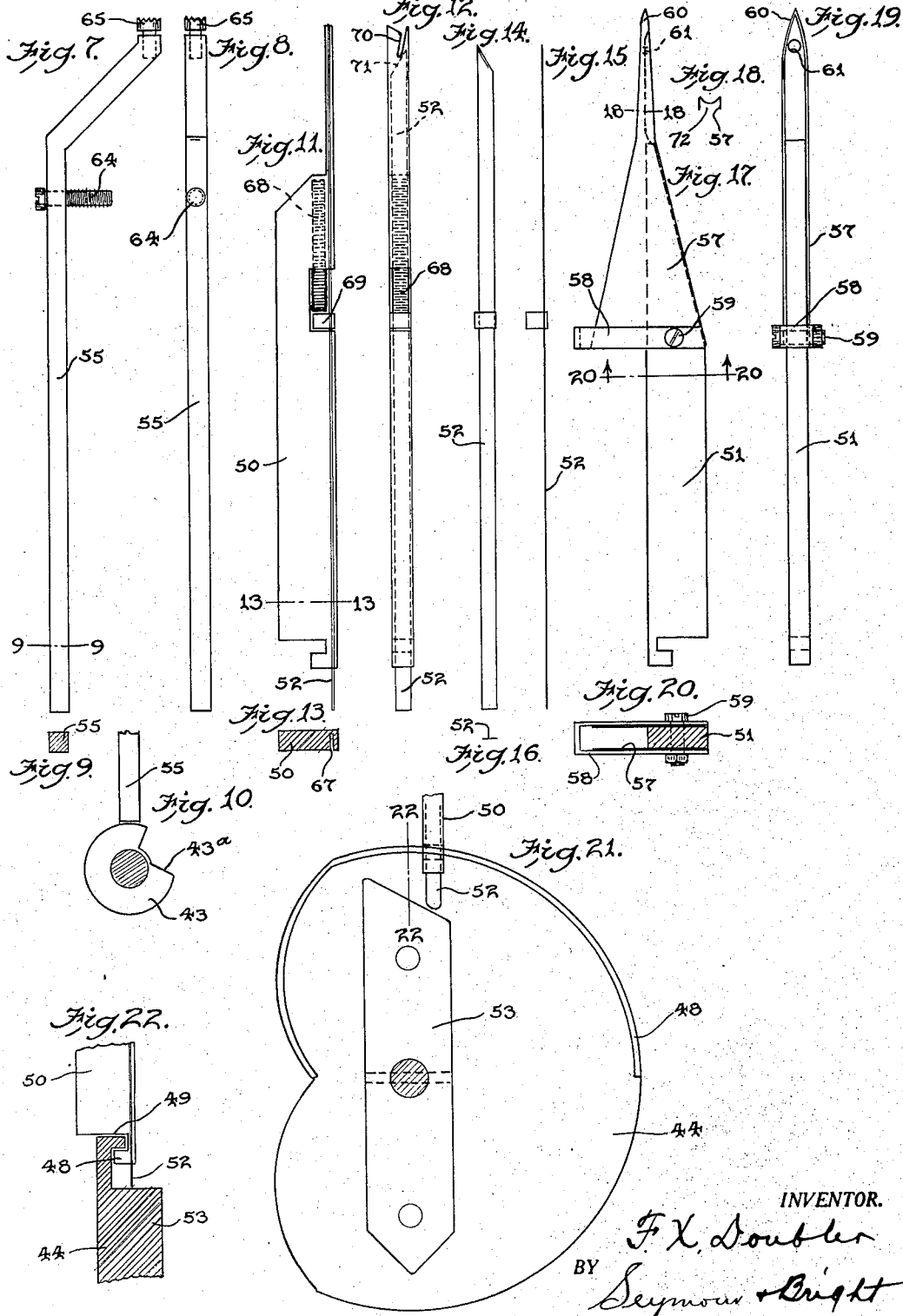
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ART STITCHER

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

1,960,100

ART STITCHER

Francis X. Doubler, Cleveland, Ohio

Application March 2, 1932, Serial No. 596,345

14 Claims. (Cl. 112—79)

This invention relates to improvements in art stitchers.

One of the objects of the invention is to provide an art stitcher designed to make hooked rugs and similar articles, or any article requiring loops or severed loops of any design or pattern upon a suitable base such as burlap. The material used for the loops may be rags, yarns, flosses, strips cut from discarded stockings, etc.

Another object is to provide a machine for this purpose with which the loops can be left intact or be clipped at will.

A further object is to supply an inexpensive machine of simple construction, and one which may be operated even by an unskilled operator for the production of pleasing designs on suitable textile fabric bases.

With the foregoing objects outlined and with other objects in view which will appear as the description proceeds, the invention consists in the novel features hereinafter described in detail, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

In the drawings,

Fig. 1 is a vertical sectional view of the machine, taken on the line 1—1 of Fig. 2.

Fig. 2 is a top plan view of the same with the hood removed.

Fig. 3 is an enlarged top plan view of the central portion of the hood and showing the slot through which the needle, knife and tension members operate.

Fig. 4 is an enlarged sectional view of the main operating parts of the machine, taken on the line 4—4 of Fig. 6.

Fig. 5 is a sectional view of the same taken on the line 5—5 of Fig. 6.

Fig. 6 is a top plan view of certain of these parts, with some of the other parts removed.

Figs. 7 and 8 are respectively a side elevation and an end elevation of the tension member of the mechanism.

Fig. 9 is a horizontal sectional view of the same on the line 9—9 of Fig. 7.

Fig. 10 is a detail view showing the manner in which a cam raises the tension member.

Figs. 11 and 12 are respectively, a side elevation, and end elevation of the knife needle of the apparatus.

Fig. 13 is a sectional view on the line 13—13 of Fig. 11.

Figs. 14, 15 and 16 are respectively, a side elevation, edge elevation, and end view of the knife.

Fig. 17 is a side elevation of the yarn needle.

Fig. 18 is a sectional view of the same on the line 18—18 of Fig. 17.

Fig. 19 is an edge elevation of the needle.

Fig. 20 is a horizontal sectional view of the needle, taken on the line 20—20 of Fig. 17.

Fig. 21 is a detail view showing how one of the cams actuates the knife needle as well as the knife of that needle.

Fig. 22 is a sectional view of a detail on the line 22—22 of Fig. 21.

Referring to the drawings, it will be noted that the improved art stitcher preferably consists of a small stand 23 supported by legs 24 which also support a shelf 25.

At the top of the stand, there is a casing 26 having a cover 27 of pyramidal shape, forming a hood which may be adjusted vertically by means of screws 28 for the purpose of adjusting the height to which the loops will be projected through the sheet 29 of burlap or the like, which is tautly secured to a rectangular frame 30 that may be manipulated by the operator.

As best shown in Fig. 3, the hood has a slot 31 in its top through which the tension member, knife needle and yarn needle operate in forming loops in the sheet 29.

Any suitable electric motor 32 is arranged in the casing, and the switch for this motor may be controlled by the foot of the operator while he is sitting in front of the machine.

By means of any suitable device, such as a belt 33, the motor drives a pulley 34 which in turn actuates a worm 35 on a shaft 36 that is mounted in suitable bearings on posts 37, preferably forming integral parts of a metal base 38 that is secured to the bottom of the casing by any suitable means such as bolts 39 and strips 40.

A worm gear 41 is mounted on a shaft 42 and driven by the worm, and this shaft carries a tension member operating cam 43, a knife needle operating cam 44, and the main needle operating cam 45.

For lubricating purposes, the base is shaped to form oil wells 46 and 47, into which the worm gear and cams 44 and 45 project.

The general outline of each of the cams 44 and 45 is shown in Fig. 21, and it will be noted that each of these cams has a flange 48 extending throughout half of its circumference and designed to hook into a recess 49 arranged respectively in the lower ends of the knife needle 50 and yarn needle 51.

As part of the knife needle, there is a knife 52 shown in detail in Figs. 14 and 15, and it will be noted from Fig. 21 that the cam 44 has fixed

thereto an auxiliary cam 53 which functions to raise the knife 52 in the needle 50 as the cam 53 rotates.

Guide means 54 for guiding the lower ends of the tension member 55 and the needles 50, 51, is mounted on the base 38 and may be braced by straps 56, as shown in Fig. 5.

From Figs. 4, 17, 18, 19 and 20, it will be noted that the yarn needle 51 is provided with a wedge-shaped head 57 having fixed to its lower end a yoke 58 which is pivotally connected at 59 to the body of the needle. This construction permits the head of the needle to rock.

The needle head has a pointed end 60 to pierce the fabric 29, and it also has a hole 61 through which the yarn 62 passes.

From Fig. 4 it will be noted that as the needle 51 descends, the yoke 58 comes in contact with an adjustable screw 63 mounted on the guide 54, and this causes the cap 57 to move in one direction on the pivot 59. The cap is moved in the opposite direction by means of an abutment 64 which is mounted on the reciprocating tension member 55, and can engage the yoke 58.

The tension member 55 has a head 65 designed to engage the yarn and to hold it against the sheet 29 while the needles are performing some of their functions.

A spring 66 on the tension member functions to pull that member down, while the cam 43 acts to raise it once during each revolution of the shaft 42.

As best shown in Figs. 4, 11, 12 and 13, the knife needle 50 is provided with a groove 67 functioning as a guide for the knife 52, and arranged in the upper portion of this needle is a coil spring 68 which coacts with an abutment 69 on the knife to normally press the knife downwardly.

It will be noted that the top of the needle 50 is provided with a slot 70 for the yarn, and that the cutting edge 71 of the knife can move up into this slotted portion of the needle 50 for the purpose of severing the yarn.

Obviously, if the knife 52 is not used, the loops formed by the machine will not be clipped.

It will be seen from the drawings that the body portion of the knife needle 50 slides within the yoke 58 of the main needle, and it will be noted that when the main needle head 57 is in the position shown in Fig. 17, the head portion of the knife needle slides upwardly in a channel 72 (Fig. 18) in one side of the needle cap so that the upper end of the knife needle can pass through a hole in the fabric 29 after such hole has been made by the point 60 of the main needle.

In operation, the operator occupies a chair in front of the machine and the top of the latter is just above the operator's knees to allow free movement of the sheet to be stitched. The sheet bearing the design or pattern to be worked is stretched on the frame and rests on top of the hood 27. When the operator presses the foot operated switch (not shown), controlling the motor, the threaded yarn needle 51 passes up through the sheet, bringing with it the yarn, and when the yarn needle has reached its highest position the knife 52 rises, due to its cam 53, severing the yarn 62, held in the slot 70. Now the knife needle 50 moves down, and when it has reached its lowest position within the hood 27, the tension member 55 moves down, and pin 64 comes in contact with yoke 58, causing the yarn needle to pull sheet 29 forward, and placing 57 in the position shown in Fig. 17. Immediately afterwards, the knife needle 50 is moved upwardly

alongside the thread needle so as to catch the loop in the yarn above the sheet 29 in the notch 70. At this time, the yarn needle 51 is drawn down by its cam until the point 60 is below the sheet, and as the yarn needle descends, its yoke 58 comes into engagement with the screw 63 so that the pivoted portion of the needle is swung forward, the length of a stitch, prior to the time when the yarn needle is again raised to make a new stitch.

During the time the yarn needle is going downwardly, its pivoted end moving forwardly and then up through the burlap sheet, the knife needle and the tension member 65 holds the previously formed loop from slipping back. After the yarn needle has been moved to its highest point, the cam 53 comes into engagement with the lower end of the knife 52 and causes the edge 71 of the knife to rise and sever the portion of the yarn which extends through the slot 70. Instantly, after the yarn is cut, the lower end of the knife disengages the cam 53, and the spring 68 returns the knife to its lower position, and at the same time, the cam 44 lowers the knife needle 50. When the last mentioned needle reaches its lowest point, which brings its top within the hood 27, the tension member 55 drops under the influence of the spring 66, due to the notch 43a (Fig. 10) in its cam. As the member 55 moves downwardly, its pin 64 will abut against the yoke 58, and at such time, rock the pivoted portion 57 of the yarn needle in a counter-clockwise direction. At such time, the point of the yarn needle has penetrated the sheet 29 and reached its highest position and the knife needle is below said sheet, and as a result of the rocking movement about the pivot 59, the sheet 29 will be shifted forwardly one stitch, or until the yarn needle pivoted portion is above the knife needle 50. Therefore, when the knife needle is again raised, it will move upwardly along the channel 72 of the yarn needle, and at such time, the pivoted portion of the yarn needle is prevented from rocking in a clockwise direction due to the engagement of the abutment 64 with the yoke 58. The yarn needle is held in this position until the knife needle is half way up, or well through the sheet. The locking of the pivoted member by the abutment 64 is essential in order that the knife needle may rise through the same hole made by the yarn needle and inside the loop formed by the yarn needle.

Afterwards, the tension member quickly rises and holds the yarn from slipping back before the knife needle reaches the top of its stroke. It is necessary to have a slight pressure on the sheet at all times, and it has been found that the weight of the frame 30 and of the sheet, supply this pressure.

The construction is such that the tension member remains in its upper or effective position during all the time the yarn needle is in motion, except while the yarn needle is moving the burlap forward. At that time, the tension member drops into the notch 43a of its cam, and in dropping, the abutment 64 rocks the yarn needle to form a new stitch. The tension member has three functions. It prevents the yarn from slipping back, while the yarn needle is in motion. Its abutment 64 acts to cause the burlap to move forwardly. Furthermore, the abutment locks the pivoted portion of the yarn needle in place directly above the knife needle, until the latter is half way on its upward stroke.

The stitches may be made longer or shorter by adjusting the length of the stitch screw 63 up or down.

The height of the loops can be regulated by raising or lowering the hood by means of the screws 28.

For the foregoing it is believed that the construction, operation and advantages of the invention may be readily understood, and it is apparent that changes may be made in the details disclosed, without departing from the spirit of the invention, as expressed in the claims.

What is claimed and desired to be secured by Letters Patent is:

1. An art stitcher including a yarn needle having a pivoted thread carrying portion, a knife needle, a tension member, said knife needle having a thread receiving slot at its end, means for reciprocating said needles and tension member in substantially parallel paths, and means for rocking the pivoted portion of the yarn needle during reciprocation of the yarn needle.

2. An art stitcher including a yarn needle having a pivoted thread carrying portion, a knife needle, a tension member, said knife needle having a thread receiving slot at its end, means for reciprocating said needles and tension member in substantially parallel paths, and means for rocking the pivoted portion of the yarn needle during reciprocation of the yarn needle, the last mentioned means including a fixed support, and an adjustable element on said support engageable with the pivoted portion of the yarn needle.

3. An art stitcher including a yarn needle having a pivoted thread carrying portion, a knife needle, a tension member, said knife needle having a thread receiving slot at its end, means for reciprocating said needles and tension member in substantially parallel paths, and means for rocking the pivoted portion of the yarn needle during reciprocation of the yarn needle, the last mentioned means including an abutment carried by the tension member and engageable with the pivoted portion of the yarn needle.

4. An art stitcher including a yarn needle having a pivoted thread carrying portion, a knife needle, a tension member, said knife needle having a thread receiving slot at its end, means for reciprocating said needles and tension member in substantially parallel paths, and means for rocking the pivoted portion of the yarn needle during reciprocation of the yarn needle, the last mentioned means including an abutment carried by the tension member and engageable with the pivoted portion of the yarn needle, said abutment functioning to hold the pivoted portion of the yarn needle in parallelism with the knife needle during a portion of the upward stroke of the latter.

5. An art stitcher including a yarn needle having a pivoted thread carrying portion, a knife needle, a tension member, said knife needle having a thread receiving slot at its end, means for reciprocating said needles and tension member in substantially parallel paths, means for rocking the pivoted portion of the yarn needle during reciprocation of the yarn needle, a knife carried by the knife needle and arranged to sever the yarn while it occupies the slot of the knife needle, and means for actuating said knife while the knife needle is in a projected position.

6. An art stitcher including a yarn needle having a pivoted thread carrying portion, a knife needle, a tension member, said knife needle having a thread receiving slot at its end, means for reciprocating said needles and tension member in substantially parallel paths, and means for rocking the pivoted portion of the yarn needle

during reciprocation of the yarn needle, the means for reciprocating the yarn needle including a rotatable cam.

7. An art stitcher including a yarn needle having a pivoted thread carrying portion, a knife needle, a tension member, said knife needle having a thread receiving slot at its end, means for reciprocating said needles and tension member in substantially parallel paths, and means for rocking the pivoted portion of the yarn needle during reciprocation of the yarn needle, the means for reciprocating the knife needle including a rotatable cam.

8. An art stitcher including a yarn needle having a pivoted thread carrying portion, a knife needle, a tension member, said knife needle having a thread receiving slot at its end, means for reciprocating said needles and tension member in substantially parallel paths, and means for rocking the pivoted portion of the yarn needle during reciprocation of the yarn needle, the means for reciprocating the tension member including a rotatable cam.

9. An art stitcher including a yarn needle having a pivoted thread carrying portion, a knife needle, a tension member, said knife needle having a thread receiving slot at its end, means for reciprocating said needles and tension member in substantially parallel paths, and means for rocking the pivoted portion of the yarn needle during reciprocation of the yarn needle, the means for reciprocating the needles and tension member comprising cams rotating in unison.

10. An art stitcher including a yarn needle having a pivoted thread carrying portion, a knife needle, a tension member, said knife needle having a thread receiving slot at its end, means for reciprocating said needles and tension member in substantially parallel paths, means for rocking the pivoted portion of the yarn needle during reciprocation of the yarn needle, and a hood for said parts having a slot through which the upper ends of the needles and tension member reciprocate.

11. An art stitcher including a yarn needle having a pivoted thread carrying portion, a knife needle, a tension member, said knife needle having a thread receiving slot at its end, means for reciprocating said needles and tension member in substantially parallel paths, means for rocking the pivoted portion of the yarn needle during reciprocation of the yarn needle, a hood enclosing said parts and having a slot through which the upper ends of the needles and tension member reciprocate, said hood forming a support on which the sheet to be operated upon rests, and means for adjusting the height of the hood relatively to the needles and tension member for regulating the height of the loops of yarn placed in the fabric by the needles.

12. An art stitcher comprising a pyramidal hood over which a frame carrying a stretched fabric sheet may be supported, said hood having a slot in its peak, means arranged below the hood and operable through the slot for looping yarn on the fabric sheet and for feeding said sheet relatively to the hood, and holding means cooperating with the sheet for holding the loops and preventing withdrawal of the loops.

13. An art stitcher including a hood above which a taut fabric sheet can be supported, said hood having an opening at its top, a yarn needle movable through said opening and having a pivoted thread carrying portion adapted to penetrate the sheet and to feed the latter, a knife

needle also movable through said opening, a tension member movable in the opening, said knife needle having a thread receiving slot at its upper end, means for reciprocating said needles and
 5 tension member upwardly and downwardly, and means for rocking the pivoted portion of the yarn needle during reciprocation of that needle.

14. In a machine of the character described, a needle having a base portion and a pivoted top
 10 provided with a fabric penetrating point and a yarn aperture, means for rocking said pivoted part while the needle base reciprocates in a rec-

tilinear path for feeding the fabric operated upon forwardly as each stitch is made, one side of said pivoted part having a channel extending along the tip portion thereof, a reciprocating knife
 80 needle cooperating with the yarn needle and having a portion slidable in said channel while the yarn needle is in raised position, said knife needle having a yarn engaging slot and its upper end cooperating with the yarn needle to form loops
 85 upon a fabric, and means for reciprocating the needle base in a rectilinear path.

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