March 15, 1960 B. SALTZ ET AL 2,928,363

PORTABLE HAND OPERATED SEWING DEVICE

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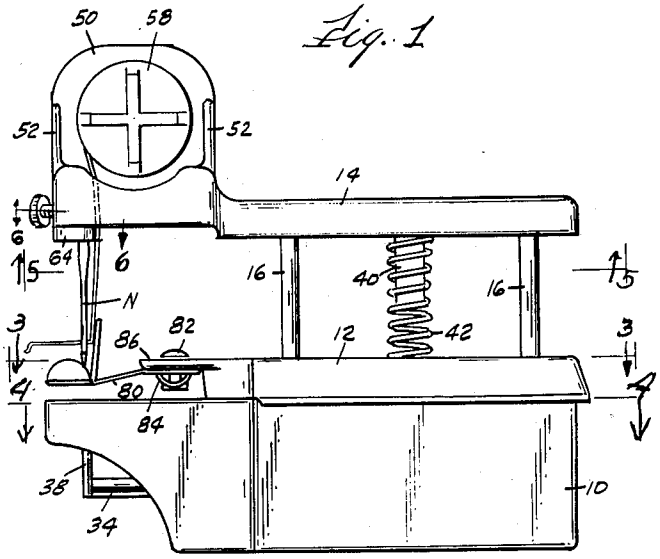


Fig. 1

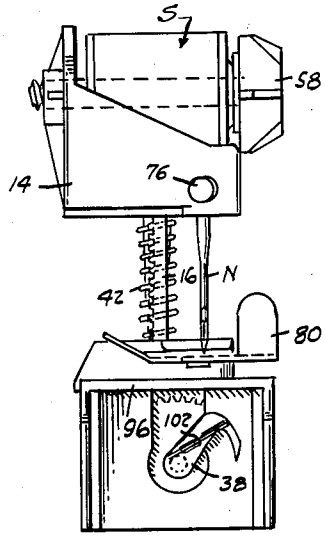


Fig. 2

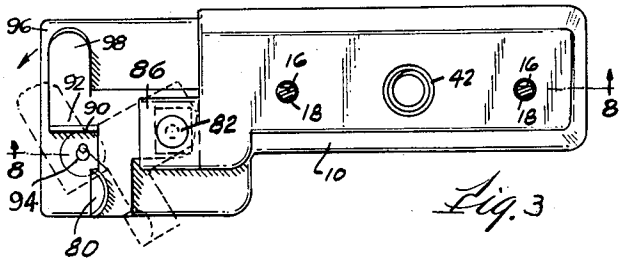


Fig. 3

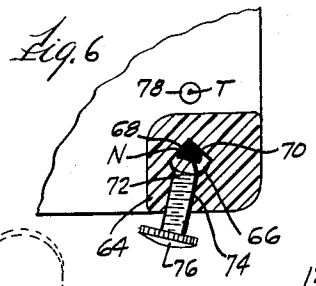


Fig. 6

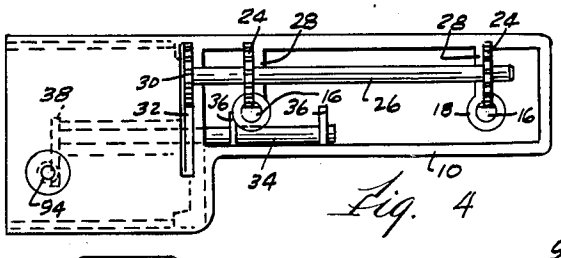


Fig. 4

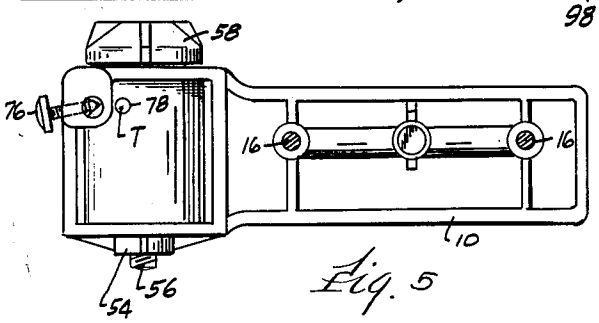


Fig. 5

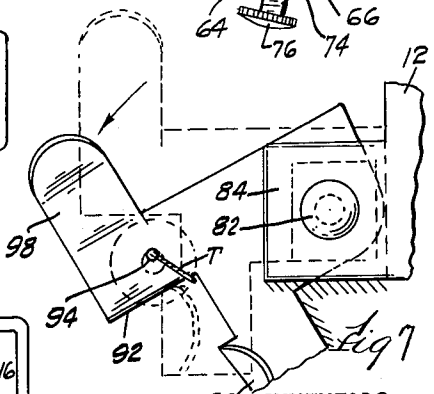


Fig 7

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Fig. 8.

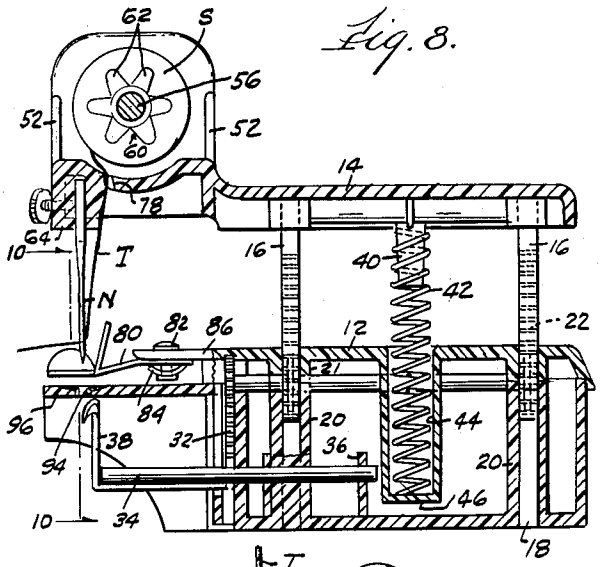


Fig 9

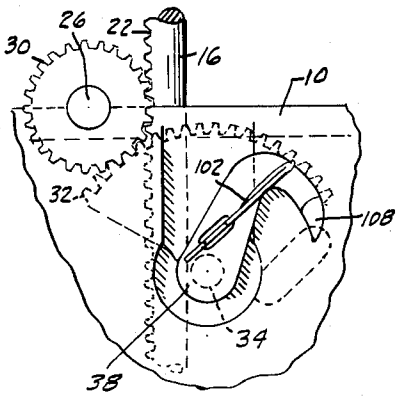


Fig 11

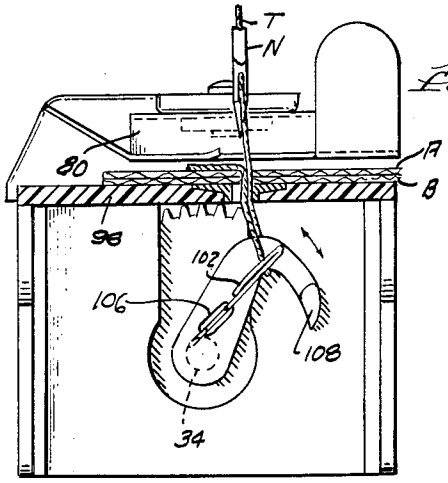
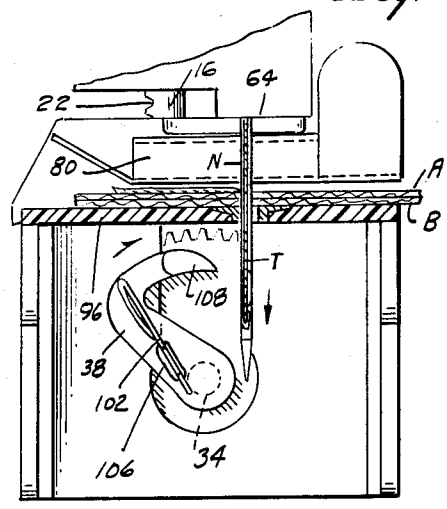


Fig. 10



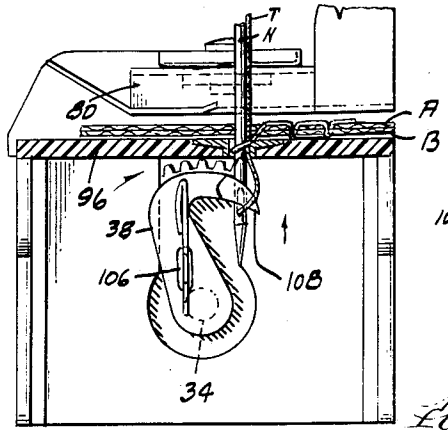


Fig. 12

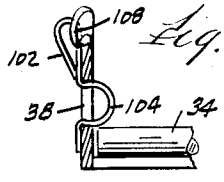


Fig. 13

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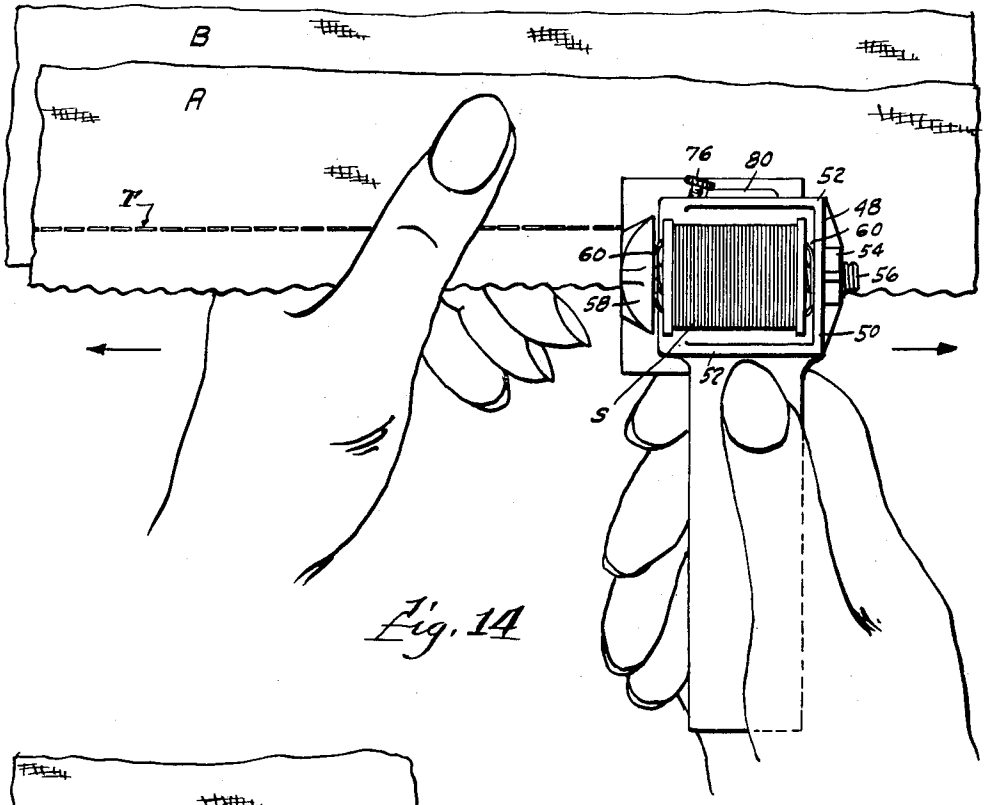


Fig. 14

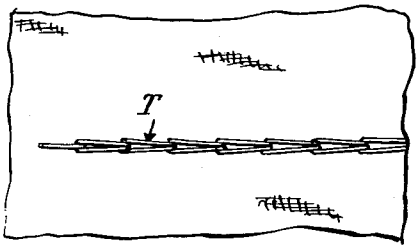


Fig 15.

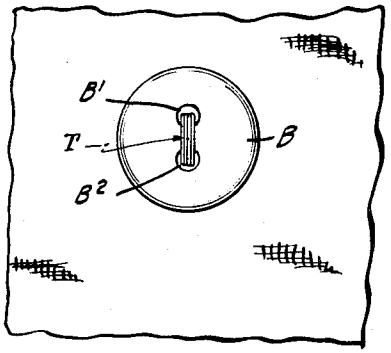


Fig. 16.

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United States Patent Office 2,928,363 Patented Mar. 15, 1960

2,928,363

PORTABLE HAND OPERATED SEWING DEVICE

Bernard Saltz and John H. Campbell, Chicago, Ill.; said Campbell assignor to said Saltz

Application February 7, 1958, Serial No. 714,462

7 Claims. (Cl. 112—169)

This application is a continuation in part of my copending application Serial No. 536,721, filed September 26, 1955, now abandoned.

Our invention relates to improvements in portable hand operated sewing devices.

Our invention relates more particularly to a hand operated sewing device that is comparatively small and compact as compared to devices of this type which are now in use, yet one which is so constructed that it can be used by unskilled persons for a large variety of sewing uses and will perform efficiently.

The principal object of the present invention is to provide an improved hand operated sewing device that has a novel thread tensioning means associated with the spool holder of the same.

A further object is to provide in a hand operated sewing device of the type described a novel needle socket and screw grip for the operating needle of the same.

Another object of the invention is to provide a hand operated sewing device of the type described having novel spring wire means for holding the thread for tying the same after a sewing operation.

A further object of the invention is to provide a hand operated sewing device of the type described having a novel thread cutter and work-holding means associated therewith.

Another object is to provide a portable sewing device having a body portion including a platform for the support of fabrics to be sewn and a treadle top normally spaced from said body, said top supporting a spool of thread and a sewing needle and capable of manual reciprocation by the normal action of opening and closing the operator's hand to effect a stitching operation.

Another object is to provide an improved hand operated sewing device of the class described which has the rack and gear construction for effecting a stitching operation and spring means for normally returning the moving parts to an open or inoperative position.

A further object is to provide an improved hand operated sewing device of the type described that is constructed of comparatively few parts that may be easily assembled to provide a device that is easily operated and one which may be used for a long period of time without becoming broken or out of order.

Other objects and advantages will be more apparent from the following description wherein reference is had to the accompanying drawings, upon which:

Fig. 1 is a side elevational view of one embodiment of our invention;

Fig. 2 is an end view of the same;

Fig. 3 is a plan sectional view thereof taken on the line 3—3 of Fig. 1;

Fig. 4 is a plan sectional view thereof taken generally on the line 4—4 of Fig. 1;

Fig. 5 is a cross-sectional view looking upwardly and is taken on the line 5—5 of Fig. 1;

Fig. 6 is an enlarged fragmentary sectional view taken generally on the line 6—6 of Fig. 1, showing the needle grip construction;

Fig. 7 is an enlarged fragmentary plan view showing the support for the thread cutter and also the thread cutter, the thread cutter being shown in normal position in dotted lines and in a cutting position in full lines;

Fig. 8 is a vertical longitudinal sectional view through the device taken generally on the line 8—8 of Fig. 3;

Fig. 9 is a fragmentary sectional view showing the rack and pinion drive for the knotter hook;

Fig. 10 is a fragmentary cross-sectional view taken on the line 10—10 of Fig. 8, showing the needle piercing several layers of fabric and at the bottom end of its stroke;

Fig. 11 is a similar cross-sectional view showing a changed position where the needle is being withdrawn for the second stitching stroke;

Fig. 12 is a similar sectional view showing a further changed position after several stitches have been made through the layers of fabric;

Fig. 13 is a sectional view of the hook and thread retaining spring;

Fig. 14 is a fragmentary plan view showing how the device is used for sewing two pieces of fabric together, the view illustrating how the left hand is used for pulling the sewed fabrics to the left while the device is held stationary and reciprocates in a sewing operation;

Fig. 15 is an enlarged fragmentary bottom plan view showing the finish of a row of stitching through pieces of fabric, the view being twice the size of the stitches shown in Fig. 14; and

Fig. 16 is a plan view of a fragment of material showing how a button is sewn to the same.

In the embodiment of the invention which we have chosen to illustrate and describe the same, the construction may generally include a sewing machine body **10**, a cover plate **12** positioned over a portion of the same and a reciprocating treadle top **14** that has a pair of depending guide rods **16** which engage in openings **18** in bosses **20** that are formed integral with the base **10** and are vertically positioned therein. The rods also pass through aligned openings in bosses **21** in the bottom of the cover plate **12**.

Each of the rods **16** is also formed with rack teeth **22** on one face of the same. These rack teeth engage a pair of gears **24** mounted upon a shaft **26** that is journaled in sockets in a pair of vertical walls **28** formed in the base **10**. A third gear **30** is fastened to one end of the shaft **26** and engages a segmental gear **32** that is mounted on a shaft **34** journaled in suitable bearings **36** in the base **10** and carries the thread hook **38** at its end The treadle top **14** may also have a downwardly projecting post **40** centrally disposed between the two rods **16** to receive a coiled compression spring **42** that has its opposite end nested in a well **44** formed in a tubular member **46** formed integral with the cover plate **12**.

The treadle top **14** may have a spool support **48** formed integral therewith consisting of a vertical end wall **50** and sloping side walls **52**. The end wall **50** may be formed with a boss **54** that has a tapped opening to receive a threaded stem **56** upon which the spool of thread S may be mounted. The stem **56** has an enlarged knob **58** at one end, and in assembling the spool of thread on the stem, a light spring washer **60** is provided at both ends of the same so that when the stem is advanced by threading the same in the tapped opening in the bearing **54**, the spring fingers **62** of the washer **60** will flex and frictionally deter the rotation of the spool during a sewing operation. The resistance provided will depend upon how tightly the spool is fastened in the holder.

The treadle top 14 may also have a downwardly projecting boss 64 formed integral therewith and provided with a sector shaped opening 66 having a pair of angularly disposed meeting walls 68 and 70 in which the head of the sewing needle N is positioned. The needles N are normally provided with a flattened surface 72 on one side of the same, and to securely hold the needle in position against a corner of the angularly disposed walls of the opening, we provide a tapped opening 74 to receive a knurled head screw 76 that locks the head of the needle in the angular position shown in Fig. 6 in the needle receiving opening 66.

An opening 78 is made in the floor of the treadle top 14 through which the thread T may pass from the spool S and down through the eye of the needle N. A combined foot arm and thread cutter unit 80 is fastened by means of a rivet 82 and tension spring 84 below an outstanding ledge 86, the ledge 86 extending forward from the top 12. The foot arm 80 has an upstanding ledge 88 for operation by a finger to rotate the same about the pivot 82 as shown in dotted lines in Fig. 3 in a thread cutting operation. The edge 90 of the shoulder 92 is bevelled and sharpened so that as the foot arm is swung around it will cut the thread, the thread being directly in its path passing downwardly through the thread opening 94 in the ledge 96 of the base 10. The foot arm also has a laterally extending hold-down plate portion 98 which assists in holding the material that is being sewn in place.

In Fig. 2 the hook 38 is shown at rest position prior to the commencement of a sewing operation, and it will be noticed that a thread retaining spring 102 is fastened to the front side of the hook, the thread retaining spring being held in the position shown by a semi-cylindrical bulge 104 in the spring that rests and locks the spring in an elongated opening 106 in the side of the hook 38. It will further be noticed that the point 108 of the hook 38 is turned forward from the body of the same, see Fig. 13.

The operation of the device will now be described: Assuming that two pieces of fabric A and B have been placed under the foot arm 80 and they are about to be sewn together, the device now is held steadily in the right hand as shown in Fig. 14, the left hand being used to pull the sewn together pieces of fabric to the left through the machine. The length of the stitches will be determined by the tension of the spring washers 60 on the spool S, and this tension is set by turning the knob 58 as previously described.

In the sewing operation the needle descends through the opening 94 in the ledge 96 of the base 10 to the position shown in Fig. 10. While this is taking place the racks 22 are rotating the two gears 24 and shaft 26, also rotating the gear 30 which meshes with the segmental gear 32 that is mounted on shaft 34. This moves the hook 38 in a counter-clockwise direction from the position shown in Fig. 9 to the position shown in Fig. 10. When thumb pressure on the treadle top is now released, the gears will swing the hook member 38 clockwise as shown in Fig. 11, and during this action the needle will be raised, permitting the end 108 of the hook 38 to catch the thread T and loop it over the forwardly extending portion of the arm 38 to catch the same behind the thread retaining spring 102 as shown in Fig. 11.

On the next depression of the treadle top 14, the hook will again come down and repeat the sequence of operations just described, during which the thread is pulled through the previously formed loop and as the fabric is pulled to the left as shown in Fig. 14 the stitch is formed. Fig. 15 shows the bottom of the stitching and Fig. 14 shows the top of the same.

In Fig. 16 we have shown a button B which can be sewn on material in the following manner: First lower the needle N into the first hole B^1 of the button B, press the treadle top all the way down, then release all the way up; now move the button B so that the needle is over the lower hole B^2, move the needle down through the hole B^2. In this manner, stitch from top to bottom and repeat until the button is securely sewed on. The stitch is locked both in sewing on buttons and in normal sewing by means of the novel foot arm which is swung around to cut off the thread against the sharpened edge 90, whereby the thread is automatically cut off and the stitch is locked.

From the above and foregoing description it can be seen that we have provided a highly improved yet comparatively simple portable hand operated sewing machine which can be carried about in purses or other small receptacles such as are used when traveling. Due to the simplicity of construction it can be seen that this device can be economically and cheaply manufactured so that individuals in a household may each have their own personal hand sewing machine at all times available.

We contemplate that changes and modifications may be made in the exact details shown and we do not wish to be limited in any particular; rather what we desire to secure and protect by Letters Patent of the United States is:

1. In a hand operated sewing machine having a top and a base mounted in mutually reciprocal relation, the base having a thread grasping hook and retaining member, and the top carrying a spool of thread and a needle fixed at the forward portion thereof; the combination comprising, a flat sewing ledge on said base having an opening to receive the needle carried fixedly by the top, a foot arm, means on said base pivotally securing the foot arm thereto, said foot arm having a fabric hold down portion, thread cutting means on said foot arm, and a finger tab on said foot arm for swinging said foot arm about its pivot whereby the thread may be tensioned, locked, and cut in a single operation.

2. In a hand operated sewing machine having a top and a base mounted in mutually reciprocal relation, the base having a thread grasping hook and retaining member, and the top carrying a spool of thread and a needle; the combination comprising, a flat sewing ledge on said base having an opening to receive the needle carried by the top, a foot arm, means on said base pivotally securing the foot arm thereto, said foot arm having a fabric hold down portion extending laterally therefrom, thread cutting means on said foot arm, and a finger tab on said foot arm extending in laterally opposed relation to the fabric hold down portion for swinging said foot arm about its pivot whereby the thread may be tensioned, locked, and cut in a single operation.

3. In a hand operated sewing machine having a top and a base mounted in mutually reciprocal relation, the base having a thread grasping hook and retaining member, and the top carrying a spool of thread and a needle; the combination comprising, a flat sewing ledge on said base having an opening to receive the needle carried by the top, a foot arm, means on said base pivotally securing the foot arm thereto, said foot arm having a fabric hold down portion extending laterally therefrom and defining a corner therewith, thread cutting means on said foot arm, and a finger tab on said foot arm for swinging said foot arm about its pivot, the finger tab extending in laterally opposed relation to the fabric hold down portion and defining a corner therewith, the said corners being oriented along an axis parallel to and adjacent the line of stitching when the foot arm hold down portion is pivoted to the fabric stitching position.

4. A hand operated chain stitch sewing machine adapted to be held in one hand of the operator while the fabrics to be sewn together are being pulled through the machine with the other hand, which comprises a base having a fabric-supporting ledge, a top above said base, means between said base and said top for mounting the same in a mutually reciprocal relationship, a spool of thread and a needle fixedly secured to said top at the for-

ward portion thereof, said base ledge having a needle opening through which said needle descends, a thread hook mounted beneath said base ledge opening for partial reciprocal rotation in said base, said thread hook being driven in timed relation and by the mutual reciprocation of the base and top so that the thread hook enters the loop formed when the thread is inserted through the fabric by the needle, a thread retaining spring secured to and yieldably engaging said hook, and operating means between said top and said hook for swinging said hook and thread retaining spring in an arcuate movement to catch the thread when the needle withdraws from the fabric and holds it to receive the next loop of thread when the needle re-enters the fabric to form chain stitches through the fabric, the hook and spring being oriented with relation to the needle so that only the hook enters the loop, one portion of the loop being retained by the spring where the latter yieldably engages the hook.

5. A hand operated chain stitch sewing machine adapted to be held in one hand of the operator while the fabrics to be sewn together are being pulled through the machine with the other hand, which comprises a base having a fabric-supporting ledge, a top above said base, means between said base and said top for mounting the same in a mutually reciprocal relationship, a spool of thread and a needle fixedly secured to said top at the forward portion thereof, said base ledge having a needle opening through which said needle descends, a thread hook mounted beneath said base ledge opening for partial reciprocal rotation in said base, said thread hook having an elongate opening therein, a thread retaining spring having two loops substantially at right angles to each other, one of said loops being yieldably engaged within the hook elongate opening, the other loop being alined along the hook, and drive means for imparting a partial reciprocating motion to the thread hook responsive to a mutual reciprocation of the top and base whereby the thread hook, needle, and thread retaining spring cooperate in chain stitch relationship.

6. A hand operated chain stitch sewing machine adapted to be held in one hand of the operator while the fabrics to be sewn together are being pulled through the machine with the other hand, which comprises a base having a fabric-supporting ledge, a top above said base, means between said base and said top for mounting the same in a mutually reciprocal relationship, a spool of thread and a needle fixedly secured to said top at the forward portion thereof, said base ledge having a needle opening through which said needle descends, a thread hook mounted beneath said base ledge opening for partial reciprocal rotation in said base, said thread hook

being driven in timed relation and by the mutual reciprocation of the base and top, a thread retaining spring secured to and yieldably engaging said hook, operating means between said top and said hook for swinging said hook and thread retaining spring in an arcuate movement to catch the thread when the needle withdraws from the fabric and holds it to receive the next loop of thread when the needle reenters the fabric to form chain stitches through the fabric, the hook and spring being oriented with relation to the needle so that only the hook enters the loop, one portion of the loop being retained by the spring where the latter yieldably engages the hook.

7. A hand operated chain stitch sewing machine adapted to be held in one hand of the operator while the fabrics to be sewn together are being pulled through the machine with the other hand, which comprises, a base having a fabric-supporting ledge, a top above said base, mounting means between said base and said top for mounting the same in a mutually reciprocal relationship, a spool of thread and a needle fixedly secured to said top at the forward portion thereof, said base ledge having a needle opening through which said needle descends, a thread hook having an elongate opening, the hook being mounted beneath said base ledge opening, drive means activated by the mounting means for imparting a partial reciprocal rotation to said hook in timed relation to the mutual reciprocation of the base, top, and needle, a thread retaining spring having a reversely folded thread retaining loop and a mounting loop, the mounting loop resting within the hook elongate opening and the retaining loop running along the hook and yieldably engaging the same, the needle, hook and retaining loop being in the aforementioned fore and aft relationship.

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