Aug. 13, 1957 J. H. JACKSON 2,802,436

THREAD POSITIONING MEANS FOR BUTTON SEWING MACHINES

Original Filed Jan. 13, 1954

FIG. 1

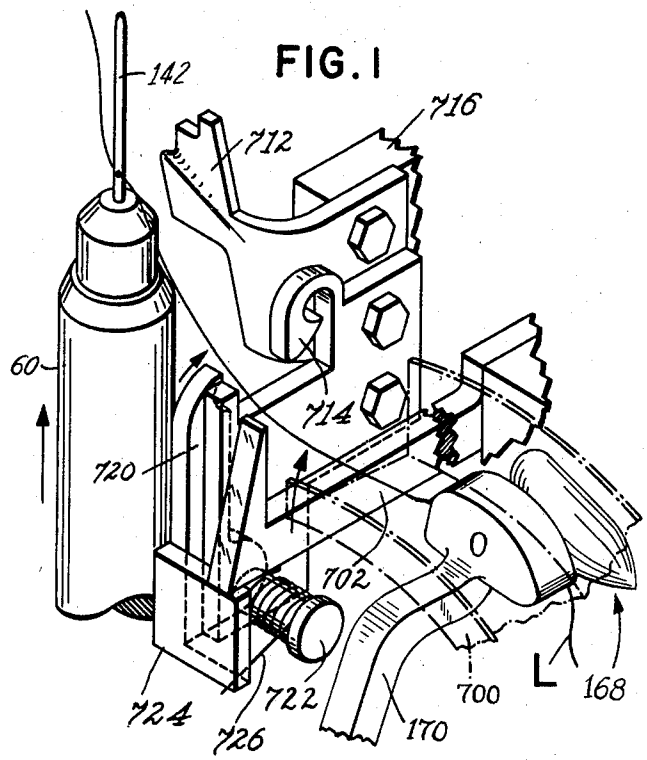


FIG. 2

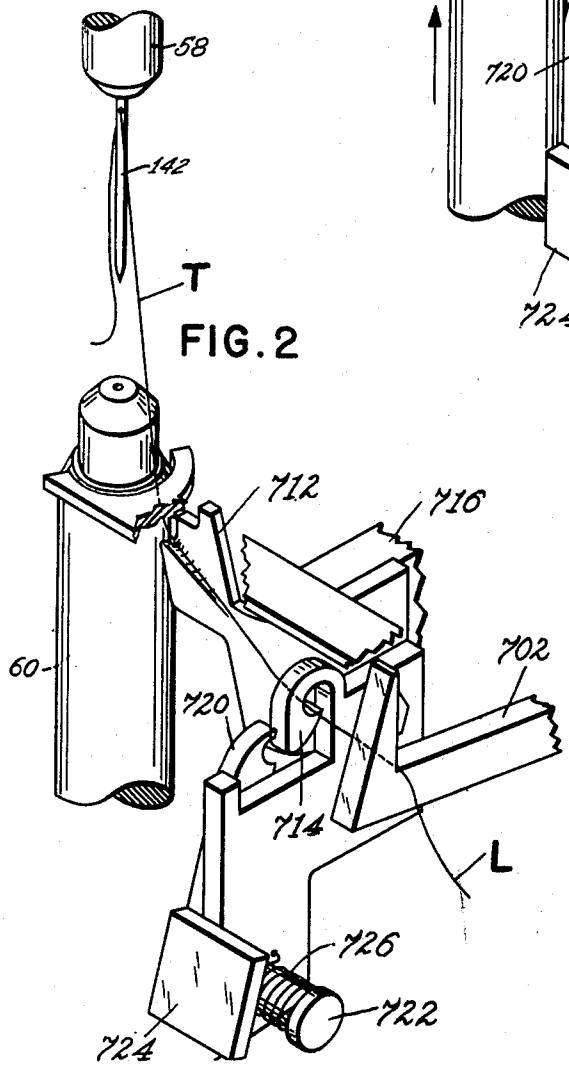
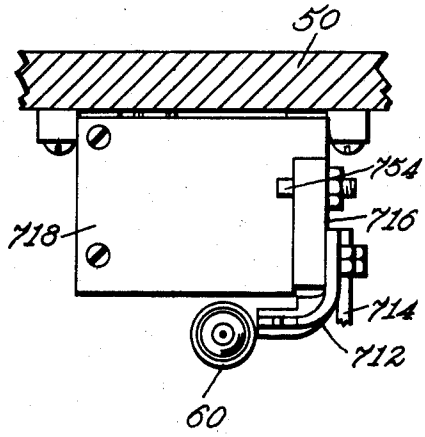


FIG. 3



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THREAD POSITIONING MEANS FOR BUTTON SEWING MACHINES

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6 Claims. (Cl. 112—110)

This invention relates to a sewing machine and more particularly to a thread positioning means adapted to receive a length of thread, position it properly and make it substantially impossible for this length of thread to get out of position where it might be spitted by the needle or broken by operating parts of the machine.

This application constitutes a division of application Ser. No. 403,678, filed by Arthur G. Mirel on January 13, 1954, for Button Sewing Machines.

The present invention consists in providing a sewing machine, such as disclosed in Johnson et al. Patent No. 2,451,495, and in copending Patterson and McGinley application S. N. 217,645, now Patent No. 2,739,550, dated March 27, 1956, with a thread trap and a thread lock adapted to function during operation of the machine in always maintaining the thread properly disposed with respect to the needle and operating parts which come in contact with the thread so that breakage of the thread is substantially eliminated.

While reference is made to the above referred to Johnson et al. patent and Patterson et al. application, it is understood that the invention is not limited in use solely to the type of the machine disclosed in such patent and said application.

According to the form of the invention illustrated herein, the loose end of the thread which is pulled through the work, in a sewing machine provided with opposed upper and lower alternately operating needle bars adapted to pass a needle back and forth through the work, is provided with a thread trap located adjacent the upper position of the lower needle bar such that when the thread puller pulls the loose end of the thread through the work, this end of the thread is disposed on a support forming a part of the thread trap.

The thread which is used in a button sewing machine of the type disclosed in the patent and application above referred to and copending application S. N. 403,678 is cut in lengths from a spool of thread. It has been found that the length of thread has a tendency to coil in conformity with the coiling of the thread on the spool from which it is cut. Thus the thread tends to move out of the position where it can be moved into the thread trap, and out of the path of the movement of a thread lifter which is provided to dispose it in the thread trap.

In order to insure that the thread will be properly located in the thread trap, there is mounted on the support a spring-urged locking finger having a bar portion adapted to be engaged by the end of the thread lifter. When the thread lifter is located in its inoperative position, the end of the thread lifter engages the bar portion of the finger and holds it against the tension of the spring out of closing position with respect to an opening in the thread trap through which the thread is moved by the thread puller.

As the thread lifter moves into engagement with the thread on the support, the thread locking finger moves forwardly under the action of its operating spring to close the opening above referred to thereby making it impossible for the thread to twist or move out of the thread trap. It will be seen therefore that the thread when thus disposed is positively locked in the thread trap against removal therefrom.

It is an object of the invention to provide a novel thread trap and means for disposing and locking a length of thread in said trap against inadvertent or unwanted removal during the operation of a sewing machine.

It is a further object of the invention to provide a novel thread controlling mechanism for a sewing machine wherein a length of thread is positively controlled and prevented from unwanted lateral displacement out of a thread trap during the operation of the sewing machine.

With these and other objects not specifically mentioned in view, the invention consists of certain combinations and constructions which will be described fully hereinafter, and then set forth in the claims hereunto appended.

In the accompanying drawings which form a part of this specification and which like characters of reference shall indicate some or like part;

Figures 1 and 2 are isometric views illustrating the successive positions of a thread control mechanism embodying the invention, during the operation of the machine; and

Figure 3 is a partial plan view of some of the elements shown in Figures 1 and 2.

Referring to the drawings which show a preferred embodiment of the invention selected for purposes of illustration, the sewing machine with which the invention associates and which forms a part, is provided with a thread receiving drum **700** on which the loose end of a length of thread is adapted to be disposed by means of a thread puller **168** during alternate operations of the upper and lower needle bars **58** and **60**.

The construction and operation of the machine with which the present invention is readily adaptable for use is similar to the type disclosed in Johnson et al. Patent Number 2,451,495. Such machine is provided with an upper needle bar **58** and a lower needle bar **60** and a thread disposing drum or surface or groove **700** on which the loose end of a thread of diminishable length is adapted to be laid by thread puller **168** during alternate movements of the needle bars when the machine is in operation. Since the specific structure for operating needle bars **58** and **60**, and finger **702** do not form a specific part of the invention, and such mechanism is fully shown in the patents and applications above referred to, further showing and description are omitted as being unnecessary to a full understanding of the invention.

In order to prevent entanglement of the loose end of the thread with thread puller **168**, or possible spitting by needle **142**, the machine is provided with a thread control mechanism, which is illustrated in Figures 1 and 2 of the drawings. As the loose end L of the thread T is laid by the thread puller **168** onto thread trough or drum **700**, it is also laid across a hook-shaped lifter finger **702** which is located in front of thread trough **700** and which is secured to an operating arm (not shown) pivotally mounted on a stud (not shown) on main base **50**. The free end of the operating arm carries a cam follower (not shown) which engages with a cam (not shown) mounted on a cam shaft (not shown). As soon as the loose end of the thread is deposited over finger **702**, the latter by means of its operating cam and operating arm is moved upwardly as well as rearwardly, causing that portion of the thread which passes through the material to engage with a stationary thread guide lug **712**, and a suitably shaped trap **714**, attached to block **716**, pref-

erably formed integrally with a member **708** secured to main base **50**. In order to guide the thread into trap **714** and prevent it from slipping out of the same, a suitably shaped lock finger **720** works in conjunction with and follows the lifter finger **702** as soon as the latter starts to move backward.

Lock finger **720** is mounted on a stud shaft **722** which is loosely supported in the lower portion of trap **714**. Lock finger **720** is also provided with plate or lug **724**, the top edge of which is in engagement with the lower front edge of lifter finger **702** which holds lock finger **720** in upright position as long as finger **702** is in its foremost position. As soon as the latter moves rearwardly, a suitable tension spring **726** urges lock finger **720** rearwardly until the top edge of plate **724** engages the front edge of the lower portion of the trap **714** and the trap is closed. Thus the trapped length of thread cannot move or twist laterally out of trap **714**.

What I claim is:

1. In a sewing machine of the type described having an upper needle bar and a lower needle bar adapted to pass a needle and a thread back and forth through work to be stitched, a thread receiving surface located adjacent said lower needle bar, a member having a narrow thread supporting ledge located adjacent said lower needle bar and above said surface, a thread puller for pulling the loose end of said thread through said work and disposing it upon said surface, a thread trap located adjacent said ledge, a device located adjacent said ledge for moving said loose end of said thread disposed on said surface to position said thread for delivery into said trap in response to the upward movement of said upper needle bar, said upward movement of said upper needle bar also locating said thread on said ledge, and a thread lock member positioned adjacent said trap adapted to move towards said thread trap to lock said thread against movement away from said thread trap.

2. The invention defined in claim 1 wherein said thread lock member comprises an arm, means pivotally mounting said arm on said thread trap for movement to and from said thread trap, means normally tending to urge said arm towards locking engagement with said thread trap, and means on said arm engaged by said device, prior to the operation of said device, for maintaining said arm out of thread locking relationship with said thread trap.

3. In a sewing machine of the type having a work support table, an upper needle bar and a lower needle bar adapted to pass a needle and a thread back and forth through work to be stitched, a thread receiving surface mounted adjacent said lower needle bar having a leading and a trailing end, a member having a thread supporting ledge positioned adjacent said surface longitudinally spaced from said leading end of said surface, means mounting said member at one side of said lower needle bar, a thread puller for pulling the loose end of said thread through said work and disposing it upon said surface, a thread trap located adjacent said leading

end of said surface, a device mounted adjacent said thread trap for moving said loose end of said thread disposed on said surface to position said thread for delivery into said trap and onto said ledge in response to the upward movement of said upper needle bar, and a thread lock member mounted on said thread trap adapted to move towards said thread trap and lock said thread against movement away from said thread trap.

4. In a sewing machine of the type having a work support table, an upper needle bar and a lower needle bar adapted to pass a needle and a thread back and forth through work to be stitched, a thread receiving surface having a portion located adjacent said lower needle bar, and a thread puller for pulling the loose end of said thread through said work and disposing it upon said surface, a member mounted above said surface having a thread supporting ledge, a thread trap located adjacent said ledge and substantially aligned therewith, a device mounted for movement above said surface for moving said loose end of said thread disposed on said drum to position said thread for delivery into said trap and on said ledge in response to the upward movement of said upper needle bar, a thread lock member positioned above said surface and adjacent said lower needle bar, and means operative in response to the movement of said device to dispose said thread on said surface for moving said lock member into operative relationship with said thread lock.

5. In a sewing machine of the type having a work support table, an upper needle bar and a lower needle bar adapted to pass a needle and a thread back and forth through work to be stitched, a thread receiving surface mounted adjacent said lower needle bar, and a thread puller for pulling the loose end of said thread through said work and disposing it upon said surface, a thread trap located adjacent said lower needle bar and along the path of travel of said thread puller, a device movably mounted above said surface for moving said loose end of said thread disposed on said surface to position said thread for delivery into said trap in response to the upward movement of said upper needle bar, and a thread lock member mounted above said surface and operative in response to the movement of said device to move towards said thread trap and lock said thread against movement away from said thread trap.

6. The invention defined in claim 5 including a thread disposing finger carried by said thread puller, and means for mounting said finger on said thread puller so as to dispose the loose end of the thread pulled by said thread puller properly on said thread receiving surface.

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