

No. 688,484.

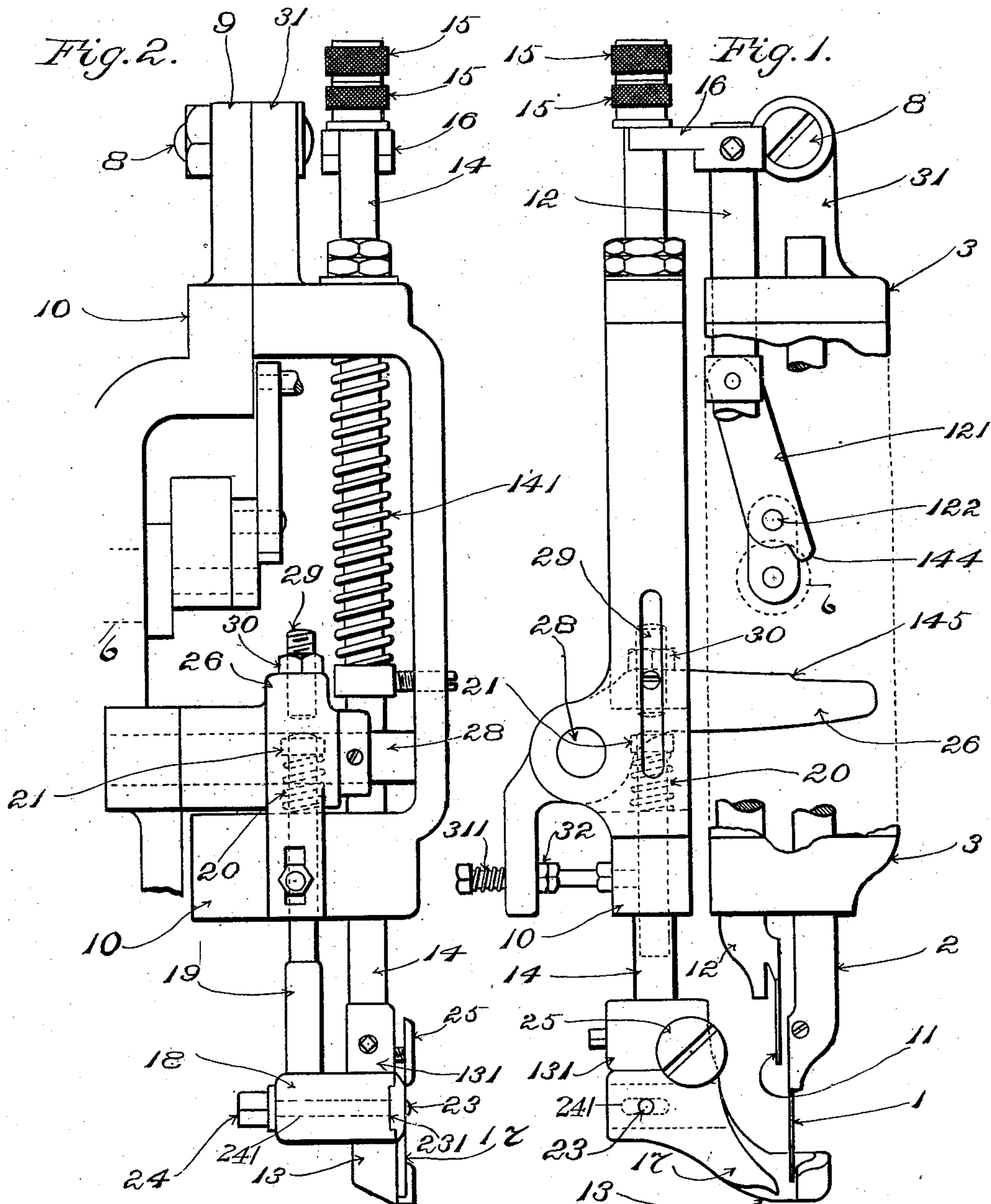
Patented Dec. 10, 1901.

H. C. PETERS.

STITCH SEPARATING MECHANISM FOR SEWING MACHINES.

(Application filed Oct. 14, 1899.)

(No Model.)



Witnesses:

Oscar F. Hill
Lepine Hall Rice

Inventor:

Heber C. Peters
by Maceo Calver & Russell
his Attorneys.

UNITED STATES PATENT OFFICE.

HEBER C. PETERS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE MOWER FAIR STITCH MACHINE COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

STITCH-SEPARATING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 688,484, dated December 10, 1901.

Application filed October 14, 1899. Serial No. 733,610. (No model.)

To all whom it may concern:

Be it known that I, HEBER C. PETERS, a citizen of the United States, residing at Boston, in the county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Stitch-Separating Mechanisms for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has relation to the devices which are employed in certain kinds of stitching and sewing machines for automatically separating, dividing, or pricking up the stitches of the seams produced in such machines and in some cases indenting the work adjacent to the line of stitches simultaneously with the operation of separating, &c., the latter, the tool that effects the separating, being constructed suitably to effect the indenting as well.

For convenience the terms "stitch-separating mechanism," "stitch-separating devices," and "stitch-separating tool" are employed hereinafter in the description and claims; but it is to be understood that by such terms I intend equally either mechanism, devices, and a tool which either only separate the stitches or both separate the stitches and indent the work.

The general aim of the invention is to provide a stitch-separating mechanism which, while characterized by acting to transmit motion positively from a part of the actuating connections for the thread-inserting tool or needle to the stitch-separating tool, thereby insuring that the latter shall act efficiently at every stroke and enter fully into the stock that is being operated on regardless of variations in the hardness or penetrability of the latter, as well as insuring that the stitch-separating tool shall act with great rapidity and force in penetrating the work, shall furthermore be characterized by acting to produce the required action of the stitch-separating tool after the needle or thread-inserting tool has completed the insertion of the thread into the work, thereby obviating any excessive strain upon the said actuating connections and providing that there shall be no material increase in the rate of wear thereof.

The invention will first be described with reference to the accompanying drawings, wherein is shown an embodiment of the said invention in connection with the head and a portion of the working mechanism of a well-known form of fair-stitch machine operating to form its stitches by punching a series of loops of thread into the upper surface of the work that is being operated on.

The novel and characteristic features of the invention will be defined in the claims at the close of this specification.

In the drawings, Figure 1 is an end elevation of the parts of the machine which is referred to just above. Fig. 2 is a side elevation of the same viewed from the left in Fig. 1.

I will first describe briefly certain of the well-known parts of the said machine.

1 designates an awl, 2 an awl-bar, and 3 a swinging portion of the machine-head. In the said swinging portion 3 the said awl-bar is received in bearings, through which latter it is free to slide endwise, it being operated as heretofore or in any preferred manner.

8 designates a bolt by means of which an upward extension 31 of the said swinging portion 3 of the head is connected pivotally with an upward extension 9 of the fixed portion 10 of the said head. In practice the said swinging portion 3 is moved about its pivot at 8 in well-known manner in occasioning the lateral movements of the awl, by which movements the work is fed through the machine.

11 designates the thread-inserting tool, and 12 the carrier-bar therefor, the said carrier-bar 12 also being mounted to slide vertically in bearings in the said swinging portion 3 of the head and usually being operated in practice by means of the link 121, connecting the same with the crank-pin 122 on the forward end of the shaft 6, the latter being indicated in dotted lines.

13 designates the presser-foot, and 14 the presser-bar, the last being mounted to slide vertically through bearings in the fixed part 10 of the head and being provided at its upper extremity with stops, herein shown adjustable on the said presser-bar and constituted by nuts 15 15. The upper end of the carrier-bar 12 for the thread-inserting tool is

provided with a projection 16, which extends underneath the lower nut 15 and makes contact therewith in the ascent of the carrier-bar 12, thereby lifting the presser-bar and raising the presser-foot from the surface of the work.

141 designates the spring that depresses the presser-bar and presser-foot.

All of the foregoing parts are or may be constructed as heretofore or as preferred.

For the sake of convenience I have represented the invention as embodied in connection with the particular construction of stitch-separating mechanism which is presented in my application for United States Letters Patent filed April 1, 1899, Serial No. 711,379. It is to be understood, however, that this precise construction is not essential to my invention and that the construction, &c., of the stitch-separating mechanism which is employed may be varied in practice.

The main features of the illustrated stitch-separating mechanism are as follows:

17 designates the tool that is employed for the purpose of stitch-separating or stitch separating and indenting. Its working extremity is sharpened to an edge and in other respects is shaped to engage properly with the work between the stitches, as shown most clearly in Fig. 1. The said tool 17 forms part of or is attached to a stock or carrier 18, the latter herein being shown located at the lower end of a stem 19. The upper reduced portion of the said stem is fitted to a bearing in a fixed part 10 of the head and projects somewhat at its free end above the lower portion of the said part of the head, it receiving on its projecting upper end a spiral spring 20. The spring is compressed between the head and a nut or collar 21 on the said stem, whereby the tendency of the spring to expand holds the stem 19, the stock or carrier 18, and the tool 17 normally upraised from the work, the limit of the ascent thereof being determined by contact of the said stock or carrier with the enlarged upper part 131 of the shank or stock of the presser-foot 13. The working extremity of the tool 17 is extended forward and downward into close proximity to the point at which the thread is driven into the work by means of the thread-inserting tool 11.

23 is the bolt by means of which the tool 17 is held to the stock or carrier 18, the threaded end of the said bolt entering a tapped hole in the said tool and the head 24 of the bolt being at the opposite side of the stock or carrier 18 from the tool 17. When the bolt is turned up tightly, the tool is clamped securely against one side of the stock or carrier 18. The tool is held from slipping or turning upon the stock or carrier in a vertical plane after having been set in proper position thereon by being provided with a horizontal rib 231, entering between ribs on the contiguous face of the stock or carrier. The said ribs form slideways, lying parallel with the elongated slot 241, extending horizontally through the stock or carrier 18, (see dot-

ted lines in the drawings) and consequently not interfering with the adjustment of the bolt 23 in the said slot 241.

The stitch-separating tool is guided in its vertical movements between the adjacent flat side of the presser-foot and the flat under side of the large head of a screw 25, applied to the upper part or stock of the presser-foot, the said head being sufficient in diameter to overlap the face of the said tool even in the lowermost position of the latter. Thereby the stitch-separating tool is confined to movement in a given vertical plane and moves in a direct path toward and from the surface of the work.

As will be apparent, the spring 20 acts to hold the tool 17 in an upraised position above the upper surface of the work and to lift the same after it has been forced down into the work by the depressing means about to be described. One of the important characteristics of the said depressing means is the fact that its action upon the stitch-separating tool is positive and that it acts to drive the working end of the said tool positively into the work. Thereby is secured an efficient action of the tool, it being caused at every stroke toward the work to enter fully into the stock that is being operated upon regardless of variations in the hardness and penetrability of the said stock. Whether the stock is hard or soft the tool is driven into the stock to the same extent, and there are no differences in this respect due to differences or variations in the hardness.

A characteristic of the illustrated depressing means for the tool, but to which I do not limit myself herein, is the fact that it communicates a percussive blow to the tool, whereby to act with greater certainty in causing the working end of the tool to enter the work to the required extent. The said percussive blow is, by preference, secured by providing for lost motion or play between certain of the members of the depressing means, allowing the tool and a part of the train of connections to remain at rest until suddenly started into motion by the impact of another part of the said train in full motion. The motion is taken from the lower end of the link 121, which transmits movement to the carrier-bar 12 from the crank-pin 122 on the operating-shaft 6. Into the path of the said lower end of the link 121 projects an arm 26, one end of which is sleeved loosely upon a shaft 28, the said arm having a projection, herein constituted by a screw 29, to engage with the upper end of the stem 19 of the stock or carrier 18 for the tool 17. The said screw 29 is fitted to a tapped hole in a portion of the arm 26 and is adjustable vertically with respect to the said arm in order to enable the extent to which the tool 17 is forced into the work to be varied as required. 30 designates a lock-nut or jam-nut on screw 29 for preventing loss of adjustment. The said screw serves as an adjustable contact-piece for transmit-

ting the pressure of the arm to the stem 19. The weight of the arm 26 is sustained by means of a spring 311, so as to relieve the spring 20 of such weight, the latter spring being located so close to the shaft 28 that if it had to bear the entire weight of arm 26 in addition to performing its other work its stiffness and size would be disadvantageous in the position in which it is placed. Normally the lower end of the contact-piece 29 is separated from the upper end of the stem 19 by a space, as is shown in the drawings. The lower end of the link 21 when it makes contact with the arm 26 strikes the latter downward, and the said arm transmits to the stem 19, through the adjustable contact-piece constituted by the screw 29, the sudden force which drives the working end of the tool 17 into the work. The percussive blow that is transmitted through the tool may be derived either from the striking of the lower end of link 121 upon arm 26 or from the striking of contact-piece 29 upon the upper end of stem 19, preferably the latter. 32 designates a stop by means of which the rise of the actuating-arm 26 under the action of the spring 311 is limited.

In accordance with the present invention the link 121 is provided with a projection 144 at the outer side of its lower extremity, the right-hand side in Fig. 1, and the arm 26 is provided with a coacting shoulder or sloping portion 145 on its upper surface, whereby the contact of the said parts does not take place until at or shortly after the moment when the link 121 has drawn down the carrier-bar 12 to the lowest point in its stroke, and hence until the thread-inserting tool of the machine has begun or is about to begin its retraction or rise. Thereafter during such rise the continued movement of the link 121 causes the projection 144 to ride over the shoulder 145, thereby depressing the movable arm 26 and driving the stitch-separating tool into the work. Such depression has the percussive quality already adverted to. It is to be observed that in practice either the projection 144 or the shoulder 145 may be decreased in degree, the other of such parts being correspondingly increased in degree, and in some cases it might be possible to entirely dispense with one of such parts, the other being sufficiently increased in degree to produce the necessary amount of depression of the arm 26 at the proper moment. In practice, however, I prefer to retain both elements in about an

equal degree, as I find that a superior result is obtained thereby. The effect thus produced is the actuation of the stitch-separating tool after the completion of the descent of the thread-inserting tool or during the retraction of the latter, but without the interposition of any levers or other additional parts, the peculiar, positive, and percussive quality of such actuation being preserved.

I claim as my invention—

1. In a sewing-machine, in combination, a rotating crank, a thread-inserter, a bar carrying the latter, a stitch-separating tool, an independent train of actuating connections for said tool, and means connected with said crank operating to occasion independent actuation of the said bar and tool, and to complete the insertion of the thread before the tool is forced into the work.

2. In a sewing-machine, in combination, a rotating crank, a link connected therewith, a thread-inserter in operative connection with said link, a stitch-separating tool, and separate operating connections for said tool intermediate the latter and the said link, the said link and connections acting to complete the insertion of the thread before the tool is forced into the work.

3. In a sewing-machine, in combination, a stitch-separating tool, a movable actuator therefor having a shoulder, as 145, a thread-inserter, its carrier-bar, a rotating crank, and the link connecting the said carrier-bar with the said crank and provided with the projection 144 to engage with the said shoulder and thereby occasion the action of the said tool after the thread-inserter has completed the insertion of the thread into the work.

4. In a sewing-machine, in combination, a rotating crank, a link having the projection 144, a thread-inserting tool, connections whereby said tool is operated from the said link, a stitch-separating tool, an arm 26 having a shoulder 145 and connections whereby said stitch-separating tool is actuated from the said arm, the said projection 144 and shoulder 145 operating to depress the latter tool after the completion of the thread-inserting movement.

In testimony whereof I affix my signature in presence of two witnesses.

HEBER C. PETERS.

Witnesses:

CHAS. F. RANDALL,
WILLIAM A. COPELAND.