Oct. 12, 1965 P. O. SPEICHERMANN ETAL 3,211,117

THREAD CUTTING DEVICE FOR DOUBLE STITCH SEWING MACHINES

Filed Sept. 16, 1963 2 Sheets-Sheet 1

Fig.1

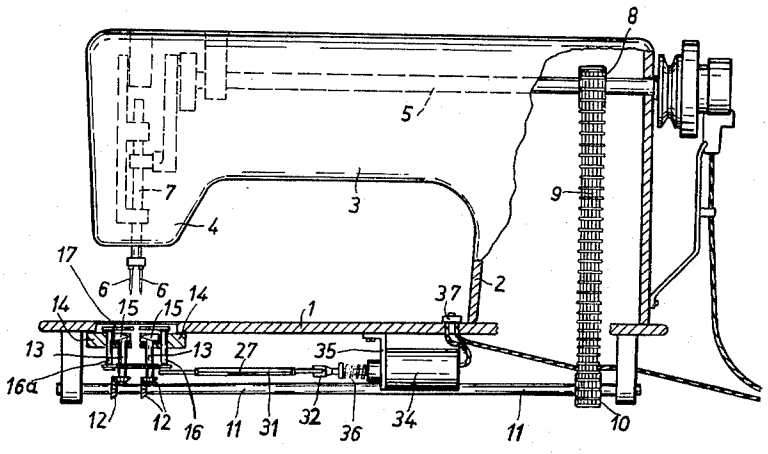


Fig.4

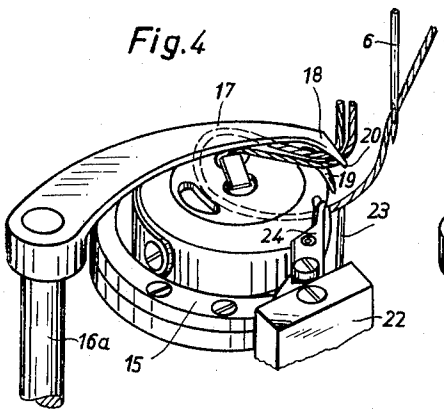
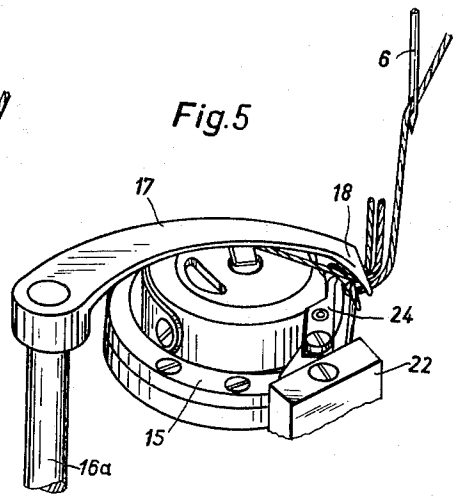


Fig.5



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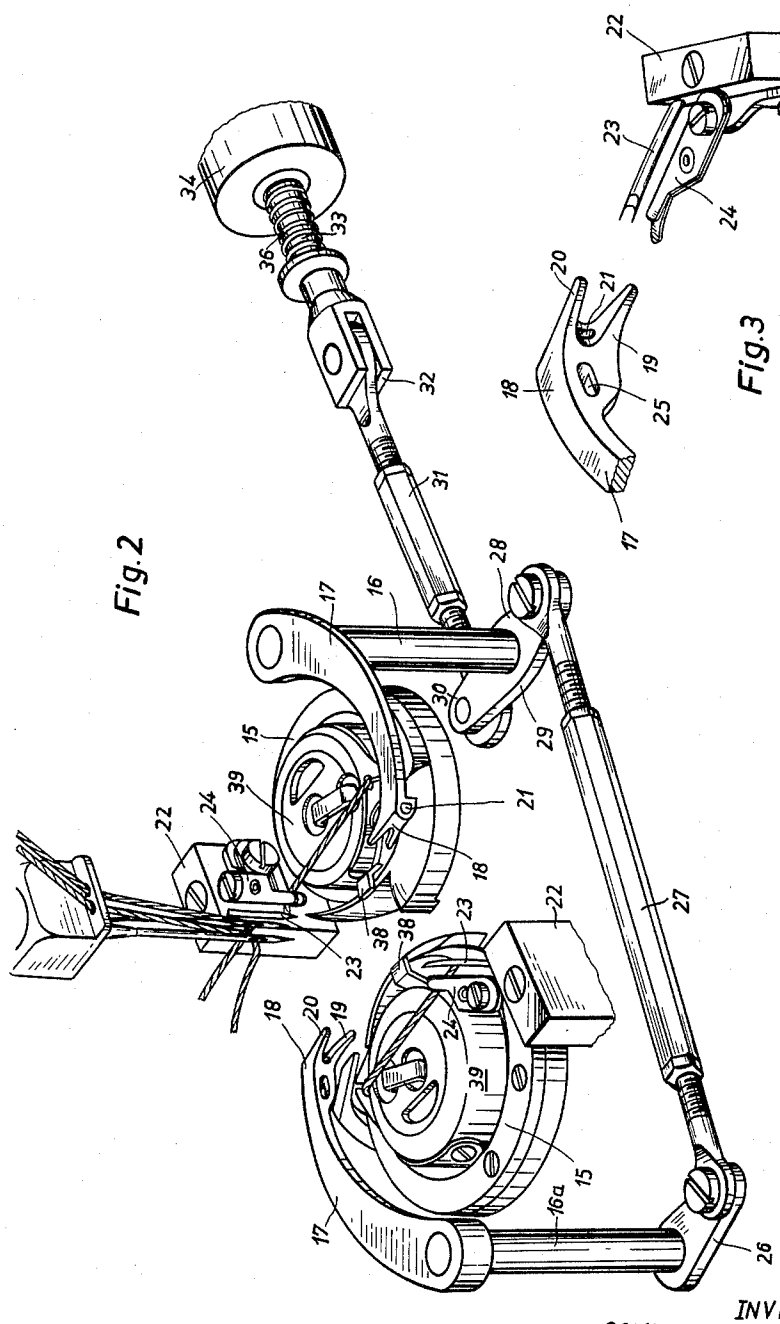


Fig.2

Fig.3

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THREAD CUTTING DEVICE FOR DOUBLE STITCH SEWING MACHINES

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The present invention relates to sewing machines, particularly to double stitch sewing machines. More in particular the invention concerns a thread catcher which cooperates with a stationary cutter and which rocks in a horizontal plane above the looper in a sewing machine provided with an upright looper shaft.

It is an object of the invention to provide a device for cutting the thread in double stitch sewing machines having flat loopers, which is capable of cutting the looper as well as the needle thread below the base plate with a single knife and which is furthermore constructed in a manner that, on the one hand, the stitch plate is completely free of driving components for the thread cutting mechanism and that, on the other hand, the accessibility of the looper is not impeded.

Accordingly the invention provides for a V-shaped construction of the point of the thread catcher which, for simultaneously seizing the looper and the needle thread, rocks along an operating path passing through between the needle and the looper shaft, which has an entrance aperture for the cutter extending from the point of intersection of the two legs that are to be connected in a plane disposed substantially parallel to the looper shaft.

In two-needle double stitch sewing machines the distance of the seams must frequently be changed when different types of sewing work are carried out. In order that during the setting of the machine to a different seam distance it is not necessary to adapt the thread catcher to the changed seam distance, the thread catcher is secured to a rocking shaft disposed parallel to the looper shaft and which is received in the bearing member for the looper shaft.

Further objects and advantageous details of the invention will become apparent from the following specification of an embodiment of the invention illustrated in the accompanying drawings in connection with a two-needle double stitch sewing machine. In the drawings:

FIG. 1 is a front view of the machine;

FIG. 2 is a perspective illustration of the thread catcher and its drive means after execution of the thread cutting operation;

FIG. 3 is a perspective view of the thread catcher and of the cutter and the thread clamp cooperating therewith;

FIG. 4 shows the thread catcher in thread seizing position; and

FIG. 5 is a view of the thread catcher prior to the cutting of the threads.

The base plate **1** of the sewing machine supports a standard **2** on which the horizontal arm **3** is formed which ends in the head **4**. The arm shaft **5** is journalled in the arm **3** and is operatively connected with the needle bar **7** carrying the thread guiding needles **6** and moving up and down in the head **4**. The belt pulley **8** is mounted on the arm shaft **5** which by way of belt **9** and cooperating pulley **10** transmits the driving movement from the arm shaft to the looper drive shaft **11** journalled below the base plate **1**. The looper drive shaft **11** is operatively connected at its forward end by way of pairs of pinion gears **12** with the vertical looper shafts **13**. The looper shafts **13** are journalled in a bearing member **14** secured to the base plate and carry at their upper end the double stitch loopers which cooperate with the needles **6**.

A rocking shaft **16** or **16***a* is journalled in each of the bearing members **14** and extends parallel to the looper shaft **13** carrying the thread catcher **17** which rocks below the material support plate **1**. The thread catcher **17** has a point **18** which is V-shaped in a manner that a plane which extends through the two legs **19**, **20** is parallel to the looper shaft **13** and intermediate said looper shaft and the axis of said needle **13**. A receiving aperture **21** extends from the intersection of the two legs **19**, **20** for a cutter **23** secured to a support **22**, which cutter cooperates with the thread catcher **17**. Laterally of the cutter **23** a thread clamp **24** is provided on the support **22** which is mounted on the base plate and for the accommodation of which the thread catcher **17** has a further receiving aperture **25** which extends parallel to the receiving aperture **21**. This aperture **25** is necessary to prevent any collision between the thread clamp **24** and the thread catcher **17**.

A lever **26** is secured to the lower end of the rocking shaft **16***a* which is connected by way of a link bar **27**, that is adjustable in the manner of a turnbuckle, to an arm **28** of a double armed lever **29** that is fastened to the rocking shaft **16**. A link bar **31** which is likewise adjustable by means of a turnbuckle is connected to the arm **30** of lever **29** at one end and at the other end engages by means of a forked head **32** the draw bar **33** of an electromagnet **34**. Between the housing of the electromagnet **34** which is fastened to the base plate by means of a bracket **35** and the forked head **32**, a pressure spring **36** is provided which encompasses the draw bar **33** which, after the magnet is deenergized, returns the draw bar to its initial position. A contact or switch device **37** is secured to the base plate which is operative to close the circuit of the magnet **34**. In the embodiment of the invention illustrated in the drawings, the retaining finger **38** of the bobbin housing **39** is displaced downwardly and bent outwardly in such a manner that between the upper housing **39** and the retaining finger **38** a free passage space is formed for the point **18** of the thread catcher **17**.

The manner of operation of the thread cutting device is as follows:

At the end of the seam the machine is briefly stopped with the needle piercing the material, for example, by a motor known under the trade mark "Stopmatic," and subsequently the half turn is imparted to the shaft which is required for cutting the thread. As the switch means **37** is operated the circuit of the electromagnet **34** is closed, so that the two rocking shafts **16***a* and **16** are synchronously moved by way of the draw bar **33** and link bars **31**, **27**. The point **18** of each thread catcher **17** thus begins after the looper **15** has seized the needle thread loop and opened it, to make its rotary movement which is synchronized with the looper **15**. Briefly before the needle thread loop drops from the bobbin housing **39** the thread catcher point **18** seizes the needle as well as also the looper thread (FIG. 4) so that both are located at the intersection of the two legs **19**, **20** ahead of the receiving aperture **21**.

During the further course of the looper movement the needle thread drops down completely from the looper housing **39** and is pulled up by the thread placer. As a result the leg of the needle thread which is connected with the thread supply comes to lie against the bottom of the leg **19** of the catcher point **18** while the leg of the needle and looper thread from the material being sewn remains in front of the receiving aperture **21**.

During the rotary movement of the thread catcher **17** the part of the looper thread extending from the thread supply is brought to the thread clamp **24** and clamped onto the same (FIG. 5). After the thread placer has reached its upper dead point position the catcher point **18** has also reached the cutter **23**, so that the needle as well as the looper thread are severed simultaneously by

means of the cutter 23 which enters the receiving aperture 21.

The leg of the needle thread from the thread supply is thus made of sufficient length for forming the initial stitch of the next sewing cycle, while the leg of the looper thread leading to the thread supply is held above the looper housing 39 by the thread clamp 24 so that it is securely seized as the next stitch is formed.

After the magnet 34 is deprived of current by releasing the switch means 37 the spring 36 becomes operative and returns the draw bar 33 and by way of the link bars 31, 27 also the thread catcher to its initial position (FIG. 2).

Having now described our invention with reference to the embodiment illustrated in the drawings, we do not wish to be limited thereto, but what we desire to protect by Letters Patent of the United States is set forth in the appended claims.

We claim:

1. In a double stitch sewing machine of the type having a base plate and provided with a vertical looper shaft, at least one needle, at least one looper supplying a looper thread and mounted on said vertical looper shaft and a needle bar carrying at least said one needle disposed above said looper and supplying a needle thread, a thread cutting means comprising a thread catcher, means supporting said thread catcher for rocking movement along a path extending in a horizontal plane above said looper and below said needle generally perpendicularly to the axis of said looper shaft and a stationary cutter mounted proximate said looper for cooperation with said thread catcher, said thread catcher having a front portion of V-shaped configuration defined by a pair of legs adapted to simultaneously seize said looper and said needle threads, and having a receiving aperture for said cutter at the intersection of said legs which are disposed in a vertical plane extending substantially parallel to said looper shaft and intermediate said looper shaft and the axis of said needle.

2. In a double stitch sewing machine of the type having a base plate and provided with a vertical looper shaft, at least one needle, at least one looper supplying a looper thread and mounted on said vertical looper shaft and a needle bar carrying at least said one needle disposed above said looper and supplying a needle thread, a thread cutting means comprising a thread catcher, means supporting said thread catcher for rocking movement along a path extending in a horizontal plane above said loooper and below said needle generally perpendicularly to the axis of said looper shaft and a stationary cutter mounted proximate said looper for cooperation with said thread catcher, said thread catcher having a front portion of V-shaped configuration defined by a pair of legs adapted to simultaneously seize said looper and said needle threads, and having a receiving aperture for said cutter at the intersection of said legs which are disposed in a vertical plane extending substantially parallel to said looper shaft and intermediate said looper shaft and the axis of said needle, said means supporting said thread catcher being a catcher shaft disposed parallel to said looper shaft, and a bearing support mounted on said base and supporting said looper shaft and said catcher shaft.

3. In a double stitch sewing machine of the type having a base plate and provided with a pair of vertical looper shafts, a pair of needles, a pair of loopers for supplying looper threads, each mounted on one said vertical looper shaft, needle bar means carrying said pair of needles for supplying needle threads disposed above said loopers, a pair of thread catchers, one associated with each looper and each mounted on a catcher shaft for rocking movement along a path extending in a horizontal plane above the associated looper and below a needle transversely of the axes of the looper shafts, and a pair of stationary cutters, one mounted proximate each said looper for cooperation with one said thread catcher, each said thread catcher having a front portion of V-shaped configuration defined by a pair of legs adapted to simultaneously seize said looper and said needle threads, and having a receiving aperture for the associated cutter at the intersection of said legs which are disposed in a vertical plane extending substantially parallel to the associated looper shaft, and bearing support means mounted on said base and supporting said looper shafts and said catcher shafts, and means including a turnbuckle or the like adjustably connecting said catcher shafts.

4. In a double stitch sewing machine of the type having a base plate and provided with a pair of vertical looper shafts, a pair of needles, a pair of loopers for supplying looper threads, each mounted on one said vertical looper shaft, needle bar means carrying said pair of needles for supplying needle threads disposed above said loopers, a pair of thread catchers, one associated with each looper and each mounted on a catcher shaft for rocking movement along a path extending in a horizontal plane above the associated looper and below a needle transversely of the axes of the looper shafts, and a pair of stationary cutters, one mounted proximate each said looper for cooperation with one said thread catcher, each said thread catcher having a front portion of V-shaped configuration defined by a pair of legs adapted to simultaneously seize said looper and said needle threads, and having a receiving aperture for the associated cutter at the intersection of said legs which are disposed in a vertical plane extending substantially parallel to the associated looper shaft, and bearing support means mounted on said base and supporting said looper shafts and said catcher shafts, and means including a turnbuckle or the like adjustably connecting said catcher shafts, and a thread clamp mounted proximate each said thread cutter, and each said thread catcher having a further aperture for receiving the associated thread clamp.

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