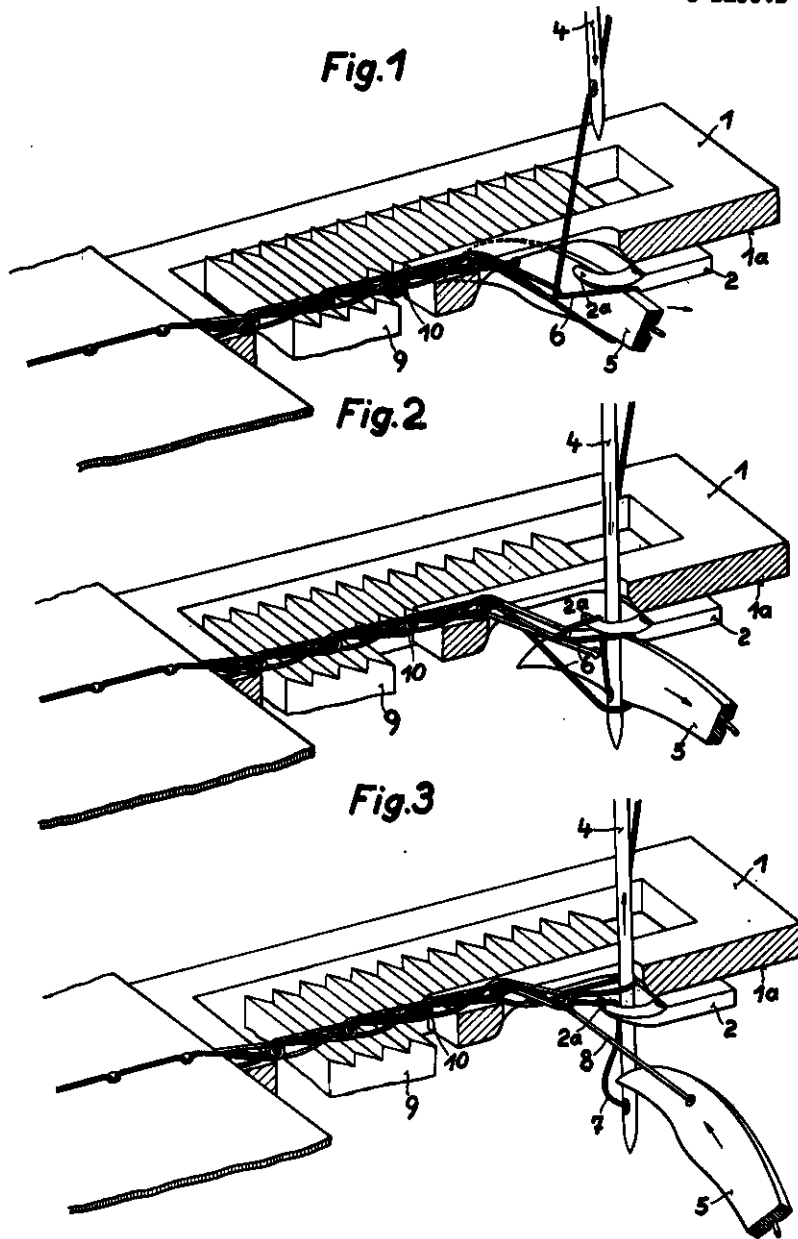


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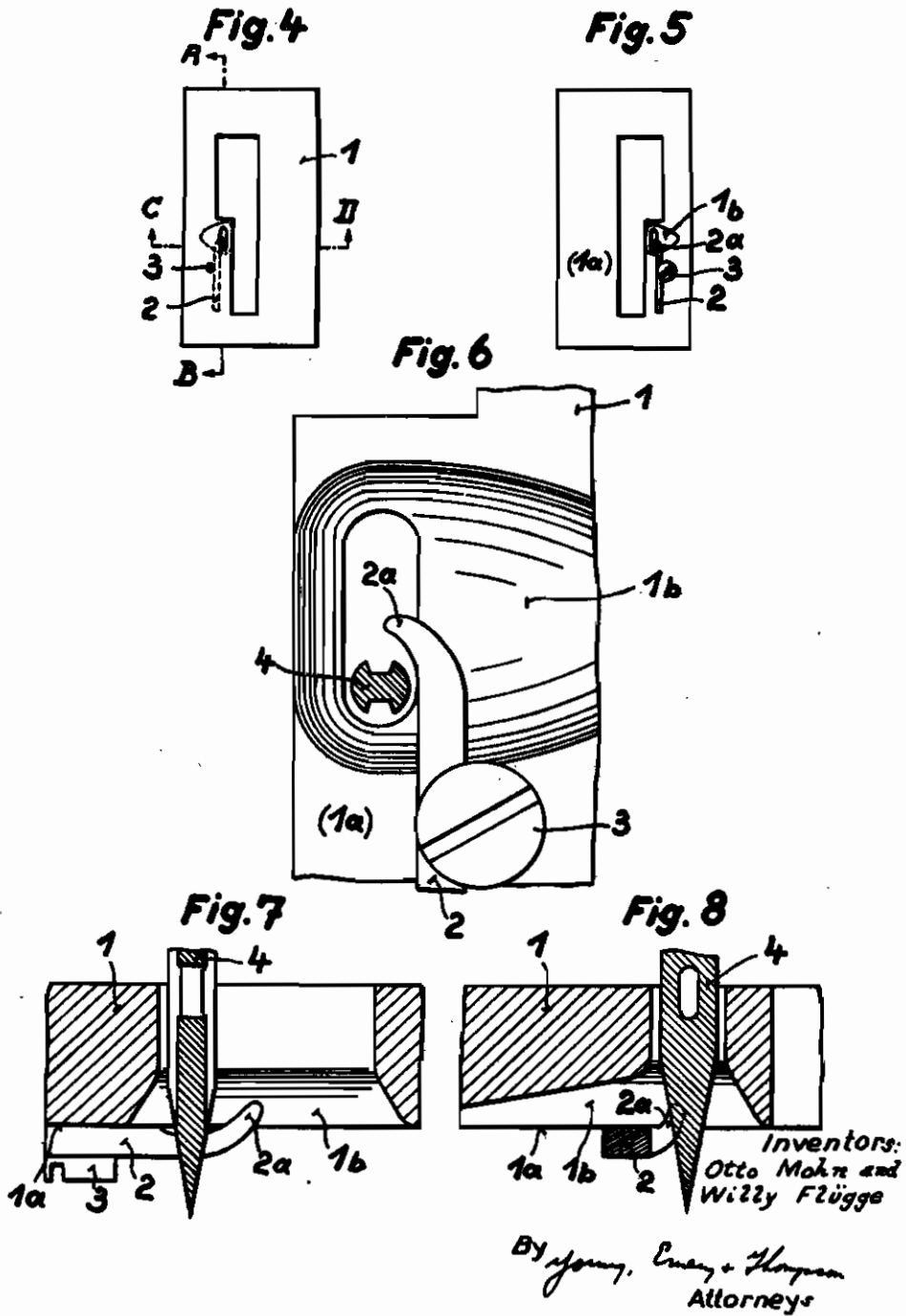


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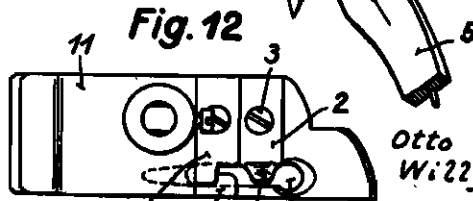
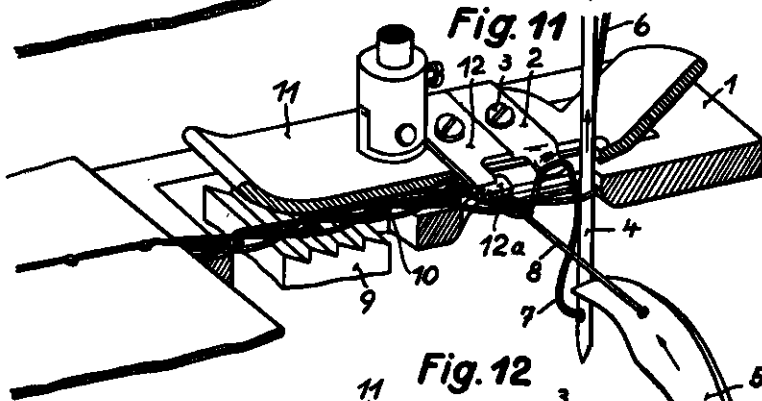
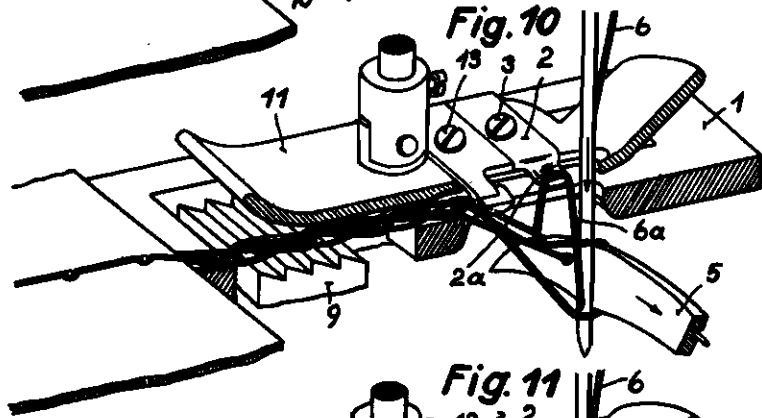
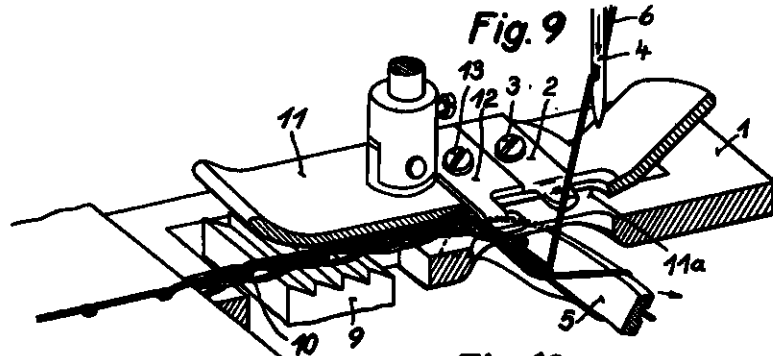
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ALIEN PROPERTY CUSTODIAN

METHOD AND MEANS FOR AUTOMATIC BLANK CHAIN STITCHING

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The present invention relates to a method of automatic blank chain-stitching for chain stitch sewing machines of all kinds, that is to say for forming the thread chain during the period when there is no work under the sewing needle, for the purpose of ensuring uninterrupted continuance of the thread chain formation between the individual pieces of work to be sewn.

In the case of overlap sewing machines it is known to use a movable looping finger for producing the automatic looping operation. However, said looping finger requires a separate drive and is also exposed to the risk of breakdowns.

In addition, measures are known which, in the case of single and double chain stitch sewing machines, produce the looping operation without additional auxiliaries, merely by giving the sewing tools a different shape. However, this remodeling of the sewing tools possesses the drawback that in certain circumstances the machine requires a resetting of the sewing tools when altering the length of stitch or when changing the thread.

The object of the present invention is to provide a simple method and means whereby the above mentioned drawbacks are obviated.

The looping operation is effected by arranging a stationary looping tongue between the stitch plate and the gripper and utilizing the available thread movement which is necessary for forming the seam. The thread movement resulting from the reciprocating horizontal movement of the gripper is preferably utilized to effect a looping on the said stationary tongue.

The said stationary looping tongue fulfills the same function as the known mechanically actuated looping finger. Owing to the peculiar shape and arrangement of the stationary looping tongue and also to the thread movement resulting from the return movement of the gripper, the portion of thread located between the needle thread loop which is suspended above the gripper, and the needle eye, comes within reach of the looping tongue. When the needle travels downwardly this section of the thread is suspended across the stationary looping tongue and remains there until the gripper has taken up the thread loop thrown out by the needle, i. e. until the thread chain link is tied. It is only during the further course of the stitch formation that said thread chain link is pulled off the stationary looping tongue owing to the thread movement due to the forward movement of the gripper and the forward feed movement of the thread chain. In this manner there

is no need for the looping auxiliaries to carry out movements on their own.

Owing to this accurate tying of the thread chain link to the stationary looping tongue a more effective linking process is developed, which in this manner is independent of the shape and length of the stitch hole, the size of the movement of the fabric feeding motion and the nature of the thread.

For fabrics made of teased thread an additional curved guide is required for guiding the needle thread.

When using teased thread the looping tongue and the curved guide are preferably attached to and level with the stitch plate. It is, however, particularly advantageous to arrange the looping tongue and the curved guide level with the presser foot, so that they may also be attached to the latter. The above arrangement possesses the advantage in that the looping tongue also remains in action during the sewing process, so that in this manner, when the goods to be sewn are delicate, for example paper bags, there is no tearing due to rough thread at the points where the needle enters.

The method is applicable to all sewing machines having one or more needles and wherein the movement of the thread during the formation of the seam is suitable to produce a looping process by means of single or multiple use of a looping auxiliary.

In the accompanying drawings a constructional form according to the invention is illustrated by way of example as applied to a single needle, double chain-stitching sewing machine.

In these drawings:

Figure 1 illustrates in perspective a section through the stitch plate of a double chain-stitching machine showing the thread chain formation at the commencement of the downward movement of the needle:

Figure 2 is a view similar to Figure 1 but showing the needle in a position where it has almost completed its downward movement:

Figure 3 is a similar view showing the needle shortly before the commencement of its upward movement (the thread loops in Figures 1, 2 and 3 have been pulled apart for the sake of clarity):

Figure 4 is a plan view of the stitch plate:

Figure 5 is a view showing the underside of the stitch plate:

Figure 6 is an enlarged view of the underside of the stitch plate showing the stitch hole with the looping tongue:

Figure 7 is a longitudinal section through the stitch hole on the line A—B in Figure 4:

Figure 8 is a cross section through the stitch hole on the line C—D in Figure 4;

Figure 9 is a perspective view in section through a stitch plate and a presser foot of a double chain stitch sewing machine in particular when using fabric made of teaseled thread, the chain formation being shown at the commencement of the downward movement of the needle:

Figure 10 is a similar view showing the needle having almost completed its downward movement.

Figure 11 is a similar view showing the needle shortly before the commencement of its upward movement (the loops of the threads in Figures 9, 10 and 11 have been pulled apart for the sake of clearness), and

Figure 12 is a plan view of the presser foot.

On the underside of the stitchplate 1 (Figs. 4-7) the stationary looping tongue 2 is fixedly secured by means of a screw 3. The looping tongue 2 extends laterally of the needle 4 and ends in a hook-shaped point 2a behind the said needle. Between the point 2a and the underside 1a of the stitchplate there is provided a recessed portion 1b which is adapted to allow the thread to come to rest unhindered upon the looping tongue.

The looping process is carried out in the following manner:

When the needle 4 (Fig. 1) commences to move downwardly the gripper 5 is carrying out its return movement. This causes the needle thread loop 6b of the needle thread 6 which is suspended on the gripper 5 to be moved in the direction of movement of the gripper so as to come within reach of the point 2a of the looping tongue 2.

In the course of the continued downward movement of the needle 4 (Fig. 2) the thread portion 6a is consequently laid over the point 2a of the looping tongue 2, where it remains until, at the commencement of the upward movement of the needle 4 (Figure 3), the forwardly moving gripper 5 picks up the needle thread loop 7, thrown out behind the needle 4, and loops it together with the gripper thread loop 8, that is to say until the adjacent thread chain link has been tied.

In the further movement of the needle the thread chain link formed upon the looping tongue 2 is stripped from the tongue 2 owing to the

forward movement of the gripper 5 and the forward feed movement of the thread chain 10, whereupon the thread picture seen in Figure 1 reappears.

The arrangement of the looping tongue and curved guide upon the presser foot is preferably adopted in the case of fabrics made from teaseled thread.

Upon the upper side of the presser foot 11 (Figs. 9-12) the looping tongue 2 is attached by means of screw 3. The looping tongue extends into the stitch hole 11a of the presser foot 11 to behind the needle 4, so that the hook-shaped point 2a of the looping tongue when seen in the direction of the forward feeding device, assumes a position substantially behind the centre of the needle.

A curved guide 12 is attached behind the looping tongue 2 to the presser foot by means of screw 13. Said guide lies across the stitch hole 11a of the presser foot 11 and possesses a curved portion 12a which is adapted to bring the thread portion 6a of the needle thread 6 within reach of the looping tongue 2, so long as the fabric feed motion 9 feeds forward the thread chain 10 resting on the stitch plate 1. The looping process in the case of teaseled thread fabric contains, in addition, the action of the curved guide for the needle thread.

When the needle 4 (Figure 9) commences to move downwardly the lower portion of the thread section 6a of the needle thread 6 is also pushed forward by means of the thread chain 10 which has been pushed forward by the fabric feed motion 9. During this operation the section of the thread 6a slides past the curved portion 12a of the curved guide 12 until it reaches the rear of the hook 2a of the looping tongue 2 and thus comes within reach of the said tongue.

In the course of the further downward movement of the needle 4 (Figure 10) the thread section 6a is consequently suspended over the hook 2a of the looping tongue 2, where it remains suspended until the next thread chain link is tied.

In the further course (Figure 11) the thread chain link formed upon the looping tongue 2 is pulled off therefrom owing to the forward feed movement of the thread chain 10, whereupon the thread picture seen in Figure 1 reappears.

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