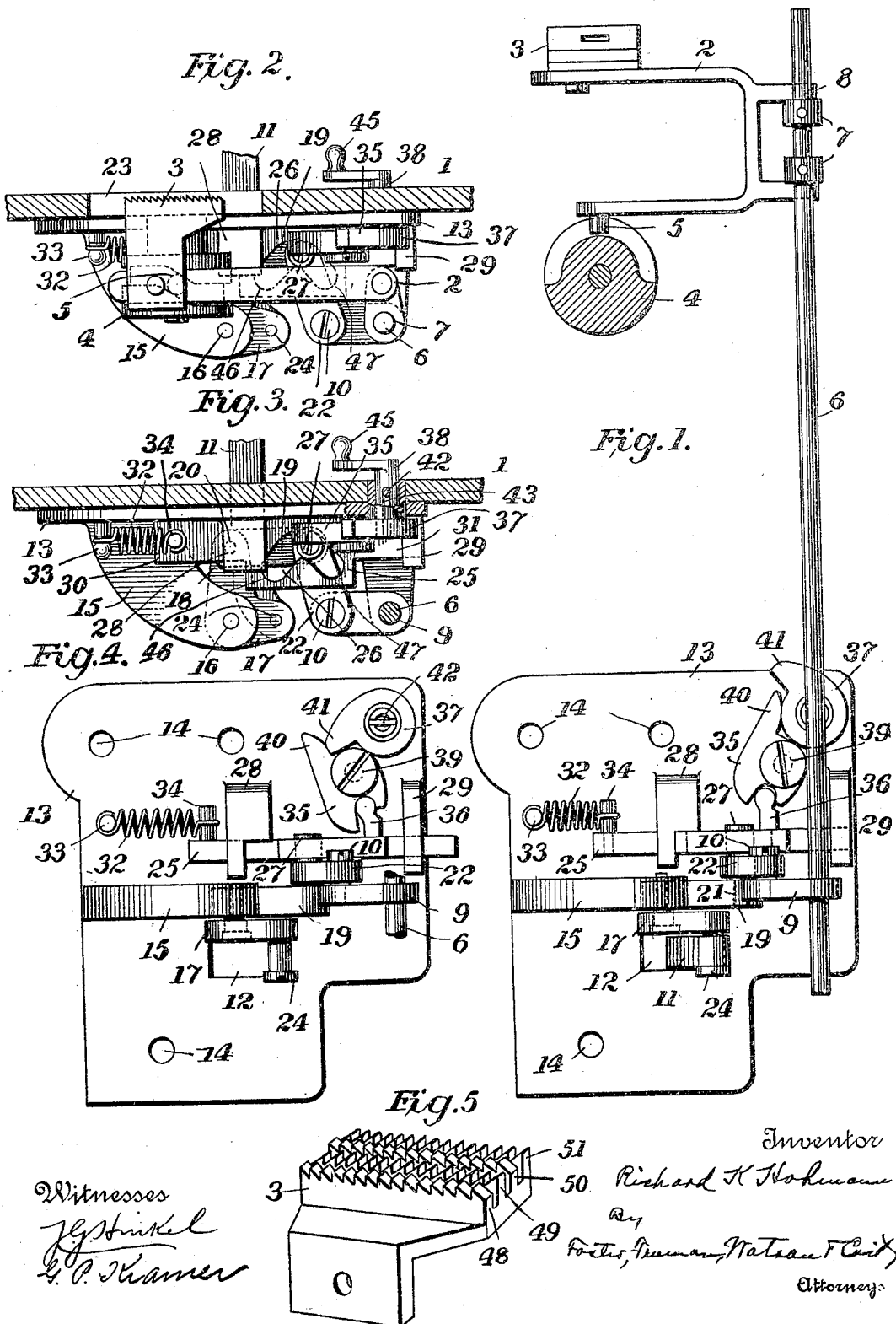


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FEEDING ATTACHMENT FOR SEWING MACHINES.
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RICHARD K. HOHMANN, OF SAN DIEGO, CALIFORNIA.

FEEDING ATTACHMENT FOR SEWING-MACHINES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, RICHARD K. HOHMANN, a citizen of the United States, and resident of San Diego, in the county of San Diego and State of California, have invented certain new and useful Improvements in Feeding Attachments for Sewing-Machines, of which the following is a specification.

This invention relates to the feed mechanism of sewing machines and particularly to means for reversing the feed. Its objects are to provide mechanism of simple construction which will reverse the feed of the cloth beneath the needle bar without shock or jar and without stopping the machine, which can be easily operated to effect this reversal and which can be easily attached to various types of machines now in commercial use embodying mechanism adapted to feed in only one direction, whereby those machines will be rendered capable of reversing the feed.

A further object is to provide a feed dog of such construction that it is capable of feeding the cloth in either direction, and which at the same time may be successfully used with a tucker.

To these ends my invention consists in mechanism which will reverse the direction in which the feed dog moves when raised into contact with the cloth and in the form of the face of said feed dog containing teeth or projections adapted to carry the cloth with the dog in whichever direction it moves. My reversing mechanism is an attachment which is designed to be secured to some of the ordinary sewing machines now in commercial use without changing or omitting parts of those machines, and which is simply interposed as a part of the chain of mechanism operating the feed dog. Two connected parts of the old feed mechanism are disconnected from each other and are connected to my interposed reversing attachment.

The novel features of my mechanism and the advantages thereof will be apparent from the following description taken in connection with the accompanying drawings.

In the drawings,—Figure 1 is a bottom plan view of my attachment together with connecting mechanism for operating the feed dog. Fig. 2 is a side view of my attachment and connected parts showing a portion of the machine table in section;

Fig. 3 is a similar view omitting the feed dog and showing the table in section at a point nearer the attachment; Fig. 4 is a bottom plan view of the attachment without the connected part; and Fig. 5 is a perspective view of the feed dog.

In these drawings 1 represents the top of an ordinary sewing machine and 2 represents the ordinary feed bar, partly broken away carrying the feed dog 3 at one end. It will be understood that in order to enable the feed dog to properly move the cloth forward beneath the needle bar it is necessary for the feed dog to be in contact with the cloth when it makes its forward stroke and to be lowered out of contact when returning to its original position where it commences its forward stroke. In making a complete stroke therefore the feed dog has four successive motions. It is raised into contact with the cloth, moved forward the required distance for feeding, lowered out of contact with the cloth, and then moved back to the starting point. The means for giving these four motions are well known in the art.

In the drawings I have shown a cam 4 engaging a roller 5 on the feed arm 2 for raising and lowering the feed dog 3, in the slot 23 in the table top and it will be understood that the cam groove is of such shape and the rotation of cam 4 is so timed that the upward and downward motion take place at the end of the forward and backward strokes of the feed arm. It is not necessary to show or describe this means for securing the upward and downward motion of the feed dog in detail since the means in common use may be employed and will be understood by those skilled in the art.

One means heretofore used for giving the feed arm 2 its backward and forward motion consists of a shaft 6 mounted to rock in fixed bearings and having a fixed arm 7 pivotally connected at 8 to the end of the feed arm 2. This shaft 6 is also provided with a fixed arm 9 which is ordinarily secured by pivot pin 10 to the end of the reciprocating arm 11 which passes through a slot in the top plate 1. This arm 11 is reciprocated by well known means which as above stated is properly timed with the means for raising and lowering the feed dog. The reciprocation of arm 11 rocks the shaft 6 and therefore gives to the feed arm 2 its necessary back and forward motion.

The parts so far described are well known in the art.

My invention resides in mechanism interposed between arms 9 and 11 for reversing the feed the arms 9 and 11 being disconnected from each other and being connected to opposite ends of the interposed chain of mechanism.

My attachment consists of a removable plate 13 adapted to be secured to the under surface of the top 1 by screws passing through holes 14 and of mechanism secured to the bottom of this plate 13. The plate 13 has upon its under surface a curved arm 15 preferably formed integral therewith, and pivotally secured thereto at 16 is the bell crank lever 17 having the upwardly extending arm 18. The longitudinal link arm 19 is pivotally secured at one end to the arm 18 at 20 and at its other end is secured by the pivot pin 21 to the downwardly extending link arm 22. This link arm 22 is secured at its lower end to the arm 9 by the pivot pin 10. The plate 13 is provided with a slot 12 through which passes the reciprocating arm 11 and this arm is pivotally connected at 24 to the bell crank lever 17.

It will be observed that the above described construction makes a continuous chain of connecting arms and links between the reciprocating arm 11 and the feed arm 2, but that the links 19 and 22 form a loose elbow joint which will not serve to transmit motion unless restrained. In order to prevent the free movement of the pivot joint 21 between arms 19 and 22, and to thus make these arms transmit motion in the desired direction I use a plate 25 adapted to slide along the under surface of plate 13 by the side of and parallel with the arm 19 and make a cam groove or slot 26 in said plate in the form of an inverted V or heart, and provide a roller 27 on the pivot 21 working in said groove or slot. The plate 25 slides in bearings formed by the plates 28, 29, which have openings fitting the reduced ends 30, 31 of the plate 25. The plate 25 is normally held in the rearward position shown in Fig. 2 by the coiled spring 32 which is secured at one end to the plate by pin 33 and at its other end to the plate 13 by pin 34. In order to move the plate against the tension of the spring to its forward position shown in Fig. 4 and to retain it in that position, I use a tumbler 35 engaging a finger 36 on the plate 25 and a latch 37 operated by a key 38 passing through an opening in plate 13 and the table top 1. The tumbler 35 is pivoted at 39 and has a rounded socket engaging the end of finger 36 and also has a curved offset or projection 40 which is adapted to ride up on the projection 41 of the latch 37. It will be understood that when the latch 37 is turned the offset 40 will ride up on the projection until

the projection reaches the position shown in Fig. 4 when the parts will be locked, and it will be further understood that this rotation of the tumbler carries the finger 36 and its attached plate 25 to its forward position shown in Fig. 4. The shaft on which the latch 37 is mounted is preferably made hollow with a cross pin 42 therein and the key 38 is made to fit in this hollow shaft and is provided with a vertical slot 43 which embraces the cross pin 42, thus furnishing the connection by which the key turns the latch. The key is provided with a suitable handle 45 above the table top for turning it.

It will be observed that when the plate 25 is in its forward position shown in Fig. 4 the roller 27 will at the beginning of its stroke be at the lower rear point 46 of the slot 26 and that at this time the arm 11 is in its elevated position. A downward stroke of the arm 11 therefore makes the roller ride up the slot to the apex thus raising link arm 22 and drawing the feed arm 2 to the right in Fig. 1. On the other hand if the plate 25 is at its forward position at the beginning of the downward stroke of arm 11 the roller 27 will be at the apex of the slot and the downward motion of arm 11 will force it to travel down to the point 47 of the slot, thus moving the link arm 22 downward and moving the feed arm 2 to the left in Fig. 1. It will therefore be observed that a downward stroke of arm 11 will move the feed dog either to the right or to the left in accordance with the position of the reversing plate 25. It will further be observed that the position of plate 25 can be changed instantaneously while the machine is in operation without any binding or jars. The roller 27 moves easily and freely along the slot while the reversal is being effected just as it does in feeding in one direction and there is no more shock or jar than in ordinary feeding. It will further be observed that this reversal does not change the relative timing of the vertical and longitudinal motions of the feed dog but merely makes that dog travel forward in contact with the cloth in one instance and backward in contact with the cloth in the other instance.

The feed dog 3 is made of the form which is clearly shown in Fig. 5 of the drawings. It has upon its upper surface the longitudinal rows of teeth 48, 49, 50 and 51 separated from each other by longitudinal grooves which extend below the roots of the teeth. The teeth upon rows 48 and 50 face in one direction, whereas the teeth upon rows 49 and 51 face in the opposite direction. It will be observed that by this construction the rows 48 and 50 cooperate to feed the cloth when the dog is moving in contact therewith in one direction, and that at this time the teeth in rows 49 and 51 do not either help or hinder the feeding operation, since they face

in a direction opposite to the feed. On the other hand when the dog is moving in contact with the cloth in the opposite direction the rows of teeth 49 and 51 take hold of the cloth and serve to feed it. The teeth on any one or each of the rows might be made to face in opposite directions, and while this would serve to feed the cloth in either direction, as above described, I have found that to use teeth on any one row facing in opposite directions will not produce satisfactory results in practice. When it is attempted to use such a feed dog with the ordinary tucker which pushes the cloth in between the dog and the presser foot I find that the points of the tucker will make contact with those teeth facing in a direction opposite to the feed and will consequently be broken or bent and the cloth will not be properly pushed by the tucker to form the tucks. With my form of feed dog this defect in operation is avoided, since the tucker may be so modified as to come in contact only with those rows of teeth which face in the direction of feed. This may be effected by removing the intermediate points on the tucker and it may then be used with my reversing feed dog without coming in contact with teeth facing contrary to the direction of feed. I have found that four rows of teeth give a uniform feed and entirely satisfactory results, but it is to be understood that I do not limit myself to this precise number.

Having thus described the invention, what is claimed is:

1. A reversing attachment for sewing machine feeds adapted to be interposed in or removed from the driving mechanism comprising a train of mechanism for transmitting motion the ends of said train being adjacent each other, and adjustable means between the ends of said train for reversing the direction of the motion transmitted.

2. An attachment for sewing machines comprising a train of mechanism for transmitting motion, a removable plate carrying said mechanism, the ends of said train being adjacent each other and the said train including an adjustable cam for reversing the direction of the motion transmitted.

3. A reversing attachment for sewing machine feeds adapted to be interposed in the driving mechanism comprising two link arms pivotally secured together, a roller secured to said arms at the pivot joint, a cam having a V-shaped slot or groove in which said roller works, and means for moving said cam so as to bring said roller into either side of said slot as desired.

4. A reversing attachment for sewing machine feeds adapted to be interposed in the driving mechanism comprising two link arms pivotally secured together, a roller secured to said arms at the pivot joint, a longitudinally movable plate by the side of said

arms provided with a heart-shaped slot or groove in which said roller works, and means for moving said plate longitudinally and retaining it in its end positions.

5. A reversing attachment for sewing machine feeds adapted to be interposed in the driving mechanism comprising two link arms pivotally secured together at an angle, a bell crank lever connected to the end of one of said arms and having a fixed pivotal support, roller secured to said link arms at the pivot joint, a longitudinally movable plate by the side of said link arms provided with a heart-shaped slot or groove in which said roller travels, and means for moving said plate longitudinally and retaining it in its end positions.

6. An attachment for ordinary sewing machines comprising a plate adapted to be secured to the under surface of the top of the machine, a bell crank lever adapted to be secured at one end to the ordinary reciprocating arm for operating the feed, two link arms pivotally secured together at one end, one of said arms being secured to the bell crank lever and the other being adapted to be secured to a pivoted arm for reciprocating the feed dog of the machine, a roller at the pivot joint of said link arms, a longitudinally movable plate provided with a heart-shaped slot or groove in which said roller works, and means for moving said plate longitudinally and retaining it in its end position.

7. In a sewing machine, the combination with a feed dog, of driving mechanism therefor, a slidable plate having a cam groove for controlling the direction of feed without stopping the machine, a spring for normally holding said plate in position to feed in one direction, and a tumbler and latch for moving said plate into position to feed in the opposite direction and for retaining it in position.

8. In a sewing machine, the combination with a feed dog, of driving mechanism therefor, a slidable cam plate for controlling the direction of feed without stopping the machine, a spring for normally holding said cam to feed in one direction, a shaft for moving said cam to feed in the opposite direction, and a key adapted to extend down through an opening in the top of the sewing machine to turn said shaft.

9. In a sewing machine, the combination with a feed dog, of mechanism for moving said dog into and out of contact with the material being operated on, mechanism for reciprocating said dog longitudinally, and a movable cam having a heart-shaped groove engaging a portion of said reciprocating mechanism for reversing the direction in which said feed dog moves.

10. In a sewing machine, the combination with a feed dog having teeth adapted to feed

in either direction, of mechanism for operating said dog to feed the material being sewed, and means including a heart-shaped cam groove for reversing said mechanism.

5 11. In a sewing machine, the combination with a feed dog having rows of teeth extending in the direction of the line of feed, all of the teeth in a row facing one end of said row, and the teeth of adjacent rows facing in opposite directions, of mechanism for
10 operating said feed dog and for reversing the direction of its motion.

12. A feed dog for sewing machines comprising teeth in longitudinal rows extending
15 in the direction of the line of feed some of which teeth face toward one end of the row and some of which face toward the other end, and all of the teeth in a single row facing in the same direction.

20 13. A feed dog for sewing machines, com-

prising longitudinal separated rows of teeth extending in the direction of the line of feed some of which teeth face toward one end of the row and some toward the other end, and all of the teeth in any single row facing in
25 the same direction.

14. A feed dog for sewing machines comprising four longitudinal separated rows of teeth extending in the direction of the line of feed, the teeth on alternate rows facing
30 opposite ends of the rows, and all of the teeth on a single longitudinal row facing in the same direction.

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

RICHARD K. HOHMANN.

Witnesses:

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