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O. RICH ET AL.

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SEWING MACHINE RUFFLER

Filed Sept. 10, 1937

2 Sheets-Sheet 1

Fig. 1

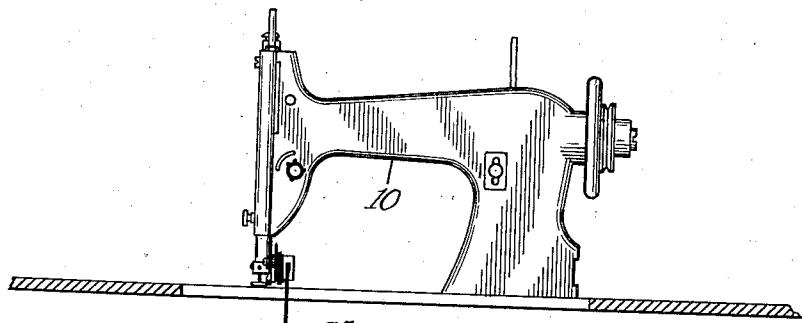


Fig. 2.

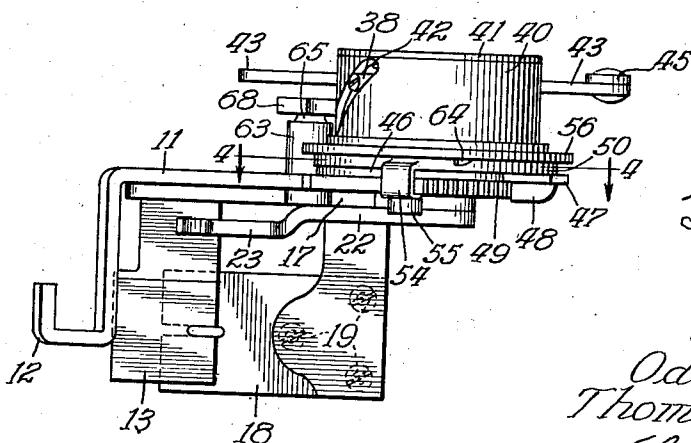
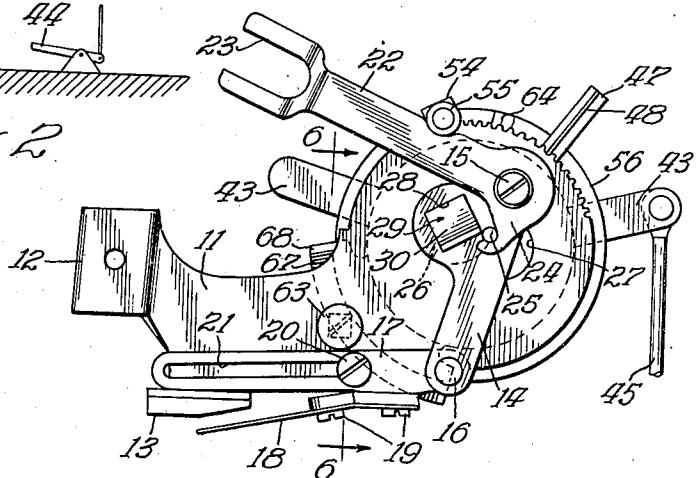


Fig. 3

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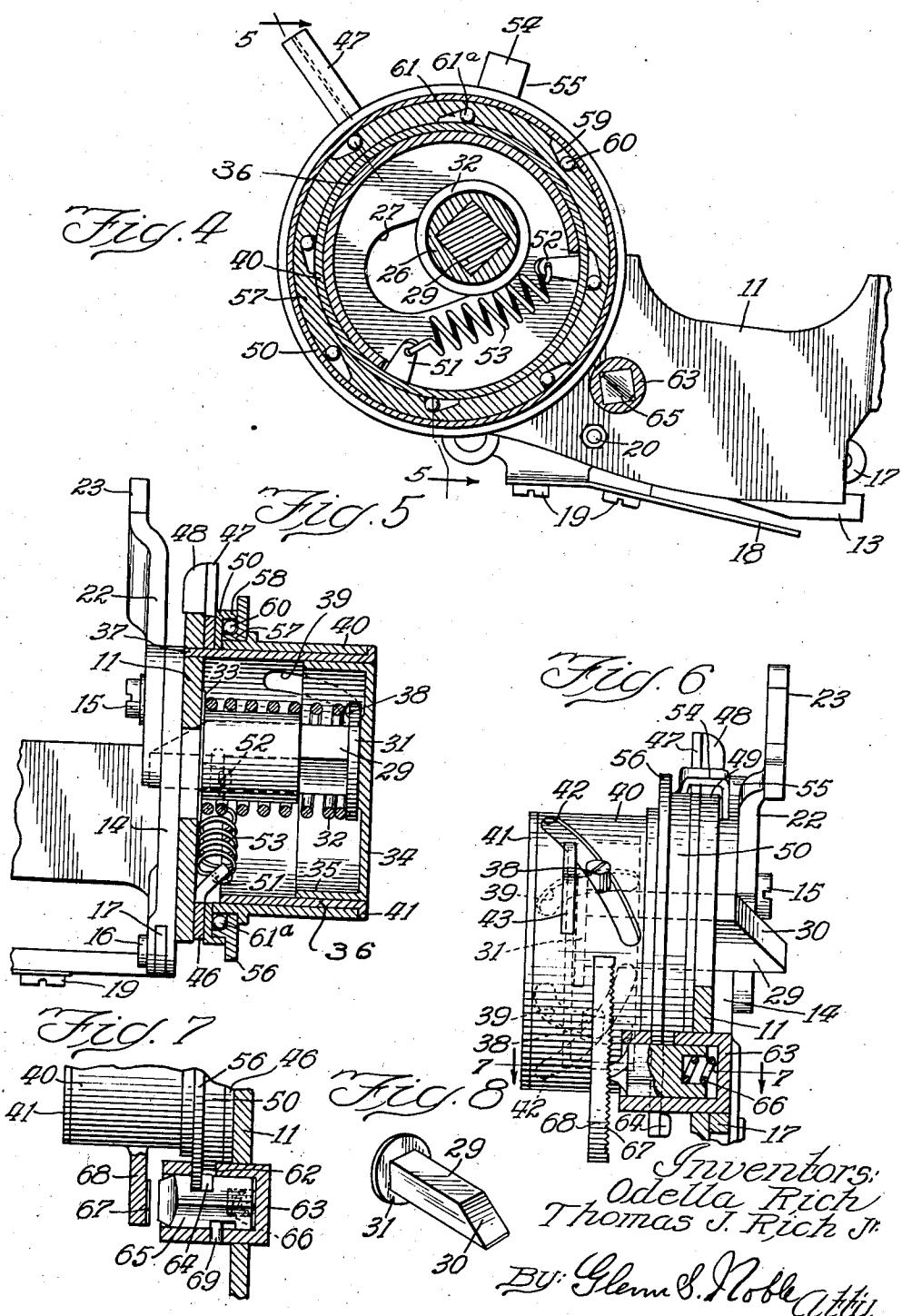
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

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SEWING MACHINE RUFFLER

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Chicago, Ill.

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12 Claims. (Cl. 112—134)

This invention relates to rufflers of the type commonly used for sewing machines for forming ruffles, pleats, waving, or Shirring, and is particularly directed to means for adjusting the same and also to means whereby the operation may be changed from ruffling to plain sewing or vice versa. Heretofore means have been provided for adjusting the length of the ruffle by adjusting the stroke of the ruffling blade but such means have usually required the stopping of the machine and the differences in the stroke of the blade have usually been more or less arbitrary. In accordance with the present invention we provide means whereby the length of the stroke or length of ruffle may be adjusted while the machine is in motion at any rate of speed or while standing still and may also be adjusted through any desired range of steps or variation. Furthermore we provide means whereby the changing of the operation from ruffling to plain sewing may be done in a convenient and feasible manner and such changes may be made automatically, if desired, while the machine is in operation.

The objects of this invention are to provide means of a simple and efficient character for performing the operations noted and to provide means which may be readily attached to any ordinary or power sewing machine in a convenient manner; to provide a ruffler which may be adjusted for length of ruffle, either by hand or by foot or pedal operated means; to provide means for adjusting the throw of the ruffler blade through an infinite number of ranges of operation; to provide a novel stroke or feed adjusting mechanism; and to provide such other novel features in construction and improvements in operation as will appear more fully hereinafter.

In the accompanying drawings illustrating this invention,

Figure 1 is a front view of a sewing machine showing the ruffler applied thereto;

Figure 2 is a side view of the ruffler;

Figure 3 is a plan view of the same;

Figure 4 is a sectional view taken on the line 4—4 of Figure 3;

Figure 5 is a sectional view taken on the line 5—5 of Figure 4;

Figure 6 is a detail of the adjusting mechanism with parts broken away to show the interior construction;

Figure 7 is a sectional view taken substantially on the line 7—7 of Figure 6, but showing the spring-pressed detent out of engaging position; and

Figure 8 is a detail of the stroke adjusting plunger.

As shown in these drawings, 10 represents generally a sewing machine of either domestic or commercial form having the usual presser-bar and vertically reciprocating needle bar. Our im-

proved ruffler has a frame 11 which may be secured to the presser-bar in the usual manner, having a bracket 12 which is adapted to fit over the bar and be attached thereto by means of a screw or the like. The frame has a substantially horizontal separator blade 13 which may be attached thereto but is preferably made integrally therewith as shown. A lever or pusher arm 14 is pivotally mounted in the main frame by means of a pivot or screw 15 and is bifurcated at its lower end for pivotal engagement at 16 with the pusher or carrier 17 to which the ruffling blade 18 is attached as by means of screws 19. The pusher or carrier 17 is guided by means of a pin or screw 20 in the main frame which engages with a slot 21 in the carrier as shown in Figure 2.

The pusher arm 14 is actuated by an operating lever or arm 22 which is pivoted on the screw 15 and which is preferably forked as shown at 23 for attachment to the needle bar in the usual manner. The operating lever 22 is of the bell-crank type having one arm 24 provided with a hook which engages with a pin 25 on the pusher arm 14 for moving or swinging the arm in one direction.

The pusher arm 14 has a short tube or bearing 26 secured thereto or formed integrally therewith which projects rearwardly as shown in Figure 2, through a slot or opening 27 in the main frame, which opening is arranged circumferentially with respect to the pivot 15 so that the bearing may swing freely therein. The bearing has a longitudinal hole or bore 28 of rectangular cross section to receive a stroke adjusting plunger 29 which is slidably mounted therein and which has a beveled or tapered end 30. The tapered end 30 of this plunger is adapted to be projected within the path of the operating lever 22 and serves as the medium through which the lever actuates or moves the pusher arm 14 in order to retract the ruffler blade. The beveled surface or end of this plunger is engaged by the side of the operating lever 22 so that the stroke of the pusher arm may be adjusted by moving the plunger 29 longitudinally in its socket whereby the end thereof will be engaged sooner or later by the operating lever and the stroke of the blade may be adjusted for any desired movement. The plunger 29 may be adjusted longitudinally in its bearing by any suitable means but in the present arrangement is provided with a head 31 which is engaged by a spring 32 for retracting or moving the plunger for shorter ruffling strokes or to inoperative position. The opposite end of the spring engages with a washer 33 which rests against the face of the frame member or plate as shown in Figure 5. The plunger is moved inwardly or to operating position against the tension of the spring 32 by a slideable or reciprocable cap or disc 34 which has an inwardly extending

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flange 35 that fits in a stationary housing or cylinder 36 that is rigidly secured to the frame 11 as by means of integrally formed projections or rivets 37 that extend through slots in the frame 5 and are headed or riveted over to hold the housing in position. The flange 35 has two oppositely disposed outwardly projecting pins 38 which engage with cam slots 39 in the housing or drum 36. The pins 38 are actuated or moved inwardly 10 and outwardly by means of a rotatable sleeve 40 which is mounted on the cylinder or housing 36 and is held against movement in one direction by means of a flange 41 extending outwardly from the housing. The sleeve 40 is provided with diagonal cam slots 42 which engage with the pins 38 and cause the pins to be moved in the slots 39 relatively lengthwise of the housing when the sleeve is rotated, thus causing the cap or disc 34 to move inwardly for adjusting the plunger 29. 15 The sleeve 40 may be turned in any convenient manner as by means of radial pins or arms 43 which may be engaged by the fingers of the operator and turned to adjust the stroke when the machine is either in operation or standing still. 20 The sleeve may also be adjusted by means of a foot operated pedal or arm 44 which may be connected with the sleeve by means of a rod 45 or in any suitable manner whereby the sleeve may be rotated to adjust the throw by means of the foot, 25 thus leaving the hands free for other purposes. It is often desirable to form a certain number or length of ruffles and then change to plain sewing. Our invention provides means whereby the ruffling operation may be automatically stopped 30 after a predetermined length of ruffling or shirring has been made which is accomplished by the following particular mechanism. 35 An adjusting washer 46 is rotatably mounted on the barrel 36 next to the frame plate 11 and has a projecting thumb-piece or arm 47 for rotatably adjusting the same. This arm has a spring detent 48 which engages with notches 49 on the peripheral portion of the frame 11 for holding the ring in adjusted position. The length of the ruffling or pleating, or number of pleating operations, is determined by the position of such washer. The length of the ruffling or pleating can be adjusted from about four to any desired 40 number of stitches. An operating or outer ratchet ring 50 is mounted next to the ring 46 as shown in Figure 3. The rings 46 and 50 are provided respectively with inwardly extending lugs or projections 51 and 52 which are connected by a tension spring 53 as shown in Figure 4, this spring tending to return the operating or outer ratchet ring 50 to normal position. The ring 50 has a bracket 54 which extends forwardly over the frame and is provided with a roller 55 that lies within the path of the operating lever 22 as 45 shown in Figures 2 and 3, the arrangement being such that when the operating lever is vibrated it tends to move the roller 55 and parts connected therewith a predetermined distance in a clockwise direction at each upward movement of the lever. 50 The rotative movement of the outer ratchet ring 50 is transmitted to an inner ratchet ring 56 by means of any suitable ratchet mechanism such as the ball ratchet shown. The ring 56 has 55 an annular shouldered portion or flange 57 which fits within a flange 58 on the ring 50. Cam or clutch grooves 59 are provided around the outer periphery of the flange 57 and clutch balls 60 are positioned in the grooves, the arrangement being 60 such that they tend to turn the inner ratchet

ring 56 in a clockwise direction as shown in Figure 2. In order to prevent the reverse or return movement of the inner ratchet ring we provide cam or clutch grooves 61 on the inside of the flange or shouldered portion 57 having balls 61a which coat with the outer surface of the sleeve 40 to hold the inner ratchet ring in its adjusted positions. 5

The rim or outer periphery of the inner ratchet ring 56 extends into a slot or opening 62 in one side of a bearing or hollow projection 63 which is secured in the frame 11 as shown in Figure 7. The ring 56 has a beveled or cam shaped projection 64 which is adapted to engage at times with a detent or ratchet member 65 which is slidably mounted in the bearing 63 and which is of angular cross section to prevent its rotating in the bearing. The detent 65 is urged outwardly by means of a compression spring 66 which is interposed between the detent and bottom of the bearing as shown in Figure 6. The sharpened end of the detent engages with teeth 67 which are arranged radially on the face of a segment 68 that extends outwardly from the sleeve 40. The sleeve 40 preferably has an outwardly extending flange at its inner end to provide a thrust bearing for the inner ratchet ring 56. If desired a pin or the like 69 may be provided to prevent the detent 65 from being inadvertently ejected from the bearing by the spring 66. 10

When this automatic feature is to be used the operator sets the adjusting washer 46 by means of the thumb-piece 47 to any predetermined position which adjusts the outer ratchet ring 50 through the medium of the spring 53. The sleeve 40 is then adjusted for the desired length of ruffle and the sewing and ruffling proceeds in the usual manner. At each movement of the lever 22 the outer ratchet ring 50 is rotated in a step by step movement by the roller 55. This step by step movement is transmitted to the inner ratchet ring 56 through the ball clutch mechanism and is gradually rotated until the lug or projection 64 engages with the spring-pressed detent 65 and draws it out of engagement with the teeth 67 as shown in Figure 7. As soon as this pin or detent is released it releases the ruffle adjustment and permits the sleeve 40 to return to normal position through the action of the spring 32. This withdraws the end of the plunger 29 from engagement with the lever 22 so that further movement of the lever does not actuate the ruffer but permits the plain sewing to continue. 20

From this description it will be seen that we provide an efficient and compact mechanism for performing the objects set forth which may be made of any desired size and of any suitable material. In the drawings other than Figure 1, the parts are shown on a considerably larger scale than the size adapted for an ordinary sewing machine. 30

It will also be noted that changes may be made in order to effect different movements or to adapt the apparatus for various makes of sewing machines and therefore we do not wish to be limited to the particular construction shown and described except as specified in the following claims, in which we claim:

1. In a sewing machine ruffer, the combination 70 with an operating lever and a driven arm for actuating the ruffer blade, of a reciprocable stroke adjusting plunger carried by one of said members and having a beveled surface which is engaged by the other member for transmitting the 75

movement from the operating lever to the driven arm, and means for adjusting the plunger.

5 2. The combination with a sewing machine ruffler having a pusher arm and an operating lever, of stroke adjusting means comprising a plunger slidably mounted in the pusher arm and having a tapered portion which is engaged by the operating lever to swing the pusher arm, and means for manually adjusting the plunger longitudinally whereby the movement of the pusher arm may be varied.

10 3. The combination with a sewing machine ruffler including a pusher arm and an operating lever, of stroke adjusting means comprising a plunger slidably mounted in the pusher arm and having a beveled portion to be engaged by the operating lever for swinging the pusher arm, a spring tending to move the plunger out of operative position and manually operable means for 15 moving the plunger toward operative position, said means being adapted to be actuated when the ruffler is in operation or standing still.

20 4. Adjusting means for adjusting the stroke of a tucker having a pusher arm and having an operating lever for vibrating said arm, comprising a plunger slidably mounted in the pusher arm and engageable by the operating lever for moving the arm in one direction, said plunger having a beveled surface whereby the movement of the arm may be adjusted, a spring tending to hold 25 the plunger in inoperative position, manually operable means for adjusting the plunger to operating positions, and means for automatically releasing the last-named means to permit the plunger to return to inoperative position.

25 5. In a sewing machine tucker, the combination of a frame, a pusher arm pivotally mounted on the frame, tucking or pleating means actuated by the pusher arm, an operating lever pivoted on the pusher arm pivot and having a projection, a pin on the pusher arm which is engaged by the projection to move the arm in one direction, a bearing on the pusher arm extending through a slot in the frame, a rectangular plunger mounted in the bearing and having a beveled portion for engagement with the operating lever to move the pusher arm in one direction, a spring coacting with the frame and plunger tending to hold the plunger in inoperative position, a barrel secured to the frame and enclosing said plunger and bearing, a cap slidably mounted in the barrel and engaging with said plunger, cam means for adjusting the cap longitudinally of the barrel to move the plunger into operative positions, and a detent for holding the cam means in adjusted position.

30 6. The combination with a sewing machine ruffler, having a driving member and a driven member for actuating the ruffler blade, of adjustable means adapted to be set to cause the driving member to actuate the driven member a predetermined number of times and then to automatically disengage the driving member after the driven member has been actuated said predetermined number of times.

35 7. The combination with a ruffling device of the character set forth, of means for adjusting the length of the ruffle and adjustable means adapted to be set to cause the ruffler to be operated a predetermined number of times and then to automatically change the operation from ruffling to plain sewing.

40 8. In a sewing machine ruffler, in combination, a frame adapted to be attached to the machine, a pusher arm pivotally mounted on the frame, a

ruffling blade coacting with the pusher arm, an operating lever pivotally mounted on the frame and having one end formed for engagement with the needle bar of the sewing machine, an arm on the lever, a pin on the pusher arm which is engaged by the lever arm for moving the pusher arm in one direction, a bearing carried by the pusher arm extending through a slot in the frame, a plunger slidably mounted in the bearing and adapted to be interposed within the path of the operating lever to move the pusher arm in the opposite direction, said plunger having a beveled engaging portion whereby the stroke may be varied, a barrel projecting from the frame and enclosing said bearing, a cap slidably mounted in the bearing, a sleeve engaging with the barrel, means for holding the sleeve against longitudinal movement, pins secured to the cap and projecting through cam slots in the barrel and in the sleeve, means for rotating the sleeve to adjust 15 the cap longitudinally of the barrel, a circumferential toothed segment projecting from the sleeve, a spring-pressed detent mounted in the frame and engaging with said teeth, an adjustable washer mounted on the barrel adjacent to 20 the frame, means for holding the washer in adjusted position, a rotatable ratchet ring mounted adjacent to the washer, yielding means connecting the adjusting washer and said ring, whereby the ring will be returned to normal position, 25 means projecting from the ratchet ring within the path of the operating lever whereby the ring will be moved a predetermined distance for each movement of the lever, a second ratchet ring mounted adjacent to the first-named ratchet ring, 30 ratchet means for moving the second-named ring in one direction when the first-named ring is actuated, and a projection on the last-named ring which engages with the spring-pressed detent to release the same when the second-named ratchet 35 ring has been actuated a predetermined number of times, the arrangement being such that the plunger will return to normal position under the action of the spring when said detent is released.

9. A device as per claim 8 in which the sleeve 40 is provided with pedal operating means for adjusting the same.

10. A device as per claim 8 in which the sleeve is provided with thumb pieces for rotating the same.

45 11. A new mechanical movement for giving a variable stroke, comprising a driving member and a driven member, and a coacting member interposed between said driving and driven members for varying the movement of the driven 50 member, said coacting member comprising a longitudinally movable slide having a tapered end for coaction with the driving member and being yieldably pressed in one direction and means for moving it in the opposite direction against said 55 yieldable means.

12. A new movement comprising a vibrating driving member, a vibrating driven member and a movable member adapted to be interposed between the driving member and the driven member for varying the movement of the driven member, said movable member comprising a longitudinally movable slide having a tapered end for coaction with the driving member and being 60 yieldably pressed in one direction, and means for moving it in the opposite direction against said 65 yieldable means.