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COMBINED RUFFLING AND ORNAMENTAL STITCHING MECHANISM

Filed Oct. 27, 1930 3 Sheets-Sheet 1

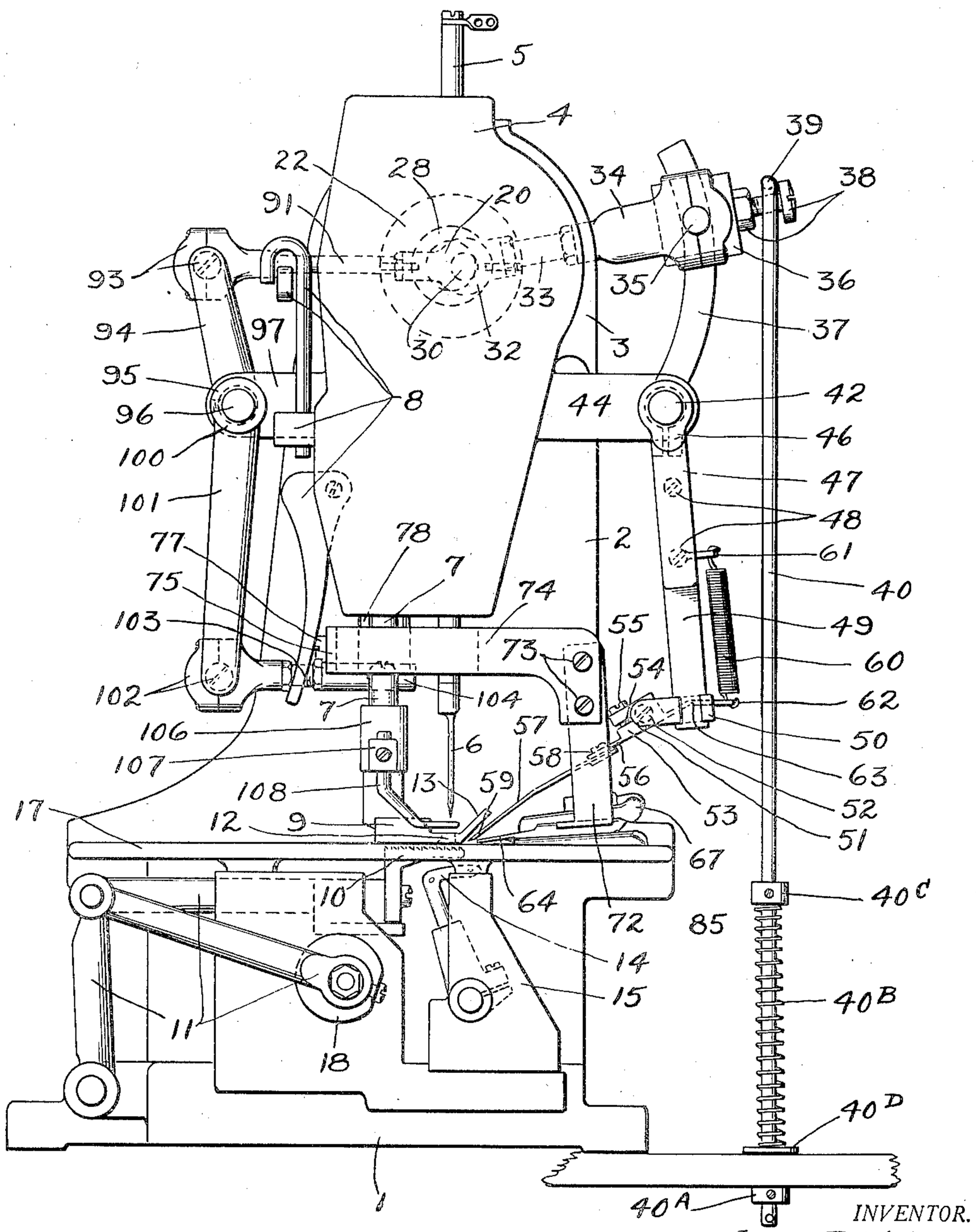


Fig. 1.

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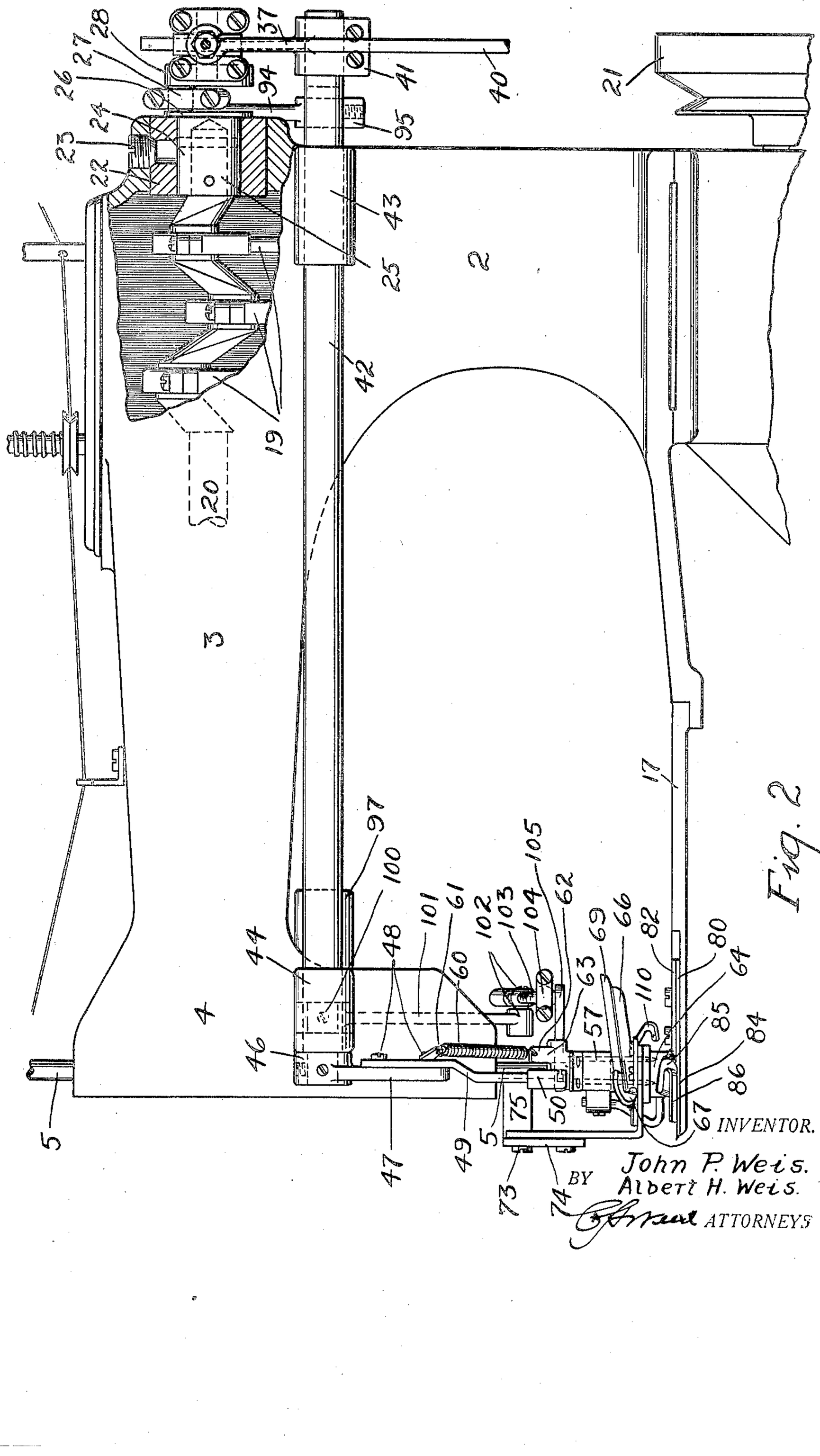


Fig. 2

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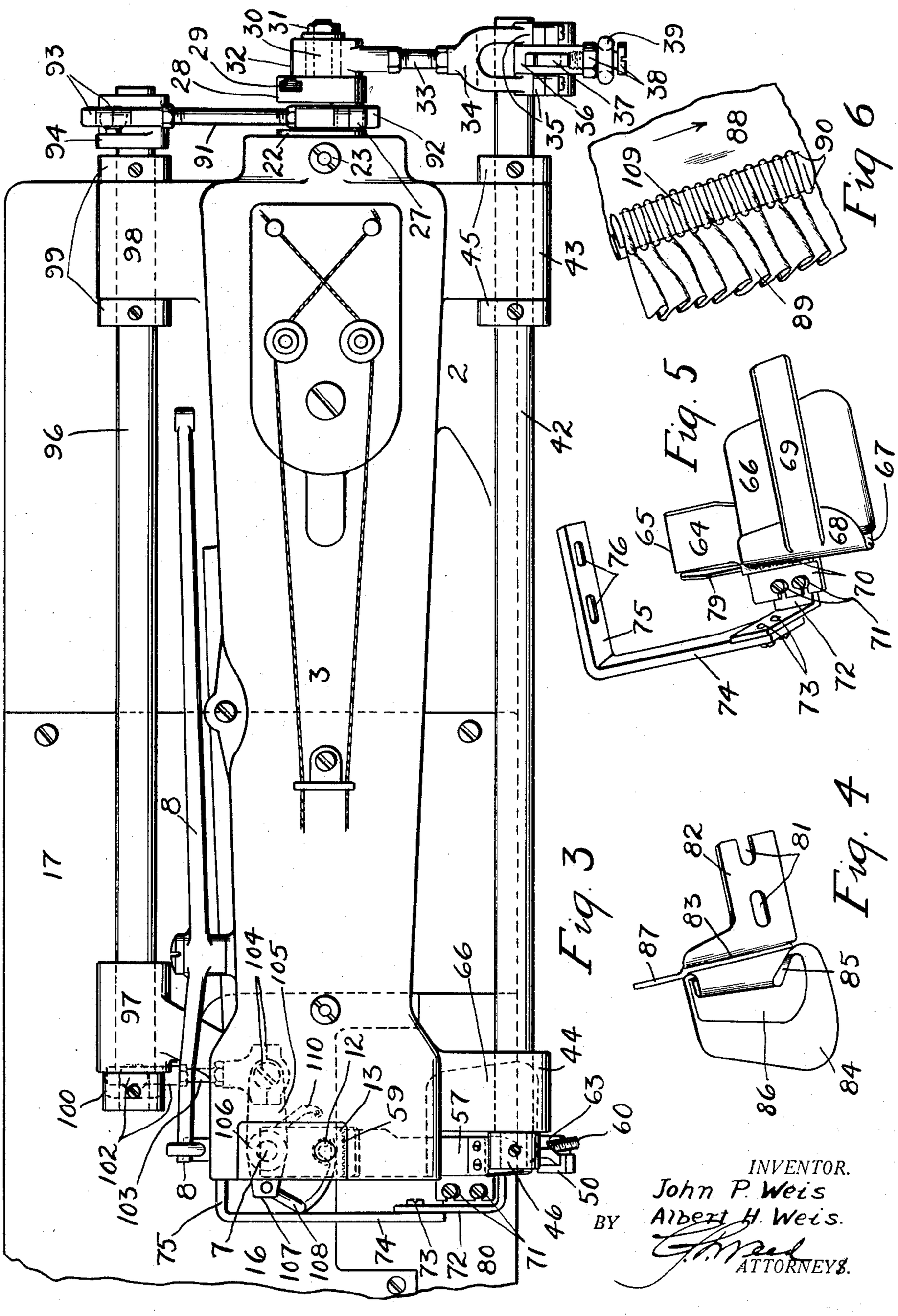


Fig 6




Fig. 5




Fig. 3

Fig. 4




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# UNITED STATES PATENT OFFICE

1,961,951

## COMBINED RUFFLING AND ORNAMENTAL STITCHING MECHANISM

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Application October 27, 1930, Serial No. 491,419

30 Claims. (Cl. 112—100)

This invention relates to sewing machines, the object of the invention being to provide a sewing machine in which, simultaneously with the stitching of a seam or hem, the work may be ruffled and an ornamental stitch or thread applied to the ruffled seam on one surface of the work, as, for instance, to the top of the ruffle, whereby manufacturers are enabled to produce articles such as curtains, drapes, bedspreads, underwear, dresses and many other varieties of articles in an expeditious and inexpensive manner.

Another object of the invention is the provision of an improved sewing machine in which, simultaneously with the folding of one or both edges of superposed plies of work, the folded edges may be ruffled and an ornamental stitch simultaneously stitched down across the folded ruffled edges.

Another object of the invention is the provision of an improved ruffling mechanism.

By means of this improved machine, which may be run at a relatively high speed of 3,000 R. P. M., the cost of producing such articles is materially reduced since it is readily adapted for different kinds of work by the addition of certain attachments, and which work may be finished in one operation on one machine, whereas it formerly required several operations and several machines, thus effecting a substantial reduction in the cost of producing the work while the quality thereof is improved and the quantity increased.

The present improved machine is so organized that the ruffling means is located in front of the needles as distinguished from a ruffling mechanism mounted and operated from the rear of the stitching mechanism, and one of the advantages of this construction is that the ruffling blade operating means can be located high enough above the work or cloth plate of the machine to permit the use of hem folders, guides and other attachments fixed, one on top of the other, for handling overlapping plies of material so essential for economical production of the work. Furthermore, the ruffling mechanism shown has a long ruffling hinge supported blade which permits a delicate resilient downward pressure on the material, thus enabling the most accurate manipulation of the finest to the heaviest fabrics with no change in the adjustment of the ruffler other than the stroke for more or less depth of the fold of the fabric from which the ruffles are to be formed.

Control means for changing the stroke of the ruffling blade is provided which permits instantaneous changes in the stroke of the blade and this is obtained by a foot treadle or knee shift connected to the driving means of the ruffler, thereby permitting complete control thereof at the will of the operator without necessitating the removal of his hands from the work.

The construction is simple and durable and the precise timing relation of the ruffling blade with the needles so essential to good uniform work is provided for by connecting it with the top rotary shaft of the machine, and as it is very important that the ruffling blade deliver each and every ruffle directly under the needles and also hold the material until the needles have passed therethrough to stitch each ruffle in place, this connection with the rotary top shaft which drives the needles assists in accomplishing this result, and this accurate movement cannot be obtained with needle lever sewing machines.

The present improved machine which is built for the job is also provided with a top ornamental stitch forming mechanism effective to lay loops of a cross thread under the needles simultaneously with the stitching and ruffling of the work and at no extra cost, whereby a new finish is produced which will add saleability to the articles to which it is applied. The ornamental character of the stitching, especially when combined with color combinations of stitches by the use of fancy threads will thus produce a combination of striking effects that are much in demand.

Nothing has been found to replace ruffling for decorative trim and where fullness of seams requires material in addition to that of the straight flat seam, the addition of a fancy stitch which may be placed directly over such seam, holding the ruffle in place simultaneously with the sewing and ruffling, effects very important savings in the production of the work and also increases the saleability of the article.

In the drawings accompanying and forming a part of this specification, Figure 1 is an end view of this improved machine.

Figure 2 is a front view thereof.

Figure 3 is a top view of the machine.

Figure 4 is a perspective view of one form of bottom folder.

Figure 5 is a perspective view of one form of top folder with stripper blade, and

Figure 6 shows a piece of work having a folded ruffled seam provided with ornamental stitching across the top thereof.

Similar characters of reference indicate corresponding parts in the several views.

Before explaining in detail the present improvement and mode of operation thereof, we desire to have it understood that the invention is not limited to the details of construction and arrangement of parts which are illustrated in the accompanying drawings, since the invention is capable of other embodiments, and that the phraseology which we employ is for the purpose of description and not of limitation.

In the drawings, the base 1 is provided with a trunk 2 having an overhanging arm 3 terminating in a head 4 in which is located the reciprocating needle bar 5 carrying the needles 6 and also the presser bar 7 operative in the usual way under spring pressure and provided with lifting means 8 that is controlled by the hand or foot by a connection with a foot treadle located under the table.

The presser bar has attached to its bottom end a presser foot 9 coacting with a feed dog 10 of the feed mechanism generally indicated by 11, this feed being the usual four-motion feed for feeding the work. The presser foot has needle holes 12 very close to the upturned front end 13 thereof.

The thread carrying needles co-operate with thread carrying loopers 14 operated by the looper mechanism 15, thereby forming the stitches for sewing the material or joining the seam.

The needles 6 and feed dog 10 work through the throat plate 16 supported by the cloth plate 17 secured to the base of the machine in the usual way. In the base of the machine is located a rotary main shaft 18 for operating the looper and feed mechanisms and this shaft has connecting rods 19, see Figure 2, to impart rotary movement to the top shaft 20. The rear end of the bottom shaft has a belt and hand wheel 21 for driving the lower shaft and its connecting mechanisms.

The connecting rods 19 are coupled to the cranks of the lower and top shafts 18 and 20 and the top shaft is supported near its rear end by split bearings 22 clamped in the frame by screws 23 formed hollow to provide oil conduits to the rotary shaft as at 24. An extension 25 of the rotary shaft 20, which is secured thereto in any suitable way, forms a crank portion of this shaft 20 and is provided with a flange 26 and a crank pin 27 connected to another flange 28 having a T-shaped slot 29 therein, see Figure 3, for the reception of an adjustable crank pin 30 which is clamped in this T-shaped slot by a nut 31. This crank pin 30 carries one end of a pitman 33 having its opposite yoked end 34 coupled freely to bearing pins 35 of a slide block 36 which slides up and down a curved arm or lever 37 and which may be clamped thereto in any position by a screw and nut 38, and to which screw is attached the top end 39 of a long rod 40 which is connected under the table with a knee shift or foot treadle, not shown. To limit the upward movement of this rod, a collar 40A is clamped to the rod 40 in position to engage the under side of the table and by providing a spring 40B located between a collar 40C and a washer 40D, the return movement of the slide block 36 to the top of the curved arm is effected each time pressure is released on the treadle or knee shift. The operation of these parts is necessary to obtain fullness of ruffle each time a corner of the material being ruffled reaches the stitching position. For instance, the corners of ruffled curtains, spreads and other bed covering, cushions and the like all require this manipulation. The curved arm 37 has a hub 41 clamped to a rock shaft 42, rocking in bearings 43 and 44 formed by castings, preferably cast integral with the trunk 2 and head 4 of the machine and projecting laterally therefrom. Collars 45 prevent end movement of the shaft 42 in its bearings. The other end of this shaft has clamped thereto a hub 46, see Figure 2, of a lever 47, which is secured by screws 48 to an offset extension of a lever 49 and to the end of this lever 49 is clamped an adjustable piece 50 having a T-shaped slot to fit over the end of this lever 49. This adjustable piece or block 50 has a projection 51 tapped to receive a shoulder screw 52 forming a pivotal support for the ruffling blade holder 53 and since this must be a very close fit and free from vibration, a saw-cut 54 and screw 55 is provided to adjust the holder 53 on the screw 52. The ruffling blade holder has a reduced extending portion 56 to which the ruffling blade 57 is clamped as at 58. The toothed work engaging end 59 of this ruffling blade carries and projects the ruffles under the upturned end 13 of the presser foot 9 and presents the folded over material to the needles so that these parts will pass through the folder and be prevented from straightening out or drawing back with the backward movement of the ruffling blade. To maintain the ruffling blade teeth in contact with the material to be ruffled, a gentle pressure is brought to bear on the blade 57 by a spring 60, see Figure 1, connected at 61 to the lever 47 and at 62 to the rearward extending reduced end 63 of the ruffling blade holder 53. The construction of these parts is such, although built of light weight, that they will stand up under high speed and require a minimum of upkeep. The ruffling blade 57 coacts with a stripper blade 64 which is also made of spring tempered steel having its free end projecting against the front face of the upturned end 13 of the presser foot, and this stripper blade separates the plies of fabric and prevents the teeth of the ruffling blade from contact with it and it also prevents back drag on the work during the ruffling thereof since the spring action of this stripper blade is upward slightly against the inclined end of the presser foot. This stripper blade 64 is secured to the top hem folder, see Figure 5, and has its end 65 free to spring up and down to a limited extent.

The hem folder comprising a work supporting portion 66, a scroll 67 and an overhanging top wall 68 provided with an extension strip 69 to hold the material flat as it is being folded. The scroll part of this hem folder is attached to a shank 70 that is slotted for screws 71 carried by the L-shaped bracket 72 that is adjustably secured at 73 to a holding bracket 74 provided with a right angle portion 75 having screw openings 76 for attaching the screws 77, whereby the folder may be secured to a block that is clamped to the bushing 78 of the presser bar 7. Thus, it will be seen that by this holding means, the hem folder and stripper blade are conveniently located so that adjustments thereof can be readily made while the delivery of the hemmed material is directly to the ruffling and stitching positions. To prevent the hemmed edge from getting out of control the shank 70 of the folder has a projection forming a side wall or guide 79 that reaches close to the presser foot.

For hemming the bottom ply of the material, a folder such as shown in Figure 4 is secured to the cloth plate slide 80 by screws extending through openings 81 of the shank 82 of the folder.

This shank 82 has a wall 83 to which the hem folder is secured and the folder comprises a bottom portion 84 bent upward and over forming a scroll 85 and then under and outward to form a guard portion 86 which may be made of one piece of metal if desired. Thus, the goods passes through in folded-over form with the turned portion resting against the extension 87 which reaches close to the presser foot.

In Figure 6, the arrow indicates the direction of the feed of the work, while 88 indicates that portion or ply of the work which passes through the bottom folder, Figure 4, and 89 that portion or ply which passes through the top folder Figure 5, the two folds being superposed upon and with the folded edges opposite each other. The folds, it will be observed, are narrower than the needle spacing to prevent the raw edges from protruding beyond the stitch lines 90 made by the needles and looper threads.

The ornamental stitch mechanism is operated by the crank pin 27 driving the pitman 91, see Figure 3, one end of which connects with this crank pin while the other end 93 is connected by a ball and socket joint with the lever 94 secured at 95 to a rock shaft 96 operating in bearings 97 and 98 formed by castings preferably integral with the trunk 2 and head 4 of the machine, and therefore extending laterally therefrom but at the rear side thereof.

Collars 99 secured to this rock shaft prevent end movement thereof in its bearings. The forward end of the rock shaft 96 has clamped thereto a hub 100 of a lever 101 having a ball and socket connection 102 with one end of a pitman 103, the opposite end of which, 104, has a ball and socket connection with an arm 105 of a rock lever hub 106 pivotally supported on the presser bar 7 just above the presser foot 9. Another arm 107 of this rock lever hub 106 carries a thread manipulating finger 108 having a hook or eye in the free end for carrying and forming loops of thread to make the ornamental stitches represented by 109 in Figure 6. These loops of thread lie on the ruffled surface and thus decorate the same and also hold the folds of material more accurately in place. This cross thread carrying finger 108 co-operates with a stationary thread guide 110 secured to the presser foot with its free end resting at the right and slightly in the rear of the right hand needle to deliver a bite of its thread to the carrying finger 108 at each cycle of the machine.

In the present instance, the improvements are applied to the well-known Metropolitan long-arm type of sewing machine, although the invention is not limited thereto for any other form of top shaft machine can be used, but as the Metropolitan top arms are separable from the base thus permitting the interchangeable use of different heads equipped for different uses with different mechanisms, they offer a wide range of bottom stitching and feeding mechanisms that meet the needs of the manufacturers in the simplest form and with the least expense.

From the foregoing, it will thus be seen that the ruffling mechanism and ornamental cross thread laying mechanism are operated, each by its own rock shaft, one located in front and the other in the rear of the sewing machine and supported by laterally extending castings carried by the trunk and head of the machine and which rock shafts are operated from the top rotary shaft operating the needle mechanism which, in turn, is operated by the lower driving shaft operating the looper and feed mechanisms, thus providing a very simple and convenient operating means for the ruffling mechanism and cross thread laying mechanism, and by means of which the ruffling mechanism is so located that, as hereinbefore stated, various attachments including the folding means herein shown may be readily used to provide a folded, ruffled, ornamentally stitched piece of work, all of which may be done at one and the same operation on one and the same machine, thus avoiding the necessity of using separate machines and separate operators which, obviously increases the cost of production since power, space, thread and money are all saved by this improved machine while a very highly ornamented piece of work is the result.

In Figure 6, the cross thread 109 is shown lying in loop form and held in position by the needle threads. The finger for carrying the cross thread obtains its movement from the top shaft of the machine by means of the eccentric crank and the rock shaft mechanism so that this finger vibrates back and forth in front of the needles and thus lays a loop of thread in the path of the needles for each stitch and, to do this, the stationary finger 110 is essential and its location with respect to the needle is of importance in order that the thread be carried into a position by the finger 108 to permit the left hand needle to pass down through a loop of thread 109 and the right hand needle step over the strand of thread whereby the stitches will secure the loops to the ruffled surface of the work as shown.

In other words, by the present mechanism, the cross thread is not laid in the path of the needles at every second stitch but is laid in the path of the needles at each stitch.

It is to be understood that by describing in detail herein any particular form, structure or arrangement, it is not intended to limit the invention beyond the terms of the several claims or the requirements of the prior art.

Having thus explained the nature of our said invention and described a way of constructing and using the same, although without attempting to set forth all of the forms in which it may be made or all of the modes of its use, we claim:

1. In a sewing machine, the combination of stitching mechanism including needles, means for folding the edges of superposed plies of work with the folded edges opposite each other, means for ruffling the work, and means for laying an ornamental stitch across the folded portion of the work, said cross stitch means comprising a fixed thread guide located adjacent to the needles of the stitching mechanism and a shiftable thread laying finger.

2. In a sewing machine having stitching mechanism including a needle bar, the combination of ruffling means, means for laying an ornamental cross stitch on one surface of the work, means for operating the ruffling means and comprising a rock shaft, and means for operating the cross thread laying means and also comprising a rock shaft.

3. In a sewing machine having stitching mechanism including a needle bar, the combination of means for laying an ornamental cross stitch on one surface of the work, ruffling means, means for operating the ruffling means and comprising a rock shaft, and means for operating the cross thread laying means and also comprising a rock shaft, both extending lengthwise of and one located at the front and the other at the rear of the machine.

4. In a sewing machine having a trunk and a head connected therewith and having laterally extending castings at the front and rear of said trunk and head, rock shafts carried by said castings, a driving shaft, means connected therewith and with the rock shafts for operating them, a needle bar in the head, ruffling means connected with one of said rock shafts for ruffling the work, and ornamental stitch laying means connected with the other rock shaft.

5. In a sewing machine having a trunk and a head connected therewith and having laterally extending castings at the front and rear of said trunk and head, rock shafts carried by said castings, a driving shaft, means connected therewith and with the rock shafts for operating them, a needle bar in the head, ruffling means connected with one of said rock shafts for ruffling the work, and ornamental stitch laying means connected with the other rock shaft, said ruffling means including a resilient reciprocating ruffling blade a resilient stripper blade co-operating therewith, and means projecting above the ruffling blade for suspending said stripper blade below the ruffling blade.

6. In a sewing machine having a trunk and a head connected therewith and having laterally extending castings at the front and rear of said trunk and head, rock shafts carried by said castings, a driving shaft, means connected therewith and with the rock shafts for operating them, a needle bar in the head, needles carried by said bar, ruffling means connected with one of said rock shafts for ruffling the work, and ornamental stitch laying means connected with the other rock shaft, said ornamental stitch laying mechanism comprising a fixed thread guide located adjacent to the needles of the stitching mechanism and an oscillating thread guide.

7. In a sewing machine having a trunk and a head connected therewith and having laterally extending castings at the front and rear of said trunk and head, rock shafts carried by said castings, a driving shaft, means connected therewith and with the rock shafts for operating them, a needle bar in the head, needles carried by said bar, ruffling means connected with one of said rock shafts for ruffling the work, and ornamental stitch laying means connected with the other rock shaft, said ornamental stitch laying mechanism comprising a fixed thread guide located adjacent to the needles of the stitching mechanism and an oscillating thread guide, and said ruffling mechanism comprising a reciprocating resilient blade.

8. In a sewing machine having a trunk and a head connected therewith and having laterally extending castings at the front and rear of said trunk and head, rock shafts carried by said castings, a driving shaft, means connected therewith and with the rock shafts for operating them, stitching means including needles, ruffling means connected with one of said rock shafts for ruffling the work, ornamental stitch laying means connected with the other rock shaft, said ornamental stitch laying mechanism comprising a fixed thread guide located adjacent to the needles of the stitching mechanism and an oscillating thread guide, and said ruffling mechanism comprising a reciprocating resilient blade, and means for folding one edge of the work prior to the ruffling thereof.

9. In a sewing machine having a trunk and a head connected therewith and having laterally extending castings at the front and rear of said trunk and head, rock shafts carried by said castings, a driving shaft, means connected therewith and with the rock shafts for operating them, stitching means including needles, ruffling means connected with one of said rock shafts for ruffling the work, ornamental stitch laying means connected with the other rock shaft, said ornamental stitch laying mechanism comprising a fixed thread guide located adjacent to the needles of the stitching mechanism and an oscillating thread guide, and said ruffling mechanism comprising a reciprocating resilient blade, and means for folding both edges of superposed plies of work prior to the ruffling thereof.

10. In a sewing machine having, in combination, means for ruffling the work, ornamental thread laying means for laying an ornamental thread across the ruffled work, and stitching mechanism for simultaneously stitching down the ornamental stitches and ruffles of the work and including operating means for the stitching mechanism comprising a rotary shaft, operating means for the ruffling means comprising a shaft, and operating means for the ornamental stitching mechanism comprising a shaft, said last pair of shafts connected with the rotary shaft at one end of the machine and with the ruffling means and ornamental stitching mechanism at the opposite end of the machine.

11. In a sewing machine having, in combination, means for ruffling the work, ornamental thread laying means for laying an ornamental thread across the ruffled work, and stitching mechanism for simultaneously stitching down the ornamental stitches and ruffles of the work and including operating means for the stitching mechanism comprising a rotary shaft, operating means for the ruffling means comprising a shaft, and operating means for the ornamental stitching mechanism comprising a shaft, said last pair of shafts being connected with the rotary shaft at one end of the machine and with the ruffling means and ornamental stitching mechanism at the opposite end of the machine and located at opposite sides of the machine.

12. In a sewing machine having, in combination, means for ruffling the work, ornamental thread laying means for laying an ornamental thread across the ruffled work, and stitching mechanism for simultaneously stitching down the ornamental stitches and ruffles of the work and including operating means for the stitching mechanism comprising a rotary shaft, operating means for the ruffling means comprising a rock shaft, and operating means for the ornamental stitching mechanism comprising a rock shaft, said last pair of rock shafts being connected with the rotary shaft and located at opposite sides of the machine, and means comprising laterally extending castings forming bearings for said rock shafts.

13. In a sewing machine for ruffling, hemming and ornamental stitching in one operation and having, in combination, a folder for folding the edge of the work, means for ruffling the folded edge, means for laying an ornamental stitch across the folded edge, and stitching mechanism including a needle bar for simultaneously stitching down the ornamental stitch and the ruffled edge.

14. In a sewing machine for ruffling, hemming and ornamental stitching in one operation and having, in combination, a folder for folding the edge of the work, means for ruffling the folded edge, means for laying an ornamental cross stitch

over the folded edge, stitching mechanism for simultaneously stitching down the ornamental stitch and the ruffled edge, and means for operating said ornamental stitching mechanism and said ruffling means, each comprising a rock shaft, and means for driving the stitching mechanism and connected with said rock shafts at one end of the machine, the connection of the rock shafts with said ornamental stitching and ruffling means being located at the opposite end of the machine.

15. In a sewing machine for ruffling, hemming and ornamental stitching in one operation and having, in combination, a folder for folding the edge of the work, means for ruffling the folded edge, means for laying an ornamental cross stitch over the folded edge, stitching mechanism for simultaneously stitching down the ornamental stitch and the ruffled edge, and means for operating said ornamental stitching mechanism and said ruffling means, each comprising a rock shaft, and means for driving the stitching mechanism and connected with said rock shafts at one end of the machine, the connection of the rock shafts with said ornamental stitching and ruffling means being located at the opposite end of the machine, said rock shafts being located, one at the front and the other at the rear of the machine.

16. In a sewing machine having, in combination, stitching mechanism a driving shaft therefor, and ruffling mechanism, the latter comprising a ruffling blade located in front of the stitching mechanism, a rock shaft, an upwardly extending arm therefrom and connected with the driving shaft for rocking the rock shaft, a depending lever connected with said shaft for supporting the rear end of the blade, spring means for maintaining the blade in contact with the material to be ruffled, and means carried by said upwardly extending arm for adjusting the throw of said blade, said rock shaft and its arm and lever all located at the front of the machine.

17. In a sewing machine having, in combination, means for ruffling and hemming a part of the work and hemming only another part of the work, a shiftable ornamental thread laying means for laying an ornamental thread across the work and so organized as to lay a loop of thread in the path of the needles for each stitch, and stitching mechanism including needles for stitching down the ornamental thread.

18. In a sewing machine having a presser foot bar and, in combination, means for ruffling and hemming a part of the work and hemming only another part of the work, ornamental thread laying means for laying an ornamental thread across the work and stitching mechanism for stitching down the ornamental thread, said thread laying means comprising a fixed thread guide and a shiftable thread guide having its axis of movement coinciding with the axis of the presser foot bar.

19. In a sewing machine for ruffling, hemming and ornamental stitching in one operation and having stitching mechanism for joining the work, the combination of means for folding a hem in the lower part of a superposed seam, means for folding a hem and ruffling the top part of said seam, and means for laying an ornamental stitch across the ruffled seam of the work transversely thereof and the joining stitch.

20. In a sewing machine for ruffling, hemming and ornamental stitching in one operation and having a presser foot bar and stitching mechanism, the combination of means for folding a hem in the lower part of a superposed seam, means for folding a hem and ruffling the top part of said seam, and means for laying an ornamental stitch across the ruffled seam of the work, said thread laying means comprising a fixed thread guide and a shiftable thread carrier having its axis of movement coinciding with the axis of the presser foot bar.

21. In a sewing machine for ruffling, hemming and ornamental stitching in one operation and having stitch mechanism including a needle bar, needles carried by the bar, the combination of means for folding a hem in the work, means for ruffling the work, and means for laying an ornamental stitch across the ruffled seam of the work and so organized as to lay a loop of thread in the path of the needles for each stitch.

22. In a sewing machine for ruffling, hemming and ornamental stitching in one operation and having a presser foot bar and stitching mechanism including needles, the combination of means for folding a hem in the work, means for ruffling the work, and means for laying an ornamental stitch across the ruffled seam of the work and so organized as to lay a loop of thread in the path of the needles for each stitch and comprising a shiftable thread carrier having its axis of movement coinciding with the axis of the presser foot bar.

23. In a sewing machine, the combination of means for ruffling the work, ornamental thread laying means for laying an ornamental thread across the ruffled work and stitching mechanism for simultaneously stitching down the ornamental stitches and ruffles on the work, a rotary shaft for operating the stitching mechanism, a rock shaft connected with the rotary shaft for operating the ornamental stitching mechanism, and a rock shaft connected with the rotary shaft for operating the ruffling mechanism, said last rock shaft connection including a slidable block and a curved arm carrying said block.

24. In a sewing machine, the combination of means for ruffling the work, ornamental thread laying means for laying an ornamental thread across the ruffled work and stitching mechanism for simultaneously stitching down the ornamental stitches and ruffles on the work, a rotary shaft for operating the stitching mechanism, a rock shaft connected with the rotary shaft for operating the ornamental stitching mechanism, and a rock shaft connected with the rotary shaft for operating the ruffling mechanism, said last rock shaft connection including a slidable block, a curved arm carrying said block, and means for shifting said block on said arm thereby to vary the movement of the ruffling means.

25. In a sewing machine having stitching mechanism including a needle bar, the combination of means for ruffling the work, and shiftable means for laying an ornamental stitch across the ruffled seam of the work.

26. In a sewing machine having stitching mechanism including a needle bar and a presser foot bar, the combination of means for ruffling the work, means independent of the needle and presser foot bars for operating the ruffling means, and shiftable means for laying an ornamental stitch across the ruffled seam of the work.

27. In a sewing machine having stitching mechanism including a needle bar and a presser foot bar, the combination of means for ruffling the work, and means for laying an ornamental stitch across the ruffled seam of the work and

comprising a fixed thread guide and a shiftable thread carrier having its axis of movement coinciding with the axis of the presser foot bar.

28. In a sewing machine having a presser foot bar and stitching mechanism including a plurality of needles, the combination of means for ruffling the work, and means for laying an ornamental stitch across the ruffled seam of the work so organized as to lay a loop of thread in the path of the needles for each stitch and comprising a shiftable thread carrier having its axis of movement coinciding with the axis of the presser foot bar.

29. In a sewing machine for ruffling, hemming and ornamental stitching in one operation and having stitching mechanism for joining the work, the combination of means for folding a hem in the work, means for ruffling the work, and means for laying an ornamental stitch across the ruffled seam of the work transversely thereof and the joining stitch.

30. In a sewing machine for ruffling, hemming and ornamental stitching in one operation, the combination of stitching mechanism for joining the work, means for folding the edges of superposed plies of work, means for ruffling the work, and means for laying an ornamental stitch across the folded portion of the work transversely thereof and the joining stitch.

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