A. H. DE VOE.

RUFFLING AND STITCHING MACHINE.

APPLICATION FILED OCT. 13, 1908.

983,031.

Patented Jan. 31, 1911.

2 SHEETS—SHEET 1.

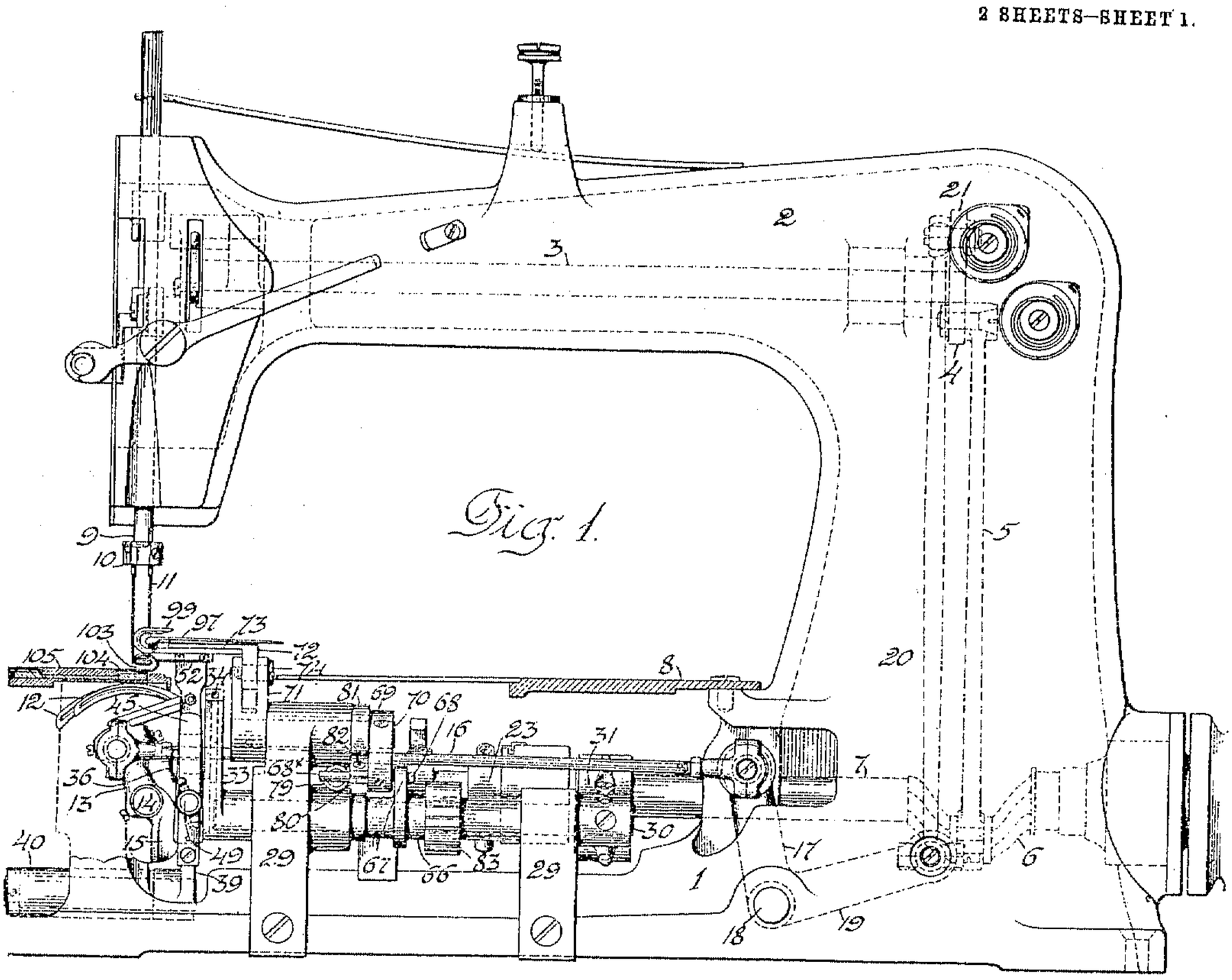

Fig. 1.

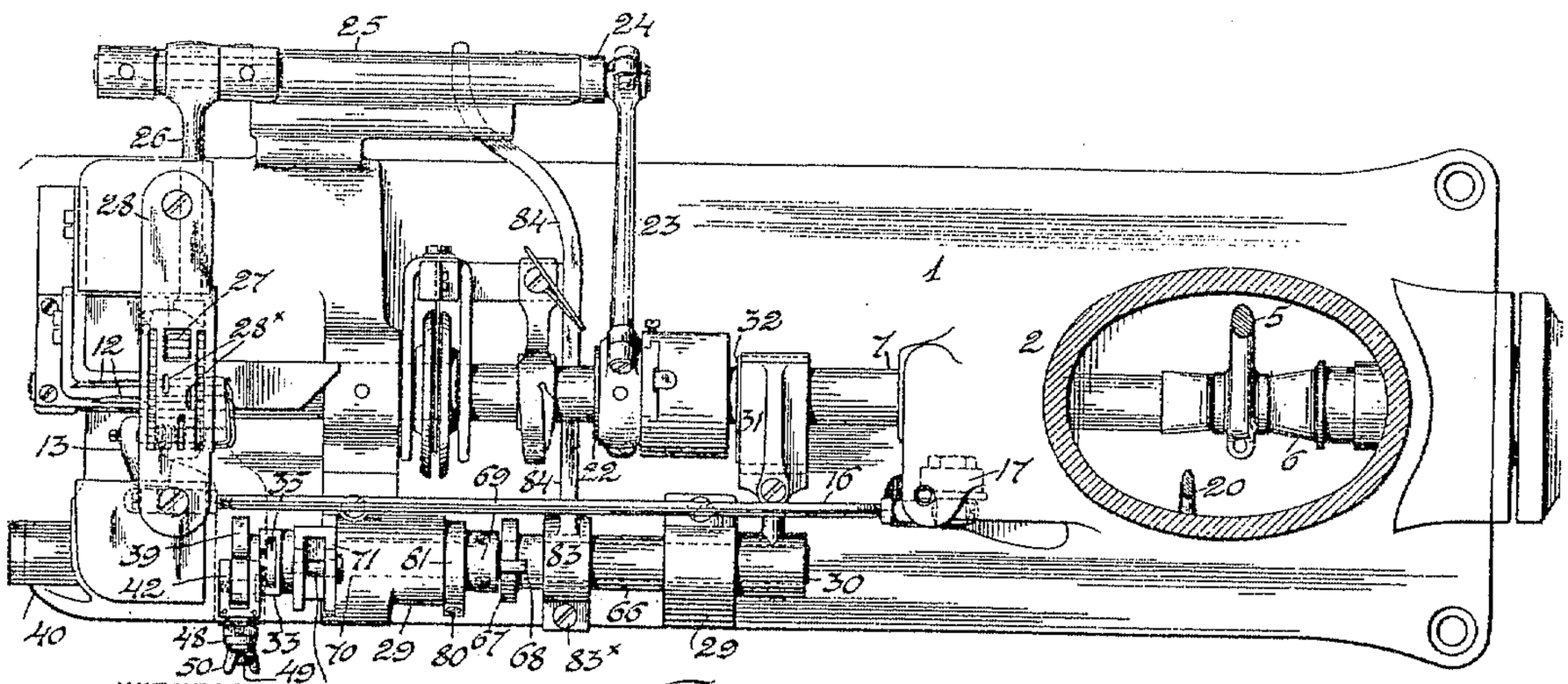

Fig. 2.

WITNESSES

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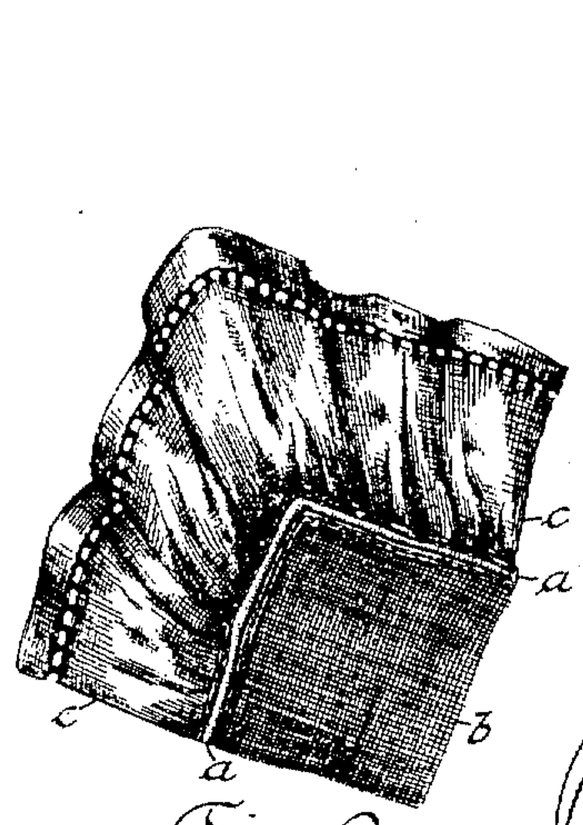

Fig. 9.

Fig. 3.

Fig. 7.

Fig. 8.

Fig. 4.

Fig. 6.

Fig. 4a.

Fig. 5.

Fig. 6a.

WITNESSES

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RUFFLING AND STITCHING MACHINE.

983,031. Specification of Letters Patent. **Patented Jan. 31, 1911.**

Application filed October 13, 1908. Serial No. 457,538.

To all whom it may concern:

Be it known that I, ALBERT H. DE VOE, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Ruffling and Stitching Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates more particularly to that class of ruffling mechanism in which the ruffling blade is carried by a vibrating arm extended upwardly from a supporting shaft mounted beneath the bed-plate, and it has for one of its objects to provide manually operated controlling means for varying the fullness of the ruffles produced while the machine is in operation, whereby, in the turning of sharp corners, as in the ruffling and stitching of the borders of curtains, pillow-shams and other articles having attached ruffled marginal strips, the fullness of the ruffle may be increased so that additional slack will be provided to prevent the outer portion of the marginal strip becoming taut in being extended over the increased area which it there occupies as compared with the adjacent portions.

Another object of the invention is to provide means for insuring the movement of the unstitched ruffles from the advance position of the ruffling blade to the stitch-forming mechanism without disturbing the folds initially presented by the ruffling member.

The invention consists in the various constructive features shown, described and claimed herein.

In the accompanying drawings, Figure 1 is a side elevation of a sewing machine embodying the present improvement, with the work-plate in section and a portion of the frame broken out to expose the operative parts behind the same, and Fig. 2 is a sectional plan of the machine with the overhanging bracket-arm and the cloth-plate removed. Fig. 3 is a front end view of the machine with the face-plate omitted. Fig. 4 is a detail sectional elevation of a part of the ruffler controlling means and Fig. 4ª a similar elevation of another portion of the same mechanism. Fig. 5 is a perspective view showing the presser-foot and the several parts coöperating therewith in presenting the fabric to the stitching mechanism. Fig. 6 is a sectional elevation of the presser-foot and the fabric engaging parts carried thereby and Fig. 6ª a bottom view of the same. Fig. 7 is a perspective view of the edge-folder and Fig. 8 a similar view of the separator-plate and its carrier. Fig. 9 is a view representing a corner of a sash-curtain provided with a ruffled margin applied by the use of the present improvement.

The frame of the machine is constructed with the base 1 and hollow overhanging bracket-arm 2 in which is journaled the needle-actuating rock-shaft 3 having a lateral crank 4 connected by means of the pitman 5 with an actuating crank 6 in the main-shaft 7 journaled in the base 1 beneath the work-plate 8. The rock-shaft 3 has at its forward end a crank-and-pitman connection with the reciprocating needle-bar 9 provided with the twin needle-clamp 10 carrying the diagonally arranged needles 11 coöperating with the thread-carrying loopers 12 mounted upon the rocking carrier 13 fulcrumed at 14 upon the transversely rocking frame 15 and having a pitman connection 16 with the upright arm 17 of a bell-crank-lever mounted upon the fixed fulcrum 18 and having a lateral arm 19 connected by means of a pitman 20 with a second crank-arm 21 upon the rearward end of the needle-actuating rock-shaft 3 from which the loopers derive their longitudinal or loop-seizing and shedding movements.

The main-shaft carries the usual feed-actuating eccentric 22 embraced by a strap upon one end of the eccentric-rod 23 whose opposite end is connected with a crank-arm 24 of the feed-rocker 25 to which is pivotally connected the rear end of the feed-bar 26 to whose forward end is secured the feed-dog 27 whose serrated feeding surfaces enter suitably disposed apertures in the throat-plate 28. The feed-bar may be provided with any usual or suitable lifting means.

Mounted in suitable bearing bosses 29 at the front side of the bed 1 is the ruffler actuating rock-shaft 30 provided at its rearward end with a lateral arm 31 forked to embrace an actuating eccentric 32 fixed upon the main-shaft and adapted to impart rocking movements to the ruffler shaft, which

has fixed upon its forward end an upright arm 33 with an undercut slot 34 running lengthwise thereof in which is slidingly fitted the head 35 of a screw-stud 36 entering a slide-block 37 fitted within a slot 38 in an upright arm 39 fulcrumed upon the supporting rocking pin 40 which is mounted within a suitable bearing at the front end of the machine bed. The slotted arm 39 is formed at its upper end with a lug 41 entering a slot in the carrier-block 42 pivoted thereon by means of the transverse pin 43, said block being provided with a depending stop-finger 44 normally pressed toward the adjacent edge of the arm 39 by the action of a flat spring 45 having its lower end secured by a pin 46 in a lug 47 upon the front side of the arm 39, such lug having an upward extension 48 through which is tapped the adjusting screw 49 whose point rests upon the spring 45, and which adjusting screw is maintained in position by means of a set-nut 50. By turning the adjusting screw 49 in one or the other direction, the tension of the spring 45 may be increased or decreased upon the depending finger 44 of the block 42. The finger 44 is provided intermediate its ends with the stop-screw 51 whose point is adapted to engage the adjacent edge of the arm 39 for adjustment of the initial relation of the block 42 to the ruffler supporting arm.

The ruffling member consists of a flat blade 52 secured by means of screws 53 upon a seat afforded by the upper face of the block 42 and having the usual serrated forward end.

In chain-stitch machines it is impracticable to extend the path of operative movement of the ruffling blade beyond the needle-paths to insure the catching of the folds by the needles before the feeding operation so as to prevent disarrangement in the advance of the fabric, as this is likely to impair the effective coöperation of the stitch-forming members in the production of stitches. According to the present improvement, the serrated operative surfaces of the feed-dog 27 are extended forwardly some distance beyond the needle-holes $28^{\times}$, and the forward portion of the ruffling blade is provided with notches 54 to accommodate these extended feeding surfaces, in order that the operative portion of the ruffling blade may not be interposed in the fold of the ruffle between the operative faces of the feed-dog and the under side of the presser-foot 55 between which the folds of the ruffle are compressed and the faces of the several plies are sufficiently interlocked to prevent their disarrangement under the feeding action. As will be evident, were the ruffling blade 52 left continuous so as to partially overlie the feed-dog, the overlapping portion would serve to shield the upper ply of the ruffle from the action of the feed-dog, and the two lower plies would be advanced while the upper ply would be clamped between the ruffling blade and the presser-foot, and the ruffle thus reduced and distorted.

As herein represented, the presser-foot is provided with the usual slotted needle-holes 56 extending within the central channel 57 in the bottom of the foot into the forward end of which channel also extends the delivery end of the integral strip fold-guide tube 58 with the forming member 59 and guide-eye 60. The foot 55 is formed with an upwardly inclined extension 61 formed in the lower face intermediate its ends with a transverse recess 62 and is provided along one edge at its upper end with a lug 63 having a slit in its inner side in which is secured by means of fastening screws 64 one side of a spring detent-blade 65 whose serrated operative edge is disposed near the lower end of the recess 62 but spaced from the bottom of the same to permit the slight yield of the same in the operation of the ruffling devices. As the detent-blade is secured to the presser-foot along one edge and at its forward end only it is adapted to yield differently on opposite sides to accommodate any slight unevenness in the work.

Mounted upon the ruffler actuating rock-shaft 30 intermediate the bearing posts 29 is a sleeve 66 having fixed thereon an upwardly extending finger 67 normally resting in contact with a pin 68 carried by a depending crank-arm 69 fixed upon a rock-shaft 70 which is mounted in the forward bearing post 29 above and parallel with the rock-shaft 30 and carries at its forward end an upwardly extending arm 71 forked to receive the depending shank 72 of a carrier-plate 73, which is pivotally connected therewith by means of the stud-screw 74. Upon the carrier-plate 73 is secured the shank 75 of the separator-plate 76, the shank 75 being provided with parallel slots 77 through which are extended the fastening screws 78 by means of which the separator-plate is provided with means of adjustment transversely of the supporting rock-shaft 70. The forward or operative portion $76^{\times}$ of the separator-plate is disposed intermediate the ruffling blade 52 and detent-blade 65, as indicated in Fig. 5, the relation of its forward edge to the initial position of the serrated edge of the ruffling blade determining the time of engagement of the ruffling blade with the under face of the fabric interposed between the same and the presser-foot. The separator-plate carrying arm 71 is normally maintained in its forward position by the action of a spring 79 interposed between a web $29^{\times}$ of the forward post 29 and a forward extension $68^{\times}$ of the pin 68, the latter being forced by the spring into contact with a stop shoulder

formed by the lateral ears 80 of a split collar 81 clamped adjustably by means of the screw 82 upon a reduced portion of the upper bearing boss of the forward post 29. By circumferentially adjusting the collar 81, it will be observed that the ears 80 will assume such positions as will cause the desired initial positioning of the separator-plate 76.

Clamped upon the sleeve 66 is the split hub 83 of a rearwardly extending lever 84 having at its rear end an eye for connection with the upper end of a chain 85 whose lower end is attached to the perforated lug 86 of a laterally adjustable plate 87 carried by the treadle plate 88 pivotally mounted by means of the pin 89 upon the lug 90 of the floor plate 91. The attachment plate 87 is adapted to swing around the rounded toe portion of the treadle-plate 88 upon the clamping fastening screw 92, to enable the lug 86 to be set upon the front or either side of the treadle-plate, the forward end of which latter is normally maintained tilted upwardly by means of the spring 93. The floor-plate 91 is provided upon opposite sides of the lug 90 with bosses 94 to which are fitted for vertical adjustment the stop-screws 95 provided with jam-nuts 96 and serving to limit the tilting motions of the treadle plate 88 in both directions. By depressing the treadle-plate 88, the lever 84 will be drawn downward and the sleeve 66 rocked to correspondingly turn the rock-shaft 70 and retract the separator-plate so as to produce the increased action of the ruffling blade upon the fabric to be ruffled.

In order to turn in the edge of the border to be ruffled, an edge-folder is provided composed of the supporting plate 97 affording at its forward edge a tongue 98 around which the margin of the fabric is turned by means of the scroll 99 attached to said plate. The folder is adjustably secured upon the carrier-plate 73 by means of fastening screws 100 passing through elongated holes 101 therein and tapped into a reinforcing plate 97× upon the under side of the folder-plate 97, the portion of the latter overlying the shank or foot 75 of the separator-plate being provided with apertures 102 for access to the fastening screws 78. As will be observed, by loosening the screws 100, the folder-plate 97 may be shifted crosswise of the scroll 99 to vary the relation of the fold to the stitching line.

In Fig. 1 is represented in sectional end view an edge-turning scroll 103 for the margin of the body fabric, which is formed at one edge of a plate 104 carried by a slide 105 suitably applied to the cloth-plate 8. As the specific construction of this edge-turning guide is not material to the present invention, no further description thereof is necessary.

In the use of the machine, constructed in accordance with the foregoing description, the presser-foot is raised and a tape *a* is passed through the guide-eye 60 and introduced into the arched mouth of the fold-guide tube 58 over the forming member 59, and thence lead into the channel 57 of the presser-foot with its opposite edges inturned. The margin of the body fabric *b* is introduced from the left into the scroll 103 and the margin of the border fabric *c* is similarly introduced from the right into the edge-turning scroll 99, the folded edge of the body fabric being led over the throat-plate beneath the ruffling blade 52 and the similarly folded edge of the border fabric being led intermediate the separator-foot 76 and the detent-blade 65 carried by the presser-foot, the covering strip or tape entering the channel 57 of the foot intermediate the parts 52 and 65 and the needle holes 56. The presser-foot being lowered and the machine started, the ruffling blade 52, pressed upwardly by the action of the spring 45, works idly upon the bottom of the separator-plate 76 until it advances beyond the forward edge of the latter, when it engages the border fabric and advances the same toward the needle-paths and beyond the forward end of the feed apertures in the throat-plate, through which the serrated feeding surfaces of the feed-dog 27 rise, passing through the notches 54 of the ruffling blades 52 and compressing the body fabric and superposed plies forming a ruffle of the border fabric against the detaining blade 65 and bottom of the presser-foot 55, serving to advance the several plies equally while the ruffling blade 52 is retracted from the fold or plait produced thereby for a subsequent operation, the serrated forward edge of the detent-blade 65 serving to strip the border fabric from the ruffling blade 52 in the backward movement of the latter. The detent-blade 65 thus acts not only to detain the portions of fabric advanced by the ruffling-blade, but serves as a yielding wearing member for the upturned portion of the presser-foot to sustain the thrust of the ruffling-blade 52. As represented in the drawings, the serrated work-engaging edge of the detent-blade bears such relation with the lower face of the presser-foot opposed to the feed-dog, which extends slightly forward of the upturned portion of the presser-foot provided with such work-engaging implement, that this serrated edge of the detent-blade affords a yielding pressure member for insuring the operative engagement of one portion of the fold with the operative face of the feed-dog while the advance portion of the fulled fabric is securely gripped between the rigid portion of the presser-foot and the feed-dog so as to insure the proper propulsion of the work. Ac-

cording to the present improvement, in which the ruffling-blade is interposed between the feed-dog and the fabric to be ruffled, the forward end of the ruffling-blade would act as a shield to prevent the engagement of the forward portion of the feed-dog with a part of the fold advanced by the ruffling-blade were it not for the notches 54 in the latter which allow the feeding surfaces to act freely upon the bottom of the work in conjunction with the yielding serrated edge of the detent-blade 65 and the bottom of the presser-foot. As the construction and arrangement of the constituent elements of the ruffling blade actuating mechanism are such as to impart to the latter uniform operative or work-advancing movements for each initial stroke-adjustment, it is evident that the ruffles normally produced by the machine will be of equal depth; but the depressing of the operating lever 84 by tilting of the treadle-plate 88 causes the rocking of the supporting shaft 70 and retraction of the carrier 73, with the consequent earlier exposure of the border fabric to the action of the ruffling blade, whereby deeper ruffles are formed and greater fullness in the ruffled border is afforded to compensate for the spreading of the outer periphery of the border around angles of the body fabric to be bordered, as represented in Fig. 9. As already explained, the initial position of the normally stationary separator-plate 76 may be determined by the adjustment of the stop-collar 81 with its projecting ears in engagement with the shoulder afforded by the spring-pressed pin 68×, and the range of retractive movement of the separator-plate is fixed by the range of movement of the vibrating operating lever 84 whose upward limit of movement is fixed by the main-shaft 7 serving as a stop therefor, and whose downward movement is similarly arrested by the rearward edge of the bed 1. It is evident, however, that by the loosening of the clamp-screw 83× of the split hub 83, the position of the lever 84 may be adjusted upon the rocking sleeve 66 and the throw of the separator-plate may thus be altered when desired.

It is to be understood that, while special means are provided to determine the range of movement of the separator-plate, the suitable actuation of the operating lever 84 by the operator will serve to control the size of the ruffles to any desired degree intermediate the limits provided by the adjusting means.

To insure entire freedom in the handling of the several plies of work, and to provide convenient means for shifting the separator-plate forward and backward in the line of feed, it is important that the actuating mechanism for the separator-plate should be arranged below the level of the work-plate, and should preferably have its point of connection with the actuating treadle or knee-lever at the back of the machine; and the present improvement has been designed to meet such requirements.

As the throw of the ruffling blade 52 may be changed by shifting the screw-stud 36 lengthwise of the vibrating actuating arm 33, and the initial position and degree of retraction of the separator-plate are susceptible of adjustment, it is evident that the present machine is adapted for a wide range of work of the class described, although certain of its constructive features are adapted for employment in other kinds of machines fitted for different classes of work.

From the foregoing description, it will be observed that many of the details of construction and arrangement which are considered preferable, are not essential to the present improvement, and that they may be materially modified and otherwise combined without departure from the present invention.

Having thus set forth the nature of the invention what I claim herein is:—

1. In a sewing machine, the combination with the work-plate and stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a separator plate, a longitudinally extending rock-shaft journaled below the work-plate and provided with an arm extending above the latter, a connection between said arm and the separator-plate, and means for actuating said rock-shaft.

2. In a sewing machine, the combination with the frame comprising a base and overhanging bracket-arm, a work-plate, and stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a separator-plate movably mounted upon said base and supported independently of the work-plate, a longitudinally extending rock-shaft journaled below the work-plate and provided with an upwardly extending arm and with a rearwardly extending arm disposed intermediate a member of said base and the work-plate, a connection between said upwardly extending arm and the separator-plate, and actuating means connected with the rearwardly extending arm of said rock-shaft at the rear of said base for operating said rock-shaft.

3. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a separator-plate movable within the direction of feed, a carrier therefor, an adjustable stop operating in conjunction with said carrier for determining the initial position of said separator-plate, and means un-

der the control of the operator for moving said separator-plate toward and from said initial position while the machine is in operation.

4. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a separator-plate, a rock-shaft, an arm upon said rock-shaft to which said separator-plate is pivotally connected, and means independent of the ruffling blade actuating means for rocking said shaft to change the position of said separator-plate while the machine is in operation.

5. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a separator-plate, a rock-shaft, an arm upon said rock-shaft, a carrier for said separator-plate pivotally connected with said arm, an edge-folder also mounted upon said carrier, and means independent of the ruffling blade actuating means for rocking said shaft to change the positions of said separator-plate and edge-folder while the machine is in operation.

6. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a rock-shaft, an arm upon said rock-shaft, a carrier mounted upon said arm, a separator-plate adjustably mounted upon said carrier, an edge-folder also adjustably mounted upon said carrier, and means for rocking said shaft to change the positions of said separator-plate and edge-folder.

7. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a separator-plate, a rock-shaft, an arm upon said rock-shaft, a carrier for said separator-plate mounted upon said arm, an edge-folder directed toward said stitch-forming mechanism and attached to said carrier, a second edge-folder also directed toward said stitch-forming mechanism and mounted independently thereof, and means for rocking said shaft to change the positions of said separator-plate and first-named edge-folder while the machine is in operation.

8. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a separator-plate, a reciprocating carrier for said separator-plate, an adjustable stop for determining the initial position of said carrier, and means under the control of the operator for moving said carrier toward and from said stop to vary the position of the separator-plate while the machine is in operation.

9. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a separator-plate, a reciprocating carrier for said separator-plate, an adjustable stop for determining the initial position of said carrier, and an operating lever connected with said carrier and having a limited path of movement whereby the carrier with its supported separator-plate may be moved intermediate initial position and a predetermined retracted position.

10. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a separator-plate, a reciprocating carrier for said separator-plate, an adjustable stop for determining the initial position of said carrier, and an operating lever adjustably connected with said carrier and having a limited path of movement whereby the carrier with its supported separator-plate may be moved intermediate initial position and a predetermined retracted position.

11. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a separator-plate, a reciprocating carrier therefor, means connected with said carrier and operative while the machine is in operation for changing the position of said separator-plate, and adjustable means for determining the range of movement of said separator-plate.

12. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a separator-plate, a reciprocating carrier therefor, means for adjustably securing the separator-plate upon said carrier, means connected with said carrier and operative while the machine is in operation for changing the position of said separator-plate, and adjustable means for determining the range of movement of said separator-plate.

13. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, means for adjusting the extent of said work-advancing movements, a separator-plate movable within the direction of feed, a carrier therefor, a stop for limiting the range of movement of said carrier, a spring for maintaining said carrier in operative relation with said stop, and means for shifting said separator-plate in opposition to said spring.

14. In a sewing machine, the combination

with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a separator-plate, a rock-shaft, an arm upon said rock-shaft, a carrier for said separator-plate mounted upon said arm, a second arm upon said rock-shaft, an operating lever, means for limiting the range of movement of said operating lever, and an operative connection intermediate the second-named arm of said rock-shaft and said operating lever.

15. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a separator-plate, a rock-shaft, an arm upon said rock-shaft, a carrier for said separator-plate mounted upon said arm, a second arm upon said rock-shaft, a stop for limiting the movement of the second-named arm in one direction, a spring for yieldingly maintaining said arm in engagement with said stop, an operating lever, an operative connection intermediate said operating lever and the second-named arm of said rock-shaft, and means for arresting the movement of said operating lever in shifting the second-named rock-shaft arm out of engagement with its stop.

16. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a separator-plate, a rock-shaft, an arm upon said rock-shaft, a carrier for said separator-plate mounted upon said arm, a second arm upon said rock-shaft, a lateral pin carried by said arm, an adjustable stop for said pin, a spring for maintaining said pin in contact with said stop, an operating lever, and a finger connected with said operating lever and adapted to operatively engage said pin for moving the same in opposition to said spring.

17. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a separator-plate, a rock-shaft, an arm upon said rock-shaft, a carrier for said separator-plate mounted upon said arm, a second arm upon said rock-shaft, a lateral pin carried by said arm, an adjustable stop for said pin, a spring for maintaining said pin in contact with said stop, a rocking sleeve, a finger extended therefrom and adapted to engage said pin, and an operating lever adjustably secured upon said rocking sleeve.

18. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, feeding mechanism including a feed-dog having a feeding surface extending in advance of said needle and a presser-foot opposed to said feed-dog and constructed with upturned forward portion, of a ruffling-blade having an operative work-engaging edge notched to embrace said feeding surface of the feed-dog in advance of the needle and pressed normally upwardly into operative relation with the upturned forward portion of the presser-foot, means for imparting to said ruffling-blade operative work-advancing movements, a separator-plate interposed between said ruffling-blade and the upturned forward portion of the presser-foot, and means for shifting said separator-plate within the direction of feed.

19. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, and feeding mechanism including a feed-dog having a feeding surface in advance of said needle, of a ruffling blade having its operative or work-engaging edge notched to embrace said feeding surface of the feed-dog in advance of the needle, means for imparting to said ruffling blade operative work-advancing movements, a presser-foot, and a detent-blade carried by said presser-foot and acting as a stripper for said ruffling blade.

20. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, and feeding mechanism including a feed-dog and means for actuating it, of a ruffling-blade, means for imparting thereto operative work-advancing movements, a throat-plate, a presser-foot formed with upturned forward portion provided with a recess in its lower face, a detent-blade secured to the upturned portion of said presser-foot and having its operative edge overhanging said recess above and in operative relation with the forward portion of said feed-dog, a separator-plate intermediate said detent-blade and the ruffling-blade, and means for shifting said separator-plate within the direction of feed.

21. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a throat-plate, a presser-foot formed with an upturned forward portion provided with a recess in its lower face, and with an adjacent holding lug at one edge, and a detent-blade having one edge of an end portion secured to said holding lug and its operative edge overhanging said recess.

22. In a sewing machine, the combination with a work-plate, a main-shaft journaled beneath the same, and stitch-forming and feeding mechanisms operatively connected with said main-shaft, of a ruffling blade, a supporting rock-shaft mounted beneath said work-plate, a slotted upright arm upon said rock-shaft upon which said ruffling blade is pivotally mounted, an actuating rock-shaft parallel with said supporting rock-shaft,

means connected with the main-shaft for rocking the same, a slotted arm fixed upon said actuating rock-shaft adjacent the slotted arm of said supporting rock-shaft, and an adjustable connection intermediate said slotted arms whereby reciprocating movements are imparted to said ruffling blade.

23. In a sewing machine, the combination with a work-plate, a main-shaft journaled beneath the same, and stitch-forming and feeding mechanisms operatively connected with said main-shaft, of a ruffling blade, a supporting rock-shaft mounted beneath said work-plate, a slotted upright arm upon said rock-shaft, a carrier-block pivotally mounted upon said slotted arm and provided with a depending finger overlying said arm, a spring applied to said arm and normally pressing said finger toward the latter, an actuating rock-shaft parallel with said supporting rock-shaft, means connected with the main-shaft for rocking the same, a slotted arm fixed upon said actuating rock-shaft adjacent the slotted arm of said supporting rock-shaft, and an adjustable connection intermediate said slotted arms whereby reciprocating movements are imparted to said ruffling blade.

24. In a sewing machine, the combination with a work-plate, a main-shaft journaled beneath the same, and stitch-forming and feeding mechanisms operatively connected with said main-shaft, of a ruffling blade, a supporting rock-shaft mounted beneath said work-plate, a slotted upright arm upon said rock-shaft, a carrier-block pivotally mounted upon said slotted arm and provided with a depending finger overlying said arm, an adjustable stop-screw carried by said finger and adapted to engage the adjacent edge of said upright arm, a spring applied to said arm and normally pressing said finger toward the latter, an actuating rock-shaft parallel with said supporting rock-shaft, means connected with the main-shaft for rocking the same, a slotted arm fixed upon said actuating rock-shaft adjacent the slotted arm of said supporting rock-shaft, and an adjustable connection intermediate said slotted arms whereby reciprocating movements are imparted to said ruffling blade.

25. In a sewing machine, the combination with a work-plate, a main-shaft journaled beneath the same, and stitch-forming and feeding mechanisms operatively connected with said main-shaft, of a ruffling blade, a supporting rock-shaft mounted beneath said work-plate, a slotted upright arm upon said rock-shaft, a carrier-block pivotally mounted upon said slotted arm and provided with a depending finger overlying said arm, a spring applied to said arm and normally pressing said finger toward the latter, means for adjusting the pressure of said spring upon said finger, an actuating rock-shaft parallel with said supporting rock-shaft, means connected with the main-shaft for rocking the same, a slotted arm fixed upon said actuating rock-shaft adjacent the slotted arm of said supporting rock-shaft, and an adjustable connection intermediate said slotted arms whereby reciprocating movements are imparted to said ruffling blade.

26. In a sewing machine, the combination with a work-plate, a main-shaft journaled beneath the same, and stitch-forming and feeding mechanisms operatively connected with said main-shaft, of a ruffling blade, a supporting rock-shaft mounted beneath said work-plate, a slotted upright arm upon said rock-shaft upon which said ruffling blade is mounted, an actuating rock-shaft parallel with said supporting rock-shaft, means connected with the main-shaft for rocking the same, a slotted arm fixed upon said actuating rock-shaft adjacent the slotted arm of said supporting rock-shaft, a connection intermediate said slotted arms whereby reciprocating movements are imparted to said ruffling blade, a separator-plate overlying the ruffling blade, a vibrating arm by which said separator-plate is supported, and means for shifting said vibrating arm to change the position of the separator-plate.

27. In a sewing machine, the combination with a work-plate, a main-shaft journaled beneath the same, a throat-plate, a presser-foot, and stitch-forming and feeding mechanisms operatively connected with said main-shaft, of a ruffling blade, a supporting rock-shaft journaled beneath the work-plate, an upright arm upon said rock-shaft and upon which said ruffling blade is pivotally mounted, means for imparting vibrating movements to said upright arm, a vibrating arm having a fulcrum parallel with said rock-shaft, a separator-plate overlying said ruffling blade and pivotally mounted upon said vibrating arm, and means for moving said arm for shifting the position of said separator-plate.

28. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a ruffling blade, means for imparting thereto operative work-advancing movements, a separator-plate, a reciprocating carrier for said separator-plate, and edge-folder arranged above said separator-plate and directed toward said stitch-forming mechanism, a second edge-folder also directed toward said stitch-forming mechanism, and means for moving said carrier to change the position of said separator-plate.

29. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, and feeding mechanism including a feed-dog having a feeding surface in advance of said needle, of a

ruffling blade having its operative or work-engaging edge notched to embrace said feeding surface of the feed-dog in advance of the needle, means for imparting to said ruffling blade operative work-advancing movements, a presser-foot, and a detent-blade carried by said presser-foot and having a serrated operative edge disposed above the portion of the feeding surface of said feed-dog embraced by the notch of said ruffling blade.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ALBERT H. DE VOE.

Witnesses:

D. P. BIRNIE,

H. J. MILLER.