No. 751,056. PATENTED FEB. 2, 1904.

E. H. COOPER & C. SCHÜTZ.

SEWING MACHINE.

APPLICATION FILED APR. 26, 1902.

NO MODEL. 5 SHEETS—SHEET 1.

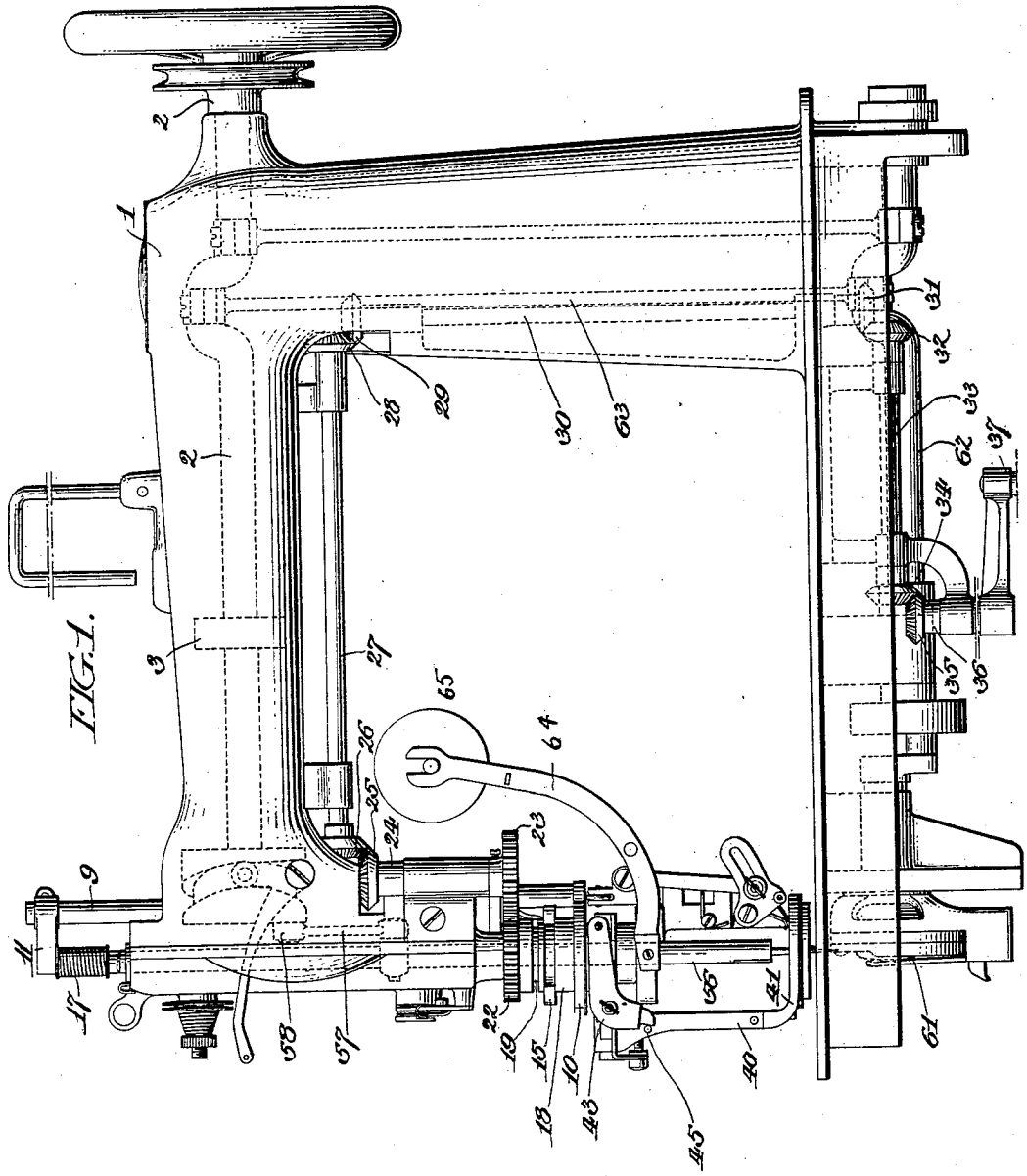


FIG. 1.

WITNESSES:

Hamilton Keer

Wm. C. Crane

INVENTORS:

E. H. Cooper and C. Schütz,

By Chas. N. Butler,

Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 751,056. PATENTED FEB. 2, 1904.

E. H. COOPER & C. SCHÜTZ.

SEWING MACHINE.

APPLICATION FILED APR. 26, 1902.

NO MODEL. 5 SHEETS—SHEET 2.

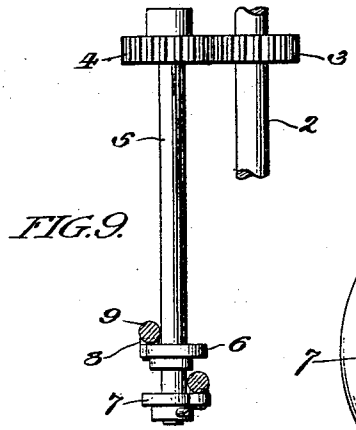


FIG. 9.

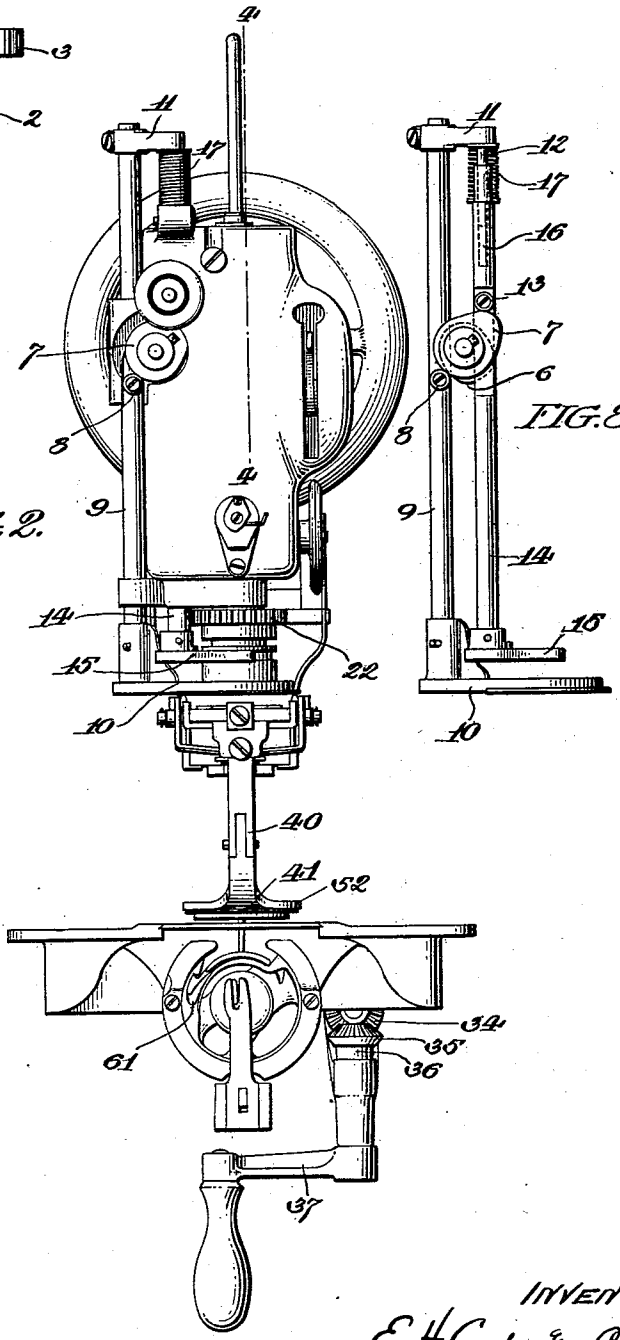


FIG. 2.

FIG. 8.

WITNESSES:

Ham C. Keller

W. E. Crane

INVENTORS:

E. H. Cooper and C. Schütz

By Charles N. Butler, Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 751,056. PATENTED FEB. 2, 1904.

E. H. COOPER & C. SCHÜTZ.

SEWING MACHINE.

APPLICATION FILED APR. 26, 1902.

NO MODEL. 5 SHEETS—SHEET 3.

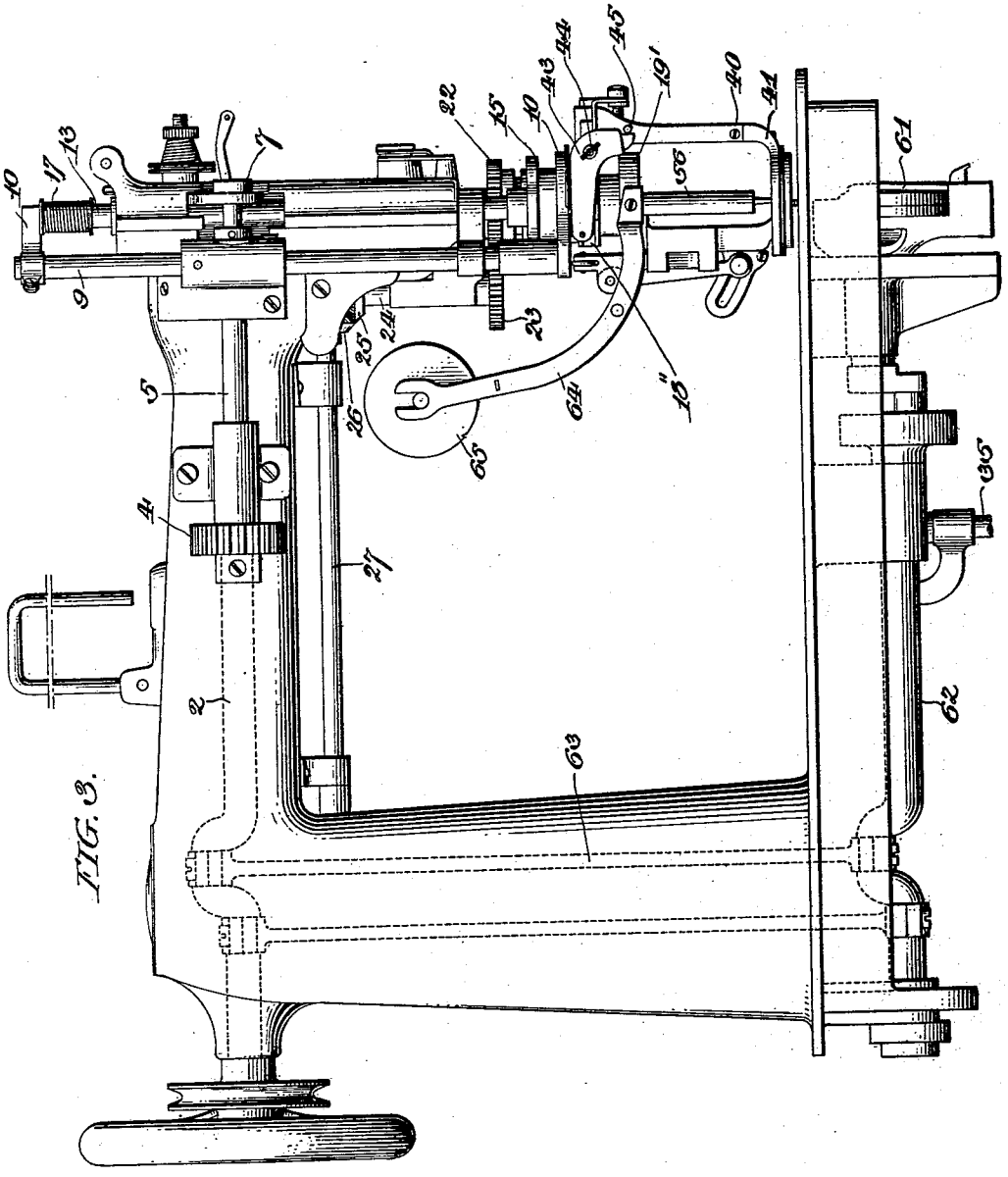


FIG. 3.

WITNESSES:
Harry E. Kells
Utley L. Crane

INVENTORS:
E. H. Cooper and C. Schütz
By Charles N. Butler
Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 751,056. PATENTED FEB. 2, 1904.

E. H. COOPER & C. SCHÜTZ.

SEWING MACHINE.

APPLICATION FILED APR. 26, 1902.

NO MODEL. 5 SHEETS—SHEET 4.

FIG. 5.

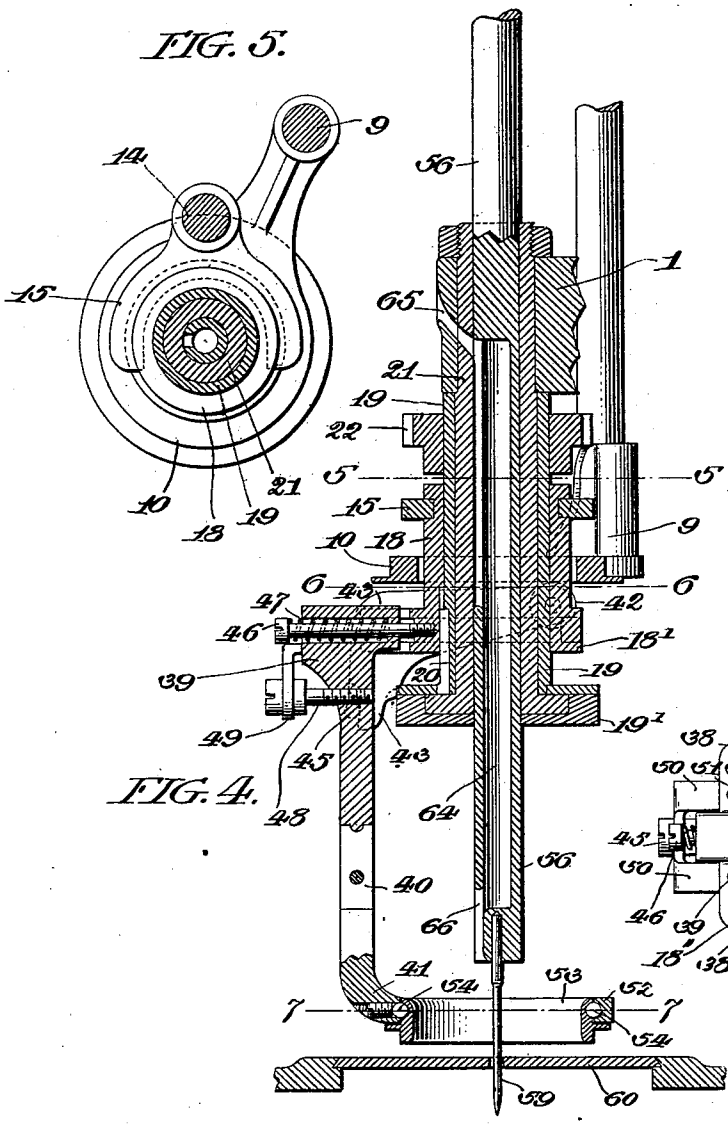


FIG. 4.

FIG. 6.

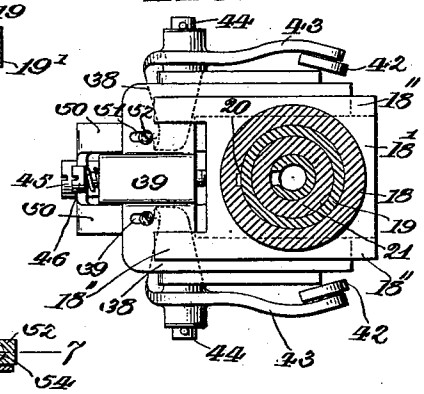
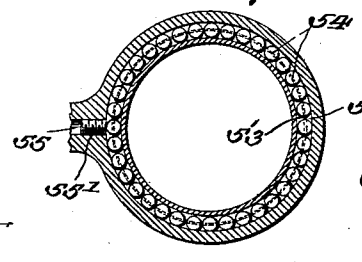


FIG. 7.



WITNESSES:

Harry E. Keller

Wesley E. Crane

INVENTORS:

E. H. Cooper and C. Schütz

By Charles N. Butler,

Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 751,056. PATENTED FEB. 2, 1904.

E. H. COOPER & C. SCHÜTZ.

SEWING MACHINE.

APPLICATION FILED APR. 26, 1902.

NO MODEL. 5 SHEETS—SHEET 5.

FIG. 10.

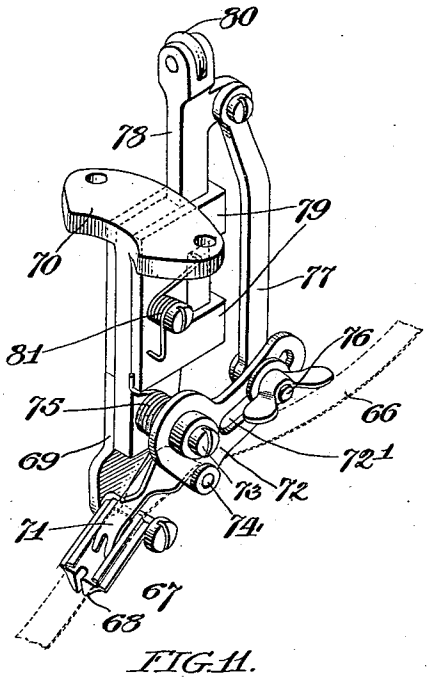
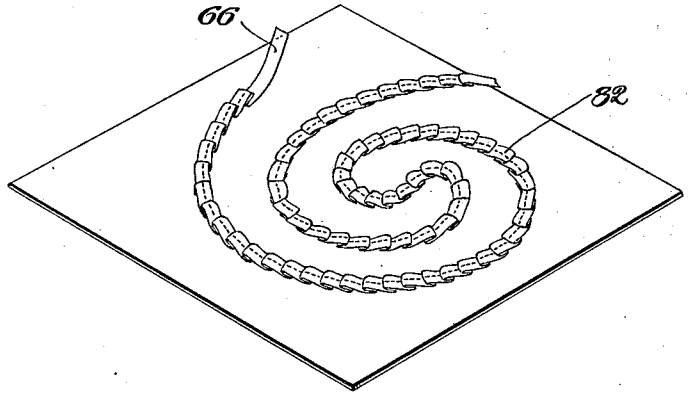


FIG. 11.



WITNESSES:

Harry E. Keller

Utley K. Crane

INVENTORS:

E. H. Cooper and C. Schütz

By Charles N. Butler

Atty

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 751,056. Patented February 2, 1904.

UNITED STATES PATENT OFFICE.

ERNEST H. COOPER AND CONRAD SCHÜTZ, OF PHILADELPHIA, PENNSYLVANIA.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 751,056, dated February 2, 1904.

Application filed April 26, 1902. Serial No. 104,807. (No model.)

To all whom it may concern:

Be it known that we, ERNEST H. COOPER and CONRAD SCHÜTZ, residents of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have jointly invented certain Improvements in Sewing-Machines, of which the following is a specification.

This invention is an improved sewing-machine having a peculiar universal feeding mechanism in combination with stitching mechanism adapted for plain sewing, embroidering, braiding, and ruffling.

The nature and characteristic features of the improvements will more fully appear by reference to the accompanying drawings, of which—

Figure 1 is a front elevation of a sewing-machine embodying our invention. Fig. 2 is an end elevation thereof. Fig. 3 is a rear elevation thereof. Fig. 4 is a sectional view taken on the line 4 4 of Fig. 2. Fig. 5 is a sectional view taken on the line 5 5 of Fig. 4. Fig. 6 is a sectional view taken on the line 6 6 of Fig. 4. Fig. 7 is a sectional view taken on the line 7 7 of Fig. 4. Fig. 8 is a view in illustration of details of the feeding mechanism. Fig. 9 is a view of detached shafts for driving the feeding mechanism. Fig. 10 is a perspective view of the ruffling mechanism detached, and Fig. 11 is a perspective view of the product.

As illustrated in the drawings, a sewing-machine head 1 of usual character has the revoluble main shaft 2, provided with a gear-wheel 3, which engages with a gear-wheel 4, fixed on a revoluble shaft 5, having the cams 6 and 7 fixed thereon. The cam 6 engages the stud 8 of the vertically-reciprocating bar 9, which has the ring or bearing 10 and the arm 11, with the depending finger 12 fixed thereon. The cam 7 engages the stud 13 of the vertically-reciprocating bar 14, which has the yoke or bearing 15 fixed thereon. The finger 12 connects the arm 11 with the bar 14, reciprocating in the way 16, and a spring 17, having its lower end connected with this bar and its upper end connected with the arm, tends to simultaneously elevate the bar 8 and depress the bar 14.

The yoke 15 provides a bearing in which the sleeve 18 revolves and by which it is elevated, the sleeve 18 reciprocating on a revoluble sleeve 19, which revolves the sleeve 18 by means of the feather 20. The sleeve or shaft 19, having the gear-wheel 22 fixed thereon, is revolubly mounted on a stem 21, which is carried by the head 1. The gear-wheel 22 is driven by a gear-wheel 23, fixed on the journaled shaft 24, which is revolved by the bevel-gear 25, fixed thereto. The bevel-gear 25 is driven by the bevel-gear 26, fixed on the journaled shaft 27, which is revolved by the bevel-gear 28, fixed thereto. The bevel-gear 28 is driven by the bevel-gear 29, fixed on the journaled shaft 30, which is revolved by the bevel-gear 31, fixed thereto. The bevel-gear 31 is driven by the bevel-gear 32, fixed on the journaled shaft 33, having the bevel-gear 34 fixed thereon, the latter being driven by the bevel-gear 35 on the journaled shaft 36, which is revolved by the crank 37.

The sleeve 18 is provided with the base 18′, having the ways 18″, in which guides 38 on the shank-head 39 reciprocate to reciprocate the shank 40 and the foot 41 joined thereto. The reciprocation is effected in outward movement by the downward movement of the rod 9 and the action of the ring 10 upon the rollers 42 on the long arms of the crank-levers 43, fulcrumed on the bearings 44, which are carried by the sleeve 18, the depression of the long arms of the levers causing their short arms, which rest against the bearing-pins 45 of the shank, to thrust the foot mechanism outward from the axis about which it revolves, and the inward movement is effected by means of a stud 46, passed through the shank-head 39 into the base 18′, and the coiled spring 47, which is supported by the stud and exerts an inward thrust upon the head. The movement of the foot may be regulated by adjustment of the screw 48, which runs in the shank 40 and is swiveled in the hanger 49 of the slide-bars 50. The bars 50 abut against the base 18′ in inward movement and have a limited movement in relation to the head 39 by means of the slots 51, formed therein, and the

screws 52, which pass therethrough and engage the bars 50.

The foot 41 comprises the bearing-ring 52 and the feeding-ring or feeder 53, revolubly supported thereby. The feeding-ring preferably telescopes with the bearing-ring and is held thereto by means of the complementary grooves 52′ and 53′, which are formed in the respective rings, so as to register and receive the balls 54, the latter being passed into the channel through the socket 55, normally closed by the screw 55′. This construction permits the feeding mechanism to turn while the feeding-ring engages with and moves the work straight to the needle, radially to the curve of which the needle is the center, by which a universal feeding movement is obtained without twisting the work.

The stitching mechanism may be of usual construction, if desired, comprising the needle-bar 56, connected by the pitman 57 with the main-shaft crank 58. The needle 59, passing through the throat-plate 60, coöperates with the hook 61, which is revolved by the shaft 62, having the pitman connection 63 with the main shaft 2; but the needle-bar has a passage 64 therethrough, by means of which and the openings 65 and 66 thread is passed to the needle clear of the feeding mechanism.

The mechanism described, as will be understood, is adapted for plain sewing, embroidering, and braiding. For braiding and ruffling the spool-carrier 64 is fixed to the base 19′, revoluble with the sleeve 19 on the supporting-stem 21, the spool 65, journaled in the carrier, delivering the braid or ribbon 66 to the feeding mechanism. The braid or ribbon feeding mechanism comprises the guide 67, having a pivot bearing-point 68, upon which the guide freely turns about the needle in the operation of feeding the braid thereto from whatever direction required. The guide is carried by the hanger 69, which is provided with a head 70, rigidly secured to the revoluble sleeve-base 19′. In plain braiding this guiding mechanism delivers the braid without crimping to the feeder and needle. In ruffling the finger 71 is caused to reciprocate in the guides 67 by means of a lever 72, fulcrumed on the pin 73, the finger being pivotally connected to the lever by the pintle 74 and held in flexible relation to the work by the coiled spring 75, one end of which bears upon the finger, while the other engages the hanger. The lever 72 has the slot 72′, in which the pintle 76 is adjustably held, and the pitman 77, having one end pivotally connected to the pintle and the other end pivotally connected to the reciprocating bar 78, actuates the finger 71, crimping the braid, as determined by the regulation of the pintle 76. The bar 78 reciprocates in ways 79, carried by the hanger 69, the bar being depressed by the downward thrust of the ring 10 on the roller 80 and being elevated by the coiled spring 81, having one end fixed to the hanger 69 and the other end to the bar. This mechanism is adapted for universal feeding and simultaneously fluting or crimping the braid in the operation of making the ruffling 82.

It will now be understood that the main shaft 2, operating through the gears 3 and 4, drives the shaft 5 and the cams 6 and 7, the latter being so connected with the respective rods or bars 9 and 14 that the sleeve 18, with the feeding mechanism connected therewith, first carry the feeder 53 downward into engagement with the work, upon which the ring 10 descends to rock the levers 43 and move the shank 40, with its its connections, outward, causing the feeder to advance the work to the descending needle 59. As the needle descends through the work the sleeve 18 and the feeding mechanism connected therewith are elevated, the spring 47 simultaneously moving the shank 40, with its connections, inward and again descend into engagement with the work as the needle rises and the ring 10 completes its upward movement. Simultaneously with this operation of feeding by revolving the crank 37 the dependent transmitting mechanism operating through the gears 23 and 22 revolves the sleeve 19 and the sleeve 18, with the feeding mechanism connected therewith, so that the radial action of the foot 41 may be varied at will and the work fed to the needle from any desired direction without twisting, as the shank 40 turns independently of the feeder 53. The braid guiding and ruffling mechanism revolving with the feeding mechanism delivers the ribbon or braid in the direction that the feeder is carrying the work. The downward movement of the ring 10 thrusts down the bar 78 and the pitman 77 rocks the lever 72 and advances the finger 71, which advances the braid and crimps it, as determined by the position of the pintle 76. As the ring 10 rises the springs 75 and 81 restore the finger 71 and the bar 78 to their initial positions.

Having described our invention, we claim—

1. In a sewing-machine, a universal feeding mechanism comprising a foot having a feeder, and a support for said feeder revoluble independently thereof, in combination with foot-operating mechanism, substantially as specified.

2. In a sewing-machine, feeding mechanism comprising a reciprocating foot having a feeder, foot-operating mechanism comprising a reciprocating shank, and means for revolving said foot-operating mechanism independently of said feeder, in combination with stitching mechanism, substantially as specified.

3. In a sewing-machine, a reciprocating needle, and feeding mechanism having a motion of revolution and radial reciprocation

relatively to the axis of said needle, said feeding mechanism comprising a foot having a feeder and a support for said feeder revoluble independently thereof, substantially as specified.

4. In a sewing-machine, stitching mechanism, in combination with a revoluble foot comprising a bearing-ring and a feeding-ring, complementary channels formed in said rings, and bearing-balls in said channels, substantially as specified.

5. In a sewing-machine, stitching mechanism, in combination with a revoluble foot comprising a bearing-ring and a feeding-ring, said rings having telescoping members and complementary channels formed therein, and balls in said channels for holding said rings together and providing bearings therefor, substantially as specified.

6. In a sewing-machine, a foot comprising a bearing-ring and a feeding-ring revolubly supported thereby, a revoluble shank connected with said bearing-ring, means for reciprocating said shank horizontally, and means for reciprocating said shank vertically, substantially as specified.

7. In a sewing-machine, a revoluble and vertically-reciprocating bearing, a reciprocating shank supported by said bearing, a revoluble foot supported by said shank, and mechanism for reciprocating said shank and foot horizontally with relation to said bearing, substantially as specified.

8. In a sewing-machine, a revoluble and vertically-reciprocating sleeve provided with bearings, feeding mechanism supported by said bearings, and mechanism for reciprocating said feeding mechanism in said bearings, substantially as specified.

9. In a sewing-machine, a vertically-reciprocating rod, a sleeve revolubly connected with and vertically reciprocated by said rod, means for revolving said sleeve, a bearing carried by said sleeve, feeding mechanism supported by and adapted to reciprocate in said bearing, and mechanism for reciprocating said feeding mechanism, substantially as specified.

10. In a sewing-machine, a revoluble and vertically-reciprocating bearing, feeding mechanism comprising a shank and a foot supported by and adapted to reciprocate in said bearing, and a lever for moving said feeding mechanism in said bearing, substantially as specified.

11. In a sewing-machine, a revoluble and vertically-reciprocating bearing, feeding mechanism comprising a shank and a foot supported by and adapted to reciprocate in said bearing, in combination with a lever and spring for reciprocating said feeding mechanism in said bearing, substantially as specified.

12. In a sewing-machine, a revoluble and vertically-reciprocating bearing, feeding mechanism supported by and adapted to reciprocate in said bearing, a lever adapted for moving said feeding mechanism in said bearing, and a vertically-reciprocating ring adapted for actuating said lever, substantially as specified.

13. In a sewing-machine, a revoluble and vertically-reciprocating bearing, horizontally-reciprocating feeding mechanism supported by said bearing, a lever for moving said feeding mechanism relatively to said bearing, and a vertically-reciprocating bar having means for engaging and actuating said lever, substantially as specified.

14. In a sewing-machine, a bearing, feeding mechanism adapted to reciprocate in said bearing, a fulcrumed crank-lever which engages and moves said feeding mechanism outwardly, and mechanism comprising a spring for limiting the outward movement and effecting the inward movement of said feeding mechanism, substantially as specified.

15. In a sewing-machine, a revoluble and vertically-reciprocating bearing, feeding mechanism supported by said bearing and reciprocating horizontally with relation thereto, and mechanism comprising a spring for actuating said feeding mechanism, substantially as specified.

16. In a sewing-machine, in combination with a foot, a revoluble and vertically-reciprocating sleeve, a vertically-reciprocating bar connected with said sleeve, a revoluble shaft connected with and operating said bar, a second vertically-reciprocating bar connected with and operated by said shaft, and a ring connected with and reciprocated by said second bar, substantially as specified.

17. In a sewing-machine, in combination with a foot, a revoluble sleeve, a second sleeve revolubly fixed and longitudinally movable on said first sleeve, a vertically-reciprocating bar having a revoluble connection with said second sleeve, and a gear-wheel connected with first sleeve, substantially as specified.

18. In a sewing-machine, in combination with a foot, a revoluble shaft having a gear-wheel fixed thereon, a sleeve revolubly fixed and longitudinally movable on said shaft, a reciprocating bar having a bearing in which said sleeve is revolubly mounted, a second revoluble shaft connected with and operating said bar, and a second reciprocating bar connected with and operated by said second shaft, substantially as specified.

19. In a sewing-machine, a revoluble shaft having a gear-wheel fixed thereon, a sleeve revolubly fixed and longitudinally movable on said shaft, feeding mechanism carried by and reciprocating relatively to said sleeve, a reciprocating bar having a bearing in which said sleeve is revolubly mounted, a second revoluble shaft connected with and operating said bar, a second reciprocating bar connected with and operated by said second shaft, and mechanism operated by said second bar for actuat-

ing said feeding mechanism, substantially as specified.

20. In a sewing-machine, the combination of the main shaft having a gear-wheel thereon, with a second shaft having a gear-wheel engaging with said first gear-wheel, a cam on said second shaft, a reciprocating bar connected with and operated by said cam, a bearing carried by said bar, a sleeve revolubly mounted in said bearing and vertically reciprocated by said bar, feeding mechanism carried by said sleeve and reciprocating relatively thereto, mechanism for revolving said sleeve, and mechanism for reciprocating said feeding mechanism, substantially as specified.

21. In a sewing-machine, the combination of the main shaft having a gear-wheel thereon, with a second shaft having a gear-wheel engaging with said first gear-wheel, a cam on said second shaft, a reciprocating bar connected with and operated by said cam, and reciprocating feeding mechanism connected with and actuated by said reciprocating bar, substantially as specified.

22. In a sewing-machine, the combination of the main shaft having a gear-wheel thereon, with a second shaft having a gear-wheel engaging with said first gear-wheel, a cam on said second shaft, a reciprocating bar connected with and operated by said cam, a foot connected with and vertically reciprocated by said bar, and mechanism for horizontally reciprocating said foot comprising a cam on said second shaft and a vertically-reciprocating bar connected with and operated thereby, substantially as specified.

23. In a sewing-machine, in combination with feeding mechanism comprising a feeding-ring and a supporting-ring revoluble independently of said feeding-ring, means for vertically reciprocating said feeding mechanism, means for revolving said feeding mechanism, and means for horizontally reciprocating said feeding mechanism radially to its axis of revolution, substantially as specified.

24. In a sewing-machine, a vertically-reciprocating bar, reciprocating feeding mechanism revolubly connected with said bar, means for revolving said feeding mechanism, in combination with a vertically-reciprocating bar and means connected therewith for horizontally reciprocating said feeding mechanism.

25. In a sewing-machine, a universal braid or ribbon guide, reciprocating mechanism for engaging and feeding the braid or ribbon through said guide, in combination with revoluble mechanism for feeding the work to which said braid or ribbon is applied, substantially as specified.

26. In a sewing-machine, a revoluble braid-guide, a reciprocating finger for feeding the braid through said guide, a lever for actuating said finger, and means for oscillating said lever in combination with feeding mechanism, and stitching mechanism, substantially as specified.

27. In a sewing-machine, a revoluble hanger, a guide carried by said hanger, a lever fulcrumed on said hanger, a reciprocating finger operated by said lever, and a rod supported by said hanger for reciprocating said lever in combination with feeding mechanism, and stitching mechanism, substantially as specified.

28. In a sewing-machine, a revoluble hanger, a guide carried by said hanger, a lever fulcrumed on said hanger, a finger having a flexible connection with said lever, a pitman connected with said lever, and a vertically-reciprocating rod for actuating said pitman in combination with feeding mechanism, and stitching mechanism, substantially as specified.

29. In a sewing-machine, a hanger, a guide carried by said hanger, a lever fulcrumed on said hanger, a finger pivoted to said hanger, a spring engaging said finger, a pitman connected with said lever, a reciprocating rod connected with said pitman, and means for reciprocating said rod in combination with feeding mechanism, and stitching mechanism, substantially as specified.

In testimony whereof we have signed our names to this specification in the presence of the subscribing witnesses.

ERNEST H. COOPER.
CONRAD SCHÜTZ.

Witnesses:
THOMAS S. GATES,
UTLEY E. CRANE.