

June 17, 1930.

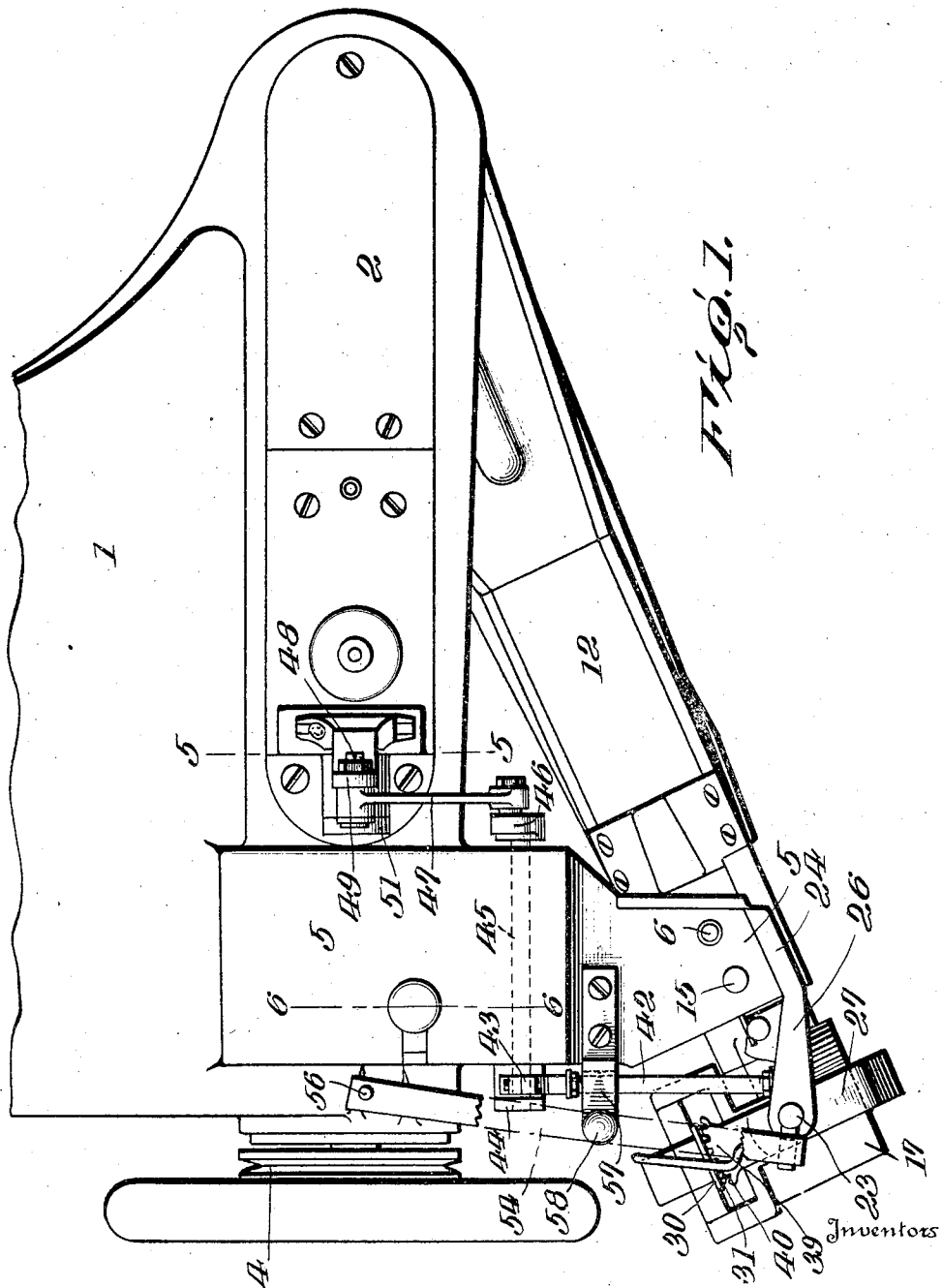
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1,765,206

FEEDING MECHANISM FOR SEWING MACHINES

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4 Sheets-Sheet 1



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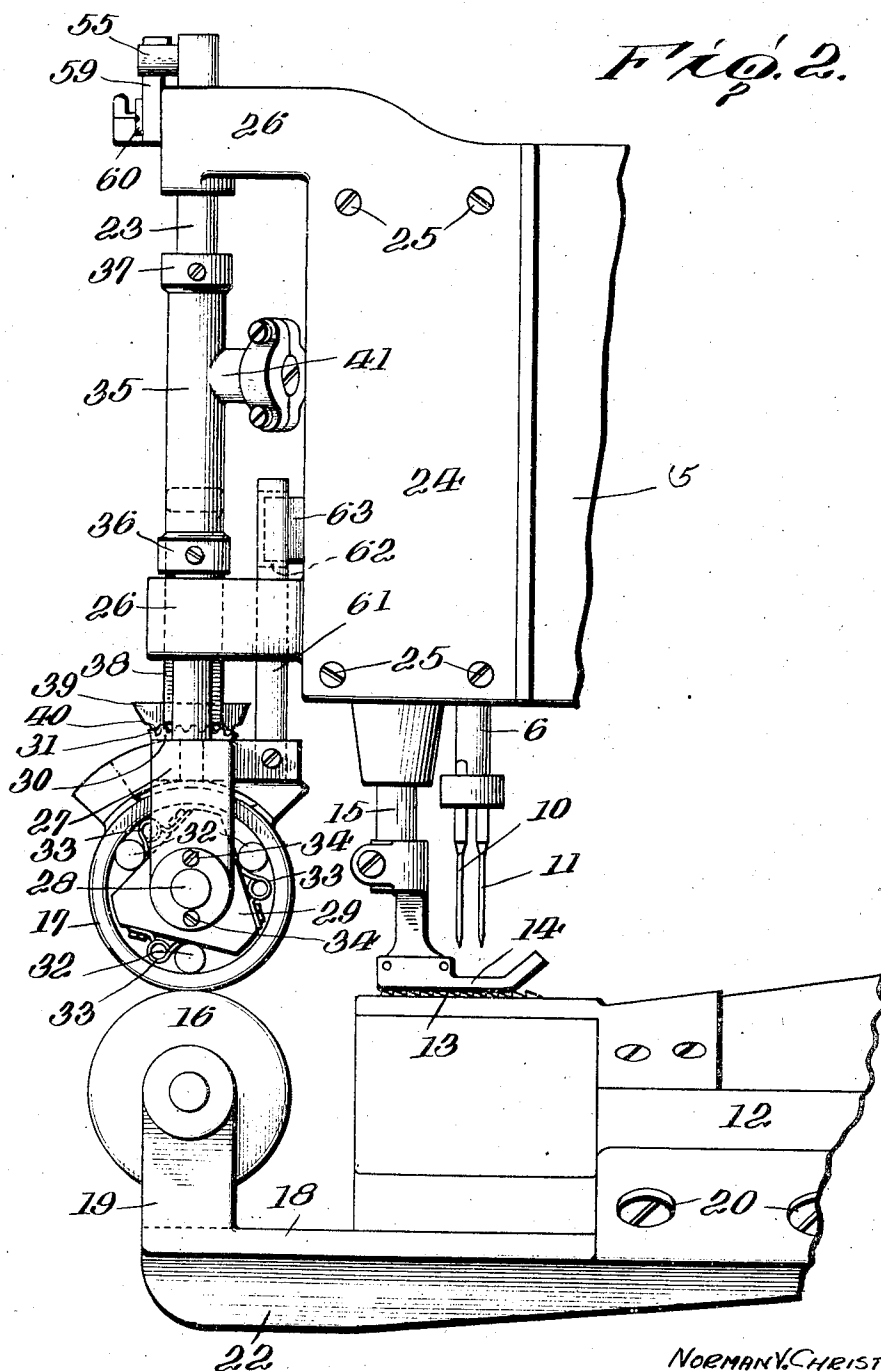
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Fig. 2.



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FIG. 3.

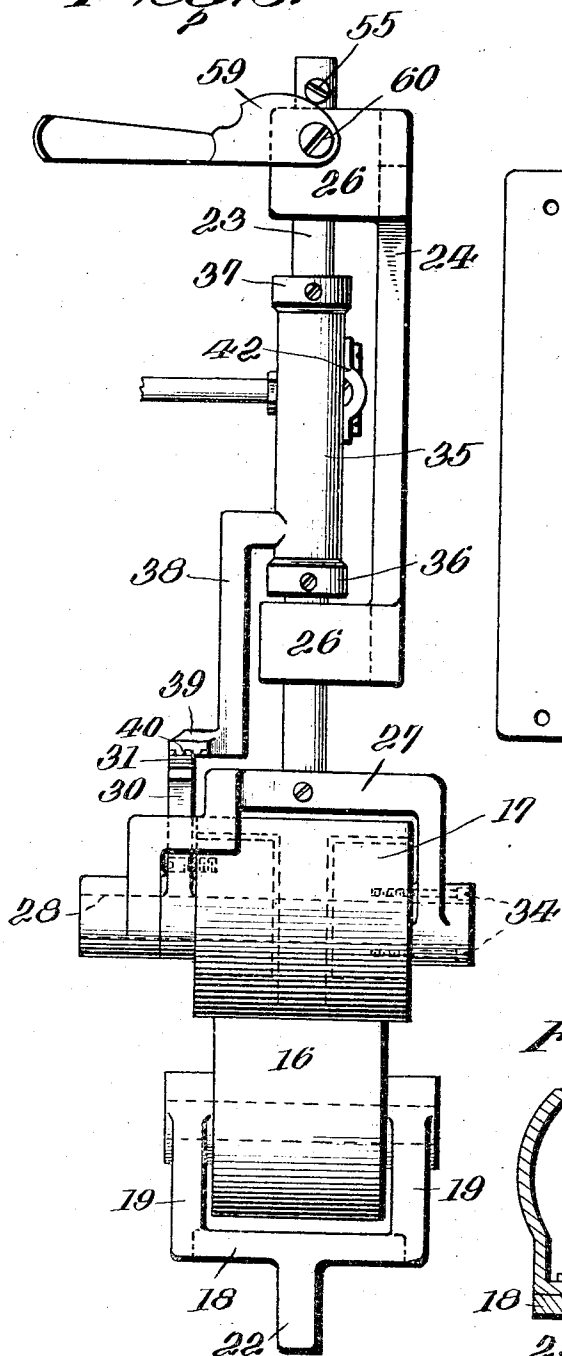


FIG. 4.

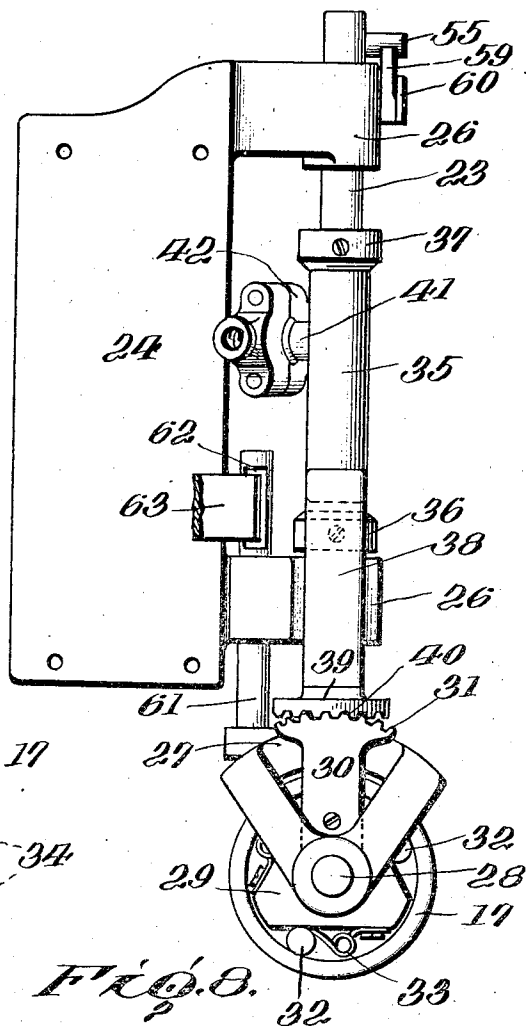
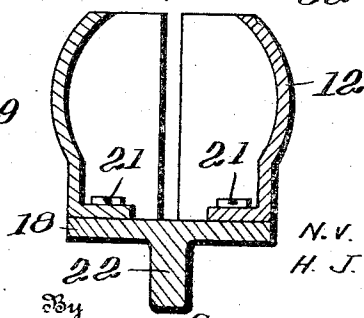


FIG. 5.



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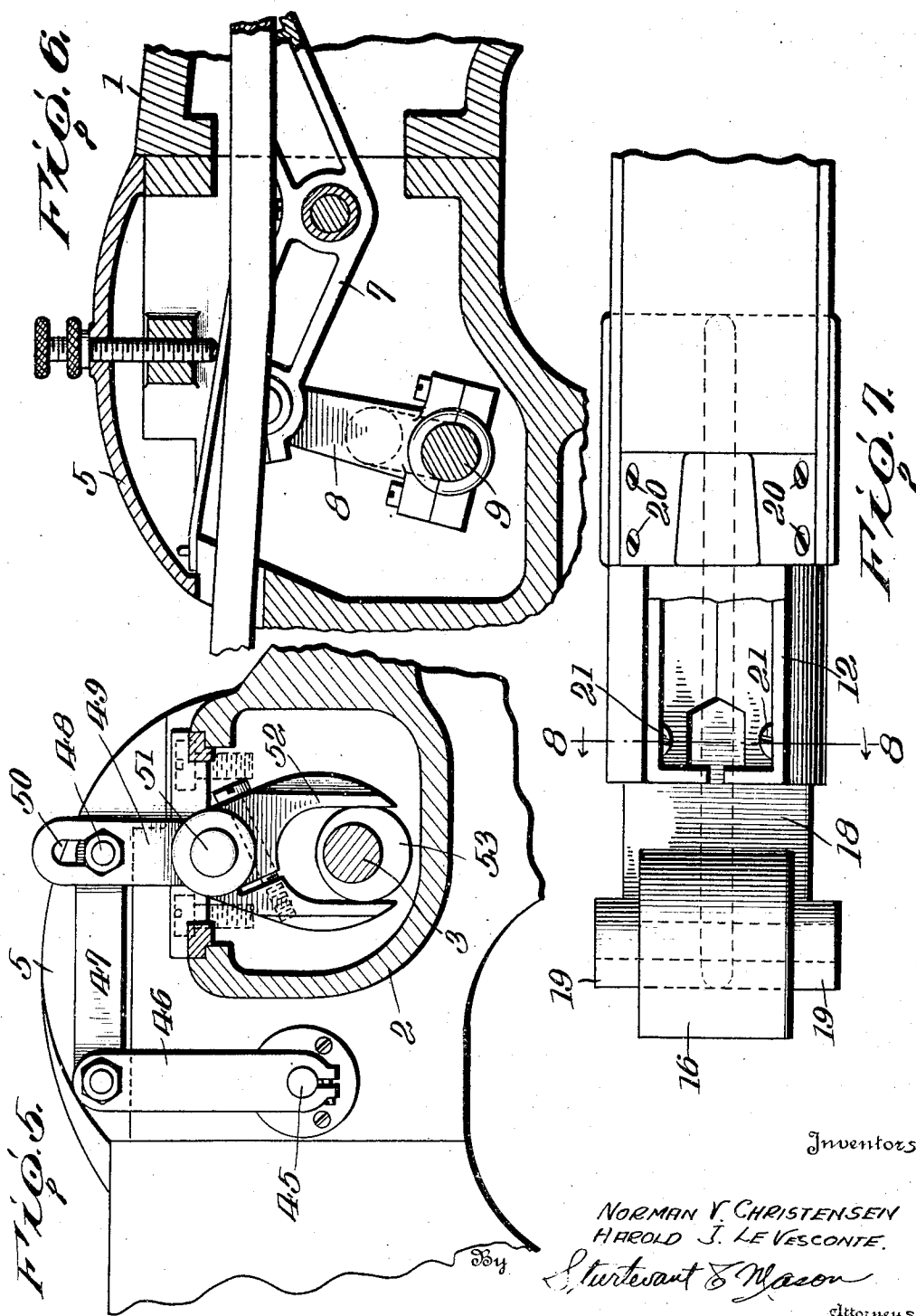
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FEEDING MECHANISM FOR SEWING MACHINES

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UNITED STATES PATENT OFFICE

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FEEDING MECHANISM FOR SEWING MACHINES

Application filed April 1, 1929. Serial No. 351,675.

The invention relates to new and useful improvements in feeding mechanisms for sewing machines, and more particularly to a puller feed used in connection with the ordinary feeding mechanism for aiding in feeding heavy articles to and from the stitching mechanism.

An object of the invention is to provide a feeding mechanism of the above type which may be used in connection with a cylindrical work supporting arm and wherein the lower member of the puller is so arranged and operated that said member will pass through the tubular article being stitched.

A further object of the invention is to provide a feeding mechanism of the above type wherein the lower puller roller is freely mounted on a bracket formed as an extension of the work supporting arm and the upper roller is positively given an intermittent rotation for feeding the material.

A further object of the invention is to provide a feeding mechanism of the above type wherein the upper feeding roller and the immediate actuating mechanism therefor are all mounted on a supporting bar which is capable of being raised and lowered to facilitate the insertion and removal of the material.

These and other objects will in part be obvious and will in part be hereinafter more fully disclosed.

In the drawings which show by way of illustration one embodiment of the invention:

Fig. 1 is a plan view showing a portion of a machine having the improvements applied thereto.

Fig. 2 is a front view of the same.

Fig. 3 is a rear view of the puller feed and the supporting bracket on which it is mounted.

Fig. 4 is a side view of the same.

Fig. 5 is a sectional view on the line 5—5 of Fig. 1.

Fig. 6 is a sectional view on the line 6—6 of Fig. 1.

Fig. 7 is a view of the end of the work supporting arm showing the bracket carrying the lower roller or pulling mechanism,

the throat plate and feeding mechanism being removed.

Fig. 8 is a sectional view on the line 8—8 of Fig. 7.

The invention is directed to a puller mechanism for a feed-off-the-arm machine. A feed-off-the-arm machine is particularly adapted for stitching tubular articles. The puller mechanism must, therefore, be adapted to the stitching of tubular articles. The puller mechanism includes a lower roller which is freely mounted on a bracket carried by the work supporting arm and extending in the general direction of the work supporting arm, so that a tubular article as it is stitched may pass over the bracket and over the feed roller carried thereby. Associated with this lower feed roller which is free to rotate but is not positively driven is an upper feed roller which is carried by a bracket mounted at the lower end of a presser bar. Mounted on this bracket and bar is an actuating mechanism for intermittently rotating the upper feed roller. This actuating mechanism includes an oscillating lever for actuating a clutch which intermittently grips and turns the roller and the lever is oscillated by means of a sector gear engaging a gear segment carried by a bracket arm mounted on a sleeve which is free to oscillate on the presser bar. This sleeve is actuated by a suitable train of mechanism from the main shaft. The presser bar may be raised and lowered for separating the feeding rollers of the puller mechanism to facilitate the insertion and removal of the material being stitched.

Referring more in detail to the drawings, the invention is shown as applied to a feed-off-the-arm machine including a supporting bracket 1 on which the sewing machine unit is mounted and suspended. The sewing machine unit includes an upper horizontal member 2 in which the main shaft 3 is mounted. The main shaft is actuated by a suitable belt wheel 4. Projecting laterally from this upper horizontal member is a housing 5. A needle bar 6 is mounted in this housing for reciprocation and is actuated by a lever 7 which is connected by a link 8 to a crank 9

in the main shaft 3. As shown in the drawings, the needle bar is provided with two needles 10 and 11. Depending from the horizontal member 2 is a vertical arm which carries at its lower end a work supporting arm 12. This work supporting arm is of the general cylindrical character. Mounted in this work supporting arm are the loopers which cooperate respectively with the needles 10 and 11 for forming two independent lines of stitching.

Also mounted in the work supporting arm is a feeding mechanism which includes a feed dog 13. The feeding mechanism is of the usual four-motion type. Cooperating with the feeding mechanism is a presser foot 14 carried by a presser bar 15 also mounted in the laterally extending housing 5.

The invention is directed particularly to a puller feeding mechanism which may be used in connection with a work supporting arm of the above description. This puller feeding mechanism includes a lower roller 16 and an upper roller 17. The lower roller 16 is freely journaled in a bracket 18. The bracket is provided with upwardly projecting arms 19, 19 and the roller is journaled in these arms. The bracket 18 is secured to the work supporting arm 12 by suitable screws 20, 20 passing through laterally projecting wings at the rear end of the bracket. These wings and the bracket portion carrying the same are shaped so as to conform to the outer surface of the work supporting arm 12. End caps for housing the loopers are secured to the bracket 18 by screws 21, 21 threaded into the bracket. The bracket is provided with a web 22 on its under face which extends substantially the full length of the bracket. This makes a very strong bracket rigidly secured to the work arm, so that sufficient pressure may be applied to the roller 17 for the gripping of the material and the feeding of the same without slippage. The supporting bracket and the roller 16 are so proportioned and arranged that a tubular article after it has been stitched by the needles 10 and 11 will pass over the bracket portion and roller 16 which is in rear of the stitching point. This roller is freely mounted and is rotated only through the rotations imparted to the upper feed roller pressing the fabric against the lower feed roller.

The upper feed roller 17 is mounted at the lower end of a presser bar 23. This presser bar 23 is mounted in a bracket 24 which is secured by suitable screws 25, 25 to the housing 5 in which the needle bar reciprocates. The bracket is located at the side face of the housing and is provided with rearwardly extending arms 26, 26. The presser bar 23 is mounted in these arms 26, 26. At the lower end of the presser bar 23 is a yoke bracket member 27. The roller 17 is mounted for

free rotation on a shaft 28 which in turn is mounted in the yoke arms of this bracket 27. Also mounted on the shaft 28 is a block 29. Attached to this block 29 is an arm 30 carrying a sector gear 31. Between the block 29 and the inner cylindrical face of the roller 17 are gripping rollers 32, 32 and springs 33 which normally hold the rollers so as to cause the same to grip the roller 17 when the block 29 is oscillated by imparting a positive intermittent rotation thereto. There is a block similar to the block 29 at the other end of the roller 17 which is attached to one of the yoke arms by screws 34. The purpose of this block is to prevent any retrograde movement of the roller 17 as the block 29 is turned backwardly for the purpose of obtaining a new grip on the roller. This means for actuating the roller forms no part of the present invention per se; any suitable clutching mechanism may be used for the purpose of imparting the oscillation of the arm 30 to the roller 17 when said arm 30 is moved in one direction and for holding the roller in its set position when the arm 30 is retracted.

The arm 30 is oscillated by means of a sleeve 35 which is freely mounted on the presser bar 23 between two collars 36 and 37. This permits free oscillation of the sleeve on the presser bar but prevents any endwise movement thereon. The sleeve is provided with an arm 38 which has an outturned portion 39 on the under face of which is a segment gear 40. This segment gear 40 meshes with the sector gear 31. When the sleeve 35 is oscillated, it will impart an oscillation to the arm 30.

Also carried by the sleeve 35 is an arm 41. On the outer end of this arm 41 is a ball stud to which a link 42 is attached. This link 42 at its other end is connected to a ball stud 43 carried by an arm 44 mounted on a cross shaft 45 journaled in suitable bearings in the housing 5. On the other end of this cross shaft 45 is an arm 46 which is clamped thereto. A link 47 is pivoted to the upper end of the arm 46. The link 47 is also pivoted at 48 to a lever 49. The lever at its upper end is provided with a slot 50 and the bolt forming the pivot 48 is shiftable in this slot for varying the throw imparted to the upper feed roller. The lever 49 is pivoted at 51 and is provided with a fork 52 at its lower end cooperating with an eccentric 53 on the main shaft 3. As the main shaft 3 rotates it will oscillate the lever 49 and this through the train of mechanism described will impart an intermittent step by step rotation to the upper feed roller 17.

The presser bar 23 carrying this upper feed roller is normally forced downwardly by a leaf spring 54. This leaf spring 54 bears on the upper face of a pin 55 carried by the presser bar 23. It is also seated

on a stud 56 carried by the frame of the machine. A bracket 57 overhangs the leaf spring and is provided with an adjustable bolt 58 through which the tension of the spring on the presser bar may be varied. The presser bar may be raised by a hand operated lever 59 which is pivoted at 60 to the bracket arm 26.

In order to hold the axis of the roller 17 at right angles to the line of feed the yoke bracket member 27 is provided with a guide bar 61 which slides freely in the lower arm 26. The guide bar 61 is provided with a recess 62 adjacent its upper end. A lifting lever 63 extends into said recess. This lifting lever is the usual treadle controlled lever and serves as a means whereby the upper puller roller may be simultaneously lifted when the main presser foot is lifted.

The operation of the device will be apparent from the above description. The material to be stitched is placed about the work supporting arm and fed beneath the presser foot 14. As it is stitched in tubular form the tube passes over the roller 16 and the bracket 22 supporting the same. The upper feed roller will be intermittently rotated and as it bears against the material it will pull on the material feeding it step by step as it is stitched. This puller feed, of course, operates in timing with the four motion feed within the work arm. This provides a structure which enables heavy fabrics to be stitched in tubular form. It will be understood, of course, that the term "tubular form" is used in its broad sense, meaning such articles as the body portions, arms and legs of garments, or the like. In fact any article which has its opposite side edges joined produces a tube and the present puller mechanism is especially adapted for stitching such articles which must pass over the lower feeding roller. By the construction described, however, the tube may be made comparatively small if desired.

It is obvious that minor changes in the details of construction and the arrangement of the parts may be made without departing from the spirit of the invention as set forth in the appended claims.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:—

1. The combination of a work supporting arm having a feeding mechanism for feeding the articles as stitched off the end of the arm, a puller feeding mechanism including a lower puller roller, a bracket carried by the arm and on which said roller is mounted whereby a tubular article stitched on said arm will pass over said bracket and feeding roller, an upper feeding roller located above and cooperating with said lower feeding roller, a supporting means on which

said upper feeding roller is mounted, and means for intermittently rotating said upper feeding roller.

2. The combination of a work supporting arm having a feeding mechanism for feeding the articles as stitched off the end of the arm, a puller feeding mechanism including a lower puller roller located in line with the arm and spaced from the free end thereof, a bracket carried by the arm and extending in the direction of the arm on which said roller is mounted whereby a tubular article stitched on said arm will pass over said bracket and feeding roller, an upper feeding roller located above and cooperating with said lower feeding roller, a presser bar, a yoke bracket carried thereby and supporting said upper feeding roller, and devices mounted on said bar and yoke for intermittently rotating said upper feeding roller.

3. The combination of a work supporting arm having a feeding mechanism for feeding the articles as stitched off the end of the arm, a puller feeding mechanism including a lower puller roller located in line with the arm and spaced from the free end thereof, a bracket carried by the arm and extending in the direction of the arm on which said roller is mounted whereby a tubular article stitched on said arm will pass over said bracket and feeding roller, an upper feeding roller located above and cooperating with said lower feeding roller, a presser bar, a yoke bracket carried by said presser bar and supporting said roller, a clutch lever for intermittently rotating said roller, a sector gear carried by said lever, a sleeve mounted on said bar for free rotation, and a segment gear carried thereby and meshing with said sector gear for oscillating the clutch lever.

4. The combination of a work supporting arm having a feeding mechanism for feeding the articles as stitched off the end of the arm, a puller feeding mechanism including a lower puller roller located in line with the arm and spaced from the free end thereof, a bracket carried by the arm and extending in the direction of the arm on which said roller is mounted whereby a tubular article stitched on said arm will pass over said bracket and feeding roller, an upper feeding roller located above and cooperating with said lower feeding roller, a presser bar, a yoke bracket carried by said presser bar and supporting said roller, a clutch lever for intermittently rotating said roller, a sector gear carried by said lever, a sleeve mounted on said bar for free rotation, a segment gear carried thereby and meshing with said sector gear for oscillating the clutch lever, an arm mounted on said sleeve, a rock lever, a link connecting said rock

lever to said arm, and means for oscillating the rock lever.

5. The combination of an upper supporting member, a main shaft mounted therein, a housing projecting laterally from said upper member, a work supporting arm suspended by said upper member, a feeding mechanism for feeding the articles as stitched off the end of the arm, a puller feeding mechanism including a lower puller roller located at the end of said arm and in alignment therewith, a bracket carried by said arm and supporting said roller, an upper feeding roller, a presser bar mounted in said housing, a yoke bracket carried thereby and supporting said upper feeding roller, and means for intermittently rotating said upper feeding roller.

6. The combination of an upper supporting member, a main shaft mounted therein, a housing projecting laterally from said upper member, a work supporting arm suspended by said upper member, a feeding mechanism for feeding the articles as stitched off the end of the arm, a puller feeding mechanism including a lower puller roller located at the end of said arm and in alignment therewith, a bracket carried by said arm and supporting said roller, an upper feeding roller, a presser bar mounted in said housing, a yoke bracket carried thereby and supporting said upper feeding roller, a clutch lever for intermittently rotating said upper feeding roller, an oscillating member carried by said presser bar and movable endwise therewith for oscillating said clutch lever, and means actuated by said main shaft for oscillating said member on the presser bar.

7. The combination of an upper supporting member, a main shaft mounted therein, a housing projecting laterally from said upper member, a work supporting arm suspended by said upper member, a feeding mechanism for feeding the articles as stitched off the end of the arm, a puller feeding mechanism including a lower puller roller located at the end of said arm and in alignment therewith, a bracket carried by said arm and supporting said roller, an upper feeding roller, a presser bar mounted in said housing, a yoke bracket carried thereby and supporting said upper feeding roller, a clutch lever for intermittently rotating said upper feeding roller, a sleeve on said presser bar, means for connecting said sleeve to said clutch lever, a rock shaft mounted in said housing, a link connecting the rock shaft to the sleeve, an eccentric on the main shaft, a lever oscillated thereby, and connections between said lever and said rock shaft.

8. The combination of an upper frame member, a main shaft mounted therein, a housing projecting laterally therefrom, a needle bar reciprocating in said housing, a

presser bar, a presser foot carried thereby, a work supporting arm suspended from said upper frame member, a feeding mechanism in said work supporting arm for feeding the articles as stitched off the end of the arm, a feeding roller located in line with the work supporting arm and spaced from the end thereof, a bracket carrying said feeding roller, a second presser bar mounted on said housing, an upper feeding roller carried thereby cooperating with said lower feeding roller, means for intermittently rotating said upper feeding roller, and spring means for yieldingly forcing said presser bar downwardly for holding said rollers in cooperative relation.

9. The combination of an upper frame member, a main shaft mounted therein, a housing projecting laterally therefrom, a needle bar reciprocating in said housing, a presser bar, a presser foot carried thereby, a work supporting arm suspended from said upper frame member, a feeding mechanism in said work supporting arm for feeding the articles as stitched off the end of the arm, a feeding roller located in line with the work supporting arm and spaced from the end thereof, a bracket carrying said feeding roller, a second presser bar mounted on said housing, an upper feeding roller carried thereby cooperating with said lower feeding roller, means for intermittently rotating said upper feeding roller, spring means for yieldingly forcing said presser bar downwardly for holding said rollers in cooperative relation, said means for rotating the feed roller including a clutch lever, a segment gear carried thereby, a sleeve mounted on said presser bar carrying the feeding roller, a connection between said sleeve and said clutch lever, and means for oscillating said sleeve from said main shaft.

In testimony whereof, we affix our signatures.

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