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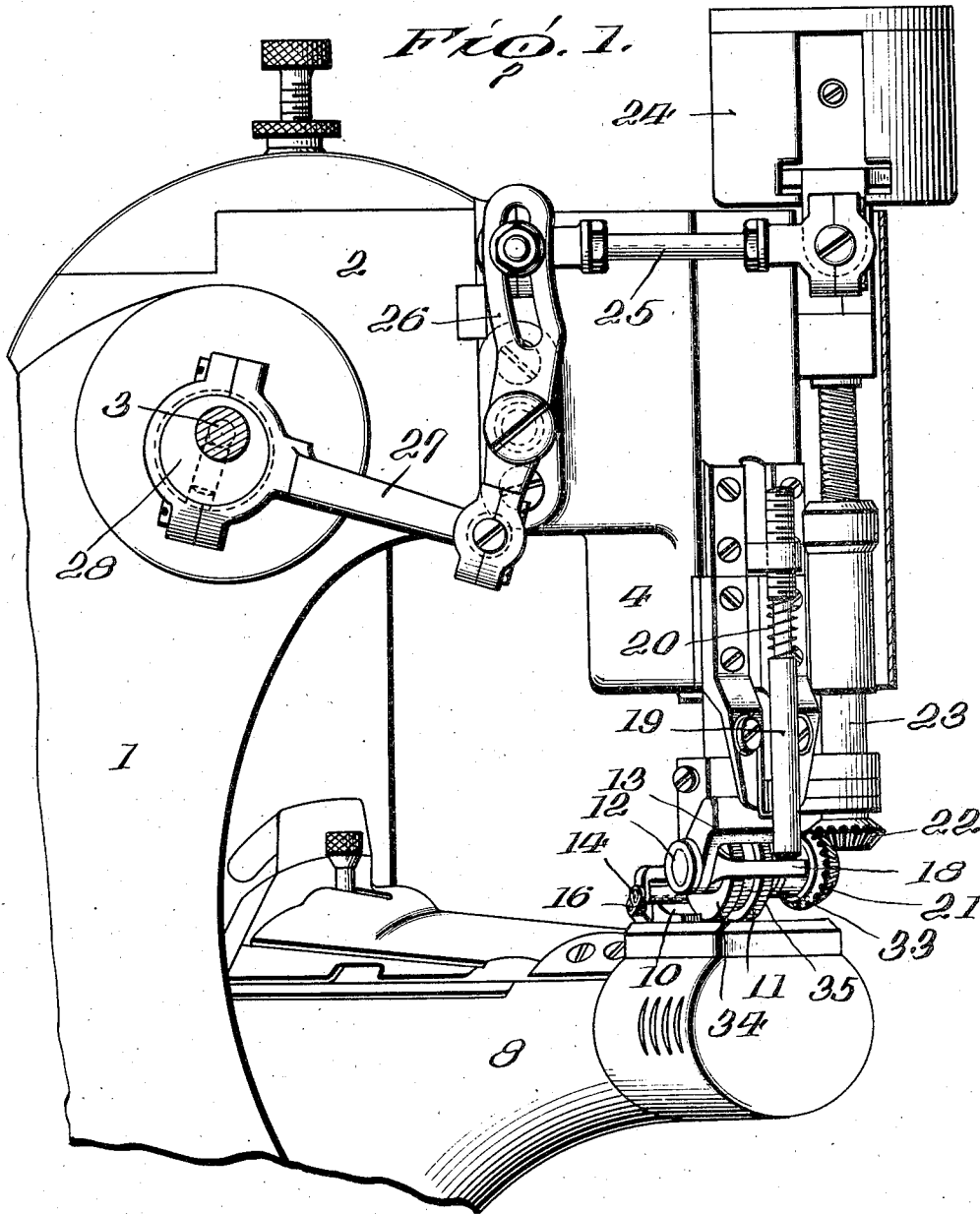
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2,031,193

FELLING MACHINE FOR SEAMING FABRIC SECTIONS

Filed Sept. 19, 1932

3 Sheets-Sheet 1



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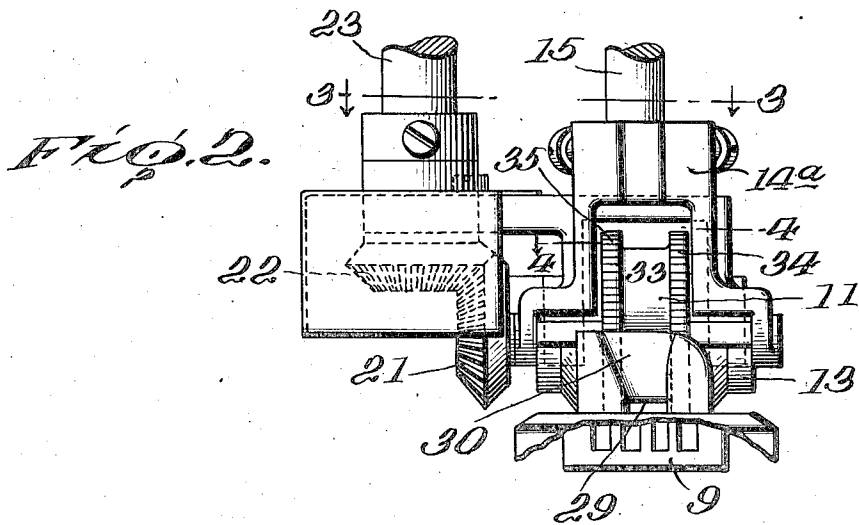
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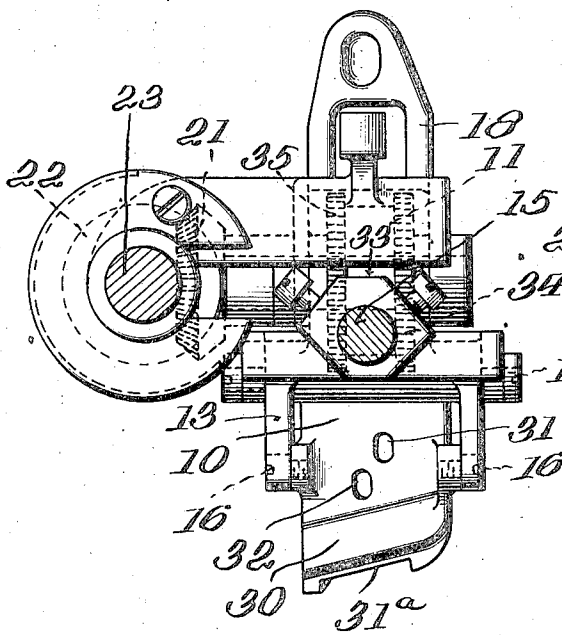
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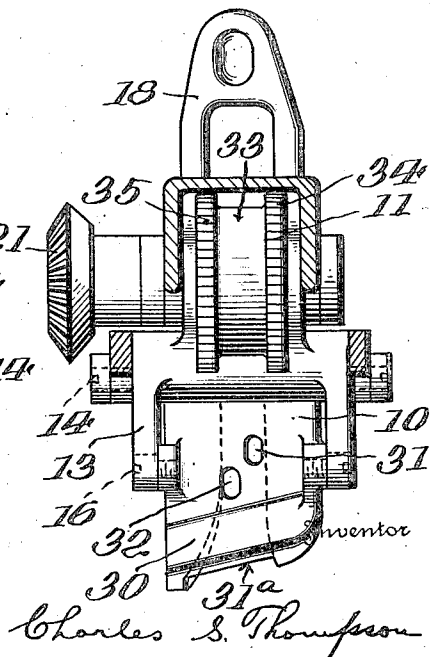
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*FIG. 3.*



*FIG. 4.*



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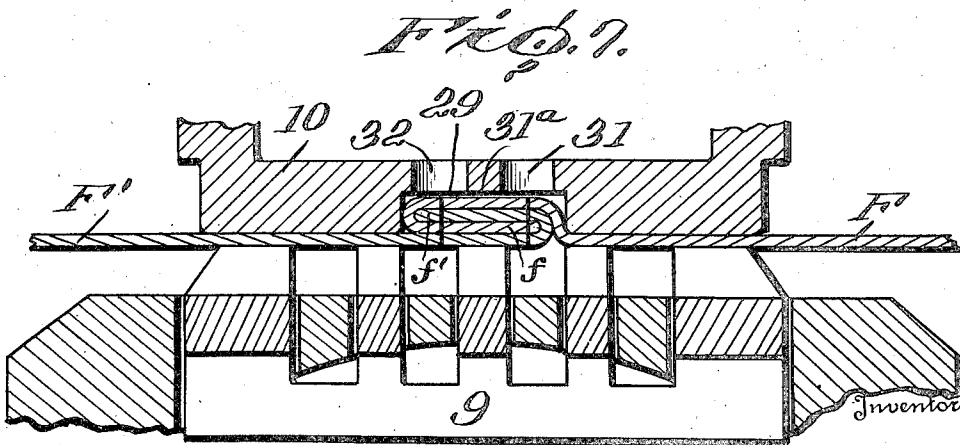
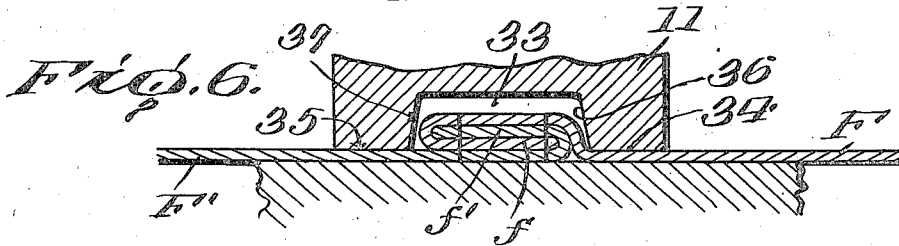
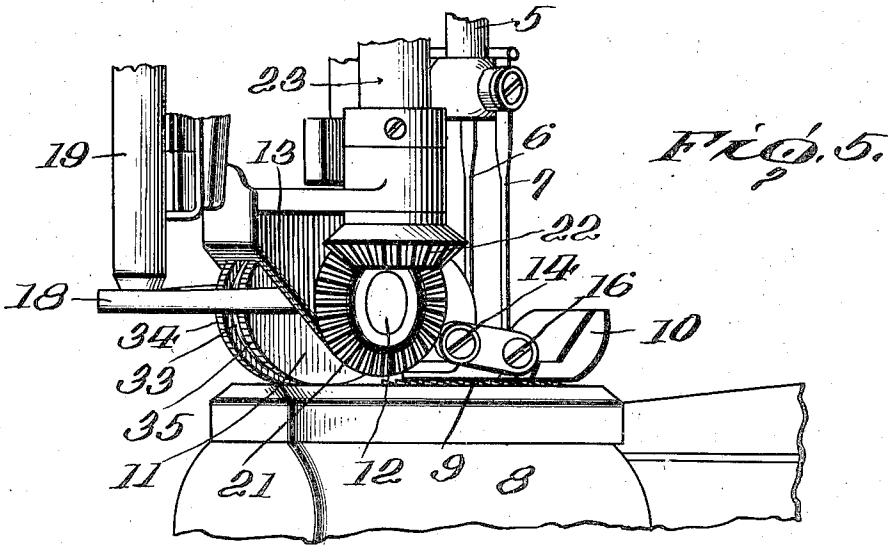
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FELLING MACHINE FOR SEAMING FABRIC SECTIONS

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3 Sheets-Sheet 3



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# UNITED STATES PATENT OFFICE

2,031,193

## FELLING MACHINE FOR SEAMING FABRIC SECTIONS

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a corporation of Illinois

Application September 19, 1932, Serial No. 633,900

5 Claims. (Cl. 112—214)

The invention relates to new and useful improvements in a felling machine for seaming fabric sections, and more particularly to the feeding mechanism of the felling machine.

5 An object of the invention is to provide a felling machine having an intermittently operating feeding roller contacting with the upper face of the fabric sections, which is so constructed as to independently grip the fabric sections which are  
10 interfolded for the feeding of the same.

A further object of the invention is to provide a machine of the above type wherein the feed roller is provided with a channel dimensioned so as to guide the interfolded fabric sections without  
15 subjecting the same to excessive pressure so that the interfolded portions of the fabric sections, as well as cross seams therein, may have a free movement through the machine.

A still further object of the invention is to provide a machine of the above type with stitching  
20 devices which are located in front of the feed roller, and a feeding mechanism and cooperating presser member which operate upon the fabric sections at the stitching point, and which presser  
25 member is also provided with a channel for guiding the interfolded fabric sections.

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

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

Figure 1 is a side view of a portion of the sewing machine embodying the invention, the work arm and the parts disposed at the free end  
35 thereof for feeding the material are shown in perspective;

40 Fig. 2 is a front view of the feed roller and the presser foot associated therewith, and showing a portion of the throat plate and also the operating means for the feed roller;

Fig. 3 is a sectional view on the line 3—3 of Fig. 2;

Fig. 4 is a sectional view on the line 4—4 of Fig. 2;

45 Fig. 5 is a view showing more or less diagrammatically a side view of the feed roller and the presser foot and the immediate parts associated therewith;

50 Fig. 6 is a sectional view through the feed roller and the work support, and showing diagrammatically the fabric sections fed thereby;

55 Fig. 7 is a sectional view through the presser foot, the throat plate and the feed dog associated therewith, and showing diagrammatically the fabric sections fed thereby.

The invention is embodied in a sewing machine which includes a work supporting arm, off from the end of which the fabric sections are fed as they are stitched together. The fabric sections are stitched by sewing devices, and as illustrated, there are two needles. Cooperating with each  
5 needle is a looper so that two independent lines of stitching are formed. The fabric sections to be stitched are directed through a folding guide which underfolds the upper fabric section and  
10 overfolds the under fabric section, and interfolds the two fabric sections for stitching. The interfolded fabric sections are directed beneath a presser foot which bears thereon in the region of the stitching devices. Located beneath the  
15 presser foot is a feed dog which is of the usual character. In rear of the stitching devices is a feed roller which bears upon the fabric sections for contact in the feeding of the same, and the  
20 feed roller is intermittently rotated in proper timing with the main feed dog. The feed roller and the presser foot are mounted on a common supporting means so that they are yieldingly  
25 pressed against the fabric and either may be moved upwardly by the cross seam without disturbing the action of the other. The presser foot and the feed roller are each channeled, and the channel is so dimensioned as to guide the inter-  
30 folded fabric sections and independently grip the fabric section at each side of the interfolded sections without exerting excessive pressure on the interfolded sections.

It is thought the invention will be better understood by a more detailed description of the illustrated embodiment thereof. The machine to  
35 which the invention is applied includes a supporting base carrying a standard 1 having an overhanging portion 2. Mounted in the standard is the main operating shaft 3. The overhanging portion 2 carries a needle head 4 in which the  
40 needle bar 5 reciprocates. Said needle bar carries two needles 6 and 7. Suspended from the standard is a work supporting arm 8. Located in this work supporting arm is the complementary  
45 stitch forming mechanism which includes loopers each cooperating with a needle, so that two independent lines of stitching are formed. Also located in this work supporting arm is the ordinary four-motion feeding mechanism which includes  
50 a feed dog 9. Cooperating with the feed dog 9 is a presser foot 10 which yieldingly engages the material, clamping the same against the feed dog or the throat plate of the work supporting arm during the feed cycle.

Located in rear of the stitching needles 6 and 55

7 is a feed roller 11. The feed roller 11 is fixed to a shaft 12 which is mounted in a supporting yoke 13 which in turn is pivoted at 14 to a bracket 14<sup>a</sup> fixed to the presser bar 15. The presser foot 10 is pivoted at 16 to this supporting yoke. It is noted that the pivotal connection of the yoke to the presser foot is in front of the pivotal connection to the presser bar and likewise the pivotal support of the feed roller is located in the supporting yoke in rear of this pivotal connection to the presser bar. There is a spring which yieldingly forces the presser bar downward and yieldingly holds the feed roller and the presser foot 10 in contact with the material.

The supporting yoke has a rearwardly projecting arm 18 against which a rod 19 is yieldingly forced by a spring 20. The spring 20 adds to the spring pressure on the presser bar in the forcing of the feed roller into contact with the material being stitched. This spring 20, however, is in opposition to the spring pressure of the presser bar exerted upon the presser foot, so that the presser foot rests comparatively lightly on the fabric sections.

The feed roller 11, as noted above, is carried by the shaft 12. This shaft 12 is provided with a bevel gear 21 which meshes with a bevel gear 22 carried by a shaft 23 which is formed with telescoping sections. It also includes a flexible section. The shaft is independently operated by a feed drum 24 with which is associated a feed clutch operated by a link 25 connected to a lever 26 which in turn is attached to an eccentric strap 27 cooperating with an eccentric 28 on the main shaft. This provides a means whereby the feed roller has positively imparted thereto independent feeding movements, and at the same time, the feed roller may be freely raised or lowered without disturbing the operating connections thereof.

This particular arrangement of feed roller and presser foot and the mounting of the same, forms no part of the present invention, but is shown, described and claimed in the application filed by Charles F. Rubel, April 25, 1931, Serial No. 532,934.

The present invention has to do with the particular shaping of the fabric engaging surfaces of the feed roller and the presser foot. The presser foot has a channel 29 in its under face. This channel extends all the way up the under face of the upturned toe 30 of the presser foot. This presser foot is provided with openings 31 and 32 which receive, respectively, the needles 6 and 7. The channel 29 in the under face of the presser foot receives the interfolded portions of the fabric sections. In Figures 6 and 7, the upper fabric section is indicated at F, while the under fabric section is indicated at F'. The upper section is provided with an underfold *f*, while the under fabric section is provided with an overfold *f'*. It is these interfolded portions of the fabric sections which form the felled seam, and through which the needles penetrate for uniting the same with two lines of stitching. It is understood, of course, that a greater or less number of lines of stitching may be used for joining the fabric sections. The channel in the under face of the presser foot is slightly wider than the width of the felled seam, so that the fabric section F will be bent down into contact with the feed dog and the throat plate. The feed dog is extended laterally so that the presser foot will independently clamp the fabric sections against the feed dog and the throat plate during

the feed cycle. From certain aspects of the invention, this presser foot, however, which has a very light pressure against the fabric sections, may be of the usual type, and have a guiding channel which is rather shallow, and serves as a guide for the interfolded sections, but contacts with said folded sections, pressing the same against the feed and the throat plate during the feed cycle.

The invention has to do particularly with the feed roller. The feed roller is provided with a channel 33, which channel is in line with the channel 29 in the presser foot. At each side of the channel 33, the feed roller is provided with knurled sections 34 and 35. The channel 33 in the feed roller is of a width slightly greater than the width of the interfolded seamed portions, so that the fabric section F is bent down into contact with the work support by the knurled section 34 of the feed roller. The fabric section F' is forced against the work support by the knurled section 35 of the feed roller. The vertical walls 36 and 37 are spaced not only so as to permit the free movement of the interfolded fabric sections, but also to permit a cross seam to pass without undue wedging in the channel. The depth of the channel is greater than the thicknesses of the fabric sections which are interfolded so that there is little pressure exerted against the interfolded sections. The feed roller grips the fabric sections independently and imparts feeding movement thereto. This prevents any uneven pull on the fabric sections due to the feeding force of the feed roller. Even when the presser foot bears immediately on the fabric sections, the feed of the fabric section is accomplished, to a major extent, by the feed roller. Furthermore, when the feed roller independently contacts with the fabric sections rather than with the interfolded portions thereof, there is little or no undue stretching of the fabric as it is pulled through the folder and carried to and away from the stitching devices.

While I have shown the feed dog as terminating adjacent the rear end of the presser foot 10, it will be understood that it may be extended if desired so as to cooperate with the feed roller 11.

It is obvious that other ways may be provided for the supporting of the feed roller and the associated presser foot. The invention has to do particularly with the construction of the feed roller, regardless of its mounting, and the action of the same on the fabric sections.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is—

1. In a felling machine, the combination of a work support, a presser foot adapted to receive and direct interfolded fabric sections, stitching devices for uniting the interfolded fabric sections, a feeding means including a feed roller yieldingly contacting with the fabric sections on the work support in rear of the presser foot, and means for intermittently rotating said roller, a feed dog mounted beneath the work support and engaging the material beneath the presser foot, said presser foot and said feed roller having channels in their fabric engaging faces located in alignment and adapted to receive the interfolded portions of the fabric sections, each of said channels being of a greater width than the interfolded fabric sections and of a greater depth than the combined thicknesses of the interfolded fabric sections.

2. In a felling machine, the combination of a work support, a presser foot adapted to receive and direct interfolded fabric sections, stitching devices for uniting the interfolded fabric sections, a feeding means including a feed roller yieldingly contacting with the fabric sections on the work support in rear of the presser foot, means for intermittently rotating said roller, a feed dog mounted beneath the work support and engaging the material beneath the presser foot, said presser foot and said feed roller having channels in their fabric engaging faces located in alinement and adapted to receive the interfolded portions of the fabric sections, each of said channels being of a greater width than the interfolded fabric sections and of a greater depth than the combined thicknesses of the interfolded fabric sections, said presser foot and said feed roller each having fabric engaging portions contacting independently with the fabric sections at each side of and adjacent the interfolded portions of the fabric sections.

3. In a felling machine, the combination of a work support, a presser foot adapted to receive and direct interfolded fabric sections, stitching devices for uniting the interfolded fabric sections, a feeding means including a feed roller yieldingly contacting with the fabric sections on the work support in rear of the presser foot, means for intermittently rotating said roller, a feed dog mounted beneath the work support and engaging the material beneath the presser foot, said presser foot and said feed roller having channels in their fabric engaging faces located in alinement and adapted to receive the interfolded portions of the fabric sections, each of said channels being of a greater width than the interfolded fabric sections and of a greater depth than the combined thicknesses of the interfolded

fabric sections, a yieldingly mounted pivoted yoke member carrying said feed roller at the rear end thereof and on which said presser foot is pivotally mounted at the forward end thereof, and means for yieldingly centering said yoke on its pivot.

4. In a felling machine, the combination of a work support, a presser foot adapted to receive and direct interfolded fabric sections, stitch forming devices including a plurality of needles for uniting the interfolded fabric sections, a feeding means including a feed roller yieldingly contacting with the fabric sections on the work support in rear of the presser foot, and means for intermittently rotating said roller, said roller having a channel in its fabric engaging face of sufficiently greater width than the transverse distance between the outer limits of the stitch forming devices and the lines of stitching produced thereby and of sufficient depth so that the feed roller engages the fabric sections with a feeding pressure only at each side of and adjacent the interfolded portions of the fabric sections for the feeding of the same.

5. In a felling machine, the combination of a work support, stitching devices including a plurality of needles for uniting interfolded fabric sections, a feeding means including a feed roller yieldingly contacting with the fabric sections on the work support, and means for intermittently rotating said roller, said roller having spaced fabric feeding sections, said sections being spaced a distance sufficiently greater than the transverse distance between the outer limits of the stitching devices and the lines of stitching produced thereby so that the fabric feeding sections engage the fabric sections with a feeding pressure only at each side of and adjacent the interfolded portions of the fabric sections for the feeding of the same.

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