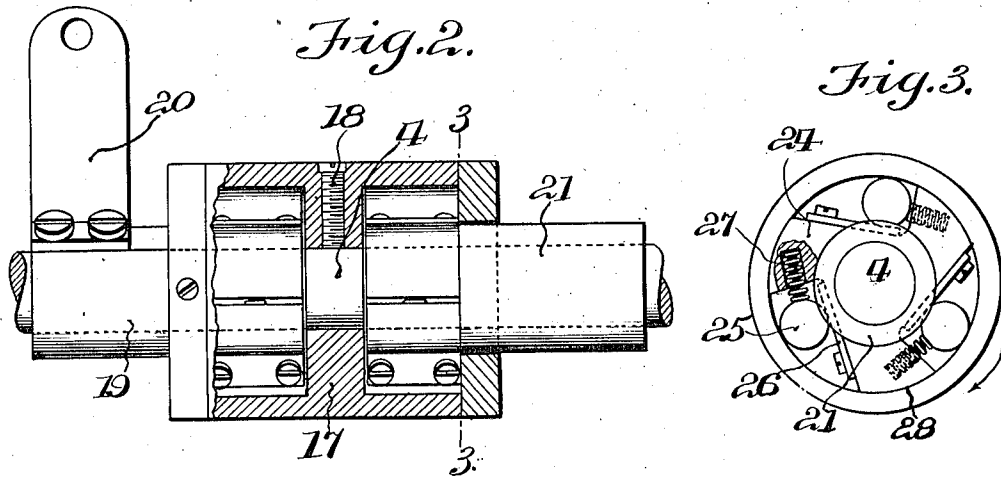
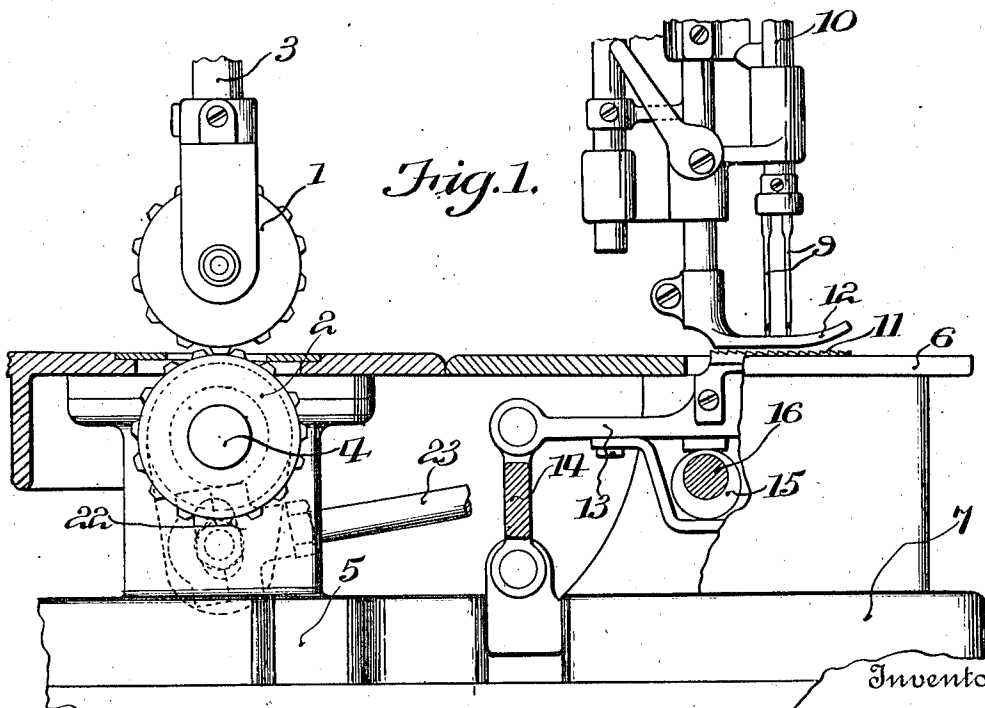


D. S. SEYMOUR.
FEEDING MECHANISM FOR SEWING MACHINES.
APPLICATION FILED JAN. 6, 1914.

1,292,099.

Patented Jan. 21, 1919.
2 SHEETS—SHEET 1.



Witnesses

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Fig. 4.

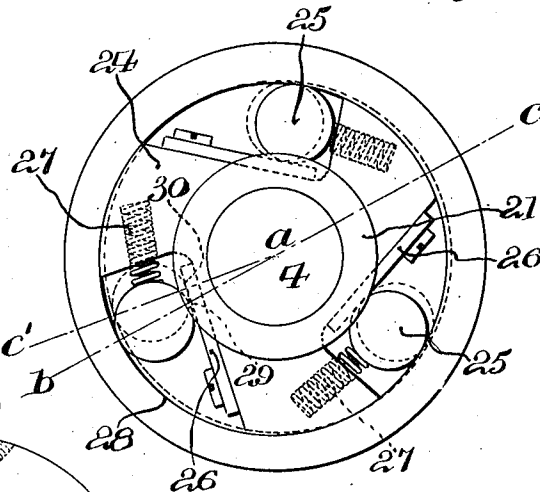


Fig. 6.

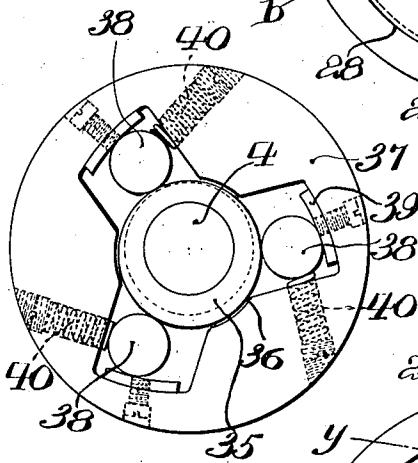
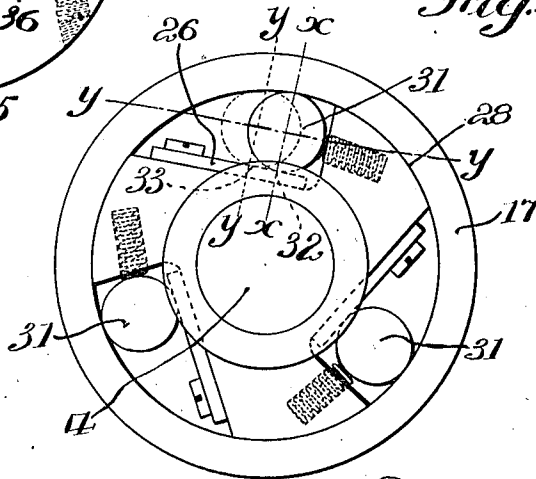


Fig. 5.



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UNITED STATES PATENT OFFICE.

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FEEDING MECHANISM FOR SEWING-MACHINES.

1,292,099.

Specification of Letters Patent.

Patented Jan. 21, 1919.

Application filed January 6, 1914. Serial No. 810,647.

To all whom it may concern:

Be it known that I, DUDLEY S. SEYMOUR, a citizen of the United States, residing at Oak Park, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Feeding Mechanism for Sewing-Machines, of which the following is a description, reference being had to the accompanying drawing and to the figures of reference marked thereon.

The invention relates more particularly to the means for imparting an intermittent movement to a feed roller used in connection with sewing machines for pulling the material through the machine in timed relation to the actuation of the feed of the sewing machine.

An object of the invention is to provide a friction clutch for operating the feed rollers which is so constructed that the wear of the friction gripping members is widely distributed so as to increase the life and efficiency of the clutch.

In the drawings, Figure 1 is a view partly in section showing a puller mechanism used in connection with the feeding mechanism of a sewing machine, which puller mechanism embodies my improved clutch for rotating the feed rollers.

Fig. 2 is a view partly in plan and partly in section of the friction clutch.

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

Fig. 4 is an enlarged view showing in dotted lines a different position of the clutch members and the manner in which the wear on the hardened clutch plate is distributed.

Fig. 5 is a detail similar to Fig. 4 showing a slightly modified form of the invention.

Fig. 6 is a detail similar to Fig. 4, showing a further modification of the invention.

In Fig. 1 of the drawing, I have shown a puller mechanism which consists of rotating feed rolls 1 and 2. The feed roll 1 is carried by a presser bar 3, while the feed roll 2 is mounted on the end of a feed shaft 4. This shaft is mounted in suitable bearings in brackets carried by the bed plate 5.

The sewing machine proper consists of a work support 6 which is also carried by a bed plate 7, and the bed plates 5 and 7 are

mounted on a common supporting bed 8. The needles 9 are carried by a needle bar 10 which is reciprocated in the needle head. A feed dog 11 coöperates with a presser foot 12. This feed dog is carried by a feed bar 13 which is moved back and forth by a feed rocker 14. The feed bar is raised and lowered by an eccentric 15 on the main shaft 16 of the sewing machine. The above devices are of the usual construction and form no part of my present invention.

The shaft 4 is intermittently rotated in timed relation to the feeding mechanism of the sewing machine. This shaft 4 is intermittently rotated by a friction clutch and my invention is directed to this friction clutch. The friction clutch consists of an outer sleeve 17 which is fixed to the shaft 4 by a set screw 18. An inner sleeve 19 is fixed to the bracket 20, which in turn is attached to the supporting bed 5. An inner sleeve 21 is mounted to turn freely on the shaft 4 and this sleeve 21 is oscillated back and forth by an arm 22, see Fig. 1, which is connected to a link 23 which in turn is moved endwise by an eccentric on the main shaft 16 of the sewing machine. The inner sleeve 21 extends into the outer sleeve 17, and is provided with outwardly projecting arms 24 which, as herein shown, are three in number.

Rollers 25 are disposed between the arms 24. These rollers rest on hardened plates 26 carried by the arms 24. Springs 27 carried by the arms 24 engage the rollers and normally force the same along the hardened plates into contact with the inner surface of the sleeve 17. Clutches of this general type are old in the art and the method of frictionally locking the inner sleeve to the outer sleeve will be obvious.

When the inner sleeve turns in the direction of the arrow in Fig. 3, the hardened plates which are set so as to intersect the friction gripping surface on the inner face of the sleeve 17 will cause the rollers to grip said friction surface and this in turn will cause the sleeve 17 to move with said inner sleeve 21. A movement in the opposite direction, however, will carry the hardened plate away from the rollers sufficiently to release the rollers from gripping contact with the

outer sleeve. There are similar rollers and springs and hardened plates between the inner sleeve 19 and the opposite end of the outer sleeve 17, the only difference between these parts being that the rollers are so set that the sleeve 19 which is fixed holds the sleeve 17 from any retrograde movement when the sleeve 21 is moved in a backward direction for the next feeding stroke.

The rollers in clutches of the above character have always come into gripping contact in the same relative position on the hardened plates and this is found in practice to wear the hardened plate so as to form a groove therein and thus soon destroy the efficiency of the clutch as new plates must be substituted for the old ones to prevent slipping of the clutch parts.

My invention is directed particularly to the construction of a clutch of the above character wherein the wear on the hardened plates will be distributed. In carrying out the invention as shown in Fig. 4, the inner clutch surface 28 of the sleeve 17 is formed eccentric to the center of the shaft 4. By forming this inner clutch surface eccentric to the center of the shaft 4, the wear on the hardened plates is distributed as will appear from the dotted line position of the parts in Fig. 4. The line $a-b$ in this figure is the radius of the greatest eccentricity of the clutch surface 28, while the line $a-c$ is the radius of least eccentricity. The line $a-c'$ represents the positions of the parts when the radius $a-c$ of least eccentricity has reached the position $a-c'$.

When the parts are in the position shown in the full lines, the distance between the outer face of the inner sleeve 21 and the clutch surface of the outer sleeve along the line $a-b$ is greater than the distance between the outer face of the inner sleeve and the clutch surface of the outer sleeve along the line $a-c$. Therefore, the roller when in gripping position will engage the hardened plate at the point 29. When the parts are returned to the position shown in dotted lines, this same roller will grip the hardened plate at the point 30 for now the distance between the hardened plate and the clutch surface of the outer sleeve is less. Between these extreme positions as the roller engages the clutch surface, the point of contact with the hardened plate will be shifted between points 28 and 29 and, therefore, the wear on the hardened plate is distributed.

In Fig. 5 of the drawings, I have shown a construction wherein the clutch surface 28 on the inner face of the outer sleeve 17 is concentric with the axis a of the shaft 4. Each of the rollers 31 are, however, slightly out of true or eccentric. In this figure the maximum diameter of the roller 31 is indicated at $x-x$, while the minimum diameter is indicated at $y-y$. When this roller

is caught so as to grip the hardened plate 26 and the clutch surface 28 with the longest diameter $x-x$ in gripping engagement with these parts, then the point of contact between the roller and the hardened plate is at the point 32. When, however, this roller is gripped with the minimum diameter $y-y$ in contact with the hardened plate and the outer clutch surface, then the point of contact between the roller and the hardened plate is at the point 33. The gripping of the roller at points between the minimum and maximum diameters will vary the point of gripping contact with the hardened plate between the points 32 and 33. Therefore, this forming of the roller or one of the clutching parts with its surface eccentric causes a distribution or shifting of the wear on the hardened gripping plate.

In Fig. 6 of the drawings, I have shown a further modification of the invention. In this figure, the inner member is formed eccentrically to the axis of the supporting shaft for the clutch wheel. The outer member carries the clutch plates. The shaft 4 carries a collar 35 having an eccentric outer surface 36. This collar is loosely mounted on the shaft and is oscillated for intermittently moving the outer sleeve 37 and is held from movement when the parts form the holding member attached to the fixed bracket 20. The outer sleeve 37, like the sleeve 17, is fixed to the shaft 4. The rollers 38 are concentric and rest on this surface 36 and bear against hardened plates 39 carried by the sleeve 37. Springs 40 force the rollers into contact with the plates.

The operation of the parts is precisely the same as above described, wherein the outer member is eccentric, and further description of this modified form of the invention is not thought necessary.

While I have described my friction clutch as especially adapted for use in connection with the feeding mechanism for sewing machines, it will be understood from certain aspects of the invention that said clutch may be used for purposes wherein it is desired to give an intermittent rotation to an operated part.

Having thus described my invention, what I claim is:

A friction clutch comprising an outer rotating sleeve having two spaced cylindrical clutching surfaces, each of which is eccentric to the axis of rotation of the sleeve, an inner oscillating member mounted so as to oscillate about the axis of rotation of said outer member, said inner member having two sets of hardened plates, one set for each clutching surface, a roller associated with each plate and adapted to engage the plate and the clutching surface, and a spring bearing against each roller and normally tending to hold the roller in clutching en-

gagement with the hardened plate and the clutching surface, one of said cylindrical clutching surfaces and the parts associated therewith operating to rotate the sleeve and
3 the other cylindrical clutching surface operating to hold the sleeve from movement in a backward direction.

In testimony whereof, I affix my signature, in the presence of two witnesses.

DUDLEY S. SEYMOUR.

Witnesses:

S. GEORGE TATE,
T. C. FETROW.