May 13, 1924. 1,493,639

W. MYERS

UNIVERSAL FEED EMBROIDERING MACHINE

Filed Dec. 14, 1921

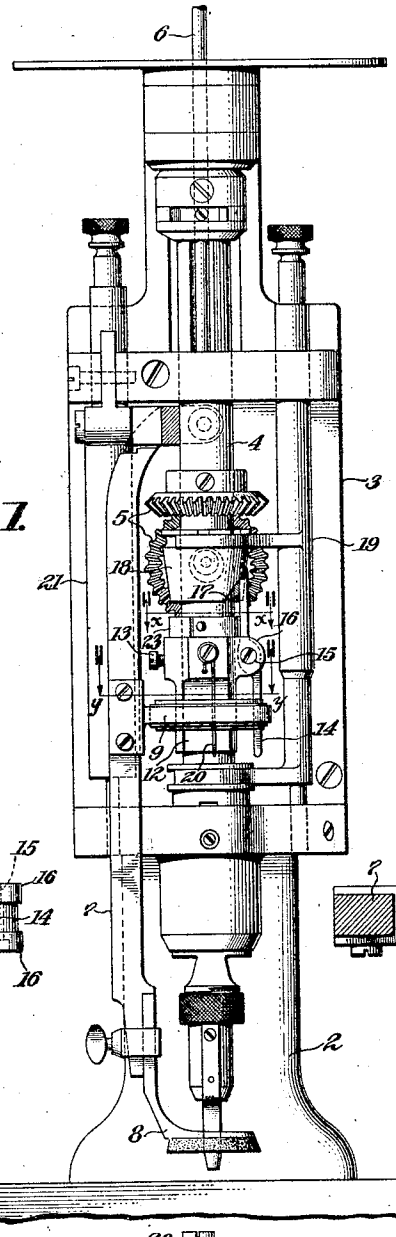


Fig. 1.

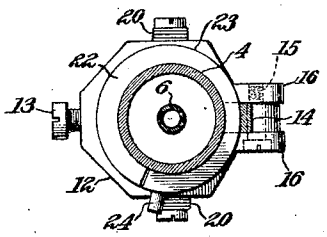


Fig. 2.

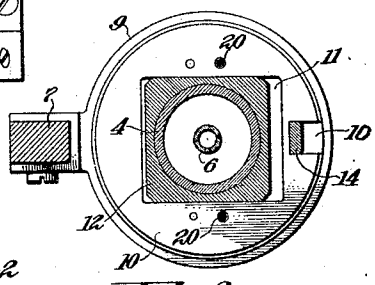


Fig. 3.

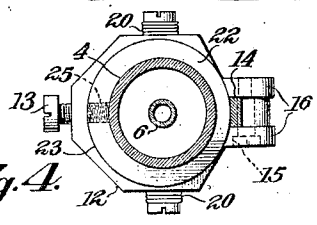


Fig. 4.

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UNITED STATES PATENT OFFICE.

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UNIVERSAL FEED EMBROIDERING MACHINE.

Application filed December 14, 1921. Serial No. 522,355.

To all whom it may concern:

Be it known that I, WALTER MYERS, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Universal Feed Embroidering Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improvement in the feeding mechanism of universal feed embroidering machines such as disclosed in my U. S. Patent No. 1,325,033, granted December 16, 1919.

The present invention has for its object to provide simple means of a readily manipulated character for regulating the amplitude of fabric feed-movement of the feeding-foot in universal feed sewing machines.

To this end the present improvement may be embodied in a sewing machine of the character referred to and in which a feed-actuating lever is pivotally sustained upon a cylinder rotatable in accordance with the direction of feed. As is usual in these machines, the feed-actuating lever is yieldingly held in contact with an inclined cam-surface of a cam-element constrained to rotate with the cylinder but free to be reciprocated thereupon. The rocking movements imparted to the feed-actuating lever by the reciprocating cam-element are transmitted by said lever to a feeding-foot carrying bar suitably sustained to permit fabric feeding movements of the feeding-foot in any direction in a given plane.

In order to regulate the amplitude of fabric feeding movement of the feeding foot, the present invention in its preferred embodiment contemplates the provision upon said cylinder of an adjusting collar of which the outer surface is eccentric to the axis of the cylinder and is positioned to engage the feed-actuating lever, whereby circular adjustment upon the cylinder of said collar causes rocking movement of the feed-actuating lever. Proportionate with the degree of said adjustment, a greater or less extent of the inclined cam-surface of said reciprocating cam-element engages the feed-actuating lever and consequently the amplitude of feed movement of the feeding-foot is altered accordingly.

In the accompanying drawings, Fig. 1 is a front end elevation of a portion of a universal feed embroidering machine to which the present improvement has been applied. Fig. 2 is an enlarged sectional view on the line *x*—*x* of Fig. 1. Fig. 3 is an enlarged sectional view on the line *y*—*y* of Fig. 1. Fig. 4 is a view similar to Fig. 2 of a modification.

It may be mentioned that only so much of a universal feed embroidering machine has been illustrated in the drawings and is herein described as is deemed essential for an understanding of the present invention, inasmuch as the improvement is not dependent upon the particular construction of the actuating mechanism, but on the contrary is applicable to machines of this type generally. If desired, reference may be made for instance to my prior Patent No. 1,325,033 hereinbefore mentioned for an understanding of any mechanism not herein disclosed and forming no direct part of the present invention.

Referring to the drawings, the present improvement has been applied to a universal feed embroidering machine including a cloth-plate 1 from which rises the standard 2 of an overhanging arm terminating in the head 3. Journaled for rotary movement in suitable bearings provided in the head 3 is the cylinder 4 which may be rotated by means of bevel-gears, as 5, from the usual actuating mechanism. Mounted for reciprocating movements within the cylinder 4 is the needle-bar 6, while the feed-bar 7 carrying the feeding-foot 8 is sustained to permit of fabric-feeding movements of the feeding-foot in any direction in a given plane, as well as movements toward and from the fabric, all as is usual in sewing machines of this character.

Secured to the feed-bar 7, intermediate its ends, is the feed-ring 9 embracing the feed-collar 10 provided with the rectangular opening 11 affording a guideway for sliding movements upon the guide-block 12 secured by means of a screw 13 upon the cylinder 4. The feed-collar 10 is provided with the notch 10′ entered by one arm of the feed-actuating lever 14 fulcrumed upon the screw 15 between spaced ears, as 16, provided upon the block 12. The other arm of the lever 14 enters the groove 17 of the

cam-element 18, which is vertically reciprocated upon the cylinder 4 by means of the sleeve 19, as is fully disclosed and described in my prior Patent No. 1,325,033. The base of the groove 17 is inclined, as usual, to the longitudinal axis of the cylinder 4 to afford a cam-surface against which the lever 14 is yieldingly urged by means of the springs, as 20, secured upon opposite sides of the guide-block 12 and entering suitable apertures in the feed-collar 10.

It will be understood that the cam-element 18 partakes of the rotary movements of the cylinder 4 by reason of the action of the lever 14 against the side walls of the groove 17, inasmuch as the guide-block 12 which carries the lever 14 is secured upon the cylinder. It will further be understood that the vertically reciprocatory movements of the cam-element 18, which may be imparted thereto in any approved manner cause rocking movements of the lever 14 in opposition to the action of the springs 20. These rocking movements are transmitted to the feed-collar 10 and through the latter to the feeding-foot 8 in a direction dependent upon the degree of rotation of the cylinder 4. The described movements of the feeding-foot 8 may obviously occur in any direction in the plane of the cloth-plate 1, while vertical movements are imparted to the feeding-foot in the usual manner from the sliding sleeve 21.

In order to regulate the amplitude of movement of the feeding-foot 8 in the plane of the cloth-plate, i. e., regulate the stitch-length, a collar 22 is positioned upon the cylinder 4 such that the outer surface 23 of the collar may bear against the feed-lever 14. The surface 23 is disposed eccentric to the axis of the cylinder 4, whereupon circular adjustment of the collar 22 upon the cylinder will displace said feed-lever and cause a greater or less extent of the inclined base of the cam-groove 17 to engage the feed-lever in the operation of the machine. Conforming with the degree of circular adjustment of the collar is therefore the amplitude of fabric-feeding movement of the feeding-foot 8.

The preferred embodiment of the collar 22 is illustrated in Fig. 2 of the drawings in which the collar is split and frictionally engages the cylinder 4, adjustment being more readily effected by means of a pin 24 projecting from the collar. It is obvious, however, that various modifications of this construction may be made within the spirit and scope of the invention, a modified form being illustrated in Fig. 4 in which the collar 22 is secured in adjusted position upon the cylinder 4 by means of a set-screw 25.

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

1. In a universal feed mechanism for embroidering machines, the combination with a feeding-foot sustained to perform fabric-feeding movements in any direction in a given plane, a feeding-foot actuating lever, rotatable supporting means for said lever, and a reciprocatory cam-element operatively engaging said lever, of means for regulating the amplitude of fabric-feeding movement of said feeding-foot comprising an adjustable device operatively disposed to effect a predetermined degree of lost motion between said cam-element and said feed-actuating lever.

2. In a universal feed mechanism for embroidering machines, the combination with a feeding-foot sustained to perform fabric-feeding movements in any direction in a given plane, a feeding-foot actuating lever, rotatable supporting means for said lever, and a reciprocatory cam-element operatively engaging said lever, of means for regulating the amplitude of fabric-feeding movement of said feeding-foot comprising a feed-adjusting eccentric sustained for rotation with said lever and disposed with respect thereto to effect a predetermined degree of lost motion between said cam-element and said feed-actuating lever.

3. In a universal feed mechanism for embroidering machines, the combination with a feed-bar, a feeding-foot carried by said bar, a rotary cylinder, a cam-element sustained for reciprocating movements upon said cylinder, a feed-lever actuated by said cam-element and operative connections between said feed-lever and said feed-bar for imparting fabric-feeding movements to said feeding-foot in any direction in a given plane, of means for regulating the amplitude of fabric feeding movement of said feeding foot comprising a collar adjustably secured upon said cylinder and having an eccentric surface disposed with respect to said feed-lever to effect a predetermined degree of lost motion between said cam-element and said feed-actuating lever.

In testimony whereof, I have signed my name to this specification.

WALTER MYERS.