

Sept. 8, 1936.

W. MYERS

2,053,968

SEWING MACHINE

Filed July 26, 1934

2 Sheets-Sheet 1

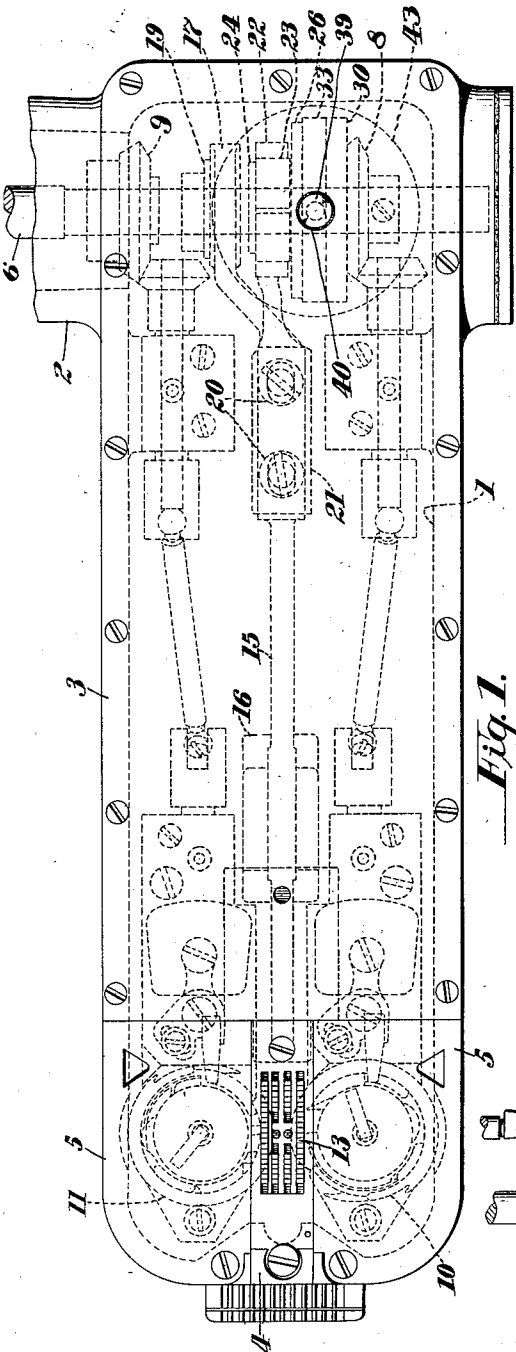


Fig. 1.

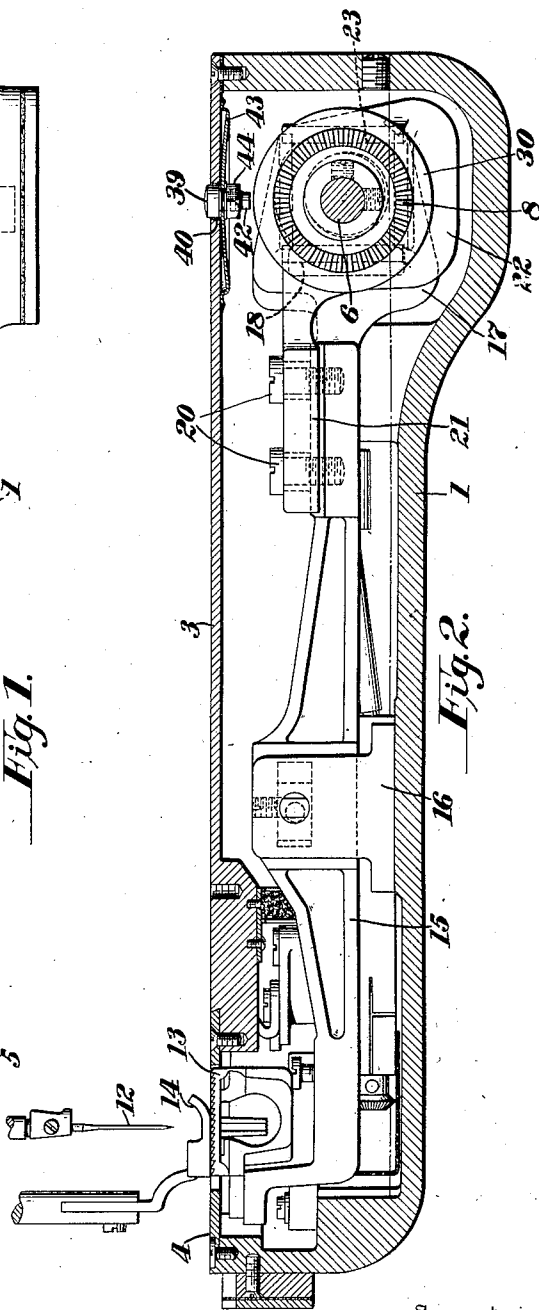


Fig. 2.

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2 Sheets-Sheet 2

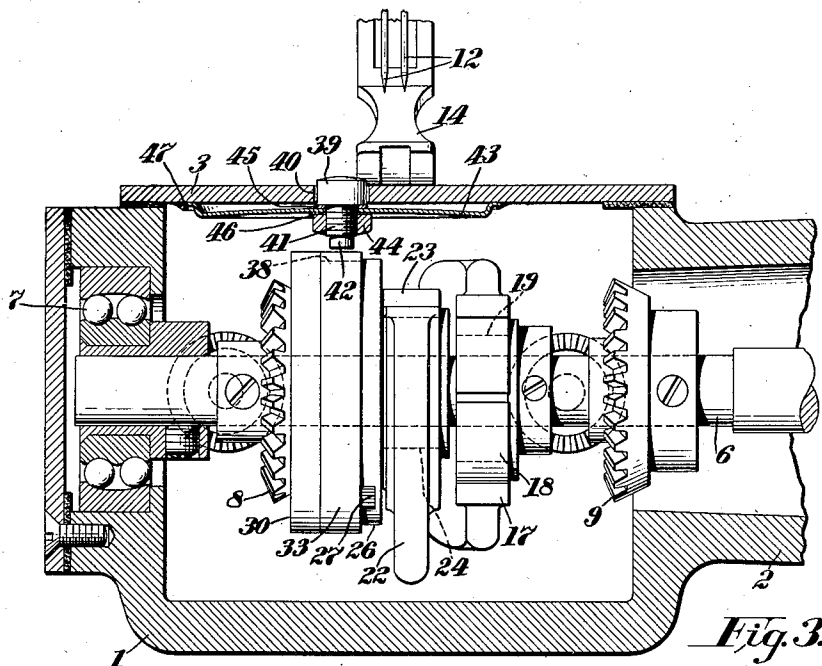


Fig. 3.

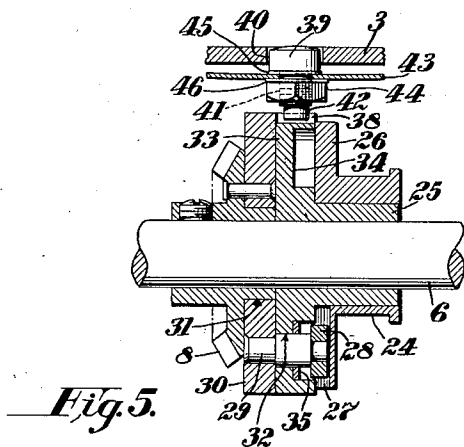


Fig. 5.

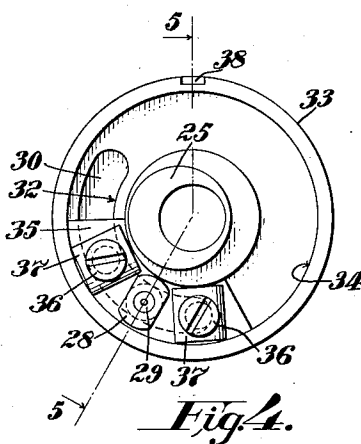


Fig. 4.

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UNITED STATES PATENT OFFICE

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SEWING MACHINE

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Application July 26, 1934, Serial No. 737,002

18 Claims. (Cl. 112—210)

This invention relates to improvements in sewing machines and has for its primary object to provide a sewing machine with improved oil-tight means whereby an operative or controlling member may be actuated from the exterior of and through the sewing machine frame or the casing of a mechanism-housing chamber of a sewing machine. From another aspect, the invention has for an object to provide means, which is completely oil-tight, for transmitting motion through the frame or a mechanism-housing casing of a sewing machine.

The invention also aims to provide improved means, devoid of working joints, for transmitting motion through the frame or a mechanism-housing casing of a sewing machine. A more specific object of the invention is to provide improved means for effecting adjustment of a sewing machine eccentric housed within a chamber provided in the sewing machine frame.

With the above and other more specific objects in view, the invention consists in the devices, combinations and arrangements of parts hereinafter described in connection with the accompanying drawings which illustrate a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the accompanying drawings, Fig. 1 is a top plan view of the work-arm of a feed-off-arm sewing machine, with the carrier-arm for said work-arm broken away. Fig. 2 represents a longitudinal section of the work-arm. Fig. 3 represents a transverse section of the work-arm in a vertical plane substantially through the actuating shaft for the feed and loop-takers. Fig. 4 is a detail view of the adjusting member from the recessed side face thereof. Fig. 5 represents a sectional view of the adjustable eccentric, substantially on the line 5—5 of Fig. 4.

The drawings illustrate the present improvement as embodied in a feed-off-arm sewing machine such as shown and described in my prior patent application Serial No. 627,409, filed August 4, 1932. The sewing machine shown in the drawings has a frame including a hollow work-arm 1 supported by a carrier-arm 2 which is coplanar with the work-arm. The work-arm 1 comprises a trough-shaped casing, closed at its top by a removable cover-plate 3, a throat-plate 4, and swing-out cover-plates 5 disposed at opposite sides of the throat-plate 4.

Journalled in the carrier-arm 2 and extending within and transversely of the work-arm 1 is a

rotary actuating shaft 6 journaled at one end in a ball-bearing 7 in the work-arm. Carried by the shaft 6 are bevel-gears 8 and 9 connected to driving mechanisms for loop-takers 10 and 11, disposed within and at the free end of the work-arm 1 for cooperation with a pair of needles 12 in the formation of stitches.

The work is advanced longitudinally of the work-arm 1 and off the free end thereof by a feed-dog 13, operating through the suitably slotted throat-plate 4 and opposed by a presser-foot 14. The feed-dog 13 is carried by one end of a feed-bar 15 extending longitudinally of and within the work-arm 1, said feed-bar being suitably fulcrumed for rocking and endwise movements upon a bracket 16 within the work-arm.

In order to impart rocking movements to the feed-bar 15, and thereby rising and falling movements to the feed-dog 13, said feed-bar at its end opposite to the feed-dog is provided with a fork 17 slidably straddling a block 18 embracing a feed-lift eccentric 19 suitably secured upon the rotary actuating shaft 6 within the work-arm. The fork 17 is offset laterally of the feed-bar 15 and, in the present case, is formed integral with said feed-bar by laterally bending the feed-bar.

Secured, by screws 20, upon the feed-bar 15 for adjustment lengthwise thereof, is the shank 21 of a fork 22 slidably straddling a block 23 embracing a feed-advance eccentric 24, the fork 22 extending transversely of the feed-lift fork 17. The feed-advance eccentric 24 is secured upon the shaft 6, within the work-arm, for adjustment of the eccentricity of the eccentric, the arrangement illustrated in the drawings and as embodied in the present machine corresponding substantially with the disclosure in the U. S. Patent to A. Grieb, No. 1,605,937, November 9, 1926.

In general, the eccentric 24 embraces an adjusting eccentric 25, which in turn embraces the shaft 6 for rotary adjustment thereupon. The eccentric 24 has a flange 26 provided with a radial slot 27 slidably entered by a pivot-block 28 carried by a shouldered anchor-pin 29 projecting from a side face of a supporting disk 30. The disk 30 is seated upon the hub-extension 31 of the loop-taker actuating bevel-gear 8 and is suitably secured to said bevel-gear for rotation therewith. Consequently, the anchor-pin 29 constitutes a driving connection compelling rotation of the eccentric 24 with the shaft 6.

The anchor-pin 29 extends loosely through an arcuate slot 32 provided in a flange 33 of the adjusting eccentric 25, the flange 33 being disposed between the flange 26 of the eccentric 24

and the supporting disk 30. The adjusting member, comprising the eccentric 25 and its flange 33, is secured to the supporting disk 30 for rotation therewith during the normal operation of the machine, but in a manner permitting relative rotation of said adjusting member and supporting disk for purposes of adjustment of the eccentricity of the eccentric 24. To that end, the side face of the adjusting-member flange 33, adjacent to the eccentric-flange 26, is provided with a circular groove 34 affording a clearance recess for a friction-plate 35 and the heads of screws 36 passing freely through the arcuate slot 32 in the flange 33, which screws 36 are threaded into the supporting disk 30. Friction-washers 37 are interposed between the friction plate 35 and the heads of the screws 36.

The flange 33 of the adjusting member is peripherally provided with a stop-notch 38 adapted to receive a detent which is manually operable to hold said adjusting member against rotation. It is a specific object of the present invention to provide oil-tight means, free of working joints, whereby said detent may be operated from the exterior and through the wall of the work-arm.

The improved detent has a button or head 39 loosely disposed for movement in an aperture 40 provided in a wall of the work-arm 2, and in the present case in the detachable cover-plate 3 of said work-arm, said head 39 having a threaded shank 41 terminating in a reduced tip 42 extending within the work-arm. The detent shank 41 passes through an aperture provided in a flexible section of the work-arm wall and comprising, in the present case, a flexible and preferably metallic disk or circular diaphragm 43, the detent being secured to said diaphragm by a nut 44 threaded upon the shank 41. Sealing washers 45 and 46 at opposite sides of the diaphragm serve to render the connection of the detent with the diaphragm completely oil tight. It will be understood, of course, that the detent may be formed integral with the flexible wall-section or diaphragm 43. The diaphragm has a rolled rim 47, secured by solder or other suitable means to the inner face of the cover-plate 3, whereby the diaphragm is, in effect, integral throughout the rim thereof with the cover-plate 3 and thereby provides an imperforate oil-tight seal for the aperture 40. To provide for flexing the diaphragm, it is centrally arched so that its convex surface is proximate to the inner face of the cover-plate and its concave face is opposed to the adjusting member 33, the detent tip 42 being thereby normally held clear of but in proximity to said adjusting member. The detent head 39 is normally substantially flush with the outer face of the cover-plate, whereby it may be conveniently actuated from the exterior of the work-arm but does not obstruct handling of the work.

By pressing downwardly upon the detent-head 39, when the stop-notch 38 of the eccentric adjusting member is directly under the detent tip 42, the flexible diaphragm yields sufficiently for said detent tip 42 to enter the stop-notch 38, thereby anchoring said adjusting member against rotation. The shaft 6 may now be manually turned to effect rotation of the eccentric 24 about the eccentric 25, thereby adjusting the eccentricity of the eccentric 24. Release of the detent permits the flexible diaphragm to automatically withdraw the detent from the adjusting member stop-notch.

It is to be understood that the present inven-

tion is not limited to the specific eccentric-adjustment arrangement herein described or in fact to the employment of the controlling member as a detent, as it will be obvious that the present improvement may be employed in various ways as oil-tight means, free of working joints, for projecting a movable member through a casing or frame of a mechanism-housing chamber.

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

1. A sewing machine having a frame including a wall provided with a flexible section oil-tight with said wall, and a mechanism carried by said frame in position to be influenced by the flexing of said section.

2. A sewing machine having a frame including a wall provided with an imperforate flexible section oil-tight with said wall, and a mechanism carried by said frame in position to be influenced by the flexing of said section.

3. A sewing machine having a frame including a wall provided with a flexible section oil-tight with said wall, an operative member carried by the flexible section of said wall, and a mechanism carried by said frame in position to be acted upon by said operative member.

4. A sewing machine having a frame including an apertured wall provided with a flexible section constituting oil-tight sealing means for the aperture in said wall, an operative member carried by the flexible wall-section and shiftably disposed in the wall aperture, and a mechanism carried by said frame in position to be influenced by the flexing of said section.

5. A sewing machine having a frame including a wall, an operative member for transmitting motion from one side to the other of said wall, imperforate means comprising an oil-tight connection between said wall and member, and a mechanism carried by said frame in position to be influenced upon actuation of said member.

6. A sewing machine having a mechanism-housing frame including an apertured wall, an operative member shiftably disposed in the aperture of said wall to extend within said frame for cooperation with mechanism housed thereby, and imperforate oil-tight sealing means for said wall aperture.

7. A sewing machine having a mechanism-housing frame including a wall provided with a flexible section oil-tight with said wall, and an operative member actuatable from the exterior of said frame and carried by said flexible section for cooperation with mechanism within said frame.

8. A sewing machine having a mechanism-housing frame including a wall provided with a metallic flexible section oil-tight with said wall, and an operative member actuatable from the exterior of said frame and carried by said flexible section for cooperation with mechanism within said frame.

9. A sewing machine having a mechanism-housing frame including a detachable plate provided in an oil-tight manner with a flexible section, and a controlling member operable from the exterior of said frame and carried by said flexible section for cooperation with mechanism within said frame.

10. A sewing machine having a frame including a wall provided in an oil-tight manner with a flexible diaphragm, an adjusting member housed within said frame, and a manually operable detent carried by said diaphragm to extend

within said frame for cooperation with said adjusting member.

11. A sewing machine having a mechanism-housing frame provided with an apertured wall, a controlling member manually operable from the exterior of said wall and extending within said frame for cooperation with mechanism housed thereby, and a controlling member carrying flexible diaphragm soldered to said wall to thereby seal the wall aperture.

12. A sewing machine having a frame, a feed-eccentric and a feed-eccentric adjusting member disposed within said frame for relative movement, a manually operable detent engageable with said adjusting member and movable through said frame, and an oil-tight connection between said detent and said frame providing for movement of said detent into engagement with said adjusting member.

13. A sewing machine having a frame including a hollow work-arm provided with a wall having an oil-tight flexible section, a rotary actuating shaft extending into said work-arm, an eccentric carried by said shaft for rotation therewith and for adjustment relatively thereto, an eccentric-adjusting member mounted upon said shaft for normal rotation with and adapted to be restrained against rotation with said eccentric, and a manually operable detent carried by said flexible section for engagement with said adjusting member.

14. A sewing machine having a frame including a hollow work-arm provided with an apertured wall, a rotary actuating shaft extending into said work-arm, an eccentric carried by said shaft for rotation therewith and for adjustment relatively thereto, an eccentric-adjusting member mounted upon said shaft for normal rotation with and adapted to be restrained against rotation with said eccentric, a flexible diaphragm attached to the under side of said apertured wall

and providing an oil-tight seal for the wall aperture, and a detent carried by said diaphragm for engagement with said adjusting member, said detent being accessibly disposed for manual operation through said wall aperture.

15. A sewing machine having a mechanism-housing frame provided with an aperture, a flexible diaphragm attached to the inner wall of said frame and providing an oil-tight seal for said aperture, and an operative member carried by said diaphragm for cooperation with mechanism within said frame.

16. A sewing machine having a mechanism-housing frame including an apertured wall provided with an arched flexible section having its convex wall proximate to the aperture in said wall and its concave face opposed to the mechanism within said frame, and an operative member carried by said flexible section for cooperation with mechanism within said frame.

17. A sewing machine having a mechanism-housing frame including a detachable cover-plate provided with an aperture, a flexible arched diaphragm accessible through said aperture and having a rim attached to the inner face of said plate, and an operative member carried by said diaphragm for cooperation with mechanism within said frame.

18. A feed-off-arm sewing machine having a frame including a substantially coplanar hollow work-arm and a work-arm carrier arm, a rotary shaft journaled in said carrier arm extending transversely of and into said work-arm, feeding mechanism carried by said shaft within said work-arm including a feed-actuating eccentric and a feed-adjusting member, a detent operable from the exterior of and through said work-arm for cooperation with said adjusting member, and oil-tight sealing means for said detent.

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