Aug. 31, 1954

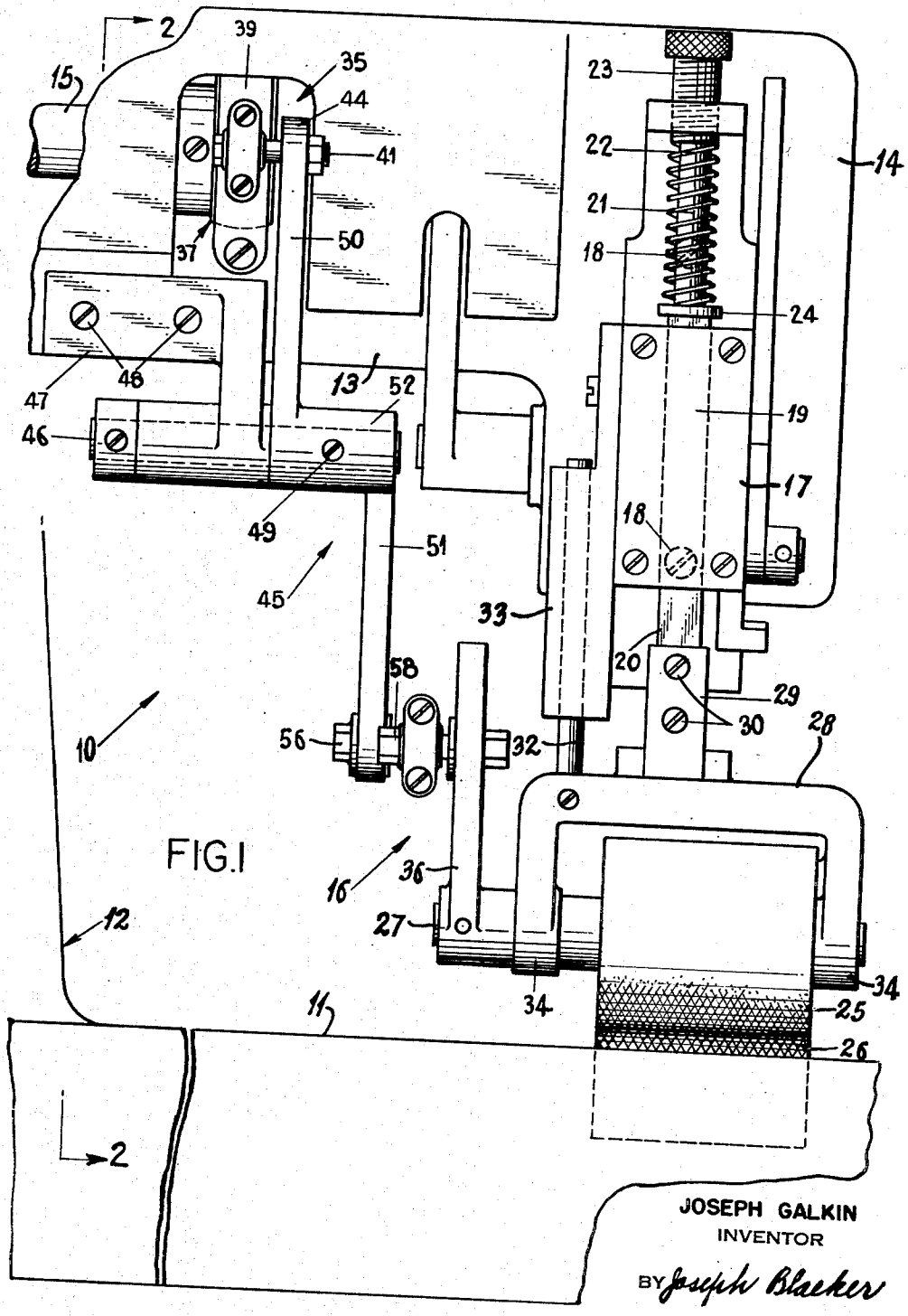
J. GALKIN

UPPER MAIN SHAFT DRIVE MOUNTING FOR SEWING MACHINE FEED ROLLERS

2,687,704

Filed July 24, 1952

3 Sheets-Sheet 1



JOSEPH GALKIN
INVENTOR

BY Joseph Blacker

ATTORNEY

Aug. 31, 1954

J. GALKIN

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3 Sheets-Sheet 2

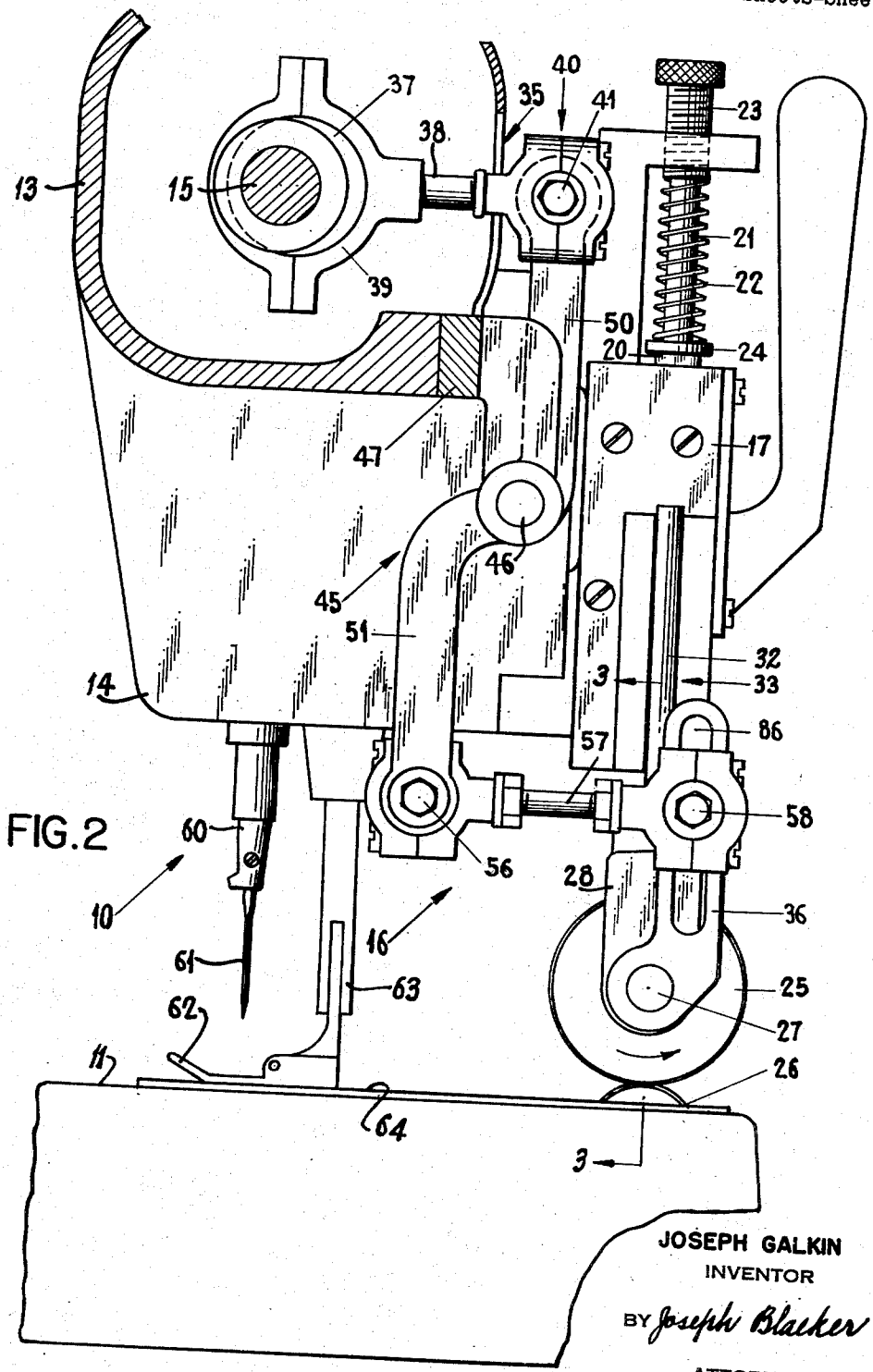


FIG. 2

JOSEPH GALKIN
INVENTOR

BY Joseph Blacker

ATTORNEY

Aug. 31, 1954

J. GALKIN

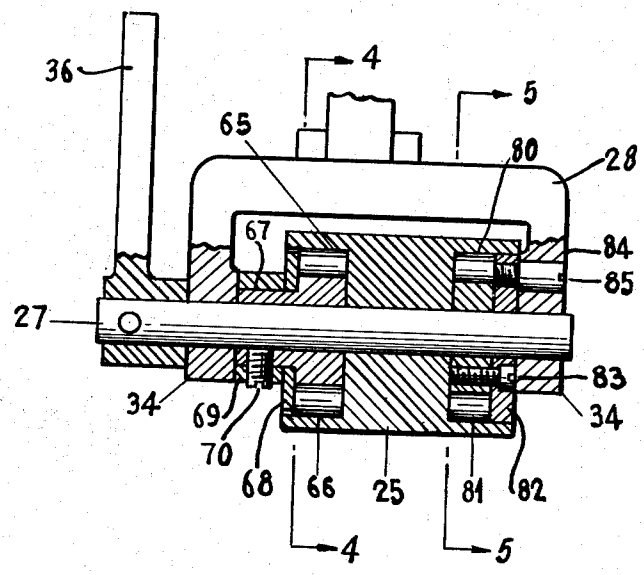
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3 Sheets-Sheet 3

FIG.3



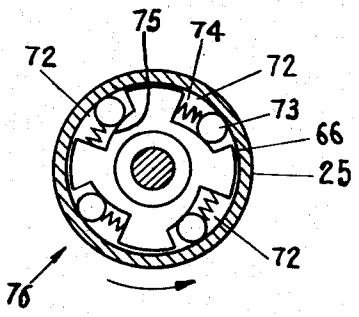


FIG.4

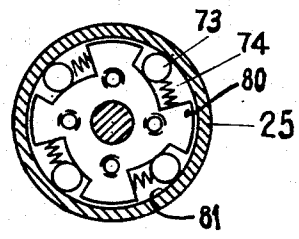


FIG.5

JOSEPH GALKIN
INVENTOR

BY Joseph Blacker

ATTORNEY

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UNITED STATES PATENT OFFICE

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UPPER MAIN SHAFT DRIVE MOUNTING FOR SEWING MACHINE FEED ROLLERS

Joseph Galkin, New York, N. Y.

Application July 24, 1952, Serial No. 300,582

1 Claim. (Cl. 112—211)

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This invention relates to sewing machines having superposed feed rollers to augment the feeding of the fabric by the feed-dog.

In prior practice, attempts have been made to drive puller feed rollers for sewing machines to make it possible to work on heavy fabric garments, such as overalls, by driving the rollers with a drive shaft extending the entire length of the machine. This elongated shaft developed a twist during sewing operations, causing irregular feeding and an overthrow.

In other prior designs of feed roller drives, clutch mechanisms, were mounted on the work supporting base of the sewing machine in a manner as to cover up or clutter up the base which made it difficult to operate.

An object of this invention is to provide a mounting for auxiliary feeding rollers driven from the upper main drive shaft, directly and very close to the upper feed roller, whereby twisting of the drive shaft is eliminated, and whereby the entire area above the work supporting base and between the head and the standard is clear for unencumbered sewing operations.

With the above and other objects in view, the invention will be hereinafter more particularly described, and the combination and arrangement of parts will be shown in the accompanying drawings and pointed out in the claim which forms part of this specification.

Reference will now be had to the drawings, wherein like numerals of reference designate corresponding parts throughout the several views, in which:

Figure 1 is a rear view of a fragmentary portion of a sewing machine to which my invention is applied.

Figure 2 is a cross-sectional view taken on line 2—2 in Figure 1.

Figure 3 is a cross-sectional view taken on line 3—3 in Figure 2.

Figure 4 is a cross-sectional view taken on line 4—4 in Figure 3.

Figure 5 is a cross-sectional view taken on line 5—5 in Figure 3.

In the illustrated embodiment of the invention, the numeral 10 indicates a sewing machine comprising a flat bed or work-supporting base 11 having an upright tubular standard 12 extending therefrom and having an upper overhanging horizontal arm 13 terminating in an upright head 14. A drive shaft 15 is mounted horizontally in the overhanging upper arm 13.

The sewing machine 10 has a sewing and feeding mechanism well known in the art. The main object of this invention is to provide a mounting for auxiliary feeding rollers to assist the feed-dog feeding mechanism of the sewing machine in order to be able to operate on heavy fabric garments such as overalls. The gist of the invention resides in the fact that the entire area above the work-supporting base and between the horizontal arm 13 and the standard 12 is clear for unencumbered sewing operations.

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The mounting 16 comprises an upright guideway member 17 which is suitably supported by screws 18 to the rear surface of the upright head 14. The guideway member 17 has a vertical guideway 19 in which a carrier member 20 is mounted for vertical movements. At the upper end of the carrier member 20 is a rod 21 on which a coil spring 22 is mounted. The spring reacts at its upper end against the lower surface of an adjusting screw 23 threaded in a lateral extension in the upright guideway member 17. At its lower end, the spring 22 reacts against a shoulder 24 at the upper end of the carrier member 20 and forces the carrier member 20 in a downward direction.

The auxiliary feeding rollers consist of an upper roller 25 and a lower roller 26. I have found in practice that in order to efficiently feed heavy fabric such as that used in making work clothes, the feed rollers must be elongated to secure an augmented grip. For this purpose, the upper roller 25 is centrally apertured and is rotatably mounted on a shaft 27 in an elongated forked housing 28. The housing has an arm 29 which receives the lower portion of the carrier member 20 and is secured thereto by screws 30.

To further secure the elongated housing 28 in alignment with the lower roller 26, I provide a rod 32 extending vertically from the housing 28 and in slidable engagement in a bearing 33 extending downwardly from the carrier member 17. It will be seen that the distance between the rod 32 and the carrier member 20 is considerable so as to provide leverage to prevent the upper roller 25 from getting out of alignment with the lower roller 26.

For the purpose of driving the feed rollers 25, 26, without an overthrow and without encumbering the work supporting base, I cut an opening 35 in the rear portion of the overhanging upper member 12 substantially in line with a crank 36 suitably secured to the shaft 27.

The drive mounting for the feed rollers comprises an eccentric 37 on the main shaft 15. An arm or strap link 38 has its strap end portion 39 in circumscribing and contacting engagement with the eccentric 37. The other end 40 of the strap link 38 is vibratably connected to a stud 41 having a ball shaped end.

The stud 41 has a threaded end secured to the upper end portion 44 of a modified bell-crank lever 45. The lever is fulcrumed on a rock-shaft 46 mounted in a bracket 47 which is fixed to the rear portion of the overhanging member 12 by screws 48. The lever 45 is fixed to the rock-shaft

46 by a screw 49. The lever 45 has an upper arm 50 and a lower arm 51.

The upper and lower arms 50, 51, lie in spaced-apart relation in different planes. The arms are caused to be in considerably spaced-apart relation from each other by an elongated hub 52 connecting the arms. The result is that the lower arm 51 is brought closer to the upper feed roller 25 than the upper arm 50 in a manner as to leave a maximum space above the work supporting base clear for operations and the upper roller drive shaft of minimum length.

The lower end of the lever 45 is pivotally connected at 56 to one end of a horizontal link 57. The other end of the link 57 is pivotally connected at 58 to the crank 36.

In the head 14 is journaled a needle bar 60 carrying a needle 61. The material worked upon is held down by a presser-foot 62 carried by a presser-bar 63. The presser-foot rests on a cloth plate 64 secured to and above the work supporting base 11. The material is moved across the work support by a feed-dog which is moved back and forth and up and down, as is well known in the art.

Figure 3 is a cross-sectional view taken on line 3—3 in Figure 2 and shows the shaft 27 rotatably supported in bearings 34 in the forked housing 28. The puller-feed roller 25 is freely rotatably mounted on the roller shaft 27, and shown in cross-section.

The puller-feed roller 25 has a bore 65 in which an oscillating clutching detent carrier 66 is rotatably mounted. The carrier 66 has a hub 67. Mounted on the hub 67 is a washer 68 and a collar 69. A screw 70 threaded in the collar 69 and the hub 67 secures the carrier 66 to the shaft 27 (Figure 3).

As shown in Figure 4, the detent carrier 66 has peripheral cavities 72 in each of which a ball or roller detent 73 and a spring 74 is mounted in a manner as to cause the detent to be wedged between a cam surface 75 in a cavity 72 and the peripheral surface defining the bore 65.

The detent carrier 66 and the detent 73 and spring 74 mounted inside the bore 65 of the feed roller 25, constitute a friction clutch 76.

Step-by-step rotation of the feed-roller 25 in synchronism with the feed-dog of the sewing machine is effected by the friction clutch 76. The clutch is actuated by the crank 36, the lever 45 and the arm 38 in operative engagement with the eccentric 37 on the shaft 15.

In order to prevent reverse movement of the feed-roller 25, I have provided a braking detent carrier 80 freely mounted within a bore 81 in the feed-roller 25, as shown in Figure 5. The braking detent carrier 80 is secured to a disk 82 by a screw 83 and to one side arm 84 of the forked housing 28 by a screw 85.

The clutch detent carrier 66 and the braking detent carrier 80 are mounted in the feed-roller 25 to work in opposite directions and may be in the form shown and described in Patent No. 1,985,406, issued to Nathan B. Galkin, dated December 25, 1934.

It is to be noted that the crank 36 has an elongated slot 86 which permits slidable movement therein of the screw 58. It is thus possible to adjust the screw 58 in relation to the slot 86 and to increase or decrease the throw of the link 57 for varying the movements of the clutch 76 and the roller 25.

It will be seen that due to the fact that the upper feed-roller stub shaft 27 terminates directly at the outer face of the crank 36, that the entire area above the work-supporting base and between the head and the standard is clear for unencumbered operations.

In accordance with the patent statutes I have described and illustrated the preferred embodiment of my invention, but it will be understood that various changes and modifications can be made therein without departing from the spirit of the invention as defined by the appended claim.

I claim:

In a sewing machine having a work-supporting base, an upright tubular standard extending from said base and having an upper overhanging member terminating in an upright head, a sewing mechanism, a main drive shaft in said overhanging upper member, auxiliary feeding mechanism including a pair of cooperating upper and lower feed rollers, one of said feed rollers being rotatably mounted below said work-supporting base and extending upwardly slightly above said base, said upper roller being internally bored at both ends, an upright guideway member secured to said head rearwardly thereof, and having a spring-pressed carrier member slidably mounted thereon, a forked housing supported by said carrier member, said upper feed roller being rotatably mounted on a horizontal stub-shaft in said housing and resiliently supported on said carrier member for vertical movements rearward of said head and into pressure contacting relation with said lower feed roller, a crank secured to said upper feed roller shaft, drive means entirely clear of said base and in considerably spaced-apart relation from said upright standard for actuating said upper feed roller during its up and down movements, comprising an eccentric on said upper main shaft, a roller actuating arm having a strap in circumscribing and contacting engagement with said eccentric, an opening in the rear portion of said overhanging member closely adjacent said roller, and permitting said arm to pass therethrough in alignment with said eccentric for actuation by said eccentric, a modified bell-crank lever fulcrumed on said head rearwardly thereof and connected at its upper end to said arm, said lever having upper and lower arms in spaced-apart relation, said upper arm being connected to said actuating arm, a link connecting the lower arm of said lever with said upper feed roller crank, a spring-pressed roller friction drive clutch in one of said bores and driven by said stub-shaft, a spring-pressed roller friction brake clutch in the other of said bores, and means for adjusting said link to actuate said clutch means and said rollers in timed relation with said sewing mechanism, said upper feed roller stub shaft terminating directly at the outer face of said crank, and the entire area above said work-supporting base and between said head and said standard being clear for unencumbered operations.

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