Sept. 8, 1953

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2,651,366

BELT CUTTING AND RIPPING DEVICE

Filed Aug. 4, 1950

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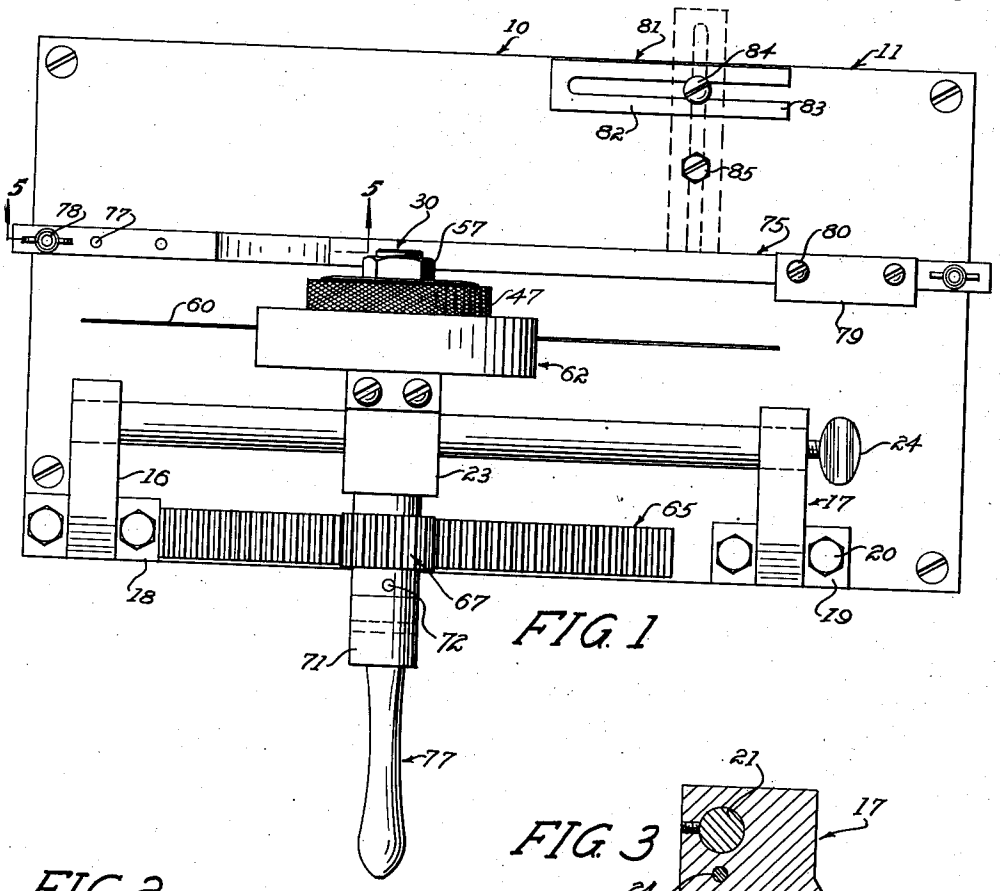


FIG. 1

FIG. 2

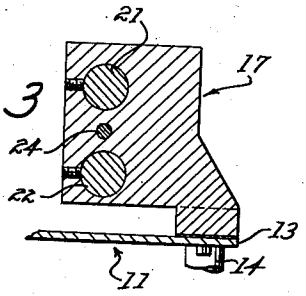
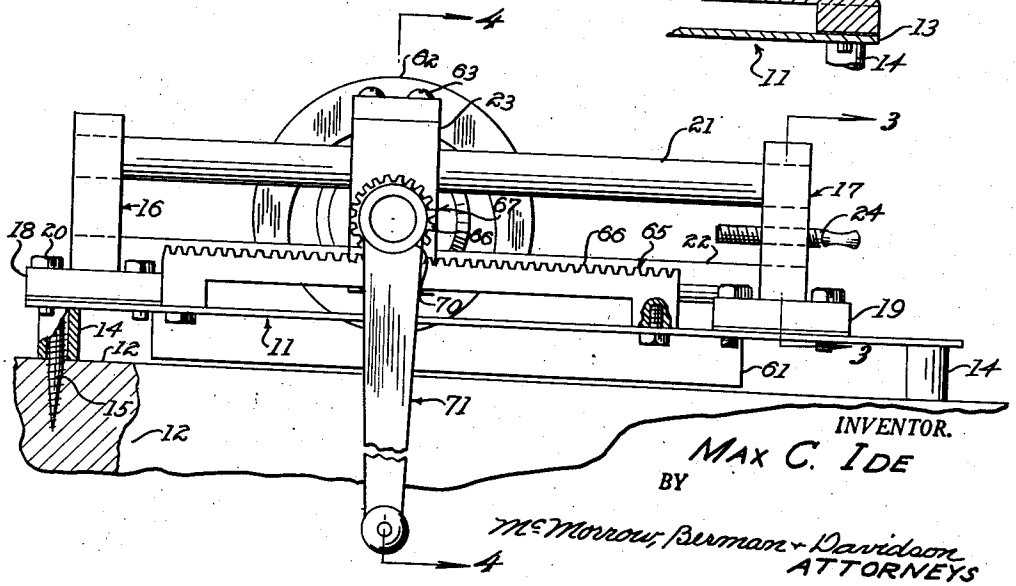


FIG. 3



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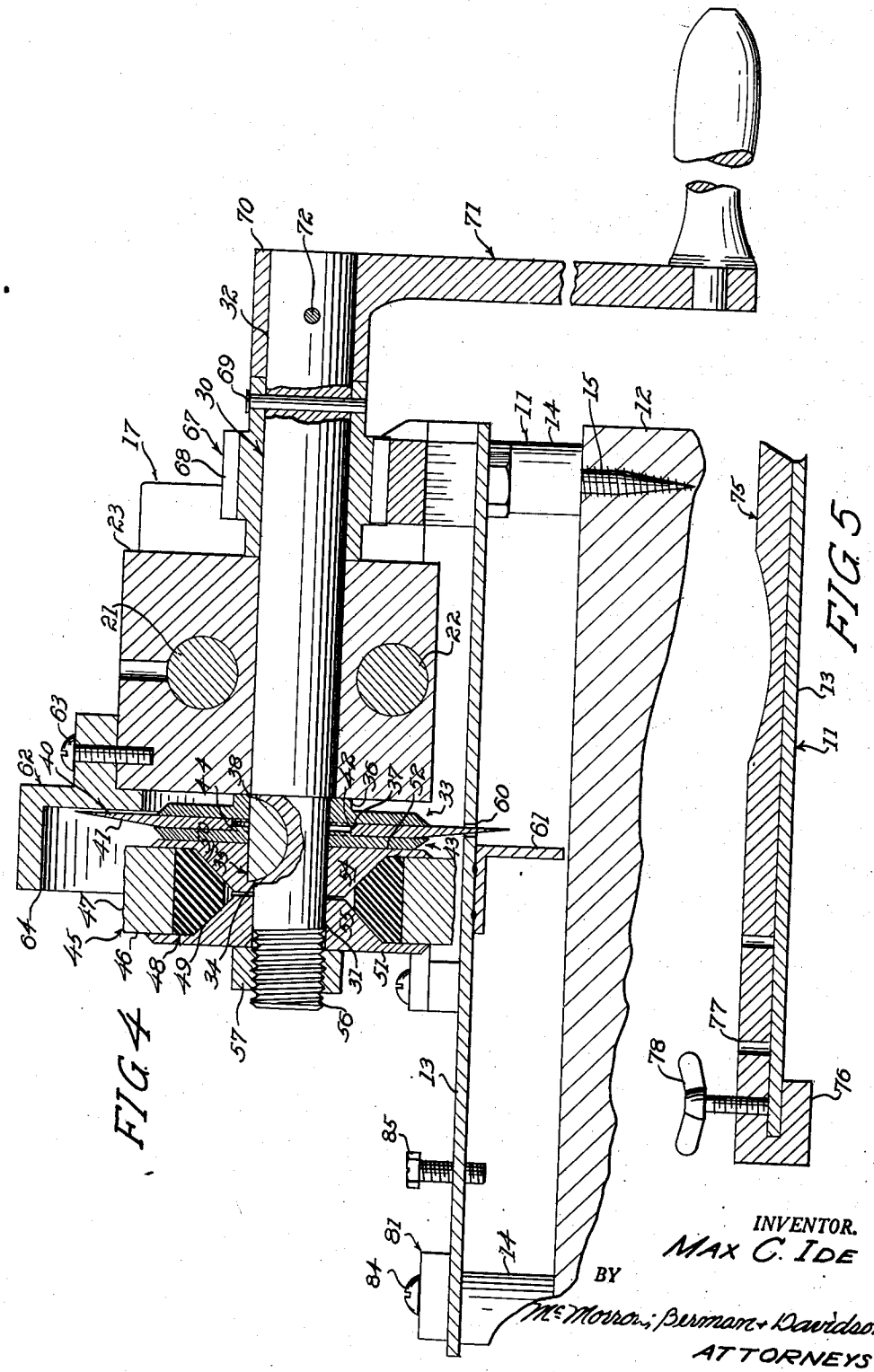


FIG 4

FIG 5

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UNITED STATES PATENT OFFICE

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BELT-CUTTING AND RIPPING DEVICE

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2 Claims. (Cl. 164—77)

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This invention relates to a cutter, and more particularly to a device for cutting and ripping belts.

An object of this invention is to provide a device which is particularly adapted for cutting a belt longitudinally thereof to subdivide the belt into a plurality of parts having sharp lines of division.

Another object of this invention is to provide a belt cutter which is particularly adapted to maintain belting to be cut in a position wherein an accurate longitudinal or transverse cut can be made.

A further object of this invention is to provide a cutter and ripper which can be readily dismantled for cleaning and replacement of the various structural components. A still further object of this invention is to provide a belt-cutting and ripping device which is relatively simple in structure and cheap to manufacture.

The above and still further objects and advantages of the invention will become apparent upon consideration of the following detailed description of the invention, when taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a top plan view of the belt-cutting and ripping device of the present invention;

Figure 2 is a side elevational view, with parts broken away and shown in section, of the belt-cutting and ripping device shown in Figure 1;

Figure 3 is an enlarged fragmentary sectional view taken substantially along the line 3—3 of Figure 2;

Figure 4 is an enlarged fragmentary sectional view taken along the line 4—4 of Figure 2; and

Figure 5 is an enlarged fragmentary sectional view taken along the line 5—5 of Figure 1.

Referring now more particularly to the drawings, wherein like reference numerals have been used throughout the several views to designate like parts, there is shown the belt-cutting and ripping device of the present invention, generally designated by the reference numeral 10 which embodies a base 11 adapted for securement to a supporting surface 12. As clearly illustrated in Figure 4, the base includes a flat, rectangular plate 13 having legs 14 dependingly supported from each of its corners. The base is fixedly secured to the supporting surface 12 by means of the screws 15 which extend through each of the corners of the plate 13 and the adjacent one of the legs 14.

Disposed in spaced, parallel relation with respect to each other and secured to the base 11

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are a pair of spaced, upstanding walls 16 and 17. Each of the walls 16 and 17 includes a securing flange 18, 19 which overlies the rectangular plate 13 of the base 11 and is secured thereto by means of the bolts, generally designated by the reference numeral 20.

Extending between the upstanding walls 16 and 17 and secured therebetween are a pair of guide rods 21 and 22 which are disposed in overlying spaced relation with respect to each other. Positioned upon the guide rods 21 and 22 is a sliding block 23 which is supported on the guide rods for movement longitudinally thereof between the upstanding walls 16 and 17. Extending transversely through the upstanding wall 17 is a threaded stop member 24 which is mounted for movement transversely of the wall 17. Accordingly, the sliding movement of the block 23 toward the upstanding wall 17 can be limited by selectively varying the disposition of the stop element 24 with respect to the wall.

Disposed transversely of the base 11 is a shaft 30 which is rotatably supported intermediate its ends in the sliding block 23 and has each of its ends extending beyond the side faces of the block 23, the projecting ends being designated by the reference numerals 31 and 32.

Positioned upon the projecting end 31 of the shaft 30 is a first abutment plate 33. As clearly illustrated in Figure 4, the projecting end 31 of the shaft 30 is provided with a longitudinally extending keyway 34 in which is supported a key 35 of the type generally known as a Woodruff key. One face of the abutment plate 33 is provided with a concentrically disposed, cylindrical extension 36, and the other face thereof is provided with a key 37. The abutment plate 33 is further provided with a transversely extending slot 38 for engagement about the adjacent portion of the key 35 to non-rotatably support the abutment plate 33 on the shaft 30.

Arranged upon the shaft 30 in side by side relation with respect to the abutment plate 33 is a cutter element 40 which is provided with a beveled cutting surface 41 along one face thereof. The other face of the cutter element 40 is disposed in abutting and confronting relation with respect to the adjacent face of the abutment plate 33 and is provided with a slot 42 for the reception of the key 37 of the abutment plate 33. As clearly illustrated, the cutter element 40 is supported transversely of the shaft and is spaced from the adjacent end thereof and secured to the shaft for rotation therewith.

Disposed in abutting and confronting relation

with respect to the cutter element 40 is a second abutment plate 43. The abutment plate 43 is provided with a slot 44 for engagement about the adjacent portion of the key 35 to thereby secure the abutment plate to the shaft 30.

Disposed in side-by-side relation with respect to the cutter element 40 is a belt-engaging roller assembly 45 mounted on the shaft 30 and is frictionally driven thereby. The belt-engaging roller assembly 45 embodies a roller having an annular ring 46 which has its outer periphery knurled, as indicated by the reference numeral 47. Disposed interiorly of the outer ring 46 and secured therein is an inner ring 48 which is fabricated of rubber, a clutch element secured to said shaft 30 for rotation therewith being interposed within and frictionally engaging the inner ring 48. Specifically, the ring 48 is provided with convergent beveled surfaces 49 and 50 which extend inwardly from the opposed sides thereof toward and terminating in the inner periphery thereof. Positioned on opposite sides of the inner and outer rings 46 and 46 are a pair of bearing plates 51 and 52. The bearing plates 51 and 52 have complemental frusto-conical extensions 53, 54 which bear against the beveled surfaces 49 and 50 of the inner ring 48. The bearing plate 52 is provided with a slot 55 for engagement about the adjacent portion of the key 35 to secure the bearing plate 52 to the shaft 30 for rotation therewith. The projecting end 31 of the shaft 30 is threaded, as indicated by the reference numeral 56, for the support thereon of a nut 57. The nut 57 bears against the adjacent face of the bearing plate 51 to thereby urge the bearing plate into engagement with the rubber ring 48. From the foregoing it is readily apparent that upon effecting the rotary movement of the shaft 30, the abutment plates 33 and 43, cutter element 40, and the strap engaging roller assembly 45 will be rotated with the shaft 30. It is to be further noted that the aforementioned assembly of the cutter element 40 and the strap-engaging roller assembly 45 can be dismantled upon removing the nut 57 from the threaded portion 56 of the shaft 30.

As clearly illustrated in Figures 1 and 4, the rectangular plate 13 of the base 11 is provided with a longitudinally extending slot 60 for the extension therethrough of the adjacent beveled cutting surface 41 of the cutter element 40. Disposed longitudinally of the base 11 and secured to the other surface thereof is an angle iron 61 which acts as a reinforcing rib for the portion of the plate 13 of the base 11 contiguous to the belt engaging roller assembly 45. Circumposed about the upper exposed end of the cutter element 40 is a protective hood 62 which is detachably secured to the sliding block 23 by means of the threaded bolt 63. As clearly shown in Figure 4, the open side 64 of the hood 62 overlies the belt-engaging roller assembly 45 to thereby form an effective closure for the cutter element 40.

Underlying the projecting end 32 of the shaft 30 and secured longitudinally of the base 11 is a rack 65 which is provided with a plurality of transversely extending gear teeth 66. Circumposed about the projecting end 32 of the shaft 30 is a pinion 67 which is provided with a plurality of transversely extending gear teeth 68. The teeth 68 of the pinion gear 67 are in meshing engagement with respect to the teeth 66 of the rack 65, and accordingly, upon effecting the rotary movement of the shaft 30, the block 23 will be slid longitudinally of the base 11. As shown

in Figure 4, the securement of the pinion gear 67 to the shaft 30 is effected by means of a pin 69 which extends transversely through the gear 67 and the shaft 30.

Slidably supported of the projecting end 32 of the shaft 30 is the hollow open-ended sleeve 70 of the handle 71. The securement of the handle 71 to the shaft 30 is effected by means of a pin 72 which extends transversely through the sleeve 70 of the handle and the shaft 30.

Disposed longitudinally of the base is a cutting gauge 75 which is mounted for movement transversely of the base 11 toward and away from the cutter element 40. Each of the free ends of the cutting gauge 75 is provided with an inwardly extending leg, generally designated by the reference numeral 76, Figure 5, for engagement beneath the adjacent side edge of the base 11. Contiguous to each of its ends, the cutting gauge 75 is provided with longitudinally spaced, threaded bores, designated generally by the reference numeral 77, for the support therein of the threaded set screw 78. Upon effecting the engagement of the set screw 78 with the adjacent face of the base 11, the cutting gauge 75 can be detachably secured in a select position of its movement with respect to the cutter element. Overlying the cutting gauge 75 contiguous to one of its ends is the stop plate 79 which is detachably secured to the cutting gauge 75 by means of the bolts 80 which are selectively engageable in the threaded bores 77. It is to be noted that the positioning of the innermost ones of the bores 77 is selected so that the stop plate 79 can be supported contiguous to either of the ends of the cutting gauge 75. When cutting, if the movement of the cutter element 40 is to be toward the wall 17, the stop plate 79 is supported in the position indicated in Figure 1. In the event that the cutting operation is to take place toward the wall 16, the stop plate is supported contiguous to the other end of the cutting gauge.

Overlying the base 11 and supported thereon is a ripping gauge 81. The ripping gauge includes an elongated plate 82 which is provided with a slot 83 which extends inwardly from one end thereof and terminates adjacent to and spaced from the other end thereof. The ripping gauge is normally supported by means of the threaded bolt 84 which extends transversely through the slot 83 and is in threaded engagement with the plate 13 of the base 11. Spaced inwardly from the threaded bolt 84 transversely of the base 11 is a second bolt 85. When the ripping gauge 81 is to be utilized, the plate 83 is swung to the position illustrated by the broken line in Figure 1, with the bolts 84 and 85 received within the slot 83. The ripping gauge is then positioned transversely of the base for engagement with one side of a belt to be cut.

In actual use, the belt to be cut is guidingly supported on the base 11 by means of either the cutting gauge 75 or the ripping gauge 81. Upon effecting the rotary movement of the shaft 30, the block 23 is moved longitudinally of the base and simultaneously the cutter element 40 and roller assembly 45 are rotated with the shaft 30, the knurled periphery 47 of the annular ring 46 of the roller of the roller assembly 45 engaging the adjacent top surface of the belt and feeding the belt being cut by the cutter element 40. During engagement of the knurled periphery 47 of the roller of the roller assembly 45 with the belt to be cut the said roller is frictionally driven by the shaft 30 through the complemental conical

extensions 53 and 54 carried by the bearing plates 51 and 52 respectively and the rubber ring 48 fixedly secured to the interior of said roller, resulting in rotation of the roller of the roller assembly 45 at a rate less than the rate of rotation of the pinion gear 67. Accordingly, belting can be cut longitudinally or transversely to subdivide the belting into a plurality of parts having sharp lines of division. It is readily apparent that the cutting operation is effected with speed and facility and the belting can be maintained in a position wherein an accurate cut can be made.

Although only one embodiment of the belt-cutting and ripping device of the present invention has been described, numerous modifications can be made without departing from the spirit of the invention as set forth in the appended claims.

What I claim is:

1. In a belt cutting machine, a base adapted for securement to a supporting surface, said base having a longitudinally extending slot, a pair of upstanding walls arranged in longitudinal spaced relation on one side of and spaced from said slot and secured to said base, spaced guide rods extending between and secured to said upstanding walls, a block supported on said guide rods for longitudinal sliding movement therealong, a shaft disposed transversely of said base and rotatably supported intermediate its ends in said block, a cutter element disposed on one side of said block inwardly of one end of said shaft and secured to said shaft for rotation therewith, said cutter element being in longitudinal alignment with respect to said slot with a portion of its cutting edge extending through said slot, a belt engaging roller assembly disposed in side by side spaced relation with respect to said cutter element, said assembly including a roller having an outer ring provided with a knurled surface, an inner resilient ring secured to said outer ring, and a clutch element secured to said shaft for rotation therewith interposed within and frictionally engaging said inner ring, means on the other side of said block extending longitudinally of said base and carried by said base and engageable with means on said shaft for effecting the movement of said block in response to rotary movement of said shaft, and hand actuated means carried by the other end of said shaft for effecting the rotary movement of the latter.

2. In a belt cutting machine, a base adapted for securement to a supporting surface, said base having a longitudinally extending slot, a pair of upstanding walls arranged in longitudinal spaced relation on one side of and spaced from said slot and secured to said base, spaced guide rods extending between and secured to said upstanding walls, a block supported on said guide rods for longitudinal sliding movement therealong, a shaft disposed transversely of said base and rotatably supported intermediate its ends in said block, a cutter element disposed on one side of said block inwardly of one end of said shaft and secured to said shaft for rotation therewith, said cutter element being in longitudinal alignment with respect to said slot with a portion of its cutting edge extending through said slot, a belt engaging roller assembly disposed in side by side spaced relation with respect to said cutter element, said assembly including a roller having an outer ring provided with a knurled surface, an inner resilient ring provided with convergent beveled surfaces secured to said outer ring, and opposed frusto-conical extensions secured to said shaft for rotation therewith interposed between and frictionally engaging the convergent beveled surfaces of said inner ring, means on the other side of said block and secured longitudinally of said base and engageable with means carried by said shaft for effecting the movement of said block in response to the rotary movement of said shaft, and hand actuated means carried by the other end of said shaft for effecting the rotary movement of the latter.

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