July 15, 1947. F. E. STRATTON 2,423,953

SIGNALING SYSTEM FOR FASTENING-INSERTING MACHINES

Original Filed Aug. 5, 1943 3 Sheets-Sheet 2

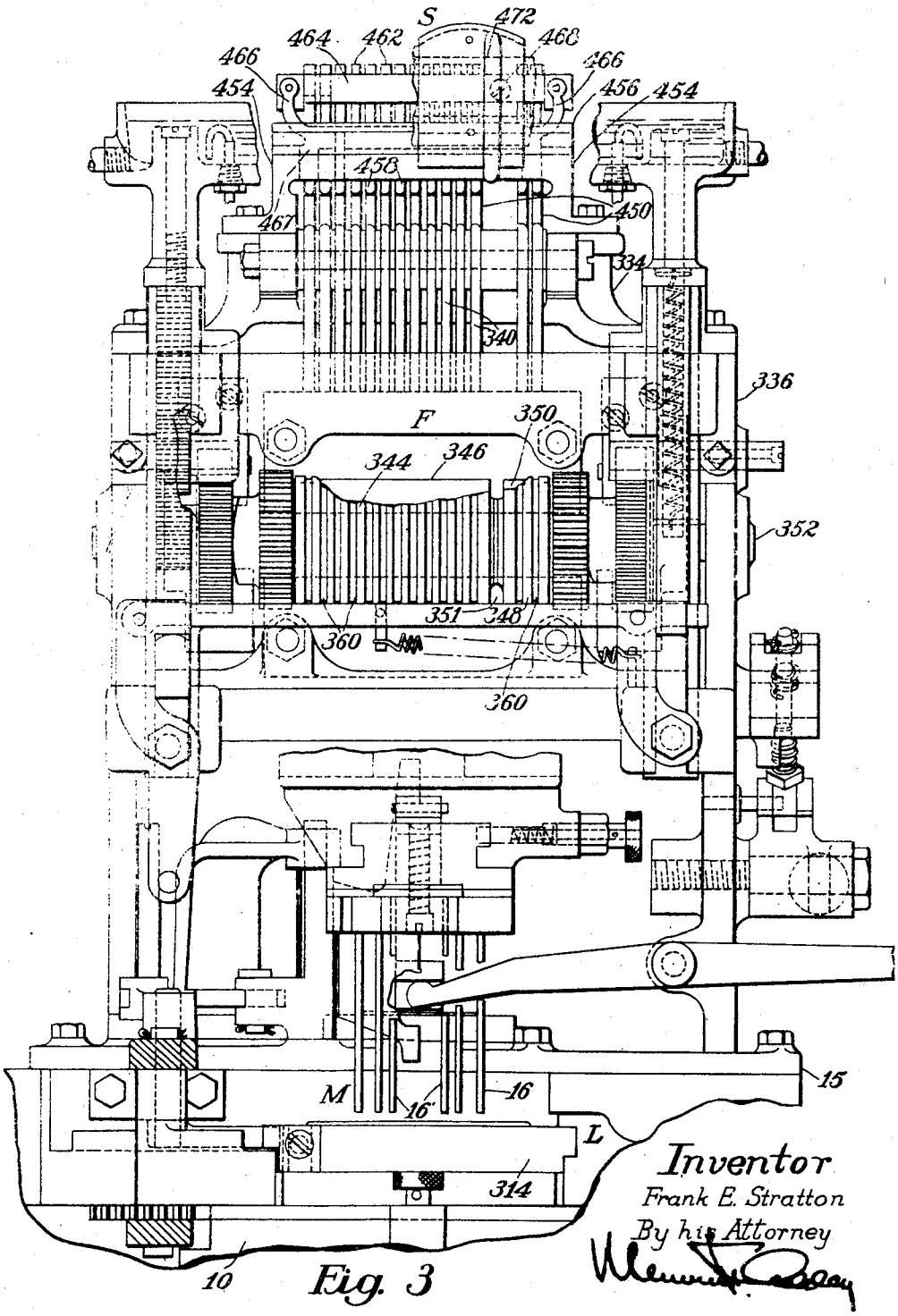


Fig. 3

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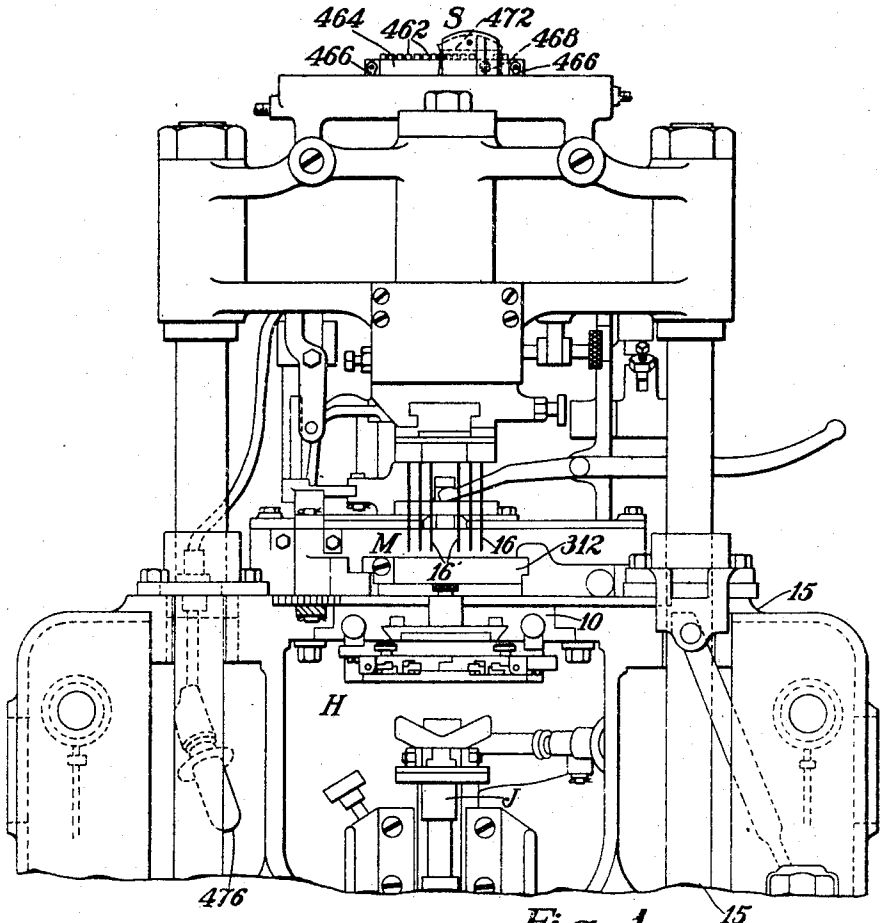


Fig. 1

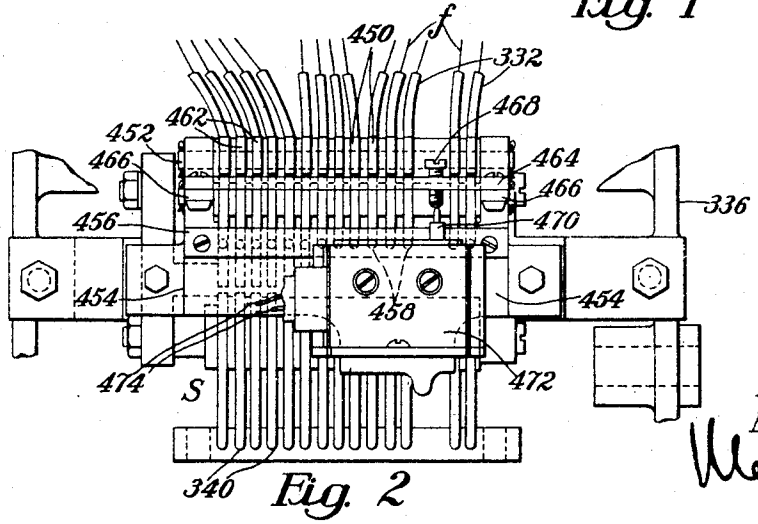


Fig. 2

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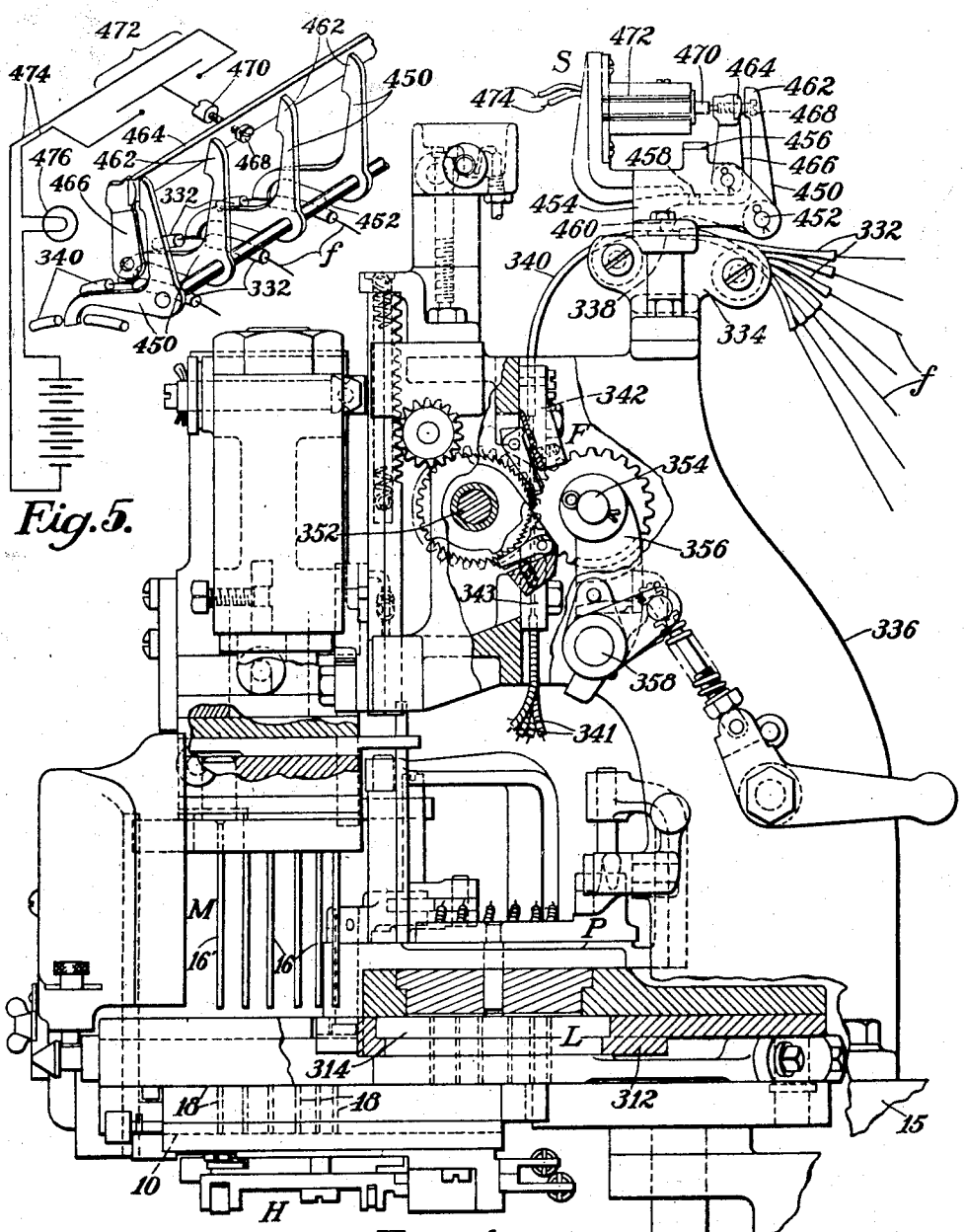


Fig. 5.

Fig. 4

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UNITED STATES PATENT OFFICE

2,423,953

SIGNALING SYSTEM FOR FASTENING-INSERTING MACHINES

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3 Claims. (Cl. 177—311)

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My invention relates to machines by which work-portions are secured to each other, as in the attachment of heel-parts to the heel-seats of shoes, by machines of the character disclosed in Letters Patent of the United States No. 2,293,624, Parkhurst, August 18, 1942, and in which the attachment of heels is effected by fastenings cut from strings of fiber. It is particularly concerned with a signaling system under the control of the strings. The present case is a division of the application filed in my name in the United States Patent Office August 5, 1943, bearing Serial No. 497,461 (now Patent No. 2,396,349, granted on March 12, 1946).

An object of the invention is to warn the operator of the machine that the supply of any one of the strings of fastening-material has been nearly used, thereby preventing defects in the work produced by the attachment of a heel with fewer than the correct number of fastenings. In the attainment of this object, I combine with fastening-inserting mechanism and a mechanism by which strings of fastening-material are fed for insertion, means controlled by the strings for indicating when the supply of material approaches exhaustion. This indicating means preferably includes an electrically operated signal, controlled by a switch actuated by any one of a plurality of feelers engaging the strings. The feelers are herein shown as contacting with the strings where they are held in definite positions between spaced sections of guide-tubes, which direct them to the feeding mechanism. The signal may consist of an electric lamp, situated in such relation to the inserting mechanism that the operator is in part dependent upon it for proper inspection of the work, so the warning furnished by its extinction will be heeded promptly. The signal-controlling system is simplified by causing the feelers to actuate a single member common to all, which, in turn, operates the switch.

In the accompanying drawings,

Fig. 1 is a partial front elevation of a fastening-inserting machine to which my invention is applied;

Fig. 2, a top plan view of the signaling mechanism;

Fig. 3, a partial view, similar to Fig. 1, enlarged and broken away to show the fiber-feeding mechanism;

Fig. 4, a broken side elevation looking from the right of Fig. 3; and

Fig. 5 is a diagrammatical view of the signaling mechanism.

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Generally, this invention is applicable to machines of the character of that disclosed in the previously mentioned Parkhurst patent, and of this machine only a brief description is necessary. Upon the frame 15, the work, as a shoe to be heeled, is supported upon a jack J beneath a die and abutment 10 of fastening-inserting mechanism M (Fig. 1). With the die is associated a holder H retaining against the underside of said die a top-lift, which may be of rubber, and below this a heel-base. The heel-seat of the shoe is brought into preliminary engagement with the heel-base in the holder through elevation of the jack by an unillustrated treadle, and receives final work-clamping pressure under the power of the machine. Reciprocatory drivers 16, 16' of the inserting mechanism M act through multiple fastening-receiving passages 18, 18' in the die to first serve as awls, pricking through the heel-parts into the heel-seat of the shoe, and, upon a second movement, inserting fastenings in the pricked openings. These fastenings preferably consist of pegs cut from strings of fiber *f*, advanced from feeding mechanism F to loading mechanism L through foot-plate mechanism P. The feeding mechanism is operated under the influence of the pricking stroke of the drivers to advance the correct lengths of the fiber strings into passages in the loading mechanism. Said loading mechanism then acts to shear off discrete fastenings and transfer these above the die-passages, presenting them to receive the inserting stroke of the drivers. As herein illustrated, the drivers 16 and their receiving die-passages 18 are each twelve in number, these being arranged to act about the curved periphery of the heel, while two drivers 16' and their passages 18' act at the breast of said heel.

The string of fiber *f* for each of the die-passages 18, 18' is drawn by the feeding mechanism F from an unillustrated coil. Each string of fiber is led up through a guide-tube 332, supported upon a bracket 334 rising from a feeder-frame 336 mounted at the rear of the frame 15. Traversing a space at 338 (Fig. 4), each string is guided downwardly by a tube 340 clamped at 342 on the feeder-frame. From the tubes 340, the fiber passes through tubes 341 clamped at 343 and is delivered to the foot-plate mechanism P, arranged to direct said fiber to different sets of passages in the multiple loader-block 314 of mechanism L. To advance the strings of fiber from the tubes 340 into the tubes 341, they are received between feed-rolls having sections 344 and

346 for the peripheral fastenings of the die-passages 18, and shorter sections 348 and 350 for the breast-fastenings of the passages 18'. There is a space 351 between the longer and shorter sections of both rolls. By this independent feed of the fiber for different portions of the heel, fastenings may be obtained which are of the correct lengths for the particular points of insertion, and therefore may be headed over or upset uniformly throughout. The roll-sections 344, 348 are arranged end-to-end to turn about a horizontal spindle 352 extending across the frame 336. The sections 346, 350 are rotatable about a spindle 354 parallel to the spindle 352 and carried by arms 356 turning with a shaft 358 rotatable in the frame 336. All the strings lie in grooves 360 in the roll-sections 344 and 348, and are forced into feeding engagement with said grooves by a yieldable covering of rubber, or the like, upon the sections 346 and 350. Both the peripheral roll-sections 344, 346 and the breast-roll sections 348, 350 are rotated under the influence of the driving mechanism, in a manner with which the present invention is not concerned, to give an advance of the fiber equal to the length of the pricking stroke of the drivers 16 and 16', plus an additional amount to provide for the heading or enlarging of the ends of the pegs.

That the operator may know, without the necessity for closely following the feed of the fiber, when any one of the coils is nearly exhausted, a signal mechanism S is made a part of the machine. There is mounted upon the top of the bracket 334, above the space 338 between the adjacent ends of the tubes 332 and 340, a series of feeler-levers 450 fulcrumed upon a spindle 452 extending horizontally between side-walls 454, 454 of the bracket. Between the side-walls is a crossbar 456, in which are mounted spring-plungers 458, one for each feeler, acting to press the downwardly turned end 460 of its feeler against one of the strings as it passes through the space 338. Each feeler has an upward actuating extension which, at 462, lies in proximity to a crossbar 464, supported at its ends by arms 466, 466 yoked together at 467 and pivoted upon the respective side-walls 454, 454. Threaded through the bar 464, in the space between the feeler-ends 462 corresponding to the separation 351 between the adjacent ends of the pairs of roll-sections for the peripheral and breast-fastenings, is a screw 468 with its inner end adjacent to the actuating member 470 of a sensitive switch, the casing of which is shown at 472. This switch controls, through conductors indicated at 474, a signal, which may consist of an incandescent lamp 476 (Fig. 1) placed below the inserting mechanism M and throwing its light upon the jacked work, where its absence will readily be noted by the operator. As long as the string of fiber is passing from one of the tubes 332 into the registering tube 340, it will, by its engagement with the feeler-end 460, prevent the plunger 458 from forcing the feeler-extension 462 against the bar 464. Under these conditions, the screw 468 does not press against the switch member 470, and the switch 472 holds the circuit 474 of the lamp 476 closed. Observing the light, the operator will know whether strings of fiber are being drawn through all the tubes 332 by the feeding and loading mechanisms for delivery to the inserting mechanism. When the trailing end from any one of the coils passes the space 338, the

plunger 458 of the feeler associated with the empty tube 332 urges the end 460 down. The feeler-extension at 462 is forced against the crossbar 464, operating the switch to open the circuit 474 (as indicated in Fig. 5), and the lamp 476 is therefore extinguished. When the operator jacks a shoe, he will observe the absence of light upon the jacked work, and is thereby warned that, before the machine is operated, an exhausted coil of fiber should be replaced. This ensures the attachment of all heels by the full number of fastenings. The location of the signal mechanism S at the side of the feeding mechanism removed from the inserting mechanism M, provides for a certain number of full loads of fastenings after the trailing end of a coil has passed the signal mechanism.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a fastening-inserting machine, fastening-inserting mechanism, mechanism by which strings of fastening-material are fed for insertion, guide-tubes through which the strings pass to the feeding mechanism, said guide-tubes being in spaced sections, a feeler engaging each string at the space between the tube-sections, the spacing of the tubes being so close as to resist displacement of the strings by the feelers, an electrically operated signal at the inserting mechanism, and a switch in circuit with the signal and controlled by each of the feelers.

2. In a fastening-inserting machine, fastening-inserting mechanism, mechanism by which strings of fastening-material are fed for insertion, an electric lamp situated in such proximity to the inserting mechanism as to illuminate the work, a switch in circuit with the lamp, a feeler engaging each string, and means for causing each of the feelers to open the switch when the corresponding string passes out of engagement with said feeler.

3. In a fastening-inserting machine, a frame, fastening-inserting mechanism and mechanism for feeding a plurality of strings of fastening-material to the inserting mechanism, both mounted upon the frame, an electrically operated signal, a bracket attached to the frame, guide-tubes through which the strings pass to the feeding mechanism, said guide-tubes each having an open space beneath the bracket, a switch carried by the bracket and in the circuit of the signal, a set of feelers one for each guide-tube pivoted upon the bracket, a spring device interposed between each feeler and the bracket and urging its feeler into the space in the corresponding guide-tube, and a switch-operating bar pivotally mounted upon the bracket for actuation by any one of the feelers in absence of the string.

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