Aug. 22, 1939. P. NEDAL 2,170,609

MACHINE FOR CUTTING SLIDE FASTENER STRIPS

Filed March 2, 1937

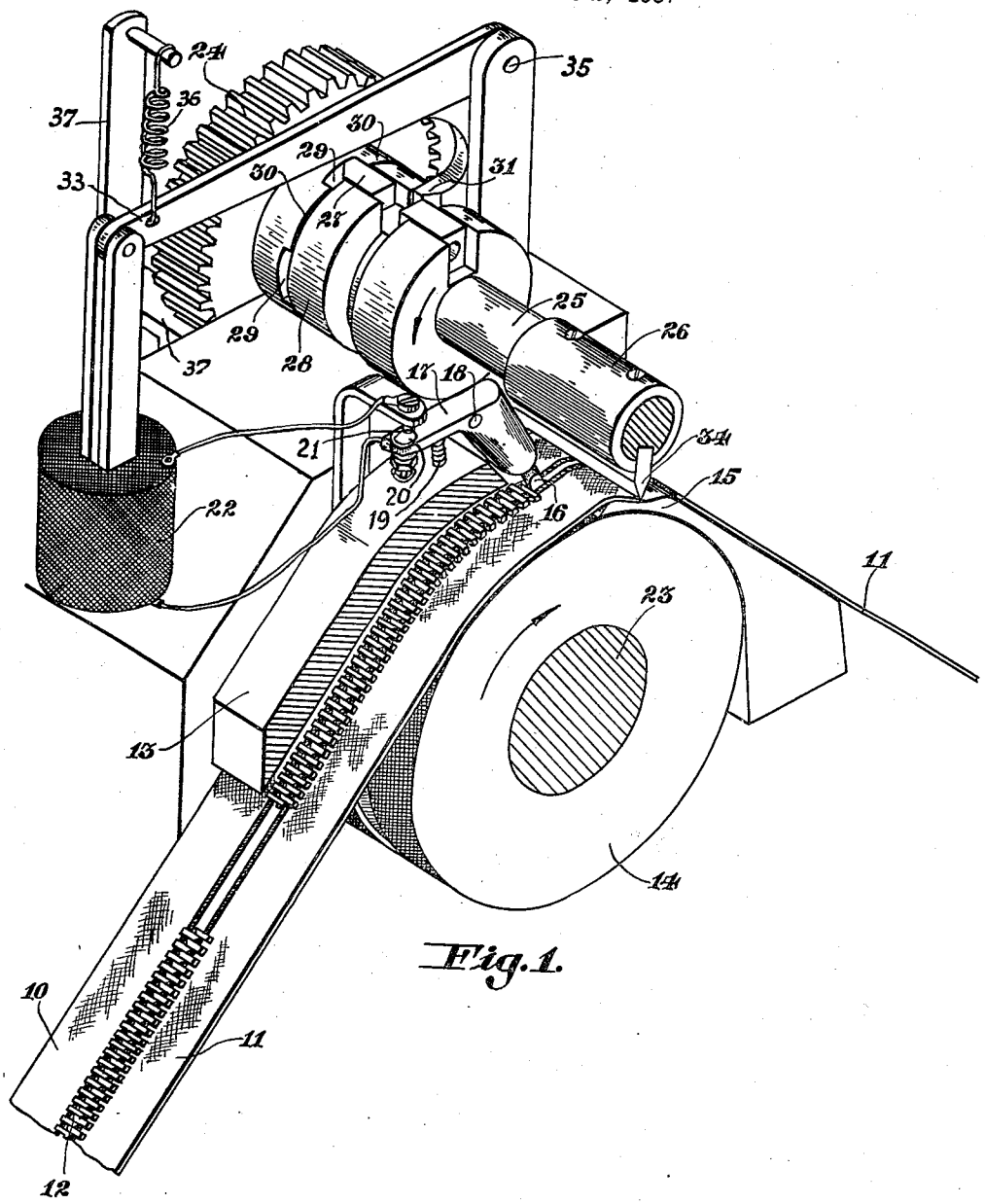


Fig. 1.

INVENTOR.
Peder Nedal.
BY Kelley & Chisholm.
ATTORNEYS.

Patented Aug. 22, 1939 2,170,609

UNITED STATES PATENT OFFICE

2,170,609

MACHINE FOR CUTTING SLIDE FASTENER STRIPS

Peder Nedal, Meadville, Pa., assignor to Talon, Inc., a corporation of Pennsylvania

Application March 2, 1937, Serial No. 128,610

6 Claims. (Cl. 164—68)

My invention relates to a machine for cutting individual fastener lengths from a continuous strip of slide fastener chain.

The object of the invention is to provide a machine which will automatically cut apart the tapes of the fastener stringers into fastener lengths accurately between the groups of fastener elements.

In the manufacture of slide fasteners the series of fastener elements are formed and attached to a tape by automatic machines usually in spaced apart groups as it is necessary to have a short blank portion of tape, that is, where there are no fastener elements attached, at each end of the completed fastener for the purpose of properly applying it to the article in which it is to be used. In order to complete the fastener it is usually the procedure to then connect the corresponding groups on the two tapes and cut into individual fastener lengths between groups at the blank portion, place a slider on the stringers and apply bottom stops and top stops.

In the former methods of manufacture, it was necessary to cut the stringers apart into individual fastener lengths by hand. This was a long and tedious operation and it was difficult to cut the tapes accurately between the groups and maintain the proper over-all fastener length with the proper amount of blank tape at each end of the fastener.

Thus, it was not only a problem to provide a machine to cut the stringers apart into fastener lengths, but it was also necessary that this machine cut accurately and at the same time automatically accommodate various lengths of fasteners because in the manufacture of slide fasteners the lengths vary from three inches up by intervals to very long lengths, and also some fasteners require a longer blank tape portion above and below the end of the fastener elements than others.

In the accompanying drawing, I have shown, in Fig. 1, for the purpose of illustration, one embodiment which my invention may assume in practice in the form of a schematic view showing the principal working parts.

The fastener strips 10, 11 with their attached fastener elements 12 are interlocked together in proper order so that each group of fastener elements will make a complete fastener. There are blank lengths of tape between each group of fastener elements called "gap spaces" where the groups are to be cut apart leaving tape ends which can be folded over for finishing in attaching the fastener in the article. The fastener strips are fed up between the guide plate 13 and the feed roller 14 over the anvil 15. Both the plate and the feed roller are provided with registering guideways in the form of a groove which guides the strips into the machine by means of the rows of fastener elements. The fastener strips are frictionally fed through the guideway continuously into the machine by means of the feed roller 14.

Means is provided for cutting the strips into fastener lengths at the blank or gap space between each group of fastener elements. For actuating the cutting means there is a finger 16 mounted in a swinging bracket 17 pivoted to the stationary frame at 18. A coil spring 19 tends to normally hold the bracket 17 back against the end of the plate 13 at all times. The free end of the finger 16 is relatively thin and in position to register with the space between the tapes at the gap spaces where there are no fastener elements attached. When, therefore, a blank space is presented under the finger, the finger will drop downwardly between the tapes and until the electrical contacts 20 and 21 come together, closing the circuit energizing the solenoid 22.

The machine is driven by any suitable source of power, preferably, by a motor attached to the end of the main drive shaft 23. Just above and forwardly of the main drive shaft there is rotatably mounted the driven gear member 24 at one end of the shaft 25 of the clutch assembly and on the opposite end the rotary cutting member 26 which is keyed to the shaft 25. Engagement between the gear member and the driven cutting member is accomplished by a sliding key 27 which slides in a suitable guideway in the driven clutch collar 28. The end of the key engages in relatively wide notches 29 between the lugs 30 of the gear member. The clutch key is normally pressed toward engaging position by a suitable coil spring (not shown).

The clutch key is controlled by the clutch operating member 31, normally held in engagement with the clutch key. Assuming that the clutch operating member 31 is held inwardly in position to disengage the clutch, the clutch key will strike the bevelled face of the clutch operating member and will be forced outwardly against the compression of a spring (not shown), in the opposite end of the key, thus disengaging the key from the gear member of the clutch assembly.

The electrical clutch control mechanism consists of the solenoid 22. The armature of the solenoid is connected to a bell-crank lever 33 piv-

oted to the base of the machine (not shown) at 35, which controls the movement of the clutch operating member 31. When the solenoid is energized the clutch is engaged. When the solenoid is deenergized lever 33 will spring upwardly due to the action of tension spring 36 having one end attached to the lever and the other end attached to a suitable bracket 37 secured to the base or frame of the machine.

The operation of the machine will be readily understood in view of the above description and may be briefly summarized as follows:

The fastener strip is continuously fed forwardly into the machine and the end of the finger 16 tends to ride centrally over the top of the fastener elements until a gap or blank space comes along at which time it falls between the tapes, bringing together the contact points 20 and 21 of a relay switch energizing the clutch operating solenoid.

This, of course, pulls down the armature of the solenoid and the end of the lever 33, which in turn mechanically moves the clutch operating member 31 out of engagement with the sliding key. This allows the key to then slide into engagement with the notches of the gear member revolving the rotary cutting member 26 carrying the knife 34, which cuts the fastener strip against the anvil 15 at the blank space into fastener lengths, and throws them out of the machine. When the finger 16 drops into the space between groups of fastener elements there will be a short interval of time before the cutting tool 34 comes into contact with the tape, due to the required period of time for the mechanical operation of the solenoid clutch and revolving shaft which carries the cutter. The stringer feed continues meanwhile at its normal rate thus moving to a position where the cutter will operate in the blank space. Some adjustment of the position in which this cutter operates may be accomplished by a suitable adjustment screw on the contact points. When the fastener elements of the next group strike the finger 16 it will again be lifted thus breaking the contacts 20, 21, deenergizing the solenoid 22 and allowing it to spring up, thus moving the clutch control member 31 which is so designed as to hold the clutch engaging member 27 out of engagement. The operation is repeated over and over again and the machine automatically adjusts itself to any length of fastener and to various sizes of gap or blank spacing between groups of fastener elements.

While I have shown and described in this application one embodiment which my invention may assume in practice, it will be understood that this embodiment is merely for the purposes of illustration and description, and that various other forms may be devised within the scope of my invention as set forth in the appended claims.

What I claim as my invention is:

1. A machine of the class described comprising a guideway, means for supplying a continuous fastener strip which consists of spaced groups of fastener elements attached to a flexible tape, feeding mechanism engaging said strip to move it along said guideway, means for cutting the strips into fastener lengths between each group of fastener elements, and control devices for said cutting means including a movable finger mounted in the path of said fastener elements and adapted to be moved thereby.

2. A machine of the class described comprising a guideway, means for supplying a continuous fastener strip consisting of two parallel tapes having attached thereto spaced groups of fastener elements with blank spaces between each group, each group of fastener elements on one tape being interlocked with a corresponding group on the opposite tape, means for positioning the blank spaces so that said spaces arrive successively in position to be cut, means for cutting the strip at said blank spaces into predetermined fastener lengths, and control devices for said cutting means including a movable finger mounted in the path of said interlocked elements and movable into position between said tapes or when engaged by said fastener elements into a position where it will ride over said fastener elements.

3. A machine of the class described comprising a guideway to guide a continuous fastener strip which consists of spaced groups of fastener elements attached to a flexible tape, feeding mechanism engaging said strip to move it along said guideway, a knife for cutting the strip between groups, and a finger member projecting into said guideway and engageable with the end member of each of said groups to control the actuation of said knife.

4. A machine of the class described comprising a guideway, means for supplying a continuous fastener strip which consists of spaced groups of fastener elements attached to a flexible tape, feeding mechanism engaging said strip to move it along said guideway, a knife for cutting the strip at the end of each group, a movable finger projecting into said guideway and engageable with the end member of each of said groups, a relay switch operated by the movement of said finger, and a solenoid energized by said switch to actuate said knife.

5. A machine of the class described comprising a guideway for a continuous fastener strip of the type having spaced groups of fastener elements attached to a flexible tape, feed mechanism engaging said strip to move it along the guideway, a knife for cutting the strip between groups of elements to leave tape ends projecting from each group, and control means for said knife including a finger projecting into the guideway and engageable with the end member of each group, and adjusting means to vary the time of actuation of the cutting knife whereby tape ends of various lengths may be produced.

6. A machine of the class described comprising means for feeding a fastener strip of the type having a series of spaced groups of fastener elements attached to the edge of a tape, a cutter, power means for actuating said cutter, control means for controlling the actuation of said cutter in relation to the position of the strip which includes a movable finger adjacent the guideway normally projecting across the path of the fastener elements, said finger being movable out of its normal position when engaged by the first fastener elements of a group, and means controlled by such movement which in turn operates said power actuating means to cut the tape.

PEDER NEDAL.