

Nov. 8, 1966

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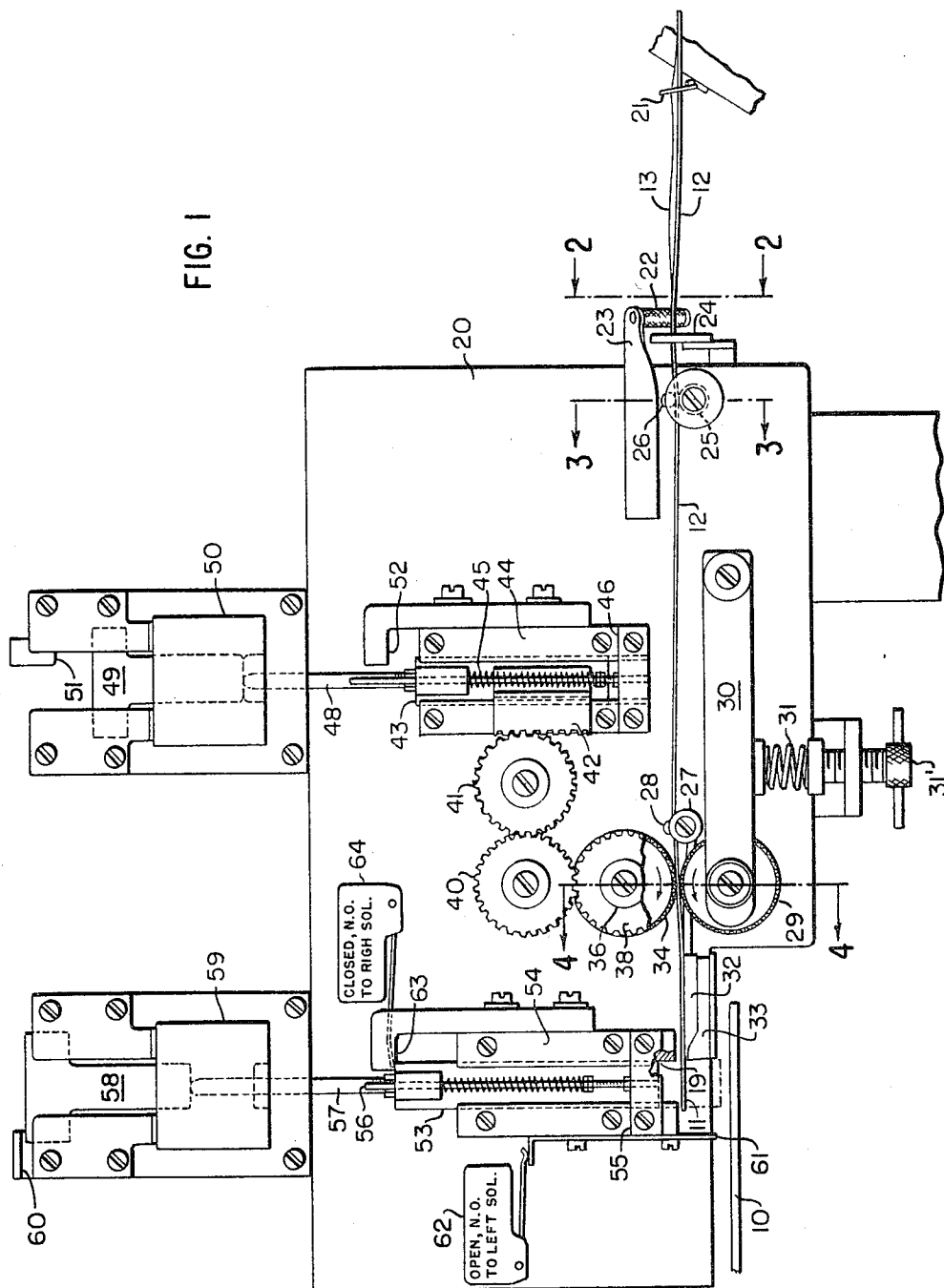
3,283,631

MACHINE FOR FEEDING AND CUTTING ADHESIVE TAPE

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2 Sheets-Sheet 1

FIG. 1



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FIG. 2

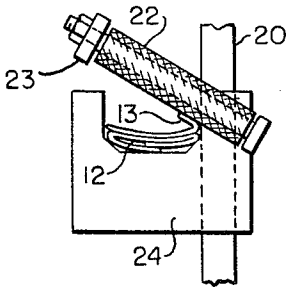


FIG. 3

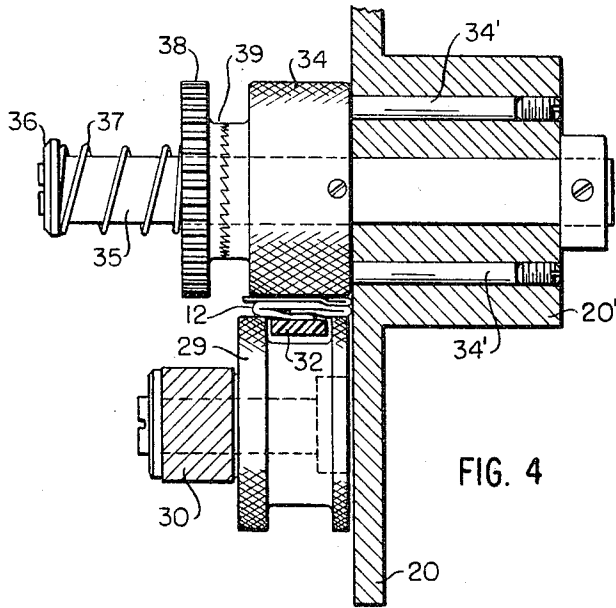
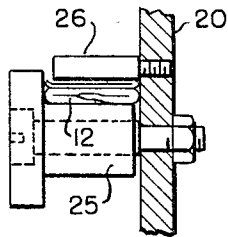


FIG. 4

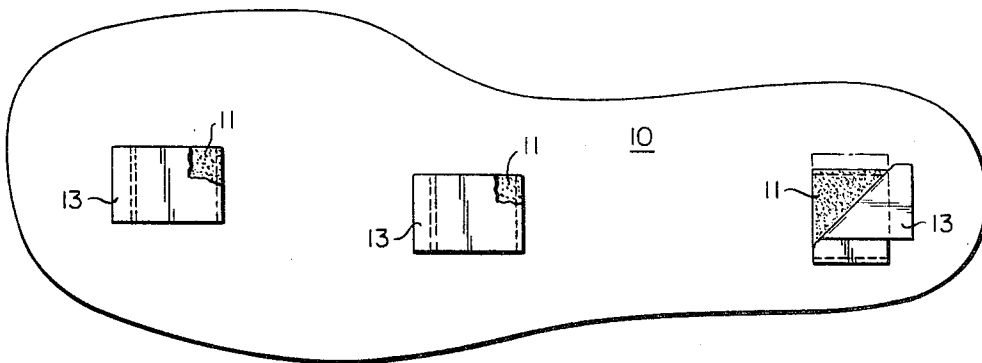


FIG. 5

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MACHINE FOR FEEDING AND CUTTING ADHESIVE TAPE

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6 Claims. (Cl. 83-211)

This invention comprises a new and improved machine for cutting patches or wafers from a strip of adhesive tape and applying them to the surface of an insole or last.

In order to obviate the insole tacking operation which is objectionable for well known reasons, a successful system has been developed which is characterized by the employment of flat patches or wafers folded from sheet material in two-ply formation and having an exterior coating of pressure-sensitive adhesive. The interior surfaces of the patches are not coated but may slip freely on themselves by rolling action when the connection is to be released as in pulling the last.

The machine of the present invention is supplied from a coil of folded tape of this kind and has feeding mechanism acting intermittently to advance the tape to cutting position where an end section is severed and immediately applied as a patch or wafer to the insole or last bottom. At the cutting station a knife is provided which is controlled in its action by a trigger arranged to be tripped by contact with the work presented to the machine. The operation of the feeding mechanism is timed by the action of the knife so that the tape is advanced after each cutting operation to supply the place of the severed patch.

The tape itself may be formed of any satisfactory sheet material such as cotton fabric, osnaberg, or paper. In practice this is coated on one side and then folded in such fashion that its entire exterior surface presents a pressure-sensitive adhesive coating. This tape is coiled with a release liner which may remain with the tape and with the severed patches thereof until removed before the insole and last bottom are brought into contact.

The two-ply or tubular wafer has the advantage of maintaining a secure adhesive bond between the last bottom and insole during the shoemaking operations which require that connection, while at the same time, permitting the bond to be readily broken by sliding action between the attached parts, as in pulling the last from the finished shoe.

The invention comprises a machine capable of automatically feeding step-by-step a tubular adhesive tape in a cleanly and reliable manner to a discharge or delivery station where a wafer of predetermined dimensions is caused to be severed by presentation of the work to the machine in which a conveniently located trigger is tripped.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof selected for purposes of illustration and shown in the accompanying drawings in which:

FIG. 1 is a view in elevation of the machine,

FIG. 2 is a fragmentary view as seen from the plane 2-2 of FIG. 1,

FIG. 3 is a fragmentary view as shown from the plane 3-3 of FIG. 1,

FIG. 4 is a sectional view on an enlarged scale of the feeding mechanism, and

FIG. 5 is a plan view of an insole with adhesive patches applied thereto.

The machine in its illustrated form comprises an upright back plate 20 upon which all the elements of the

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machine are mounted with the exception of a wire guide eye 21 by which the tape is directed to an obliquely mounted entering guide roll 22 of the machine. This is mounted upon a bracket 23 secured to the plate 20 and disposed at an angle as shown in FIG. 2 so as to fold over one edge of the release liner 13 as the tape 12 is drawn through a guide plate 24. This guide plate is mounted on a bracket secured to the back plate 20 and stands in close proximity to the inclined roll 22. The tape 12 is fed toward the left as seen in FIG. 1 over a guide roll 25 and beneath a hold-down roll 26 of smaller diameter as shown in FIG. 3. These rolls control and flatten the tape as it is advanced to a second guide roll 27 associated with a hold-down roll 28 of smaller diameter.

Upon leaving the second set of guide rolls the tape is engaged between a supporting roll 29 and a feeding roll 34. The supporting roll 29 is adjustably mounted in an arm 30 pivotally secured to the back plate 20 and yieldingly supported by a spring 31 adjustable by a screw 31' so that the feeding pressure upon the tape may be regulated. The supporting roll 29 is flanged as shown in FIG. 4 and an arm or bar 32 of Teflon or other smooth resinous material is located between the flanges of the roll in position to support the intermediate zone of the tape while it is engaged on both edges by the flanges of the roll 29. Upon leaving the feed rolls the tape is advanced over a stationary cutting block 33 into line with a reciprocating knife which will be described hereinafter.

The driven feed roll 34 is fast upon a shaft 35 carrying at its outer end a washer 36 and spring 37 which engages a gear 38 loose on the shaft 35. The hub 39 of the gear 38 is formed as one member of a ratchet clutch of which the other member is formed on the hub of the feed roll 34. The shaft 35 is journaled in a block 20' secured to the back plate 20 and containing friction plugs 34' which prevent reverse movement of the feed roll between its feeding steps.

The gear 38 meshes through intermediate gears 40 and 41 with a rack 42 which is part of a frame 43 mounted to reciprocate in ways 44 on the back plate 20. A compression spring 45 surrounds a rod connected to the frame and tends to hold it initially in elevated position. The frame is connected through a rod 48 to the core 49 of a solenoid 50 permanently mounted above the back plate 20. The solenoid 50 is in circuit with a switch 64. When the switch is operated to actuate the solenoid 50 the frame 43 with the rack 42 is moved downwardly and the feed roll 34 is rotated to advance the tape toward the left in a feeding step of predetermined adjustable extent. In the up-stroke of the rack the gear 38 clicks idly over the ratchet teeth of the clutch while the feed roll 34 remains at rest under pressure of the friction plugs 34'.

In FIG. 1 the solenoid 50 is represented as being energized so that the rack 42 occupies its lowermost position and the feeding operation has advanced the end of the tape 12 to cutting off position. The machine is thus organized and poised for severing an adhesive wafer from the tape. The downward stroke of the rack 42 is limited by the engagement of its frame with a fixed stop 46 secured to the back plate 20. The upward movement of the rack and its initial position prior to the feeding step is adjustably governed by an angle gauge 52 secured to the ways 44. The length of the feeding step is of course determined by the setting of the gauge 52.

The knife 19 is carried in a frame 53 arranged to reciprocate in ways 54 secured to the back plate and carrying a cross bar 55 to which is attached a rod 56 carrying a compression spring tending at all times to maintain the knife in its elevated initial position. To the frame is also connected a second rod 57 extending upwardly in con-

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tact with the core 58 of a second solenoid 59. The upward movement of the core 58 is limited by an overhead stop 60 with which the core is shown as engaged in FIG. 1. The initial position of the knife is adjustably determined by the setting of the angle gauge stop 63 which is secured by the ways 44.

The knife 19 is reciprocated in shearing relation with the stationary metal shear block 33 which is slightly under cut or backed off in its outer face to facilitate clean cutting of the tacky tape. The Teflon guide bar or arm 32 extends from the bite of the feed roll 29 to the shear block 33 and supplies a substantially frictionless support for the tape as it is advanced to the severing station.

A trigger in the form of a rod 61 or finger is slidably secured to the ways 54 and normally stands with its lower end in free space where it may be conveniently contacted and lifted by an insole 10 or other workpiece as shown in FIG. 1. The trigger is arranged when lifted to close a switch 62 which is in circuit with the knife solenoid 59. Accordingly, when the trigger is lifted the solenoid 59 is energized and the knife makes one complete reciprocation.

The second switch 64 is fast upon the face of the back plate 20 in position to be closed by the upward movement of the knife frame 53. When this occurs the solenoid 50 is energized and the feeding mechanism performs its function as above explained.

Thus the machine comes to rest with the unsevered end of the tape advanced to cutting-off position in readiness for a new cycle of operations.

The invention has been herein disclosed in its application to the shoemaking industry and in FIG. 5 is shown an insole 10 to which three adhesive wafers 11 have been applied. When the tape carries a release liner 13 a section of this will remain on the wafer until removed by the operator, as suggested in FIG. 5, just prior to attaching the insole to the last bottom.

It will be understood that the machine herein disclosed has a wide range of different uses. For example, the wafers may be applied to the last bottom rather than the surface of the insole, and in general the machine may be used for temporarily attaching any two material articles to each other where it is desired that they may be subsequently released without damage to either article.

Having thus disclosed my invention what I claim as new and desire to secure by Letters Patent is:

1. A machine for feeding and cutting patches from a tubular adhesive-coated tape, comprising an upright plate having a vertically reciprocable rack and a knife slide mounted side by side in spaced relation thereon, means for guiding tape in a path below said rack and slide, a switch-controlled solenoid for operating the knife slide,

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a separate solenoid for operating the rack, tape feeding means actuated by said rack, and a switch in circuit with the rack-operating solenoid and arranged to be tripped by the knife slide on its return to initial position after making a tape cutting stroke whereby the unsevered end of the tape is advanced to cutting-off position when the machine comes to rest.

2. A machine for feeding and cutting an adhesive tape, comprising cooperating feed rolls flanged to engage marginal zones of the tape under feeding pressure, and a bar of low friction composition mounted between the flanges of the feed rolls for contact with an intermediate zone of the tape.

3. A machine for feeding and cutting an adhesive tape including in its organization cooperating feed rolls flanged to engage marginal zones of the tape under feeding pressure, a bar of Teflon mounted between the flanges of the feed rolls and extending outwardly from the bite of the rolls, and a metal shear block contiguous to the outer end of the Teflon bar.

4. A machine for feeding and cutting an adhesive tape as described in claim 3, further characterized in that the feed rolls are mounted for relative adjustment in the direction of feed and also for relative yielding adjustment in a direction at right angles to the direction of feed.

5. A machine for feeding and cutting an adhesive tape as described in claim 3, further characterized in that means are provided for relative adjustment of the feed rolls both in the direction of feed and at right angles thereto, and means are also provided for adjusting the length of each feeding step imparted to the tape by the feed rolls.

6. A machine for feeding and cutting multi-ply adhesive tape, comprising a feed roll flanged to engage the strip in marginal zones, a bar of low-friction resin arranged to support an intermediate zone of the tape between the flanges of the feed roll and extending forwardly beyond the bite of the feed roll, and a stationary cutting element located contiguous to the outer end of said low friction bar.

References Cited by the Examiner

UNITED STATES PATENTS

2,465,453	3/1949	Holbrook	83—575 X
2,589,347	3/1952	Demerath	83—577 X
2,734,571	2/1956	Martell	83—210
2,898,995	8/1959	Funnel	83—210
3,122,955	3/1964	Eisenman	83—922 X
3,165,957	1/1965	Kaplan	83—436 X

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