March 23, 1937. H. D. REGAR 2,074,670

LACE TIPPING MACHINE

Filed Jan. 16, 1936

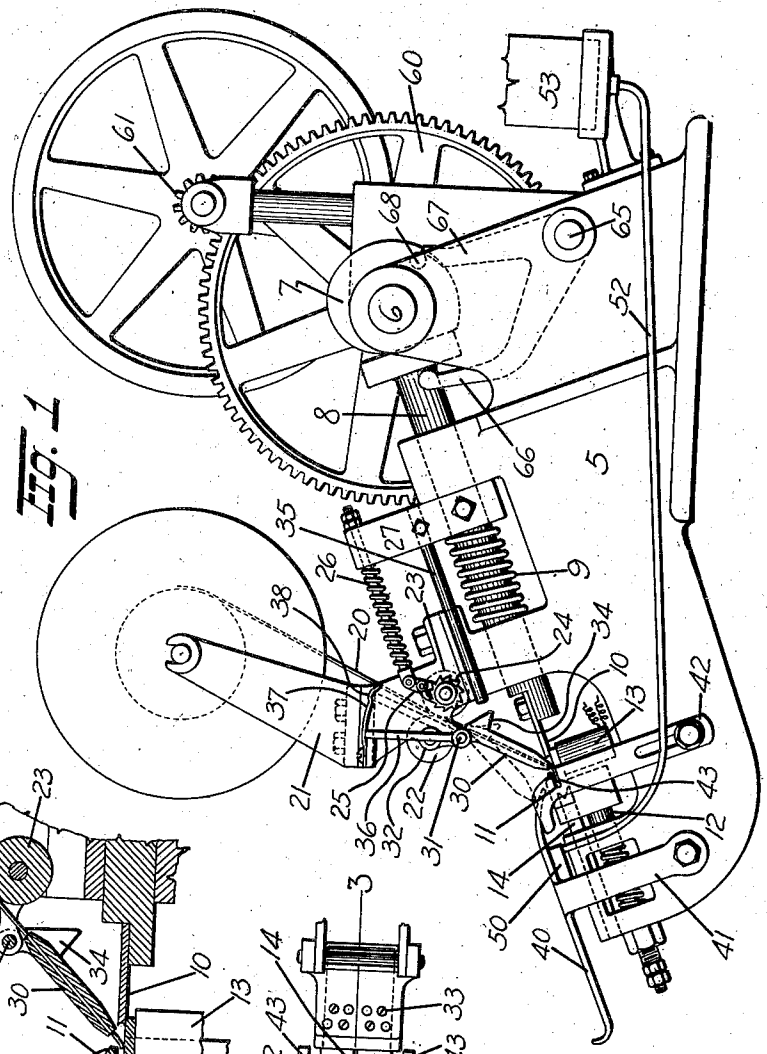


Fig. 1

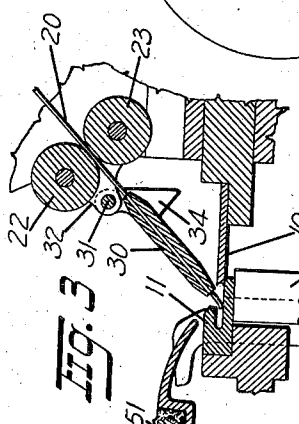


Fig. 3

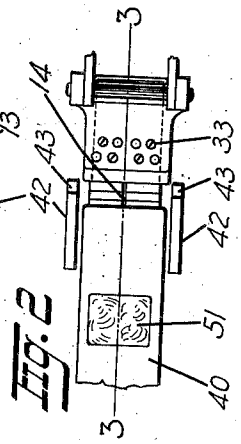


Fig. 2

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LACE-TIPPING MACHINE

Harold D. Regar, Reading, Pa.

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8 Claims. (Cl. 18—1)

My invention relates to lace-tipping machines of the kind shown and described in my Patent No. 1,535,546, of April 28, 1928, and my present object is to improve certain features thereof particularly relating to guiding the lacings into the die and protecting the end of the tip-forming ribbon from harmful action of the heated tip forming dies between the feeding movements of the ribbon.

With these main objects in view and with others that will be developed later herein, my invention comprises the improved machine construction and the manner of its operation more fully described in the following specification in connection with the accompanying drawing, and the novel features thereof are specifically set forth in the appended claims.

Fig. 1 is a side elevation of a lace-tipping machine showing a preferred embodiment of my present improvements.

Fig. 2 is a fragmentary plan view largely diagrammatic and on a somewhat enlarged scale, looking down upon the tip forming dies and showing the relation thereto of my improved feeding means for the lacings and for the feeding end of the tip-forming ribbon.

Fig. 3 is a cross-sectional elevation taken on the line 3—3 of Fig. 2.

Referring to the drawing, 5 indicates the supporting frame having suitable bearings for a power driven shaft 6, provided with a suitable cam 7 to longitudinally move plunger shaft 8 againgst the reverse bias of its tensioning spring 9. A male die member 10, mounted on the forward end of shaft 8, is moved with the latter into cooperative relation with a female die member 11, carried by a spring-backed rod 12 and heated as by an electrical heating unit 13. A fixed knife blade 14 is alined with central slots provided in the die members 10 and 11, and the advancing shaft 8 causes the die chamber of the engaged die members to cross said blade 14 due to yield of the spring backed rod 12.

The above parts are the same or like similar parts more fully described in my aforesaid patent and operated in the manner therein set forth to form a tipping cover on a length of lacing material and midway sever the same to produce two tipped lacing ends.

The tip-forming material 20, in the preferred form of a strip or ribbon, is shown as supplied from a reel thereof mounted in suitable frame-carried brackets 21, and its free end is lead between two coacting rollers 22 and 23, the latter of which is driven, as by a ratchet gear 24 having a concentrically swingable pawl-carrying arm 25 connected by a spring-biased rod 26 to an arm 27 fixed to shaft 8; forward movement of shaft 8 rotating said rollers 22 and 23 to feed a length of said strip 20 to the tip-forming dies, and spring retracted movements of said shaft 8 merely idly returning said pawl to its initial operative position.

In my prior patent I showed a fixed chute acting as a guide to lead the strip or ribbon to the dies, with the result that the strip end at the point of severance by the closing dies rested on the heated member thereof between strip feeding movements, with consequent harmful effect upon the tipping material, particularly aggravated by prolonged pauses or interruptions between operations.

To overcome the above stated harmful action of the heated die member, I have shown in the drawing, a chute guide 30, having a pivotal support 31 in suitable frame-carried supporting arms 32, and swingable into lowered feeding position relative to die member 11, or into raised non-feeding position out of proximity to the die heat. The chute opening in the guide 30 is adapted for a maximum width of strip or ribbon, and its upper surface is provided with heat-releasing apertures 33, certain of which may be formed to receive screw pins to act as lateral guides for narrower widths. The guide 30 is shown with a projection 34 in the path of a push rod 35 carried by arm 27 on shaft 8 whereby forward movement of said shaft to close the dies and sever an end from said strip, swings the guide 30 to raised position. And an upward extension 36 from the guide 30 is positioned to frictionally rub against a spring blade 37 fixed to frame 5, and to engage an end detent 38 in said spring to hold guide 30 in raised non-feeding position. Lowering of guide 30 is manually effected, as hereinafter described, and it will be clear from the foregoing description that the lowered guide is positioned as in my prior patent to feed a length of tip forming strip or ribbon to the tip-forming dies, but in the present case is raised when such length is severed by the closing dies to carry the end of the strip and its guide chute out of proximity to the heated die, so that interrupted machine operations, however prolonged can have no harmful effect on the tip-forming material, and the friction of spring blade 37 insures against any unintended or vibratory movement of the swinging guide.

The supply of lacing material is carried on a table **40** supported on frame-secured arms **41**, and they are individually fed to the die as heretofore over the downwardly curved front end of said table. To insure their accurate feeding into die member **11**, I have shown guide arms **42**, **42**, adjustably secured to frame **5** on each side of table **40**, and positioned adjacent its downwardly curved end to cause a forwardly-moved lengthwise-tauted lacing to ride downward over the forward edges of said arms into the die member **11**, the arms **42**, **42** having notches **43**, **43** to permit the lacings to enter the tip-forming chamber of said die. The arms **42**, **42**, are also positioned relative to the raised guide **30**, so that movement of the lacing to the die insures that the portion between the arms **42**, **42** will engage the raised guide **30** and lower the latter to feeding position.

I have also shown a recessed chamber formed in the table **50**, to receive a wick **51** or the like, and supply said chamber through a pipe **52** from a suitable source of supply **53**, with a suitable liquid solvent, a proper amount being applied to each lacing as it passes over said wick **51** on its way to the die chamber. This wick **51** and its supply **53** is removed from the action of the heated die, and by proper location of said supply **53**, an adequate level may be maintained to saturate the wick without danger of leakage and waste between machine operations.

From the foregoing description it is believed the nature of my improvements and their advantages in the improved operation of the machine will be readily understood. The lower end of the tip-forming strip or ribbon is constantly protected between its feeding movements from the necessary heat supplied to the tip-forming die members, and it is positively positioned for feeding to said dies by movement of the lacing into die engagement over guide arms insuring accurate positioning of the latter.

The shaft **6** is shown as preferably, though not necessarily, power driven by a gear wheel **60** and drive pinion **61**, and each shaft rotation is a complete cycle for each tip formation. The shaft may be driven, as desired, in a continuous timed rotation, or in single cycles started by the operator, and the retracting spring or plunger shaft **8** keeps the head of the latter in contact with cam. To insure positive retraction of shaft **8**, I have shown in the drawing a bell crank pivotally mounted on the frame at **65**, with one arm **66** bearing against the inner face of the shaft head and its other arm **67** positioned for engagement with a pin **68** on cam **7**. The bell-crank acts to positively retract shaft **8** in case the spring becomes sluggish in its operation due to sticking of the dies from any cause, the top of pin **68** against arm **67** warning the operator that lubrication or repairs are needed.

The preferred embodiment of my improvements as shown in the drawing and above fully described may of course be modified or changed within the spirit of my invention as specifically set forth in the following claims:

What I claim is:—

1. In combination with a lace-tipping machine comprising an intermittently fed ribbon strip of tip-forming material, and tip-forming die members cooperatively movable with said fed strip to sever a tip-forming length from the latter, of a relatively fixed guide member having a hinged extension for the feeding end of said strip, and means to move said guide extension away from said die members after severance of each tip-forming strip length.

2. In combination with a lace-tipping machine comprising an intermittently fed ribbon strip of tip-forming material, and tip-forming die members cooperatively movable with said fed strip to sever a tip-forming length from the latter, of a guide member for said strip having a pivotally swingable feeding end, and die-operating means for swinging said guide end away from said die members after severance of each tip-forming strip length.

3. In combination with a lace-tipping machine comprising an intermittently fed ribbon strip of tip-forming material, and tip-forming die members cooperatively movable with said fed strip to sever a tip-forming length from the latter, of a pivotally movable guide member for the feeding end of said strip, means to move said guide away from said die members after severance of each tip-forming strip length, and lacing guides to said die members for the lacing to be tipped positioned to cause contact of the lacing with said strip guide to move the latter into feeding position relative to said die members.

4. In combination with a lace-tipping machine comprising an intermittently fed ribbon strip of tip-forming material, and tip-forming die members cooperatively movable with said fed strip to sever a tip-forming length from the latter, of a pivotally movable guide member for the feeding end of said strip, means to move said guide away from said die members after severance of each tip-forming strip length, a supporting table for the lacings to be tipped having a liquid solvent supply chamber in the path of movement of said lacings, and lacing guides from said table to said die members positioned to cause contact of each lacing with said strip guide to lower the latter into die-feeding position.

5. In a lace-tipping machine, a pair of cooperatively movable tip-forming die members having a heating unit therefor, a supply of tip-forming material in the form of a ribbon strip, feeding rollers for said strip, a hingedly mounted guide chute for the end of said strip swingable into and out of feeding position relative to said tip-forming die members, a plunger shaft for one die member having a feed-roller driving connection and a guide-chute-swinging push rod, and means for axially moving said plunger shaft to cooperatively feed said ribbon strip to said die members, close said die members to sever a tip-forming length from said strip, and swing said guide chute away from said die members after severance of said tip forming ribbon strip length.

6. In a lace-tipping machine having means for feeding a ribbon strip of tip-forming material and cooperating heated tip-forming dies operative to receive said strip, cut an end length therefrom, and wrap the same around a lacing laid in said dies, a guide for said strip having a hingedly connected feeding-end chute lowerable into close feeding relation to said dies and raisable to a spaced distance therefrom removed from the heat action of said dies.

7. In combination with a lace-tipping machine comprising an intermittently fed ribbon strip of tip-forming material, and tip-forming die members cooperatively movable with said fed strip to sever a tip-forming length from the latter, of a guide member for said strip having a pivotally swingable end movable to feeding position by action of the lacing entered into the dies, and

movable to raised non-feeding position by action of the die-closing means.

8. In a lace-tipping machine having means for feeding a ribbon strip of tip-forming material and cooperating heated tip-forming dies operative to receive said strip, cut an end length therefrom and wrap the same around a lacing laid in said dies, a guide for said strip having a hinged end swung into die-feeding position by engagement of the lacing therewith in positioning the latter in the dies, said hinged end being raised to a non-feeding spaced distance removed from the heat action of said dies by means operated by the closing movement of said dies.

HAROLD D. REGAR.