Jan. 20, 1925. 1,523,529

C. G. HULTMAN

LACING TIPPING MACHINE

Filed Aug. 26, 1921 3 Sheets-Sheet 1

Fig. 1

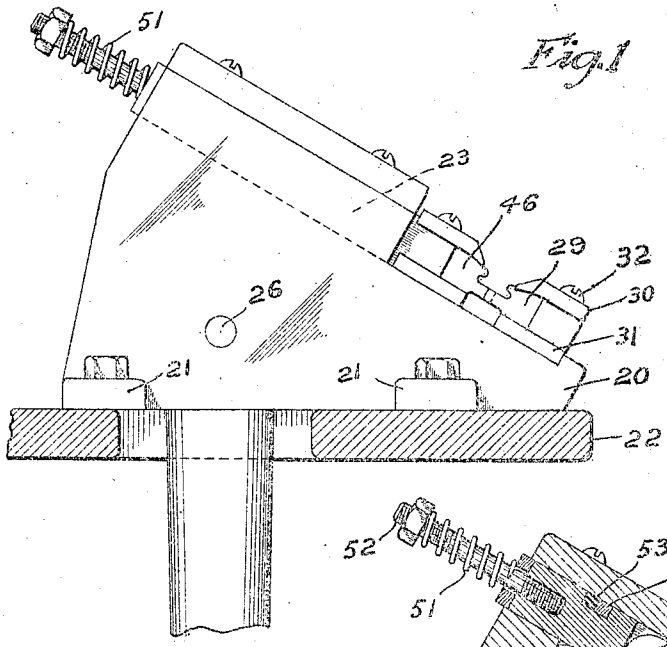
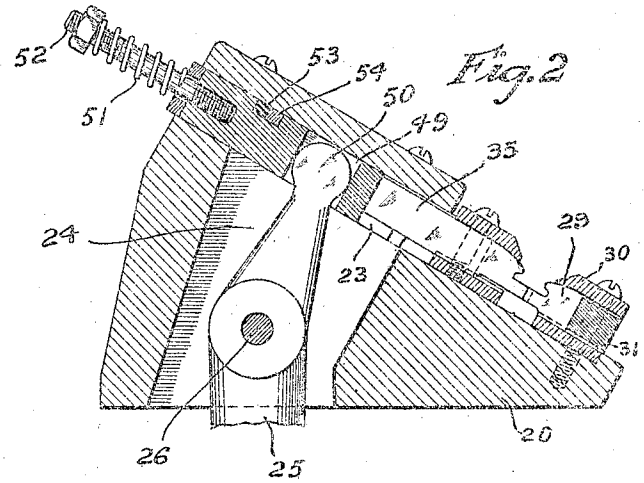


Fig. 2



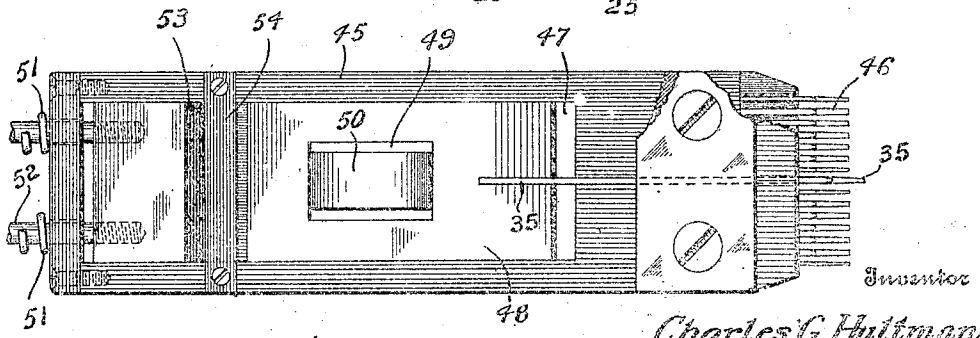


Fig. 3

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LACING TIPPING MACHINE

Filed Aug. 26, 1921 3 Sheets-Sheet 2

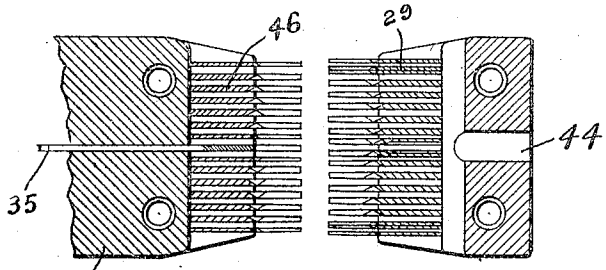


Fig. 4

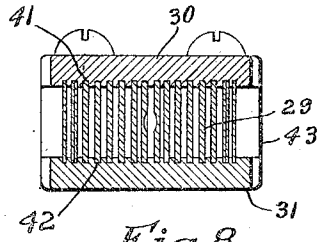


Fig. 8

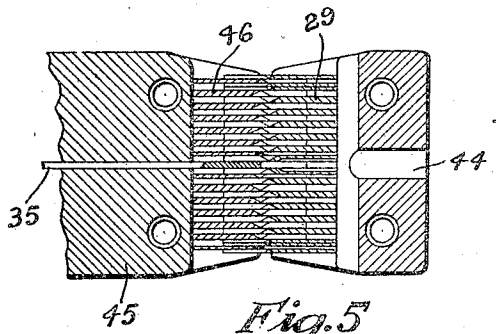


Fig. 5

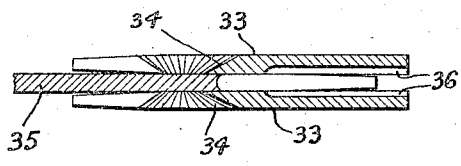


Fig. 9

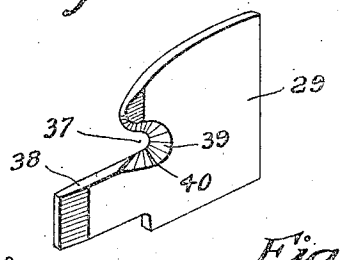


Fig. 10

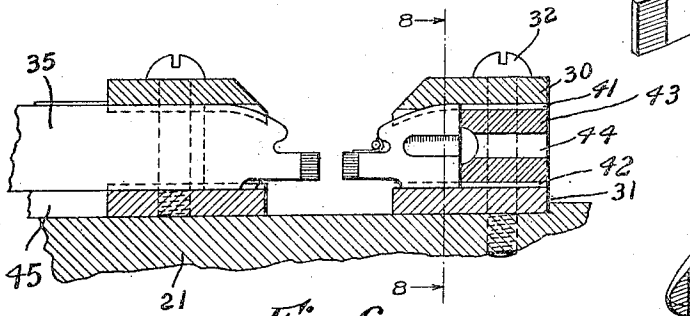


Fig. 6

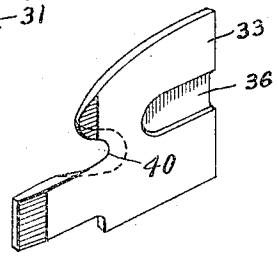


Fig. 11

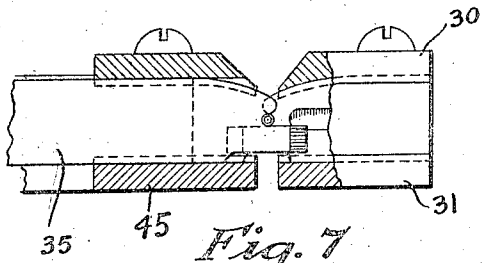


Fig. 7

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LACING TIPPING MACHINE

Filed Aug. 26, 1921 3 Sheets-Sheet 3

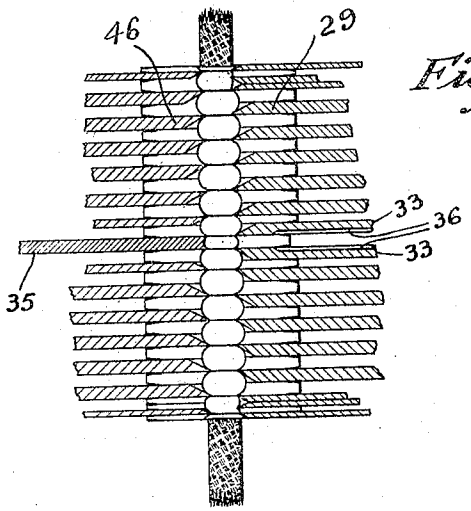


Fig.12

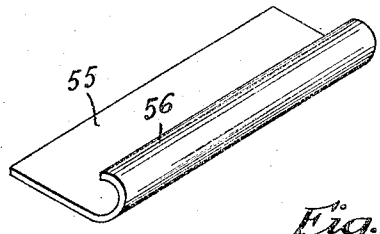


Fig.13

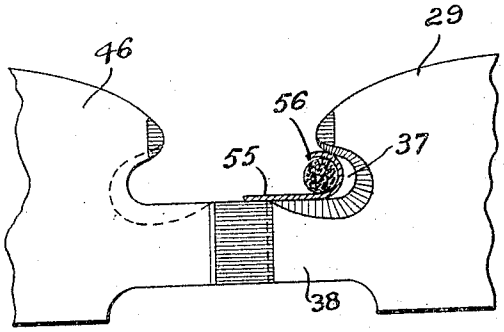


Fig.14

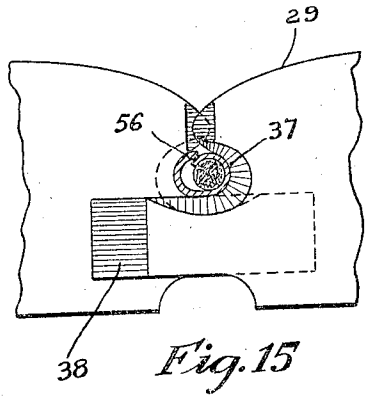


Fig.15

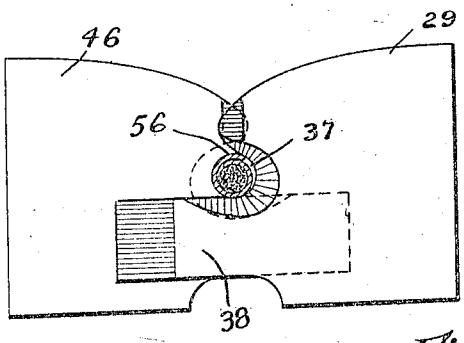


Fig.16

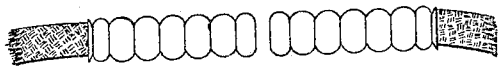


Fig.17



Fig.18

Inventor

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Patented Jan. 20, 1925. 1,523,529

UNITED STATES PATENT OFFICE.

CHARLES G. HULTMAN, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED LACE & BRAID MANUFACTURING COMPANY, A CORPORATION OF RHODE ISLAND.

LACING-TIPPING MACHINE.

Application filed August 26, 1921. Serial No. 495,753.

To all whom it may concern:

Be it known that I, CHARLES G. HULTMAN, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in a Lacing-Tipping Machine, of which the following is a specification.

This invention relates to a lacing tipping machine for applying a length of tipping material to a lacing; and the object of this invention is to provide in such a machine a fixed die and a co-operating movable die, each having a set of blades adapted to act upon and fold a length of sheet material about a lacing, said blades being also adapted to indent or corrugate the tip after it has been applied to the lacing.

A further object of this invention is to provide a cutting member for severing the tip mid-way of its length after it has been applied to the lacing.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a side elevation of my improved tipping machine showing the inter-engaging die-members, the movable member of the die being operated on an incline.

Fig. 2 is a central sectional elevation showing the operating lever as engaging the slide bar which carries the movable die.

Fig. 3 is an enlarged plan view of the slide bar and showing the cutter carrying block as slightly advanced therein in the performance of its severing action.

Fig. 4 is a top view partially in section showing the fixed and movable dies as separated and partly in section.

Fig. 5 shows the fixed and movable dies with their blades in engaging position.

Fig. 6 is an elevation showing the dies in the separated position.

Fig. 7 is an elevation showing the dies in their closed position.

Fig. 8 is a section on line 8—8 of Fig. 6.

Fig. 9 is an enlarged view illustrating the cutting blade which is mounted on the movable die, and the two cutting blades mounted on the fixed die; also showing the recesses in the rear of the two fixed blades, through which the waste cut from the tip may be discharged.

Fig. 10 is a perspective view of one of the tip metal folding-blades.

Fig. 11 is a perspective view of one of the fixed cutting blades showing the recess in its side face through which the waste is conducted.

Fig. 12 is an enlarged top view illustrating the cooperating blades of the different dies as in the act of crimping or corrugating a tip after having rolled the same onto a lacing fabric.

Fig. 13 shows a length of tipping material illustrating the shape into which one of its edges is rolled before this length is placed between the die blades to receive the lacing.

Fig. 14 is a greatly enlarged view showing this tipping strip in section and placed in the notch of the fixed blades ready to be rolled or folded about the lacing.

Fig. 15 shows the dies as nearly closed and the tip-strip in the act of being rolled or folded about the lacing.

Fig. 16 shows the dies as having been closed and the folding or rolling of the tipping material completed.

Fig. 17 shows the tipping strip as having been applied to a lacing and severed at its middle portion.

Fig. 18 is a greatly enlarged transverse section through the lacing and tip after the latter has been applied to the lacing.

It is found in practice desirable to provide a lacing tipping device wherein a length of sheet material of a width equal to twice the length of a tip may be readily applied to a lacing, the tip corrugated circularly, and subsequently severed approximately at its middle portion all by a single operation, and the following is a detailed description of one means by which this result may be accomplished.

With reference to the drawings, 20 designates the frame portion of my improved lacing tipping machine, which is provided with ears 21, through which it may be bolted to any suitable table or base 22. This

frame is provided with a guideway 23, which is set on an incline relative to the base, and is also provided with a cutaway portion 24, see Fig. 2, through the center thereof communicating with this guideway, and in which the operated lever 25 is pivotedly mounted as at 26, the lower end of which lever is provided with a cross-bar 28, adapted to be engaged by the foot of the operator for actuating the machine to apply the strip of tipping metal to the lacing, as presently described. On the lower end of this frame adjacent to the bottom portion of the inclined guideway, I have mounted the fixed portion of the die which comprises essentially a set or plurality of spaced apart blades 29, see Figs. 4 and 5, which are clamped between the upper and lower plates 30 and 31 respectively, by the screws 32.

The two middle blades 33, as best illustrated in Fig. 9, are oppositely beveled inwardly or towards each other as at 34 to cooperate with the punch or cutter blade 35, which is mounted in the reciprocating slide-bar, presently described, for the purpose of severing the tip after having been rolled and applied to the lacing.

The inner surfaces of these two cutter blades at the rear of their cutting edge are recessed as at 36, to provide a space or opening through which waste cut from the tip by the cutter may be freely discharged to prevent clogging the action of the cutter during its cutting operation.

Each of the metal rolling or folding-blades 29 is provided with a semi-circular recess 37 on its working edge, and an under forwardly projecting guiding lip or portion 38. The stock around the recess 37 being preferably beveled back as at 39, providing a comparatively sharp edge 40, whereby it is adapted to corrugate or form substantially circular indentations or recesses at spaced apart intervals along the length of the tip, causing the tip to firmly grip the fabric of the lacing to prevent its removel therefrom and to also lend to the tip a handsome and attractive annularly ribbed appearance.

In order to locate these blades in their required spaced apart arrangement, I preferably provide the inner faces of both the upper and lower clamp plates 30 and 31 with corresponding blade-receiving grooves 41 and 42 respectively, as best shown in Fig. 8, so that when these blades are positioned in these grooves and the two plates bolted together onto the spacer member 43, the blades must necessarily be in proper position relative to each other and also relative to those co-operating interengaging blades in the slide-bar presently described. The rear of this spacer-bar 43 is provided with an opening 44, to permit the free discharge of the waste cut from the lacing.

In the inclined guideway 23, of the frame 20, I have mounted a slide-bar 45, on the lower end of which is mounted another set of blades 46, which are similar in construction to the fixed blades, and are spaced to engage and co-operate with them for the purpose of rolling or folding the strip of metal about the lacing to form a tip thereon.

This slide-bar is cut out at its center portion 47, and a sliding block 48 is mounted therein, the same being provided with a central opening 49, into which the operating end 50 of the lever 25 extends. In the inner end of this sliding block is fixed the cutter blade 35, which extends through between the blades 46 and is adapted to sever the tip after being applied to the lacing. To cause this block to function so as to first roll the tip onto the lacing and subsequently move forward to cause the cutter 35 to sever the lacing, I have provided a yielding resistance to the forward movement of this block in its slide-bar 45, which resistance is in the form of two springs 51, acting upon the studs 52 fixed to the outer end of this slide block. I have also inserted a strip of crushable material 53, such as a combination of rubber and fabric, to be forced against a fixed cross-bar 54 in the slide-bar, whereby the combined resistance of the springs and this yieldable member causes the slide-bar, under action of its operating lever, to advance and roll or fold the tipping strip about the lacing, and when this has been done the resistance of these several blades 46, against the rolled stock of the tip, prevents further forward movement of the slide bar 45, then a continued forward movement of the lever 25 causes the springs and the rubber plate to yield sufficiently to permit a further forward advance of the slide-block to drive its cutter through the tip and lacing fabric to sever both, after which the block returns to its normal position in the bar and the bar returns to its rear or upward position in its frame, opening the dies and permitting the tipped and severed lacing to be removed therefrom to be replaced by fresh work.

The operation of my improved lacing tipping machine is as follows:

The operator sits facing the bench on which the machine is mounted, with the operating lever 25 projecting down into position to be engaged and operated by foot action. The normal position of the slide-bar with its blades 46 is as shown in Figs. 1 and 2, in which the forwardly extending under lips of the two sets of blades 29 and 46 overlap each other, providing a rest onto which the tip material 55 may be placed. This tip material is preferably a strip of sheet metal of a width double the length of the tip when finished. One edge of this tip

material is previously bent up into the form illustrated in Fig. 13, and is, while in this form, positioned to rest upon these under lips with the curved portion in the recess 37 of the fixed blades.

A lacing of double the required length is placed with its middle portion in the curved portion of this tipping metal, then by a foot action upon the swinging lever 25, the slide-bar 45, with its blades 46, is brought downward and causes the free end of the tip metal to be folded, rolled or curled over the previously curved portion 56 thereof, as illustrated in Figs. 15 and 16, and a continued forward motion of this movable die causes its blades to form circular indentations spaced apart along the length of the metal tip, as illustrated in Fig. 17. The resistance now caused by the engaging of the many blades upon the sides of the compressed tip, arrests a further movement of the slide-bar 45, when a continued forward action of the lever causes the block 48 to slide or move forward against its yielding resisting members in the bar 45 and drive the cutter blade 35 through the tip, severing it at its center portion. The waste stock which is cut from the tip is forced through between the cutter blades 33 into the space 36 beyond, to be finally discharged through the opening 44 in the spacer block 43.

This operation may be repeated very rapidly and the tips applied, corrugated and severed, forming two complete tips, at a single operation of the machine. The device is extremely practical in its operation and by its use tips may be applied to the lacing and caused to grip the same so firmly that they cannot be removed therefrom, at the same time producing a tip which is very handsome and attractive in appearance.

The foregoing description is directed solely toward the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

I claim:

1. In a lacing tipping machine, a set of relatively-movable cooperating dies formed to first fold a length of tipping material about a lacing and subsequently corrugate the material on the lacing.

2. In a lacing tipping machine, a set of cooperating dies, means for imparting a relative movement to said dies for applying a length of tipping material to a lacing and subsequently corrugating the material on the lacing.

3. In a lacing tipping machine, a set of cooperating dies, a cutter blade carried by one of said dies, means for imparting a relative movement to said dies to apply a strip of tipping material to a lacing and subsequently corrugate the material on the lacing, said means also causing said cutter blade to advance and sever the tip after the corrugating operation.

4. In a lacing tipping machine, a fixed die, a movable die to cooperate with said fixed die, said dies having a plurality of interengaging blades formed to first apply a length of material to a lacing and subsequently corrugate said material on the lacing during the continued forward movement of said movable die.

5. In a lacing tipping machine, a fixed die, a movable die to cooperate with said fixed die, said dies having a plurality of interengaging blades formed to first apply a length of material to a lacing and subsequently corrugate said material on the lacing during the continued forward movement of said movable die, and means for dividing the finished tip and its inclosed lacing while gripped by said dies.

6. In a lacing tipping machine, an operating lever, means responsive to the continuous forward movement of said lever for applying a strip of tipping material to a lacing, and corrugating the material on the lacing.

7. In a lacing tipping machine, an operating lever, means responsive to the continuous forward movement of said lever for applying a strip of tipping material to a lacing, corrugating the material on the lacing, and subsequently severing the lacing.

8. In a lacing tipping machine, a fixed die, a movable die, said dies having cooperating tip-corrugating blades, a cutting blade, and means for moving the cutting blade to sever the tip after the corrugating operation.

9. In a lacing tipping machine, a fixed die, a movable die, said dies having cooperating tip-corrugating blades, a cutter blade, and means for operating the movable die and subsequently moving said blade to sever the tip.

10. In a lacing tipping machine, a fixed die, a movable die, said dies having cooperating interengaging members adapted between them to corrugate a length of tipping material upon a lacing, a cutter carried in said movable die, and means for permitting said cutter to continue to advance to sever the tip after the folding members have finished their working stroke.

11. In a lacing tipping machine, a fixed die, a movable die, said dies having cooperating interengaging members adapted between them to support a length of tipping material and fold the same about a lacing, a cutter carried by said movable die, and means for permitting said cutter to move

relatively to said movable die and continue to advance to sever the tip after the folding members have finished their working stroke.

12. In a lacing tipping machine, a fixed die, a reciprocating die, said dies having cooperating interengaging members adapted between them to fold a length of tipping material about a lacing, a cutter slidably mounted in said movable die, and yielding means for permitting said cutter to continue to advance to sever the tip after the folding members have finished their working stroke.

13. In a lacing tipping machine, a fixed die and a cooperating reciprocating die, said dies provided with a multiplicity of interengaging blades shaped to operate upon and roll or fold a length of tipping material about a lacing, a cutter blade carried by the movable die shaped to remove a portion of the tip at each severing operation and slidable between said folding blades, cooperating cutter blades in the fixed die, and means for advancing said slidable cutter to sever the tip after having been applied to the lacing, one of said dies being provided with an opening through which said removed portion may be discharged.

14. In a lacing tipping machine, a fixed die and a cooperating reciprocating die, said dies provided with a set of interengaging blades shaped to fold and corrugate a length of tipping material about a lacing, a cutter blade carried by the movable die shaped to remove a portion of the tip at each severing operation and slidable between said folding blades, and means for advancing said cutter to sever the tip after said blades have completed their working stroke, said fixed cutter blades being recessed providing an opening through which said portion cut from the tip may be discharged.

15. In a lacing tipping machine, a fixed die and a cooperating movable die, said dies being provided with a set of interengaging blades adapted to close upon a length of sheet material to fold it about a lacing, said blades being formed thin on their engaging ends to indent and corrugate the tip circularly, and a cutter mounted to operate between and independently of said blades for severing the tip when finished.

16. In a lacing tipping machine, a frame having a guideway set on an incline and provided near its lower end with a fixed die having a set of spaced apart blades, a lever operated slide-bar mounted in said guideway and provided with a multi-bladed die adapted to cooperate with said fixed die to fold a length of sheet stock about a lacing, a cutter blade also carried by said slide-bar, and means whereby said cutter is permitted to advance and sever the tip after the tip has been folded and grooved by said blades about the lacing.

17. In a lacing tipping machine, a fixed die, a bladed movable die adapted to cooperate with said fixed die to act upon and fold a length of material about a lacing, a cutter blade slidably mounted between blades of said movable die, and means whereby said cutter blade is permitted to advance independently of said movable die and sever the tip after the folding portion of the die has reached the end of its working stroke.

18. In a lacing tipping machine, a fixed die and a cooperating reciprocating die, said dies provided with a multiplicity of interengaging blades shaped to fold and crimp a length of tipping material about a lacing, a cutter blade slidable between said folding and crimping blades, and means for advancing said cutter blade to sever the tip after said folding and crimping blades have applied the tipping material to the lacing.

19. In a lacing tipping machine, a fixed die, a cooperating movable die, said dies being provided with a set of interengaging blades adapted to close upon a length of sheet stock to fold and groove it about a lacing, a cutter blade slidably mounted in said movable die, and means whereby said cutter is caused to advance and sever the tip after the tip stock has been folded and grooved by said blades about the lacing.

20. In a lacing tipping machine, a fixed die, a cooperating movable die, a single operating member actuating said movable die, said dies being provided with a set of interengaging blades thinned on their engaging edges to close upon a length of sheet stock to fold it about a lacing, a cutter blade mounted in said movable die, and means whereby a continuous advancing stroke of a single operating member first advances the interengaging blades of said movable die to fold and groove the stock about the lacing and then advances the cutter blade to divide the tip.

21. In a lacing tipping machine, a fixed die with a set of spaced apart blades, a slide bar provided with a multi-bladed die, the blades of which cooperate with the blades of said fixed die to fold a length of sheet stock about a lacing, a cutter blade also carried by said slide-bar, and yieldable means in said bar whereby said cutter is permitted to advance and sever the tip after it has been folded by said blades about the lacing.

In testimony whereof I affix my signature.

CHARLES G. HULTMAN.