

L. MUTHER.
MACHINE FOR COVERING EYELETS.
APPLICATION FILED FEB. 21, 1907.

1,022,043.

Patented Apr. 2, 1912.

4 SHEETS—SHEET 1.

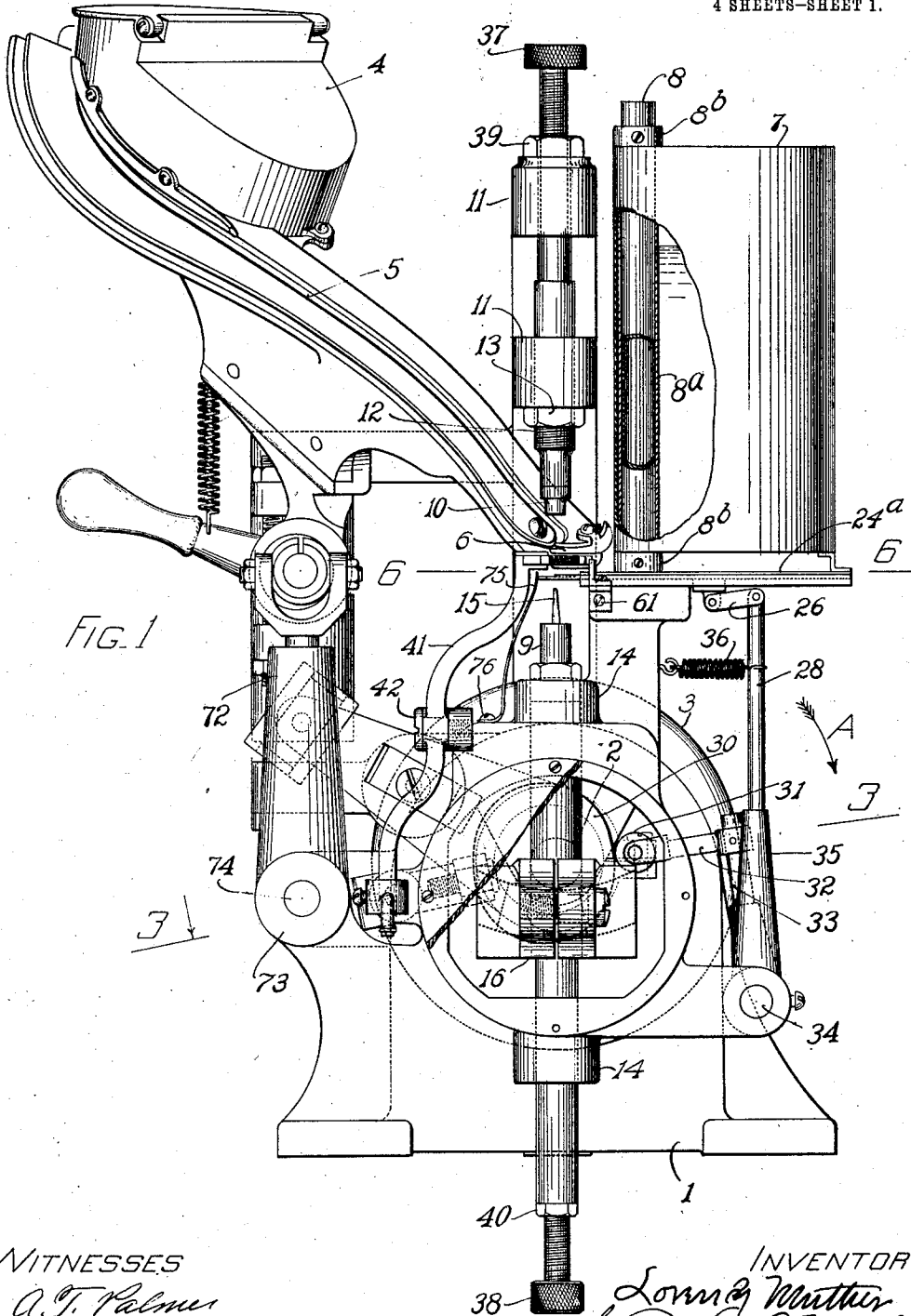


FIG. 1

WITNESSES

A. T. Palmer
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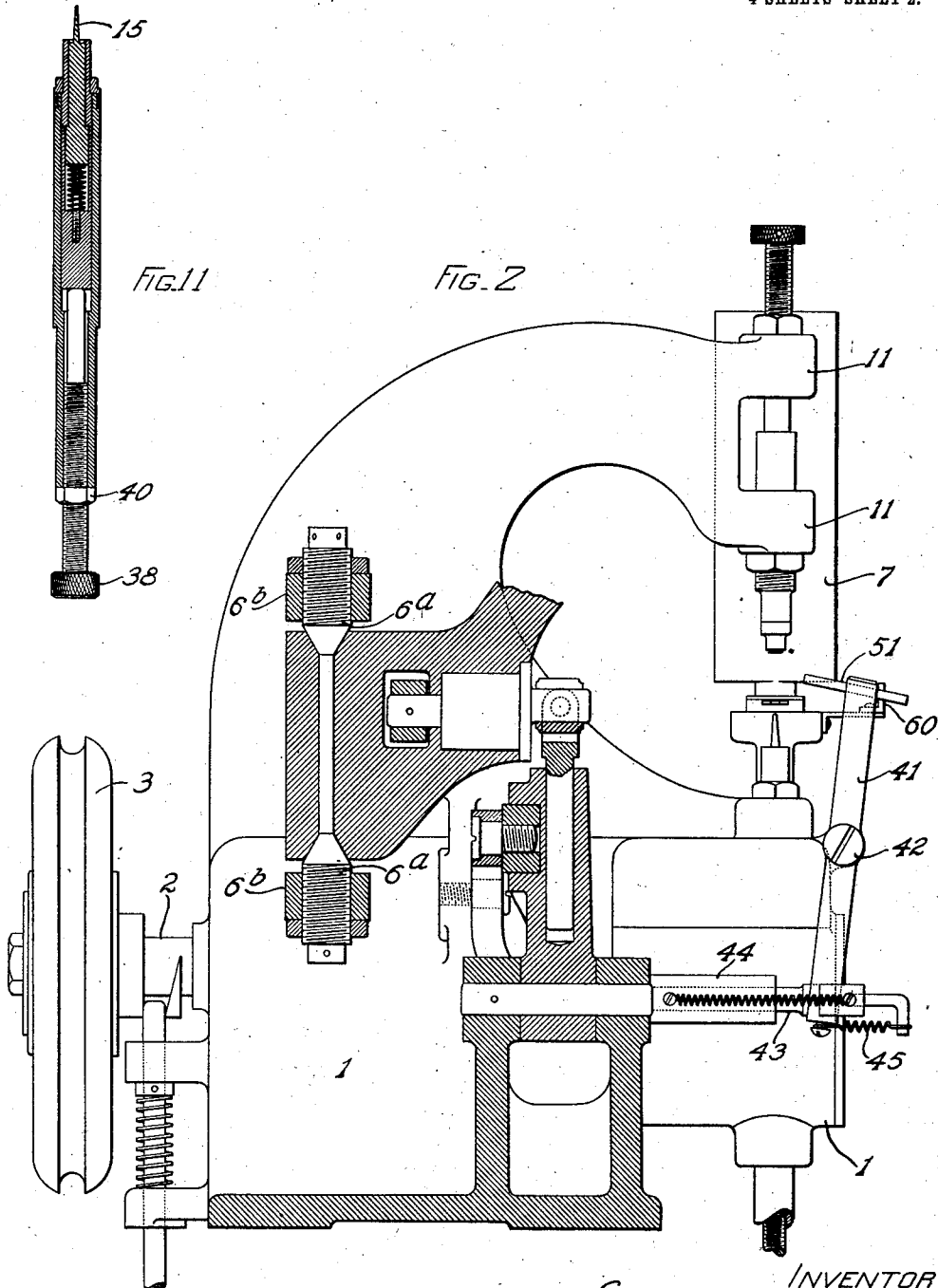
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WITNESSES

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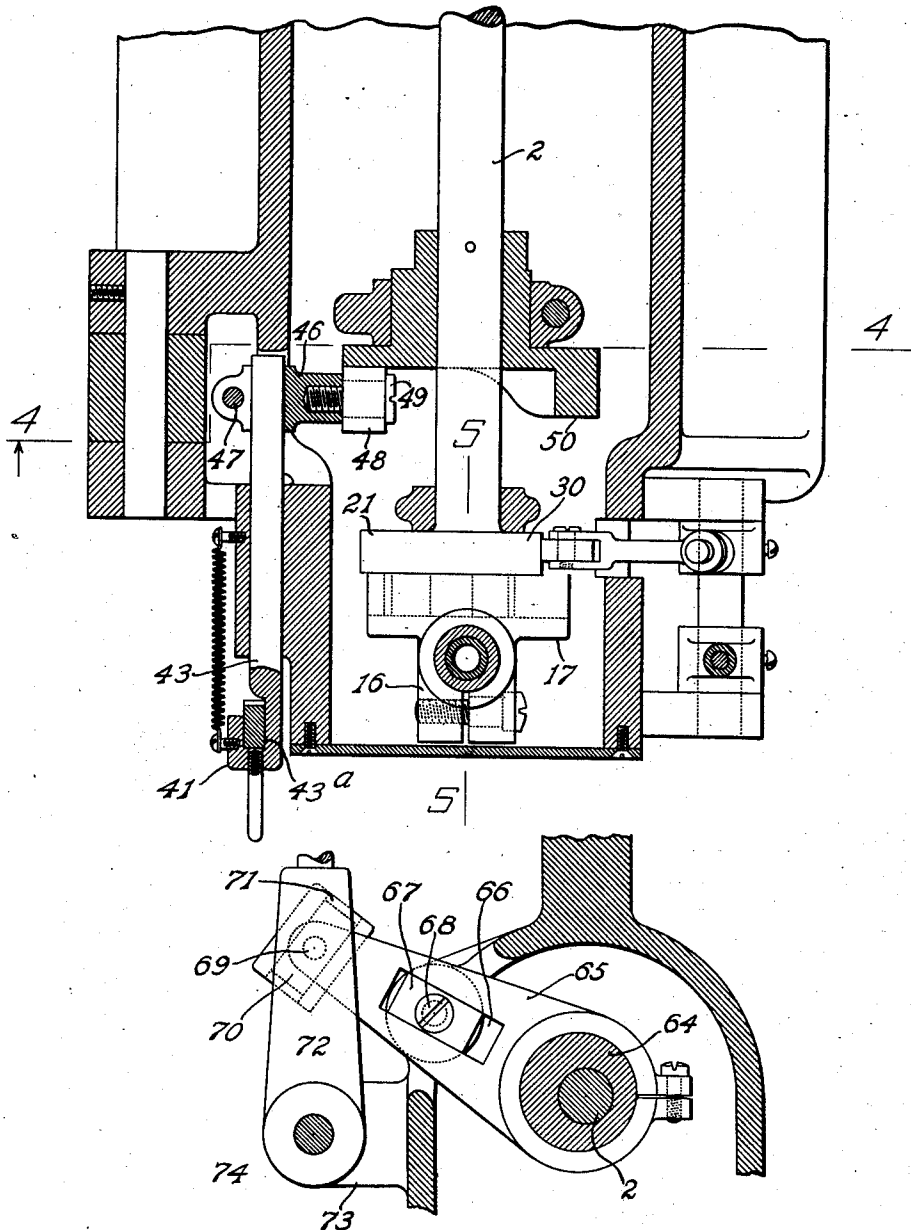
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4 SHEETS—SHEET 3.

FIG. 3



WITNESSES
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FIG. 4

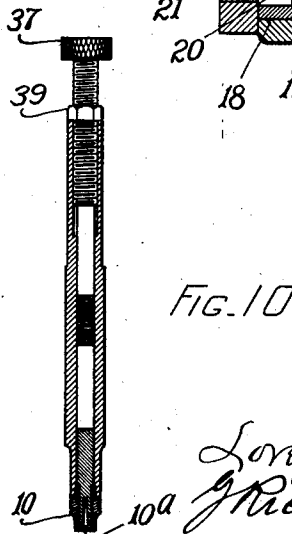
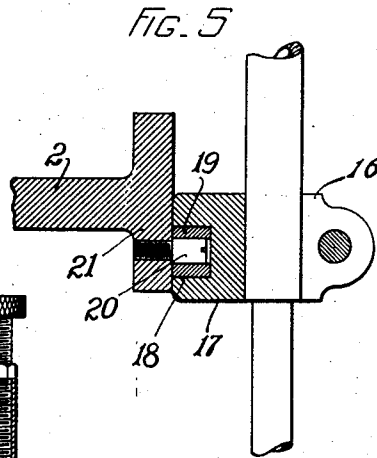
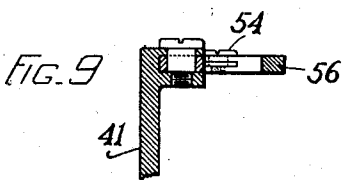
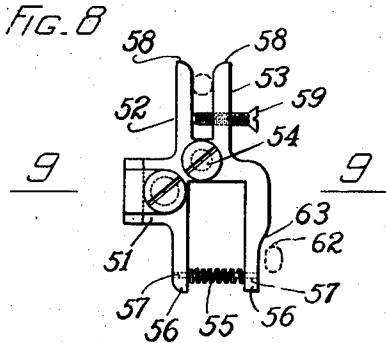
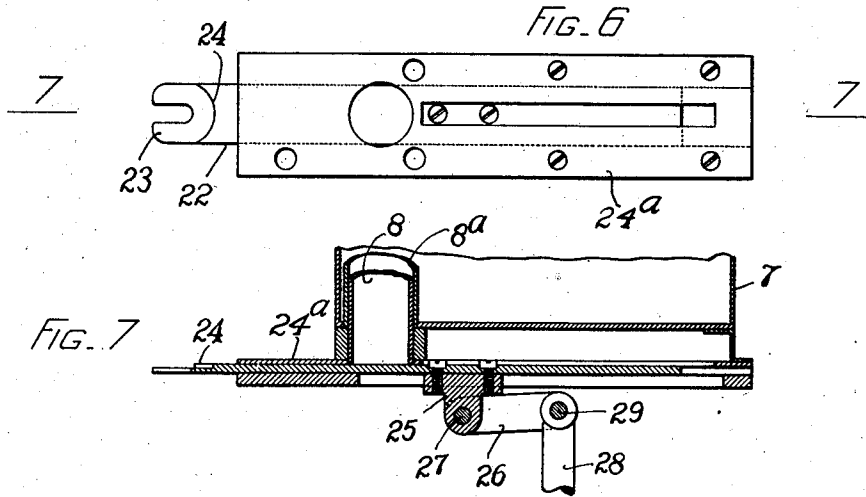
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4 SHEETS—SHEET 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

LORENZ MUTHER, OF BOSTON, MASSACHUSETTS.

MACHINE FOR COVERING EYELETS.

1,022,043.

Specification of Letters Patent.

Patented Apr. 2, 1912.

Application filed February 21, 1907. Serial No. 358,610.

To all whom it may concern:

Be it known that I, LORENZ MUTHER, a citizen of the United States, residing at Boston, county of Suffolk, and State of Massachusetts, have invented certain new and useful Improvements in Machines for Covering Eyelets, reference being had therein to the accompanying drawings.

My invention relates to a machine for covering eyelets with a flexible or pliable material.

The object of my invention is to produce a machine which will automatically feed the eyelet and the flexible or pliable material and cover the eyelet with the same.

In the drawings accompanying and forming a part of this specification, Figure 1 is a front elevation of my eyelet covering machine. Fig. 2 is a side elevation with the eyelet feeding device removed and portions of the machine in cross section. Fig. 3 is a partial sectional plan view taken through line 3—3 Fig. 1. Fig. 4 is a partial sectional elevation taken through line 4—4 Fig. 3. Fig. 5 is a partial sectional elevation taken through line 5—5 Fig. 3. Fig. 6 is a partial plan of the mechanism for feeding and positioning the material for covering the eyelets taken on line 6—6 Fig. 1. Fig. 7 is a sectional elevation taken on line 7—7 Fig. 6. Fig. 8 is a plan of the device for removing the eyelets from the dies after they are covered. Fig. 9 is a sectional elevation of same on line 9—9 Fig. 8. Fig. 10 is an axial section of the upper covering die. Fig. 11 is an axial section of the lower covering die.

In the drawings illustrating my invention, 1 represents the frame of the machine; 2 the driving shaft, and 3 the driving pulley mounted on said shaft in such manner as to cause the shaft to revolve by means of a suitable clutch, which is not shown. The machine is provided with the eyelet-holding hopper 4, the raceway 5 down which the eyelets slide to the dies, and the eyelet-feeding mechanism 6 at the bottom of the raceway 5, which feeds the eyelets to the lower covering die; the whole being mounted on the pivot screws 6^a, 6^a threaded in the lugs 6^b, 6^b, the ends of the screws 6^a being tapered to fit the tapered holes in the frame of the hopper. The eyelet hopper and raceway are of the usual type used in what is known as eyelet-setting machines, and their specific construction does not form a part of my invention.

The covering machine is provided with a heating-tank 7 arranged to contain either hot water or steam. The tank 7 is provided with a tube 8^a fixed therein in a manner to be water or steam-tight. The tube 8 is a sliding fit in the tube 8^a and of a sufficient length to extend beyond it at both ends. Its lower end is fitted into a hole in the slide-plate and rests upon the edges of the guide-ways of said slide-plate 24^a. Collars 8^b, 8^b, hold said tube 8 in place. The internal diameter of said tube 8 is slightly larger than the diameter of the covering disks in order that they may pass freely through it.

The machine is provided with the lower covering die 9 and the upper covering die 10. The upper covering die 10 is adjustably mounted in the brackets 11, 11, which brackets form a part of the frame of the machine. The die 10 is adjustable vertically by means of the screw threaded portion 12 which is threaded into the lower bracket 11, the adjusting nut 13 being designed to hold the die 10 in its adjusted position. The lower covering die 9 is slidably mounted in the portion 14, 14, of the frame 1 and is so positioned that the point 15 will enter the hole 10^a in the upper covering die 10. The lower covering die 9 is moved up and down by means of the clamp 16 secured to it and which is provided with an inwardly projecting portion 17 having a raceway 18 arranged to receive a roll 19, which roll is revolubly mounted by means of the screw 20 upon the crank disk 21. Said crank disk 21 forms the end of the shaft 2. The parts are so arranged that when the shaft 2 revolves in the direction of the arrow A, the lower forming die 9 will move up and down vertically. During the vertical movement of the lower forming die 9 the point 15 will move upwardly so as to pass through an eyelet held in the lower end of the raceway 5 thus positioning the eyelet upon said lower forming die. The blanks of flexible covering material are held in the tube 8 and are in the form of disks of the proper diameter, having a hole in their center through which the point 15 can pass. These covering disks are held in the tube 8 and moved down in said tube by means of the suitable weight or spring, not shown, over the sliding-plate 22 which has a forked portion 23 formed upon its end to enable the plate 22 to pass each side of the point 15. Said plate 22 is provided with the shoulder 24 designed to feed

the covering material to a position over the point 15. The plate 22 has a lug 25 secured to the bottom, and a link 26 pivoted to said lug 25 by the pin 27, the opposite end of said link 26 being pivoted to an oscillating arm 28 by means of the pin 29. The arm 28 is oscillated back and forth by means of a cam 30 mounted upon the shaft 2 acting through a roll 31, rod 32, an oscillating arm 33 secured to the rotating shaft 34, and the arm 35 secured to said rotating shaft 34. The arm 35 has secured in it the arm 28. These several parts are so arranged that on each revolution of the shaft 2 the cam 30 will cause the slide 22 to move back under the tube 8, receive a disk of covering material, move forward to a position straddling the point 15 so that when the lower forming die moves up it will first receive a disk of covering material and thereafter receive an eyelet and press and form the covering material around the eyelet by its coöperation with the upper forming die 10. The oscillating arm 28 is provided with a spring 36, one end of which is attached to the frame 1 and the other end to said arm 28, the spring 36 serving to pull the slide forward to feed the covering material to the lower forming die, while the cam 30 serves to move the slide backward to receive another disk of covering material.

The details of construction of the dies are shown in Figs. 10 and 11. Fig. 10 shows the upper forming die, and Fig. 11 the lower forming die, each of which is adjustable by means of the adjusting screws 37 and 38, and held in their adjusted position by the binding nuts 39 and 40.

The particular construction of the forming dies shown in Figs. 10 and 11 is not my invention, my invention being more particularly the combination of operating mechanisms for operating said dies and other devices, as will be hereinafter more fully explained.

My covering machine is provided with means for removing the eyelet from the point 15 of the lower forming die 9 after the head of the eyelet has been covered by the flexible material. In said removing mechanism 41 is an oscillating lever which is pivoted to the frame of the machine by the pivot screw 42 in such manner that it will oscillate back and forth through the medium of the axially moving shaft 43 which is slidably mounted in a bearing in the portion 44 formed upon the frame of the machine. The shaft 43 being fulcrumed upon the lever 41 as shown more particularly in Fig. 3. The lever 41 is held back in a notch 43^a in the shaft 43 by the spring 45. The shaft 43 is provided at its inner end with the bearing 46 clamped thereon by the screw 47. The bearing 46 is provided with the roll 48 on its outer end held in

position by the screw 49. The roll 48 contacts with the face of the face-cam 50, which cam is mounted upon the shaft 2, the parts being so arranged that rotation of the face-cam 50 will move the shaft 43 axially forward and thereby oscillate the lever 41 at its upper end toward the forming dies. The lever 41 has secured to its upper end spring clamps 51, which spring clamps 51 are shown in detail in Fig. 8 as being composed of the member 52 and the member 53 pivoted together by means of the pivot-screw 54. The inner end is pressed together by the spring 55 which is mounted between the ends 56, 56, and held in place by the pins 57, 57. The inward movement of the fingers 58, 58, is limited by means of an adjusting screw 59.

The clamping device 51 as illustrated in Fig. 8 is shown with an eyelet between its inner ends. To open the fingers 58, 58, I provide a lug 60 secured to the frame of the machine by the screw 61 in such position that its upper end 62, as is shown in Fig. 8, will contact with the cam portion 63 of the part 53, thereby pressing the ends 56, 56, together and loosening the hold upon the eyelet, allowing it to fall out.

It is necessary to agitate the hopper 4 and the raceway 5 in order to cause the eyelets to feed properly down said raceway to the forming dies. For that purpose I have devised the means shown in detail in Fig. 4 of the drawings, which means consist of the eccentric cam 64 which is mounted upon the shaft 2, the pitman 65 having a bearing surrounding said eccentric cam 64, said pitman 65 being provided with an axial slot 66 adapted to receive a slide-block 67 which is secured by the pivot screw 68 to the frame of the machine. The outer end of said pitman is pivoted by the pin 69 to the slide-block 70, which slides in the slideway 71 formed upon the oscillating arm 72 which supports the raceway and hopper. The arm 72 is pivoted to the frame at 73 by means of the pivot-pin 74. By means of this device the hopper is agitated at the proper points in the revolution of the shaft 2. When an eyelet is being fed to the point 15 of the lower forming die, and when the material is being formed on the head of the eyelet, the cam 64 reaches points where the movement of the shaft 2 and cam 64 does not cause any movement of the hopper and raceway. As will be readily seen, this occurs at two points in the revolution of the cam 64; *i. e.*, when the greatest throw of the cam is in line with the axis of the pitman in its extreme throw toward the pitman and away from it.

The operation of my machine for covering eyelets is as follows:—Fig. 1 shows the forming die 9 at the lowest point of its movement, the slide 22 for feeding the cov-

ering material at a point where the point 15 will pass through the hole in said material at its upward movement, and the lower end of the raceway 5 for feeding the eyelets to the point 15 in position where said point 15 will pass through an eyelet at its upward movement. By revolving the shaft 2 in the direction of the arrow A, the lower forming die 9 will move upwardly, take on a disk of covering material, whereupon the slide 22 will move backwardly to its rear-most position, the lower forming die 9 will continue upwardly, take on an eyelet, the raceway will move backwardly out of the track of said forming die; thereupon, the point 15 will move upward into the hole 10^a in the center of the upper forming die 10 and crimp and bend the covering material around the head of the eyelet and firmly press it thereon. Thereafter, by continuing the revolution of the shaft 2 the lower forming die 9 will move downwardly until the body of the eyelet is opposite the opening between the fingers 58, 58, of the eyelet removing clamp 51, whereupon it will move forward and slide over the body of the eyelet, being pressed against the eyelet by the spring 55, and hold it until the point 15 of the lower forming die 9 has been withdrawn from the hole in said eyelet; thereupon the removing clamps 51 will move backward to the position shown in Fig. 2, when the point 62 will contact with the cam surface 63 and permit the eyelet to drop out of the clamp, which completes the cycle of operation of the covering devices.

The particular device shown for warming the covering material to make it more pliable is novel in respect that the steam or water or other heating medium in the tank 7 surrounds and heats the tubes 8 and 8^a but is not permitted to come in contact with the disks contained in said tube 8. This construction is very desirable in that most eyelets are covered with either celluloid or rubber disks made of polished material to render them bright and smooth, and should steam or water come in contact with this material it would dim the shiny or glossy finish of the disks, thus rendering an eyelet covered with them unmarketable and unfit for use.

The heating-tank 7 is arranged so that it may be filled with hot water, or pipes may be attached and steam or hot water may be circulated through it, or a lamp, gas jet or other suitable heating medium arranged within it; but however it is arranged, the heating medium does not come in direct contact with the covering material.

The stop 75 is attached to the frame of the machine by suitable means as the screw 76, its upper end being so positioned that it will prevent the disk of covering material from being displaced from the slide 22 by

its momentum as it is fed forward to the covering dies.

Changes in form and size of the eyelet covering machine or its parts may be made without departing from the spirit of my invention.

What I claim is:—

1. In a machine for covering eyelets, upper and lower forming dies; means for feeding eyelets to said forming dies; means to contain and indirectly heat disks of covering material; a carrier for feeding said disks of covering material to the forming dies one at a time; yielding means mounted in both said forming dies for positioning and holding said disks in place; and means causing said forming dies to cooperate to form and press the covering material upon the head of an eyelet.

2. In a machine for covering eyelets, upper and lower forming dies; means for feeding eyelets to said forming dies; means to contain and indirectly heat disks of covering material; a carrier for feeding said disks of covering material to the forming dies one at a time, and for positioning and holding said disk in place; means for causing said forming dies to co-act to form and press the covering material upon the head of an eyelet; means for removing the covered eyelet from the forming dies; and means for clamping the covered eyelet, carrying it away from the path of the covering means, and for releasing it from said removing means.

3. A machine for covering eyelets comprising upper and lower forming dies; means for operating said dies to press a disk of covering material upon an eyelet; means for feeding eyelets to said forming dies, comprising a hopper to contain said eyelets and a raceway for conveying the eyelets to one of said forming dies; and means for agitating the hopper at certain points in the movement of the dies and for causing the hopper to remain at rest at certain other portions of the movement of said forming dies.

4. In a machine for covering eyelets, a frame; a shaft revolubly mounted in said frame; an upper forming die yieldingly mounted in said frame; a lower forming die slidably mounted in said frame; means on said shaft for moving said lower die axially to cause it to cooperate with said upper forming die to cover an eyelet with a disk of previously heated flexible covering material.

5. In a machine for covering eyelets, a frame; a shaft revolubly mounted in said frame; an upper forming die yieldingly and adjustably mounted in said frame; a lower forming die slidably mounted in said frame; means on said shaft for moving said lower forming die axially; means for feeding eyelets to said forming dies; means for feeding

disks of covering material to said forming dies; and means whereby said forming dies coöperate to form and press the covering material upon the head of the eyelet; and means for removing the eyelet from the forming dies.

6. A machine for covering eyelets, comprising a frame; an upper forming die adjustably and yieldingly mounted in said frame; a lower forming die adjustably and slidably mounted in said frame; means mounted in said frame adapted to impart an axial reciprocating movement to the lower forming die; a hopper for holding the eyelets; means for feeding them to the forming dies; a hopper for holding the disks of covering material; means in said hopper for heating said disks of covering material, a reciprocating carrier for feeding said disks of heated covering material from the hopper to the forming dies; and yielding means mounted on the frame of the machine adapted to coöperate with the carrier to position the disks of covering material in alinement with the forming dies and to prevent it from being displaced from the carrier.

7. An eyelet covering machine comprising means for pressing the covering material upon eyelets; means for feeding the eyelet and covering material to forming dies, and means for removing the covered eyelet from the forming dies, comprising oscillating clamping members; means for oscillating the clamping members to cause them to clamp an eyelet; a spring for pressing the clamps against the eyelet and holding said eyelet until the forming dies are withdrawn therefrom; and means for moving said clamping members from the path of the forming dies, and for releasing the eyelet from the clamping members.

8. In an eyelet covering machine, means for removing eyelets from the covering dies, comprising pivoted clamping members, means for pressing said clamping members upon an eyelet; means for carrying the eye-

let away from the path of the covering means; and means for releasing the clamping members from the eyelet.

9. An eyelet covering machine comprising dies for covering an eyelet with flexible material; and means for warming said flexible material before feeding it to the dies, comprising a tank to contain the heating medium, a receptacle in said tank for holding disks of the covering material, the whole being so arranged that the heating medium will not contact with the disks of covering material.

10. An eyelet covering machine comprising dies for covering an eyelet; and means for feeding eyelets to the covering means comprising a hopper, a raceway to conduct the eyelets from the hopper to the covering means; and means for agitating the hopper, comprising a cam, a pitman and a plurality of slide-blocks arranged radially and tangent to the cam.

11. A machine for covering eyelets, comprising dies for forming and pressing covering material upon an eyelet; means for feeding the eyelet to the covering means; and means for feeding disks of covering material to the covering means, comprising a receptacle for holding the covering material, a slide having a recess in one end of a depth corresponding to the thickness of the covering material, and means on the slide for removing a disk of covering material from beneath the receptacle for holding said covering material; and means for feeding said disk of covering material to the covering means.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses, this 18 day of February, A. D. 1907.

LORENZ MUTHER.

Witnesses:

R. P. ELLIOTT,
ARTHUR P. HARDY.