A. L. CURRIER.

MECHANISM FOR FEEDING EYELETS AND THE LIKE,

APPLICATION FILED MAY 7, 1914.

1,260,518.

Patented Mar. 26, 1918.

4 SHEETS—SHEET 1.

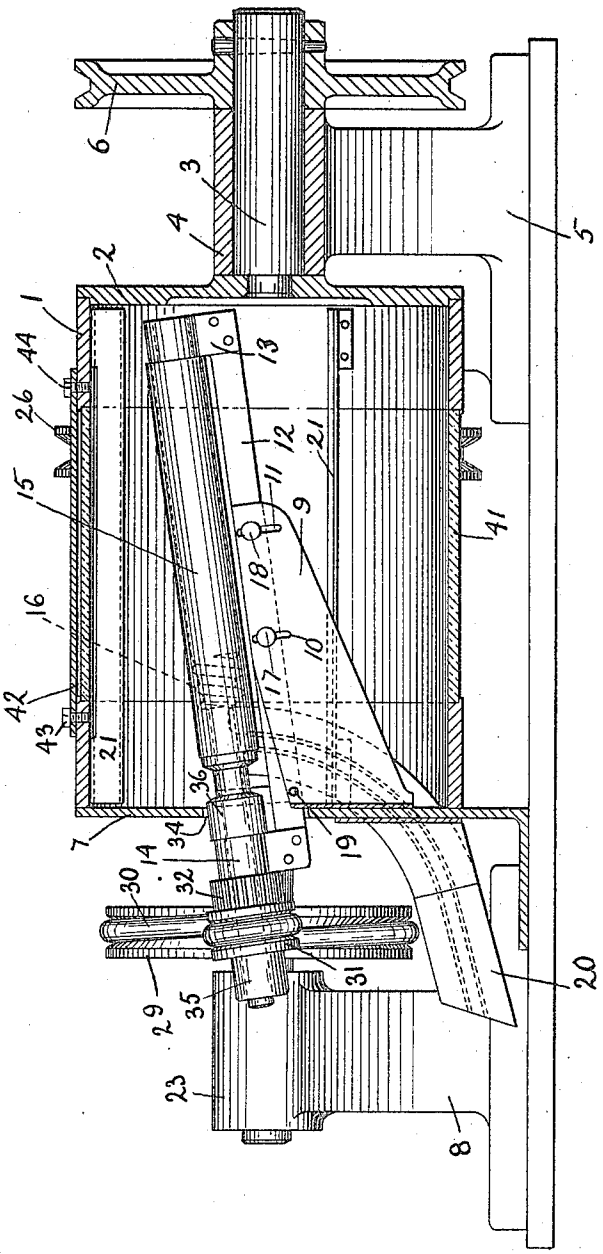


Fig. 1

WITNESSES

James R. Hoddes

R. J. Hersey

INVENTOR

Arthur L. Currier

by Geo. S. S. Maxwell,

Atty

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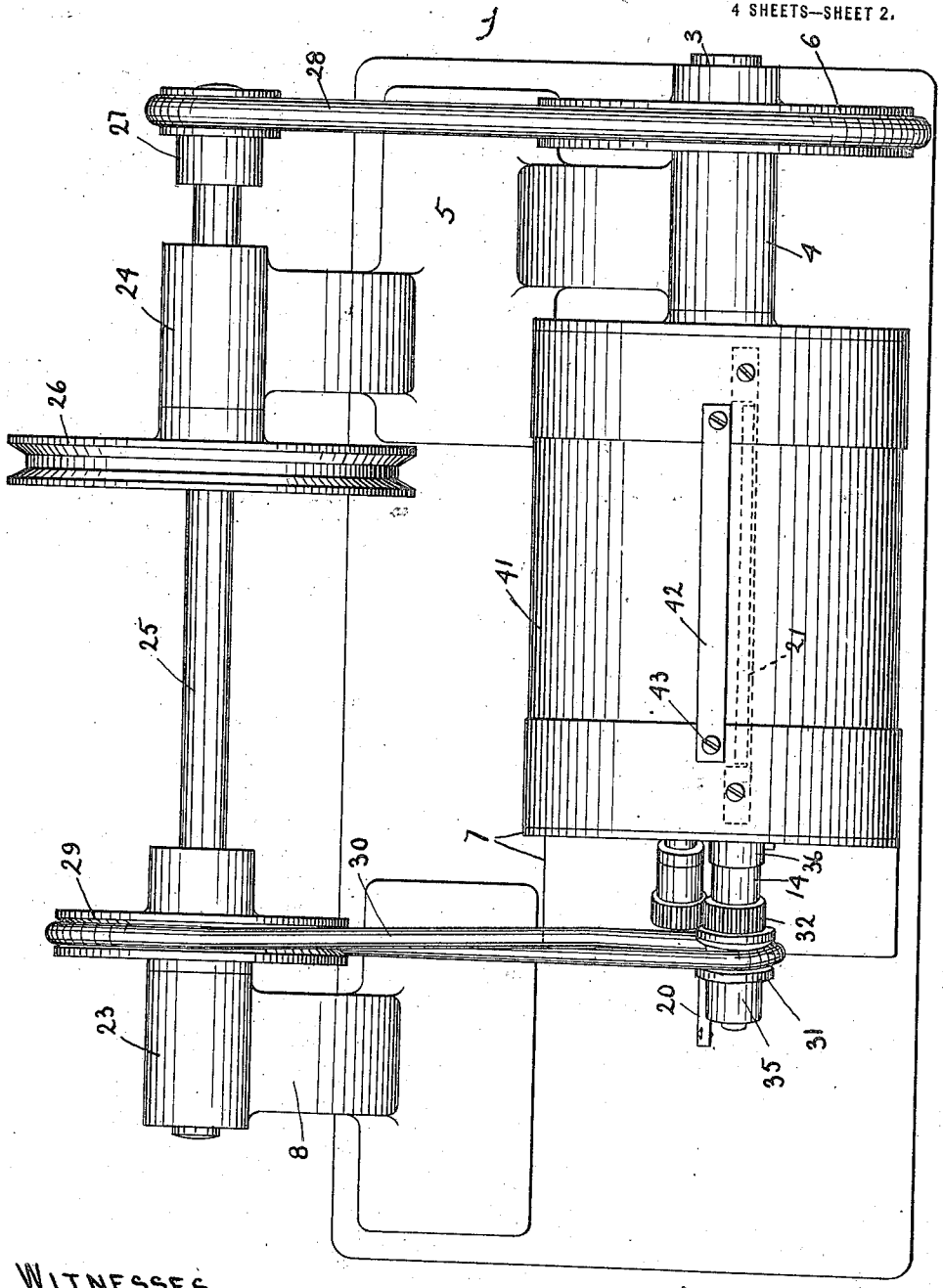


Fig. 2.

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James R. Hodder.

R. J. Hersey

INVENTOR

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by Geo. H. Maxwell,

Att'y

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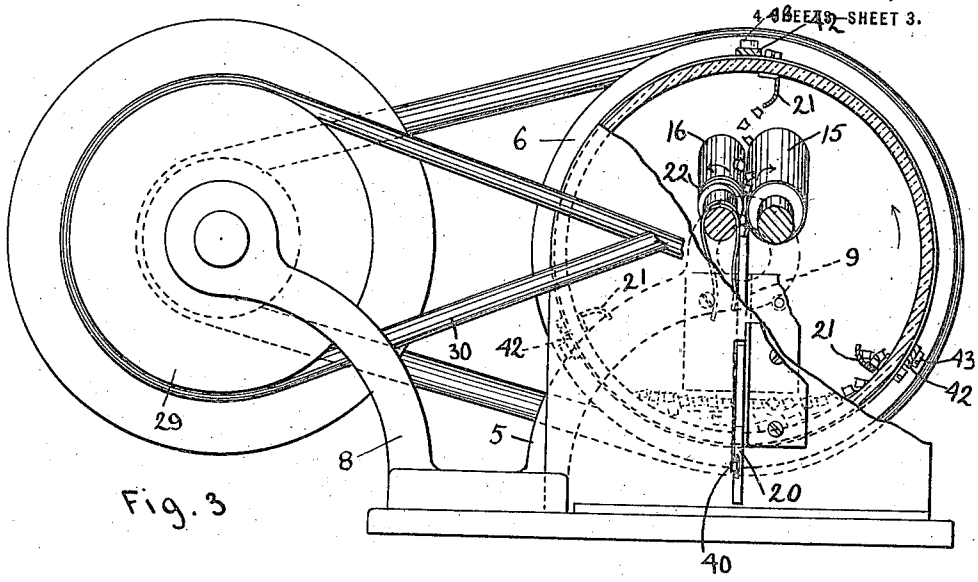


Fig. 3

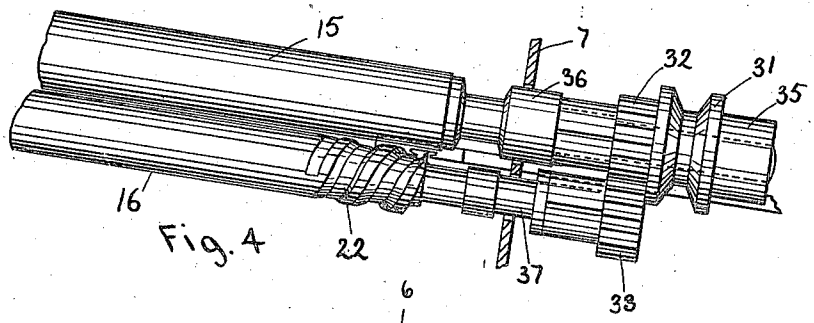


Fig. 4

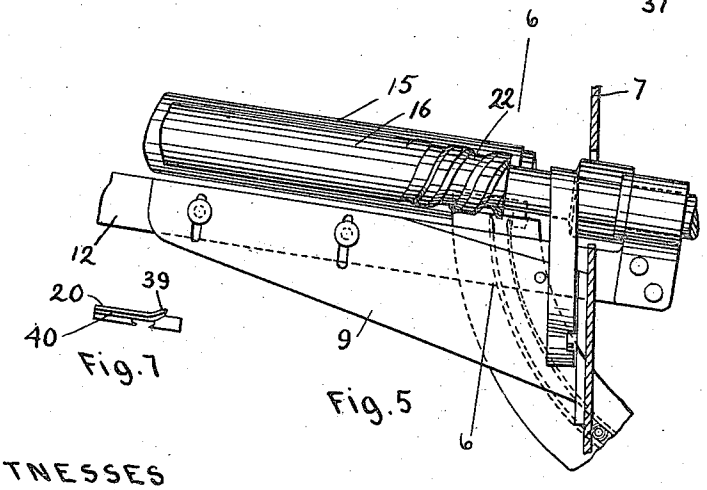


Fig. 5

Fig. 7

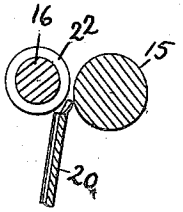


Fig. 6

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R. G. Hersey

INVENTOR

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by Geo. S. Maxwell

Att'y

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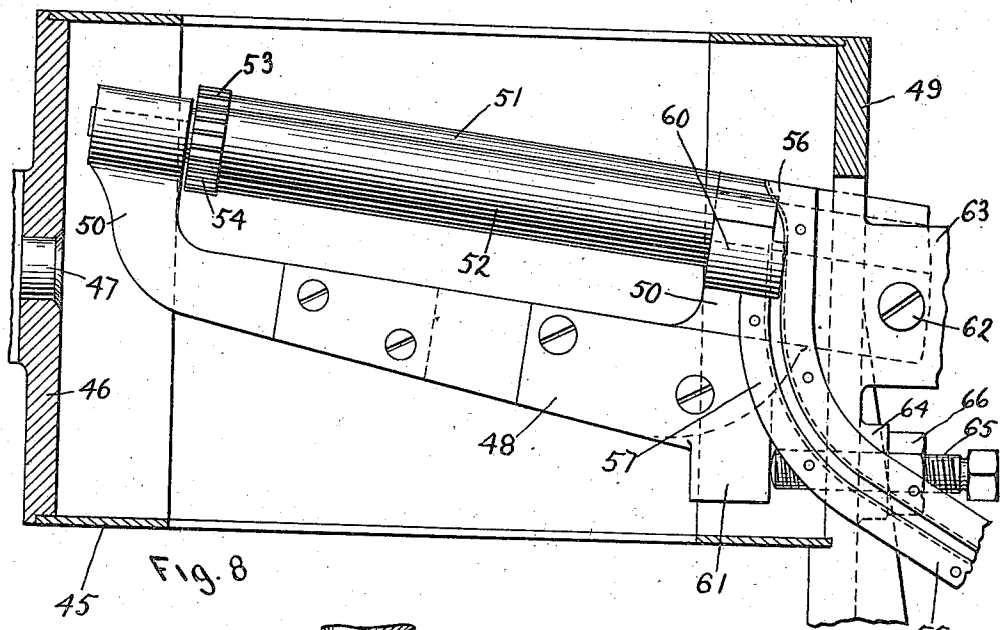


Fig. 8

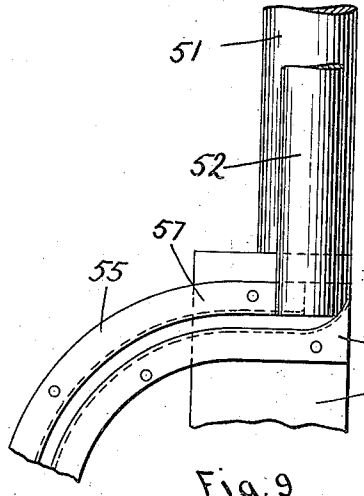


Fig. 9

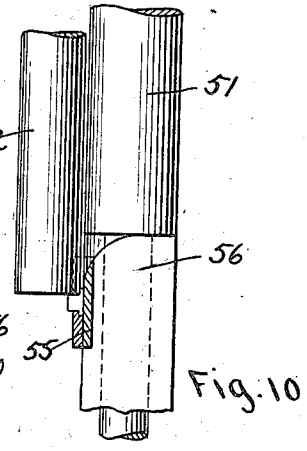


Fig. 10

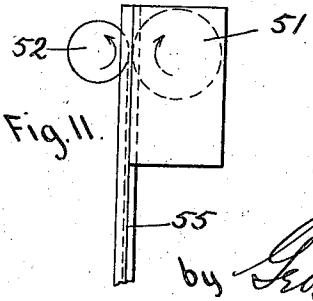


Fig. 11.

WITNESSES

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R. G. Hersey.

INVENTOR

Arthur L. Currier

by Geo. S. Maxwell,

Atty

UNITED STATES PATENT OFFICE.

ARTHUR L. CURRIER, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO THE J. W. MOORE MACHINE COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

MECHANISM FOR FEEDING EYELETS AND THE LIKE.

1,260,518. Specification of Letters Patent. Patented Mar. 26, 1918.

Application filed May 7, 1914. Serial No. 837,058.

To all whom it may concern:

Be it known that I, ARTHUR L. CURRIER, a citizen of the United States, and resident of Newton, county of Middlesex, State of Massachusetts, have invented an Improvement in Mechanisms for Feeding Eyelets and the like, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My present invention is an apparatus for sorting and feeding eyelets from a magazine or hopper to a raceway, and its object is to improve and perfect apparatus of this kind and particularly to provide means which will handle eyelets or the like, with their barrels approximately equal to their length. In prior eyelet feeding devices or hoppers, great difficulty has been experienced in the mechanism to sort the eyelets and feed the same from the hopper, especially where eyelets which were of substantially equal length of barrel to the diameter of flange were to be handled, such eyelets frequently becoming jammed and failing to feed properly from the hopper or in the raceway therefrom. To obviate these difficulties, my present invention comprises means to lift eyelets from the bottom of the hopper, to hold and carry the same upwardly to practically the top of the hopper, and then to drop the eyelets upon a pair of rotating rolls which will act automatically to feed the eyelets toward the outlet of the raceway and to position the same accurately, and also eliminate all danger of such eyelets becoming jammed. In carrying out my invention, I prefer to utilize a rotary hopper or a rotary section in a hopper or magazine, which will pick up the eyelets from the bottom and carry the same during the rotation of the hopper to the topmost part, and there will drop the eyelets upon a pair of adjacent rolls, positioned approximately centrally within the magazine or hopper and for substantially an equal length therewith. These rolls I prefer to rotate, with their upper surfaces moving in opposite directions, so that as eyelets are dropped thereon by the rotating hopper, the tendency will be to throw off the surplus eyelets which will drop back into the bottom of the hopper. This pair of adjacent rolls I also prefer to so position that one roll is above the plane of the other, or of larger diameter so that as the eyelets are dropped thereon, a tendency seems to be automatically given to each one to stick in the interstice between the two rolls with the flange of each eyelet in a substantially vertical position. This results from the eyelets being dropped on to the roll, the flanged portion being slightly heavier will tend to strike first on the higher roll, and then slide downwardly until the barrel of the eyelet strikes the lower roll, being thus automatically positioned with the flange nearly vertical. I also prefer to corrugate or groove the surfaces of these rolls in such a manner that their rotation in opposite directions, as above explained will tend to positively carry or "fleet" the eyelets longitudinally of the rolls to the gateway and raceway at one end of the pair of rolls. I find that a further advantage of having one feeding roll of larger diameter than the other, is that the eyelets which strike upon the smaller feeding roll and are moved toward the larger, as well as those eyelets which strike substantially in proper position upon both rolls, *i. e.* with the flange vertical, acts to hold the flanges of all such eyelets in a practically vertical plane. If both rolls were of the same diameter, the eyelets would lie at an indiscriminate angle in the valley between the two rolls, *i. e.* some at approximately 45° inclining on one roll, and others at a similar angle inclining upon the other roll. Difficulty would then be experienced in delivering such eyelets to a raceway. By my arrangement they are practically in position to be delivered into the raceway itself, being further strengthened and guided by the overhanging or upwardly extending edge of one side of the raceway, as will be explained. In order to further facilitate this longitudinal feeding action, I prefer to have the pair of rolls inclined in the hopper toward the raceway or gateway, and may arrange these rolls to be adjustably inclined for better feeding action with different classes of work.

My present invention is particularly valuable in handling small eyelets, such as those used in gloves and the like, wherein a short barrel and flange are necessary. A

further feature of the invention is that the spiral groove formed in one of the pair of feeding rolls is preferably of the same diameter as the width of barrel of the eyelets being handled so that, as an eyelet falls on the pair of rolls and assumes the proper position for entering the raceway at the end of said rolls, with its barrel engaged in the spiral groove, it is fed in this position continuously until it reaches the gateway to the raceway where it enters the slide or guideway in the raceway and emerges from the hopper.

Other features of the invention, details of construction, and novel combinations of parts, will be hereinafter more fully pointed out and claimed.

Referring to the drawings, illustrating a preferred embodiment of the invention,

Figure 1 is a side view, partly in cross section, of a hopper and the sorting and feeding rolls therein.

Fig. 2 is a plan view;

Fig. 3 is an end view with a portion of the hopper broken away to more fully illustrate the position of the sorting rolls;

Fig. 4 is a plan view of the sorting rolls;

Fig. 5 being a side view of the sorting rolls as shown in Fig. 4;

Fig. 6 is a cross sectional view of the rolls where the raceway receives an eyelet fed from the rolls;

Fig. 7 is a detail of the end portion of the raceway; and

Fig. 8 is a view, partly in cross section, of a modified form illustrating the provision for adjustment of the rolls and raceway, together with a preferred form of gate between the rolls and the raceway underneath said rolls;

Figs. 9 and 10 are views illustrating the gate to the raceway at the end of one roll; and

Fig. 11 is an end view of the rolls and raceway gate.

It will be understood that I may use my improved hopper or magazine and eyelet feeding mechanism in connection with any customary eyelet handling or setting mechanism, such as the eyelet setters used in affixing eyelets in gloves, clothing, or the like, or to shoes and belting, or the like, my invention having to do with the sorting and feeding of the eyelets from a magazine to a raceway. As illustrated in the drawings, a rotatable hopper, comprising the sides 1 and back 2 is mounted on a shaft 3, held in bearings 4 on a standard 5, with a pulley 6 keyed to one end of the shaft 3, so that the hopper may be rotated. The hopper is preferably cylindrical in form, the sides 1 being a continuous circular sheet, fitted rigidly to the end 2, which in turn is secured to the shaft 3, as illustrated in Fig. 1. The opposite end of the hopper is open, but is maintained in a closed position by a plate 7, affixed to a standard 8, and constituting an end to the hopper with suitable openings therethrough for the feed rolls and raceway, as will be explained. Mounted on the inner side of the plate 7 closing the open end of the hopper is a bracket plate 9, having radial slots 10 and 11 formed therein, and being adapted to hold a frame 12, having end plates 13 and 14, respectively, which carry journal bearings for the adjacent feeding and sorting rolls 15 and 16 (see Fig. 1). This frame is preferably held in adjusted position with angular relation to the axis of rotation of the magazine, by a pair of threaded screws 17 and 18 passing through the radial slots 10 and 11, and being tapped into the frame 12, so that loosening of the screws 17 and 18 will permit of a considerable adjustment of the frame 12. To still further facilitate this adjustment, I provide a pivot pin 19 from the rearmost portion of the plate 9 into the frame 12. I find this adjustment is desirable to permit the hopper to handle a wider range of eyelets, some eyelets being more readily sorted and fed at a different angle of inclination for the rolls 15 and 16 than is desirable with others. Also secured to the frame 12 is a raceway 20, which leads up to the lowermost end of the adjacent rolls 15 and 16, and which are of suitable form in cross section to receive and carry eyelets fed thereto, swinging said eyelets by means of the flanges thereof. The eyelet hopper is provided with a plurality of cup shaped shelves 21 and during the rotation of the hopper, which is at any suitable speed, the shelves 21 lift a number of eyelets from the lower portion of the hopper, the hopper being partially filled with loose eyelets, and raise the same until in a nearly vertical position (see Fig. 3) when the eyelets are dropped off and fall upon the rolls 15 and 16. In order to carry these loose eyelets to a position above the rolls 15 and 16, I prefer to make the shelves 21 curved substantially as shown. The eyelets being now dropped on to the rolls 15 and 16 at any point throughout their length, will tend to slide toward the lowermost end of the rolls where the raceway is positioned. To facilitate this sliding, or positive longitudinal feeding action, I prefer to rotate the rolls 15 and 16, and may desire to corrugate both rolls to still further feed the eyelets, but prefer to corrugate at least one roll with a spiral groove, which will positively feed eyelets to the raceway. This spiral is so formed that the roll carrying it, when rotated with its upper surface away from the adjacent roll, will feed eyelets longitudinally thereof and into the raceway 20. Furthermore, I prefer to form this spiral groove 22 of appropriate diameter to receive the barrel of an eyelet, such eyelet

having a flange extending between the adjacent surfaces of the two rolls, and to position the raceway so that it will receive the eyelet so fed at the end of the spiral groove. I have discovered that it is desirable to have one roll either of larger diameter or raised above the other roll, so that the eyelets as they are tumbled upon the two feeding and sorting rolls 15 and 16, will be automatically given a tendency to be thrown upon the lower roll with the flange in a nearly vertical position. This feature is of decided importance, and greatly facilitates the positioning, sorting, and feeding of the eyelets, as the same work downwardly along the feeding rolls and finally into the feeding groove 22, from whence they are conducted through the raceway to any desired position.

In order to rotate the hopper and also the rolls 15 and 16, I provide a pair of journal bearings 23 and 24, which may be conveniently mounted from brackets on the bases 5 and 8, to carry a shaft 25 having a driving pulley 26 thereon, belted to any suitable source of power, and a small driving pulley 27 in position to receive a belt 28 and connect the same with a pulley 6 to revolve the hopper. On another portion of the shaft 25 is a pulley 29, in position to carry a belt 30, led around a pulley 31 on the roll 15. In order to turn the roll 15 with its upper surface in a direction contrary to the line of rotation of the corresponding roll 16, said roll 16 is rotated by the gear 32 on the roll 15 meshing with the gear 33 on the roll 16, see Figs. 2 and 4. Any suitable ratio of speed between the revolution of the hopper and the rotation of the rolls 15 and 16 may be provided; I find that a relative speed of about 10 to 1 is satisfactory for work on glove eyelets, *i. e.* the rolls 15 and 16 are rotated at about ten times the rate of speed as that of the hopper. The end plate 7 is provided with a recess 34 to permit the frame 12, rolls 15 and 16, and raceway 20 to project within the interior of the hopper, which recess is preferably a close fit to prevent eyelets from egress therethrough. In assembling the rolls and gears as above mentioned, I prefer to fix collars 35 and 36 on the roll 15, and 37 on the roll 16, substantially as shown in Fig. 4.

In Fig. 6 I have illustrated in cross section the manner in which the raceway 20 projects into the interstice between the spiral groove 22 on the roll 16 and the adjacent surface of the roll 15, Fig. 7 still further illustrating the form of the end of the raceway 20, which is provided with a finger or prong 39 to facilitate the feeding of the eyelet from the groove 22 into the slot 40 of the raceway 20.

Any suitable form of hopper may be utilized, but I prefer to form a hopper with a glass section 41 in the sides 1, which may be held in position by guards 42 secured by set screws 43 and 44, as illustrated in Fig. 1.

The main features of my machine are also useful in the feeding of fire crackers.

I have illustrated a modified form of the invention in Figs. 8, 9, 10, and 11, wherein a hopper similar to that already described is shown with sides 45, head 46, adapted to rotate on a shaft 47, and with a frame 48 projecting into the hopper through the fixed plate 49 to carry the sorting and feeding rolls. On each end of the frame 48 are brackets 50 carrying suitable bearings for the feeding rolls 51 and 52. The roll 51 is provided with a pulley outside the plate 49 (not shown) to rotate the same, and the inner ends of the rolls 51 and 52 are provided with intermeshing gears 53 and 54, respectively. In the present form of my invention the smaller roll 52 has its eyelet engaging surface of greater length than the larger roll 51, ending adjacent the raceway 55, said raceway being in position with one side 56 overlapping the reduced or shouldered portion of larger roll 51, and with the other side 57 in position to catch the eyelets as the same roll off the end of the shorter roll 52. The side 56, where it overlaps slightly a reduced or shouldered portion of the larger roll 51 is preferably curved to engage the flange of an eyelet reaching the end of the feeding rolls and insure such eyelet entering the raceway correctly. Thus the end of the raceway is itself a gate, no separate passage or gate being necessary to control the escape of the eyelets from the hopper to the raceway. In order to provide a suitable bearing for the roll 52, I form on one of the brackets 50 a cup shaped member 60, to act as a peripheral bearing for the roll 52, and to permit the raceway to come directly at the end of said roll. The raceway 55 is also secured to the frame 48, which frame is made angularly adjustable, as in the former construction. To effect this adjustment, I provide the frame 48 with an extension 61, the frame being pivoted at 62 to a bracket 63 formed on the plate 49, and adjacent the opening in said plate through which the feeding rolls 51 and 52 and the raceway project. Fitted through a bearing 64 in the fixed plate or end 49 and in position to contact with the extension 61, is a threaded screw 65, provided with a lock nut 66. Adjustment of the screw 65 acts to oscillate the frame 48 and consequently to fix the angle of inclination of the feeding and sorting rolls 51 and 52 in any desired position.

The action of the feeding and sorting rolls, by having the upper surfaces rotating oppositely to throw off any surplus eyelets, while still feeding such eyelets carried by it toward the raceway, acts to positively pre-

vent any binding of the eyelets or their flanges while being so fed from the magazine. This feature I believe to be a distinct novelty in such sorting and feeding mechanism, and I wish to claim the same broadly. It will be also understood that while I have illustrated the invention as applied to an eyelet feeding hopper, it is equally valuable for use in handling other devices than eyelets, such as gromets, snap fasteners, etc.

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

1. An apparatus of the kind described, comprising a magazine to contain a quantity of eyelets, means to carry eyelets from the bottom of said magazine upwardly and drop them when in uppermost position, a pair of eyelet sorting and feeding rolls within the magazine in position to catch eyelets when dropped, means to adjust the angle of said rolls, means to rotate said rolls, a raceway coöperating with the lowermost ends of the feeding rolls and adjustable therewith, and means to transfer an eyelet from the lowermost ends of the rolls to the raceway.

2. An apparatus of the kind described, comprising a magazine to contain a quantity of eyelets, means to carry eyelets from the bottom of said magazine upwardly and drop them when in uppermost position, a pair of eyelet sorting and feeding rolls within the magazine in position to catch eyelets when dropped, the eyelet receiving surface of one feeding roll being in a higher plane than that of the adjacent roll, means to rotate said rolls in opposite directions, mechanism to vary the axis of inclination of said rolls, and a raceway coöperating with said rolls at their lowermost ends and adapted to receive an eyelet from said feeding rolls irrespective of the angle of adjustment of said rolls.

3. An apparatus of the kind described, comprising a magazine to contain a quantity of eyelets, means to carry eyelets from the bottom of said magazine upwardly and drop them when in uppermost position, a pair of eyelet sorting and feeding rolls within the magazine in position to catch eyelets when dropped, the eyelet receiving surfaces of said rolls being constructed and arranged to rotate in opposite directions at different peripheral speeds, and means to vary the angle of the surfaces of said rolls to adjust the same to regulate the feeding of eyelets thereby.

4. An apparatus of the kind described, comprising a magazine to contain a quantity of eyelets, means to carry eyelets from the bottom of said magazine upwardly, allowing the same to fall when the carrying means is in uppermost position, and eyelet sorting and feeding mechanism adapted to catch eyelets when thus let fall, comprising a pair of adjacent rolls and a raceway, both adjustably supported within the hopper with relation to the axis of rotation thereof.

5. An apparatus of the kind described, comprising a rotatable magazine to contain a quantity of eyelets, means to carry eyelets from the bottom of said magazine upwardly, allowing the same to fall when the carrying means is in uppermost position, and eyelet sorting and feeding mechanism adapted to catch eyelets when thus let fall, comprising a carrier for a pair of adjacent rolls and a raceway, a pivot for said carrier, and mechanism to adjust both the raceway and the pair of rolls with relation to the axis of rotation of the magazine by swinging said carrier on its pivot.

6. An apparatus of the kind described, comprising a magazine to contain a quantity of flanged eyelets, and means to deliver said eyelets to sorting and feeding mechanism which normally feeds said eyelets with their flanges substantially in a vertical plane, said mechanism comprising a plurality of oppositely moving surfaces, one surface moving at a greater speed than the other.

7. An apparatus of the kind described, having a pair of feeding rolls, a raceway to coöperate with said rolls to receive and conduct an article from said rolls, and a guide constituting a continuation of one wall of said raceway overlapping one of the feeding rolls constructed and arranged to engage and guide an article from the rolls into the raceway.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ARTHUR L. CURRIER.

Witnesses:
JAMES R. HODDER,
R. G. HERSEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."