To all whom it may concern:

Be it known that I, Walter L. Curtis, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Eye-Feeding Device, of which the following is a specification.

This invention relates to a mechanism for feeding certain articles, particularly articles which are made in substantially flat form and which have a recess or opening in the side so that they can be received on a roll or guide and fed thereby; such for example as eyes for use in connection with lacing hooks.

The principal objects of the invention are to provide a construction in which the eyes or other articles can be placed in the hopper in bulk without special reference to the way in which they are placed therein or the quantity, and which will operate to discharge the articles in a predetermined position so as to be received by a series of guides without necessitating operation at a high rate of speed so that there will be little likelihood of injuring the articles; also to provide a simple and inexpensive construction for releasing the articles from the hopper when the latter reaches a position for discharging them; and improved means whereby the eyes are discharged in such a position that they cannot be received by the guides, they will be released automatically before the next operation and taken back into the hopper instead of being thrown aside; also to provide certain improvements in the manner of operating the hopper for this purpose and in the guides for receiving the eyes from the hopper; to provide a simple and automatic means whereby the articles are collected in great numbers on continuous guides, the surplus will be automatically discharged therefrom so as not to clog up the machine.

Another object of the invention is to provide details of construction which will appear hereinafter.

Reference is to be had to the accompanying drawings in which:

Figure 1 is a side elevation of a practicable embodiment of the invention. Fig. 2 is a transverse sectional view of the same, and Fig. 3 is an end view on a reduced scale showing additional features of the invention.

The invention is illustrated as embodying a frame 10 on which is located a power shaft 11 provided with a driving pulley 12. On this shaft is an eccentric 13, the eccentric rod 14 of which is connected with an arm 15 fixed to a shaft 16 by means of a bolt 17 or other construction allowing of adjustment. The eccentric then oscillates the shaft. On the shaft 16 is fixed a hopper 18 for receiving the eyes or other articles in bulk. This hopper is provided with end walls 19 and 19d shown as open at the top so that the articles can be shoveled into it in an indiscriminate manner. On the end of the shaft 16 is shown a hand-wheel 21 by which the shaft can be operated independently of the power, if the connections between it and the eccentric are removed or the bolt or screw 17 loosened so that the device can be manipulated in any desired way.

The bottom 25 of the hopper is formed in a separate piece from the remainder of the hopper and is movable with respect thereto. In the form illustrated this is shown as pivoted on the walls of the hopper by means of pivots 26 so that it is capable of swinging. The top surface of this bottom may be flat if desired but it is shown as slightly inclined from the center toward its ends.

Below the opposite end walls of the hopper are two or more passages 27, the height of which is controlled by the position of the bottom. These passages are shown as formed by spaces between integral projections 270 extending up under the walls of the hopper from the edges of the bottom. They are designed and proportioned for the discharge of the articles to be fed by the hopper and the device preferably is so constructed that as the hopper tilts into one extreme position, as shown in Fig. 2, to discharge eyes through one of the passages or sets of passages 27, the bottom will be moved toward the lowermost wall so that these passages will be smallest when in that position. As that part of the hopper swings upwardly, the bottom is intended to turn on its pivot so that the passages on that side will gradually increase in size so that any articles that are wedged into them will be released and slide back into the hopper as they can from the left-hand passages 27 in the position shown in Fig. 2. For this purpose the lower side of the bottom 25 is shown as provided with a projection 28 having a slot therein into which projects a 110
spring 20. The bottom of this spring is shown as held in fixed position on the frame and it obviously acts automatically to decrease the opening through the lower passage or passages 27 as the hopper swings and simultaneously increase the distance between the top of the upper passages 27 and the bottom to release articles held therein.

In connection with the hopper a series of guides preferably are used, shown in the present instance as comprising guides or sets of guides 30 and 31, one set of guides being adapted to receive articles from each set of passages 27. These guides extend upwardly to a position at about the level of the shaft 16 and extend down below the bottom of the hopper. The guide 31 terminates at a point a little above the guide 30 so as to permit articles to be fed down the latter and yet permit them to be discharged from the guide 31 on the guide 30.

For the purpose of keeping the articles in position, a guard 32 is employed at the junction between each two guides serving to keep the articles from rebounding when they drop from the guide 31 onto the guide 30. This guard is shown as held by a cross-bar on the frame. The guide 30 is shown as having a movable section 33 pivoted at its upper end near the lower end of the stationary part of the guide 30 on a cross bar so that the lower end of the movable section is adapted to swing into the dotted line position in Fig. 2. A spring 34 is employed to normally hold this section up in alignment with the guide 30 and with the lower inclined guide 33. This spring is adjusted by a screw 36 for obvious purposes. The inclined guide 33 extends down and feeds the articles to any desired mechanism or may be provided with a movable stop 37 on the bottom. In either case it will be obvious that some time the eyes or articles might not feed away from the guide as fast as desired and that the guide 35 might get full of them so that they would pile up on the movable section 33. The spring 34 is designed and adjusted so as to have sufficient resistance to hold a small number of articles upon the section 33 but so that when they pile up thereon their weight will overcome the resistance of the spring 34 and cause this section to move down into dotted line position against an adjustable stop 39 supported by a cross-bar on the frame. This discharges the surplus articles from the guide and the spring immediately returns the section 33 to position so that a continuous guide is provided and yet when the inclined guide gets too full the surplus articles will automatically be discharged.

Although most of this description is made with reference to a single guide 30 and 31, it is to be understood that a plurality of them preferably are employed as shown in Fig. 1. While I have illustrated and described a preferred embodiment of the invention, I am aware that many modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to all the details of construction shown, but

What I do claim and desire to secure by Letters Patent of the United States is,—

1. In a machine of the character described, the combination of a hopper adapted to receive articles, said hopper having an end wall and a passage under it through which the articles can be discharged, means for moving said hopper so as to lower said passage, and means for decreasing the size of said passage during the last part of such motion of the hopper.

2. As an article of manufacture, a hopper movable bodily to and from a certain position and having a wall and a passage below said wall through which articles are discharged as the hopper approaches said position, and having means for reducing the size of said passage during the last part of the motion of the hopper as it moves to said position.

3. As an article of manufacture, a hopper adapted to receive articles in bulk and provided with openings oppositely disposed through which said articles can be discharged, and having means for alternately decreasing said openings in size just before the articles are discharged therefrom.

4. In a machine of the character described, the combination of a hopper adapted to receive articles in bulk and having oppositely disposed discharge openings, means whereby each of said openings is alternately moved to the lowermost position, and means whereby each opening is decreased in size as it approaches the lowermost position.

5. In a machine of the character described, the combination of a hopper having a bottom and provided with openings at opposite edges of said bottom, means for tilting said hopper into two positions in each of which the bottom will be inclined downwardly toward one of said openings, and means for simultaneously moving said bottom with respect to the rest of the hopper so as to reduce the size of the latter opening.

6. In a device of the character described, the combination of an oscillatory hopper having means whereby articles may be discharged therefrom, the bottom thereof being moveable with the hopper and also oscillatable relatively to the hopper on an axis parallel with the axis on which the hopper oscillates.

7. In a device of the character described, the combination of an oscillatory hopper 130
having means whereby articles may be discharged therefrom, a bottom therefor movable with the hopper and also movable relatively to the hopper, means for moving the hopper so as to bring the bottom into inclined position, and means constructed and adapted to be set into operation by the motion of the hopper for shifting the position of the bottom.

8. In a device of the character described, the combination of an oscillatory hopper having means whereby articles may be discharged therefrom, a bottom therefor movable with the hopper and also movable as a whole relatively to the hopper, means for moving the hopper to bring the bottom into an inclined position, and means for simultaneously shifting the bottom relatively to the hopper.

9. In a device of the character described, the combination of a hopper for receiving articles in bulk, a bottom therefor having a space between its opposite edges and the wall of the hopper through which the articles can be discharged, said bottom being pivotally mounted on the hopper, and means for swinging said bottom on its pivot to increase the height of one space and decrease that of the other.

10. In a device of the character described, the combination of a hopper, means for oscillating said hopper on an axis, a bottom movably mounted on the hopper and extending from one end to the other, said hopper being provided with a wall and with a space between the wall and bottom, and means for automatically moving said bottom to change the height of said space when the hopper is oscillated.

11. In a device of the character described, the combination of a hopper, means for oscillating said hopper on an axis, a bottom movably mounted on the hopper, said hopper being provided with a wall and with a space between the wall and bottom, and a spring, having one end fixed and the other end engaging said bottom, for automatically moving said bottom to change the height of said space when the hopper is oscillated.

12. A hopper for the purpose described having walls and a movable bottom therefor provided with integral projections on its edges under the walls of the hopper and spaced apart to form discharge openings.

13. In a device of the character described, the combination of a shaft, a hopper for receiving articles in bulk fixed thereon, means for oscillating said shaft, said hopper having means for discharging articles from its opposite sides, a pair of guides in position for receiving articles directly from the opposite sides of the hopper while being discharged, each of said guides extending upwardly from a point below the hopper to a point above the bottom of the hopper, whereby articles discharged from the hopper in position for being received by the guides will be conducted away from the hopper and articles projecting into contact with the guides and not in position to be received thereby will move back into the hopper as it oscillates.

14. In a machine of the character described, the combination of a hopper adapted to discharge articles from opposite sides thereof, guides extending downwardly from a position adjacent to the opposite sides of the hopper, one of said guides terminating in a position just above the other, and a guard located above the point of junction of said guides.

15. In a device of the character described, the combination of an inclined guide for feeding eyes and similar articles having a movable section therein, a spring for normally holding said section in alinement with the rest of the guide and adapted to yield when said section is weighted with articles to permit the section to drop back and allow the articles to be discharged therefrom.

16. In a device of the character described, the combination of an inclined guide for feeding articles by gravity, a section pivotally mounted at the bottom thereof and extending below the guide in line therewith, a spring for holding said section in alinement with the guide, means for adjusting the spring, and an adjustable stop for receiving the bottom of the guide when moved in opposition to the spring.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

WALTER L. CURTIS.

Witnesses:

ALBERT E. FAY,

C. FORREST WESSON.