Aug. 24, 1926. 1,597,540

L. E. PARKER

SLIDE FEEDER FOR MATCH MACHINES

Filed May 29, 1924 3 Sheets-Sheet 1

Fig. 1.

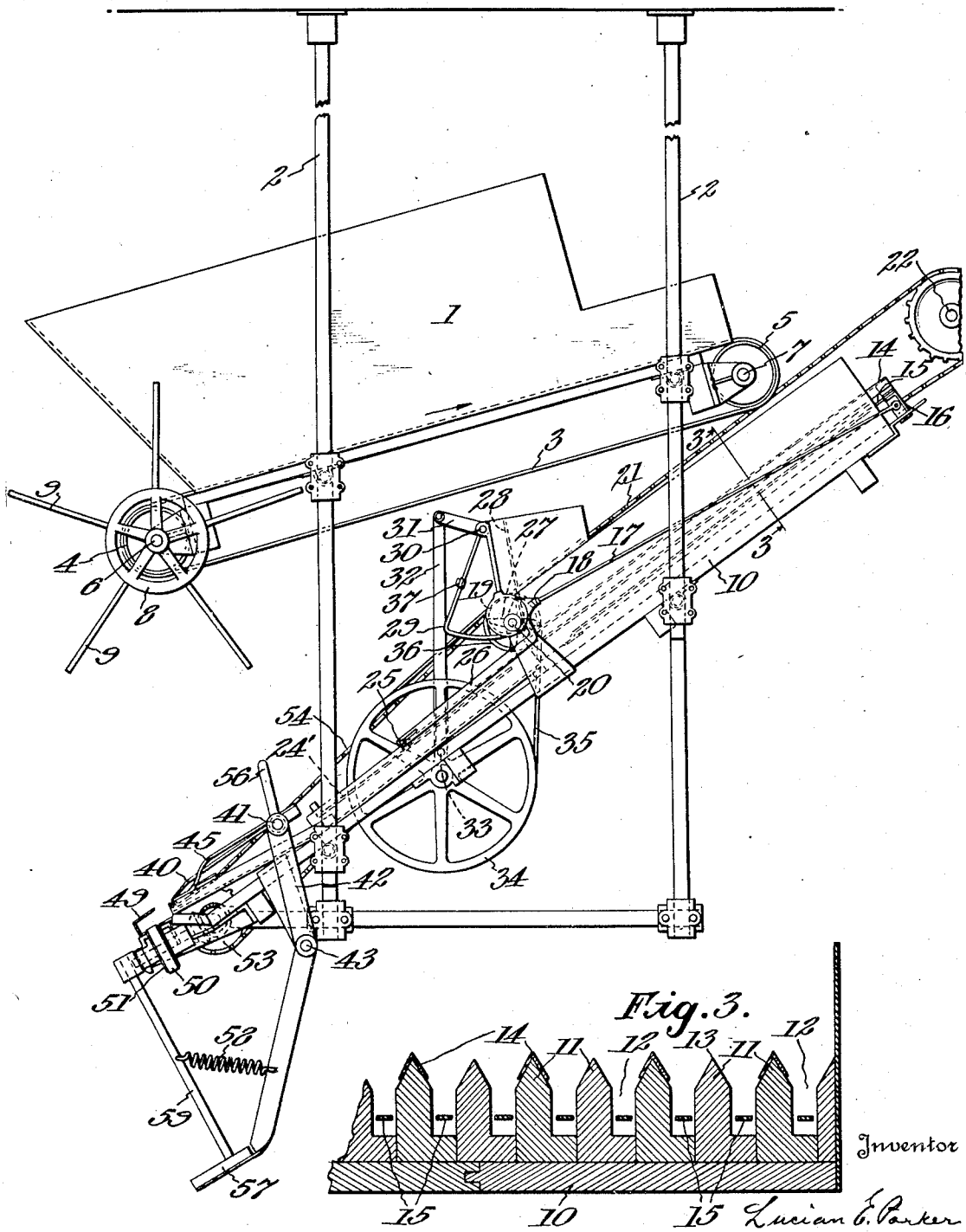


Fig. 3.

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Aug. 24, 1926.

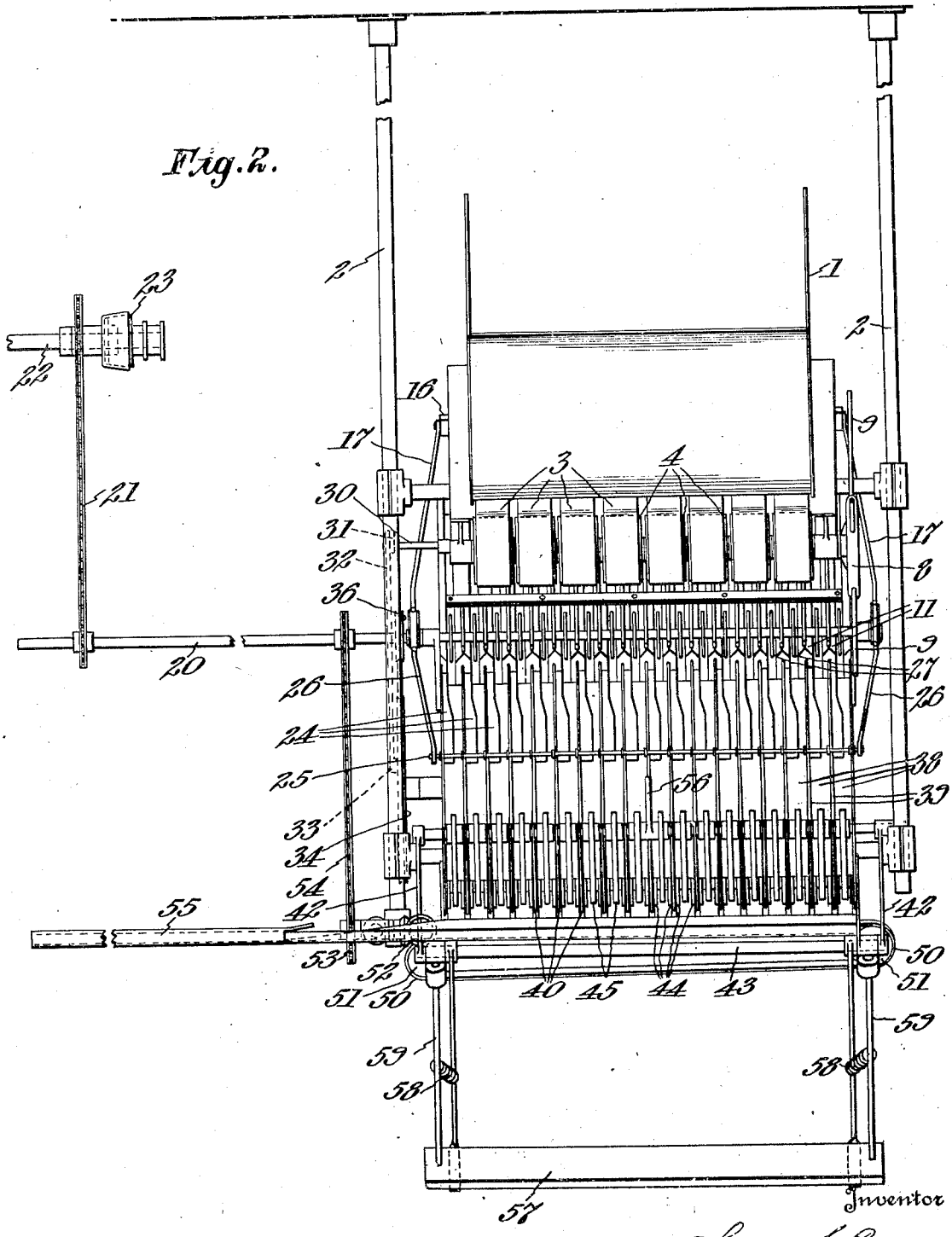
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SLIDE FEEDER FOR MATCH MACHINES

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Fig. 2.



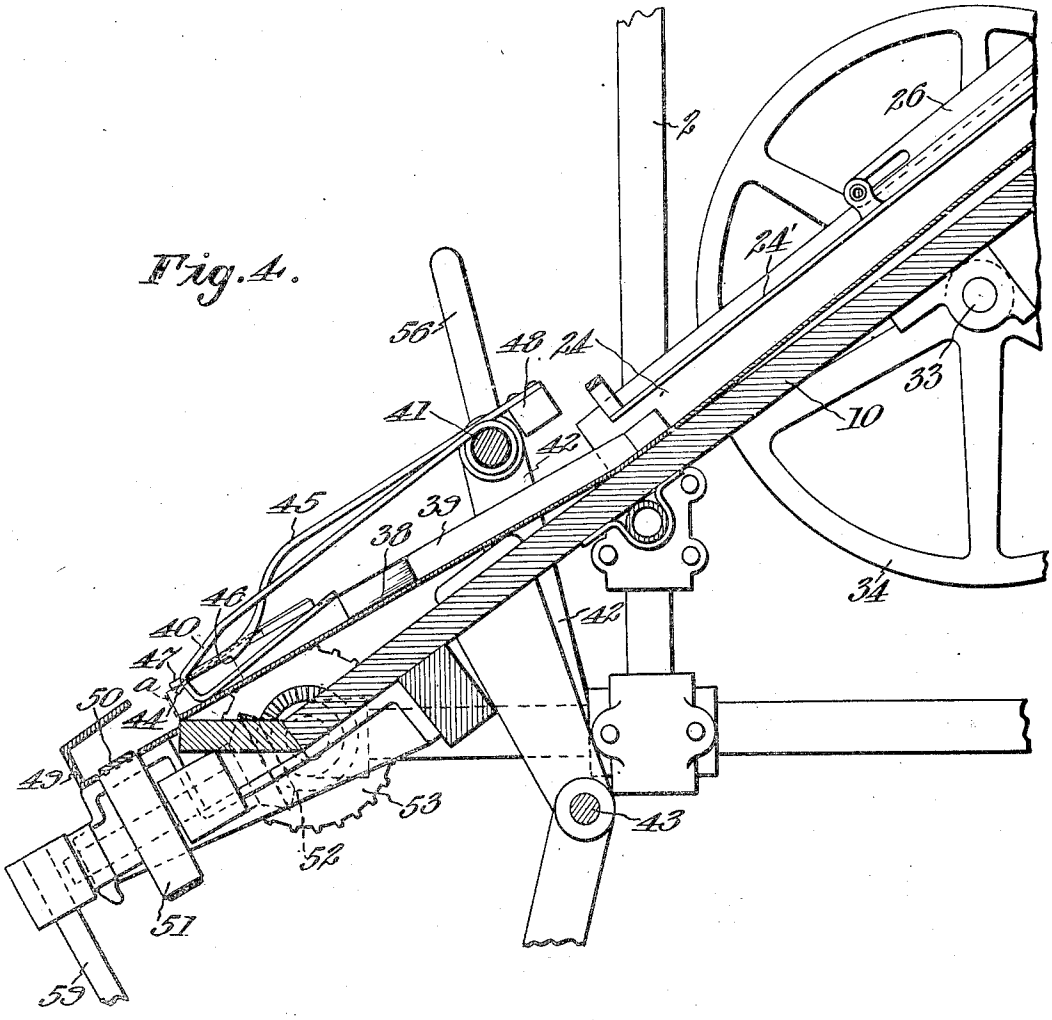
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SLIDE FEEDER FOR MATCH MACHINES

Filed May 29, 1924 3 Sheets-Sheet 3

Fig. 4.



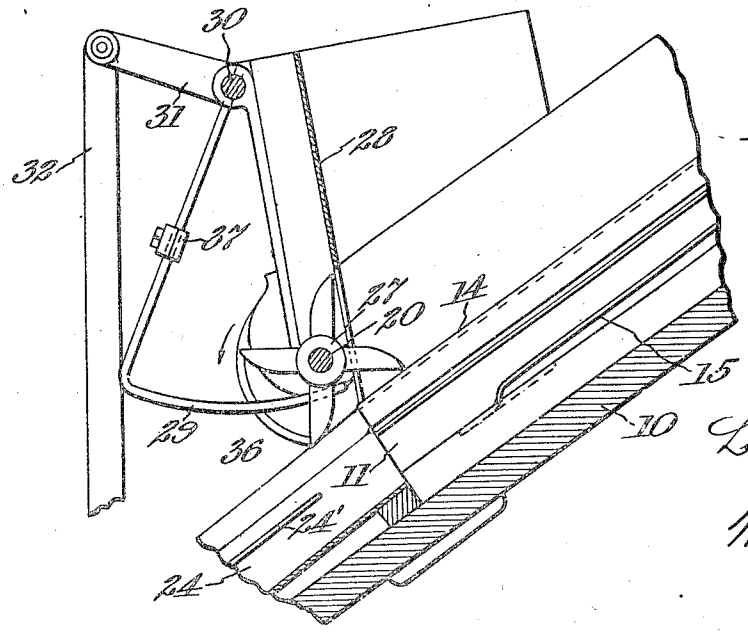


Fig. 5.

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UNITED STATES PATENT OFFICE.

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SLIDE FEEDER FOR MATCH MACHINES.

Application filed May 29, 1924. Serial No. 716,675.

In the boxing of matches, especially where automatic machinery is used for the purpose, it is desirable to provide a continuous feed of the boxes and their complemental slides to the boxing machine in order that its operation may be continuous and may not be interrupted owing to a cessation of the supply of the complemental parts of the boxes.

Obviously, where the box parts, namely the boxes and slides, are supplied in bulk, they are in haphazard arrangement, and some means must be provided for arranging them in systematic, uniform order before they are fed to the boxing machine, so that their hand manipulation may be in great part dispensed with.

The device of this invention is adapted particularly for the handling of the match box slides, for the purpose of arranging them in the desired uniform order for their subsequent introduction into the boxing machine.

The invention consists broadly in a hopper adapted to receive a quantity of slides in a haphazard mass and provided with means whereby they may be discharged therefrom at will onto an inclined feeder trough having a plurality of separated paths arranged to receive the slides upon their sides or ends, and incapable of receiving them in any other position, means being associated with the trough for agitating the slides fed thereto from the hopper and for causing them to to be deposited in proper position in the paths, means for causing slides deposited in the paths upon their ends to be turned therein upon their sides, means for agitating the slides as and after they are deposited in the paths for causing them to move in a predetermined direction therein, means for changing the position of said slides during their travel in said paths whereby they will continue their travel upon their tops or bottoms rather than upon their sides, means associated with the discharge end of each of said paths for arresting the travel of the slides therein in uniform alignment, and means for simultaneously advancing a row of slides comprising one slide from each of said paths, whereby a plurality of slides is discharge from said feeder trough in predetermined uniform arrangement, as desired; and the invention consists, further, in various details of construction and arrangement of parts, as I will proceed now to explain and finally claim.

In the accompanying drawings illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is a side elevation of the device of my invention. Fig. 2 is a front elevation thereof. Fig. 3 is an enlarged fragmentary transverse section taken in the plane of line 3—3, Fig. 1. Fig. 4 is an enlarged fragmentary longitudinal section of the discharge end of the feeder trough and associated mechanism. Fig. 5 is an enlarged fragmentary longitudinal section of the mechanism for agitating the slides as they are fed to the trough and for turning those resting in the paths upon their ends to a position therein upon their sides.

A hopper 1 having a front and sides, but open at the rear and at its top and bottom is suitably mounted upon an ordinary pipe framework 2. This hopper is provided with a bottom comprising a plurality of belts 3 traveling upon similar rollers 4 and 5 mounted upon shafts 6 and 7 carried adjacent to the front and rear ends of the hopper respectively. The shaft 6 is provided with a hand wheel 8 carrying a plurality of spoke extensions or hand grips 9 by which it and the shaft 6 may be turned by an operator for the purpose of causing the belts 3 to travel simultaneously in the direction of the arrow, Fig. 1, to cause a number of the slides resting upon the belts to be discharged from the rear end of the hopper.

Below this hopper and carried preferably upon the same framework 2 at an incline sufficient to cause slides dropping therein from the hopper to slide down it by gravity, is a feeder trough 10 provided with a plurality of partition members 11 (see particularly Fig. 3) so relatively arranged as to provide between their adjacent faces, paths 12 of a width capable of receiving slides upon their sides or ends, but incapable of receiving them upon their tops or bottoms or in other undesirable positions. These partition members 11 are bevelled to form sharp extremities upon their upper edges 13 for the purpose of causing slides falling upon them to tilt by gravity either to one side or the other so as to fall into the paths 12 between them, and alternate partition

members are provided upon these bevelled edges with longitudinally extending cap pieces 14 arranged for reciprocation longitudinally thereof and thereby adapted to agitate the slides resting thereon. Each path is provided with a longitudinally reciprocating bottom member 15 adapted to aid gravity in the feeding of the slides down the paths. The cap pieces 14 and the bottom members 15 are connected for simultaneous reciprocation by means of a transverse frame member 16 connected by links 17 with the straps 18 of eccentrics 19. These eccentrics are carried upon opposite ends of a transverse shaft 20 driven through a sprocket and chain gearing 21 from a shaft 22 adapted to be connected by a clutch 23 (Fig. 2) with any appropriate source of power, such as one of the rotating shafts (not shown) of the match machine.

As will be seen, particularly by reference to Figs. 1 and 2, the partition members 11 terminates at a point substantially in line with the shaft 20 and the paths 12 are continued therefrom by means of arcuate guides 24 which serve to turn the slides from their positions resting upon their sides to positions resting upon their tops or bottoms. This turning is accomplished by gravity as the slides travel down the paths, and a plurality of reciprocating members 24′ is provided for aiding the slides in turning to the desired position. These members 24′ are supported by a bar 25 carried in links 26 connected with the straps 18 of the eccentrics 19 and reciprocated thereby.

In order that slides which enter the paths upon their ends may be turned upon their sides, I provide the shaft 20 with a plurality of finned members 27, one for each path, which rotate in the direction of the arrow, Fig. 5, and the fins of which come in contact with the boxes to turn them over upon their sides.

As will be seen by reference particularly to Figs. 1 and 5, a barrier 28 extends across the trough at a point adjacent to the ends of the partition members 11. This barrier is for the purpose of stopping all slides which may feed down the trough upon the tops of the partition members without falling between them into the paths 12. In order to so agitate these slides that they may be thrown back and be again presented to such action as will cause them to enter the paths, I provide a plurality of reciprocating fingers 29, one above each partition member, carried upon a shaft 30 mounted in suitable bearings upon the partition member 28 and reciprocated by means of a lever 31 connected by a link 32 with a crank 33 carried by a pulley 34. This pulley is driven by a belt 35 from a pulley 36 on the shaft 20. The fingers 29 are made adjustable at 37 so that they may be raised and lowered with respect to their pivots to provide for proper clearance in relation to the partition members.

As the slides leave the guides 24, they travel upon members 38 which provide continuations of the paths and convey the slides to the point of discharge from the paths. These members 38 are provided with sides 39 which keep the slides separated so as to cause them to move in their paths, and these sides terminate adjacent to the discharge ends of the members 38 and are suplemented by means of movable spacer members 40 carried by a transverse rod 41 mounted in arms 42 pivoted upon a bar 43. When the slides reach the position in the paths indicated by the dotted lines at *a*, Fig. 4, their movement is arrested by means of light spring fingers 44, but in reaching this position, they pass beneath pushers 45 which are, like the link members 40, carried by the bar 41, and are movable therewith. These pushers 45 are provided with offset shoulders 46 and hold-down portions 47 for engagement with the slides, and are counterbalanced by weights 48 so as to be easily raised by the slides to permit the slides to pass under them by gravity and assume the position *a*, above mentioned.

Communicating with the discharge ends of all of the paths as defined by the ends of the members 38 is a trough 49, and, if desired, this trough may be provided with a feed belt 50 arranged on suitable pulleys 51 at its ends and constantly driven by bevel gearing 52 and chain and sprocket gearing 53, 54 from the shaft 20. The trough 49 is continued by means of a chute 55 into which the slides are fed from the trough and by which they are conveyed to the boxing machine.

The bar 41 and with it the link members 40 and pushers 45 may be actuated by means of a handle 56, or by means of a treadle 57 held in normal retracted position by springs 58 and its movement limited by any suitable stops 59.

The operation of the device is as follows: Slides are deposited in a mass in the hopper 1, and are fed therefrom into the feeder trough 10 by turning the shaft 6 by means of the hand wheel 8 or its grips 9 so that the belts 3 travel in the direction of the arrow. As the slides drop upon the partition members 11, and upon the reciprocating cap pieces 14, they will be agitated, and, owing to the beveled edges of the partition members and cap pieces will be caused to fall therefrom and into the paths 12, wherein they will rest upon the bottom members 15. As hereinbefore pointed out, the paths 12 are of such dimensions that the slides can only fall into same in such position they rest either upon their sides or upon their ends, and any slides which cannot so enter the paths will be carried down the trough upon the tops of the partition members until they

come in contact with the abutment 28. When the slides reach this position against the abutment 28, they will be acted upon by the fingers 29 and will be thereby kicked back up the trough and be given a further opportunity to enter the paths 12. Obviously this operation will be repeated as long as there are any slides which have not properly entered the paths.

Those slides which have entered the paths upon their ends will, as they descend the paths along with the slides properly positioned therein upon their sides, under the influence of the longitudinal reciprocation of the bottom members 15, and due to the action of gravity, will come in contact with the rotating finned members 27, the fins of which will turn them onto their sides. It will thus be seen that no slides may emerge from the portions of the paths determined by the partition members 11 unless they are properly positioned therein resting upon their sides. Passing from the portion of the paths determined by the partition members 11, the slides will come in contact with arcuate guide members 24 and will, due to the curvature of these members, be turned to a position wherein they are resting either upon their tops or bottoms, and will continue their movement down the trough in this position.

When the slides leave the arcuate guides, they run upon the members 38 and slide down same, passing under the pushers 45 until they are stopped by frictional engagement with them of the spring fingers 44. This position is indicated, as above pointed out, by the dotted lines at *a*.

Obviously it is possible that there may be some paths which will receive no slides, but this is immaterial. Each of the paths which does receive slides will have a slide in it which has assumed the position indicated at *a*, and if there are other slides in the path behind the thus positioned slide, they will be held back by it, and by the pusher 45.

In order to discharge a series of slides from the position *a* into the trough 49, it is only necessary for the operator to pull upon the lever 56 by hand, or to press upon the treadle 57 with her foot. Either one of these actions will cause the arms 42 to swing about their pivot 43 and carry forward the spacer members 40 and the pushers 45. The pushers 45 in moving forward will advance a series of slides into the trough 49, and the spacer members 40, being advanced with the slides, will keep them properly alined in the trough. Now, upon retraction of the pushers and link members by the springs 58, upon release of the handle 56 or treadle 57, the belt 50 will be free to carry the series of slides deposited upon it in the trough 49 along the trough and into the chute 55 by which they are conveyed to the boxing machine.

Obviously, if desired, the belt 50 may be dispensed with, and the slides may be pushed along the trough by the operator placing her finger behind the one nearest the right hand side of the machine and by means of it pushing the whole series along the trough and into the chute 55. As will be apparent, when a series of slides is being discharged into the trough, those in the paths behind the series discharged will slide into and assume the position *a* just vacated, and upon retraction of the pushers and spacer members 45 and 40 respectively, these members will again take their proper positions with respect to this new series of slides.

Of course, as the quantity of slides in the feeder trough becomes depleted as series of slides are fed from it into the trough 49, an additional supply may be introduced into the feeder trough by repetition of the manipulation of the hand wheel 8 to discharge more slides from the hopper.

By this arrangement I am enabled to continuously feed slides in uniform predetermined arrangement for introduction into the boxing machine, without hand manipulation other than that necessary to supply the hopper 1, the slides in their passage down the feeder trough automatically assuming the position in which it is desired to have them when discharged into the trough 49.

My feeder operates efficiently with slides of either the type where the tops and bottoms are the same or where an additional label is pasted upon the top. In the first case, it is immaterial whether the top or the bottom is uppermost, but in the latter case, it is essential that the tops should be uniformly arranged. Inasmuch as I depend primarily upon the action of gravity for turning the slides from positions upon their sides, to positions upon their tops or bottoms by means of the arcuate guide members 24, it will be seen that, due to the added weight of the top of the slide incident to the extra label pasted thereon, the top will gravitate to the bottom of the path and the bottom of the slide will be uppermost.

My device makes possible the uniform arranging of slides with much greater facility and rapidity than they can be arranged by hand, thereby making possible the automatic supplying of slides to a boxing machine without interruption, and consequently without intermittent stopping of the boxing machine to replenish the supply of slides therefor.

I have shown and described a particular embodiment of my invention, but it is obvious that various changes may be made therein, and I therefore wish it understood

that I do not consider my invention as thereby limited, except as hereinafter pointed out in the claims.

What I claim is:—

1. In a slide feeder for match machines, a feeder trough adapted to receive a plurality of slides in haphazard arrangement, partition members defining a plurality of paths in said trough, means mounted upon said partition members and reciprocable thereon for causing said slides to assume a predetermined arrangement in said paths, and means for simultaneously discharging a plurality of said slides from said trough in uniform alignment.

2. In a slide feeder for match machines, a feeder trough adapted to receive a mass of slides in haphazard arrangement, partition members defining a plurality of paths in said trough, means carried by said members and reciprocable thereon for agitating said slides and thus causing them to fall into said paths in predetermined arrangement, means for causing feeding of the thus arranged slides toward the discharge ends of said paths, and means for simultaneously discharging a plurality of said slides from said paths in uniform arrangement and alignment.

3. In a slide feeder for match machines, an inclined feeder trough adapted to receive a mass of slides in haphazard arrangement, partition members defining a plurality of slide-receiving paths in said trough, means carried by said members and reciprocable thereon for agitating said slides and causing them to fall into said paths in predetermined position, means arranged in the bottoms of said paths for thereafter agitating said slides to aid gravity in feeding them toward the discharge ends of the paths, and means for simultaneously discharging a plurality of said slides comprising one from each of said paths in uniform alignment.

4. In a slide feeder for match machines, an inclined feeder trough adapted to receive a plurality of slides in haphazard arrangement, partition members defining a plurality of slide-receiving paths in said trough, means carried by said members and reciprocable longitudinally thereof for agitating said slides and causing them to fall into said paths upon their sides or ends, means for turning the slides resting upon their ends to positions resting upon their sides, means reciprocable in said paths for aiding gravity in the feeding of the slides down the paths, and means adjacent to the discharge ends of said paths for simultaneously discharging a series of slides from said paths in uniform arrangement.

5. In a slide feeder for match machines, an inclined feeder trough adapted to receive a plurality of slides in haphazard arrangement, means defining a plurality of paths capable of receiving slides upon their sides or ends but not otherwise, means for agitating said slides to cause them to fall into said paths, means for causing all slides in said paths to assume positions therein upon their sides, means for causing the thus arranged slides to be turned from positions upon their sides to positions upon their tops or bottoms, and means adjacent to the discharge ends of said paths for simultaneously discharging a series of slides comprising one slide for each slide-holding path in predetermined uniform arrangement.

6. In a slide feeder for match machines, an inclined feeder trough adapted to receive a plurality of slides in haphazard arrangement, partition members defining a plurality of slide receiving paths, reciprocable means carried by said members for agitating said slides and causing them to fall into said paths in predetermined position, means for arresting movement of slides which do not enter said paths and for returning same to a point in said trough from which they may be reintroduced into said paths, means for causing said slides to travel down said paths to their discharge ends, means adjacent to said discharge ends for arresting such tavel, and means for discharging said slides from said paths in uniform predetermined arrangement.

7. In a slide feeder for match machines, a feeder trough adapted to receive a plurality of slides in haphazard arrangement, a plurality of partition members arranged longitudinally of said trough and forming paths for the reception of said slides in predetermined position, cap pieces carried by said members and reciprocable longitudinally thereof to agitate said slides and cause them to fall into said paths, bottom members arranged in said paths and longitudinally reciprocable therein to aid in the feeding of slides resting on them, means for imparting reciprocation to said cap pieces and bottom members, means for arresting the movement of said slides at the discharge ends of said paths in uniform alignment, and means for simultaneously discharging a plurality of slides comprising one from each path in uniform arrangement.

8. In a slide feeder for match machines, an inclined feeder trough adapted to receive a plurality of slides in haphazard arrangement, a plurality of path-forming partition members arranged longitudinally of said trough and so spaced as to permit slides to fall therebetween only upon their sides or ends, means for aiding gravity in causing the travel of said slides down said paths, means for causing all the slides resting on their ends to be turned upon their sides, an arcuate guide member for each path adapted to turn the slides there-

m from their sides to their bottoms or tops, means for arresting the travel of the slides in uniform alignment, and means for discharging a series of slides comprising one from each path in uniform predetermined arrangement.

9. In a slide feeder for match machines, an inclined feeder trough adapted to receive a plurality of slides in haphazard arrangement, means defining a plurality of slide receiving paths, means for agitating said slides and causing them to fall into said paths in predetermined position, means for causing said slides to travel down said paths to their discharge ends, spring fingers arranged adjacent to said discharge ends and under which said slides gravitate for arresting the travel of the slides, and means comprising a plurality of simultaneously operable pushers for dislodging the slides from beneath said fingers and discharging the slides from said paths in uniform predetermined arrangement.

10. In a slide feeder for match machines, an inclined feeder trough adapted to receive a plurality of slides in haphazard arrangement, means defining a plurality of slide receiving paths, means for agitating said slides and causing them to fall into said paths in predetermined position, means for causing said slides to travel down said paths to their discharge ends, means adjacent to said discharge ends for arresting such travel, means comprising a plurality of simultaneously operable pushers for discharging said slides from said paths in uniform predetermined arrangement, and means for maintaining the thus discharged slides temporarily in alignment.

11. In a slide feeder for match machines, an inclined feeder trough adapted to receive a plurality of slides in haphazard arrangement, means defining a plurality of slide receiving paths, means for agitating said slides and causing them to fall into said paths in predetermined position, means for causing said slides to travel down said paths to their discharge ends, means adjacent to said discharge ends for arresting such travel, means comprising a plurality of simultaneously operable pushers for discharging said slides from said paths in uniform predetermined arrangement, and means comprising a plurality of spacer members for maintaining the thus discharged slides temporarily in alignment.

12. In a slide feeder for match machines, an inclined feeder trough adapted to receive a plurality of slides in haphazard arrangement, means defining a plurality of slide receiving paths, means for agitating said slides and causing them to fall into said paths in predetermined position, means for causing said slides to travel down said paths to their discharge ends, means adjacent to said discharge ends for arresting such travel, means comprising a plurality of simultaneously operable pushers for discharging said slides from said paths in uniform predetermined arrangement, and means comprising a plurality of simultaneously operable spacer members for maintaining the thus discharged slides temporarily in alignment.

13. In a slide feeder for match machines, an inclined feeder trough adapted to receive a plurality of slides in haphazard arrangement, means defining a plurality of slide receiving paths, means for agitating said slides and causing them to fall into said paths in predetermined position, means for causing said slides to travel down said paths to their discharge ends, means adjacent to said discharge ends for arresting such travel, means comprising a plurality of simultaneously operable pushers for discharging said slides from said paths in uniform predetermined arrangement, and means comprising a plurality of simultaneously operable spacer members actuated in unison with said pushers for maintaining the thus discharged slides temporarily in alignment.

In testimony whereof I have hereunto set my hand this 27th day of May A. D. 1924.

LUCIAN E. PARKER.