Aug. 24, 1926. 1,597,439

J. T. FAGAN ET AL

APPARATUS FOR FEEDING GLASS PARTS

Original Filed Sept. 19, 1922

Fig. 1

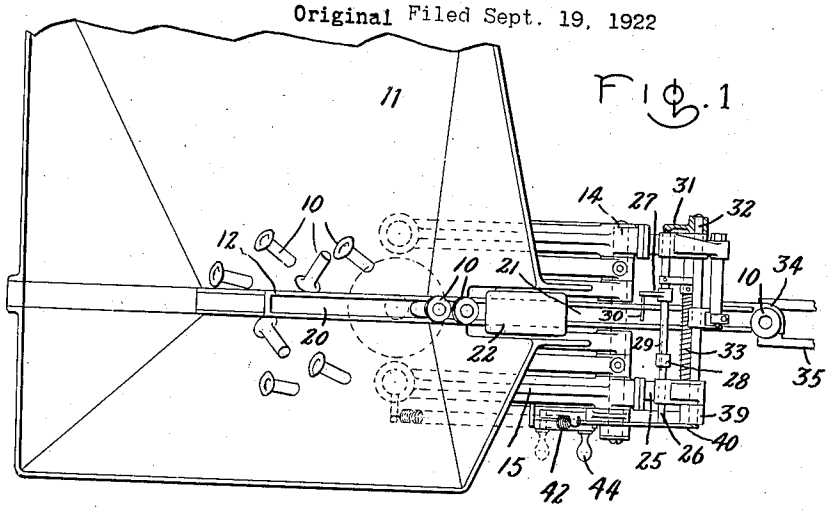


Fig. 2

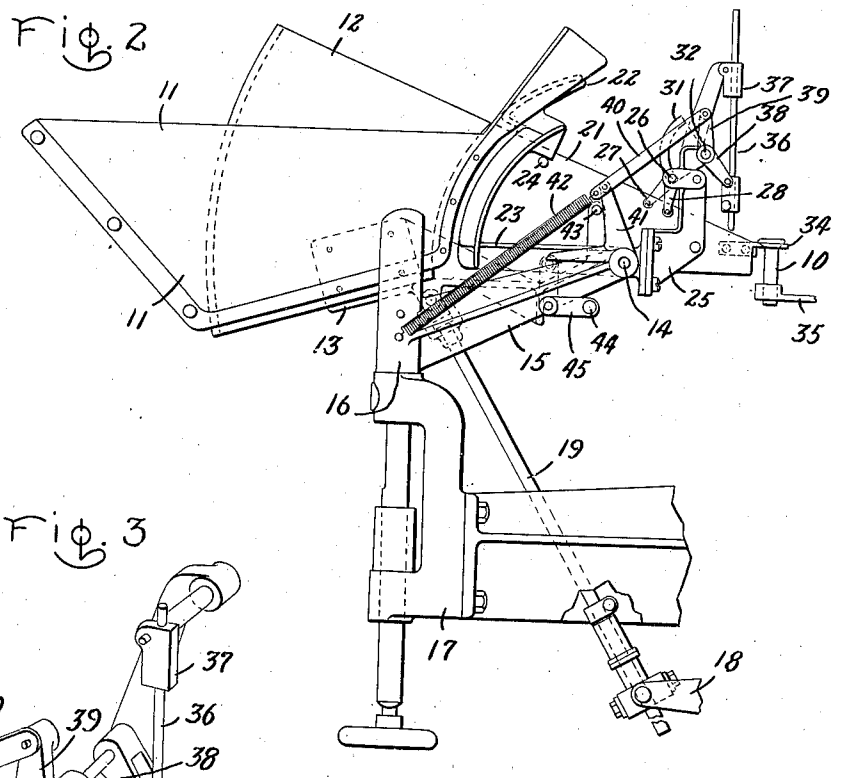
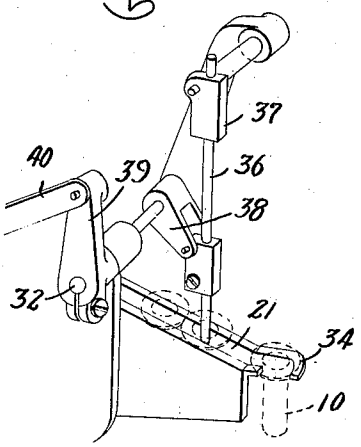


Fig. 3



INVENTORS:
JOHN T. FAGAN,
FRANCIS J. RIPPL,
BY Alexander S. Lamb
THEIR ATTORNEY.

Patented Aug. 24, 1926. 1,597,439

UNITED STATES PATENT OFFICE.

JOHN T. FAGAN AND FRANCIS J. RIPPL, OF CLEVELAND, OHIO, ASSIGNORS TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

APPARATUS FOR FEEDING GLASS PARTS.

Original application filed September 19, 1922, Serial No. 589,249. Divided and this application filed January 19, 1925. Serial No. 3,220.

Our invention relates to apparatus for feeding tubular glass parts, as for example, to machines for making stems for electric incandescent lamps, vacuum tubes and like devices. This application is a division of our Patent No. 1,536,833, issued May 5, 1925. Our invention has been applied to the machine described in Fagan and Staudenmeir application, Serial No. 667,584, filed October 9, 1923. That machine comprises a number of heads mounted upon a rotatable carrier, each head being adapted to receive the parts necessary for making an incandescent lamp stem which in the case of tipless stems consists of a flare tube, an exhaust tube, a piece of cane glass, and two leading-in conductors. Each head comprises separate chucks for successively receiving these various parts. After a head has received all the necessary parts and they have been properly positioned, it continues to advance intermittently around the machine and encounters various agencies which cause the fusion together of portions of the assembled parts, the clamping of the fused mass to form a seal, and the blowing of a passage through the mass communicating with the exhaust tube. After the completion of the stem, it is discharged from the head. Our invention, however, is obviously adapted for feeding tubes to other types of machines.

In the drawing, Fig. 1 is a top plan view of our improved feeding device; Fig. 2 is a side elevation thereof; and Fig. 3 is a perspective of a portion of the flare tube feeding means.

Referring now to Fig. 1 of the drawing, a quantity of flare tubes 10 are placed loosely in a hopper 11, said hopper having a slot in the bottom thereof which forms a passage for the rotating segment 12. The segment 12 is attached to an arm 13 which is pivotally mounted on a shaft 14, carried by a bracket 15 which is attached to a standard 16. The standard 16 also carries the hopper 11 and is mounted in a bracket 17 attached to a lamp parts assembling machine which is not shown. The segment 12 is raised and lowered by means of a cam (not shown) driven from the lamp parts machine and which acts through a crank 18 and a rod 19 pivotally attached thereto, the latter being pivotally connected to the arm 13 of the segment 12. The shape of the cam is such that the segment 12 is alternately lowered and raised to receive flare tubes and to allow their discharge. When the segment is in the lowered position its upper edge is even or flush with the bottom of the hopper 11. As the segment is raised it pushes its way through the flare tubes, whereupon a number of tubes fall into the channel 20 of the segment and are carried up thereby. At the top of the stroke the upper edge of the segment coincides with the upper edges of the channeled guideway 21 on to which the tubes slide by gravity to the feeding mechanism.

A baffle or guard 22 is mounted just above the discharge end of the segment 12, and is pivoted at 14 through an integral extension arm 23. A stop 24 serves to hold the guard in operative position. The pivotal mounting allows the guard to give if a tube should become wedged between it and the segment. This baffle or guard has the function of forcing back into the hopper any improperly placed tubes. The guideway 21 along which the flared tubes feed is stationary. It carries at its discharge end a means for securing a uniform, uninterrupted feed of tubes to the lamp parts machine. For this purpose, there is rigidly attached to the bracket 15 a bracket 25 which supports a reciprocable rod 26 carrying arms 27 and 28 provided respectively with substantially horizontally disposed pins 29 and 30 mounted to register with apertures on opposite sides of the channeled guideway 21. The pins 29 and 30 are spaced approximately the width of one of the flare tubes and by reason of the action of the cam 31 on the end of the rod 26, the rod is caused to reciprocate and to cause the pin 29 and the pin 30 to alternately pass through its aperture and to engage a tube, the result being that the line of tubes coming from the hopper is held back by the pin 30 while a tube passes down to take the place of a removed tube in the line at the end of the guideway 21. The pin 30 is then withdrawn and the pin 29 becomes operative to hold the line of tubes coming from the hopper so that another tube is added to the line for delivery at the next reciprocation of the rod 26. The cam 31 is mounted on a shaft 32 which is rotated in synchronism with the movements of the segment 12. The spring 33 acts to keep the end of rod 26 against the cam 31.

At the discharge end of the guideway 21 is disposed a receiving hook 34 into which the tubes successively feed and in which they are held until the jaws 35 of the lamp parts assembling machine engage and remove them one by one. Adjacent thereto is mounted a means for engaging the tube next in line and drawing it back the moment the tube in the hook 34 is being removed. This forces the line of tubes back up the incline and prevents crowding the flare which is being picked off by the jaws 35 of the assembling machine. Upon the release of said engaging means, the line advances and forces a new tube into the hook 34.

The said engaging means comprises a rod 36 which reciprocates in a pivoted sleeve 37 carried by an extension on bracket 25. The said rod is reciprocated and given a swinging movement by a crank 38 mounted on the shaft 32. The latter is rotated by a crank 39 through link 40 attached to a bell crank 41 which is rotatably mounted on shaft 14. A spring 42 tends to draw the crank 41 backwardly and to reciprocate upwardly the rod 36. A stop 43 on the arm 13 is in engagement with the crank 41 so that the latter is turned clockwise as the segment 12 rises to lower the rod 36 and cause the lower end thereof to enter a tube and to force said tube and the line of tubes back of it up the inclined guideway for a short distance. When the segment is lowered the spring 42 causes the crank 41 to turn counter-clockwise to raise the rod 36 out of engagement with said tube and to allow the line of tubes to advance until one is seated in the hook 34. As it may be desirable to allow the segment to rise and lower without actuation of the engaging means just described, there is provided a removable detent 44 on a link 45 which engages an arm of the crank 41 and holds it in raised position.

What we claim as new and desire to secure by Letters Patent of the United States is:—

1. In a feeding apparatus, the combination of an inclined chute having a slot therein adapted to support a series of tubes in substantially vertical positions and to allow them to feed therealong by gravity, a holder at the lower end of said chute adapted to receive said tubes and to allow them to be removed one by one in a substantially vertical position and means for preventing crowding during said removal comprising a means for retracting the tube abutting against the tube in said holder and subsequently allowing said retracted tube to enter the holder.

2. In a feeding apparatus, the combination of an inclined chute having a slot therein adapted to support a series of tubes in substantially vertical positions and to allow them to feed therealong by gravity, a holder at the lower end of said chute adapted to receive said tubes and to allow them to be removed one by one, means for preventing crowding, during said removal, comprising a pin positioned over the tube which abuts against that in the holder, and means for causing said pin to enter said tube and then to be retracted during the removal operation and finally to be withdrawn so as to allow the said tube to enter the said holder.

3. In a feeding apparatus, the combination of an inclined chute having a slot therein adapted to support a series of tubes in substantially vertical positions and to allow them to feed therealong by gravity, a holder at the lower end of said chute adapted to receive said tubes and to allow them to be removed one by one, means for preventing crowding, during said removal, comprising a substantially vertically disposed pin positioned over the tube which abuts against that in the holder, and means for causing said pin to enter said tube and then to be retracted during the removal operation and finally to be withdrawn so as to allow the said tube to enter the said holder.

4. In a feeding apparatus, the combination of an inclined chute having a slot therein adapted to support a series of tubes in substantially vertical positions and to allow them to feed therealong by gravity, a holder at the lower end of said chute adapted to receive said tubes and to allow them to be removed one by one, means for preventing crowding, during said removal, comprising a substantially vertically disposed pin positioned over the tube which abuts against that in the holder, means for causing said pin to enter said tube, means for swinging said pin to retract said tube during the removal operation and means to subsequently withdraw said pin to allow the said tube to enter the said holder.

5. In a feeding apparatus, the combination of an inclined chute having a slot therein adapted to support a series of tubes in substantially vertical positions and to allow them to feed therealong by gravity, means disposed near the lower end of said chute for ensuring a uniform feeding of said tubes, a holder at the lower end of said chute adapted to receive said tubes and to allow them to be removed one by one, means for preventing crowding, during said removal comprising a means for retracting the tube abutting against the tube in said holder and subsequently allowing said retracted tube to enter the holder.

6. In a feeding apparatus, the combination of an inclined chute having a slot therein adapted to support a series of tubes in substantially vertical positions and to allow them to feed therealong by gravity, means disposed near the lower end of said chute

for ensuring a uniform feeding of said tubes, a holder at the lower end of said chute adapted to receive said tubes and to allow them to be removed one by one, means for preventing crowding, during said removal, comprising a pin positioned over the tube which abuts against that in the holder, and means for causing said pin to enter said tube and then to be retracted during the removal operation and finally to be withdrawn so as to allow the said tube to enter the said holder.

7. In a feeding apparatus, the combination of an inclined chute having a slot therein adapted to support a series of tubes in substantially vertical positions and to allow them to feed therealong by gravity, means disposed near the lower end of said chute for ensuring a uniform feeding of said tubes, a holder at the lower end of said chute adapted to receive said tubes and to allow them to be removed one by one, means for preventing crowding, during said removal, comprising a substantially vertically disposed pin positioned over the tube which abuts against that in the holder, and means for causing said pin to enter said tube and then to be retracted during the removal operation and finally to be withdrawn so as to allow the said tube to enter the said holder.

8. In a feeding apparatus, the combination of an inclined chute having a slot therein adapted to support a series of tubes in substantially vertical positions and to allow them to feed therealong by gravity, means disposed near the lower end of said chute for ensuring a uniform feeding of said tubes, a holder at the lower end of said chute adapted to receive said tubes and to allow them to be removed one by one, means for preventing crowding, during said removal, comprising a substantially vertically disposed pin positioned over the tube which abuts against that in the holder, means for causing said pin to enter said tube, means for swinging said pin to retract said tube during the removal operation and means to subsequently withdraw said pin to allow the said tube to enter the said holder.

In witness whereof, we have hereunto set our hands this 15th day of January, 1925.

JOHN T. FAGAN.
FRANCIS J. RIPPL.