Sept. 15, 1953 S. C. BAEHR ET AL 2,652,139

FEEDER

Filed Jan. 15, 1952 3 Sheets-Sheet 1

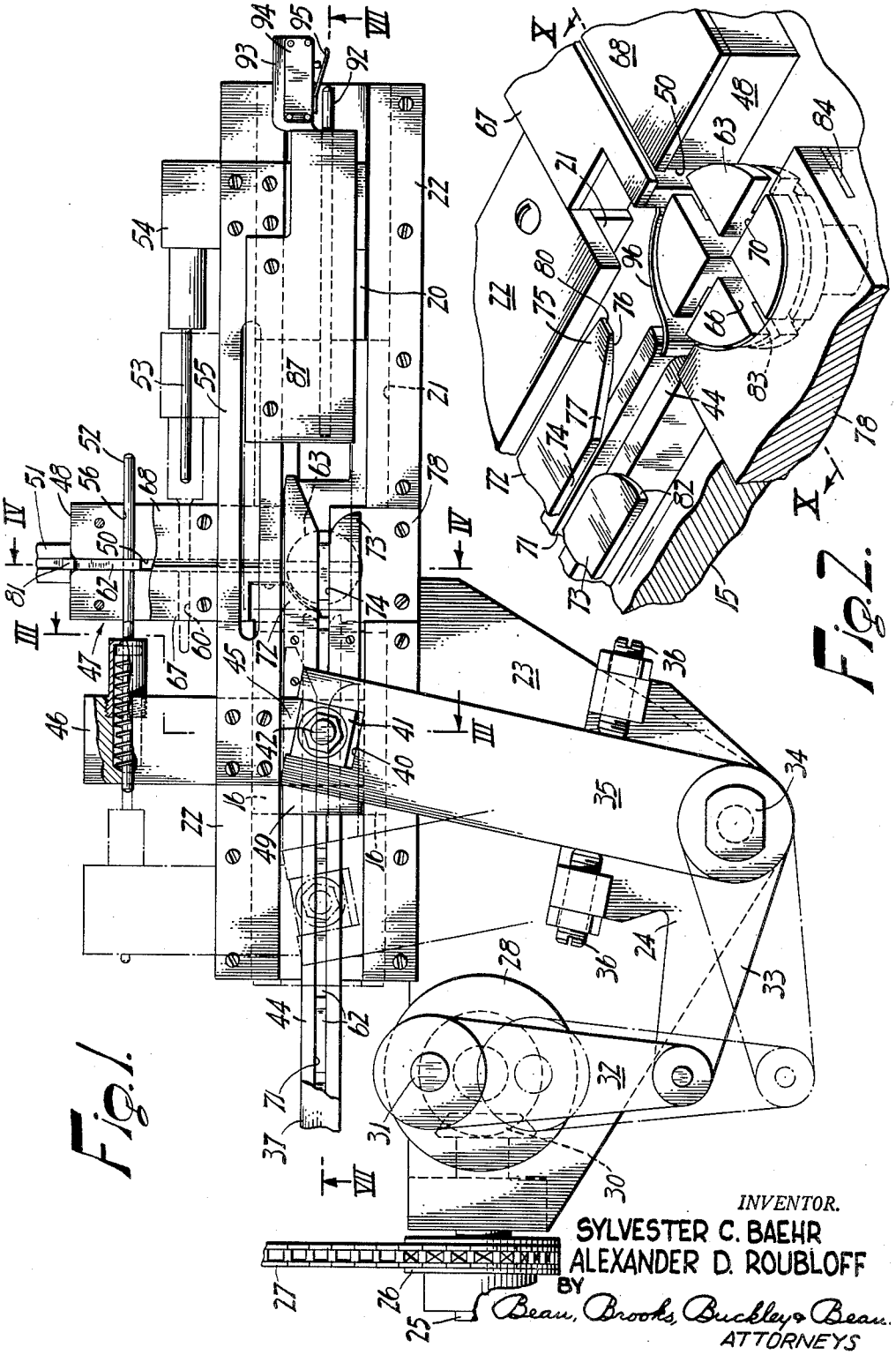


Fig. 1.

Fig. 2.

INVENTOR.
SYLVESTER C. BAEHR
ALEXANDER D. ROUBLOFF
BY
Beau, Brooks, Buckley & Beau.
ATTORNEYS

Sept. 15, 1953 S. C. BAEHR ET AL 2,652,139

FEEDER

Filed Jan. 15, 1952 3 Sheets-Sheet 2

Fig. 3.

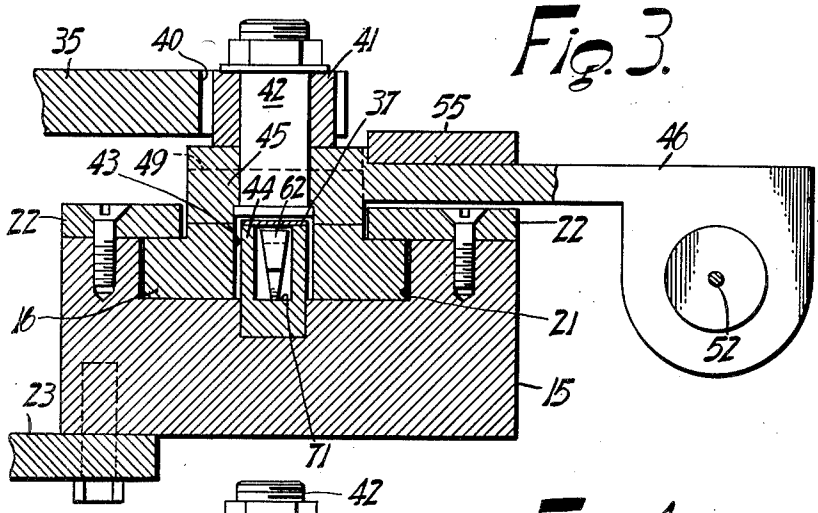


Fig. 4.

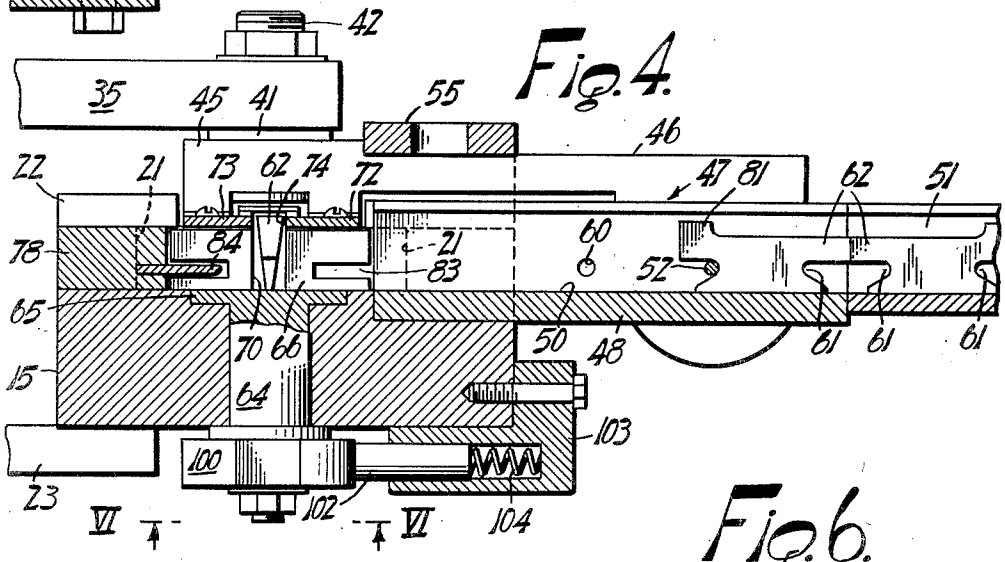


Fig. 5.

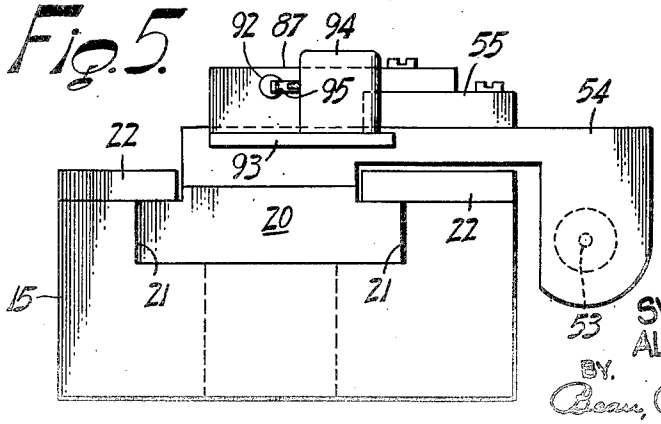
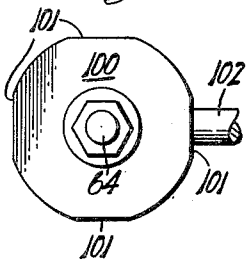


Fig. 6.



INVENTOR.
SYLVESTER C. BAEHR
ALEXANDER D. ROUBLOFF
BY.
Bean, Brooks, Buckley & Bean
ATTORNEYS

Sept. 15, 1953 S. C. BAEHR ET AL 2,652,139

FEEDER

Filed Jan. 15, 1952 3 Sheets-Sheet 3

Fig. 7.

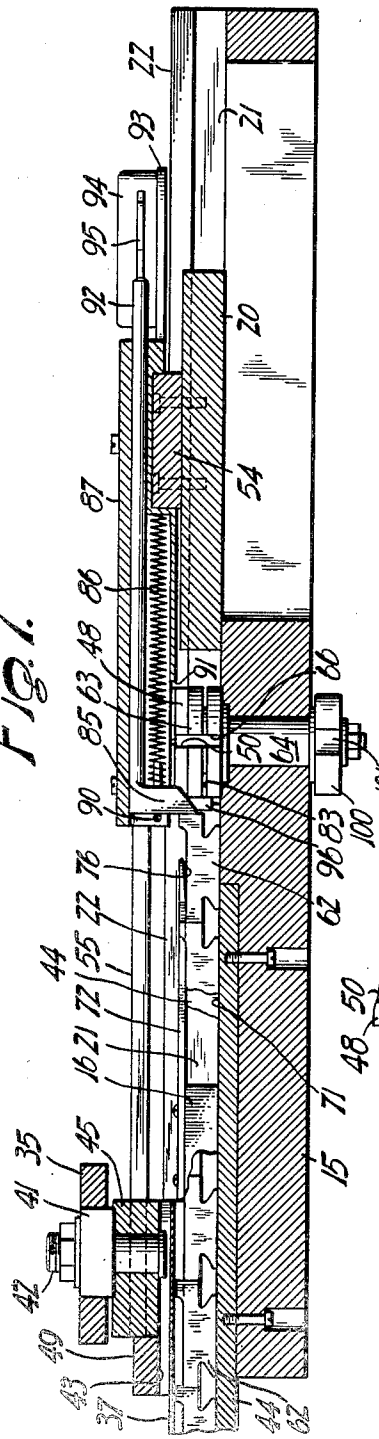


Fig. 10.

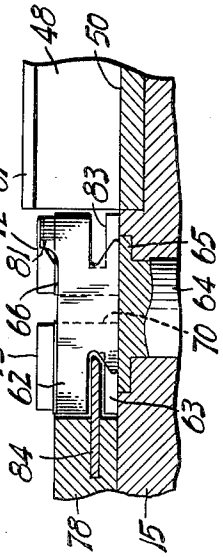


Fig. 8.

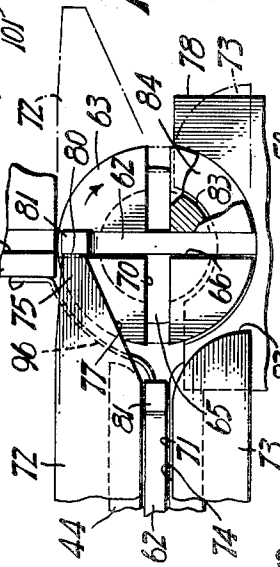
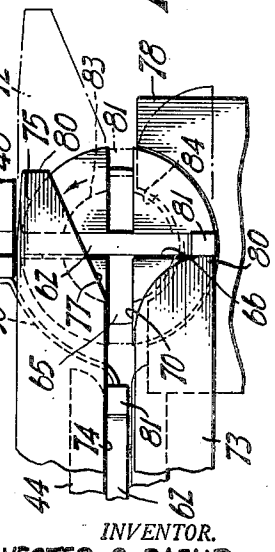


Fig. 9.



INVENTOR.
SYLVESTER C. BAEHR
ALEXANDER D. ROUBLOFF

BY
Bean, Brooks, Buckley & Bean.
ATTORNEYS

Patented Sept. 15, 1953

2,652,139

UNITED STATES PATENT OFFICE

2,652,139

FEEDER

Sylvester C. Baehr, Cheektowaga, and Alexander D. Roubloff, Kenmore, N. Y., assignors to Wiesner-Rapp Company, Inc., Buffalo, N. Y.

Application January 15, 1952, Serial No. 266,578

19 Claims. (Cl. 198—33)

1

The invention relates in general to devices for feeding articles one by one, and more particularly to a machine for uniformly positioning irregularly shaped articles and intermittently feeding them through the machine.

While this machine may be adapted to feed articles having various irregular shapes, it is designed especially for feeding commutator bars each of which is provided with a terminal lug at one end which projects outwardly beyond the surface of the finished commutator. Obviously, as these bars are being assembled in a subsequent operation, it is necessary that they be fed to the assembling machine in such manner that the same end of each bar will be arranged in the same direction relative to the direction of feeding. However, some of these bars are received by the machine with the terminal lugs at the advance ends and others with the lugs at the trailing ends, and it is the function of the machine to turn the incorrectly arranged bars and to uniformly position them before being discharged from the device.

The principal object of the invention is therefore, to provide a feeding device which will receive irregularly shaped articles in random longitudinal positions and turn them to the correct positions before they are fed from the machine.

Another object is to provide a device having a turntable to receive articles at substantially right angles to the path of discharge and to turn the articles so as to correctly position them.

A further object is to provide actuating cams to rotate the turntable in a direction indicated by the position of the article when received by the table, and to thereby correctly position the same.

Moreover, the device is provided with means for holding the articles within the turntable as they are being moved therewith.

Moreover, safety means are provided to stop the machine if for any reason the discharge chute should become overloaded, or in the event that the articles are fed too fast to be received for subsequent treatment.

Furthermore, the device is of such nature that some projection or irregular shape of the article provides the means for rotating the turntable and for determining the correct direction of rotation thereof.

The above objects have been accomplished by the device shown in the accompanying drawings, of which:

Fig. 1 is a plan view of the complete device shown in a horizontal plane;

2

Fig. 2 is an enlarged isometrical perspective view showing the turntable of the device and the cooperating chutes;

Fig. 3 is an enlarged sectional elevation taken on line III—III of Fig. 1;

Fig. 4 is a similar view taken on line IV—IV of Fig. 1;

Fig. 5 is an enlarged end elevation of the device from the ejector end thereof;

Fig. 6 is a bottom plan view of the detent means for the turntable;

Fig. 7 is a longitudinal sectional elevation of the device taken on line VII—VII of Fig. 1, and shows the parts in position opposite to those shown in Fig. 1;

Figs. 8 and 9 are enlarged fragmentary detailed views of the turntable showing articles fed therein and occupying the two different positions; and,

Fig. 10 is an enlarged fragmentary sectional view taken on line X—X of Fig. 2.

The device comprises a longitudinally arranged carriage 15 which slidably supports a cam slide 16 at one end and an ejector slide 20 at the other end. These slides are disposed in suitable grooves or ways 21 and are retained in position by means of retaining plates 22. Extending from one side of the carriage is a platform 23 which supports a bell crank 24. The bell crank is carried by a suitable stud 34 and is provided with an outwardly projecting arm 33. A drive shaft 25 is suitably supported by the platform 23 and is rotated by means of a sprocket wheel 26 and a chain 27 driven by any suitable power means (not shown). An actuating disc 28 is also rotatably mounted upon the platform 23 and is driven by the shaft 25 through a pair of beveled gears 30. The disc 28 carries a crank pin 31 upon which one end of a link 32 is mounted. The other end of the link is pivotally attached to the arm 33 of the bell crank 24. Also mounted upon the stud 34 is one end of a bell crank lever 35 which is held in adjustable position by means of screws 36 carried by the bell crank and arranged one on each side of the lever 35 for adjustment thereof. The outer end of the bell crank lever 35 is provided with a slot 40 in which is slidably mounted a slide block 41. The block 41 is mounted upon a slide stud 42 carried by the lug 45 of an outer index arm 46 which is attached to the cam slide 16. The slide 16 is provided with a longitudinal passageway 43 which is spanned by a cross member 49. A discharge chute 44 is attached to the carriage and is disposed within the passageway 43. The

outer end of the channel 71 of the discharge chute is preferably enclosed by means of a cover plate 37.

Arranged near the center of the longitudinal carriage is an intermittent feeding device 47 which comprises a feed block 48 formed with a channel 50 which is partly covered by plates 67 and 68 for the passage of articles as they come from the feed chute 51. It is preferable that the articles be fed to the device by gravity so that the carriage is inclined somewhat toward the vertical whereby articles coming from the feed chute 51 will drop into the channel 50 of the intermittent indexing device. For clearness of illustration, however, the device is shown in a horizontal plane, and all of the sectional views are shown in a similar plane.

The intermittent feeding device comprises two index pins 52 and 53. The pin 52 is carried by the outer index arm 46 and the pin 53 is carried by an inner index arm 54. The inner arm 54 is attached to the ejector slide 20 and is connected to the outer arm 46 by means of a connecting bar 55, whereby both indexing arms are reciprocated in unison. The pins 52 and 53 are each engageable with a separate aperture 56 and 60, respectively, formed in the feed block and spaced apart a distance equal to the distance between the bottoms of the V-shaped notches 61 formed in the article 62. The pins are so positioned and are of such length that when pin 52 is in engagement with the upper article as shown in Fig. 1, the lower or inner pin 53 is withdrawn from its aperture and has released the preceding article. As the pin 53 is fed into its aperture and is disposed across the channel 50 of the block, the pin 52 will be withdrawn to a position where the article supported by the latter will be released and will be allowed to fall onto the pin 53 which will prevent its being discharged through the feed chute until it is released by the reverse reciprocation of this pin, whereupon the pin 52 which has again been disposed across the channel 50 will support the next successive article. The pin 52 is preferably spring pressed, as shown in Fig. 1, whereby should it contact a workpiece as it is being fed forwardly it will allow full movement of the arm 46 until the next stroke when it will be synchronized with the workpiece fed.

A turntable 63, mounted upon a turntable shaft 64 is rotatably supported in a turntable block 78 attached to the carriage 15. The turntable is so disposed as to have its axis at substantially the point of intersection of the discharge chute and the feed chute and it is formed with grooves 66 and 70 arranged at substantially right angles to each other, whereby when the groove 66 is in registration with the channel 50 of the feed block, the groove 70 will be in registration with the channel 71 formed in the discharge chute, whereby an article 62 when deposited in the groove 66 will register with the channel 71 of the discharge chute when the turntable is rotated 90°, as hereinafter described.

Carried by the cam slide 16 is an inner actuating cam 72 and an outer actuating cam 73. These cams are preferably in the form of flat plates which are secured to and reciprocated with the cam slide. A channel 74 is formed between them which is of substantially the same width as the channel 71 of the discharge chute 44. The inner actuating cam 72 is longer than the cam 73 and is provided with a tapered point 75 formed by a wedge shape surface 77 and provided with an inclined under-surface 76 for purposes to be hereinafter described. This cam is formed with a blunt end 80 which engages the upwardly extending terminal lug 81 of the article when fed in the direction indicated in the perspective view. When this article has reached the groove 66 of the turntable the terminal lug 81 will be at the upper end of the groove, and when the inner actuating cam is now moved toward the turntable the blunt end 80 will engage the lug and serve to move the turntable with the article in clockwise direction. After the initial movement, the lug 81 will engage inclined or tapered surface 77 of the cam and will continue to rotate the turntable until the groove 66 has been moved through an arc of 90° from its initial position, whereupon it will be in line with the channel 71 of the discharge chute. Should the article be fed with the terminal lug at the advance end or disposed at the lower end of the groove 66, it will then be engaged by the front or advance end 82 of the outer actuating cam 73. This cam will serve to rotate the turntable in counterclockwise direction and to cause the terminal lug to be disposed also at the trailing end, as was the article previously described, so that when ejected, as will hereinafter be apparent, into the channel 71 of the discharge chute, the articles will be arranged in the same endwise position.

The turntable block 78 carries a hold-down plate 84 which extends into an annular groove 83 formed in the periphery of the turntable 63. When an article 62 positioned as that shown in the perspective view is fed into the groove 66, the V-shaped notch of the article at the advance end or the end opposite the terminal lug will engage the hold-down plate and serve to retain the article within the turntable groove. When the article is fed in the opposite direction, the end opposite the terminal lug will be held in place by means of the forward end of the inner actuating cam 72. The inclined surface 76 of this end will ride over the top of the article to prevent it from projecting above the surface of the turntable.

The ejector slide 20 is mounted in the same ways 21 as the cam slide 16 and it is connected to the cam slide by means of the connecting bar 55, whereby both slides are reciprocated in unison. An ejector housing is carried by the connecting plate and it is provided with an ejector lug 85. The lug 85 is mounted upon an ejector rod 92 which is slidably mounted within the housing and which extends some distance beyond the rear end thereof. The lug is kept in its forward position by means of an ejector spring 86. This spring is of such strength as to feed the article without becoming compressed. Suitable stops 90 and 91 fixed to the housing serve to limit the predetermined travel of the ejector lug. The housing is provided at its rear end with a switch plate 93 upon which is mounted a micro switch 94. The spring arm 95 of this switch lies within the path of movement of the rear end of the ejector rod, and when the ejector spring is compressed for any reason the ejector rod will be pushed backwardly against the tension of the spring, and the micro switch will be actuated to cause the motor which drives the device to be stopped. This is a precautionary method to prevent jamming of the articles should the discharge chute be prematurely filled or be interrupted in this passage through the device by any means whatsoever. The ejector lug

85 is carried forwardly when the ejector slide is actuated and it engages the end of the article which is disposed in the groove and which has been moved to a position of registration with the channel 71 of the discharge chute, as clearly shown in the perspective view. When in this position, each article is pushed lengthwise through the groove of the turntable and into the channel 71 of the discharge chute. A retaining spring 96 is located at the entrance end of the discharge chute and has its free end arranged in the path of the articles as they are pushed out of the turntable and into the discharge chute. The stroke of the ejector lug 85 pushes the trailing end of the article past the end of the spring which will snap in behind the articles and therefore prevent them from being moved backwardly toward the turntable when once they have passed the spring.

A turntable detent means is provided for assuring the stoppage and retention of the turntable in such position that the grooves thereof will be in registration with the cooperating chutes. These means comprise a detent cam 100 formed with four substantially flat surfaces 101, at angles of substantially 90° to each other. A detent plunger 102 carried by a detent bracket 103 is engageable with either of the surfaces 101 when the turntable has been rotated substantially 90°. The plunger is spring pressed by means of a detent spring 104 which is mounted in the bracket and bears against the plunger. The bracket is suitably secured to the carriage 15.

When the device is to be used to feed articles, they are received in the groove 50 of the feed block from any suitable source. Some of the articles will be fed with the terminal lug at advance end and some will be fed in reverse position. The reciprocating index pins 52 and 53 will serve to feed these articles one at a time into the lower end of the feed block. The released article will therefore drop into the registering groove of the turntable 63 which may be the groove 66. After being deposited in this groove, the cam slide is actuated by the bell crank 24 to project the actuating cams forwardly toward and over the turntable 63. Since the article 62 shown in perspective view has the terminal lug at its trailing end, the inner actuating cam 72 will engage the lug and thereby rotate the turntable through an angle of 90° and thereby position the article in registration with the channel 71 of the discharge chute. The cam slide will then be returned to its initial position and the ejector slide 29 will be simultaneously actuated. The ejector lug 85 carried by the ejector slide will then engage the article and push it out of the groove and feed it into the discharge chute to a position beyond the free end of the retaining spring 96 where it will remain until the next successive article has been fed into the discharge chute. Obviously, when an article is presented and fed into the turntable with its terminal lug at the advance end, then the outer actuating cam 73 will engage the terminal lug and rotate the turntable in counter-clockwise direction until the article has been positioned in registration with the discharge chute whereupon it will be pushed out of the groove of the turntable and fed into the discharge chute by means of the ejector lug.

What is claimed is:

1. A feeding device for irregularly shaped articles, comprising a turntable, means for feeding articles to said turntable, a discharge chute to receive articles from said turntable, intermittently-actuated turning means engageable with the articles when disposed in the turntable to actuate the turntable to correctly position the articles for subsequent feeding therefrom, and means for ejecting the correctly positioned articles from the turntable and feeding them into the discharge chute.

2. A feeding device for irregularly shaped articles, comprising a turntable, means for feeding articles to said turntable, a discharge chute to receive articles from said turntable, means engaging said articles to correctly position them for delivery to said discharge chute, and means for ejecting the correctly positioned articles from the turntable and feeding them into the discharge chute.

3. A feeding device for irregularly shaped articles, comprising a turntable formed with a diametrical groove, means for feeding articles to said turntable, a discharge chute to receive articles from said turntable, means engaging each of the articles when in the groove to rotate the turntable and thereby correctly position the articles for delivery to said discharge chute, and means for ejecting the correctly positioned articles from the turntable and feeding them into the discharge chute.

4. A feeding device for irregularly shaped articles, comprising a turntable formed with two diametrical grooves for alternately receiving articles fed thereto, means for feeding articles to the grooves of said turntable, a discharge chute to receive articles from said turntable, intermittently actuated means engageable with each of the articles when disposed in one of the grooves of the turntable to rotate the turntable and thereby correctly position the articles for subsequent delivery to said discharge chute, and means for ejecting the correctly positioned articles from the turntable and feeding them into the discharge chute.

5. A feeding device for irregularly shaped articles, comprising a turntable formed with two diametrical grooves for alternately receiving articles fed thereto, means for feeding articles to the grooves of said turntable, a discharge chute to receive articles from said turntable, intermittently actuated means engageable with each of the articles when disposed in one of the grooves of the turntable to rotate the turntable and thereby correctly position the article for subsequent delivery to said discharge chute, means for ejecting the correctly positioned articles from the turntable and feeding them into the discharge chute, and detent means for retaining the turntable in its predetermined positions.

6. A feeding device for irregularly shaped articles, comprising a turntable formed with two diametrical grooves arranged at right angles to each other for alternately receiving articles fed thereto, means for feeding articles to said turntable, a discharge chute to receive articles from said turntable, and intermittently actuated means engageable with each article when fed into one of the grooves of the turntable to rotate the turnable and thereby correctly position the article for subsequent feeding to said discharge chute, means for ejecting the correctly positioned articles from the turntable and feeding them into the discharge chute.

7. A feeding device for irregularly shaped articles comprising a turntable formed with two diametrical grooves for alternately receiving articles fed thereto, a feed chute in line with one of the

turntable grooves for delivering articles thereto, a delivery chute in line with the other groove to receive articles from said turntable, intermittently actuated means engageable with each of the articles when disposed in the first mentioned groove of the turntable to rotate the same and to thereby correctly position the article so that the groove containing the same will be in registration with said discharge chute, and means for ejecting the correctly positioned articles from said turntable and feeding them into said discharge chute.

8. A feeding device for irregularly shaped articles, comprising a feed chute having a channel for receiving and feeding articles, a discharge chute for receiving articles fed thereto, said feed chute and said discharge chute being arranged at right angles to each other, a turntable formed with article-receiving grooves and having its axis at substantially the point of intersection of the channels of the feed and discharge chutes, means engaging the article contained in one of the grooves to correctly position it for delivery to said discharge chute, and means for ejecting the correctly positioned article from the groove of the turntable and feeding it into the discharge chute.

9. A feeding device for irregularly shaped articles, comprising a feed chute having a channel for receiving and feeding articles, a discharge chute for receiving articles fed thereto, said feed chute and said discharge chute being arranged at right angles to each other, a turntable formed with article-receiving grooves and having its axis at substantially the point of intersection of the channels of the feed and discharge chutes, feeding means carried by said feed chute for feeding articles one at a time therethrough to be received by one of the grooves of said turntable, means engaging the article contained in one of the grooves to correctly position it for delivery to said discharge chute, and means for ejecting the correctly positioned article from the groove of the turntable and feeding it into the discharge chute.

10. A feeding device for irregularly shaped articles, comprising a turntable for receiving the articles, a feed block adjacent the turntable and formed with a longitudinal channel, spaced index pins engageable with apertures formed in the feed block and disposable across the channel of said block, means for reciprocating such pins for alternate engagement with the apertures of the block to feed articles into the turntable one at a time, a discharge chute to receive articles from the turntable, means for engaging the articles when received by the turntable to correctly position them for delivery to said discharge chute, and means actuated in unison with the reciprocating movement of the index pins for ejecting the correctly positioned article from the turntable and feeding it into the discharge chute.

11. A feeding device for irregularly shaped articles, comprising a turntable formed with two diametrical grooves for alternately receiving articles fed thereto, a feed chute registering with one of the grooves of said table, a discharge chute in registration with the other groove of the table, two spaced intermittently-actuated cams arranged for passage over the top of the turntable and engagement with an article disposed in the turntable groove which is in registration with the feed chute, whereby either cam will engage the article disposed in the turntable to rotate the latter and thereby position the article for feeding it into the discharge chute, and means for ejecting the correctly positioned article from the turntable and feeding it into the discharge chute.

12. A feeding device for irregularly shaped articles, comprising a chute slide and an ejector slide movably mounted in suitable ways and actuated in unison, a discharge chute in coacting relationship with the chute slide, and an ejector carried by the ejector slide, a feed chute arranged at right angles to the discharge chute and located between the chute slide and the ejector slide, a turntable rotatably disposed at the point of intersection of the discharge chute and the feed chute and formed with grooves for receiving articles from the feed chute, means engaging an article carried by the turntable to correctly position it for delivery to said discharge chute, and means carried by the ejector slide for ejecting the correctly positioned articles from the turntable and feeding it into the discharge chute.

13. A feeding device for irregularly shaped articles, comprising a chute slide and an ejector slide movably mounted in suitable ways and actuated in unison, a discharge chute in coacting relationship with the chute slide, and an ejector carried by the ejector slide, a feed chute arranged at right angles to the discharge chute and located between the chute slide and the ejector slide, a turntable rotatably disposed at the point of intersection of the discharge chute and the feed chute and formed with grooves for receiving articles from the feed chute, means engaging an article carried by the turntable to correctly position it for delivery to said discharge chute, means carried by the ejector slide for ejecting the correctly positioned articles from the turntable and feeding it into the discharge chute, and a detent spring adjacent the discharge chute to engage each article as it is ejected from the turntable.

14. A feeding device for irregularly shaped articles, comprising a reciprocating slide chute, a reciprocating ejector chute, said chutes being oppositely arranged in spaced relation with each other and being connected for unison actuation, a turntable rotatably disposed in the space between the slides and formed with means for receiving articles, means for feeding articles to said turntable, means carried by said chute slide for engagement with an article carried by the turntable to rotate the latter to correctly position the articles, a discharge chute for receiving articles from said turntable, and means carried by said ejector slide to eject the articles from the turntable and feed them into said discharge chute.

15. A feeding device for irregularly shaped articles, comprising a turntable for receiving articles, an actuating cam reciprocally mounted for passage over said turntable, said cam being engageable with the articles carried by said turntable to correctly position them for discharge from the latter, a discharge chute for receiving the articles from said turntable and ejector means for feeding the articles into said discharge chute.

16. A feeding device for irregularly shaped articles, comprising a turntable for receiving articles, an actuating cam reciprocally mounted for passage over said turntable, said cam being engageable with the articles carried by said turntable to correctly position them for discharge from the latter, a discharge chute for receiving the articles from said turntable and ejector means connected to and actuated in synchronism with said cam for feeding the articles into said discharge.

17. A feeding device for irregularly sahped articles, comprising a turntable formed with two

article receiving grooves arranged at right angles to each other, means for feeding articles one at a time alternately to each of the grooves of said turntable, an inner actuating cam, an outer actuating cam, said cams being spaced on each side of the axis of the turntable and movable over the upper face thereof to engage articles disposed within the grooves to rotate the turntable and thereby correctly position the articles for discharge therefrom, a discharge chute for receiving the articles from said turntable, and ejector means for feeding the articles into said discharge chute.

18. A feeding device for irregularly shaped articles, comprising a turntable formed with two article receiving grooves arranged at right angles to each other, a feed chute in registration with one of the turntable grooves, a discharge chute in registration with the other groove, an inner actuating cam, an outer actuating cam, said cams being reciprocated in planes parallel to the longitudinal plane of said discharge chute and movable over the upper face of said turntable to engage articles disposed within the groove thereof to correctly position them for discharge therefrom, and ejector means for feeding the articles into said discharge chute.

19. A feeding device for irregularly shaped articles, comprising a turntable formed with article-receiving grooves, means for feeding articles one at a time in endwise random positions to the turntable grooves, positioning means engageable with the articles disposed within the grooves for rotating the turntable in the direction indicated by the position of each article, a discharge chute in registration with one of the grooves, and ejector means for feeding the correctly positioned articles from the engaged groove into the discharge chute.

SYLVESTER C. BAEHR.
ALEXANDER D. ROUBLOFF.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,479,490	Zomnir	Jan. 1, 1924