April 14, 1970 G. M. TARZIAN 3,506,107

SQUARE FEEDER BOWL

Filed March 27, 1968

FIG. 1

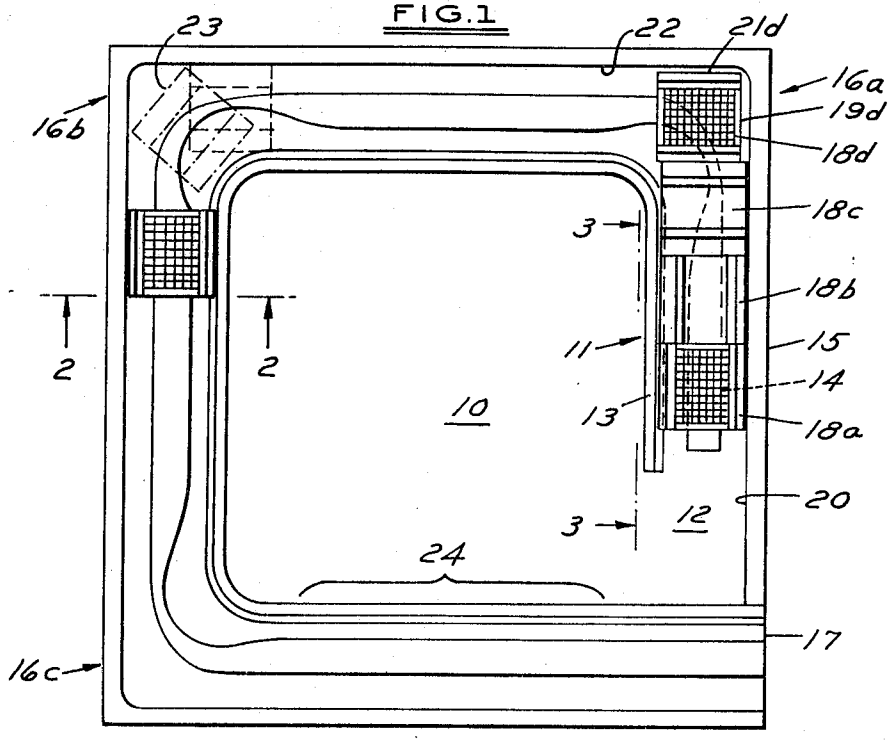


FIG. 2

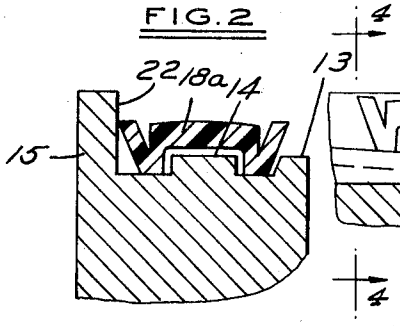
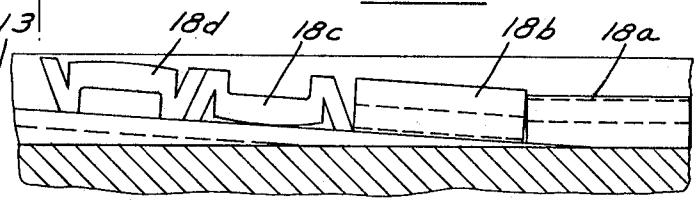


FIG. 3



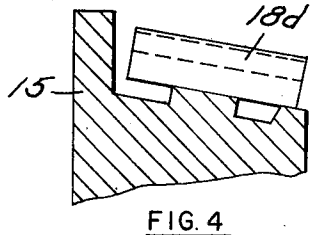


FIG. 4

INVENTOR
GEORGE M. TARZIAN
BY
Farley, Forster & Farley

ATTORNEYS

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SQUARE FEEDER BOWL

George M. Tarzian, 1744 Rosehill Drive, Chicago, Ill. 60626

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U.S. Cl. 198—33 9 Claims

ABSTRACT OF THE DISCLOSURE

A square feeder bowl for square parts having correct angle orientation requirements including discriminating corner part orientation means adapted to selectively reorient only misoriented parts and thereby increase the useable yield.

BACKGROUND OF THE INVENTION

In the case of numerous square and other polygonal parts fed by conventional, cylindrical vibratory feeder bowl in which the parts move up in ascending spiral track, the yield is limited by the continuous engagement of one side of the part with the inner cylindrical surface of the bowl maintaining initial orientation throughout the travel of each part up the ascending spiral track. Thus, for example, if a square extruded part requires correct orientation with respect to angle of departure as well as top and bottom, an average of only one out of four parts entering the spiral ramp on a random basis would be properly oriented so that any provision for returning misoriented parts would result in the feeder having only a 25% yield. Accordingly, in order to improve the efficiency of yield a need has existed for discriminating, selective reorientation supplementing conventional means for merely returning misoriented parts at some stage of the feeder action.

SUMMARY OF THE INVENTION

I have discovered that through the employment of a square or other polygonal vibratory feeder bowl configuration having corner angles in the ascending part path, the sudden change in wall direction at the corners may be employed to advantage in selectively reorienting parts on a discriminating basis thereby improving the efficiency of yield. For example, a track may be employed which will lead a part oriented to engage the track around the corners of a square feeder bowl whereas a part not so oriented will be fed straight into the wall and then proceed in a 90 deg. reoriented direction which, if properly oriented as to top and bottom, will lead to track engagement and continuing properly oriented travel to the discharge exit; thus a 25% yield for a conventional cylindrical feeder bowl may be improved to a 50% yield through the adoption of a square feeder bowl configuration.

While this technique finds most application in the feeding of square parts with square bowls, other polygonal forms of bowls such as triangular, pentagonal or hexagonal may likewise be employed to advantage in certain cases where the part configuration is appropriate.

A further advantage of the invention lies in economy of construction due to the relative simplicity of providing straight wall and straight track elements.

The foregoing and other objects of the invention will best be understood from the following detailed description of a preferred embodiment with reference to the drawings forming a part of this disclosure wherein:

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a square feeder bowl constructed in accordance with the present invention;

FIG. 2 is a fragmentary sectional view taken along the line 2—2 of FIG. 1;

FIG. 3 is a fragmentary partially sectioned view taken along the line 3—3 of FIG. 1; and

FIG. 4 is a fragmentary partially sectioned view taken along the line 4—4 of FIG. 3.

DETAILED DESCRIPTION OF THE INVENTION

With reference to the drawings, FIG. 1 discloses a square bowl configuration including a central open parts storage area **10**; an ascending ramp track **11** having an entrance area **12** flush with the bottom of the bowl; a side retaining ledge **13**; a central raised track element **14**; outer bowl walls **15**; the bowl including three right angle corners **16***a*, **16***b*, and **16***c*; and the ramp **11** leading to a final discharge at **17**.

The particular embodiment disclosed is adapted to feed square extruded plastic parts having the configuration shown in FIGS. 2 and 3 with four possible entry orientations as indicated at **18***a*, **18***b*, **18***c* and **18***d*. Actuation of the bowl may be by conventional vibratory bowl feeder energizing means, not disclosed, but preferably embodying the advantages of the bowl vibratory drive system disclosed in my copending application, Ser. No. 696,407 filed on Jan. 8, 1968. The action of any such vibratory drive will be to move the parts from the central storage area outwardly by centrifugal action and then up the ramp by an oscillating pitching action providing a forward upward flight path in a counter clockwise direction as seen in FIG. 1. Considering the respective alternative possible positions of the parts **18***a*, **18***b*, **18***c* and **18***d* ascending the initial ramp section of the feeder bowl it will be understood that the part **18***a* is the only one of the four initially oriented properly as to both top and bottom and direction of extruded form so as to properly engage the side ledge **13** and track **14** (best shown in FIG. 2), parts **18***b* and **18***c* being misoriented with respect to being bottom side up and part **18***c* also as to direction. Part **18***d*, it will be noted, was initially misoriented with respect to direction of extruded form causing it to ride on the top surface of the track element **14** rather than to engage such track and accordingly the vibratory movement causes such part to move straight up the ramp with face **19***d* in engagement with the inner side wall **20** until face **21***d* is arrested by the inner wall **22** at which time the part proceeds up the ramp with the latter two surfaces continually in engagement thereby causing the part **21***d* to engage the side ledge **13** and track elements **14** as a fully oriented part and proceed around the next corner as shown in **23** through continuing track engagement and likewise around corner **16***c* to a properly oriented discharge position at the end of the ramp **17**. Neither of the parts **18***b* nor **18***c* can become properly oriented since they are upside down and therefore incapable of track engagement regardless of direction so that such parts when they come to the area **24** which is provided with downward inclination to the center of the bowl will fall off the ramp back into the storage area.

From the foregoing it will be understood that each of the parts properly oriented with regard to top and bottom will become oriented with regard to direction at a corner passage, will remain oriented through track engagement so as to produce an average yield as compared to a 25% yield in the case of a conventional cylindrical bowl. While the particular embodiments of part and feeder bowl in the present illustration employ a square configuration it will be understood that a triangular, pentagonal, hexagonal or other polygonal form may be employed for the feeder bowl to meet particular part requirements each of which may employ the common features of part side registration with one straight inner face of the bowl utilizing an abrupt

change in path of travel at a corner in combination with track configuration to effect selective orientation. It will be further understood that while a particular embodiment has been shown and described above in detail numerous other modifications are possible without departing from the scope of the invention as defined in the following claims:

I claim:

1. A vibratory parts feeder bowl having an upwardly inclined parts feeder ramp extending around the inner bowl wall along which noncircular parts are moved by vibratory actuation characterized by

a polygonal bowl configuration providing abrupt changes in ramp path direction adapted to effect a selective reorientation of parts relative to direction of travel during corner travel.

2. A parts feeder bowl as set forth in claim 1 including cooperating ramp track means adapted to selectively maintain properly oriented parts relative to direction of travel.

3. A parts feeder bowl as set forth in claim 1 including a square bowl configuration.

4. A parts feeder bowl as set forth in claim 3 including cooperating ramp track means adapted to selectively maintain properly oriented parts relative to direction of travel.

5. A parts feeder bowl as set forth in claim 4 for parts having a directional surface related to proper orientation for engaging said track means.

6. A parts feeder bowl as set forth in claim 4 said ramp having a retaining ridge cooperating with the bowl wall in retaining properly oriented parts.

7. A parts feeder bowl as set forth in claim 4 said ramp including an outer ridge and central track adapted to cooperated with the bowl wall in retaining properly oriented parts.

8. A parts feeder bowl as set forth in claim 4 said track being provided with an arcuate configuration at said corners.

9. A parts feeder bowl as set forth in claim 4 said ramp having an area after at least one of said abrupt turns sloping towards the storage area of the bowl for returning misoriented parts.

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HUGO O. SCHULZ, Primary Examiner

U.S. Cl. X.R.

198—220