CLAIMS

1. A rotary valve device, comprising:

an inlet and a plurality of tapering outlets;

a curved, arcuate discharge chute disposed between the inlet and the plurality of outlets;

~~a main shaft extending from~~ a funnel trough above the plurality of tapering outlets, the funnel trough configured to direct material flowing out of the discharge chute into one or more outlets of the plurality of tapering outlets ~~through a bottom-mounted actuator~~; and

~~an encoder~~ a main shaft coupled to the ~~bottom-mounted actuator~~ discharge chute and a gear box, ~~fixably attached to~~ the main shaft extending through a bearing located proximate the top of the shaft and the gear box located proximate the bottom of the shaft.

2. The device of claim 1, wherein the plurality of outlets are equidistant from each other.

3. The device of claim 1, wherein the inlet has a tapered interior structure.

4. The device of claim 1, wherein a top portion of the discharge chute is tapered.

5. The device of claim 1, further comprising a gasket ring surrounding a top portion of the discharge chute.

6. The device of claim 1, wherein the ~~actuator~~ gear box comprises ~~a gear box comprising~~ a gear reduction unit adapted to rotate the main shaft which subsequently rotates the discharge chute.

7. The device of claim 6, wherein the gear box is substantially enclosed.

8. The device of claim 6, wherein the main shaft and the gear box are correspondingly keyed such that additional couplings are not needed to couple the main shaft and the gear box.

9. The device of claim 6, further comprising an electrical motor configured to power

the gear box.

10 The device of claim 9, wherein the electrical motor is coupled to the gear box at a right angle.

11. The device of claim 1, further comprising an encoder coupled to the main shaft, the encoder configured to indicate the position of the discharge chute at any given position of the discharge chute.

~~11.~~12. The device of claim 11, wherein the encoder provides precise position feedback at any given position of the discharge chute with an accuracy of less than one degree of rotation.

~~12. The device of Claim 1, further comprising a bottom-mounted valve bearing configured to secure the main shaft to the discharge chute.~~

13. The device of claim 1, wherein the discharge chute is of an angle of 10° to 80° with respect to the vertical.

14. The device of claim 13, wherein the discharge chute is of an angle of about 22.5° with respect to the vertical.

15. The device of claim 13, wherein the discharge chute is of an angle of about 45° with respect to the vertical.

16. The device of claim 1, wherein at least a portion of one interior component of the continuous rotary valve device is surface treated with corrosion protection, wear and abrasion resistance, surface traction, low friction, non-conductive, conductive coatings, or combinations thereof.

17. The device of claim 16, further comprising surface treating at least one component layer by cleaning, degreasing, etching, primer coating, roughening, grit-blasting, sand-blasting, peening, pickling, acid-wash, base-wash, nitriding, carbonitriding, electroplating, electroless plating, flame spraying including high velocity applications, thermal spraying, plasma spraying, sintering, dip coating, powder coating, vacuum deposition, chemical vapor deposition, physical vapor deposition, sputtering techniques, spray coating, roll coating, rod coating,

extrusion, rotational molding, slush molding, and reactive coatings utilizing thermal, radiational, and/or photoinitiation cure techniques, nitriding, carbonitriding, phosphating, or combinations thereof.

18. The device of claim 16, wherein the surface treatment is at least one of metals, inorganic salts, inorganic oxides, inorganic carbides, inorganic nitrides, inorganic carbonitrides, corrosion inhibitors, sacrificial electrodes, primers, conductors, optical reflectors, pigments, passivating agents, radiation modifiers, ~~primers,~~ topcoats, adhesives, and polymers including urethanes and fluorourethanes, polyolefins and substituted polyolefins, polyesters, polyamides, fluoropolymers, polycarbonates, polyacetals, polysulfides, polysulfones, polyamideimides, polyethers, polyetherketones, silicones, or combinations thereof.

19. ~~A rotary valve device, comprising:~~

~~an inlet and a plurality of tapering outlets;~~

~~a curved discharge chute disposed between the inlet and the plurality of outlets;~~

~~a main shaft extending from the discharge chute;~~

~~a secondary shaft coupled to the main shaft via an intermediate coupling device, wherein the secondary shaft extends through a bottom-mounted actuator; and~~

~~an encoder coupled to the bottom-mounted actuator and fixably attached to the secondary shaft.~~

The device of claim 1, further comprising:

an inlet pipe assembly that receives the discharge chute, rotates with the discharge chute, is disposed around the discharge chute, and is coupled to the discharge chute and the main shaft.

~~20. The device of Claim 19, wherein the plurality of outlets are equidistant from each other.~~

~~21. The device of Claim 19, wherein actuator is pneumatically propelled.~~

~~22. The device of Claim 19, wherein actuator is hydraulically propelled.~~

~~23. The device of Claim 19, wherein the inlet has a tapered interior structure.~~

~~24. The device of Claim 19, wherein a top portion of the discharge chute is tapered.~~

~~25. The device of Claim 19, further comprising a gasket ring surrounding a top portion of the discharge chute.~~

~~26~~ 20. The device of claim 19, wherein the curved, arcuate ~~encoder provides precise position feedback at any given position of the~~ discharge chute has only ~~with an accuracy of less than~~ one change ~~degree~~ of ~~rotation~~ direction.

21. The device of claim 1, further comprising:

a lid between the inlet and the plurality of tapering outlets, the lid comprising one or more doors, the one or more doors permitting access to the interior of the rotary valve device; and

one or more removable guards that enable access to the bearing.

22. The device of claim 1, wherein one or more outlets of the plurality of tapering outlets feeds into a bagging system.

23. The device of claim 1, wherein one or more outlets of the plurality of tapering outlets feeds into a conditioning system.

~~27. The device of Claim 19, further comprising a bottom-mounted valve bearing configured to secure the main shaft to the discharge chute.~~

~~28. The device of Claim 19, wherein the discharge chute is of an angle of 10° to 80° with respect to the vertical.~~

~~29. The device of Claim 28, wherein the discharge chute is of an angle of about 22.5° with respect to the vertical.~~

~~30. The device of Claim 28, wherein the discharge chute is of an angle of about 45°~~

~~with respect to the vertical.~~

~~31. The device of Claim 19, wherein at least a portion of one interior component of the continuous rotary valve device is surface treated with corrosion protection, wear and abrasion resistance, surface traction, low friction, non-conductive, conductive coatings, or combinations thereof.~~

~~32. The device of Claim 31, further comprising surface treating at least one component layer by cleaning, degreasing, etching, primer coating, roughening, grit-blasting, sand-blasting, peening, pickling, acid-wash, base-wash, nitriding, carbonitriding, electroplating, electroless plating, flame spraying including high velocity applications, thermal spraying, plasma spraying, sintering, dip coating, powder coating, vacuum deposition, chemical vapor deposition, physical vapor deposition, sputtering techniques, spray coating, roll coating, rod coating, extrusion, rotational molding, slush molding, and reactive coatings utilizing thermal, radiational, and/or photoinitiation cure techniques, nitriding, carbonitriding, phosphating, or combinations thereof.~~

~~33. The device of Claim 31, wherein the surface treatment is at least one of metals, inorganic salts, inorganic oxides, inorganic carbides, inorganic nitrides, inorganic carbonitrides, corrosion inhibitors, sacrificial electrodes, primers, conductors, optical reflectors, pigments, passivating agents, radiation modifiers, primers, topcoats, adhesives, and polymers including urethanes and fluorourethanes, polyolefins and substituted polyolefins, polyesters, polyamides, fluoropolymers, polycarbonates, polyacetals, polysulfides, polysulfones, polyamideimides, polyethers, polyetherketones, silicones, or combinations thereof.~~

~~34. A method of outputting a material, comprising:~~

~~feeding a material into an inlet of a rotary valve device;~~

~~transporting the material through a rotating discharge chute;~~

~~rotating the discharge to a first outlet;~~

~~outputting the material through the first outlet;~~

~~rotating the discharge to a second outlet; and~~

~~outputting the material through the second outlet;~~

~~wherein the material continuously flows from the inlet to at least one of the outlets and further wherein the rotating discharge chute is bottom-actuated.~~

~~35. The method of Claim 34, wherein the material is a polymer-containing material.~~

~~36. The method of Claim 34, wherein the material is in the form of dry pellets, pellet-fluid slurry, tacky pellets, or combinations thereof.~~

~~37. The method of Claim 34, wherein the material is subsequently bagged into bags aligned with the first and second outlets.~~

~~38. The method of Claim 37, wherein the material is in the form of dry pellets, tacky pellets, or combinations thereof.~~

~~39. The method of Claim 34, wherein the material is subsequently transported to a reservoir of a pellet condition system or a drying system.~~

~~40. The method of Claim 39, wherein the material is in the form of a pellet-fluid slurry.~~