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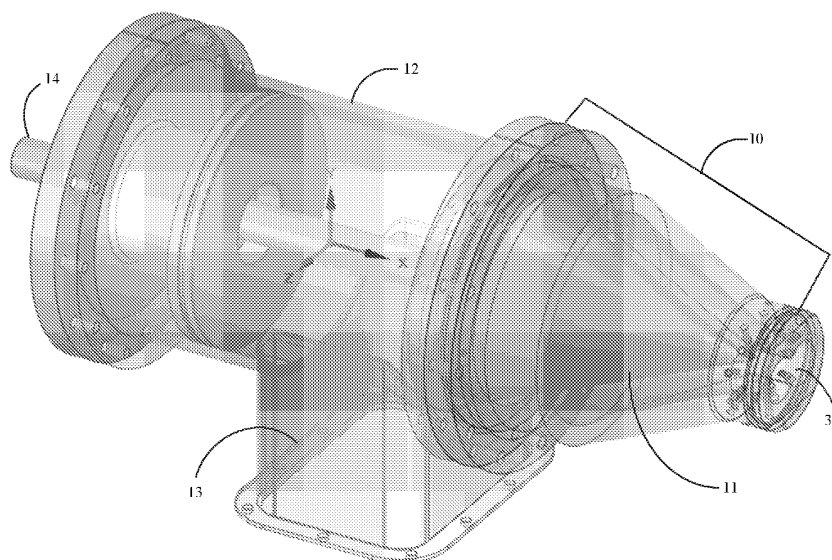
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FIG. 1



(57) Abstract: A valve assembly wherein the inner wall of the valve body comprises at least one opening for the entry of a liquid under pressure following output of a slurry or liquid from a tube or pipe. The valve assembly is particularly useful in maintaining a semi-continuous or continuous pressurized flow of biomass from an extruder and extending the reaction zone downstream from the extruder. An advantage of having an extended reaction zone allows for a complete treatment of materials without further wear on the extruder and also allows manipulation of the upstream treatment of materials in the tube or pipe.

[Continued on next page]

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