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(54) Title: APPARATUS AND METHODS FOR TREATING OBSTRUCTIONS WITHIN BODY LUMENS

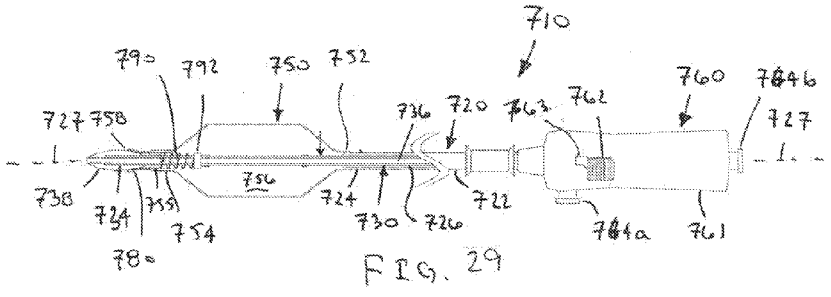


FIG. 29

(57) Abstract: An apparatus is provided that is operable in different modes to perform various functions for treating a body lumen. The apparatus includes a shaft including proximal and distal ends, a lumen extending therebetween, and a balloon on the distal end. The apparatus includes a valve on the distal end that selectively opens or closes an outlet communicating with the lumen. With the valve open, fluid introduced into the lumen exits the outlet into a body lumen. With the valve closed, fluid introduced into the lumen expands the balloon. The valve may be biased to be closed, e.g., by a spring element disposed within the balloon. Optionally, the apparatus also includes an actuator for expanding a helical member within the balloon interior, e.g., either before or after expanding the balloon, such that the helical member and balloon may adopt an expanded helical shape for removing material within a body lumen.

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