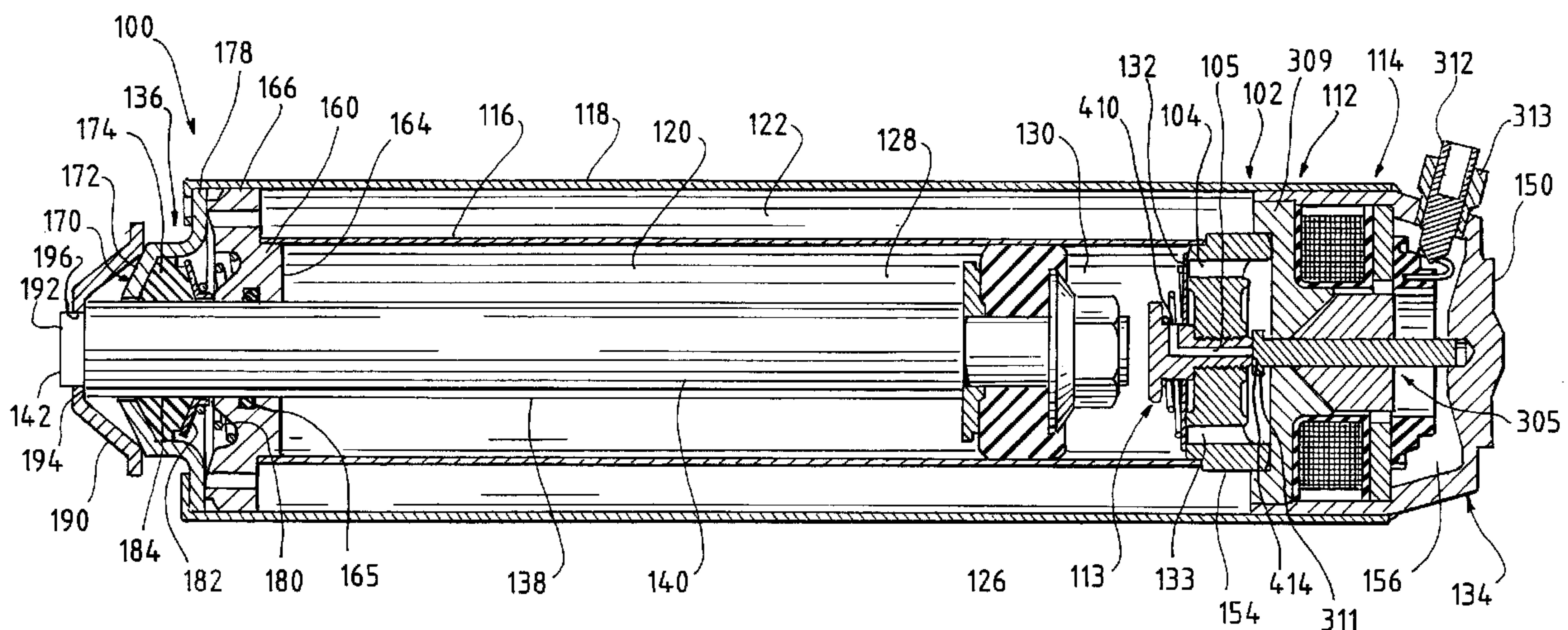




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(54) Title: IMPROVED SHOCK ABSORBER



(57) **Abrégé/Abstract:**

The present invention provides an improved method and apparatus for controlling and making real-time adjustments to damping in a shock absorber (100) based on driving conditions and desired driving characteristics. The shock absorber has a reservoir compartment (122) and a fluid-filled internal chamber (120) divided into a compression compartment (130) and a rebound compartment (128) by a movable piston (126). A piston rod (138) is connected to the piston (126) and extends through a seal (174) in the rebound end of the internal chamber (120). The shock absorber contains flow passages (410) connecting, and normally allowing fluid to flow between, the reservoir compartment (122), the compression compartment (130) and the rebound compartment (128). Fluid flow in the flow passages (410), which is directly related to the relative motion between the shock main body and the piston rod assembly, is controlled by providing a variable valve closing force (112). Control of the valve closing force, and thus the damping of the shock absorber, may be controlled in real-time either by the vehicle operator or an autonomous damping control system.

TITLE OF THE INVENTION

IMPROVED SHOCK ABSORBER

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BACKGROUND OF THE INVENTION

The present invention relates to hydraulic shock absorbers. More specifically, the present invention relates to a method and apparatus for increasing the performance of hydraulic shock absorbers by providing adjustable damping through the regulation of fluid flow within the shock absorber.

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DESCRIPTION OF THE RELATED ART

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Shock absorbers are commonly used in vehicle suspension systems to absorb unwanted vibrations which occur during driving. Specifically, shock absorbers are generally connected between the body (sprung mass) and the suspension (unsprung mass) of the vehicle to "dampen" vibrations transmitted from the suspension to the body.

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Vehicle shock absorbers usually have a hollow cylinder defining an internal chamber which is divided into a compression compartment and a rebound compartment by a piston assembly slidably positioned in the internal chamber. The shock absorber includes internal valving which permits fluid to flow between the compression and rebound compartments as the piston moves within the internal chamber. One end of the cylinder is closed and is typically connected to the vehicle suspension by a suitable linkage. A piston rod extends through a seal assembly mounted in the other end of the cylinder and has its inner end connected to the piston and its outer end connected to the vehicle body by a suitable connector.

