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Information packet.

Sub title: "Zero float valve for internal combustion engine and method of operation thereof", U.S. Pat. No. 8,087,393 Patent was granted on Jan 3, 2012

Introduction.

Hello and thank you for taking the time to read this information packet concerning my newly patented innovative valve design for the internal combustion engine.

The design of my invention enables it to recapture wasted energy from a 4 stroke engine and recycle it back into the drive train. This is a first in history that I am currently aware of.

The term “Zero Float” in my patent title is a technical term that refers to my valve design as being connectively and directly driven. My design does not require the use of springs to return the valve to the closed position as in today’s poppet valve design. The valve body of my design operates in a reciprocating motion, at the back end of the valve body it is directly connected to a connecting rod the opposite end of that connecting rod is directly connected to a driving force such as a crankshaft or cam. It is thru these parts is how energy is recaptured and returned to the drive train. Since springs are not required to return the valve to the closed position the engine would not suffer “valve float” as in today’s poppet valve engine designs, hence the term “ Zero float valve”. Valve float occurs when the engine is running at a very high R.P.M. This occurs to all engines using the current poppet valve design.

This design is so new and innovative that there is no compatible engine to compare it to.
I am recommending building a prototype engine using my valve design to the same size and specifications as a current poppet valve engine that is in use today. In that way we could compare apples to apples so to speak and physically measure the differences in horse power output.

There are more energy and cost saving to this design, as you read on I will explain them all.

Recapturing wasted energy.

The design of my invention enables it to recapture wasted energy from a 4 stroke engine and recycle it back into the drive train. This in turn would increase the engines horse power output and in doing so would reduce the number of cylinders and parts required to maintain peak performance of the engine. Fewer cylinders simply burn less fuel.

Saving even more energy and cutting production costs.

This design engineered correctly would require fewer parts , fewer cylinders and that equals to smaller lighter engines. Fewer parts required because my valve design does not enter the combustion chamber of the cylinder, its design would not be restricted in size as in the current poppet valve designs in today's engines. Current poppet valve engines can use as many as 5 valves per cylinder. My design would only require 2 valves per cylinder, one for intake and one for exhaust.

The current use of springs in today's poppet valve design also takes up horse power to operate as well. This new innovative design would eliminate this problem and conserve even more energy as well.

Fewer parts / fewer cylinders = lower production costs and lighter engine weights.
The lighter a vehicle Is, the less fuel it needs to burn to get down the road, saving even more energy.

Environmental benefits.

The environmental benefits go way beyond just a more efficient engine. From the exhaust emissions to requiring less raw materials in the production of all parts required. This in turn would help in lowering our carbon footprint on the environment as well.

Long term environmental benefits are simply do to the engine requiring fewer cylinders .
Fewer cylinders burn less fuel and therefore fewer carbon emissions being pumped into our atmosphere.

I have attached and enclosed a drawing (FIG. 1A) that I will walk you thru in explaining just how it all works.

How it all works.

I have not include drawings for the connecting rod or cam since they are not needed in this explanation of how my valve design recaptures energy, however the transfer of the recaptured energy back into the drive train is done thru these parts as I have already explained in the introduction section.

In fig1A open ports in red text 118 and 112 simply refer to the flow of gases.
Valve guide and body sleeve 102 in red text is where the valve guide 104 in red text is inserted at 123 in black text and is fixed in place by a retaining ring . The valve body 106 in red text is inserted at the other end of the valve guide and body sleeve 102 in red text. It's the valve body 106 in red text that moves in a reciprocating motion that recaptures and transfers energy back into the engine.

At the top of fig 1A you will notice Valve Guide 104 in red text and in green text a distance between the letters A and B. This distance represents the area of movement where the recapturing of energy accrues. Just after ignition the power stroke accrues in the cylinder forcing the piston in a downward motion. Within the cylinder there is high volume of pressure from the expanding gases within the cylinder that need to escape during the exhaust stroke of the engine. It's this high pressure of gases or energy if you will that are recaptured by the valve body 106 in red text.

In the fully closed position the face (See the letter C in green) of valve body 106 in red text) is up against (A in green) of the valve guide 104 in red text.

The high pressure of the exhaust gases are pushing up against the face (See the letter C in green) of the valve body 106 in red text. The distance between the green letters A and B of the valve guide 104 in red text is where the recapturing of energy happens. Between these two distances the valve body 106 in red text performs the way that the piston does, transferring this energy back into the engine. Because the valve body 106 in red text is connectively and directly driven by a cam it can reintroduce this recaptured energy back into the drive train.

The distance between A and B in green text in valve guide 104 in red text may not seem much but it can be capitalized on as much as possible by a good team of engineers. Considering that a vehicle operating at 55 MPH the engine rotation per minute would be at 1,900 to 2,000. The cam or cams that drive the valve system operate at half that speed, roughly 900 to 1,000 rotation per minute.
That's a lot of wasted energy that could be recaptured.

Thank you for taking the time to read this information packet.

Regards
Leonard Cascia inventor
Pres and CEO of Arrow Leads Inc.

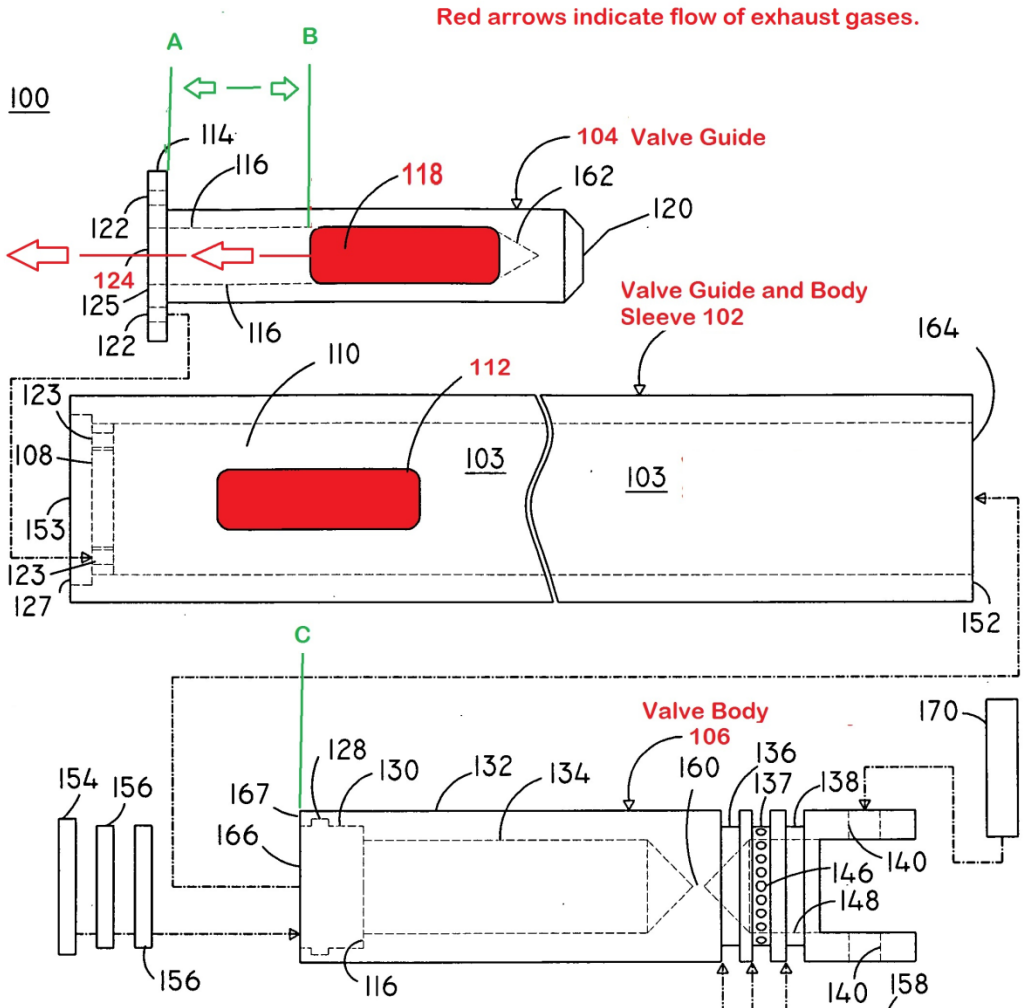
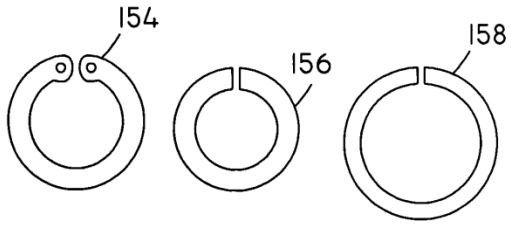


FIG. 1A



154 is a retaining ring that holds compression seal rings 156 in place.158 are compression seal rings that also provide lubrication.