Review Paper On Combination Of Fixed And Variable Displacement Pump

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Abstract- *Variable displacement hydraulic pump with high efficiency at all operating conditions from zero to maximum output is beneficial to multiple applications .There is number of architectures currently available for variable displacement pump .But variable displacement pump is 5 to 6 times costly with compared to fixed discharge pump. Thus objective of this project is defined to develop a variable displacement pump by varying the stroke of radial piston pump. This achievement is based on simple four bar linkage with one control link.*

Keywords- Discharge , Pressure ,

I. INTRODUCTION

A pump is a device that moves fluids (liquids or gases), or sometimes slurries, by mechanical action. Pumps can be classified into three major groups according to the method they use to move the fluid: direct lift, displacement, and gravitypump.Pumps operate by some mechanism (typically reciprocatingor rotary), and consume energy to perform mechanical work by moving the fluid. Pumps operate via many energy sources, including manual operation, electricity, engines, or wind power, come in many sizes, from microscopic for use in medical applications to large industrial pumps. Mechanical pumps serve in a wide range of applications such as pumping water from wells, aquarium filtering, pond filtering and aeration, in the car industry for water-cooling and fuel injection, in the energy industry for pumping oil and natural gas or for operating cooling towers. In the medical industry, pumps are used for biochemical processes in developing and manufacturing medicine, and as artificial replacements A positive displacement pump makes a fluid move by trapping a fixed amount and forcing (displacing) that trapped volume into the discharge pipe. Some positive displacement pumps use an expanding cavity on the suction side and a decreasing cavity on the discharge side. Liquid flows into the pump as the cavity on the suction side expands and the liquid flows out of the discharge as the cavity collapses. The volume is constant through each cycle of operation

Positive Displacement Pumps has an expanding cavity on the suction side and a decreasing cavity on the discharge side. Liquid flows into the pumps as the cavity on the suction side expands and the liquid flows out of the discharge as the cavity collapses. The volume is constant given each cycle of operation.

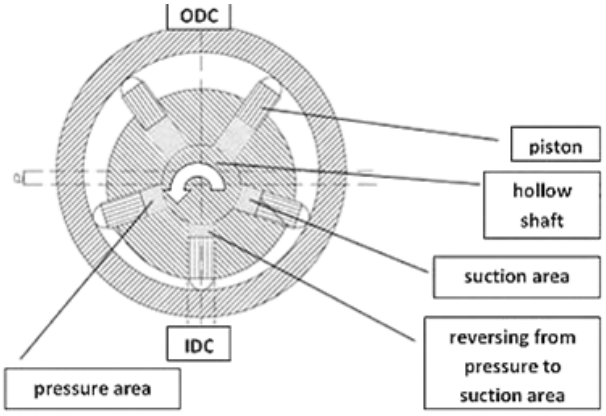

Figure 1-A - Radial Piston Pump

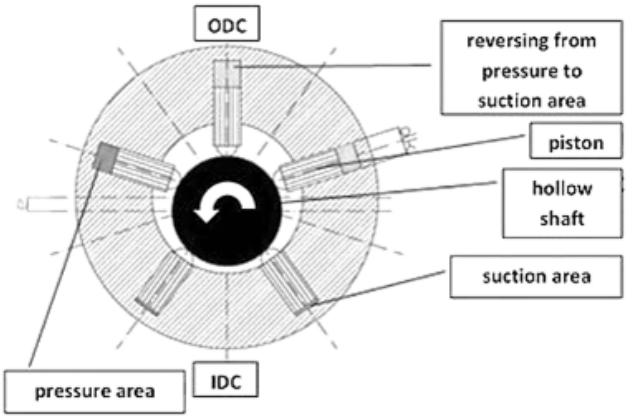

Figure 1-B - Radial Piston Pump

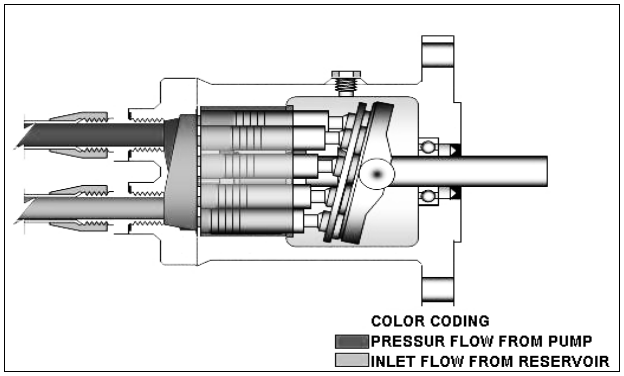

Figure 2-A - Axial Piston Pump

II. LITERARURE SURVEY

Review Paper on Application of Variable Displacement Linkage in Radial Piston PumpMr.Kekare H.T*, Prof. Patil S.S., Prof. Harugade N.V., Prof. Pol S.S.

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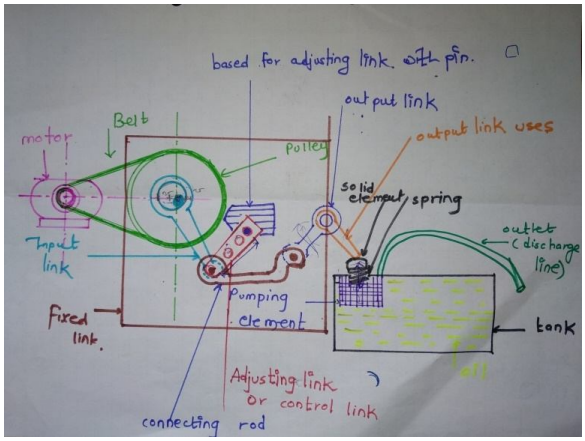
III. OBJECTIVES OF RESEARCH

1) Objective of our project is to develop a mechanism for pumping application.
2) The design so developed should be able to produce both the effect of fixed and variable type of pump.
3) The linkages designed should be able to provide various outputs at various operating position and condition of linkages.
4) Testing of pump to plot its performance curves:
   - **[a]** Flow rate vs. Speed.
   - **[b]** Efficiency vs. Speed.
5) Comparisons of flow rate vs. control angles at constant speed.
6) Comparative analysis of result of flow rate and cost required to produce the pump in comparison with bent axis or other type configuration pump.



VI. CONCLUSION

1. A mechanism of four links in which one link acts as control link is developed to obtain the effect of fixed and variable displacement.
2. From the graph of flow rate vs. speed the results obtained state that flow rate increases with increase in speed.
3. From the graph of efficiency vs. speed we conclude that efficiency drops slightly as speed decreases. This is due to stiffness of spring used in pump and friction between piston and cylinder.
4. As control angle increases flow rate decreases at constant speed.
5. Cost from data obtained from various sources we conclude that our pump gives both functions in comparatively in minimum cost as compared to pumps available in market.

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