流變液體控制之噴墨印表頭的可行性研究

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摘 要

非撞擊式印表機隨著技術之進步，已成為價位低，列印品質好之個人印表機主流。此類型之DOD(Drop-on Demand)印表機現今主要之技術為壓電式脈衝噴墨(Piezo-electric impulse ink-jet)及熱泡式噴墨(Thermal-bubble ink-jet)，然而壓電脈衝式印表機之成本較高，熱泡式之散熱、熱應力問題，在高列印速度之陣列式(Array-type)印表機之應用方面，存在著仍待克服之技術問題。更重要者，此二型式之印表機皆有專利權之問題，使此項產業受到極大之限制。針對上述問題，利用ER流體作為控制流體之設計，應可解決前述兩種型式之問題。本論文即針對設計中所使用之流變液體閥，作一理論分析與實驗量測，以驗證此一設計應用於噴墨印表機之可行性。首先，以理論推導此流變閥在靜態下之性能，並藉此以確定設計時，影響此流變閥特性的主要設計參數。接著，藉由設計製作不同尺寸之流變閥，以實驗量測驗證理論分析之正確性。最後，再以流變閥在動態下之反應作實驗量測，以確立此類流變閥可成為新的噴墨印表頭之設計。

關鍵詞 : 電流變液 ; 電流變液閥 ; 噴墨印表頭

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