

Title (en)  
A THERMALLY ACTUATED INK JET

Title (de)  
THERMISCH BETÄTIGTER TINTENSTRAHL

Title (fr)  
JET D'ENCRE A COMMANDE THERMIQUE

Publication  
**EP 0999934 A1 20000517 (EN)**

Application  
**EP 98933352 A 19980715**

- Priority
- AU 9800550 W 19980715
  - AU PO807897 A 19970715
  - AU PO793397 A 19970715
  - AU PO807597 A 19970715
  - AU PO807997 A 19970715
  - AU PO805097 A 19970715
  - AU PO805297 A 19970715
  - AU PO794897 A 19970715
  - AU PO795197 A 19970715
  - AU PO807497 A 19970715
  - AU PO794197 A 19970715
  - AU PO805197 A 19970715
  - AU PO804597 A 19970715
  - AU PO795297 A 19970715
  - AU PO804697 A 19970715
  - AU PO804297 A 19970715
  - AU PO804097 A 19970715
  - AU PO805797 A 19970715
  - AU PO805697 A 19970715
  - AU PO800197 A 19970715
  - AU PO803897 A 19970715
  - AU PO793797 A 19970715
  - AU PO800297 A 19970715
  - AU PO806897 A 19970715
  - AU PO806297 A 19970715
  - AU PO803497 A 19970715
  - AU PO803997 A 19970715
  - AU PO803797 A 19970715
  - AU PO804397 A 19970715
  - AU PO806497 A 19970715
  - AU PO794697 A 19970715
  - AU PO794397 A 19970715
  - AU PO800697 A 19970715
  - AU PO800797 A 19970715
  - AU PO800897 A 19970715
  - AU PO801097 A 19970715
  - AU PO794497 A 19970715
  - AU PO794797 A 19970715
  - AU PO794597 A 19970715
  - AU PO803397 A 19970715
  - AU PO801197 A 19970715
  - AU PO850397 A 19970811
  - AU PO939097 A 19970923
  - AU PO939397 A 19970923
  - AU PO939297 A 19970923
  - AU PO938997 A 19970923
  - AU PO939197 A 19970923
  - AU PP087397 A 19971212
  - AU PP089397 A 19971212
  - AU PP088897 A 19971212
  - AU PP089197 A 19971212
  - AU PP089097 A 19971212
  - AU PP089497 A 19971212
  - AU PP088997 A 19971212
  - AU PP087297 A 19971212
  - AU PP088297 A 19971212
  - AU PP087497 A 19971212
  - AU PP087597 A 19971212
  - AU PP089297 A 19971212
  - AU PP139898 A 19980119
  - AU PP139698 A 19980119
  - AU PP259398 A 19980325
  - AU PP259298 A 19980325
  - AU PP259198 A 19980325
  - AU PP399198 A 19980609
  - AU PP398398 A 19980609
  - AU PP398598 A 19980609

- AU PP398998 A 19980609
- AU PP398798 A 19980609
- AU PP399098 A 19980609
- AU PP398698 A 19980609
- AU PP398498 A 19980609

#### Abstract (en)

[origin: WO9903681A1] Ink jet printer ejection nozzle (2904) has ink drop (2915) ejected by motion (2914) of thermal actuator bending when heated by current flowing through it. 29 embodiments are disclosed where flaps, paddles or nozzle chamber walls are integrally or remotely actuated by thermal bending to produce an ink drop at the nozzle, or where thermal actuators move shutters to open nozzles allowing ink under cyclic pressure to form a drop, or where a thermal actuator unlatches a magnetic flap allowing it to move by magnetic pulse to produce an ink drop. The thermal bend actuators comprise multi-layer metals or metals layered with or embedded in high coefficient of thermal expansion materials. Methods of manufacturing arrangements or arrays of these nozzles as micro electromechanical systems using planar monolithic depositing, lithographic and etching processes are disclosed. Includes 195 pages of description and 681 figures, including 47 page summary of ink jet technology.

#### IPC 1-7

**B41J 2/045**; **B41J 2/055**; **B41J 2/14**; **B41J 2/16**; **B41J 2/165**

#### IPC 8 full level

**B41J 2/045** (2006.01); **B41J 2/055** (2006.01); **B41J 2/14** (2006.01); **B41J 2/16** (2006.01); **B41J 2/165** (2006.01); **B41J 2/175** (2006.01); **B41J 2/19** (2006.01); **B41J 3/42** (2006.01); **B41J 3/44** (2006.01); **H01H 1/00** (2006.01)

#### CPC (source: EP)

**B41J 2/14314** (2013.01); **B41J 2/14427** (2013.01); **B41J 2/1623** (2013.01); **B41J 2/1628** (2013.01); **B41J 2/1629** (2013.01); **B41J 2/1631** (2013.01); **B41J 2/1632** (2013.01); **B41J 2/1635** (2013.01); **B41J 2/1639** (2013.01); **B41J 2/1642** (2013.01); **B41J 2/1643** (2013.01); **B41J 2/1645** (2013.01); **B41J 2/1646** (2013.01); **B41J 2/1648** (2013.01); **B41J 2/17596** (2013.01); **B41J 3/445** (2013.01); **B41J 2002/041** (2013.01)

#### Designated contracting state (EPC)

AT BE CH DE DK ES FI FR GB GR IE IT LI NL PT SE

#### DOCDB simple family (publication)

**WO 9903681 A1 19990128**; AT E358019 T1 20070415; AT E359915 T1 20070515; AT E386638 T1 20080315; AT E409119 T1 20081015; EP 0999934 A1 20000517; EP 0999934 A4 20010627; EP 0999934 B1 20051026; EP 1637330 A1 20060322; EP 1637330 B1 20070418; EP 1640162 A1 20060329; EP 1640162 B1 20070328; EP 1650030 A1 20060426; EP 1650030 B1 20080924; EP 1650031 A1 20060426; EP 1650031 B1 20080220; ES 2302134 T3 20080701; JP 2003521389 A 20030715; JP 4160250 B2 20081001

#### DOCDB simple family (application)

**AU 9800550 W 19980715**; AT 05109700 T 19980715; AT 05109701 T 19980715; AT 05109707 T 19980715; AT 05109756 T 19980715; EP 05109700 A 19980715; EP 05109701 A 19980715; EP 05109707 A 19980715; EP 05109756 A 19980715; EP 98933352 A 19980715; ES 05109756 T 19980715; JP 2000502942 A 19980715