

Title (en)
Ink jet print head.

Title (de)
Tintenstrahldruckkopf.

Title (fr)
Tête d'imprimante à jet d'encre.

Publication
EP 0465071 A2 19920108 (EN)

Application
EP 91305676 A 19910624

Priority
US 55728090 A 19900624

Abstract (en)
A thermal drop-on-demand ink jet print head (10) has an array of heating elements (36) and near each heating element is a compression chamber (25). Each compression chamber is filled with ink from an ink reservoir (15) through an ink supply line (27) near a heating element. Each compression chamber further has an orifice (32) for ejecting ink drops (48). A dynamic valving effect is generated by configuring a protrusion (44) around the edge of the compression chamber which slightly reduces the flow area of the channel inlet. As a heating element is energized, a vapor bubble (46) of ink nucleates and grows rapidly on the heating element surface. The growth of the bubble increases the pressure in the compression chamber, pushing the ink through the orifice to eject an ink drop. Meanwhile, the formation of the growing bubble produces a dynamic valving action between the protrusion and the heating element surface, preventing a pressure leak through the ink supply line. This dynamic valving effect accelerates the bubble formation in the middle of the compression chamber, thereby creating large-size drops which eject with high speed. As the heating element is deenergized, the bubble collapses and a fast lateral pullback motion near the channel inlet enhances the replenishing of the compression chamber with ink, thereby improving the frequency response of the print head. <IMAGE>

IPC 1-7
B41J 2/005; **B41J 2/05**; **B41J 2/055**; **B41J 2/135**; **B41J 2/14**

IPC 8 full level
B41J 2/05 (2006.01); **B41J 2/055** (2006.01); **B41J 2/14** (2006.01)

CPC (source: EP)
B41J 2/055 (2013.01); **B41J 2/1404** (2013.01); **B41J 2002/14379** (2013.01); **B41J 2002/14387** (2013.01); **B41J 2202/11** (2013.01)

Cited by
US7628472B2; CN1296209C; EP0873871A3; EP1275505A3; EP1437223A3; EP0900659A3; EP1260372A3; US6471326B2; US7997709B2; US6280020B1; WO02057015A3; US8083322B2; US7036909B2; US7384130B2

Designated contracting state (EPC)
DE FR GB IT

DOCDB simple family (publication)
EP 0465071 A2 19920108; **EP 0465071 A3 19921223**; JP H04232752 A 19920821

DOCDB simple family (application)
EP 91305676 A 19910624; JP 17194391 A 19910618