

Title (en)

IMPROVED APPARATUS, SYSTEM AND METHOD FOR APPLYING OPTICAL GRADIENT FORCES

Title (de)

VERBESSERTE VORRICHTUNG, VERBESSERTES SYSTEM UND VERBESSERTES VERFAHREN ZUM ANWENDEN OPTISCHER GRADIENTENKRÄFTE

Title (fr)

APPAREIL, SYSTEME ET PROCEDES AMELIORES PERMETTANT D'APPLIQUER DES FORCES DE GRADIENT OPTIQUE

Publication

**EP 1395856 A4 20060118 (EN)**

Application

**EP 02734431 A 20020514**

Priority

- US 0215351 W 20020514
- US 85599501 A 20010514

Abstract (en)

[origin: WO02093202A2] The present invention relates generally to generating and controlling optical trap arrays for manipulating particles. In particular, the invention relates to a dual function optical element able to both diffract laser light into beamlets and converge the beamlets (acting as a virtual lens for laser light), thereby eliminating the need for multiple physical lenses to transfer the diffracted laser beams to a focusing lens. The invention also relates to improved monitoring of optical traps by limiting the amount of noise reflected and scattered resulting from un-diffracted, laser light.

[origin: WO02093202A2] An apparatus to produce and monitor at least two optical traps (1002, 1004) comprising a phase patterning element (12), a single transfer lens (L1), a beam splitter (51).

IPC 1-7

**G02B 5/18**

IPC 8 full level

**B81C 99/00** (2010.01); **B82B 3/00** (2006.01); **G02B 21/32** (2006.01); **G21K 1/00** (2006.01)

CPC (source: EP)

**G02B 21/32** (2013.01)

Citation (search report)

- [XD] US 6055106 A 20000425 - GRIER DAVID G [US], et al
- [A] US 5939716 A 19990817 - NEAL DANIEL R [US]
- [X] LIESENER J ET AL: "Multi-functional optical tweezers using computer-generated holograms", OPTICS COMMUNICATIONS, NORTH-HOLLAND PUBLISHING CO. AMSTERDAM, NL, vol. 185, no. 1-3, 1 November 2000 (2000-11-01), pages 77 - 82, XP004219458, ISSN: 0030-4018
- [X] PATENT ABSTRACTS OF JAPAN vol. 018, no. 412 (P - 1780) 2 August 1994 (1994-08-02)
- [A] MOGENSEN P C ET AL: "Dynamic array generation and pattern formation for optical tweezers", OPTICS COMMUNICATIONS, NORTH-HOLLAND PUBLISHING CO. AMSTERDAM, NL, vol. 175, no. 1-3, February 2000 (2000-02-01), pages 75 - 81, XP004189565, ISSN: 0030-4018
- [A] DUFRESNE ERIC R ET AL: "Optical tweezer arrays and optical substrates created with diffractive optics", REVIEW OF SCIENTIFIC INSTRUMENTS, AMERICAN INSTITUTE OF PHYSICS, US, vol. 69, no. 5, May 1998 (1998-05-01), pages 1974 - 1977, XP012036560, ISSN: 0034-6748
- [A] DUFRESNE ERIC R ET AL: "Computer-generated holographic optical tweezer arrays", REVIEW OF SCIENTIFIC INSTRUMENTS, AMERICAN INSTITUTE OF PHYSICS, US, vol. 72, no. 3, March 2001 (2001-03-01), pages 1810 - 1816, XP012039046, ISSN: 0034-6748
- See references of WO 02093202A2

Designated contracting state (EPC)

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

DOCDB simple family (publication)

**WO 02093202 A2 20021121**; **WO 02093202 A3 20030227**; CA 2447472 A1 20021121; CN 100353188 C 20071205; CN 1509415 A 20040630; EP 1395856 A2 20040310; EP 1395856 A4 20060118; JP 2004534661 A 20041118; JP 2008229837 A 20081002; JP 5134389 B2 20130130

DOCDB simple family (application)

**US 0215351 W 20020514**; CA 2447472 A 20020514; CN 02809991 A 20020514; EP 02734431 A 20020514; JP 2002589827 A 20020514; JP 2008034706 A 20080215