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(54) Title: CATADIOPTRIC OPTICAL SYSTEM, OPTICAL PICKUP AND OPTICAL DISK DRIVE EMPLOYING THE SAME, AND OPTICAL DISK

(57) Abstract

An optical focusing system which uses a light beam emitted from a light source, includes a refractive surface on one side of the optical focusing system and having a first radius of curvature, a first reflection surface on the above one side, surrounding the refractive surface and having a second radius of curvature being different from the first radius of curvature, a transparent beam focusing surface on the other side of the optical focusing system, and a second reflection surface on the above other side and surrounding the beam focusing surface. The refractive surface refracts an incident light beam, the second reflection surface reflects a light beam refracted by the refractive surface toward the first reflection surface, and the first reflection surface focuses a laser light beam reflected from the second reflection surface on the beam focusing surface as a focused beam spot. The optical focusing system can be used in an optical pickup. The optical pickup uses the optical focusing system to generate, from a light beam e.g. laser light emitted from a light source, a beam spot used for recording or readinginformation to a recording medium. The optical pickup uses a near field effect provided by an optical focusing system according to the present invention, to allow a superior density of recording or reading. Further, the optical focusing system according to the invention can use a light beam having a beam diameter smaller than that of the laser beam used for an existing optical focusing system for forming a near field. Thus, the optical pickup according to the invention can record or read information on an optical disk having a surface recording density of 10Gbit/inch^2 or more. Even if an incident light beam inclination occurs due to movement of the disk or the optical pickup, information can be recorded on or read from a disk accurately. Also, the assembly of the optical focusing system and the adjustment of the assembled optical focusing system are easily performed.

