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(54) Title: OPTICAL SCANNING DEVICE COMPRISING A LENS SYSTEM WITH A COMPACT ACTUATOR

(57) Abstract

The invention relates to an optical scanning device (17) for use in an optical player. The scanning device comprises an optical lens system (37) for focusing a light beam (45) into a scanning spot (47) on an information carrier (9) to be scanned. The lens system comprises a main or objective lens (53) and an auxiliary or solid immersion lens (55) providing the lens system with a large numerical aperture, so that the scanning device is suitable for scanning information carriers with a high information density, such as high–density compact discs. The lens system further comprises an actuator (63) by means of which the main and auxiliary lenses are mutually displaceable in a direction parallel to an optical axis (39) of the lens system for compensating a spherical aberration in a transparent protection layer (13) of the information carrier. According to the invention, the actuator of the lens system comprises two ring–shaped permanent magnets (75, 77) which, viewed parallel to the optical axis, are secured next to one another to a ring–shaped magnetic closing yoke (79) which is secured to a housing (57) of the lens system, and two ring–shaped electric coils (81, 83), which are secured to a ring–shaped holder (59) of one of the lenses of the lens system, said magnets being magnetized in mutually opposite radial directions relative to the optical axis, and said coils being arranged, viewed parallel to the optical axis, next to one another and opposite the two magnets, and being wound in mutually opposite directions. In this manner, the actuator of the lens system has a favorable ratio between its dimensions and its electromagnetic force, so that the dimensions and weight of the actuator necessary for obtaining a predetermined electromagnetic force can be limited.

