The invention relates to an optical scanning system consisting of a recording medium and an optical scanning device which scans the recording medium according to the triple-beam principle, the data tracks of the medium being wobbled in radial direction about their centre position with a mean frequency.

From EP-A 0 256 984 a recording medium in disc form is known, the data tracks of which are wobbled about a mean frequency. Therefore the data tracks follow a sinusoidal path. The advantage of this special form of data tracks lies in the fact that they are capable of carrying additional information, for example, information concerning position. However, it must be considered a disadvantage that tracking becomes more difficult due to the wobbled data track. Therefore great demands are imposed on the tracking control circuit.

From DE-A 34 10 589 it is known to scan an optical recording medium with three light beams. The centre beam is directed exactly onto the centre of the track while the front and the back beam are displaced from the track centre by the same distance but in different directions. The central beam is generated by a first laser while the front and the back beams are generated by a second laser with a different wavelength. All three beams are focussed onto the disc united by a prismatic beam splitter. The centre beam is used to read the data from the optical recording medium while the front and the back beam serve for the tracking.

In Electronic Components & Applications, Vol. 6, No. 4, 1984, on pages 209 to 215, in the article "An integrated approach to CD-players" by J. Nijof, an optical scanning device is described operating according to the triple-beam principle.

The light beam generated by one laser is sub-divided by means of an optical diffraction grating, into the main beam, the +1 order diffracted beam and the -1 order diffracted beam. By means of an objective lens the three beams are focussed onto an optical recording medium - for example, a compact disc - which reflects the main beam onto a four-quadrant photodetector and each first order diffracted beam onto a respective photodetector. The main beam reads the data from the recording medium while the first order diffracted beams serve for the tracking.

Now, it is the object of the invention to achieve, with an optical scanning system according to the preamble of the main claim, a precise tracking by means of a simple tracking control circuit despite wobbled data tracks on the recording medium.

The invention solves this task in that the spacing between

the +1 order diffraction beam and the -1 order diffraction beam, which generate the tracking error signal, on the recording medium is an odd integral multiple of one half the wavelength corresponding to the mean frequency.

Figure 1 shows a disc with a wobbled data track;

Figure 2 shows the position of the light beams on the wobbled data track.

Figure 2 shows a wobbled data track S on a recording medium CD. The data are scanned with the main light beam L1. The spacing between the +1 order and -1 order diffracted beams, which generate the tracking error signal, is an odd integral multiple of T/2, T being the wavelength corresponding to the mean frequency. The two diffracted beams are designated L2 and L3. The width of the data track is approximately 1μ, while the amplitude of the sinusoidal data track is only about 30 nm.

In that case the spacing of the two diffracted beams L2 and L3 is an odd integral multiple of half the wavelength T of the sine curve, the light intensity of the reflected +1 order diffracted beam L2 changes in a manner synchronised with the intensity of the -1 order diffracted beam L3. Therefore the tracking error signal, which is generated from the electrical signals generated by the diffracted beams L2 and L3 reflected from the recording medium, is no longer modulated by the sinusoidal data track. Consequently, as disturbances caused by the wobbling of the data track no longer appear in the tracking control circuit, the tracking control circuit can be constructed just as simply as for a recording medium without wobbled tracks. No higher demands are imposed on the tracking control circuit.



CLAIM

An optical scanning system consisting of a recording medium (CD) and an optical scanning device, which scans the recording medium (CD) according to the triple-beam principle, the data tracks (S) of the medium being wobbled in radial direction their centre position with a mean frequency, characterised in that the spacing between the +1 order diffraction beam and the -1 order diffraction beam (L2, L3), which generate the tracking error signal, on the recording medium (CD) is an odd integral multiple of one half the wavelength corresponding to the mean frequency.





