

HIGH-RESOLUTION, COMPACT INTRACAVITY LASER SPECTROMETER

ABSTRACT OF THE DISCLOSURE

In accordance with the present invention, a high-resolution, compact spectrometer is provided for dispersing wavelengths λ of an incoming beam for detection by a detector. The spectrometer comprises: (a) an entrance slit through which the incoming beam passes; (b) a first mirror for collimating the beam from the entrance slit; (c) a first reflectance grating for dispersing the collimated beam to form a beam having a spectral intensity distribution, the first reflectance grating having a number of grooves N_1 ; (d) a second reflectance grating for further dispersing the collimated beam, the second reflectance grating having a number of grooves N_2 ; and (e) a second mirror for focusing the collimated and dispersed beam, wherein the spectrometer has a substantially symmetrical construction. The symmetrical construction of the spectrometer doubles the resolution and dispersion of the gratings. The compact and high-resolution imaging spectrometer is capable of measuring the absorption lines of gases in high sensitivity gas sensors with an intracavity cell.

20 (Fig 2)