

(11) (21) (C) **2,026,327**
(22) 1990/09/27
(43) 1991/03/28
(45) 2000/08/22

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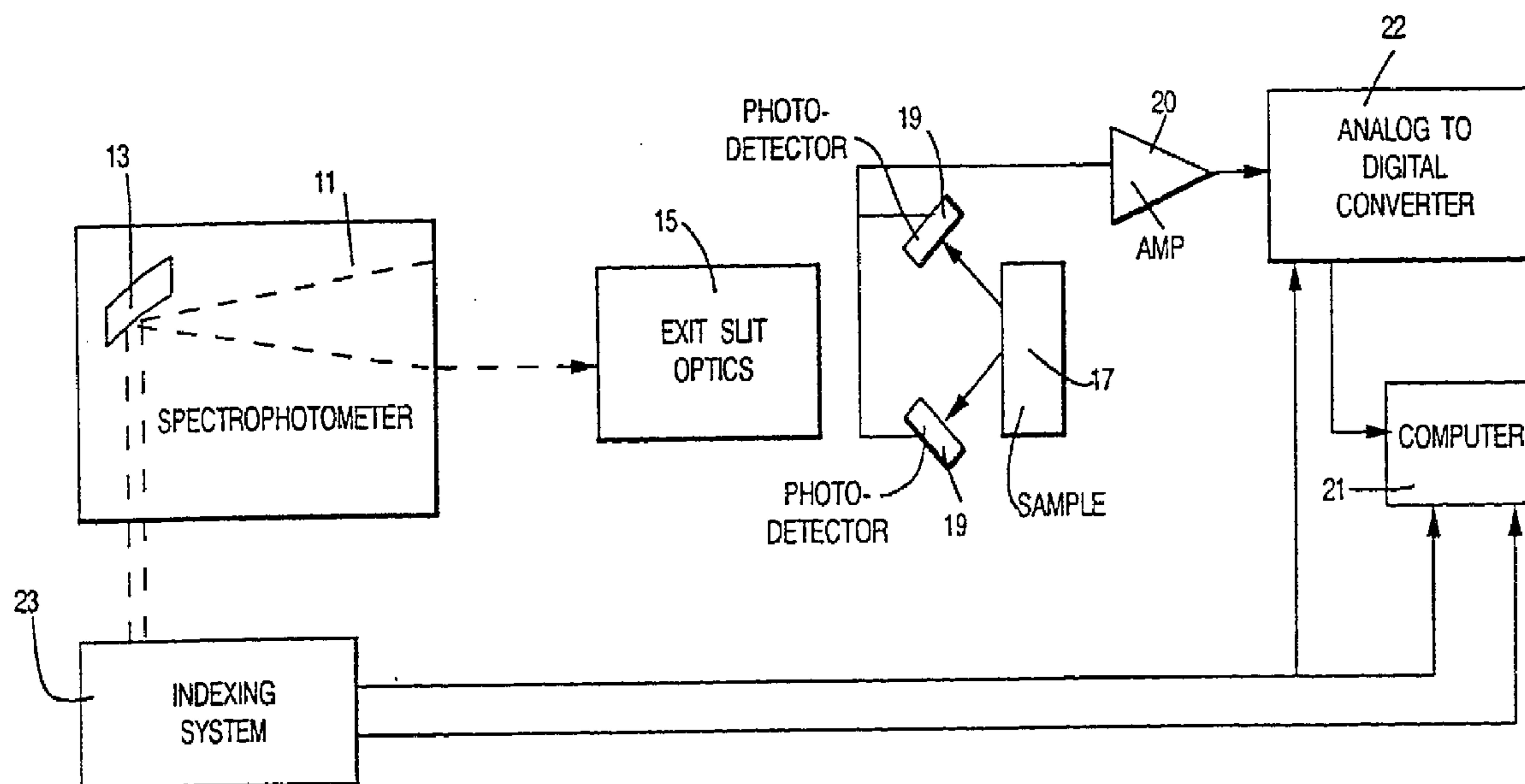
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(51) Int.Cl.⁵ G01J 3/28

(30) 1989/09/27 (413,063) US

(54) **SPECTROPHOTOMETRE AVEC CORRECTION DE LA
DISTORTION PAR BALAYAGE RAPIDE**

(54) **SPECTROPHOTOMETRIC INSTRUMENT WITH RAPID
SCANNING DISTORTION CORRECTION**



(57) In a spectrophotometric instrument, a system is provided to correct for distortion caused by rapid scanning of the spectrum. In the instrument, photodetectors detect light energy which is scanned through a spectrum at a rapid rate. An amplifier amplifies the output signal generated by the photodetectors. The output signal of the amplifier is sampled at increments and the samples are converted to digital values. A first derivative is determined from the digital values by subtracting from each value the value from the preceding increment. The first derivative values are multiplied times a constant selected to correct for the distortion and the resulting product values are added to the amplitude digital values to provide a set of corrected values representing the intensity detected by the photo-detectors.

Abstract of the Disclosure

In a spectrophotometric instrument, a system is provided to correct for distortion caused by rapid scanning of the spectrum. In the instrument, 5 photodetectors detect light energy which is scanned through a spectrum at a rapid rate. An amplifier amplifies the output signal generated by the photodetectors. The output signal of the amplifier is sampled at increments and the samples are converted to 10 digital values. A first derivative is determined from the digital values by subtracting from each value the value from the preceding increment. The first derivative values are multiplied times a constant selected to correct for the distortion and the 15 resulting product values are added to the amplitude digital values to provide a set of corrected values representing the intensity detected by the photodetectors.

fully set forth in the above mentioned Webster Patent No. 4,040,747.

5 In the oscillating grating type instruments, such as those disclosed in the above mentioned Landa patent and McGee application, the narrow bandwidth of light, which is transmitted through the exit slit illuminates a sample to be analyzed. Light reflected from the sample is detected by photodetectors and the resulting photodetector signal is amplified and then converted
10 to a sequence of digital values, each representing the energy reflected at an incremental point distributed along the spectrum being scanned as the grating oscillates. The digital values are applied to a computer, where they are received and are used to
15 analyze the sample such as to determine the oil, protein, and water content of a grain sample.

A limit on how fast a spectrum can be scanned over the photodetector is determined by the response time of the photodetectors and the amplifier connected
20 to amplify the output signal from the photodetectors. When the spectrum is scanned too rapidly, the output signal of the amplifier will fail to reach its equilibrium value at each incremental point at which the output value is converted to a digital value. As
25 a result, the digital values received by the computer will be distorted and will fail to accurately represent the reflected energy from the sample at each increment of the spectrum at which the output signal from the amplifier is converted to a digital value.

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