propagates along the zeroth-order beam path 308. If a drive signal is not applied from the second RF driver 318, then the laser energy incident upon the AO cell of the second AOD 304 simply propagates along the zeroth-order beam path 308.

[0029] Generally, when an AOD is driven in response to an applied drive signal, the ratio of optical power diffracted into the first-order beam path 112 vs. a zeroth-order beam path is determined by the amplitude of RF power in the applied drive signal and, in some cases, the frequency of the RF power in the applied drive signal. Furthermore, the amount of optical power diffracted into the first-order beam path 112 will increase with increasing RF power, until it reaches a maximum at some saturation level of RF power. The act of setting or otherwise modulating the amplitude of the RF power in a drive signal to be applied to the AOD is referred to herein as "amplitude modulation control." The act of setting or otherwise adjusting the amount of optical power diffracted into the first order beam path 112 can be considered as setting or adjusting the "transmission" of the AOD.

[0030] In embodiments where an AOD includes multiple transducers, the transmission of the AOD may also be adjusted by applying a drive signal to each of the transducers, wherein the RF frequency of each applied drive signal is the same, but is slightly out of phase with each other drive signal. As a result, Bragg angle error is adjusted by the phase offset between the RF signals, so that AOD transmission is controlled without modifying average RF power within the AO cell. The act of selecting or otherwise modulating the phase relationship of drive signals to be applied to different transducers of a common AOD is referred to herein as "phase modulation control." It should be noted, however, that phase modulation control cannot be used to completely prevent optical power from diffracted into the first order beam path 112.

[0031] By successively driving the first AOD 302 and second AOD 304 (e.g., during a workpiece processing period) using drive signals of different frequencies, the AOD scanning system 300 can be operated to rapidly deflect the first-order beam path 112" to different positions within a two-dimensional scan field that is projectable onto the workpiece 102 by the scan lens 108. During the workpiece processing period, one or both of the first AOD 302 and the second AOD 304 can be driven using amplitude modulation control and/or phase