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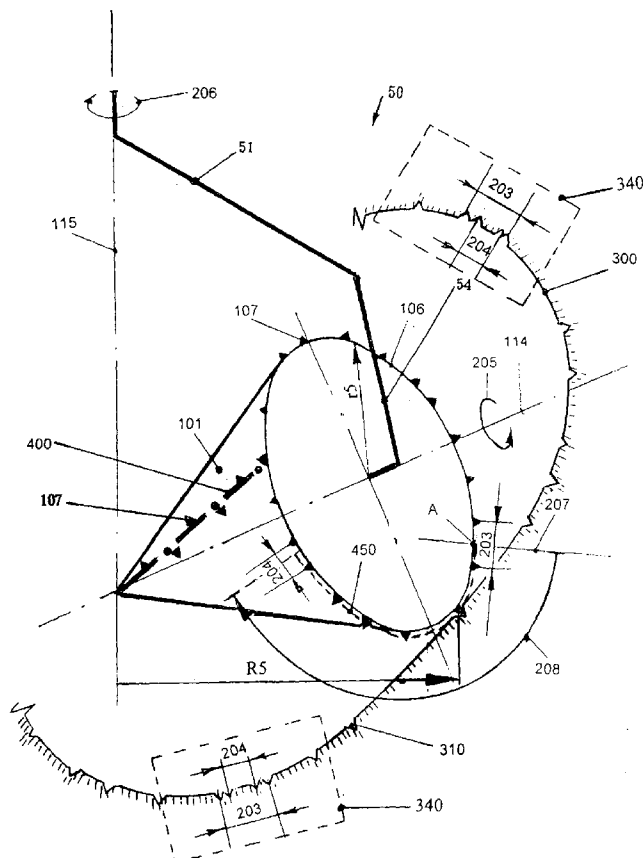
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[Continued on next page]

- (54) Title:** ANTI-TRACKING EARTH BORING BIT WITH SELECTED VARIED PITCH FOR OVERBREAK OPTIMIZATION AND VIBRATION REDUCTION



- (57) Abstract:** An earth boring drill bit is constructed having rotatable cutter for forming a borehole in earth. At least one circumferential row of cutting elements is optimized to create overbreak of rock and eliminate tracking, wherein selected pitches have mathematically determined pairs and the absolute difference between the selected pitch and its pair is greater than 10 % of the difference between maximum and minimum pitch for that circumferential row. Furthermore, cutting elements are placed along pre-selected generatrices with deviated from said generatrices, which is less than half the maximum pitch of circumferential rows occupied by said cutting element. The present invention eliminates tracking and reduces detrimental axial resonance frequency vibration while reducing cutting element count, including tungsten - carbide inserts, as compared to conventional roller cutter drill bits used for oil, gas and shot hole drilling wells and simultaneously increases footage drilled, drilling speed, and durability.



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