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(54) Title: ROTARY CONE DRILL BIT WITH TRUNCATED ROLLING CONE CUTTERS AND DOME AREA CUTTER INSERTS

(57) Abstract

A drill bit (10) includes at least two truncated conical cutter assemblies (20) rotatably coupled to support arms (18). The truncated conical cutter assemblies (20) are frusto-conical or conical frustums in shape, with a back face (60) connected to a flat truncated face (22, 62) by conical sides. Primary cutting elements (24) are arranged in a predetermined pattern on the flat truncated face (22, 62). The teeth (26) of the cutter assemblies (20) are spaced from cutting elements (24) of other cutter assemblies (20). The primary cutting elements (24) cut around a conical core rock formation (40) in the center of the borehole, which acts to stabilize the cutter assemblies (20) and urges them outward to cut a full-gage borehole. Secondary cutting elements (52) are mounted in the downward surfaces of a dome area (50). The secondary cutting elements (52) cut down the free-standing core (42) when the bit (10) advances.

