grip using hydraulically actuated tongs requires the use of a rotating hydraulic coupling, which represents a potential point of failure and/or safety concern. In cases where multiple rotations without releasing grip are driven by co-mounted electric motors, the use of commutator rings and bushings provide a relatively bulky rotating assembly that may present safety and maintenance issues.

[0007] Accordingly, there remains a need in the art for systems and methods for facilitating the connection and disconnection of pipe sections, which overcome some of the foregoing difficulties while providing more advantageous overall results.

BRIEF SUMMARY OF THE DISCLOSURE

[0007a] According to an aspect of the present invention, there is provided a clamping system for making and breaking threaded connections between a first tubular and a second tubular, the system comprising: a clamp assembly for gripping and rotating the first tubular relative to the second tubular, the clamp assembly having a central axis and including a first cam gear, a first plurality of clamp members disposed within the first cam gear, and a torque gear; wherein the first cam gear has a radially inner surface comprising a plurality of circumferentially adjacent concave recesses defining a plurality of circumferentially adjacent cam surfaces, wherein one clamp member of the first plurality of clamp members is disposed in each recess of the first cam gear; wherein each clamp member is pivotally coupled to the torque gear; wherein each clamp member is configured to pivot between a withdraw position radially spaced apart from the first tubular and a gripping position engaging the first tubular; a clamp actuator for operating the clamp assembly, the clamp actuator having a central axis and including a mounting shaft, a first clamp drive gear rotatably coupled to the mounting shaft and a torque drive gear rotatably coupled to the mounting shaft; wherein the first clamp drive gear engages the first cam gear and is configured to rotate the first cam gear and wherein the torque drive gear engages the torque gear and is configured to rotate the torque gear.

[0008] These and other needs in the art are addressed in one embodiment by a clamping system for making and breaking threaded connections between a first tubular and a second tubular. In an embodiment, the clamping system comprises a clamp assembly for gripping and rotating the first tubular relative to the second tubular. The clamp assembly has a central axis and includes a first cam gear, a first plurality of clamp members disposed within the first cam gear, and a torque gear. The first cam gear has a radially inner surface comprising a plurality of circumferentially adjacent concave recesses defining a plurality of circumferentially adjacent cam surfaces. One clamp member of the first plurality of clamp

members is disposed in each recess of the first cam gear. Each clamp member is pivotally coupled to the torque gear. Each clamp member is configured to pivot between a withdraw position radially spaced apart from the first tubular and a gripping position engaging the first tubular. In addition, the clamping system comprises a clamp actuator for operating the clamp assembly. The clamp actuator has a central axis and includes a mounting shaft, a first clamp drive gear rotatably coupled to the mounting shaft and a torque drive gear rotatably coupled to the mounting shaft. The first clamp drive gear engages the first cam gear and is configured to rotate the first cam gear and wherein the torque drive gear engages the torque gear and is configured to rotate the torque gear.

[0009] These and other needs in the art are addressed in another embodiment by an actuator for operating a clamp assembly. In an embodiment, the actuator comprises a mounting shaft having a central axis, wherein the mounting shaft is rotationally fixed relative to the central axis. In addition, the actuator comprises a first planetary gear set rotatably coupled to the mounting shaft. Further, the actuator comprises a second planetary gear set rotatably coupled to the mounting shaft. Each planetary gear set includes an annular ring gear, a plurality of