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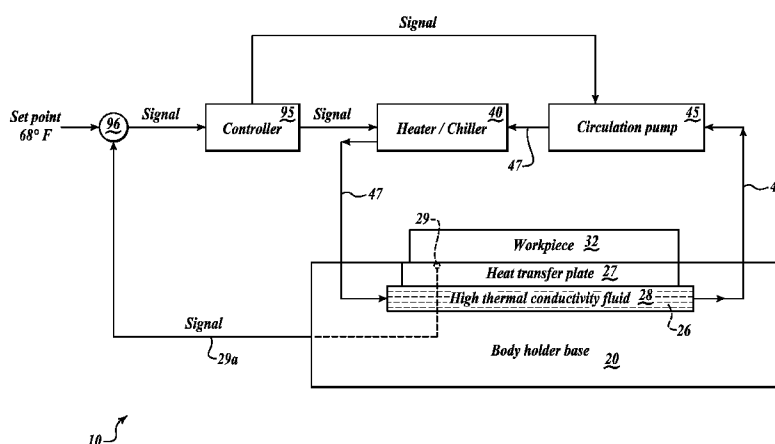
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- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))
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(54) Title: APPARATUS, SYSTEMS AND METHODS FOR WORK PIECE ISOTHERMAL DRY MACHINING AND ASSEMBLY FIXTURES



(57) Abstract: Isothermal work piece holding system uses vibration-damping, low thermal conductivity, low TCE polymer-composite holding body(ies) to damp machine tool vibration and chatter while accurately, rigidly maintaining the work piece in position by vacuum and/or mechanical clamps during machining. Cooling fluid channels having high thermal conductivity plates in contact with the work piece transfer thermal energy to/from it to maintain it isothermal during machining, inspection and assembly, eliminating dimensional changes and increasing process repeatability. Minimizing chatter reduces cycle time and improves surface finish which eliminates manual re-work. The system employs vacuum and coolant fluid pumps, heater/cooler(s), temperature sensor(s) and controller(s) to achieve highly accurate dimensional tolerances machining of parts which reduces error stack-up and assembly costs. Isothermal fixtures are disclosed for assembling parts and automated rivet settings in precise locations with reduced use of shims. The inventive isothermal system is applicable to control of TCE/IR effects in linear induction motors.