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(54) **Methods of thermo-mechanically processing tool steel and tools made from thermo-mechanically processed tool steels**

(57) A method of thermo-mechanically processing a preform (64) composed of tool steel and a tool (18) to modify a workpiece (28). The preform (64) has a region containing austenite. The method comprises establishing the region at a process temperature between a martensitic start temperature and a stable austenitic temperature. While at the process temperature, the region is deformed to change an outer dimension and to modify the microstructure to a depth of 1 millimeter or more. The tool (18) comprises a member (20) composed of tool steel. The member (20) includes a first region (30) that extends from the outer surface (22) to a depth of greater than 1 millimeter and a second region (32). The first region (30) includes a plurality of grains having an average misorientation angle greater than about 34°, an average grain size that is at least 10% smaller than the second region (30), and has a different grain orientation than the second region (30).

EP 2 090 383 A8

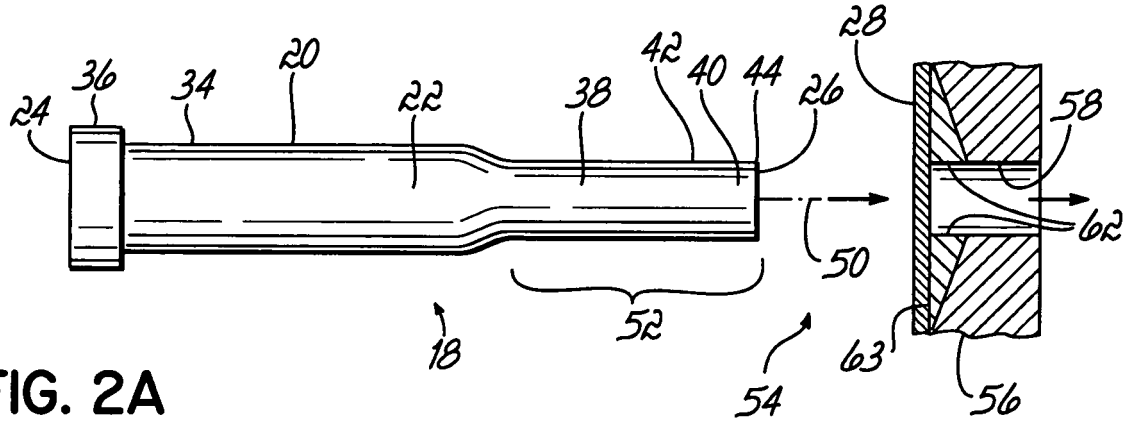

FIG. 2A