

EARTH-BORING BITS

ABSTRACT

The present invention relates to compositions and methods for forming a bit body for an earth-boring bit. The bit body may comprise hard particles, wherein the hard particles comprise at least one carbide, nitride, boride, and oxide and solid solutions thereof, and a binder binding together the hard particles. The binder may comprise at least one metal selected from cobalt, nickel, and iron, and, optionally, at least one melting point reducing constituent selected from a transition metal carbide in the range of (30) to (60) weight percent, boron up to (10) weight percent, silicon up to (20) weight percent, chromium up to (20) weight percent, and manganese up to (25) weight percent, wherein the weight percentages are based on the total weight of the binder. In addition, the hard particles may comprise at least one of (i) cast carbide (WC + W₂C) particles, (ii) transition metal carbide particles selected from the carbides of titanium, chromium, vanadium, zirconium, hafnium, tantalum, molybdenum, niobium, and tungsten, and (iii) sintered cemented carbide particles.

Figure 1