In another aspect of the disclosure, there is provided a cobalt-based alloy resistant to high speed/self-coupled sliding wear consisting essentially of:

0.4546 to 1.2054 wt.% nickel,
0.101 to 0.149 wt.% nitrogen,
25.31 to 28.39 wt.% chromium,
4.04 to 5.12 wt.% molybdenum,
1.79 to 2.87 wt.% tungsten,
1.93 to 4.01 wt.% iron,
0.586 to 1.094 wt.% manganese,
0.03 to 0.51 wt.% silicon,
0.041 to 0.089 wt.% carbon, and
0.0346 to 0.1854 wt.% aluminum, and
the balance cobalt plus impurities.

We have discovered that a wrought, low-nickel derivative of the commercial example of the alloy disclosed in United States Patent No. 5,002,731 possesses extraordinary resistance to high speed sliding wear, when self-coupled, relative to the original material and to a material with an intermediate nickel content. The influence of nickel is non-linear, and therefore counter to the current theories of cobalt-based alloy metallurgy and tribology (i.e. science of wear). This extraordinary property was achieved at a nickel content of approximately 0.83 wt.% and a

We claim:

1. A cobalt-based alloy resistant to high speed/self-coupled sliding wear consisting essentially of 0.83 wt.% nickel, 0.125 wt.% nitrogen, 26.85 wt.% chromium, 4.58 wt.% molybdenum, 2.33 wt.% tungsten, 2.97 wt.% iron, 0.84 wt.% manganese, 0.27 wt.% silicon, 0.065 wt.% carbon, and 0.11 wt.% aluminum, and the balance cobalt plus impurities wherein the alloy has a coefficient of friction between 0.2 and 0.3 at a load of 20N when tested using a pin-on disk method of ASTM Standard G99.

2. The alloy of claim 1 wherein the alloy is in a form selected from the group consisting of plates, sheets, bars, tubes, wires, billets, castings, weldments, weld overlays, and powder products.

3. A cobalt-based alloy resistant to high speed/self-coupled sliding wear consisting essentially of:

0.4546 to 1.2054 wt.% nickel,

0.101 to 0.149 wt.% nitrogen,

25.31 to 28.39 wt.% chromium,

4.04 to 5.12 wt.% molybdenum,

1.79 to 2.87 wt.% tungsten,

1.93 to 4.01 wt.% iron,

0.586 to 1.094 wt.% manganese,

0.03 to 0.51 wt.% silicon,

0.041 to 0.089 wt.% carbon, and

0.0346 to 0.1854 wt.% aluminum, and

the balance cobalt plus impurities.

4. The alloy of claim 3 wherein the alloy is in a form selected from the group consisting of plates, sheets, bars, tubes, wires, billets, castings, weldments, weld overlays, and powder products.