## CLAIMS

1. A perpendicular magnetic recording medium comprising a non-magnetic substrate and a magnetic recording layer, wherein

the magnetic recording layer has a granular structure that includes magnetic crystal grains and a non-magnetic crystal grain boundary that surrounds the magnetic crystal grains, and

the magnetic crystal grains contain an ordered alloy, and the non-magnetic crystal grain boundary ~~contains Ge oxides~~. consists of $GeO_2$

2. The perpendicular magnetic recording medium according to claim 1, wherein

the non-magnetic crystal grain boundary further contains at least one selected from the group consisting of Mn oxides, Si oxides, Al oxides, Zn oxides, B oxides, and Ti oxides.

3. The perpendicular magnetic recording medium according to claim 1 or 2, wherein

the magnetic crystal grains contain a $L1_0$-based ordered alloy.

4. The perpendicular magnetic recording medium according to claim 3, wherein

the $L1_0$-based ordered alloy contains Fe and Pt.

5. The perpendicular magnetic recording medium according to claim 4, wherein

the $L1_0$-based ordered alloy further contains at least one element selected from the group consisting of Ni, Mn, Cr, Cu, Ag, and Au.

6. A perpendicular magnetic recording medium comprising a non-magnetic substrate, a first magnetic recording layer, and a second magnetic recording layer which are formed in this order, wherein

the first magnetic recording layer has a granular structure that includes first magnetic crystal grains and a first non-magnetic crystal grain boundary that surrounds the first magnetic crystal grains, the first magnetic crystal grains contain an ordered alloy, and the first non-magnetic crystal grain boundary contains C, and

the second magnetic recording layer has a granular structure that includes second magnetic crystal grains and a second non-magnetic crystal grain boundary that surrounds the second magnetic crystal grains, the second magnetic crystal grains contain an ordered alloy, and the second non-magnetic crystal grain boundary ~~contains Ge oxides~~. consists of $GeO_2$

7. The perpendicular magnetic recording medium according to claim 6, wherein

the second non-magnetic crystal grain boundary further