Claims:

1. A magnetic encoder for a miniature four-wheel driver control comprising:

a conventional disk shaped permanent axial magnet having a first end, a second end and a continuous sidewall between said first end and second end, said disk shaped permanent axial magnet is bisected between said first end and said second end such that said continuous sidewall consists of a north pole and a south pole;

a magnet holder having a cavity to receive said disk shaped permanent magnet, said cavity; and

a sensing element position apart from said magnet holder and facing an exposed portion of said north and south poles of said disk shaped permanent axial magnet, wherein said disk shaped permanent axial magnet has a longitudinal axis running through said first end and said second end, said magnet holder and said sensing element share a longitudinal axis that is perpendicular to said longitudinal axis of said disk shaped permanent axial magnet.

~~2. The magnetic encoder according to claim 1 wherein said permanent axial magnet has a longitudinal axis running through said north pole and said south pole, said magnet holder and said sensing element share a longitudinal axis that is perpendicular to said longitudinal axis of said permanent axial magnet.~~

2~~a~~. The magnetic encoder according to claim 1 wherein said magnet holder and said sensing element share a longitudinal axis, and said permanent axial magnet has a longitudinal axis running through said north pole and said south pole that is arranged at an angle between 70 to 110 degrees to said longitudinal axis of said magnet holder and said sensing element.

3. The magnetic encoder according to any of claims 1, and 2 ~~and 2a~~ wherein a portion of said cavity is adapted to mate with a portion of said permanent axial magnet.

4. A moving object comprising a base and a magnetic encoder according to any of claims 1-3, wherein said magnetic encoder is arranged on said base to monitor the movement of the moving object.

5. A miniature two axes four-wheel drive control for an object comprising:

a base;

a first driver having:

a first wheel assembly;

a second wheel assembly;

a motor assembly for driving said second wheel assembly,

a~~n~~ magnetic encoder ~~assembly~~according to claim 1 arranged between said first and second wheel assemblies; and

a frame for holding said first wheel assembly, said second wheel assembly, said motor assembly, and said encoder assembly;

a second driver identical to said first driver; and

a controller for controlling a movement of said object, wherein in use, said motor assembly drives said second wheel assembly which causes said encoder assembly to cause said first wheel assembly to move.

6. The miniature two axes four-wheel drive control according to claim 5 wherein said frame comprises a pair of eyelets for securing said frame to said base.

7. The miniature two axes four-wheel drive control according to any of claims 5-6 wherein said first driver and said second driver are diagonally arranged apart from each other.

~~8. The miniature two axes four-wheel drive control according to any of claims 4-7 wherein said encoder assembly comprises:~~

~~a permanent axial magnet having a north pole and a south pole;~~

~~a magnet holder having a cavity to receive said permanent magnet; and~~

~~a sensing element secured to said base and position apart from said magnet holder and facing a portion of said permanent axial magnet, wherein said sensing element is facing an exposed portion of both north and south poles of said permanent axial magnet.~~

~~9. The miniature two axes four-wheel drive control according to claim 8 wherein said permanent axial magnet has a longitudinal axis running through said north pole and said south pole, said magnet holder and said sensing element share a longitudinal axis that is perpendicular to said longitudinal axis of said permanent axial magnet.~~

~~10. The miniature two axes four-wheel drive control according to any of claims 8-9 wherein a portion of said cavity of said magnet holder is adapted to mate with a portion of said permanent axial magnet.~~

~~11. The miniature two axes four-wheel drive control according to any of claims 8-10 wherein said encoder assembly further comprises:~~

~~a bearing having a bearing mechanism, a flange and a through opening; and~~

~~a pinion having a through opening.~~

12. The miniature two axes four-wheel drive control according to claim 11 wherein said magnet holder comprises an extension having a first portion for receiving said through opening of said bearing and a second portion for receiving said through opening of said pinion.

13. The miniature two axes four-wheel drive control according to claim 12 wherein said second portion of said extension of said magnet holder is diametrically smaller than said first portion of said extension of said magnet holder.

14. The miniature two axes four-wheel drive control according to claim 12 further comprises a first locking mechanism to securing said bearing, said pinion, said magnet holder to said frame.

15. The miniature two axes four-wheel drive control according to claim 14 wherein said first wheel assembly comprises:

a bearing having a bearing mechanism, a flange and a through opening;

a gear having teeth around a perimeter of said gear and an extension;

a rim having an insert adapted to receive said extension of said gear, a flange and a through opening adapted to receive said bearing; and

a second locking mechanism for securing said bearing, said gear, and said rim to said frame.

16. The miniature two axes four-wheel drive control according to claim 15 wherein said motor assembly comprises:

a motor having a shaft; and

a pinion connected to said shaft.

~~17. The miniature two axes four-wheel drive control according to claim 16 wherein said second wheel assembly comprises:~~

~~a bearing having a bearing mechanism, a flange and a through opening;~~

~~a gear having inner teeth engagably connectable to said teeth of said pinion of said motor assembly and outer teeth engagably connectable to said teeth of said pinion of said encoder assembly;~~

~~a rim having an insert adapted to receive said extension of said gear, a flange and a through opening adapted to receive said bearing; and~~

~~a third locking mechanism for securing said bearing, said gear, and said rim to said frame.~~