Claims

1. A cathode arc source comprising:

a station for a cathode target;

a first magnetic field source arranged for location above the target station;

a second magnetic field source arranged for location below the target station; and

a third magnetic field source arranged for location between the first and second magnetic field sources and configured to have an opposite polarity to the first magnetic field source;

characterised in that the cathode arc source is configured for the resultant magnetic field from the first, second and third magnetic field sources to have zero field strength in a direction substantially normal to the target station at a position of up to 10cm above the target.

2. A cathode arc source according to claim 1 wherein the cathode arc source is configured for the resultant magnetic field from the first, second and third magnetic field sources to have zero field strength in a direction substantially normal to the target station at a position of up to 8cm above the target.

3. A cathode arc source according to claim 1 or claim 2 wherein the second magnetic field source is configured to have an opposite polarity to the first magnetic field source.

4. A cathode arc source according to any one of claims 1 to 3 wherein the first, second and/or third magnetic field sources are magnetic field generating coils.

5. A cathode arc source according to any one of claims 1 to 4 wherein the strength of at least one of the first, second and third magnetic field sources are adjustable.

6. A cathode arc source according to claim 5 wherein the strengths of at least two of the first, second and third magnetic field sources are adjustable.

7. A cathode arc source according to any one of claims 1 to 6 wherein the strength of the first, second and third magnetic field sources are all adjustable.

8. A cathode arc source according to any one of claims 1 to 7 wherein the first and third magnetic field sources are magnetic field generating coils and the second magnetic field source is a permanent magnet.

9. A cathode arc source according to any one of claims 1 to 8 wherein the cathode arc source is configured such that the distances of at least one of the first, second and third magnetic field sources either above or below the target are adjustable.

10. A cathode arc source according to claim 9 wherein the cathode arc source is configured such that the distances of at least two of the first, second and third magnetic field sources either above or below the target are adjustable.

11. A cathode arc source according to any one of claims 1 to 10 wherein the cathode arc source is configured such that the distances of the first, second and third magnetic field sources above or below the target are all adjustable.

12. A cathode arc source according to any one of claims 1 to 11, comprising a carbon target.

13. A cathode arc source according to any one of claims 1 to 11, comprising a metal target or an alloy target.

14. A method of depositing a coating on a substrate, comprising generating positive ions from a target in a cathode vacuum arc source according to any one of claims 1 to 13, and depositing the ions onto the substrate, wherein the target is a metal other than aluminium, chromium or titanium.

15. A method according to claim 14, wherein the target comprises copper or nickel.

16. A method according to claim 14 or 15, wherein the coating is deposited using a cathode arc source according to any of claim 1 to 13.

17. A substrate coated with a metallic coating, wherein the coating is deposited by FCVA using a cathode arc source according to any one of claims 1 to 13.

18. A coated substrate according to claim 17, comprising a FCVA-deposited coating comprising copper.

19. A coated substrate according to claim 17 or 18, comprising a FCVA-deposited coating comprising nickel.