powder from the surface of the identified particles such that ferrosilicon powder particles may be recovered.

It is noted that in the method for separation, the identifier may also be a human that identifies the particles to be separated and marks them with a marker.

In view of the above, in accordance with a first aspect, there is provided a separation apparatus, comprising: an identifier arranged to identify the particles in a group of particles that have a specific property; an affinity modifier arranged to modify an affinity of the identified particles relative to that affinity of non-identified particles in an group; a separator arranged to separate the particles in the group based on their difference in the affinity; wherein: the affinity modifier modifies the affinity of the identified particles by applying affinity modifying particles to the identified particles; and the affinity modifying particles comprise liquid droplets to moisturize the identified particles to form a moisture bridge between the identified particles and the separator. The separator has a contact surface coated with hydrophilic material onto which identified particles are affixed thereon.

In accordance with a second aspect, there is provided a method for separation of particles from a group of particles, comprising the steps of: supplying an group of particles in an arrangement, wherein the group of particles comprises particles with different properties; identifying particles in the group of particles that have a specific property; modifying an affinity of the identified particles relative to that affinity of non-identified particles in the group with an affinity modifier; separating the particles in the group based on their difference in the affinity with a separator; wherein: the affinity modifier modifies the affinity of the identified particles by applying affinity modifying particles to the identified particles; and the affinity modifying particles comprise liquid droplets to moisturize the identified particles to form a moisture bridge between the identified particles and the separator. The separator has a contact surface coated with hydrophilic material onto which identified particles are affixed thereon.

Claims

1. A separation apparatus, comprising:

- an identifier arranged to identify the particles in a group of particles that have a specific property;

- an affinity modifier arranged to modify an affinity of the identified particles relative to that affinity of non-identified particles in an group;

- a separator arranged to separate the particles in the group based on their difference in the affinity;

wherein:

- the affinity modifier modifies the affinity of the identified particles by applying affinity modifying particles to the identified particles;
- the affinity modifying particles comprise liquid droplets to moisturize the identified particles to form a moisture bridge between the identified particles and the separator; and
- the separator has a contact surface coated with hydrophilic material onto which identified particles are affixed thereon.

2. Apparatus according to claim 1, wherein the affinity modifying particles comprise water droplets.

3. Apparatus according to claim 1 or 2, further comprising a layerizer arranged to bring the group of particles in layer.

4. Apparatus according to claim 2 or 3, wherein the layerizer provides the particles in the layer with a known, preferably constant, spatial relation in the layer between the identifier and the affinity modifier.

5. Apparatus according to any one of the claims 2 to 4, wherein the layerizer comprises a conveyor belt surface on which the particles are deposited in a planar layer.

6. Apparatus according to any one of the preceding claims, wherein the identifier is an optical sensor.

7. Apparatus according claim 1, wherein the affinity modifying particles form a coating surface layer onto the identified particles.

8. Apparatus according to any one of the claims 6 or 7, wherein the affinity modifying particles further comprise powder particles.

9. Apparatus according to claim 8, wherein the powder particles comprise magnetic powder particles, preferably spherically shaped.

10. Apparatus according to claim 9, wherein the powder particles comprise industrial ferrosilicon.

11. Apparatus according to any one of the preceding claims, wherein the affinity modifier comprises a printer head.

12. Apparatus according to any one of the preceding claims, wherein the specific property is a type of material, color, shape and/or size.

13. Apparatus according to claim 1, wherein the hydrophilic material is fibrous.

14. Apparatus according to claim 1, wherein the separator has a contact surface onto which identified particles are affixed thereon and the contact surface comprises a magnet or at least is coated with a magnetizable layer.

15. Apparatus according to any one of the preceding claims, wherein the separator comprises a mechanical pick up device having a contact surface that contacts the group of particles for picking up the identified particles.

16. Apparatus according to any one of the preceding claims, wherein the separator comprises a drum.

17. Apparatus according to any one of the preceding claims, wherein the group of particles comprises small particles with a diameter size of 1-20 mm.

18. Method for separation of particles from a group of particles, comprising the steps of:

- supplying an group of particles in an arrangement, wherein the group of particles comprises particles with different properties;
- identify particles in the group of particles that have a specific property;
- modify an affinity of the identified particles relative to that affinity of non-identified particles in the group with an affinity modifier;
- separate the particles in the group based on their difference in the affinity with a separator;

wherein:

- the affinity modifier modifies the affinity of the identified particles by applying affinity modifying particles to the identified particles;
- the affinity modifying particles comprise liquid droplets to moisturize the identified particles to form a moisture bridge between the identified particles and the separator; and
- the separator has a contact surface coated with hydrophilic material onto which identified particles are affixed thereon.

19. Method according to claim 18, wherein the different properties are material, color, shape and/or size.