Claims

1. A separation apparatus, comprising:

- a layerizer arranged to bring a group of particles in a layer on a transport surface with a constant spatial relation of the particles relative to each other in the layer;

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

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

- an affinity modifier arranged to modify said affinity for identified particles relative to non-identified particles in the group; wherein

- the layerizer comprises a recirculating transport surface on which the particles of the layer are carried along a transport trajectory, wherein

- the transport surface is arranged as a rigid plane so as to limit movement of the particles transverse to the transport trajectory.

2. The separation apparatus of claim 1, wherein the transport surface is arranged to rotate.

3. The separation apparatus of claim 2, wherein the transport surface is a mantle surface, in particular a rotating mantle surface of a drum.

4. The separation apparatus according to any of claims 1-3, wherein the transport trajectory includes a particle delivery zone where the particles disengage the transport surface to become airborne and travel along a flight path to the separator.

5. The separation apparatus according to claim 4, wherein the particle delivery zone includes a part of the transport trajectory where the transport surface moves downward.

6. The separation apparatus according to any of claims 1-5, wherein the transport trajectory includes a particle pickup zone where the particles engage the transport surface.

7. The separation apparatus according to claim 6, wherein the particle pickup zone includes a part of the transport trajectory where the inside of the mantle surface passes along a zone were air pressure is arranged to be lower than at the outside of the transport surface, and where particles are sucked onto the transport surface by ambient air passing through apertures in the transport surface.

8. The separation apparatus according to any of the preceding claims, wherein the layerizer comprises a fluidized bed of particles that is maintained along a part of the transport trajectory, in particular at the pickup zone according to claims 6 or 7.

9. The separation apparatus according to any of the preceding claims, wherein the transport surface is provided with a plurality of apertures for passing air therethrough.

10. The separation apparatus according to any of the preceding claims, wherein the transport surface is a mantle surface that is arranged to rotate about a stationary support core of a drum.

11. The separation apparatus according to any of the preceding claims, wherein the transport trajectory includes an identification zone where the transport trajectory extends along the identifier.

12. The separation apparatus according to any of the preceding claims, wherein the separator comprises a catch surface on which identified particles in are caught, preferably a recirculating catch surface.

13. The separation apparatus according to claim 12, wherein the catch surface is a mantle surface that is arranged to rotate as a rigid plane.

14. The separation apparatus according to any of the preceding claims, wherein the affinity modifier modifies the affinity of the identified particles for the catch surface by applying affinity modifying particles to the

identified particles, in particular to increase the affinity between the identified particles and the catch surface.

15. The separation apparatus according to any of the claims 1-14, wherein the affinity modifier modifies the affinity of the catch surface for the identified particles by applying affinity modifying particles to the catch surface of the separator, in particular corresponding to that particles' position in the layer on the transport surface.

16. The separation apparatus according to claim 14 or 15, wherein the affinity modifying particles form a layer onto the identified particles or the catch surface.

17. The separation apparatus according to any of claims 14-16, wherein the affinity modifying particles include or are liquid droplets.

18. The separation apparatus according to claim 17, wherein the liquid droplets comprise water to form a moisture bridge between the identified particles and the separator.

19. The separation apparatus according to any one of the preceding claims, wherein the affinity modifier comprises a printer head.

20. The separation apparatus according to any one of the preceding claims, wherein the particles are plastic flakes

21. The separation apparatus according to any of the preceding claims, wherein the specific property is a type of material, color, shape and/or size.

22. Apparatus according to any one of the preceding claims, wherein the group of particles comprises small particles with dimensions in the range between 0.2 mm and 30 mm.

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

- providing a group of particles that comprises particles with different properties, e.g. material, color, shape and/or size;

-supplying the group of particles to a transport surface that moves along a transport trajectory as a rigid plane so as to bring the group of particles in a layer with a constant spatial relation on the transport surface;

- identifying particles in the group of particles that have a specific property;

- modifying an affinity between the identified particles and a separator relative to that affinity between non-identified particles and the separator using an affinity modifier;

- separating the particles in the group based on their difference in the affinity with the separator.

24. The method according to claim 23, further including

-casting the particles off the transport surface to become airborne and travel along a flight path to a catch surface of the separator.

25. The method according to claim 24, further including

- modifying the affinity of the identified particles by applying affinity modifying particles to the identified particles and/or the catch surface to increase the affinity between the identified particles and the catch surface.