Claims

1. Filter unit for filtration of solid particles from a suspension comprising:
   - a filter housing (10) comprising a filter chamber (13), a liquid distributor (50) at the end of at least one inlet (15) to the filter chamber (13) and a base (12) and a filter medium (11), wherein the filter chamber (13) and the base (12) are connected in the region of the filter medium (11) by a connection so as to seal against the surroundings and against the filter medium (11),
   - at least one outlet (14) on the base (12) of the filter housing (10).
2. Filter unit according to Claim 1, wherein the filter housing is made of plastic.
3. Filter unit according to either of Claims 1 or 2, wherein the filter housing is constructed entirely or in part as a plastics pouch.
4. Filter unit according to any one of Claims 1 to 3, wherein the filter medium is selected from a group consisting of one or more filter plate, cylindrical filter, candle or combination thereof.
5. Filter unit according to any one of Claims 1 to 4, wherein the filter chamber (13) and the base (12) are non-detachably connected.
6. Filter unit according to any one of Claims 1 to 5, wherein a liquid distributor with filter plate is used for liquid distribution.
7. Liquid distributor comprising a predistributor (56) connected to a distributor plate (54) by means of flexible tubular lines (52) of equal length and equal diameter, wherein the flexible tubular lines (52), with expansion and a gradient as continuous as possible, open out into vertical exit openings (53) of the distributor plate (54), characterized in that the exit openings (53) are arranged on concentric tracks.
8. Liquid distributor according to Claim 7, wherein the exit openings are arranged at a 60° arrangement and the same distances from one another, with a constant distance to the outer wall of the filter chamber, or are arranged with a best possible combination thereof.
9. Liquid distributor according to either of Claims 7 or 8, wherein each exit opening is connected to the predistributor (56) with the aid of an unbranched flexible tubular line (52).
10. System for filtration of solid particles from a suspension, comprising:
    - a crystallization tank (100) which is connected temporarily via lines to one or more reservoirs for crystallization and correction media (101) at one end and is temporarily

connected at the other to a filter unit according to any one of Claims 1 to 6, or to a plurality thereof in parallel and

- a mother liquor reservoir (110) which is temporarily connected via connections to the outlet (14) of the filter unit.

11. System according to Claim 10, comprising a drying unit, a moistening unit, or both.

12. System according to Claim 11, comprising a means for non-invasive agitation of the contents of the FDS unit selected from the group consisting of an orbital shaker or a vertical rotary-oscillating shaker.

13. Method for downstream processing of a solids suspension, comprising the following steps:

- filtration of the solids suspension in a single filter unit or filter unit connected in parallel according to any one of Claims 1 to 6 in a system according to any one of Claims 10 to 12;
- washing or medium change of the retained solids and optionally convection drying of the retained crystals by means of a drying gas;
- withdrawing the solids-filled filtration unit from the system;
- transporting and storing the solids-filled filtration unit and optionally reconstitution of the proteins by dissolution in the filter unit.

14. Method according to Claim 13, wherein the convection drying is carried out with a controllable temperature, volumetric flow rate or moisture content or with a combination thereof.

Claims

1. A protein crystal filter unit for filtration of solid protein particles from a suspension comprising:

a filter housing (10) comprising:

i) a filter chamber (13);

ii) a liquid distributor (50) at the end of at least one inlet (15) to the filter chamber (13);

iii) a base (12); and

iv) a filter medium (11), wherein the filter chamber (13) and the base (12) are connected in the region of the filter medium (11) by a connection so as to seal against the surroundings and against the filter medium (11), and

at least one outlet (14) on the base (12) of the filter housing (10).

2. The filter unit according to Claim 1, wherein the filter housing is made of plastics material.

3. The filter unit according to Claim 1 or Claim 2, wherein the filter housing is constructed entirely or in part as a plastics pouch.

4. The filter unit according to any one of Claims 1 to 3, wherein the filter medium is selected from a group consisting of one or more filter plate, cylindrical filter, candle or combination thereof.

5. The filter unit according to any one of Claims 1 to 4, wherein the filter chamber (13) and the base (12) are non-detachably connected.

6. The filter unit according to any one of Claims 1 to 5, wherein a liquid distributor with filter plate is used for liquid distribution.

7. A protein crystal filter liquid distributor comprising a predistributor (56) connected to a distributor plate (54) by means of flexible tubular lines (52) of equal length and equal diameter, wherein the flexible tubular lines (52), with expansion and a gradient as continuous as possible, open out into vertical exit openings (53) of the distributor plate (54), characterized in that the exit openings (53) are arranged on concentric tracks.

8. The distributor according to Claim 7, wherein the exit openings are arranged at a 60° arrangement and the same distances from one another, with a constant distance to the outer wall of the filter chamber, or are arranged with a best possible combination thereof.

9. The distributor according to Claim 7 or Claim 8, wherein each exit opening is connected to the predistributor (56) with the aid of an unbranched flexible tubular line (52).

10. A system for filtration of solid protein particles from a suspension, comprising:

a crystallization tank (100) which is connected temporarily via lines to one or more reservoirs for crystallization and correction media (101) at one end and is temporarily connected at the other to a filter unit according to any one of Claims 1 to 6, or to a plurality thereof in parallel; and

a mother liquor reservoir (110) which is temporarily connected via connections to the outlet (14) of the filter unit.

11. The system according to Claim 10, comprising a drying unit, a moistening unit, or both.

12. The system according to Claim 11, comprising a means for non-invasive agitation of the contents of the FDS unit selected from the group consisting of an orbital shaker or a vertical rotary-oscillating shaker.

13. A method for downstream processing of a protein solids suspension, comprising the following steps:

providing a protein solids suspension;

filtration of the solids suspension in a single filter unit or filter unit connected in parallel according to any one of Claims 1 to 6 in a system according to any one of Claims 10 to 12;

washing or medium change of the retained solids and optionally convection drying of the retained crystals by means of a drying gas;

withdrawing the solids-filled filtration unit from the system;

transporting and storing the solids-filled filtration unit and optionally reconstitution of the proteins by dissolution in the filter unit.

14. The method according to Claim 13, wherein the convection drying is carried out with a controllable temperature, volumetric flow rate or moisture content or with a combination thereof.