Claims

1. The use of single-layer or multilayer plastic web plates in an inclined channel solids separator containing a plate stack for retaining solids from a reactor mixture.

2. An inclined channel solids separator for retaining and recirculating solids from a reactor mixture, comprising the following elements:
   - an upper region of the solids separator having one or more feed-throughs/fittings (80) for removing a harvest stream (70) separated from the cells (=harvest) from a harvest stream collection region (56), connected to
   - a separation region formed by a plate stack (1) composed of single-layer or multilayer plastic web plates, which stack is tilted during operation at an angle (10) of from 30° to 80° with respect to the horizontal, connected to
   - a lower segment of the solids separator having one or more feed-throughs or fittings (84) for flow distribution of the reactor mixture (74), above
   - a solids collection region (57) which is downwardly tapered for collecting the cells by means of gravity.

3. The inclined channel solids separator as claimed in claim 2, wherein the solids collection region (57) is downwardly tapered in a conical or pyramidical manner.

4. The inclined channel solids separator as claimed in claim 2 or 3, wherein the solids collection region (57) has one or more feed-throughs (89) or fittings (88) for removing the solids.

5. The inclined channel solids separator as claimed in any of claims 2 to 4, which comprises at least one disposable sensor in the interior.

6. The inclined channel solids separator as claimed in any of claims 2 to 5, wherein the separation region consists of a multiplicity of channels arranged next to one another in the plate stack (1).

7. The inclined channel solids separator as claimed in any of claims 2 to 6, wherein the ratio of strut height to channel width hs/d is $0.01 \leq hs/d \leq 5$, with the restriction that the two dimensions hs and d are both greater than or equal to 3 mm.

8. The inclined channel solids separator as claimed in any of claims 2 to 7 comprising a gamma-sterilizable plastic bag (50) through which flow passes and, within the plastic bag (50):

- in the upper region of the plastic bag (50), the feed-throughs/fittings (80) for removing a harvest stream (70) separated from the solids from the harvest stream collection region (56),
- in the upper segment of a central region of the plastic bag (50), the separation region with plate stack (1) composed of single-layer or multilayer plastic web plates,
- in the lower segment of the central region of the plastic bag (50), the feed-throughs or fittings (84) having horizontal distributors (85) for uniform horizontal flow distribution of the cell culture solution (74) via an infeed surface area (510),
- in the lower region of the plastic bag (50), the solids collection region (57) which is downwardly tapered in a conical manner for collecting the solids by means of gravity.

9. The inclined channel solids separator as claimed in claim 8, wherein the channels have a channel length L of from 30% to 95% of a length LK of the plastic bag.

10. The inclined channel solids separator as claimed in either of claims 8 and 9, comprising a container for accommodating the solids separator, wherein the container has at least one interior for accommodating the solids separator, wherein said interior comprises walls matched to the shape of the solids separator by means of to the shape of the solids separator, the walls enclose the interior and demarcate it from the outside world, an opening for introducing the solids separator from above into the container.

11. The inclined channel solids separator as claimed in any of claims 2 to 7, wherein:

- the upper region of the solids separator is a collector having a harvest stream collection region (56), connected to
- a separation region formed by a plate stack (1) composed of single-layer or multilayer plastic web plates forms a web-plate base body, which is plugged into plug plates at the top and bottom and is connected to
- a lower segment of the solids separator having one or more feed-throughs or fittings (84) for flow distribution of the reactor mixture (74), above
- a solids collection region (57) which is downwardly tapered in a conical manner for collecting the cells by means of gravity,
- wherein the lower segment and the solids collection region (57) which is downwardly tapered in a conical manner is a funnel, and
- wherein all the elements of the solids separator are composed of plastic.

12. A bioreactor unit comprising a bioreactor connected to an inclined channel solids separator as claimed in any of claims 2 to 11.

Claims

1. An inclined channel solids separator for retaining and recirculating solids from a reactor mixture, comprising the following elements:
   - an upper region of the solids separator having one or more feed-throughs/fittings (80) for removing a harvest stream (70) separated from the cells (=harvest) from a harvest stream collection region (56), connected to
   - a separation region formed by a plate stack (1) composed of single-layer or multilayer plastic web plates, which stack is tilted during operation at an angle (10) of from 30° to 80° with respect to the horizontal, connected to
   - a lower segment of the solids separator having one or more feed-throughs or fittings (84) for flow distribution of the reactor mixture (74), above
   - a solids collection region (57) which is downwardly tapered for collecting the cells by means of gravity,

   wherein the solids collection region (57) is downwardly tapered in a conical or pyramidical manner.

2. The inclined channel solids separator as claimed in claim 1, wherein the solids collection region (57) has one or more feed-throughs (89) or fittings (88) for removing the solids.

3. The inclined channel solids separator as claimed in any of claims 1 or 2, which comprises at least one disposable sensor in the interior.

4. The inclined channel solids separator as claimed in any of claims 1 to 3, wherein the separation region consists of a multiplicity of channels arranged next to one another in the plate stack (1).

5. The inclined channel solids separator as claimed in any of claims 1 to 4, wherein the ratio of strut height to channel width hs/d is $0.01 \leq hs/d \leq 5$, with the restriction that the two dimensions hs and d are both greater than or equal to 3 mm.

6. The inclined channel solids separator as claimed in any of claims 1 to 5 comprising a gamma-sterilizable plastic bag (50) through which flow passes and, within the plastic bag (50):
   - in the upper region of the plastic bag (50), the feed-throughs/fittings (80) for removing a harvest stream (70) separated from the solids from the harvest stream collection region (56),

- in the upper segment of a central region of the plastic bag (50), the separation region with plate stack (1) composed of single-layer or multilayer plastic web plates,
- in the lower segment of the central region of the plastic bag (50), the feed-throughs or fittings (84) having horizontal distributors (85) for uniform horizontal flow distribution of the cell culture solution (74) via an infeed surface area (510),
- in the lower region of the plastic bag (50), the solids collection region (57) which is downwardly tapered in a conical manner for collecting the solids by means of gravity.

7. The inclined channel solids separator as claimed in claim 6, wherein the channels have a channel length L of from 30% to 95% of a length LK of the plastic bag.

8. The inclined channel solids separator as claimed in either of claims 6 and 7, comprising a container for accommodating the solids separator, wherein the container has at least one interior for accommodating the solids separator, wherein said interior comprises walls matched to the shape of the solids separator by means of to the shape of the solids separator, the walls enclose the interior and demarcate it from the outside world, an opening for introducing the solids separator from above into the container.

9. The inclined channel solids separator as claimed in any of claims 1 to 5, wherein:
- the upper region of the solids separator is a collector having a harvest stream collection region (56), connected to
- a separation region formed by a plate stack (1) composed of single-layer or multilayer plastic web plates forms a web-plate base body, which is plugged into plug plates at the top and bottom and is connected to
- a lower segment of the solids separator having one or more feed-throughs or fittings (84) for flow distribution of the reactor mixture (74), above
- a solids collection region (57) which is downwardly tapered in a conical manner for collecting the cells by means of gravity,
- wherein the lower segment and the solids collection region (57) which is downwardly tapered in a conical manner is a funnel, and
- wherein all the elements of the solids separator are composed of plastic.

10. A bioreactor unit comprising a bioreactor connected to an inclined channel solids separator as claimed in any of claims 1 to 9.