Claims

1. An apparatus comprising

i) one or more mixing sectors, wherein the mixing sectors is placed on top of the apparatus as a whole and further comprises at least 4 or more plates or weirs at an angle of 5º to 20°,

ii) one or more liquid distribution sector, wherein the liquid distribution sector is placed between the one or more mixing sectors and one or more liquid retention sectors and thus such that the liquid retention sector is in fluid connection with at least the liquid distribution sector and placed down stream of both the liquid distribution sector and the mixing sector,

iii) one or more liquid retention sector, wherein the retention sector is placed at the bottom of the apparatus and is in fluid connection with liquid distribution sector and further divided in one or more sub sectors in fluid connection with one another, wherein the one or more sub sectors are chambers and/or pipes,

c h a r a c t e r i z e d in that the liquid distribution sector comprises at least three or more plates, trays and/or elements, or at least four or more plates, trays and/or elements, wherein one plates, trays and/or elements is positioned at the lower part of the liquid distribution sector and placed in a horizontal position and may be regarded as a liquid distributor, and wherein the liquid distribution sector comprises a second additional plates, trays and/or elements, which may be denoted as a third plate, which is placed in between the said liquid distributor and said plates, trays and/or elements.

2. The apparatus according to claim 1, wherein the one or more mixing sectors consist of mixing elements, selected from at least 5 or more plates or weirs, at least 6 or more plates or weirs, at least 7 or more plates or weirs, at least 8 or more plates or weirs, at least 9 or more plates or weirs, at least 10 or more plates or weirs, at least 15 or more plates or weirs, at least 20 or more plates or weirs.

3. The apparatus according to any one of claims 1-2, wherein the mixing elements are tilted at an angle of 5 to 15°, or 5°, or 10°, or 15°, or 20° in relation to the horizontal plane.

4. The apparatus according to any one of the preceding claims, wherein the mixing sector comprises a means to ensure even distribution of feedstock entering the apparatus, by having incorporated an element placed above the plates, and comprises one or more collision plates.

5. The apparatus according to claim 4, wherein at least one collision plate is vertical.

6. The apparatus according to any one of claims 4-5, wherein at least one collision plate is tilted at any angle of 5 degrees to 20 degrees.

7. The apparatus according to any one of the preceding claims, wherein the one or more mixing sectors are in fluid connection with the liquid with the liquid distribution sector and the liquid retention sector.

8. The apparatus according to any of the preceding claims, wherein the liquid distribution sector is placed in between the mixing sector and the liquid retention sector, and which is in fluid connection with the mixing sector and the liquid retention sector.

9. The apparatus according to any one of the preceding claims, wherein the liquid distribution sector comprises a plate or tray position above the liquid distributor and wherein the plate or tray is horizontal.

10. The apparatus according to claim 1, wherein the third plate or tray is tilted to an angle of 5- 20°.

11. The apparatus according to any of the preceding claims, wherein the liquid retention sector is further be divided into one or more subsectors, 2 or more subsections, 3 or more subsections, 4 or more subsections, 5 or more subsections, 6

or more subsections, 7 or more subsections, 8 or more subsections, 10 or more subsections, or 20 or more subsections.

12. The apparatus according to any of claim 11, wherein the subsectors are in fluid connection with one another.

13. The apparatus according to any of claims 11-12, wherein at least one subsector is in fluid connection with the mixing sector.

14. The apparatus according to any of claims 11-13, wherein the apparatus comprises three subsectors.

15. The apparatus according to claim 14, wherein one subsector, denoted as subsector 1 is in fluid connection with the other two subsectors, denoted as subsector 2 and 3 respectively.

16. The apparatus according to any of claims 11-15, wherein the subsector 1 is in fluid connection with one outlet suitably being the product flow with finished and fully processed product.

17. The apparatus according to any of claims 11-16, wherein the liquid retention sector is further equipped with vertical pipes.

18. The apparatus according to claim 17, wherein the vertical pipes connecting subsector 2 and 3 with one another.

19. The apparatus according to any of claims 11-18, wherein subsector 3 is in fluid connection with an outlet suitably being the circulation flow outlet, circulating material back to the mixing sector.