CLAIMS

1. A method of separating solids from liquids of a slurry, the method comprising:

saccharifying a biomass and applying the saccharified biomass to a surface ~~(e.g., the outer portion)~~ of a filter device, wherein the filter device comprises a vacuum belt filter.

~~2. The method of claim 1, wherein the filter device is a rotary drum filter device.~~

~~3~~2. The method of claim 1 ~~or 2~~, wherein the saccharified biomass comprises sugars selected from the group consisting of glucose, xylose and mixtures thereof.

43. The method of any one of the above claims wherein the saccharified biomass comprises an aqueous solvent.

~~5~~4. The method of any one of the above claims, wherein the saccharified biomass comprises a non-aqueous solvent.

~~6~~5. The method of any one of the above claims, wherein the saccharified biomass includes cells.

~~7~~6. The method of any one of the above claims, wherein the saccharified biomass includes cells selected from the group consisting of yeast cells, bacterial cells, fungal cells ~~or~~ and mixtures thereof.

~~8~~7. The method of any one of the above claims, wherein the saccharified biomass includes protein material.

~~9~~8. The method of claim ~~8~~7, wherein the protein material is substantially denatured protein material.

~~10~~9. The method of claim ~~8~~7 or ~~9~~8, wherein the protein material includes an enzyme material.

~~11~~10. The method of any one of the above claims, wherein the saccharified biomass includes a fermentation product.

~~12~~11. The method of any one of the above claims, wherein the saccharified biomass includes an alcohol.

~~13~~12. The method of claim ~~12~~11, wherein the alcohol is ethanol or butanol.

~~14~~13. The method of any one of claims 1 through ~~11~~10, wherein the saccharified biomass includes an organic acid.

~~15~~14. The method of claims ~~14~~13, wherein the saccharified biomass includes butyric acid.

~~16~~15. The method of any one of the above claims, wherein the saccharified biomass is substantially devoid of one or more soluble sugars from which the biomass is composed.

~~17~~16. The method of claim ~~16~~15, wherein the saccharified biomass is substantially devoid of glucose.

~~18~~17. The method of claims ~~16~~ 15 or ~~17~~16, wherein the saccharified ~~saccharide~~ biomass is substantially devoid of xylose.

~~19~~18. The method of any one of the above claims, wherein the biomass has been saccharified using one or more saccharification agent.

~~20~~19. The method of claim ~~19~~18, wherein the saccharification agent is selected from the group consisting of enzymes, acids, bases, oxidants and mixtures thereof.

~~21~~20. The method of claim ~~19~~18, wherein the saccharification agent includes sulfuric acid and an enzyme.

~~22~~21. The method of claim ~~19~~18, wherein the saccharification agent is a cellulolytic enzyme.

~~23~~22. The method of any one of the above claims, wherein the biomass has been treated to reduce its recalcitrance prior to saccharification.

~~24~~23. The method of claim ~~23~~22, wherein recalcitrance has been reduced by the application of electron beam radiation to the biomass.

~~25~~24. The method of any one of the above claims, wherein the filter device comprises ~~a rotatable drum having~~ a filter face through which liquid of the saccharified ~~material~~ biomass can pass, while retaining solids of the saccharified ~~material~~ biomass thereon.

~~26~~25. The method of claim 25, wherein the filter face has a filter aid extending outwardly therefrom.

~~27~~26. The method of claim ~~26~~25, wherein the filter aid covers substantially the entire filter face ~~of the rotatable drum~~.

~~28~~27. The method of claim ~~26~~ 25 or ~~27~~26, wherein the filter aid is selected from the group consisting of diatomaceous earth, celite, silica, pumice, perlite, alumina, zeolites, sand, cellulosic material, lignocellulosic material, and mixtures thereof.

~~29~~28. The method of any one of claims ~~26~~ 25 through ~~28~~27, wherein the filter aid extends from the filter face a distance of from between about 0.5 mm to about 250 mm.

~~30~~29. The method of any one of claims ~~26~~ 25 through ~~28~~27, wherein the filter aid extends from the filter face a distance of from between about 1 mm and about 100 mm.

~~31~~30. The method of any one of claims ~~26~~25 through ~~28~~27, wherein the filter aid extends from the filter face a distance of from between about 1 mm to about 50 mm.

~~32~~31. The method of any one of claims ~~26~~25 through ~~28~~27, wherein the filter aid extends from the filter face a distance of from between about 2 mm to about 25 mm.

~~33~~32. The method of any one of claims 25 through ~~33~~31, wherein the ~~rotatable drum~~vacuum belt filter includes an inner portion and wherein the inner portion is maintained at a lower pressure than the filter face.

~~34~~33. The method of claim ~~33~~32, wherein the pressure difference between the inner portion and the filter face is maintained between about 20 and about 25 inches (50.8 and about 63.5 cm) of Hg.

~~35~~34. The method of claim ~~33~~32 or ~~34~~33, wherein the inner portion is in communication with a vacuum pump and/or a vacuum source.

~~36~~35. The method of any one of claims ~~26~~25 through ~~35~~34, wherein the filter face includes a filter cloth.

~~37~~36. The method of claim ~~36~~35, wherein the filter cloth is a woven cloth.

~~38~~37. The method of claim ~~37~~36, wherein the cloth has a weave selected from the group consisting of a twill weave, a plain weave, a satin weave, a knot weave, a basket weave, an oxford weave and combinations of these.

~~39~~38. The method of any one of claims ~~36~~ 35 to ~~38~~37, wherein the filter cloth has a porosity rating range from about 1 to 100 CFM/ft^2 (11 to 1076 CFM/m^2) can be utilized (e.g., about 1-3 (11 to 32 CFM/m^2), about 1-10 (11 to 108 CFM/m^2), about 10-30 (108 to 323 CFM/m^2), about 15-20 (161 to 215 CFM/m^2), about 30-50 (323 to 538 CFM/m^2), about 30-40 (323 to 431 CFM/m^2), about 50 to 70 (538 to 753 CFM/m^2)).

~~40~~39. The method of any one of claims ~~26~~ 25 to ~~39~~38, wherein the filter device includes a knife for continuously removing the solids deposited on the ~~drum~~ filter face as the ~~drum~~ filter face is ~~rotated~~ moved relative to the knife.

~~41. The method of claim 40, wherein the knife moves in a direction perpendicularly towards the drum face at a rate adjusted to continuously removes an interfacial region comprising the solids of the saccharified material and the filter aid.~~

~~42~~40. The ~~methods~~ method of any one of the above claims, further comprising utilizing a vibratory screener to remove solids from the saccharified biomass prior to and/or after applying the saccharified biomass ~~to the outer portion of the filter device~~.