Claims

1. A battery scrap processing method comprising:

dousing the battery scraps with an aqueous solution, the aqueous solution being an electrolyte and being chilled with a chiller system prior to dousing of the battery scraps;

fragmentizing battery scraps in a wet condition into scrap fragments, the battery scraps comprising lithium-ion battery scraps;

pre-processing the scrap fragments by an extractor system to extract at least one of cellulosic material and plastic material therefrom to thereby obtain pre-processed mass;

sifting the pre-processed mass by a first sifter to extract metal fractions therefrom to thereby obtain a processed mass;

pulverising the metal fractions by a wet pulveriser;

sifting the pulverised metal fractions by a second sifter into a plurality of metal fraction groups, wherein water is drained from the pulverised metal fractions during sifting thereof;

separating volatile organic compounds (VOC) from water drained from the second sifter by a VOC skimmer prior to providing the water to a chiller system; and

filtering the water by a filter assembly prior to being provided to the chiller system,

wherein the metal fractions comprise at least one of copper, aluminum, iron and derivatives thereof, and the processed mass comprising at least one of lithium and a lithium derivative.

2. The battery scrap processing method as in claim 1, further comprising:

separating and extracting water from the processed mass by a separator assembly to obtain black mass residue.

3. The battery scrap processing method as in claim 2, separating and extracting water from the processed mass comprising:

settling sludge from water through sedimentation in a settling thickening tank; and

dewatering the sludge with a dewatering system to obtain the black mass residue,

wherein water drained from dewatering the sludge is filtered prior to being provided to a chiller system.

4. The battery scrap processing method as in claim 1, fragmentizing battery scraps in a wet condition comprises:

one of crushing and shredding the battery scraps into first fragments by one of a crusher and a primary shredder; and

shredding the first fragments into second fragments by a secondary shredder to thereby obtain the scrap fragments, the second scrap fragments being substantially dimensionally smaller than the first scrap fragments.

5. The battery scrap processing method as in claim 1, further comprising:

separating at least a portion of the metal fractions into at least two of steel, copper and aluminum by a gravity separator.

6. A battery scrap processing system comprising:

a dispenser assembly for dousing the battery scraps with an aqueous solution prior to fragmentising thereof, the aqueous solution being an electrolyte;

a chiller system for chilling the aqueous solution prior to dousing of the battery scraps;

a fragmentation assembly for fragmentizing battery scraps in a wet condition into scrap fragments, the battery scraps comprising lithium-ion battery scraps;

an extractor system for pre-processing the scrap fragments to extract at least one of cellulosic material and plastic material therefrom to thereby obtain pre-processed mass;

a first sifter for sifting the pre-processed mass to extract metal fractions therefrom to thereby obtain a processed mass;

a wet pulveriser for pulverising the metal fractions;

a second sifter for sifting the pulverised metal fractions into a plurality of metal fraction groups, wherein water is drained from the pulverised metal fractions during sifting thereof;

a VOC skimmer for separating volatile organic compounds (VOC) from water drained from the second sifter prior to providing the water to a chiller system; and

a filter assembly filtering the water prior to being provided to the chiller system,

wherein the metal fractions comprise at least one of copper, aluminum, iron and derivatives thereof, and the processed mass comprising at least one of lithium and a lithium derivative.

7. The battery scrap processing system as in claim 6, further comprising:

a separator assembly for separating and extracting water from the processed mass to obtain black mass residue.

8. The battery scrap processing system as in claim 7, the separator assembly comprising:

a settling thickening tank for settling sludge from water in the processed mass through sedimentation; and

a dewatering system for dewatering the sludge to obtain the black mass residue,

wherein water drained from dewatering the sludge is filtered prior to being provided to a chiller system.

9. The battery scrap processing system as in claim 7, the fragmentation assembly comprising:

one of a crusher and a primary shredder for one of crushing and shredding the battery scraps into first fragments; and

a secondary shredder for shredding the first fragments into second fragments to thereby obtain the scrap fragments, the second scrap fragments being substantially dimensionally smaller than the first scrap fragments.

10. The battery scrap processing system as in claim 7, further comprising:

a gravity separator for separating at least a portion of the metal fractions into at least two of steel, copper and aluminum.