WHAT IS CLAIMED IS:

1. A tramp metal separation assembly, comprising:

a housing including a first discharging area, a second discharging area and a feeding area between the first discharging area and the second discharging area;

a cylindrical core rod made of non-magnetic materials and including a first longitudinal axis, an axial extending hollow interior having a first part, a second part and a third part, the second part adapted to be a magnetic section by being filled therewith a set of magnets, the first part and the third part respectively adapted to be a first non-magnetic section and a second non-magnetic section, the cylindrical core rod being mounted on the housing in a way that the first and second non-magnetic sections correspond respectively to the first and second discharging areas and the magnetic section corresponds to the feeding area;

a sleeve tube made of non-magnetic materials and including a first portion, a second portion, a longitudinal length shorter than the longitudinal length of the cylindrical core rod and an axial hole with an inner diameter larger than the outer diameter of the cylindrical core rod, the sleeve tube being sleeved outside the core rod in a way that it is moveable to and fro along the first longitudinal axis of the core rod and between a first position, wherein the first portion corresponds to the magnetic section to capture tramp metals of the raw materials and the second portion corresponds to the second non-magnetic section to discharge tramp metals captured thereon, and a second position, wherein the first portion corresponds to the first non-magnetic section to discharge tramp metals captured thereon, and the second portion corresponds to the magnetic section to capture tramp metals of the raw materials; and

a first non-magnetic inner tube and a second non-magnetic inner tube, wherein the first non-magnetic inner tube is disposed within the first part and abuts against a first

side of the set of magnets, and the second non-magnetic inner tube is disposed within the third part and abuts against a second side of the set of magnets.

2. A tramp metal separation assembly, comprising:

a housing including a first discharging area, a second discharging area and a feeding area between the first discharging area and the second discharging area;

a cylindrical core rod made of non-magnetic materials and including a first longitudinal axis, an axial extending hollow interior having a first part, a second part and a third part, the second part adapted to be a magnetic section by being filled therewith a set of magnets, the first part and the third part respectively adapted to be a first non-magnetic section and a second non-magnetic section, the cylindrical core rod being mounted on the housing in a way that the first and second non-magnetic sections correspond respectively to the first and second discharging areas and the magnetic section corresponds to the feeding area;

a sleeve tube made of non-magnetic materials and including a first portion, a second portion, a longitudinal length shorter than the longitudinal length of the cylindrical core rod and an axial hole with an inner diameter larger than the outer diameter of the cylindrical core rod, the sleeve tube being sleeved outside the core rod in a way that it is moveable to and fro along the first longitudinal axis of the core rod and between a first position, wherein the first portion corresponds to the magnetic section to capture tramp metals of the raw materials and the second portion corresponds to the second non-magnetic section to discharge tramp metals captured thereon, and a second position, wherein the first portion corresponds to the first non-magnetic section to discharge tramp metals captured thereon, and the second portion corresponds to the magnetic section to capture tramp metals of the raw materials, wherein the housing

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includes a front wall, a rear wall, a first side wall, a second side wall, a first inner plate and a second inner plate, the front and rear walls combine with the first and second side walls to define a generally elongate receiving space within the housing, the first inner plate and the second inner plate are respectively disposed between the first side wall and the second side wall to divide the space into the first discharging area, the second discharging area and the feeding area, the cylindrical core rod is adapted to pass through the first inner plate and the second inner plate and secures respectively each of ends thereof on the front and rear walls, and the sleeve tube is also adapted to pass through the first inner plate and the second inner plate in a way that it is moveable to and fro between the first and second positions; and

a first driving plate, a second driving plate and a linear actuator, wherein the first driving plate is fixedly connected to a first end of the sleeve tube and disposed in the first discharging area; the second driving plate is fixedly connected to a second end of the sleeve tube and disposed in the second discharging area, each of the driving plates is configured to be moveable along the cylindrical core rod, and the linear actuator is connected with one of the driving plates for actuating the sleeve tube to move back and forth between the first position and the second position.

3. The tramp metal separation assembly of claim 2, wherein the first driving plate has a third bore for being passed through by the first non-magnetic section of the cylindrical core rod and the second driving plate has a fourth bore for being passed through by the second non-magnetic section of the cylindrical core rod.

4. The tramp metal separation assembly of claim 2, further comprising a control means coupled with the linear actuator to control the action thereof.

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5. The tramp metal separation assembly of claim 2, further comprising a guiding rod disposed on one of the side walls of the housing, wherein the guiding rod has a second longitudinal axis parallel to the first longitudinal axis of the cylindrical core rod and is coupled with the driving plates for guiding the back and forth movement thereof.

6. The tramp metal separation assembly of claim 2, wherein the linear actuator is a pneumatic linear actuator.

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