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TROMMEL ASSEMBLY5 **FIELD OF THE INVENTION**

The present invention in general relates to a trommel screen assembly and more particularly to an improved trommel screen assembly comprising modular screen assembly of substantially less weight which
10 is scalable, easy to transport and easy to assemble.

BACKGROUND OF THE INVENTION

A trommel (from the german word for drum), is a screened cylinder
15 used to separate materials by size - for example, separating the biodegradable fraction of mixed municipal waste or separating different sizes of crushed stone.

Trommels or revolving screen is one of the oldest screening devices,
20 which is a cylindrical screen typically rotating at between 35 % and 45 % critical speed. Trommels are installed on a small angle to the horizontal or use a series of internal baffles to transport material along the cylinder. Trommels can be made to deliver several sized products by using trommel screens in series from finest to coarsest.

25 Portable trommels (also called portable trommel screens) are often used in the production of organic products from various types of waste.

For example, excavation contractors may screen their site debris into
30 two fractions; a saleable topsoil for farms, nurseries and site-work, as well as cleaned rock for aggregates or landscaping work. This allows

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the contractor to resell their waste, instead of incurring the cost of sending it for disposal.

5 Trommels remain widely used in some screening duties including aggregate screening plants and the screening of mill discharge streams. AG, SAG, and ball mill discharge streams. AG, SAG, and ball mill discharge streams usually pass through a trommel screen attached to the mill outlet to prevent ball scats from reaching subsequent processing equipment and to prevent a build-up of pebbles in the mill.

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Though the use of trommel in several industries like gold mine or separating biodegradable in wash plants is common in art, however, those available have been found complicated and expensive as well and difficult to transport due to its heavy weight. As a result, many
15 obstacles come across during transportation through shipping by water or by air.

Accordingly, there is a long felt need to provide an improved trammel assembly which is scalable, easy to transport and easy to assemble is
20 of substantially low weight and simultaneously is technically sacrosanct.

The present invention meets the abovementioned long felt needs.

25 **OBJECTS OF THE INVENTION**

It is the principal object of the present invention to provide an improved modular trommel assembly, which is scalable, easy to transport and easy to assemble, is of substantially low weight and is
30 simultaneously technically sacrosanct.

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It is another object of the present invention to provide an improved modular trommel assembly which ensures that the stresses and displacements in structural elements are within limits.

- 5 How the foregoing objects are achieved and the other aspects of the present invention will be clear from the following description, which is purely by way of understanding and not by way of any sort of limitation.

10 SUMMARY OF THE INVENTION

Accordingly, the present invention provides an improved trommel assembly for screening different particles, comprising a plurality of modular units detachably attached to one another, each modular unit
15 having a flange adapted to firmly attach with one or more corresponding flanges of one or more corresponding modular units.

In accordance with preferred embodiments of the trommel assembly of the present invention:

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-said flange of one modular unit is attached to a corresponding flange of another said modular unit by plates or channel sections using suitable fixing media such as herein described, said plates or channel sections being located at the ends of each said modular unit and said
25 flanges having holes arranged in an array, for facilitating joining to a corresponding flange of another module;

-there exists a plurality of beam members and cross members between every two said flanges, said beam members acting as the
30 main load carrying members and said cross members being adapted to take up and distribute the stresses and comprise different types of sections;

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-plates are applied to fix said cross members to said flanges and to said beam members, two ends of each said cross member and each said beam member being attached to a flange body at either end;

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-said plates are chamfered plates of certain sizes which are welded to the beam member and flange surfaces using standard welding procedures so that the overall rigidity of the structure remains intact;

10 -an assembly of ribs and angles are welded together to fix said beam member to said flanges;

-every two said ribs are welded to a said angle, said beam members being welded together on to said angle, said beam members being
15 fixed to said flanges by welding;

-there exists a modular transition piece for joining of said trommel structure to the mill discharge face applying suitable fixing media such as bolted connections, said transition piece having a front flange and
20 also ribs for allowing transfer of load from said trommel structure to the mill discharge face, through said bolted connections;

-modular trommel screen panels made of polyurethane or rubber are also fixed on the inner side of said assembly to complete the structure
25 and make it operational.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

30 The nature and scope of the present invention will be better understood from the accompanying drawings, which are by way of

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illustration of a preferred embodiment and not by way of any sort of limitation. In the accompanying drawings,

5 Figures 1a, 1b and 1c illustrate the isometric, front view and side view respectively of a preferred embodiment of the modular trommel assembly in accordance with the present invention.

10 Figures 2a, 2b and 2c illustrate the isometric, front view and top view respectively of the 180 degree section module unit of the modular trommel assembly.

 Figures 3a and 3b are the isometric and front view respectively of the angle section of the trommel assembly.

15 Figures 4a and 4b illustrate the isometric and front view respectively of the rib of the trommel assembly.

 Figures 5a and 5b illustrate the isometric and front view respectively of the Load carrying member or beam section of the trommel assembly.

20 Figures 5c is the isometric view of the channel section of the trommel assembly.

 Figure 5d is the isometric view of the Flange of the trommel assembly.

25 Figure 6 is the isometric view of the cross member of the trommel assembly.

30 Figures 7a and 7b illustrate the isometric and top view respectively of the chamfer plates of the trommel assembly.

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Figures 8a and 8b illustrate the isometric and front view respectively of the segmented transition pieces of the trommel assembly.

DETAILED DESCRIPTION OF THE INVENTION

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The following describes a preferred embodiment of the present invention, which is purely for the sake of understanding the present invention and not by way of any sort of limitation.

- 10 The trommel assembly in accordance with the present invention comprises of modular units for achieving its desired objectives, as narrated under the heading "Objects of the Invention"

- 15 In all the figures like reference numerals represent like features. The figures are now being referred to one after another for the purpose of explaining the invention.

- According to the invention, the whole trommel assembly as shown in Figures 1a, 1b & 1c is being made by assembling several numbers of the modular section unit(2) best shown in figure 2a. The unit (2) can be of different sizes and comprises of different dimensions of elements. Several such units (2) with its elements are all suitably fixed to form the modular trommel assembly according to the present invention. Each modular element (2) comprises plurality of elements in different configurations and size for the structural rigidity of the whole trommel assembly (1).
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- Figure 1a illustrates a perspective view of such a modular trommel assembly, while figures 1b illustrate front view and side view respectively of such assembly.

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Now, how the modular units (2) and its various parts are connected is now explained with reference to the subsequent figures.

First of all figure 2a is being referred to, which illustrates a 180°
5 section of a basic modular unit (2) of the present invention, each unit comprising of a flange (3). To be precise, figure 2a shows at least two such flanges (3) joined together. A plurality of each unit (2), are actually assembled to form the trommel structure.

10 Figure 2b is a front view of the unit shown in figure 2a, while figure 2c is a top view of the same.

Each modular unit (2) consists of a flange (3) which can be of different thickness depending on the size and length of the whole trommel
15 structure. The flange (3) has holes (9) arranged in an array in them so that they can be joined to a corresponding flange (3) of another module (2) using suitable fixing-media, to form the trommel assembly. The fixing media may be different kinds of bolts, rivets and locking systems for fixing two or more parts together. All the fixing media are
20 tested for strength and fatigue limits for safe functioning of the parts and the whole structure. Figure 5d shows the flange (3) of each modular unit (2) in greater detail. Flanges, which can be made of any structural material is an important and integral part of each modular unit (2).

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As shown in figure 2a there exist beam sections (4) between every two flanges (3) as the main load carrying members and the cross
members (5) between two such flanges (3) take up the stresses and
30 distribute them and can comprise of different types of sections. Figure 5a shows a perspective view of a beam section (4) in greater detail,

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while figure 5b shows a front view thereof. Figure 6 shows a perspective view of a cross member (5).

5 The Load carrying members (4) can be any kind of beam elements of the variable dimensions depending upon the application. Similarly, the cross members(5) which help out in distribution of the stresses and keeping the structure intact, can be of different dimensions depending on the structure of the trommel.

10 Coming back to figure 2a again, it can be seen that plates (8) are applied to fix the cross members (5) to the flanges (3) and to the beams or load carrying members (4). The two ends of each cross member (5) and each beam (4) are attached to a flange (3) body at either end. The plates (8) can be chamfered plates of certain sizes
15 which are welded to the beam (4) and flange (3) surfaces using standard welding procedures so that the overall rigidity of the structure remains intact. Figure 7a illustrates a perspective view of such a chamfered plate (8), while figure 7b illustrates a top view thereof.

20 As shown in figure 2a, two flanges (3) of two modular sections (2) are joined by plates or channel sections (7). These are located at the ends of each unit (2). These plates (7), thus facilitate joining of two different modules (2) using suitable fixing media as described hereinbefore. Figure 5c is an isometric view of such channel section or plate (7),
25 which comprises drilled holes (15) for allowing fixing of two or more modular sections (2).

The portion represented by reference numeral 6 in figure 2a is an assembly of ribs and angle welded together, to fix the load carrying
30 beams (4) to the flanges(3). As shown in detail in figures 4a and 4b, this unit (6) consists of two ribs (11). These ribs (11) are welded to the angle (10) shown in Figures 3a & 3b. It is this angle (10), on to

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which the beam sections (4) are welded together, following standard procedures which again is fixed to the flanges(3) using welding.

Now coming back to figure 1a and also figures 8a and 8b, it can be
5 seen that the transition piece (3') is also modular and after being fixed together using suitable fixing media it helps in joining of the trommel structure to the mill discharge face using bolts. The front flange (3''), which is best shown in figures 1a and 8a is a part of the transition piece (3') of the trommel assembly according to the present invention.
10 The ribs (11') of the transition piece (3') or part can be of any structural material and allows the transfer of load from the trommel structure (1) to the mill discharge face, through the bolted connections.

15 The modular trommel assembly thus functions on being fixed to the mill ends as usual rotates with the mill and functions effectively to do screening of different particle size ranges depending upon the size of the aperture on the trommel screen panels. The assembly is light weight and achieves the desired objectives of the present invention.

20 The objects of the present invention are thus achieved by fixing together different identical modular units to make up a trommel assembly, which is then fixed to the mill end.

25 The different elements or parts of the module is constructed using different materials of construction like stainless steel, mild steels etc.

30 Modular trommel screen panels made of polyurethane or rubber are also fixed on the inner side of the trommel to complete the structure and make it operational. The fixing of the panels can be of different arrangement like button type fixing or bolt-down fixing etc.

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Number of modules can be put together inside a transport container/truck/van etc and then shipped to desired site location where it can be held using cranes or other support mechanism then put
5 together using the fixing-media. Then the whole structure can then be fixed onto the mill discharge using bolts.

If any of the modules get damaged, then, according to the present invention, instead of changing the whole trommel only the damaged
10 module needs to be changed resulting in saving the customers' time and money.

From the description hereinbefore and from the claims it would be
15 clear that all objectives of the invention are achieved.

The present invention has been described with reference to some drawings and a preferred embodiment, purely for the sake of understanding and not by way of any limitation and the present
20 invention includes all legitimate developments within the scope of what has been described herein before and claimed in the appended claims.

11**CLAIM:**

1. An improved trommel assembly for screening different particles, comprising a plurality of modular units(2) detachably attached to one another, each modular unit having a flange(3) adapted to firmly attach with one or more corresponding flanges(3) of one or more corresponding modular units(2).
2. The improved trommel assembly as claimed in claim 1 wherein said flange(3) of one modular unit(2) is attached to a corresponding flange(3) of another said modular unit(2) by plates or channel sections(7) using suitable fixing media such as herein described, said plates or channel sections(7) being located at the ends of each said modular unit(2) and said flanges(3) having holes(9) arranged in an array, for facilitating joining to a corresponding flange(3) of another module(2).
3. The improved trommel assembly as claimed in claim 2 wherein there exists a plurality of beam members(4) and cross members(5) between every two said flanges(3), said beam members(4) acting as the main load carrying members and said cross members(5) being adapted to take up and distribute the stresses and comprise different types of sections.
4. The improved trommel assembly as claimed in claim 3 wherein plates(8) are applied to fix said cross members(5) to said flanges(3) and to said beam members(4), two ends of each said cross member(5) and each said beam member(4) being attached to a flange(3) body at either end.
5. The improved trommel assembly as claimed in claim 4 wherein said plates(8) are chamfered plates of certain sizes which are welded to the

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beam member(4) and flange(3)surfaces using standard welding procedures so that the overall rigidity of the structure remains intact.

6. The improved trommel assembly as claimed in claims 4 and 5 wherein an assembly of ribs(11) and angles(10) are welded together to fix said beam member(4) to said flanges(3).

7. The improved trommel assembly as claimed in claim 6 wherein every two said ribs(11)are welded to a said angle(10), said beam members (4) being welded together on to said angle(10), said beam members being fixed to said flanges(3) by welding.

8. The improved trommel assembly as claimed in any preceding claim wherein there exists a modular transition piece(3') for joining of said trommel structure to the mill discharge face applying suitable fixing media such as bolted connections, said transition piece(3') having a front flange(3'') and also ribs(11') for allowing transfer of load from said trommel structure(1) to the mill discharge face, through said bolted connections.

9. The improved trommel assembly as claimed in any preceding claim wherein modular trommel screen panels made of polyurethane or rubber are also fixed on the inner side of said assembly(1) to complete the structure and make it operational.

10. An improved trommel assembly substantially as herein described, particularly with reference to the accompanying drawings.