

PATENT SPECIFICATION

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(54) BUCKET BARREL FOR RECLAIMING STOCK PILES

(71) We, EISENWERK WESERHÜTTE Aktiengesellschaft, of 4970 Bad Oeynhausen, Germany, a joint stock company organised under the laws of the Federal Republic of Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:

Reclaimers of a wide variety of different designs are used for reclaiming stock piles and bulk materials of every kind, such as: coal, ore, sand and gravel.

A specific version of such reclaiming equipment is a barrel type unit equipped with externally arranged buckets. By rotation of the barrel around its longitudinal axis and by continuous movement of the machine towards the stockpile, the barrel-mounted buckets reclaim the material to be handled and discharge it — when reaching the upper turn-over point — into the barrel where provision is made for a belt conveyor which then gets out the material through the end of the barrel.

When compared to reclaiming equipment of other design, the barrel type bucket reclaimers have the great advantage that the material is reclaimed from the stock pile uniformly and simultaneously over its entire cross-section thus ensuring an optimum blending effect wanted or required at the reclaiming end of the stock pile. A disadvantage of such reclaimers is, however, that, as a result of the stiffening members arranged inside the tube or barrel for reasons of design, there are many edges, corners and crannies where considerable amounts of dirt can be accumulated. Such dirt accumulations are mainly due to the fact that the buckets when arriving at the dumping point discharge the material onto the internal conveyor when they are in motion so that it cannot be avoided that some particles fall

beside the mentioned belt conveyor.

According to the present invention, there is provided a bucket barrel for reclaiming stock piled material comprising a rotatable barrel, a plurality of bucket blades disposed around the peripheral wall of the barrel and projecting therefrom to define a plurality of buckets for receiving the dumped material, an internal tubular wall within the barrel and concentric with the peripheral wall of the barrel, a corresponding plurality of passages extending between the internal and peripheral walls of the barrel for the passage of the reclaimed material between the respective buckets and a conveyor within the barrel, each of said passages being inclined to the radial direction of said barrel.

Preferably, the walls of the passages arranged between the internal and peripheral walls support the internal wall within the barrel. The barrel being double-walled, a completely enclosed and smooth-walled chamber is defined by the internal wall of the barrel so that the material which falls from the conveyor cannot accumulate in crannies within the barrel.

It is within the scope of the present invention to arrange the buckets on the outer peripheral wall of the barrel in annular rows so that the material channel, of which the walls provide supporting members between the external and internal walls of the barrel, also form annular rows, the supporting members radiate from the internal wall to the external wall.

Stiffening or reinforcement in the central area of the barrel must be stronger than in the outer zones of the barrel body. For this reason, the number of buckets in each of the various annular rows may be chosen in accordance with the cross-sectional area of the stock pile. Generally, the section of the stock piles is conical or trapezoidal so that the number of buckets in the outer areas of the barrel may be fewer than in the central

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portion of the barrel.

In order to ensure that the material disposed between the rows of buckets is reclaimed, it is preferable to equip at least 5 some of the buckets with plough-shares to be attached on one or each side of the buckets.

A bucket barrel reclaimer embodying the invention is suitable for reclaiming bulk 10 materials by rotating the barrel in either of two opposite senses. The reclaimer can be installed between two stock piles of different materials built up opposed to each other but along the same longitudinal axis and may be 15 used to reclaim material from one of the two stock piles whilst the barrel is rotating in one sense and to reclaim material from the other whilst the barrel is rotating in the opposite sense.

Embodiments of the present invention will now be more particularly described with reference to the accompanying drawings, in which:—

Fig. 1 shows a side view of a bucket barrel assembly embodying the invention;

Figs. 2 and 3 show different arrangements of blades and ploughs;

Fig. 4 shows an enlarged view of the bucket barrel of Fig. 1;

Figs. 5, 6 and 7 show portions of a bucket barrel embodying the invention and provided with double blades of different constructions.

The stock pile clearing apparatus comprises a bridge 1, a rake 2 entirely or partly sweeping over the stock pile, a bucket barrel 3, and a conveyor 4 rotating in the interior of the bucket barrel 3. The bucket barrel 3 is in the form of a double tube 40 with a space between an outer peripheral tube 3a and an internal tube 3b. Material passages 6 adjoin the blades 5 disposed on the outer tube 3a and are guided through the space between the two tubes 3a and 45 3b running on an inclined path and ending flush with the inner surface of the inner tube 3b. The material passages 6 are in the form of supporting connecting elements (longitudinal bearers and partitions) of the 50 double tube 3. The material received from the blades 5 is held in the material passages 6 until the discharge edge of the passages 6 has reached the upper chute edge of the conveyor 4. Some or all of the blades 5 are 55 equipped on one or both sides with plough shares 8, which bridge over the gaps between adjacent pairs of the blades 5 and completely remove the bottom of the stock pile.

For the purpose of disposing the apparatus between two dumps or stock piles, blades 9 which are able to receive the 60 dumped material in both directions or rotation are provided on the bucket barrel 3 (Fig. 5). The cutting edges 11 of the blades

9 are located as close together as possible. The fixed middle wall 12 of the blade 9 divides the latter into two chambers. The material passages 6 are accordingly in the form of double passages 6a. 70

The blades can also be in the form of double blades adapted to tip about pivot pins 10 in both directions of rotation (Fig. 6). Cutting force and blade filling hold the blade in this case in the position shown in the drawing until the discharge operation 75 has been completed. In the opposite direction of rotation the cutting force and the material held by the bucket defined by the blade, tip the double blade into the position shown in broken lines. For each side of the double blade there is provided in the bucket barrel 3 a passage 6a, which delivers to the conveyor 4 in the prescribed 80 manner the material received by it.

As shown in Fig. 7, a double blade defines a pair of adjacent buckets which are separated by a middle wall 13 of flexible material. The middle wall 13 is formed by a chain mat or by a rubber mat. In such an arrangement, the necessary bucket capacity 90 is formed by the sag of the mat and any material adhering to the mat is completely detached as the mat flexes.

WHAT WE CLAIM IS:— 95

1. A bucket barrel for reclaiming stock piled material comprising a rotatable barrel, a plurality of bucket blades disposed around the peripheral wall of the barrel and projecting therefrom to define a plurality of 100 buckets for receiving the dumped material, an internal tubular wall within the barrel and concentric with the peripheral wall of the barrel, a corresponding plurality of passages extending between the internal and peripheral walls of the barrel for the passage of the reclaimed material between the respective buckets and a conveyor within the barrel, each of said passages being inclined to the radial direction of said barrel. 105

2. A bucket barrel as claimed in claim 1, wherein the walls of said passages support the internal wall within the barrel.

3. A bucket barrel as claimed in either claim 1 or claim 2, wherein the buckets are arranged on the peripheral wall of the barrel in a plurality of annular rows, the number of buckets in each row being chosen in accordance with the cross-sectional area of 115 the stock pile to be reclaimed.

4. A bucket barrel as claimed in any one of claims 1 to 3, wherein one or more of the buckets are equipped with a plough-share at one or each side of the respective buckets. 120

5. A bucket barrel as claimed in any one of claims 1 to 4, wherein the peripheral wall of the barrel is provided with buckets arranged in pairs, one bucket of each pair 130



portion of the barrel.

In order to ensure that the material disposed between the rows of buckets is reclaimed, it is preferable to equip at least some of the buckets with plough-shares to be attached on one or each side of the buckets.

A bucket barrel reclaimer embodying the invention is suitable for reclaiming bulk materials by rotating the barrel in either of two opposite senses. The reclaimer can be installed between two stock piles of different materials built up opposed to each other but along the same longitudinal axis and may be used to reclaim material from one of the two stock piles whilst the barrel is rotating in one sense and to reclaim material from the other whilst the barrel is rotating in the opposite sense.

Embodiments of the present invention will now be more particularly described with reference to the accompanying drawings, in which:—

Fig. 1 shows a side view of a bucket barrel assembly embodying the invention;

Figs. 2 and 3 show different arrangements of blades and ploughs;

Fig. 4 shows an enlarged view of the bucket barrel of Fig. 1;

Figs. 5, 6 and 7 show portions of a bucket barrel embodying the invention and provided with double blades of different constructions.

The stock pile clearing apparatus comprises a bridge 1, a rake 2 entirely or partly sweeping over the stock pile, a bucket barrel 3, and a conveyor 4 rotating in the interior of the bucket barrel 3. The bucket barrel 3 is in the form of a double tube with a space between an outer peripheral tube 3a and an internal tube 3b. Material passages 6 adjoin the blades 5 disposed on the outer tube 3a and are guided through the space between the two tubes 3a and 3b running on an inclined path and ending flush with the inner surface of the inner tube 3b. The material passages 6 are in the form of supporting connecting elements (longitudinal bearers and partitions) of the double tube 3. The material received from the blades 5 is held in the material passages 6 until the discharge edge of the passages 6 has reached the upper chute edge of the conveyor 4. Some or all of the blades 5 are equipped on one or both sides with plough shares 8, which bridge over the gaps between adjacent pairs of the blades 5 and completely remove the bottom of the stock pile.

For the purpose of disposing the apparatus between two dumps or stock piles, blades 9 which are able to receive the dumped material in both directions of rotation are provided on the bucket barrel 3 (Fig. 5). The cutting edges 11 of the blades

9 are located as close together as possible. The fixed middle wall 12 of the blade 9 divides the latter into two chambers. The material passages 6 are accordingly in the form of double passages 6a.

The blades can also be in the form of double blades adapted to tip about pivot pins 10 in both directions of rotation (Fig. 6). Cutting force and blade filling hold the blade in this case in the position shown in the drawing until the discharge operation has been completed. In the opposite direction of rotation the cutting force and the material held by the bucket defined by the blade, tip the double blade into the position shown in broken lines. For each side of the double blade there is provided in the bucket barrel 3 a passage 6a, which delivers to the conveyor 4 in the prescribed manner the material received by it.

As shown in Fig. 7, a double blade defines a pair of adjacent buckets which are separated by a middle wall 13 of flexible material. The middle wall 13 is formed by a chain mat or by a rubber mat. In such an arrangement, the necessary bucket capacity is formed by the sag of the mat and any material adhering to the mat is completely detached as the mat flexes.

WHAT WE CLAIM IS:—

1. A bucket barrel for reclaiming stock piled material comprising a rotatable barrel, a plurality of bucket blades disposed around the peripheral wall of the barrel and projecting therefrom to define a plurality of buckets for receiving the dumped material, an internal tubular wall within the barrel and concentric with the peripheral wall of the barrel, a corresponding plurality of passages extending between the internal and peripheral walls of the barrel for the passage of the reclaimed material between the respective buckets and a conveyor within the barrel, each of said passages being inclined to the radial direction of said barrel.

2. A bucket barrel as claimed in claim 1, wherein the walls of said passages support the internal wall within the barrel.

3. A bucket barrel as claimed in either claim 1 or claim 2, wherein the buckets are arranged on the peripheral wall of the barrel in a plurality of annular rows, the number of buckets in each row being chosen in accordance with the cross-sectional area of the stock pile to be reclaimed.

4. A bucket barrel as claimed in any one of claims 1 to 3, wherein one or more of the buckets are equipped with a plough-share at one or each side of the respective buckets.

5. A bucket barrel as claimed in any one of claims 1 to 4, wherein the peripheral wall of the barrel is provided with buckets arranged in pairs, one bucket of each pair



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being operative when the barrel is rotating in a first direction and the other bucket of each pair being operative when the barrel is rotating in a direction opposite to the first direction and the pairs of said passages corresponding to the respective pairs of buckets being adjacent one another and mutually divergent towards the centre of the barrel.

6. A bucket barrel as claimed in any one of claims 1 to 4, wherein the buckets are twin-type identical structures arranged back to back, the twin-type buckets being operative in the two senses of rotation of the barrel and being pivotally mounted on the peripheral wall of the barrel.

7. A bucket barrel as claimed in claim 6, wherein each twin-type bucket communicates with the interior of the barrel by means of a pair of said passages which are adjacent one another and which are mutu-

ally divergent towards the centre of the barrel.

8. A bucket barrel as claimed in any one of claims 1 to 3, wherein each of the blades comprises a double blade defining a pair of buckets respectively operative in opposite senses of rotation of the barrel and separated by a flexible wall.

9. A bucket barrel for reclaiming stock piles material, substantially as hereinbefore described with reference to Figs. 1 to 4.

10. A bucket barrel as claimed in claim 9 and modified as hereinbefore described with reference to Fig. 5 or Fig. 6, or Fig. 7.

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