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(71) Applicant
Weserhütte
Aktiengesellschaft
Mindener Straße 18-24
D-4970 Bad
Oeynhausen
Federal Republic of
Germany

(72) Inventors

Helmut Heuer
Wilhelm Schäpsmeier
Hans Dieter Fohlmeister

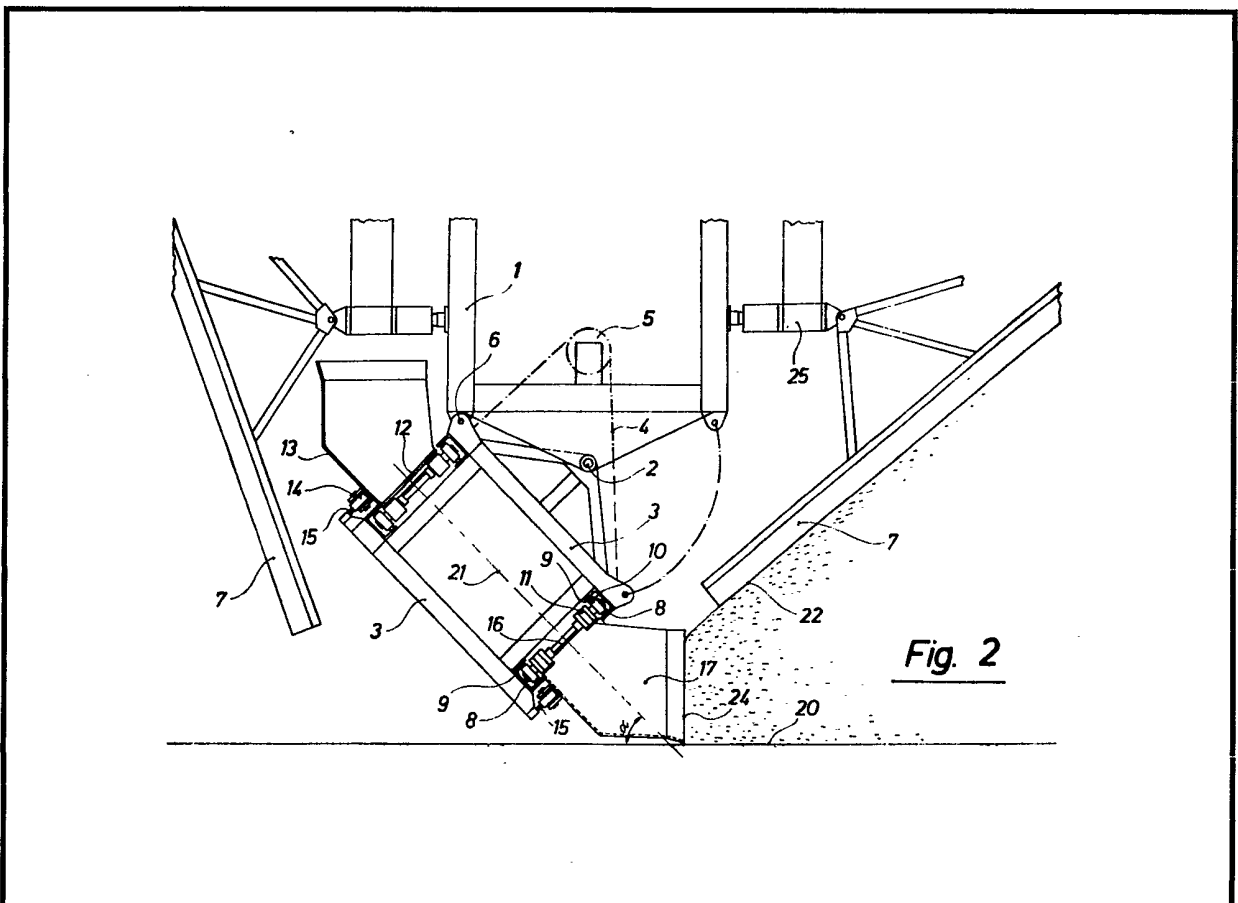
(74) Agents

Dr Walther Wolff Co

(54) Material removing apparatus

(57) An apparatus for removing material from a stockpile, comprises a bridge (1) adapted to extend over and move across the stockpile, and a rotatable discharge device adapted to engage and remove material from the foot of the stockpile and transfer the removed material to conveyer means (26). The discharge device comprises an endless two-strand chain (11) and discharge elements (17) (24) connected to the chain (11) and journalled in a supporting framework (3) disposed underneath and con-

nected to the bridge (1). The discharge device rotates in a plane (21) inclined to the bed (20) of the stockpile and the apex of the angle α formed between stockpile bed (20) and the rotational plane (21) points towards the stockpile.



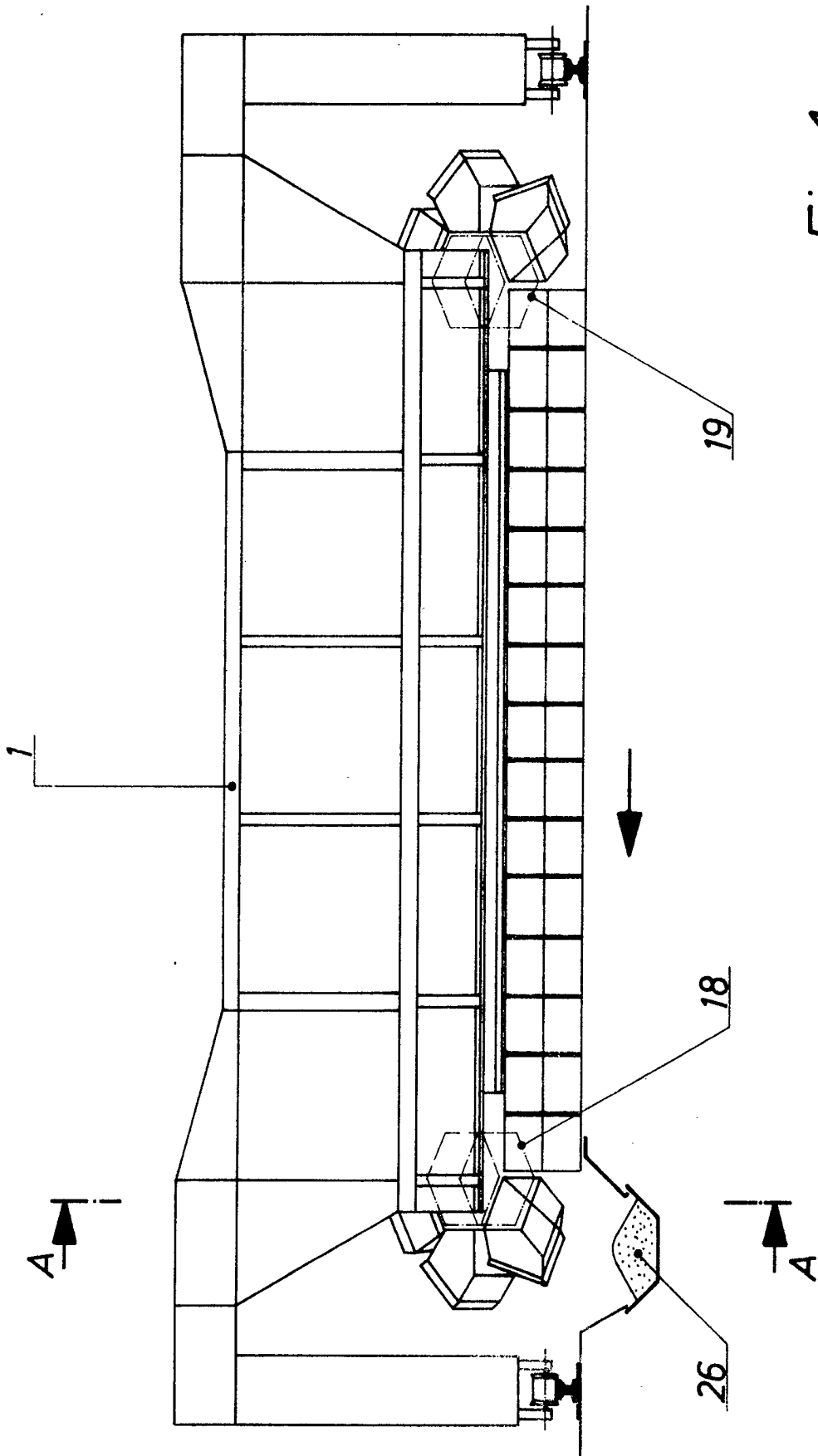


Fig. 1

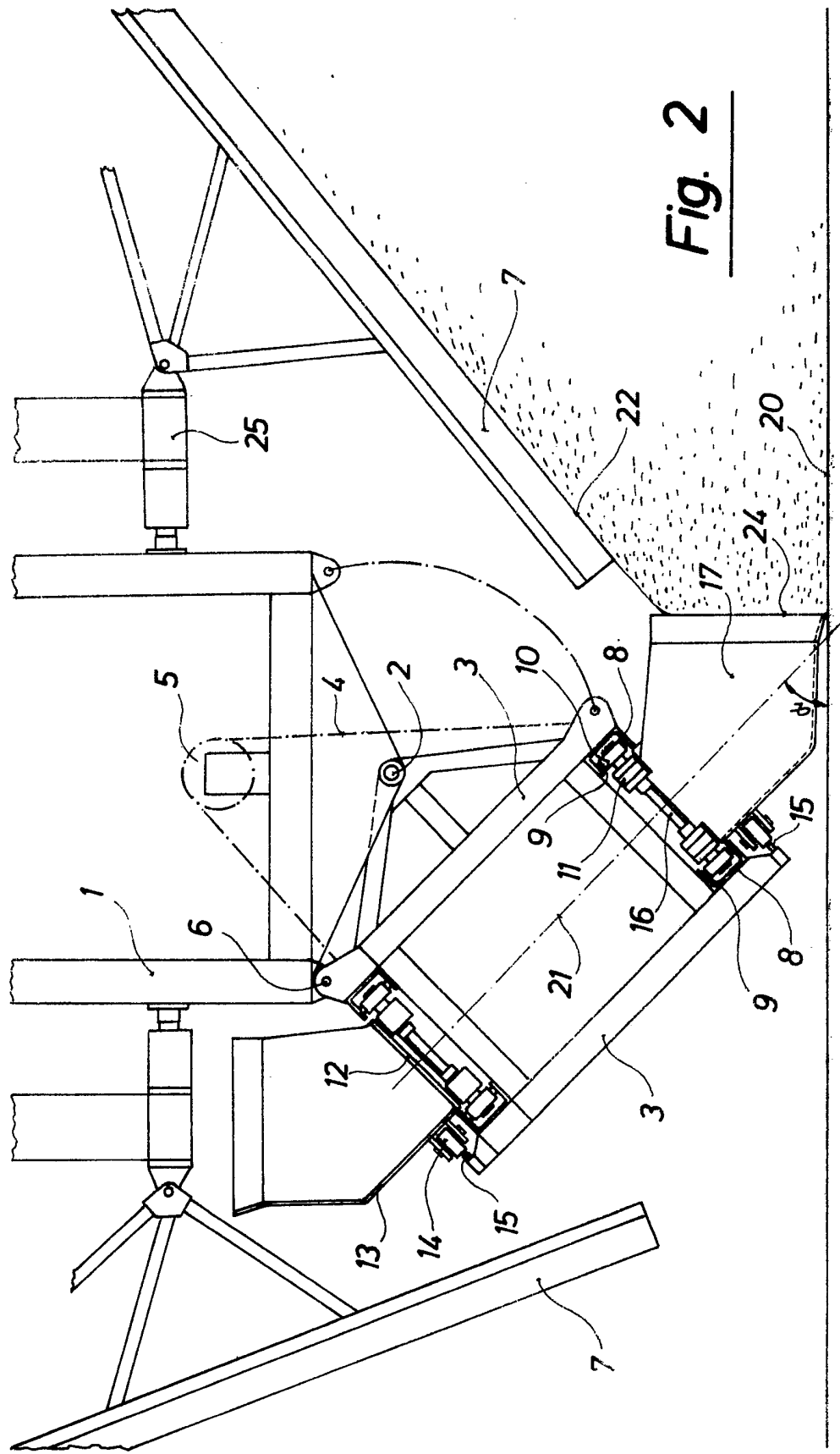


Fig. 2

SPECIFICATION

Material removing apparatus

5 The present invention relates to an apparatus for removing material from a stockpile.

Apparatuses for removing material from a stockpile serve to clear away bulk material stacked in elongate or round stockpiles and to transfer it to transport equipment connected therewith, for example a belt conveyor disposed externally of the stockpile and parallel to the axis of the stockpile. It is known to clear bulk material stockpiles from the long side of an elongate stockpile, from the head of the stockpile or from the stockpile end face, the latter having the greatest homogenizing effect. Stockpile reclaiming apparatuses operating at the stockpile end faces and displaceable in the direction of the axis of the stockpile comprise a discharge device and a supporting construction spanning over the entire width of the stockpile and mounted on bogeys. Furthermore, escarpment clearers, such as oscillating rakes, pivotable stripper ropes and the like can be included, which sweep over the stockpile end face and loosen the bulk material so that this trickles into the range of the discharging devices. Known discharging devices are rotating bucket tubes extending over the entire width of the stockpile, bucket wheels movable to and fro transversely to the axis of the stockpile and scraper equipments rotating parallel to the stockpile end face.

DE PS 21 55 355 discloses an apparatus with a scraper equipment, which is arranged centrally underneath a drivable bridge, rotates in a plane perpendicular to the base of the stockpile and parallel to the stockpile end face and which, when use of the equipment is envisaged at both sides, must be so constructed that the bulk material can get from both sides into the range of action of the scrapers. Therefore, no lateral material guides can be provided, which prevent issuing of bulk material on the side remote from the stockpile end face. It is therefore more advantageous, according to the DE AS 26 16 807 to let the scraper equipment rotate in a plane parallel to the stockpile base and to arrange a material guide between both the scraper strands. Nevertheless, there is the danger even with this equipment of bulk material remaining between the material guide and stockpile bottom and being entrained by the return run of the scraper equipment lying at the same height as the working run and discharging to the opposite side.

This disadvantageous effect can also arise when the stockpile reclaiming apparatus in consequence of an uneven driving track tilts about an axis perpendicularly to the stockpile.

It is furthermore disadvantageous in the aforementioned apparatuses that the bulk material during the lateral discharging scrapes

on the bottom of the stockpile, which leads to a possibly undesirable grain comminution.

According to the present invention there is provided an apparatus for removing material from a stockpile, comprising a bridge intended to extend over and move across such stockpile, and a discharge device which is adapted to engage such stockpile to remove material from the foot of such stockpile, the discharge device comprising endless conveyor means arranged to be so rotatable in use in a plane inclined at an acute angle to the bed of such stockpile that the apex of the angle is directed towards such stockpile, and discharge elements connected to the conveyor means and mounted to a support framework disposed below and connected to the bridge.

An embodiment of the present invention will now be more particularly described by way of example and with reference to the accompanying drawings in which:

Figure 1 shows schematically the front elevation of an apparatus for removing material from a stockpile, without an escarpment clearer and

Figure 2 shows a side elevation along line A-A of Fig. 1.

Referring to the accompanying drawings, a supporting framework 3 is mounted under a bridge 1 which is displaceable along the axis of the stockpile on rail bogeys and pivotable about an axis 2 parallel to the stockpile end face by means of a link chain 4 which is moved by a drive 5 (not shown in detail) mounted to the bridge. The framework is locked with the bridge by means of the locking device 6 to relieve the link chain 4 during operation of the apparatus. Two mutually parallel guide carriers 8, between parallel guide tracks 9 of which are guided the outer runners 10 of the endless two-strand chain 11, are respectfully arranged to both sides of the supporting framework and parallel to the longitudinal axis thereof. In place of the runners, skids may be provided. Discharge means comprising a rear wall 12 and an inclined bottom wall 13 is detachably connected by its rear wall with links of the two strand chain 11 and is supported by a roller 14 mounted at the bottom wall 13 on a guide rail 15 connected with the supporting structure. A side wall 17 is mounted on a hinge pin 16 of the two-strand chain 11 to be pivotable about the axis thereof and extends so far downwardly that, in the extended position of the two-strand chain 11, side edges of the bottom walls 13 of two adjacent discharge means prevent pivotation. Cutting edges 24 of the side walls can be vertical, or inclined forwardly or rearwardly. A driving tumbler 18 together with an associated drive and a tensioning tumbler 19 are arranged at the end faces of the supporting framework as schematically indicated in Fig. 1.

Escarpment clearers 7 are each articulated

to a framework 25 displaceable on the bridge 1 in the longitudinal direction thereof.

In the operative setting of the apparatus, the discharging device comprising two-strand chain and discharge means rotates in a plane 21 inclined to the stockpile bottom 20, while the apex of the enclosed angle α points towards the stockpile end face 22.

In the stretched position of the two-strand chain, the discharging means are open for material take-up only upwardly and towards the stockpile end face.

During the deflection at the tumblers, wedge-shaped gaps form between the bottom walls 13. As a consequence of the inclined plane of rotation, the bulk material disposed in the discharging means slides out and can be transferred to a conveyor 26 connected downstream. The pivotable side walls in that case each time remain bearing against the side edges of the discharging means lying behind them seen in the conveying direction.

With a stockpile reclaiming apparatus operating only one-sidedly, the supporting framework 3 is rigidly connected with the bridge 1 so that pivot axis 2, link chain 4 with drive 5 and locking equipment 6 are redundant. Furthermore, the side walls 17 are not pivotably connected with the hinge pins 16, but rigidly with the side edges, lying forwardly in conveying direction, of the rear walls 12 and bottom walls 13.

The aforescribed stockpile reclaiming apparatus is suitable for the removal of bulk material, which has been stacked in long or round stockpiles, from storage.

An advantage of the above described embodiment is that the bulk material is discharged with optimum grain preservation, undesirable material conveying by the return run is avoided and issuing of bulk material out of the range of action of the discharging equipment is reduced to a minimum. Also the inclined plane of rotation of the discharging device enables the return run of the discharge device to be higher than the working run and undesirable discharging the bulk material against the discharge device is thereby avoided. The bulk material during discharging no longer scrapes on the stockpile bottom so that not only undesirable grain comminution is largely avoided but also driving power is saved because of the reduced friction. Furthermore, a higher discharge performance is attained through the higher degree of filling of the discharge elements.

It is possible to use the embodiment between two stockpiles disposed behind each other due to the pivotable mounting of the supporting framework underneath the drivable bridge. The inclination of the plane of rotation is set to correspond to the direction of reclaiming.

65 CLAIMS

1. An apparatus for removing material from a stockpile, comprising a bridge intended to extend over and move across such stockpile, and a discharge device which is adapted to engage such stockpile to remove material from the foot of such stockpile, the discharge device comprising endless conveyor means arranged to be so rotatable in use in a plane inclined at an acute angle to the bed of such stockpile that the apex of the angle is directed towards such stockpile, and discharge elements connected to the conveyor means and mounted to a support framework disposed below and connected to the bridge.

2. An apparatus as claimed in claim 1, wherein the discharge elements each comprise a rear wall which in use is spaced from such stockpile, a bottom wall which extends in a plurality of planes and is connected at the rear end thereof to the rear wall, and a side wall connected to the rear and bottom walls, the conveyor means comprising a chain and the rear wall of each discharge element being so detachable connected to the chain that when the chain is under tension the side wall of each discharge element constitutes a further side wall of a respectively adjacent discharge element.

3. An apparatus as claimed in claim 2, wherein the support framework is so mounted to the bridge as to be displaceable about an axis parallel to the length direction thereof, the side walls of the discharge elements are so connected to hinge pins of the chain as to be pivotable about the axis of the pins, and when the chain is under tension the bottom walls by their edges prevent pivotation of the associated side walls.

4. An apparatus as claimed in any one of the preceding claims, wherein the discharge elements each comprise a bucket.

5. An apparatus for removing material from a stockpile substantially as hereinbefore described with reference to the accompanying drawings.

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