

74798/87

COMMONWEALTH OF AUSTRALIA

Patent Act 1952

598275
APPLICATION ACCEPTED AND AMENDMENTS
17-4-70
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SECTION 34(1)(a) DIRECTION SEE FOLIO 8
NAME DIRECTED O & K ORENSTEIN & KOPPEL AG-
3020, Dahl-Funk-Str. 30, D-4600 Dortmund 1,
Federal Republic of Germany

hereby apply for the grant of a Standard Patent for an invention entitled

Transfer system for heaped bulk goods, particularly for open cut mining equipment

which is described in the accompanying complete specification.

This application is made under the provision of Part XVI of the Patents Act 1952 and is based on an application for a patent or similar protection made

in Federal Republic of Germany

on 28 June 1986

No. (P36 21 769.7)

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No. (

My/Our address for service is

: F.B. RICE & CO.,
28A Montague Street,
Balmain N.S.W. 2041

Dated this 26th day of June

1987

PHB WESERHUTTE AKTIENGESELLSCHAFT

By:

Registered Patent Attorney

To: The Commissioner of Patents
COMMONWEALTH OF AUSTRALIA

LODGED AT SUB-OFFICE
29 JUN 1987
Sydney

30 8/11/86

Commonwealth of Australia
The Patents Act 1952
DECLARATION IN SUPPORT

In support of the (Convention) Application made by: **O & K ORENSTEIN & KOPPEL AG**

for a patent for an invention entitled: **TRANSFER SYSTEM FOR HEADED BULK GOODS,
PARTICULARLY FOR OPEN CUT MINING EQUIPMENT**

☒ (We) **Gunter Cordes and Wolfgang Cichy**

of and care of the applicant company do solemnly and sincerely declare as follows:

~~a) I am (We are) the applicant(s) for the patent~~

or

b) ~~I am~~ (We are) authorised by the applicant(s) for the patent to make this declaration on its behalf.

Delete the following if not a Convention Application.

The basic application(s) as defined by section 141 (~~xxx~~) of the Act was (~~xxxx~~) made

on **28 June 1986** in **Federal Republic of Germany**

~~XOTK~~

~~XIX~~

~~XDXK~~

~~XIX~~

by **PHB Weserhutte Aktiengesellschaft**

The basic application(s) referred to in this paragraph is (~~are~~) the first application(s) made in a Convention country in respect of the invention the subject of the application.

~~a) I am (We are) the actual inventor(s) of the invention.~~

or **Rolf Sagner, of Ernst-Albrecht-Str. 34, 4973 Vlotho, West Germany**
b)

is (~~are~~) the actual inventor(s) of the invention and the facts upon which
the applicant company

is (are) entitled to make the application are as follows:

**The applicant company is the assignee of the invention from
PHB Weserhutte Aktiengesellschaft which is the assignee of the
invention from the actual inventor**

Declared at **Dortmund** this **12** day of **March** 19**90**

Signed  Status **Head of licence dept./Head of patent dept.**

Declarant's Name **Gunter Cordes** **Wolfgang Cichy**

F. B. RICE & CO PATENT ATTORNEYS

This form is suitable for any type of Patent Application. No legalisation required.

(12) PATENT ABRIDGMENT **(11) Document No. AU-B-74798/87**
(19) AUSTRALIAN PATENT OFFICE **(10) Acceptance No. 598275**

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RECLAIMER

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(56) Prior Art Documents
AU 564024 91852/82 E21C 47/02
DE 3323395
DE 2517122

(57) Claim

1. A device for the transfer of won material onto a reclaiming conveyor for open-cut mining devices with a cutter unit as an extraction device and a guide element for the won material to be transferred, whereby the guide element is provided with an opening through which the won material may be transferred onto a reclaiming conveyor superposed to it and which is arranged on the outside of the extraction device, wherein the extraction device is pivotted on a superposed device, which preferably moves on crawler tracks, positioned transversely in front of it, comprising the combination of the features

- a chute-like element which is adjustable about a tilting axle parallel to the longitudinal axis of the open-cut mining device (feed direction, travel direction),
- the chute-like element is simultaneously hinged about

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(10) 598275

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a horizontal axle of the tail pulley of the reclaiming conveyor, and

- the chute-like element is connected to the reclaiming conveyor and the reclaiming device.

Patent Act 1952

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Related Art :

It contains the
amendments made under
Section 40.

and is correct for printing.

34 (4)

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The following statement is a full description of this invention including the best method of performing it known to us/~~me~~:-

The present invention concerns a system for the transfer of heaped bulk goods onto a reclaiming conveyor, which have been reclaimed by a series connected reclaiming device up front, particularly for open-cut mining
5 equipment.

Heading machinery to drive mining drifts and tunnels in the under-ground domain are known in many variations and are mentioned only as examples (DE-PS 3 323 395, DE-PS
2 517 122.

10 The DE-PS 2 517 122 discloses a heading machine, which incorporates a reclaiming (excavating) device consisting of several rollers, which loosens the material from the top to the bottom.

The material falls to the ground and is collected by
15 downstream series located loading shovels and fed onto a reclaiming conveyor located in the approximate centre (scraper chain conveyor). Besides the expensive method of the reclaiming (excavating) and further transporting process of the material, the drawback is here, that the
20 material cannot be always completely taken up by the reclaiming conveyor or falls past. This causes an interruption of the excavating process from time to time, since the heading machine must be driven back and pick up the material still laying on the ground. If this was not
25 taking place, then the machine would create itself all the time a new working plane while advancing, that is it would climb through the material left laying on the ground.

The (German Patent) DE-PS 3 323 395 incorporates a similar heading machine, with the difference, that the
30 loading tools are constructed as swivelling loading screws, which incorporate in their rear section, loading trough forming chutes. The scooped-up material is also fed towards a centrally located removal system, whereby the same drawbacks apply here, as described earlier.

35 It is the task of the present invention, to improve

or to further develop a system for the transfer of heaped bulk goods and to that end the present invention consists in a system for the transfer of heaped bulk goods onto a reclaimer conveyor, which have been reclaimed by a front
5 connected reclaiming device, said system comprising a chute-like shaped element provided in the transfer region which, in following the movements of the reclaiming conveyor or of the reclaiming device, can be rotated around the horizontal axle of the tail pulley of the
10 reclaiming conveyor and can be swivelled around a further axle, running horizontally in about the centre of the open cut mining reclaiming equipment. By means of the system of the present invention it is possible both during the lifting- and lowering movement as well as during
15 transverse displacement of the reclaiming (excavating) device or of the removal conveyor, without the material being able to drop onto the floor through gaps or similar.

This task is resolved in accordance with the invention by means of a chute shaped element provided in
20 the transfer region, which in following movements of the excavating device or of the removal conveyor, may be rotated around the horizontal axle of the tail pulley of the removal conveyor and can also be swivelled around a further horizontal axle, located in the approximate centre
25 of the open cut reclaiming machine. The chute ensures on the one hand, that the scooped material is transferred in a targetted manner onto the downstreams, series connected removal conveyor and no material can thus fall any longer past, and on the other hand it is ensured through the
30 mobility of the chute as a function of the movement of the excavating device or of the removal conveyor, that the material can be transferred in any position.

In a preferred embodiment the chute is fomed by a transverse angle piece, which is attached to a guide for
35 the heaped bulk material operating in conjunction with the

excavating device, as well as by a shield, also running transversely and arranged between the guide element and the approximately vertical leg of the angle piece. For preference, the shield is being overlapped at least
5 partially in the form of a housing by the approximately horizontal leg of the angle piece. The shield is supported in a rotatable manner on the horizontal axle of the tail pulley. Since in this implementation the guide element as well is supported to rotate around this axle,
10 both parts of the chute (angle piece and shield) are being rotated together through specified angles.

Constraining forces are thus avoided.

In accordance with a further embodiment of the invention, the common rotary motion is achieved by the
15 means, that a driving device is located within the region of the shield, which is constructed for preference by a profile curved through a specified radius, which is guided by a holding element encasing it.

During transverse adjustment, the horizontal shaft of
20 the tail pulley remains in its position parallel with the ground and the guide element will be transversely tilted in the one or in the other direction through a specified angle. So that in this position as well, the shield could be rotated around the axle, the curved profile is bent in
25 such a manner, that the radius passes through the centre of the axle located in the middle of the open cut mining machine.

To achieve the requisite freedom of movement in the region of the chute it is furthermore proposed, that the
30 approximately vertical leg of the angle profile which faces the removing conveyor is constructed in a curved or a slanted manner, whereby its largest dimension is provided in its central region and the smallest dimensions in its end regions. Should it be so desired,
35 there exists in addition the possibility to provide an

elastic profile within the range of the so profiled vertical leg which, possibly under pre-tension, rests against the surface of the removal conveyor. Here, an additional sealing effect is being achieved which reduces or minimises the gap, which prevents fine grained, heaped bulk goods from falling past or acts against any possible clogging of the gap between vertical leg and disk.

It is proposed as a further measure to achieve satisfactory free movement, that the substantially vertical shield, within its region facing the approx. horizontal leg of the angle piece, is constructed in a curved or slanted manner, whereby the largest dimensions are provided in its outer regions and the smallest dimension in its central region.

As a result of the proposed measures, the transfer from the guide element to the removing conveyor or to the tail pulley takes place in such a manner, that a gap can no longer form at the point of transfer, through which any material could drop between the chute and the tail pulley onto the ground and this is independent on the position of the reclaiming (excavating) device. Preferred areas of application of the invention can be found in open cut mining equipment which incorporate, as the excavating device, loading (feed) screws located transversely in front of the equipment.

The present invention will now be described by way of example with reference to the accompanying drawings, in which:-

Figure 1 shows a partial view of typical open cut mining excavation equipment with a reclaiming (excavation) device located in front in series and incorporating a system in accordance with the present invention.

Figure 2 shows a portion of the transfer zone from the reclaiming (excavating) device onto a removing conveyor;

Figure 3 shows a section through the chute in accordance with Figure 2 (Section II - II);

Figure 4 shows a section through the angle piece in accordance with Figure 3 (Section I - I).

5 Figure 1 shows the partial view of an open cut mining reclaiming (excavating) equipment. Merely indicated is a reclaiming (excavating) device 1 which is installed in series in front of a travel assembly 2. The reclaiming (excavating) device takes the form of a loading screw,
10 which scrapes up the material 3 in an undercut operational mode.

Starting off from the two sides the material 3 is transported between the loading screw 1 and a guide element 4 arranged behind it, towards the centre. It
15 piles up there and is transferred through an opening 5 located above the guide element 4 onto a reclaiming conveyor located in series downstream.

A chute-like constructed element 7 described in greater detail in Figures 2 - 4 is provided in the
20 transfer zone which, in following the movements of the reclaiming (excavating) device 1, can be rotated around the horizontal axle 8 of the tail pulley 9 of the recovering conveyor and can be tilted in addition around a further axle 20 running horizontally approximately in the
25 middle of the open cut mining equipment. The chute-like element 7 is constructed in two parts. It consists of a transverse angle piece 10, which is attached with its horizontal leg 11 to the guide element 4. In addition there is provided a shield 12 extending in an
30 approximately vertical direction which is arranged between the vertical leg 13 of the angle piece 10 and the guide element 4. The material 3 lands on the reclaiming conveyor 6 by following the direction of the arrow. Because of the barrier formed within the region of the
35 tail pulley 9, a gap cannot form there, through which

scraped up material 3 could fall back onto the floor 14 again. A continuous reclaiming and transport process is thus ensured, whereby the open cut mining equipment can travel on a self-created plane surface, without any danger of possible climbing. Both the guide element 4 as well as the shield 12 are supported in a rotatable manner around the horizontal axle 8 of the tail pulley 9, so that during movement around this axle (angle α, β) a common, simultaneous displacement takes place. This is achieved by the means, that a driving device 15 is provided, which is formed from a curved profile 16 with a specified radius 'R', which can be guided between holding elements 17, 18.

In the case of transverse adjustment, the axle 8 remains in its position parallel with the ground 14 and the guide element 4 is transversely adjusted through the angle γ . So that in this position as well, the shield 12 may be rotated around the axle 8, the profile is curved preferably with a radius 'R' around the axle 20 (Figure 1), that is the centre of its axle.

To achieve the required degree of freedom, the verticle leg 13 of the angle piece 10 as well as the shield 12 in its area facing the horizontal leg 11 of the angle piece 10 are constructed in the form of a curve 19, 21. The largest dimension 'a' of the shield 12 are located in its two external zones, while the largest dimension 'b' of the angle piece 10 or of its vertical leg 13 is provided in the centre. For the purpose of achieving a better match to the reclaiming conveyor 6, the vertical leg 13 of the angle piece 10 can possibly be equipped with an elastically deformable element (not shown).

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A device for the transfer of won material onto a reclaiming conveyor for open-cut mining devices with a cutter unit as an extraction device and a guide element for the won material to be transferred, whereby the guide element is provided with an opening through which the won material may be transferred onto a reclaiming conveyor superposed to it and which is arranged on the outside of the extraction device, wherein the extraction device is pivotted on a superposed device, which preferably moves on crawler tracks, positioned transversely in front of it, comprising the combination of the features

- a chute-like element which is adjustable about a tilting axle parallel to the longitudinal axis of the open-cut mining device (feed direction, travel direction),
- the chute-like element is simultaneously hinged about a horizontal axle of the tail pulley of the reclaiming conveyor, and
- the chute-like element is connected to the reclaiming conveyor and the reclaiming device.

2. The device as claimed in claim 1, wherein the chute-like element is formed through a transverse angle piece, which is attached to a guide element for the won material interacting with the extraction device, as well as an also transversely running shield, arranged between the guide element and the vertically running leg of the transverse angle element piece.

3. The device as claimed in any one of the claims 1 or 2, wherein the shield is at least partially overlapped casing-like by the horizontally running leg of the transverse angle element piece.

4. The device as claimed in any one of the preceding claims, wherein the guide element is rotatably hinged about the horizontal axle of the tail pulley of the



reclaiming conveyor.

5. The device as claimed in any one of the preceding claims, wherein a driving device is provided in the region of the shield.

6. The device as claimed in any one of the preceding claims, wherein the driving device is formed by a curved profile, which is directed through a holding element encompassing it.

7. The device as claimed in any one of the preceding claims, wherein the guide element is transversely adjustable by a given angle α , wherein the curved profile is bent, so that a radius (R) is formed about the centre of the axis of the axle arranged in the centre of the open-cut mining device.

8. The device as claimed in any one of the preceding claims, wherein the approximately vertically running leg of the transverse angle piece, which is facing the reclaiming conveyor, is formed arc-shaped or bevelled, wherein the largest extension of the angle piece is provided in its central region and the smallest extension in its outer regions.

9. The device as claimed in claim 8, wherein elastically deformable profiles arranged in the region of the vertical leg of the shield and/or the vertical leg of the angle piece, which may, possibly under pretension, contact the surface of the reclaiming conveyor.

10. The device as claimed in any one of the preceding claims, wherein the essentially vertically running shield is formed arc-shaped or bevelled in the region facing the approximately horizontally running leg of the transverse angle piece, wherein the largest extension of the shield is provided in its outer regions and the smallest extension in its central region.



11. A system for the transfer of heaped bulk goods onto a reclaimer conveyor substantially as hereinbefore described with reference to the accompanying drawings.

DATED this 16th day of November 1989

O & K ORENSTEIN & KOPPEL AG
Patent Attorneys for the
Applicant:

F.B. RICE & CO.



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FIG. 1

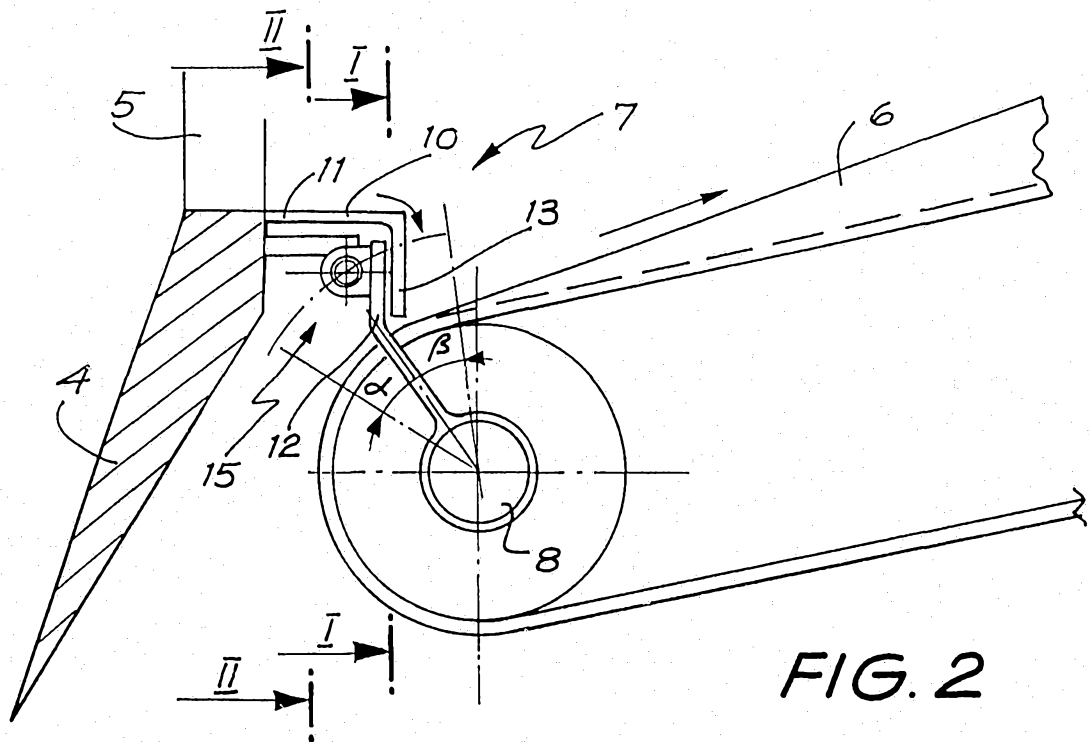
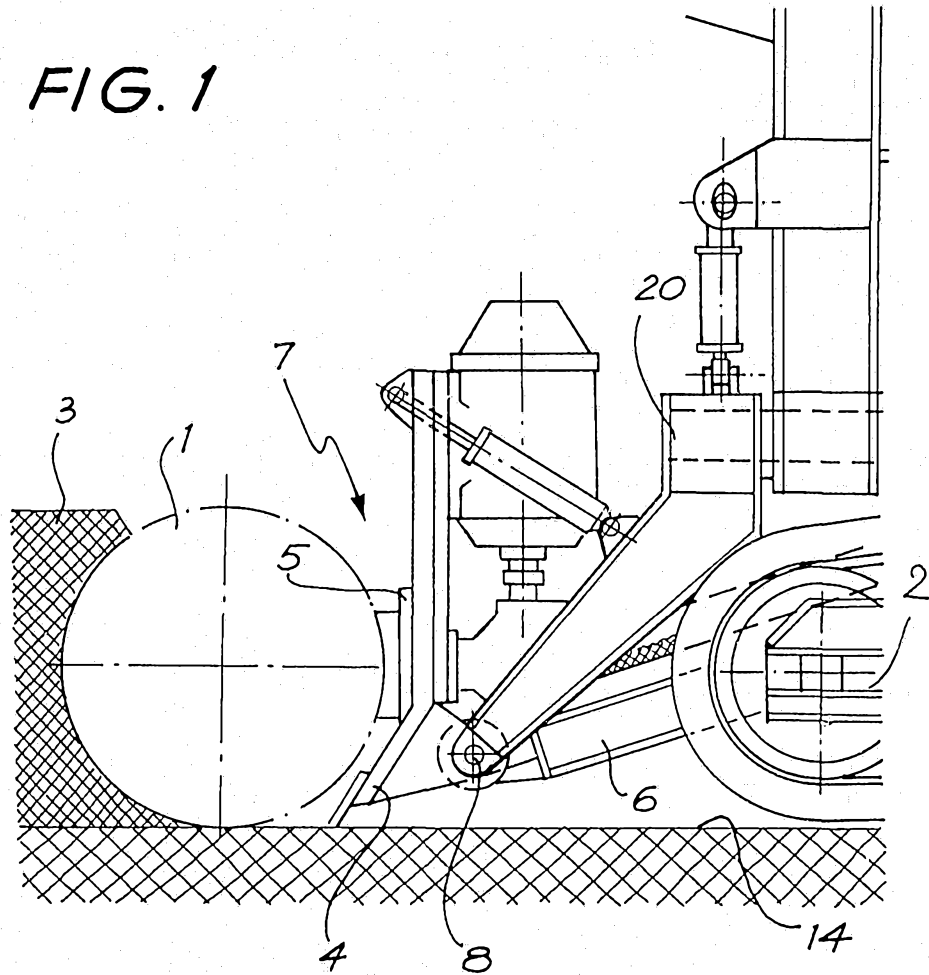


FIG. 2

