FORM 1

SPRUSON & FERGUSON

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

610985

APPLICATION FOR A STANDARD PATENT

MMD Design & Consultancy Limited, of Cotes Park Lane, Cotes Park Industrial Estate, Somercotes Derbyshire, DE55 4NJ, UNITED KINGDOM, hereby apply for the grant of a standard patent for an invention entitled:

Feeder-Breaker Apparatus

which is described in the accompanying complete specification.

This application is a further application for a standard patent made by virtue of Section 51 of the Patents Act 1952, in respect of an invention disclosed in the complete specification lodged in respect of Application No. 51419/85

The address for service is:-

Spruson & Ferguson
Patent Attorneys
Level 33 St Martins Tower
31 Market Street
Sydney New South Wales Australia

DATED this SEVENTH day of FEBRUARY 1989

MMD Design & Consultancy Limited

By: M.P. Anderson

Registered Patent Attorney

TO: THE COMMISSIONER OF PATENTS
OUR REF: 85936
S&F CODE: 60350

5845/2

SPRUSON & FERGUSON

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

DECLARATION IN SUPPORT OF AN APPLICATION FOR PATENT

In support of the application made by MMD Design & Consultancy Limited, for a patent for an invention entitled:

"Feeder-Breaker Apparatus"

I, MMD DESIGN & CONSULTANCY LIMITED ALAN POTTS
[full name of declarant(s)]

of COTES PARK LANE, COTES PARK INDUSTRIAL ESTATE, GENEINA
[full address of declarant(s) - not post office box]
SOMERCOTES 1 CHAPEL LANE
DERBYSHIRE DE55 4NJ RAVENSHEAD
NOTTINGHAMSHIRE

do solemnly and sincerely declare as follows:

1. I am authorised by MMD Design & Consultancy Limited, the applicant for the patent to make this declaration on its behalf.

2. Alan Potts, of "Geneina", No. 1 Chapel Lane, Ravenshead, Nottinghamshire, UNITED KINGDOM is the actual inventor of the invention and the facts upon which the applicant is entitled to make the application are as follows:-

   MMD Design & Consultancy Limited is entitled by Contract of Employment between the inventor as employee and MMD Design & Consultancy Limited as employer, as a person who would be entitled to have the patent assigned to it if a patent were granted upon the application made by the inventor.

DECLARED at 09.00 this 21ST day of JANUARY 1991

X .....
Signature of Declarant(s)

TO: THE COMMISSIONER OF PATENTS
AUSTRALIA

KLN/21391

(12) PATENT ABRIDGMENT (11) Document No. AU-B-29712/89
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 610985

(54) Title
FEEDER-BREAKER APPARATUS

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(72) Inventor(s)
ALAN POTTS

(74) Attorney or Agent
SPRUSON & FERGUSON, GPO Box 3898, SYDNEY NSW 2001

(56) Prior Art Documents
AU 14704/83 B02C 23/00
AU 469868 78625/75 10.1 10.3
GB 750535

(57) Claim

1. A mineral breaker having a pair of side by side breaker drums rotatably mounted on opposed end walls of a breaker housing, the upper portion of one of the end walls having an opening through which mineral to be broken can be discharged into the breaker at substantially the same level or slightly above the upper level defined by the breaker drums the drums being provided with conveying means which on rotation of the drums urges mineral to move along the drums away from the opening.

S & F Ref: 85936

FORM 10

COMMONWEALTH OF AUSTRALIA

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610985

COMPLETE SPECIFICATION

(ORIGINAL)

FOR OFFICE USE:

Class Int Class

Complete Specification Lodged:
Accepted:
Published:

Priority:

Related Art:

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Complete Specification for the invention entitled:

Feeder-Breaker Apparatus

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

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FEEDER-BREAKER APPARATUS

The present invention relates to a feeder-breaker apparatus for use in mineral handling.

In mining and quarrying mineral which is won, for instance, by blasting techniques needs to be transported away from the mining/quarrying site. This can be done by vehicles having buckets which scoop up loads of the won mineral and then deposit the loads into a hopper for transport away by belt conveyor. The won mineral contains lumps of mineral of varying sizes. The larger lumps of mineral particularly elongate pieces of mineral (commonly referred to as slabs) can cause blockage problems, particularly at transfer points and accordingly it is desirable that the conveying system be fed with won mineral which does not contain lumps of mineral above a predetermined size. In addition, since conveying systems have a maximum continuous rate at which they can convey material difficulties arise if intermittent surges of material are deposited onto the conveyor.

It is the object of the present invention to overcome or substantially ameliorate the problems and/or disadvantages of the prior art.

In one broad form the present invention provides a mineral breaker having a pair of side by side breaker drums rotatably mounted on opposed end walls of a breaker housing, the upper portion of one of the end walls having a opening through which mineral to be broken can be discharged into the breaker at substantially the same level or slightly above the upper level defined by the breaker drums the drums being provided with conveying means which on rotation of the drums urges mineral to move along the drums away from the opening.

In such an arrangement the mineral breaker ensures that lumps greater than a maximum desired size are broken down before being deposited onto the take-away conveyor.

Reference is now made to the accompanying drawings, in which:-

Figure 1 is a side view of an embodiment according to the present invention;

Figure 2 is a part plan view of the embodiment of Figure 1 as viewed in the direction of arrow C;

Figure 3 is a sectional view taken along line D-D in Figure 1; and

Figure 4 is a sectional view taken along line A-A in Figure 1.

The mineral handling apparatus according to the present invention is generally shown at 10 and includes an elongate storage compartment 14 having an inlet end 14a and an outlet end 14b. The storage compartment 14 is constructed from interconnected panels 15 which are bolted to one another to define an elongate open topped channel-shaped construction which is seen in Figure 4 has inwardly directed bottom side walls 19. Conveniently the compartment 14 is open ended at end 14a so as to facilitate deposit of won mineral into the compartment.

Located at the bottom of the storage compartment 14 and extending along its length is a conveyor assembly 20. The conveyor assemby 20 is composed of side plates 22 which are bolted to one another and to the walls of the storage compartment. The conveyor assembly 20 includes an upper run 20a defined by a floor 20b over which laterally spaced flights 20c sweep. The flights 20c are connected by a pair of continuous chains 20d which are trained about a sprocket shaft 60b which is driven by a motor 60a which is preferably a hydraulic motor.

A mineral breaker housing 30 is bolted to the storage compartment/conveyor assembly construction at the outlet end of the compartment. The housing 30 is also bolted to support brackets 32 which are connected to the compartment 14. Accordingly the storage compartment/conveyor assembly and breaker housing 30 define a composite rigid unitary structure.

The unitary structure is supported in a supporting frame 40 which basically comprises a pair of arms 41 (only one being visible in Figure 1) which are mounted on a base 42 via legs 43. The base 42 is conveniently provided with motive means which enable the whole apparatus to be moved across the ground to a different location. In the illustrated embodiment the motive means is in the form of a pair of continuous tracks 44.

The unitary structure is attached to the arms 41 via a pivotal connection 48 so that the conveyor assembly is inclined and the breaker housing is raised from the ground by a sufficient distance to enable a take-away conveyor (not shown) to be located beneath it.

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The inlet ends 14a of the compartment is provided with a foot pad 38 which in use engages the ground. The position of the pivotal connection 48 is such that the centre of gravity of the unitary structure is located to the left of the pivotal connection as viewed in Figure 1 thereby ensuring that the unitary structure normally rests on the foot pad 38. A ram 50 is provided for moving the unitary structure about the pivot to lift the foot pad 38 clear of the ground to enable the motive means to move the apparatus.

In use, won mineral is deposited into the storage compartment and the conveyor assembly moves the deposited won mineral toward the breaker. Adjustable control means are provided, which in the illustrated embodiment take the form of hydraulic valves operated by control levers 60. The levers 60 enable an operative to control the hydraulic motor 60a and thus control the rate of feed of mineral to the breaker. In this way both the rate of deposit of mineral from the apparatus onto the take-away conveyor and feed of mineral to the breaker can be accurately controlled.

The mineral breaker is preferably provided with a pair of breaker drums 80 which are in line with the direction of feed of the conveyor assembly 20. The drums 80 are driven by a motor 87 preferably at constant rate. The motor 87 is preferably an electric motor. The breaker drums 80 preferably include conveying means which in the illustrated embodiment are in the form of helical ribs 82 which on rotation of the drums serve to urge mineral along the drums away from the conveyor assembly. The drums 80 are spaced apart laterally to define a gap 84 through which dirt and undersized mineral can readily fall. The drums 80 include picks 86 which quickly break down over sized lumps of mineral and direct the broken mineral through gap 84.

The breaker drums 80 are rotatably mounted in opposed end walls, 85, 87 of the breaker housing, and as shown in Figure 3, the upper portion of end wall 85 is provided with an opening 89 (defined by wall face 90) through which mineral is discharged from the compartment into the breaker. Accordingly mineral is discharged from the compartment at substantially the same level or slightly above the level of the upper level of the breaker drums 80.

This enables the overall height of the apparatus to be kept to a minimum by avoiding the need to position the conveyor means above the breaker to drop mineral down into it as with conventional arrangements.

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It is to be appreciated that other constructions of mineral breaker may be incorporated into the above apparatus. For instance a breaker having a single drum aligned with the conveyor means may be provided. Additionally, the breaker drums 80 may have different teeth formations other than those shown in the drawings and the conveying means for each drum may be defined by the breaker teeth themselves as for example as described in our European patent publication 0096706 wherein teeth defining a discrete helical formation for movement of mineral along the breaker drum are disclosed.

AUSTRALIAN PATENT OFFICE LS

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The claims defining the invention are as follows:

1. A mineral breaker having a pair of side by side breaker drums rotatably mounted on opposed end walls of a breaker housing, the upper portion of one of the end walls having an opening through which mineral to be broken can be discharged into the breaker at substantially the same level or slightly above the upper level defined by the breaker drums the drums being provided with conveying means which on rotation of the drums urges mineral to move along the drums away from the opening.

2. A mineral breaker according to Claim 1 wherein the conveying means comprise helical ribs.

3. A mineral breaker according to Claim 1 wherin the conveying means comprise breaker teeth arranged in discrete ~~discreet~~ helical formations.

4 A mineral breaker as hereinbefore described with reference to and as shown in the accompanying drawings.

DATED this SECOND day of FEBRUARY 1989

MMD Design & Consultancy Limited

Patent Attorneys for the Applicant
SPRUSON & FERGUSON

AUSTRALIAN PATENT OFFICE
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KLN:1435b

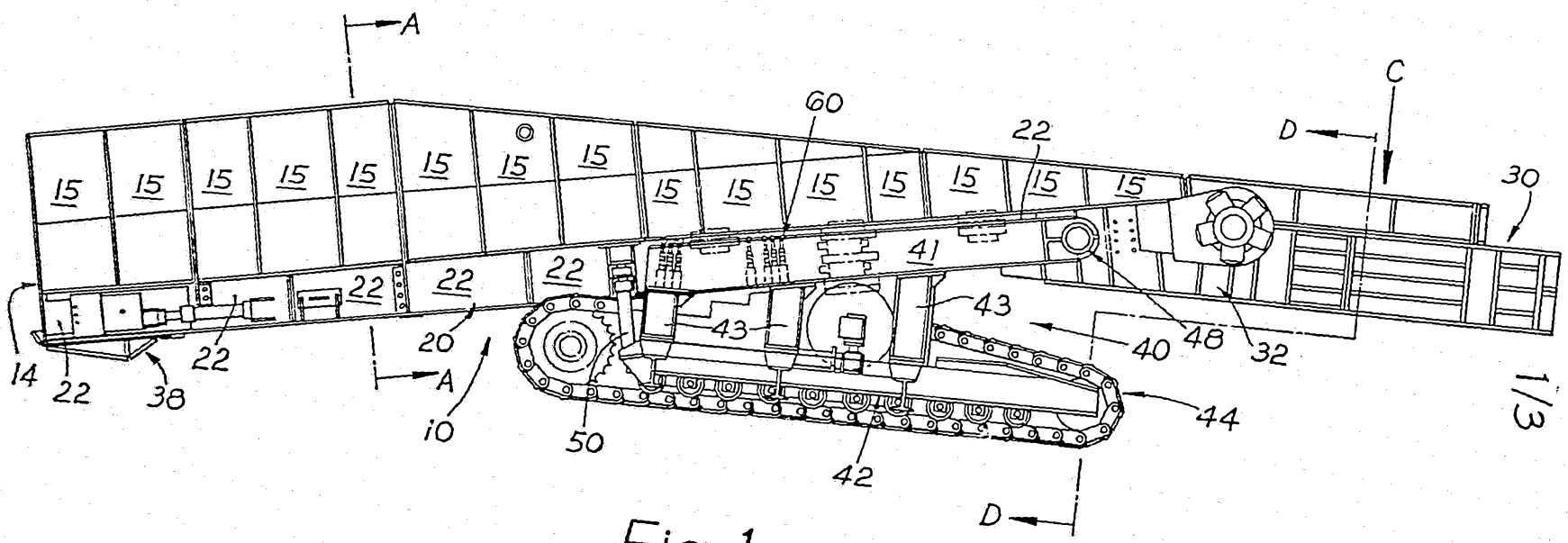

Fig. 1

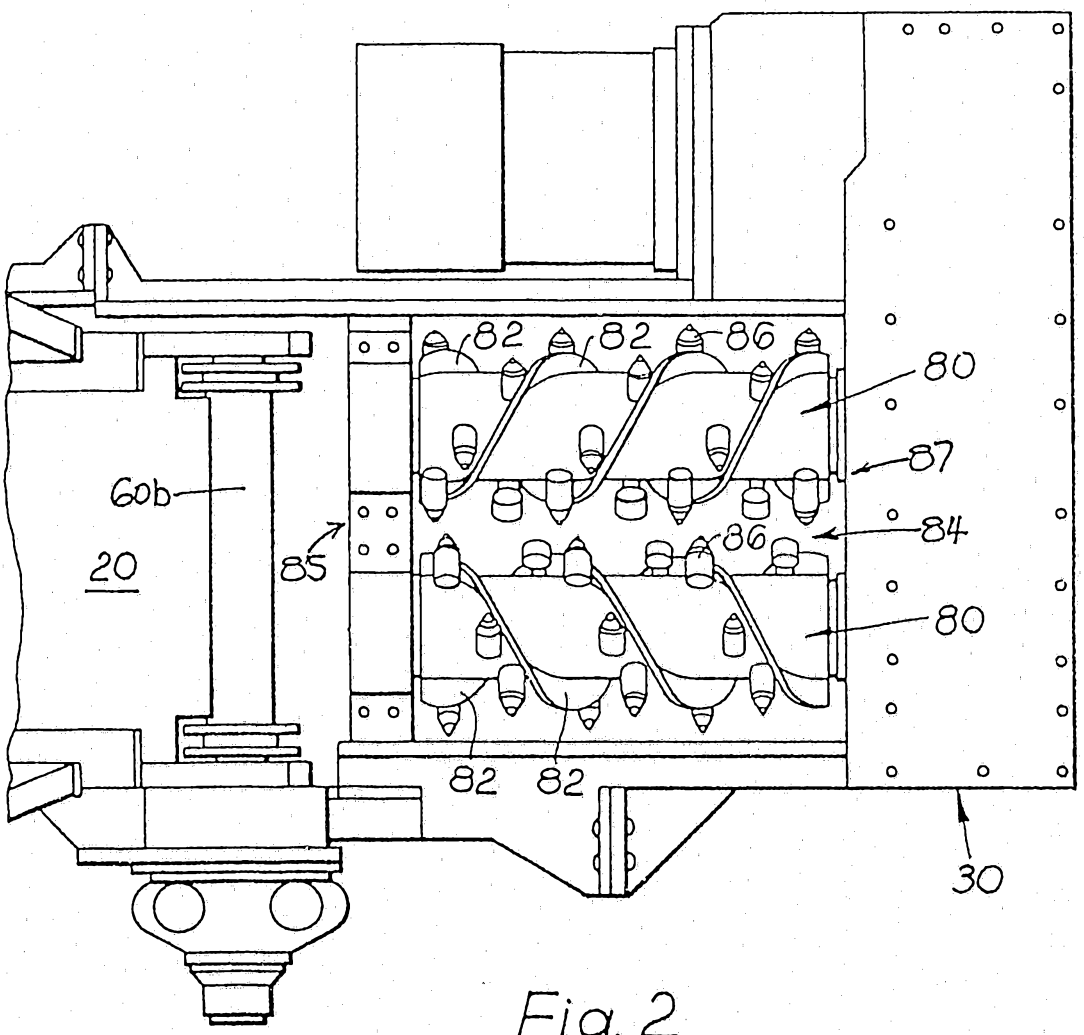

Fig. 2

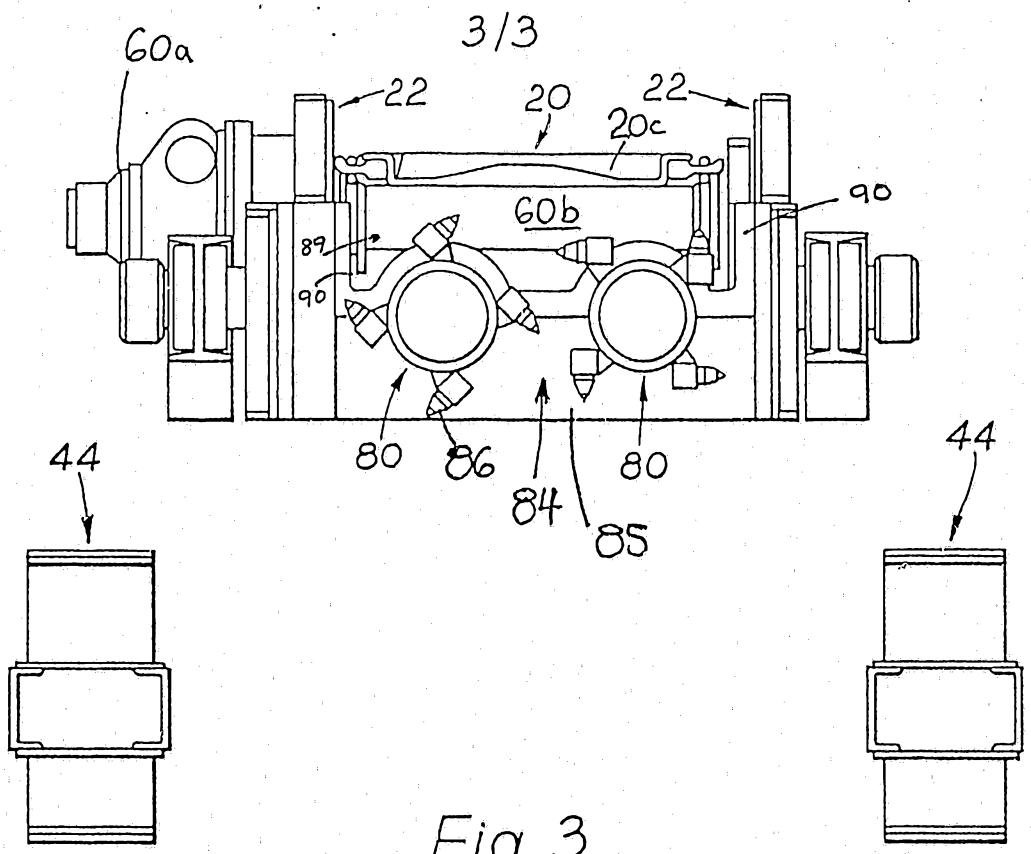
60a
22
20
22
20c
90
60b
89
90
80
86
84
85
80
44
44

Fig. 3

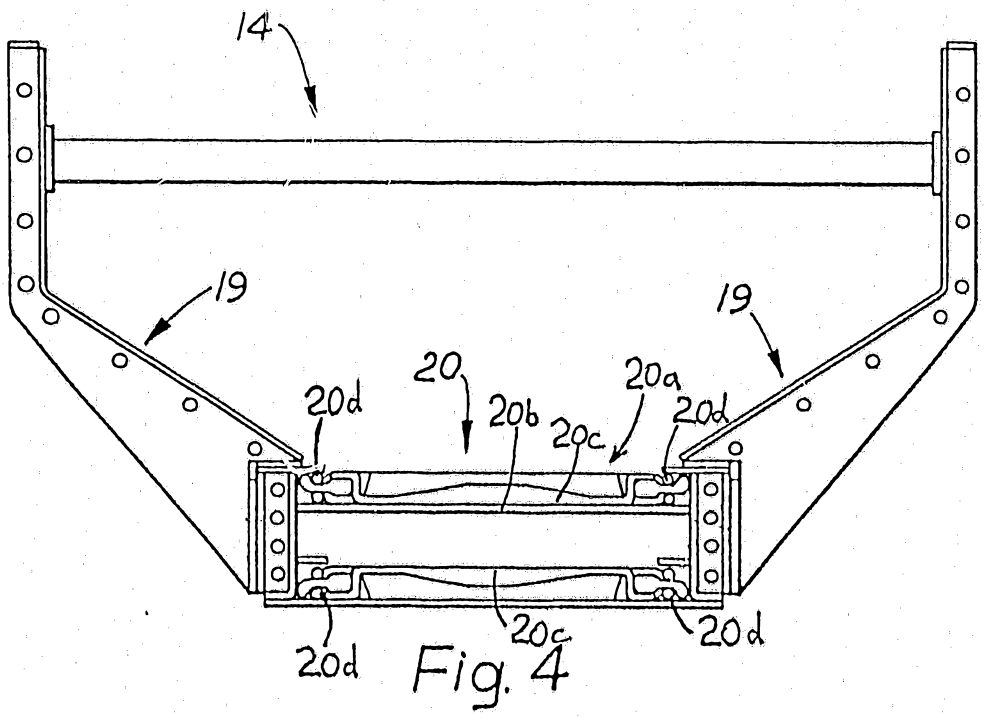
14
19
19
20
20d
20b
20a
20c
20d
20c
20d
20d

Fig. 4