APPLICATION FOR A (b) STANDARD/PETTY PATENT

We (c)
ASH ENGINEERING COMPANY LIMITED

of (d)
Ash Road
Wiri, Auckland
New Zealand

hereby apply for the grant of a (e) Standard/Petty Patent for an invention entitled (f)
IMPROVEMENTS IN AND RELATING TO PRESSING OF MATERIALS

which is described in the accompanying (g) complete specification.

(Note: The following applies only to Convention applications)
Details of basic application(s)

<table>
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<tr>
<th>Application No.</th>
<th>Country</th>
<th>Filing Date</th>
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<tr>
<td>217807</td>
<td>NEW ZEALAND</td>
<td>6 October 1986</td>
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 Lodged at Sub-Office
5 OCT 1987
Melbourne

Address for Service: PHILLIPS ORMONDE AND FITZPATRICK
Patent and Trade Mark Attorneys
367 Collins Street
Melbourne, Australia 3000

Dated (i) 2 October 1987

PHILLIPS ORMONDE & FITZPATRICK
Patent Attorneys for:
ASH ENGINEERING COMPANY LIMITED

Note: No legalization or other witness required
AUSTRALIA
Patents Act

DECLARATION FOR A PATENT APPLICATION

(a) Insert "Convention" if applicable
(b) Insert FULL name(s) of applicant(s)
(c) Insert "of addition" if applicable
(d) Insert TITLE of invention

Insert FULL name(s) and address(es) of declarant(s)
(See headnote*)

1/\(\text{Bruce Farquharson of Ash Road Wiri, Auckland New Zealand}\)

do solemnly and sincerely declare as follows:

1. I am/we are authorized to make this declaration on behalf of the applicant(s).

2. Bruce Farquharson
   Ash Road
   Wiri
   AUCKLAND NEW ZEALAND

is/are the actual inventor(s) of the invention and the facts upon which the applicant(s) is/are entitled to make the application are as follows:

(a) The applicant is the assignee of the said invention by virtue of the employment of the inventor by the applicant.

(Note: Paragraphs 3 and 4 apply only to Convention applications)

3. The basic application(s) for patent or similar protection on which the application is based is/are identified by country, filing date, and basic applicant(s) as follows:

   New Zealand 6th October 1986 by Ash Engineering Co Ltd

4. The basic application(s) referred to in paragraph 3 hereof was/were the first application(s) made in a Convention country in respect of the invention the subject of the application.

Declared at (\(\text{AUCKLAND NEW ZEALAND}\))

Dated (\(\text{28-9-87}\))

To: The Commissioner of Patents

PHILLIPS ORMONDE & FITZPATRICK
Patent and Trade Mark Attorneys
367 Collins Street
Melbourne, Australia
1. A pressing arrangement for a plurality of bales of material, including a first chamber adapted to apply lateral pressure to one or more bales; longitudinally operable ram means being provided at or adjacent one end of said first chamber; a pressing chamber being provided in communication with said first chamber; further longitudinally operable ram means being provided at or adjacent a distal end of said pressing chamber; means being provided to separate said first chamber from said pressing chamber; the arrangement being such that in use one or more bales of material are placed into said first chamber and said lateral pressure applied thereto; said first ram means thereafter moving longitudinally within said first chamber to pass said one or more bales into said pressing chamber; said separating means thereafter being located in position to separate said first chamber from said pressing chamber; said further ram means being actuable to press said bale(s) within said pressing chamber against said separating means to achieve a predetermined amount of compression; and locating means being provided to allow for strapping or binding to be passed about said compressed bale(s).

2. A method of pressing one or more bales of material, including: passing one or more bales of material into a first chamber and applying pressure thereto within said first chamber; operating first ram means within...
said first chamber to pass said bale(s) from said first chamber into a pressing chamber; separating said first chamber from said pressing chamber, so that said pressing chamber is defined at the ends thereof by said separating means and a further ram means; actuating said further ram means to compress said bale(s) of material between said inner surfaces of said further ram means and said separating means; passing binding or strapping about said pressed bale(s) to retain said bale(s) in a compressed state; removing said separating means; further operating said further ram means within said pressing chamber to move said compressed bale(s) from said pressing chamber into said first chamber, and thereafter removing said compressed bale(s) from said first chamber.
IMPROVEMENTS IN AND RELATING TO PRESSING OF MATERIALS

The following statement is a full description of this invention, including the best method of performing it known to applicant(s):
This invention relates to a pressing arrangement and in particular to a press for pressing fibrous material, such as wool, paper, other fibrous material and the like. The invention has particular application to the pressing of wool, and will be described with reference thereto. That is however by way of example only, and it should be appreciated that the invention has equal application to the pressing of other materials.

In one preferred form, the present invention relates to the pressing of bales of fibrous material such as wool, into a combined unit, so that the wool can be compressed as far as possible for storage, travel and the like.

Up until this time, various forms of presses have been known and disclosed. It has been known to press one or more bales of material or to press fibrous material into a compacted unit, by the use of one or more co-operating rams. Bindings or strapping are then placed about the compressed unit, the rams or pressing means then being withdrawn and the compressed material then being removed from the pressing arrangement.

The present invention sets out to provide a straightforward and efficient pressing arrangement.

Other objects of the present invention will become apparent from the following description.

According to one aspect of this invention there is provided a pressing arrangement for a plurality of bales of material, including a first chamber adapted to apply lateral pressure to one or more bales; first longitudinally operable ram means being provided at or adjacent one end of said first chamber; a pressing chamber being provided in communication with said first chamber; further longitudinally operable ram means being provided at or adjacent a distal end of said pressing chamber; means being provided to
separate said first chamber from said pressing chamber; the arrangement
being such that in use one or more bales of material are placed into said first
chamber and a said lateral pressure applied thereto; said first ram means
thereafter moving longitudinally within said first chamber to pass said one or
more bales into said pressing chamber; said separating means thereafter being
located in position to separate said first chamber from said pressing chamber;
said further ram means being actuable to press said bale (s) within said
pressing chamber against said separating means to achieve a predetermined
amount of compression; and locating means being provided to allow for
strapping or binding to be passed about said compressed bale (s).

According to a further aspect of this invention there is provided a
pressing arrangement including a first chamber; means being provided to allow
for one or more bales of material to pass into said first chamber; first ram
means being provided and being longitudinally operable within said first
chamber; a pressing chamber being provided in communication with said first
chamber and longitudinally operable pressing means being provided for
operation within said pressing chamber; means being provided to allow for the
separation of said pressing chamber from said first chamber; the arrangement
being such that in use, one or more bales are placed within said first chamber
and a lateral pressure applied thereto; actuation of said first ram moving said
one or more bales into said pressing chamber; location of said separating
means separating said first chamber from said pressing chamber; actuation of
said pressing means allowing for compression of a plurality of bales within said
pressing chamber and against said separation means; means being provided to
allow for the passing of strapping or binding about said compressed material;
removal of said separating means and further
operation of pressing means from within said pressing chamber passing said compressed material out of the pressing chamber and into said first chamber to allow for removal.

According to a further aspect of this invention there is provided a pressing arrangement including a first chamber adapted to apply lateral pressure to one or more bales of material; means being provided to allow for passage of said one or more bales into said first chamber; first ram means being provided and being longitudinally operable within said first chamber; a pressing chamber being provided and being in communication with said first chamber; separating means being provided and allowing for separation of said first chamber and said pressing chamber; pressing means being provided at or adjacent a distal end of said pressing chamber; the arrangement being such that a plurality of bales of material pass into said pressing chamber through said first chamber, by means of lateral pressure applied within said first chamber and longitudinal movement of said first ram; location of separating means between said first chamber and said pressing chamber defining a closed pressing chamber and allowing for a plurality of bales of material to be compressed between said separating means and an inner surface of said pressing means; means being provided to allow for the passing of binding or strapping about said compressed bales of material; removal of said separating means and further operation of said pressing means from within said pressing chamber, causing said compressed bales to move out of said pressing chamber and into said first chamber for removal.

According to a further aspect of this invention, there is provided a mobile pressing arrangement mounted on a plurality of spaced apart wheels, guides, or skids, including a first chamber adapted to apply lateral pressure to one or more bales of material;
means being provided to allow for passage of said one or more bales into said first chamber; first ram means being provided and being longitudinally operable within said first chamber; a pressing chamber being provided and in communication with said first chamber; separating means being provided and allowing for separation of said first chamber from said pressing chamber; pressing means being provided at or adjacent a distal end of said pressing chamber; the arrangement being such that a plurality of bales of material pass into said pressing chamber through said first chamber, and by means of lateral pressure applied within said first chamber and longitudinal movement of said first ram; location of said separating means between said first chamber and said pressing chamber defining a closed pressing chamber and allowing for a plurality of bales of material to be compressed between said separating means and an inner surface of said pressing ram means; means being provided to allow for the passing of binding or strapping about said compressed bales of material; removal of said separating means and further operation of said pressing ram within said pressing chamber, causing said compressed bales to move out of said pressing chamber and into said first chamber for removal.

According to a further aspect of this invention, there is provided a method of pressing a one or more of bales of material, including:

passing one or more bales of material into a first chamber and applying pressure thereto within said first chamber;
operating first ram means within said first chamber to pass said bale(s) from said first chamber into a pressing chamber;
separating said first chamber from said pressing chamber, so that said pressing chamber is defined at the ends thereof, by
said separating means and a further ram means;
actuating said further ram means to compress said bale(s) material
between inner surfaces of said further ram means and said separating
means;
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passing binding or strapping about said pressed bale(s) to retain said
bale(s) in a compressed state;
removing said separating means;
further operating said further ram means within said pressing chamber to
move said compressed bale(s) from said pressing chamber into said first
chamber, and
thereafter removing said compressed bale(s) from said first chamber.
According to a further aspect of this invention there is provided a
method of pressing a plurality of bales of material, including:
passing one or more bales of material into a first chamber and applying
at least a partial lateral pressure thereto;
operating a longitudinally operable ram within said first chamber to pass
said one or more bales from said first chamber into a pressing chamber;
repeating said operation until a predetermined or desired number of
bales are within said pressing chamber;
locating separating means between said first chamber and said pressing
chamber;
actuating pressing ram means within said pressing chamber so as to
compress said bales between said ram and said separating means;
passing binding or strapping about said compressed bales to hold them in
their substantially compressed state;
removing said separating means;
actuating pressing means within said pressing chamber to pass
said compressed bales out of said pressing chamber and into said first chamber; and
thereafter removing said compressed bales from said first chamber.

The present invention will now be described by way of example only and
with reference to the accompanying drawings, wherein:

Figure 1: is a side view of a pressing arrangement according to one
form of the present invention.

Figure 2: is a plan view of a pressing arrangement according to
one form of the present invention.

The present invention will be described by way of example only, with
reference to pressing or compressing bales of material such as for example
bales of wool, clothing, cloth, paper and the like. This is however by way of
example only, and the invention has equal application to the pressing of other
materials and in particular other fibrous materials.

In one form, the present invention is a mobile pressing arrangement,
which is mounted on a plurality of spaced apart wheels, skids or guides, or
which is alternatively trailer mounted, to allow it to be taken from place to
place. In this day and age, many pressing arrangements are particularly
expensive to manufacture and operate. Thus, it is envisaged that there are
substantial advantages in having a mobile or trailer mounted pressing
arrangement, which can for example be taken from operation to operation,
this avoiding or minimising the need for operators to spend large amounts of
money on plant and equipment. By way of example only, a mobile pressing
arrangement could be used by a number of different operators, in various
locations on a cost-sharing basis.
In the form of the present invention, the pressing arrangement includes a first chamber 1 which is essentially a pre-sizing or pre-pressing chamber, means being provided such as ramps, conveyors and the like, to pass one or more bales of material (for example bales of wool) laterally or sideways into the first chamber 1. If desired however, the chamber 1 could have an open upper top, and bales could be moved inwardly through the top. It is envisaged that the invention could also have a movable base, so that bales could be moved upwardly on a plate, into the first chamber (and downwardly out of said first chamber).

In the preferred form of the invention, the bales are moved inwardly, from one side of the chamber, by means of a conveyor. The first chamber 1 is preferably provided with sides or gates which are in fact pressing gates, and which are provided with appropriate hydraulic control means to enable them to open and shut, and at the same time enable a lateral pressure to be applied thereto, so that they move inwardly towards each other, or one towards the other. Thus, on one or more bales of material passing into the first chamber 1, appropriate actuation means are operated and the side members or gates of the first chamber will move inwardly towards each other, or one towards the other, in order to apply a lateral pressure or pre-sizing pressure to a bale or bales of material within said chamber 1. Essentially, this is a pre-pressing or pre-sizing arrangement, to ensure that the bale or bales is/are of a size sufficient to allow the bale or bales to pass into the pressing.
chamber (as will be described hereinafter).

In the preferred form of the invention, one end of the first chamber is provided with a first ram 2, which is provided with a ram plate 3 and an elongate arm and cylinder 4, the ram 2 being operable in any appropriate manner. The ram is operable longitudinally within the first chamber 1, so as to move bales from within the first chamber 1 into the pressing chamber 6 (as will be described hereinafter).

The first chamber 1 is connected to or linked so as to be in communication with, a pressing chamber 6, which is shown provided with appropriate support hoop frame or the like 9, but which can be alternatively a straightforward chamber for pressing bales of material. Preferably, the chamber 6 is of such a size as to allow a plurality of bales to be inserted thereinto, but this can vary depending upon the desires of the user or manufacturer.

In one preferred form of the invention it is envisaged that the chamber 6 is of a sufficient size as to house three bales of material such as wool.

Adjacent a connection or join between the first chamber 1 and the pressing chamber 6, an appropriate frame or slot means 7 is provided to allow for a movable separating wall to be inserted thereinto, the movable wall being in the form of a wall or plate, which is movable into and out of position, so as to separate the first chamber 1 and pressing chamber 6 one from the other, or so as to allow them to be in communication one with the other.

At the far or distal end 6a of the pressing chamber, away from the first chamber 1, a pressing ram 10 is provided having a long ram arm 11. Alternatively a double acting ram may be provided. Appropriate control and cylinder means are also provided.

At a predetermined or forward position of the pressing chamber
6, and if desired on the inner surfaces of the separating plate and the pressing
ram, slots and grooves can be provided (as at 15 in Figure 1 of the drawings),
so that appropriate bindings or straps can be passed about the compressed
material, so as to hold them in a predetermined or desired compressed
condition. This will be described hereinafter.

In use, at least one side of the first chamber 1 is opened, and a bale
passed thereinto by means of a conveyor or ramp. One or more walls are then
closed, and appropriate actuating means operated so that at least one wall
(and preferably both walls) move inwardly, to apply a lateral and pre-pressing
or pre-sizing pressure to the bale. The pressure is only such as to make sure
that the bale is of a lateral dimension sufficient to allow it to pass into the
pressing chamber 6.

Following actuation of the lateral pressing means, the first ram 2 is
actuated which will move longitudinally within the first chamber 1, moving a
bale or bales from the first chamber 1 into the pressing chamber 6. On
locating a bale within the pressing chamber 6, the first ram 2 is then
withdrawn and the process or procedure repeated until the desired number of
bales are located within the pressing chamber 6. If desired, a plurality of
bales can be inserted into the first chamber 1, and then passed into the
pressing chamber 6, but it is found more desirable and effective if one bale at
a time is pre-pressed/sized, and thereafter passed through the first chamber 1.

In a preferred form of the invention, the pressing arrangement is used to
compress three bales together, and thus the operation is repeated until such
time as three bales of material are located within the pressing chamber 6.

Following such location, the separating means, suitably a slideable plate or
wall, is then positioned in place, so as to separate the
first chamber 1 from the pressing chamber 6. The pressing ram 10 is then actuated, and will move inwardly within the pressing chamber 6 towards the bales of material, the pressure of the ram being such that the bales of material will be compressed to the desired or predetermined extent, within the pressing chamber 6 and between an inner surface of the separating wall and the inner surface of the pressing ram 10.

The compressed material will be located within the pressing chamber bounded by appropriate slots 15, and appropriate strapping and binding can then be passed about the compressed bales of material, using said slots 15, so that the bales of material are held in a compressed state.

The separating means is thereafter removed, again connecting the pressing chamber 1 and first chamber 6, one with the other. The pressing ram 10 is then further actuated, to move further within the pressing chamber 6, to move the compressed bales out of the pressing chamber 6 and into the first chamber 1. If desired, separate rams can be provided for this or alternatively the ram 10 can be a double acting ram.

The compressed and bound bales are then removed (preferably from one side of the first chamber 1) and the process repeated.

It should be appreciated that if desired, the bales may enter into and be removed from the first chamber through the base or top thereof.

Appropriate control means can be associated with the rams and pressing means to determine and vary the pressure, compression and operation thereof. Appropriate control means are provided for operation by an appropriate operator.

In one form of the invention, and referring to Figures 1 and 2 of the drawings, the pressing arrangement is mounted on appropriate
wheels 20, so as to be moveable from place to place, as referred to hereinbefore.

It should be appreciated that the present invention provides for an efficient and straightforward pressing arrangement.

Where in the foregoing description reference has been made to specific components integers of the invention having known equivalents then such equivalents are herein incorporated by way of reference.

Although this invention has been described by way of example and with reference to a preferred embodiment of the invention, it is to be understood that modifications or improvements may be made thereto without departing from the scope of invention as defined in the appended claims.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A pressing arrangement for a plurality of bales of material, including a first chamber adapted to apply lateral pressure to one or more bales; longitudinally operable ram means being provided at or adjacent one end of said first chamber; a pressing chamber being provided in communication with said first chamber; further longitudinally operable ram means being provided at or adjacent a distal end of said pressing chamber; means being provided to separate said first chamber from said pressing chamber; the arrangement being such that in use one or more bales of material are placed into said first chamber and said lateral pressure applied thereto; said first ram means thereafter moving longitudinally within such said first chamber to pass said one or more bales into said pressing chamber; said separating means thereafter being located in position to separate said first chamber from said pressing chamber; said further ram means being actuable to press said bale(s) within said pressing chamber against said separating means to achieve a predetermined amount of compression; and locating means being provided to allow for strapping or binding to be passed about said compressed bale(s).

2. A method of pressing one or more bales of material, including:

passing one or more bales of material into a first chamber and applying pressure thereto within said first chamber; operating first ram means within said first chamber to pass said bale(s) from said first chamber into a pressing chamber; separating said first chamber from said pressing chamber, so that said pressing chamber is defined at the ends thereof by said separating means and a further ram means; actuating said further ram means to compress said bale(s) of material between said inner surfaces of said further ram means and said separating means; passing binding or strapping about said pressed bale(s) to retain said bale(s) in a compressed state; removing said
separating means; further operating said further ram means within said pressing chamber to move said compressed bale(s) from said pressing chamber into said first chamber, and thereafter removing said compressed bale(s) from said first chamber.

3. A method is claimed in claim 2 wherein a plurality of bales of material are sequentially passed into said first chamber and have said pressure applied thereto and are then sequentially passed into said pressing chamber.

4. A method is claimed in claim 2 or claim 3 wherein said further ram means comprises separate first and second ram means a first of which pressing said bale(s) within said first chamber and second of which acts to move the compressed bale(s) out of the pressing chamber and into the first chamber.

5. A method is claimed in claim 2 wherein said further ram means comprises a double acting ram.

6. A method substantially as herein described with reference to the accompanying drawings.

7. Apparatus for carrying out the method of any one of claims 2 to 6.

8. A pressing arrangement as claimed in claim 1 provided with transporting means enabling said pressing arrangement to be movable from place to place as required.

9. A pressing arrangement as claimed in claim 1 or claim 8 wherein said pressing chamber includes a plurality of slots therein to accommodate said strapping or binding secured above the compressed bale(s) of material.

10. A pressing arrangement as claim in any one of claims 1 or 7 to 9 wherein said separating means comprises a slidable plate or wall moveable into position between said first and said pressing chambers.

11. Apparatus for pressing one or more bales of material substantially as herein described with reference to the accompanying drawings.

DATED: 2 October 1987
PHILLIPS ORMONDE & FITZPATRICK
Patent Attorneys for: ASH ENGINEERING COMPANY LIMITED
DRAWINGS