Title: WEAR PLATE LOCKING DEVICE

Abstract: A wear assembly (1), including an adapter (2), a wear plate (3) and a locking device (4). The adaptor (2) includes an adapter slot (9), having a first end portion (10), a central portion (12), and a second end portion (11). The wear plate (3), includes a cutout (13) therethrough which is adapted to be substantially aligned with said central portion (12) of said adapter slot (9). The locking device (4) releasably secures the wear plate (3) to said adaptor (2). The locking device (4) includes a first lock member (5), a second lock member (6), and a fastener (7). A first end (14) of the first lock member (5) is adapted to be installed in the first end portion (10) of the adaptor slot (9). A second end portion (15) of the first lock member (5) includes a first bearing surface (16) including a first orifice (17) therein. A first end (18) of the second lock member (6) is adapted to be installed on the second end portion (11) of the adaptor slot (9). A second end of the second lock member (6) includes a second bearing surface (19), an engagement portion, and a second orifice therethrough. The engagement portion is shaped to said cutout (13) of said wear plate (3). In use, the wear plate (3) is aligned on said adaptor (2), said first lock member (5) is installed in said first end portion (10) of said adaptor slot (9), said second lock member (6) is then installed in said second end portion (11) of said adaptor slot (9), such that the bearing surfaces substantially bear against each other, and such that each of said orifices are substantially aligned. Thereafter, said fastener (7) is adapted to be installed in said aligned orifices (17, 20) to lock said locking members together, thereby releasably securing said wear plate (3) to said adaptor (2).
WEAR PLATE LOCKING DEVICE

Background of the Invention

[001] The present invention relates to a method and apparatus for installing a wear plate onto mining, earth-moving or like equipment and in particular, to a method and apparatus for installing a wear plate onto an adaptor attached to mining, earth-moving or like equipment, and, to an apparatus and method by which a locking device may be utilised to releasably secure the wear plate to the adaptor.

Description of the Prior Art

[002] The reference in this specification to any prior publication (or information derived from it), or to any matter which is known, is not, and should not be taken as, an acknowledgement or admission or any form of suggestion that that prior publication (or information derived from it) or known matter forms part of the common general knowledge in the field of endeavour to which this specification relates.

[003] In the mining, earth moving and agricultural industries, it is common to attach wear plates to machinery or other equipment, such that, as the machinery or equipment is used, rather than the machinery or equipment itself wearing out, the plate wears out. Once worn out, the plate can then be replaced, without the need to replace the machinery or equipment.

[004] Traditionally, such wearable plates are welded to the machinery or equipment. When the wear plate is worn, it is typically necessary to utrweld the plate, and attach a replacement plate to the equipment. This is obviously a time consuming and labour intensive process, resulting in considerable expense associated with the equipment being non-usable during this downtime, and, due to the coast of the trades people performing these labour intensive and time consuming welding operations.
Summary of the Invention

[005] The present invention seeks to provide a wear assembly which may be releasably secured to such machinery or equipment, or at least an adaptor incorporated thereon, to overcome disadvantages of the prior art.

[006] In one broad form; the present invention provides a wear assembly, including: an adapter, including an adapter slot, the adaptor slot including a first end portion, a central portion, and, a second end portion; a wear plate, including a cutout therethrough which is adapted to be substantially aligned with said central portion of said adapter slot; a locking device for releasably securing said wear plate to said adaptor, said locking device including: a first lock member, a first end of which is adapted to be installed in said first end portion of said adapter slot, and, a second end portion which includes a first bearing surface including a first orifice therein; a second lock member, a first end of which is adapted to be installed on said second end portion of said adaptor slot, and, a second end of which includes a second bearing surface, an engagement portion, and a second orifice therethrough, the engagement portion shaped to said cutout of said wear plate; and a fastener; whereby, in use, said wear plate is aligned on said adaptor, said first lock member is installed in said first end portion of said adaptor slot, said second lock member is then installed in said second end portion of said adaptor slot such that said bearing surfaces substantially bear against each other, and such that each of said orifices are substantially aligned, and, thereafter, said fastener is adapted to be installed in said aligned orifices to lock said locking members together, thereby releasably securing said wear plate to said adaptor.

[007] Preferably, in use, said first lock member is installed in said adaptor slot either prior to or after said wear plate is aligned on said adaptor.

[008] Also preferably, said wear plate is aligned on said adaptor by being slid together via cooperating sliding guides being provided on each of said adaptor and said wear plate.

[009] Preferably, said sliding guides permit relative movement of said wear plate in a
first direction which is substantially transverse to an elongate direction of said slot.

[0010] Also preferably, said adaptor and said wear plate include cooperating stops to permit a restricted adaptor of slidable movement until said wear plate is aligned on said adaptor.

[0011] Preferably, said first lock member is slidably installed with said first end of said adaptor slot.

[0012] In a preferred version, said second lock member is installed into said adaptor slot/wear plate cutout by being inserted and then rotated until said second bearing face of said second lock member substantially abuts said first bearing face of said first lock member.

[0013] Preferably, said fastener is screwed, clipped, or otherwise releasably secured in said orifices of said lock members when substantially aligned.

[0014] Also preferably, the wear assembly includes a dirt plug installed into said second orifice after installation of said fastener.

[0015] Preferably, said bearing surfaces are angularly inclined.

[0016] In a further broad form, the present invention provides a wear plate, adapted to be releasably secured to an adaptor, said wear plate including a cutout therethrough which is adapted to be substantially aligned to a central portion of an adaptor slot, and which is further adapted to receive an engagement portion of a locking device therein, wherein said locking device includes: a first lock member, a first end of which is adapted to be installed in said first end portion of said adaptor slot, and, a second end portion which includes a first bearing surface including a first orifice therein; a second lock member, a first end of which is adapted to be installed on said second end portion of said adaptor slot, and, a second end of which includes a second bearing surface, an engagement portion, and a
second orifice therethrough, the engagement portion shaped to said cutout of said wear plate; a fastener; and whereby, in use, said wear plate is aligned on said adaptor, said first lock member is installed in said first end portion of said adaptor slot, said second lock member is then installed in said second end portion of said adaptor slot such that said bearing surfaces substantially bear against each other, such that each of said orifices are substantially aligned, and, thereafter, said fastener is adapted to be installed in said aligned orifices to lock said locking members together, thereby releasably securing said wear plate to said adaptor.

[0017] Preferably, in use, is adapted to be aligned on said adaptor either before or after said first lock member is installed in said adaptor slot.

[0018] Also preferably, the wear plate includes a slide guide on the underside thereof which is adapted to cooperate with a slide guide on said adaptor for sliding engagement.

[0019] Preferably, said slide guides permit relative movement thereof relative to said adaptor in a first direction which is substantially transverse to an elongate direction of said slot.

[0020] Also preferably, the wear plate further includes a stop which is adapted to permit a restricted amount of slidabie movement until said wear plate is aligned on said adaptor.

[0021] In a further broad form, the present invention provides a locking device for releasably securing a wear plate to an adaptor, wherein said adaptor includes an adaptor slot, the adaptor slot including a first end portion, a central portion, and, a second end portion, and, wherein said wear plate includes a cutout therethrough which is adapted in use to be substantially aligned with said central portion of said adaptor slot, said locking device including: a first lock member, a first end of which is adapted to be installed in said first end portion of said adaptor slot, and, a second end portion which includes a first bearing surface including a first orifice therein; a second lock member, a first end of which is adapted to be installed on said second end portion of said adaptor slot, and, a second end
of which includes a second hearing surface, an engagement portion, and a second orifice therethrough, the engagement portion shaped to cutout of said wear plate; and, a fastener; whereby, in use, said wear plate is aligned on said adaptor first lock member is installed in said first end portion of said adaptor slot, said second lock member is then installed in said second end portion of said adaptor slot such that said bearing surfaces substantially bear against each other, such that each of said orifices are substantially aligned, and, thereafter, said fastener is adapted to be installed in said aligned orifices to lock said locking members together, thereby releasably securing said wear plate to said adaptor.

[0022] Preferably, in use, said first lock member is installed in said adaptor slot either prior to or after said wear plate is aligned on said adaptor.

[0023] Also preferably, said first lock member is slidably installed with said first end of said adaptor slot.

[0024] Also preferably, said second lock member is installed into said adaptor slot/wear plate cutout by being inserted and then rotated until said second bearing face of said second lock member substantially abuts said first bearing face of said first lock member.

[0025] Preferably, said fastener is screwed, clipped, or otherwise releasably secured in said orifices of said lock members when substantially aligned.

[0026] Also preferably, the locking device further includes a dirt plug installed into said second orifice after installation of said fastener.

[0027] Preferably, said bearing surfaces are angularly inclined.

[0028] In a further broad form, the present invention provides a mining or earthmoving machine including a wear assembly, the wear assembly including: a first lock member, a first end of which is adapted to be installed in said first end portion of said adaptor slot,
and, a second end portion which includes a first bearing surface including a first orifice therein; a second lock member, a first end of which is adapted to be installed on said second end portion of said adaptor slot, and, a second end of which includes a second healing surface, an engagement portion, and a second orifice therethrough, the engagement portion shaped to said cutout of said wear plate; and, a fastener; whereby, in use, said wear plate is aligned on said adaptor, said first lock member is installed in said first end portion of said adaptor slot, said second lock member is then installed in said second end portion of said adaptor slot such that said bearing surfaces substantially bear against each other, such that each of said orifices are substantially aligned, and, thereafter, said fastener is adapted to be installed in said aligned orifices to lock said locking members together, thereby releasably securing said wear plate to said adaptor.

[0029] Preferably, the mining or earth moving device includes a wear assembly as hereinbefore described.

[0030] Also preferably, the mining or earth moving equipment includes a wear plate as hereinbefore described.

[0031] Also preferably, the mining or earth moving device includes a locking device as hereinbefore described.

[0032] Yet a further broad form, the present invention provides a method of installing a wear plate to an adaptor, including the steps of: aligning a cutout of said wear plate with a central portion of a slot of said adaptor; positioning a first end portion of a second lock member into a second end portion of said slot of said adaptor, such that first and second bearing surfaces of said first and second lock members bear against each other and such that first and second orifices in said first and second lock members substantially align; and, inserting a fastener into said aligned orifices of said first and second lock members thereby lock said fist and second lock member together and thereby releasably secure said wear plate to said adaptor.
[0033] Preferably, the method of installing the wear plate to the adaptor further includes the steps of positioning a first end portion of a first lock member into a first portion of said slot of said adaptor, wherein this positioning step is performed either prior to or after said aligning step.

[0034] In yet a further broad form, the present invention provides a method of removing a wear plate torn an adaptor, including the steps of: removing a fastener from aligned first and second orifices of first and second lock members, to thereby unlock said first and second lock members; removing said second lock member from within a cutout of said wear plate and a slot of said adaptor; and, removing said wear plate from said adaptor.

**Brief Description of the Drawings**

[0035] The present invention will become more fully understood from the following detailed description of prefered but non-limiting embodiments thereon, described in connection with the accompanying drawings wherein:

[0036] Fig. 1 illustrates an exploded view of the various components of the wear assembly of the present invention;

[0037] Fig. 2 illustrates the commencement of the assembly process of the components, wherein the first block member is installed in position;

[0038] Fig. 3 illustrates a next step in installation of the components, wherein the wear plate is installed over the wear adaptor;

[0039] Fig. 4 illustrates a further step in the installation of the components, wherein the wear plate is positioned in its final position over the adaptor;

[0040] Fig. 5 illustrates a next step in the installation of the components, wherein the second lock member is being installed into its location;
[0041] Fig. 6 illustrates a next step in the assembly of the components, wherein both first and second lock members are installed in their final positions;

[0042] Fig. 7 illustrates a next step in the assembly of the components, wherein the fastener/bolt is installed in position in the wear assembly; and

[0043] Fig. 8 illustrates a final step in the installation of the components, wherein a dirt plug is installed in the assembly.

**Detailed Description of Preferred Embodiments**

[0044] Throughout the drawings, like numerals will be identified by similar features, except for expressly otherwise indicated.

[0045] As shown in the drawings, a wear assembly in accordance with the present invention, and generally designated by the numeral 1, includes an adaptor 2, a wear plate 3, and locking device, generally designated by the numeral 4. The locking device includes a first lock member 5, a second lock member 6, and a fastener 7. The drawings also illustrate an optional component, being a dirt plug 8.

[0046] The wear assembly 1 of the present invention is intended to be installed on mining, earth moving or like equipment. As will be understood by a person skilled in the art, wear plates installed on such machinery is prone to wear out during mining or earth moving operations. Once worn out, a wear plate 1 of the present invention is readily replaced with a new wear plate by quickly and simply releasing it from the adaptor to which it is fastened with the locking device, and, a new wear plate 1 installed. The new wear plate 1 may be re-fastened to the adaptor 2 using the locking device 4.

[0047] Figs. 1 to 8 illustrate sequentially, the preferred steps which might be typically utilised in securing a wear plate to an adaptor. It should be appreciated that some of these
steps can be varied/interchanged, as will be clear from the following description. It will also be understood by a person skilled in the art. that the disassembly of the wear plate from the adaptor is typically performed by the reverse sequential operation illustrated in Figs. 1 to 8.

[0048] Firstly, prior to being able to use the wear assembly 1 of the present invention, an adaptor 2, or, a plurality of adaptors 2 of any desirable size and shape are firstly welded onto the surface of the mine or earth moving equipment which is sought to be protected. The adaptor 2 may typically be re-usuble, and is installed by welding onto any fiat or moderately curved surface of the mining or earth moving equipment. Whilst a substantially rectangular shaped adaptor 2 is shown in the drawings, it will be appreciated that adaptors of any desired size or shape may be utilised.

[0049] It will be understood that there are a wide variety of applications of the present invention, including any and all forms of mining or earth moving equipment, chute liners, excavator and loader buckets, dump track trays, etc. It will be understood that in any such applications, the assembly of the present invention is able to withstand tough operational forces. The device 1 of the present invention, due to its relatively low profile, has minimal engagement distance enabling closer positioning of the wear plate to the equipment.

[0050] Once the adaptor 2 is installed on the equipment, the wear plate 3 may be engaged therewith. As shown in Fig. 2, and Fig. 3, the wear plate 3 may be typically slid together with and onto the adaptor 2. Appropriate sliding guides 22 may be provided on either side of the adaptor, as are illustrated in the drawings. Correct positioning of the wear plate onto the adaptor may be enabled by the provision of a further guide 23 on the end of the adaptor 2 which abuts against a cooperating edge of the wear plate 3.

[0051] It will be noted that the wear plate 3 and adaptor 2 include a cutout 13 and a cooperating slot 9 therein, respectively. The adaptor slot 9 is effectively an elongate slot extending transversely across the adaptor 2. The adaptor slot 9 has a first end portion 10, a second end portion 11, and a central portion 12. As the wear plate 3 is slid into
engagement with the adaptor 2, a cutout 13 in. the wear plate 3 substantially aligns with the central portion 12 of the adaptor slot 9.

[0052] As previously mentioned, the locking device 1, which then locks the wear plate to the adaptor, includes three main components, namely a first lock member 5, a second lock member 6, and, a fastener 7.

[0053] As perhaps best shown in Fig. 2, the first lock member 5 is adapted to be installed in the first end portion 10 of the adaptor slot 9, whereby a first end 14 of the first lock member 5 is installed in the first end portion 10 of the adaptor slot 9. A second end portion 15 of the first lock member 5 includes a first bearing surface 16 and a first orifice 17 therethrough.

[0054] The second lock member 6 is thereafter installed via the cutout 13 in the adaptor slot 9, after the wear plate 3 is installed on the adaptor 2. In particular, the first end 18 of the second lock member 6 is installed into the second end portion 11 of the adaptor slot 9 and then, the second lock member 6 is rotated downwardly into position as illustrated in Figs. 5 and 6. In this way, a second bearing surface 19 of the first lock member 6 bears against the first bearing surface 16 of the first lock member 5. In this configuration, an orifice 20 which is provided in the second lock member 6 is substantially aligned with the first orifice 17 of the first lock member 5 such that the fastener 7 can then be installed in the aligned orifices 20 and 17, as illustrated in Figs. 6 and 7. With the fastener in position, the wear plate is effectively releasably secured to the adaptor 2. The orifices 17 and 20 may typically incorporate screw threads therein, such that the fastener 7 having a cooperating screw thread thereto, may be screwed into the orifices, when aligned, to effectively secure the locking device together, and to thereby effectively lock the wear plate 3 to the adaptor 2,

[0055] Optionally, the dirt plug 8 may thereafter be installed into the orifice 20 to prevent the rigness of dirt etc. therein.
Whilst Fig. 2 shows the installation of the first lock member 5 into position in the adaptor slot 9 prior to the alignment of the wear plate 3 thereover, it will be appreciated by a person skilled in the art, that this first lock member 5 may be installed in the adaptor slot 9 either prior to or after the wear plate 3 is aligned on the adaptor 2. In the installation of the wear plate 3 to the adaptor 2, it is shown in the various drawings that the wear plate 3 is aligned on the adaptor 2 by being slid by cooperating sliding guides 22 being provided on each of the adaptor 2 and the wear plate 3. The actual configuration of various sliding guides 22 may vary and may in fact utilise any form of inter-engaging components. Implementation of this will become obvious to a person skilled in the art. In particular, the configuration of these sliding guides 22 in the embodiments shown illustrates that relative movement is permitted of the wear plate in a first direction as shown by the arrow 21 which is substantially transverse to the elongate direction of the slot 9. Furthermore, appropriate stops 23 may be provided to permit a restricted amount of movement, until the wear plate 3 is aligned on the adaptor 2.

As also shown in Fig. 2, the first slot member is preferably slidably installed within the first end 10 of the adaptor slot 9. The adaptor slot, is preferably designed so that the first lock member will not be able to be properly installed unless it is placed into the slot 10 in the correct direction. This may be done by appropriate shaping of the adaptor slot 10 and the first lock 5 member, as shown in Fig. 2.

Once the wear plate 3 is installed on the adaptor 2, the second lock member 6 may be installed into the adaptor slot 9 and wear plate cutout 13 by being inserted and rotated until the second bearing face of the second lock member 6 substantially abuts the first bearing face of the first lock member 5.

Whilst the fastener 7 has been illustrated in the embodiment as having cooperating screw threads for screw threaded engagement with the aligned orifices, alternative releasable securement mechanisms may be utilised. The fastener may be screwed, clipped, or otherwise releasably secured in the orifices of the lock members when substantially aligned.
Whilst a particular of first lock member 5 and the second lock member 6 is shown, it will be appreciated that the size and shape of these components may vary from that illustrated. It is however important that they contain bearing surfaces which substantially align together. These bearing surfaces are preferably angularly aligned such that after installation of the first lock member 5 into position, the second lock member 6 may be easily rotated into position as described.

Whilst the present invention has been described in relation to the entire wear assembly 1, it should be appreciated that the invention further extends to the protection of the individual and separate components thereof including the wear plate 3, the locking device 4, and the lock members 5 and 6.

As will be appreciated by a person skilled in the art, this device is particularly useful for installing wear plates onto mining or earth moving equipment or other like machinery. The invention should not however be considered to be limited to these particular applications. It will however be appreciated that significant time and cost savings therefore result from the use of the present invention. Whilst various methods of installing and uninstalling the wear plate to the adaptor have been described, it will be appreciated that by variation of various component features, these method steps may be altered somewhat.

All such variations and modifications which become apparent to a person skilled in the art should be considered to fall within the scope of the invention as broadly hereinbefore described.
CLAIMS:

1. A wear assembly, including:

- an adapter, including an adapter slot, the adapter slot including a first end portion, a central portion, and, a second end portion;
- a wear plate, including a cutout therethrough which is adapted to be substantially aligned with said central portion of said adapter slot;
- a locking device for releasably securing said wear plate to said adaptor, said locking device including:
  - a first lock member, a first end of which is adapted to be installed in said first end portion of said adaptor slot, and, a second end portion which includes a first bearing surface including a first orifice therein;
  - a second lock member, a first end of which is adapted to be installed on said second end portion of said adaptor slot, and, a second end of which includes a second bearing surface, an engagement portion, and a second orifice therethrough, the engagement portion shaped to said cutout of said wear plate; and
  - a fastener;

whereby, in use, said wear plate is aligned on said adaptor, said first lock member is installed in said first end portion of said adaptor slot, said second lock member is then installed in said second end portion of said adaptor slot such that said bearing surfaces substantially bear against each other, and such that each of said orifices are substantially aligned, and, thereafter, said fastener is adapted to be installed in said aligned orifices to lock said locking members together, thereby releasably securing said wear plate to said adaptor.

2. A wear assembly as claimed in claim 1, wherein, in use, said first lock member is installed in said adaptor slot either prior to or after said wear plate is aligned on said adaptor.

3. A wear assembly as claimed in claims 1 or 2, wherein said wear plate is aligned on said adaptor by being slid together via cooperating sliding guides being provided on each
of said adaptor and said wear plate.

4. A wear assembly as claimed in claim 3, wherein said sliding guides permit relative movement of said wear plate in a first direction which is substantially transverse to an elongate direction of said slot.

5. A wear assembly as claimed in claims 3 or 4, wherein said adaptor and said wear plate include cooperating stops to permit a restricted adaptor of slidable movement until said wear plate is aligned on said adaptor.

6. A wear assembly as claimed in any one of claims 1 to 5, wherein said first lock member is slidably installed with said first end of said adaptor slot.

7. A wear assembly as claimed in any one of claims 1 to 6, wherein said second lock member is installed into said adaptor slot/wear plate cutout by being inserted and then rotated until said second bearing face of said second lock member substantially abuts said first bearing face of said first lock member.

8. A wear assembly as claimed in any one of claims 1 to 7, wherein said fastener is screwed, clipped, or otherwise releasably secured in said orifices of said lock members when substantially aligned.

9. A wear assembly as claimed in any one of claims 1 to 8, further including a dirt plug installed into said second orifice after installation of said fastener.

10. A wear assembly as claimed in any one of claims 1 to 9, wherein said bearing surfaces are angularly inclined.

11. A wear plate, adapted to be releasably secured to an adaptor, said wear plate including a cutout therethrough which is adapted to be substantially aligned to a central portion of an adaptor slot, and which is further adapted to receive an engagement-portion
of a locking device therein, wherein said locking device includes:

- a first lock member, a first end of which is adapted to be installed in said first end portion of said adaptor slot, and, a second end portion which includes a first bearing surface including a first orifice therein;

- a second lock member, a first end of which is adapted to be installed on said second end portion of said adaptor slot, and, a second end of which includes a second bearing surface, an engagement portion, and a second orifice therethrough, the engagement portion shaped to said cutout of said wear plate;

- a fastener; and

whereby, in use, said wear plate is aligned on said adaptor, said first lock member is installed in said first end portion of said adaptor slot, said second lock member is then installed in said second end portion of said adaptor slot such that said bearing surfaces substantially bear against each other, such that each of said orifices are substantially aligned, and, thereafter, said fastener is adapted to be installed in said aligned orifices to lock said locking members together, thereby releasably securing said wear plate to said adaptor.

12. A wear plate as claimed in claim 11, which, in use, is adapted to be aligned on said adaptor either before or after said first lock member is installed in said adaptor slot.

13. A wear plate as claimed in claims 1, or 12, further including a slide guide on the underside thereof which is adapted to cooperate with a slide guide on said adaptor for sliding engagement.

14. A wear plate as claimed in claim 13, wherein said slide guides permit relative movement thereof relative to said adaptor in a first direction which is substantially tangs verse to an elongate direction of said slot.

15. A wear plate as claimed in any one of claims 11 to 14, further including a stop which is adapted to permit a restricted amount of slidable movement until said wear plate is aligned on said adaptor.
16. A locking device for releasably securing a wear plate to an adaptor,

wherein said adaptor includes an adaptor slot, the adaptor slot including a first end portion, a central portion, and, a second end portion, and,

wherein said wear plate includes a cutout therethrough which is adapted in use to be substantially aligned with said central portion of said adaptor slot,

said locking device including:

a first lock member, a first end of which is adapted to be installed in said first end portion of said adaptor slot, and, a second end portion which includes a first bearing surface including a first orifice therein;

a second lock member, a first end of which is adapted to be installed on said second end portion of said adaptor slot, and, a second end of which includes a second bearing surface, an engagement portion, and a second orifice therethrough, the engagement portion shaped to said cutout of said wear plate; and,

a fastener;

whereby, in use, said wear plate is aligned on said adaptor, said first lock member is installed in said first end portion of said adaptor slot, said second lock member is then installed in said second end portion of said adaptor slot such that said bearing surfaces substantially bear against each other, such that each of said orifices are substantially aligned, and, thereafter, said fastener is adapted to be installed in said aligned orifices to lock said locking members together, thereby releasably securing said wear plate to said adaptor.

17. A locking device as claimed in claim 16, wherein

in use, said first lock member is installed in said adaptor slot either prior to or after said wear plate is aligned on said adaptor.

18. A locking device as claimed in claims 16 or 17,

wherein said first lock member is slidably installed with said first end of said adaptor slot.
19. A locking device as claimed in any one of claims 16 to 18,
wherin said second lock member is installed into said adaptor slot/wear plate cutout by being inserted and then rotated until said second bearing face of said second lock member substantially abuts said first bearing face of said first lock member.

20. A locking device as claimed in any one of claims 16 to 19,
wherin said fastener is screwed, clipped, or otherwise releasably secured in said orifices of said lock members when substantially aligned.

21. A locking device as claimed in any one of claims 16 to 20,
further including a dirt plug installed into said second orifice after installation of said fastener.

22. A locking device as claimed in any one of claims 16 to 21
wherin said bearing surfaces are angularly inclined.

23. A mining or earthmoving machine including a wear assembly, the wear assembly including:

a first lock member, a first end of which is adapted to be installed in said first end portion of said adaptor slot, and, a second end portion which includes a first bearing surface including a first orifice therein;

a second lock member, a first end of which is adapted to be installed on said second end portion of said adaptor slot, and, a second end of which includes a second bearing surface, an engagement portion, and a second orifice therethrough, the engagement portion shaped to said cutout of said wear plate; and,

a fastener;

whereby, in use, said wear plate is aligned on said adaptor, said first lock member is installed in said first end portion of said adaptor slot, said second lock member is then installed in said second end portion of said adaptor slot such that said bearing surfaces substantially bear against each other, such that each of said orifices are substantially aligned, and, thereafter, said fastener is adapted to be installed in said aligned orifices to
lock said locking members together, thereby releasably securing said wear plate to said adaptor.

24. A mining or earthmoving device, including a wear assembly, of any one of claims 1 to 10.

25. A mining or earthmoving device including a wear plate of any one of claims 11 to 15.

26. A mining or earthmoving device including a locking device of any one of claims 16 to 22.

27. A method of installing a wear plate to an adaptor, including the steps of:
   - aligning a cutout of said wear plate with a central portion of a slot of said adaptor;
   - positioning a first end portion of a second lock member into a second end portion of said slot of said adaptor, such that first and second bearing surfaces of said first and second lock members bear against each other and such that first and second orifices in said first and second lock members substantially align; and,
   - inserting a fastener into said aligned orifices of said first and second lock members to thereby lock said first and second lock member together and thereby releasably secure said wear plate to said adaptor.

28. A method of installing a wear plate to an adaptor as claimed in claim 27 further including the steps of:
   - positioning a first end portion of a first lock member into a first portion of said slot of said adaptor, wherein this positioning step is performed either prior to or after said aligning step,

29. A method of removing a wear plate from an adaptor, including the steps of:
   - removing a fastener from aligned first and second orifices of first and second lock members, to thereby unlock said first and second lock members;
removing said second lock member from within a cutout of said wear plate and a slot of said adaptor; and,

removing said wear plate from said adaptor.
Fig. 1
Fig. 2
Fig. 8
INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2014/050163

A. CLASSIFICATION OF SUBJECT MATTER

E02F 9/28 (2006.01)  E02F 9/00 (2006.01)  E02F 3/80 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC & WPI: IPC & CPC: E02F9/28/LOW, E02F9/LOW, E02F3/LOW, E02F9/2883, E02F3/8152, B65G and keywords (wear, plate, adaptor, slot, fasten, two, pair, removable) and similar terms.

ESPACENET: Applicant/Inventor name searched

ESPACENET: Keywords (wear, plate, nut, bolt, washer)

Website Search: "KEECH" and "WEAR"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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Documents are listed in the continuation of Box C

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- "#" Special categories of cited documents:
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Date of the actual completion of the international search 8 September 2014

Date of mailing of the international search report 08 September 2014

Name and mailing address of the ISA/AU

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Authorised officer

Matthew McTiernan
AUSTRALIAN PATENT OFFICE
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Telephone No. 0262256103

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End of Annex

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