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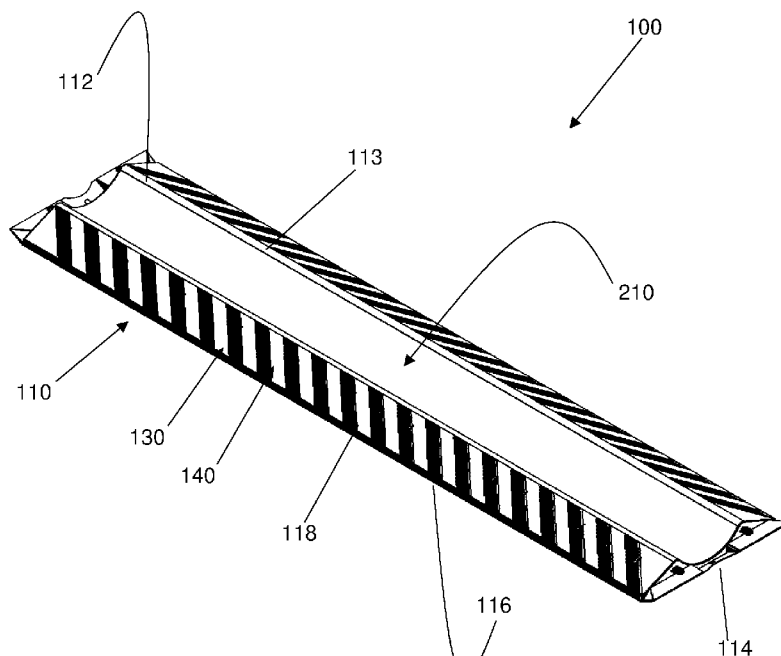


Figure 1

(57) Abstract: A portable vehicle retaining device and method of use thereof is provided for use on a mining or construction site. In one form, the device includes an elongate body configured to rest atop a supporting surface; and a channel defined in a top wall of the elongate body configured to receive a vehicle wheel therein for retaining the vehicle relative to the mining or construction site.



A PORTABLE VEHICLE RETAINING DEVICE AND METHOD OF USE THEREOF

TECHNICAL FIELD

[0001] The present invention relates to a portable vehicle retaining device and method of use thereof.

BACKGROUND

[0002] Securing parked light and medium vehicles on mining and construction sites is important so as to minimise any safety risk. For example, the ground surfaces on such sites are often irregular and can become unstable with rain and/or debris build-up resulting in parked vehicles drifting and/or bogging and possibly injury to individuals nearby or upon entering and exiting such vehicles.

[0003] Prior attempts to safely secure vehicles on mining and construction sites have involved the use of wheel chocks being placed on one or opposite sides of one or more wheels of a vehicle to prevent unintentional vehicle roll.

[0004] However, a problem generally with the use of wheel chocks is that they must be manually placed each time, which is tedious and labour intensive, particularly in poor weather conditions and/or when the chocks are centrally stored on site. Consequently, wheel chocks are often deliberately not used, or, if they are used, they are incorrectly or insufficiently positioned.

[0005] Another problem with wheel chocks is that they can result in debris accumulation about a vehicle wheel, particularly in wet conditions when rainfall may pool underneath and about a vehicle. Consequently, this may lead to ground instability, bogged vehicles and/or vehicle drift.

[0006] Current best practice on some mining sites is to dig suitably sized trenches for receiving a vehicle wheel therein. Typically, such trenches may be constructed to secure multiple vehicles in a side-by-side arrangement.

[0007] However, like with chocks, the process of routinely digging, re-digging and backfilling the trenches, particularly after rainfall, is tedious and labour intensive and can result in unnecessary mud formation, erosion, and destabilisation of the ground surface.

[0008] Lastly, the size of the trenches must be varied and tightly controlled for receiving different sized vehicle wheels and to prevent vehicle becoming inadvertently bogged in a trench.

[0009] It will be clearly understood that, if a prior art publication is referred to herein, this reference does not constitute an admission that the publication forms part of the common

general knowledge in the art in Australia or in any other country.

SUMMARY OF INVENTION

[0010] Embodiments of the present invention provide a portable vehicle retaining device and method of use thereof which may minimise or overcome at least one of the problems mentioned above, or which may provide the consumer with a useful or commercial choice.

[0011] According to a first aspect of the present invention, there is provided a portable vehicle retaining device for use on a mining or construction site including:

an elongate body configured to rest atop a supporting surface; and

a channel defined in a top wall of the elongate body configured to receive a vehicle wheel therein for retaining the vehicle relative to the mining or construction site.

[0012] Advantageously, the portable vehicle retaining device of the present inventions provides a means for readily introducing a safe and effective way to retain vehicles on a mining and construction site. By way of its constructions, the device can be readily moved to a desired location without disturbing the underlying ground surface. Moreover, embodiments of the present invention provide a device that can be readily expanded and/or contracted to meet desired need ranging from a single vehicle to a plurality of vehicles, including different sized vehicles.

[0013] As indicated above, the present invention provides a portable vehicle retaining device for use in retaining light and medium vehicles on mining and construction sites. It will therefore be convenient to describe the invention with reference to this example application. However, a person skilled in the art will appreciate that the device is capable of broader applications and may equally be used for retaining any wheeled device and/or vehicle relative to its location.

[0014] Generally, the device may be used with light and medium vehicles, such as, for example, passenger vehicles, light commercial vehicles, haul vehicles, and trucks (up to 7.5 tonne).

[0015] The device (or individual components thereof) may be formed from any suitable material or materials suitably adapted for use in rugged conditions. For example, the device (or individual components thereof) may be fabricated from a metal, metal alloy, composite or polymeric material, preferably a metal or metal alloy, more preferably steel, most preferably galvanized steel. If not galvanized, the body may be treated with a protective coating to minimise corrosion.

[0016] The elongate body may be manufactured by any suitable means, such as, e.g., as an extrusion, by casting, or even additive manufacturing or moulding.

[0017] The supporting surface may be of any suitable form. In some embodiments, the supporting surface may be a sealed surface such as a paved or concrete path, a concrete pad or slab, or a road surface, for example.

[0018] In other more likely embodiments, the supporting surface may be an unsealed ground surface formed from earthen materials. The unsealed ground surface may be irregular and characterised by depressions and peaks. The earthen materials may include soil, earth, post blast overburden, loose overburden, and the like, for example.

[0019] The elongate body may include a pair of opposed ends, a pair of opposed sidewalls extending longitudinally between the opposed ends and the top wall extending longitudinally at least partially between the opposed ends.

[0020] Each opposed sidewall may include a lower edge and an opposed upper edge adjoining the top wall. The lower edge of each opposed sidewall may be configured to rest atop the supporting surface and stabilise the elongate body relative to the supporting surface.

[0021] In some embodiments, the elongate body may further include a base extending between the lower edges. The base may include a lower surface and an opposed upper surface.

[0022] The base may be shaped so as to enhance the stability of the portable vehicle retaining device when placed on the supporting surface. For example, the base may be larger than the top wall in order to provide a larger support surface engaging lower surface and stabilise the top wall relative to the supporting surface.

[0023] In some embodiments, the base may further function as a skid plate when dragging, or towing, the device between locations, for example. In such embodiments, the ends of the base may preferably be upwardly turned to facilitate dragging, or towing, of the device in a direction parallel with its longitudinal axis.

[0024] In some embodiments, the elongate body may be of solid construction.

[0025] In other embodiments, the elongate body may be substantially hollow as defined by the opposed ends, the opposed sidewalls, the top wall and, in some embodiments, the base.

[0026] In some embodiments, one or both of the sidewalls may be angled inwards relative to the top wall. In such embodiments, the one or both of the sidewalls may function as an inclined

surface or ramp for a wheel of a vehicle to ride up and down for engagement and disengagement with the channel.

[0027] One or both of the sidewalls may angle inwards at any suitable angle relative to the base, preferably both sidewalls.

[0028] For example, one or both sidewalls may angle relative to the base at an angle of about 45°, about 50°, about 55°, about 60°, about 65°, about 70°, about 75°, about 80°, about 85° or even more. Preferably, both sidewalls may be angled at an acute relative to the base.

[0029] Suitably, the angled sidewalls may extend inwards towards the top wall no more than approximately one quarter of a width of the base.

[0030] Generally, the sidewalls may extend between the upper and lower edges in a substantially linear direction, although a gentle convex curve is also envisaged.

[0031] The adjoining of the upper edges of the sidewalls with the top wall may preferably be defined by a rounded corner.

[0032] Likewise, the adjoining of the lower edges of the sidewalls with the base may preferably be defined by a rounded corner.

[0033] Generally, the elongate body may have a substantially uniform cross section when viewed from an end. The cross section may be defined by opposed inwardly angled sidewalls and a central top wall with the channel centrally defined thereon.

[0034] The device may be of any suitable weight so as to be stable on a supporting surface but not too heavy so as to not be readily moved between desired locations. In some embodiments, device may have a weight of between 50 and 1,000 kgs, typically between about 400 kgs and 1,000 kgs.

[0035] Likewise, the device may have a low profile, or height, to minimise the risk of the device posing as a tripping hazard. For example, the device may have a height, as defined between the base and the upper edge of the sidewalls, of about 50mm, about 60mm, about 70mm, about 80mm, about 90mm, about 100mm, about 110mm, about 120mm, about 130mm, about 140mm, about 150mm, about 160mm, about 170mm, about 180mm, about 190mm, about 200mm, about 210mm, about 220mm, about 230mm, about 240mm, or about 250mm. Typically, the device may have a height of between about 150mm and about 200mm.

[0036] The elongate body may be of any suitable length, as defined between the opposed

ends. For example, the elongate body may have a length of about 500mm, about 600mm, about 700mm, about 800mm, about 900mm, about 1,000mm, about 1,100mm, about 1,200mm, about 1,300mm, about 1,400mm, about 1,500mm, about 1,600mm, about 1,800mm, about 1,900mm, about 2,000mm, about 2,100mm, about 2,200mm, about 2,300mm, about 2,400mm, about 2,500mm, about 2,600mm, about 2,700mm, about 2,800mm, about 2,900mm, about 3,000mm, about 3,100mm, about 3,200mm, about 3,300mm, about 3,400mm, about 3,500mm, about 3,600mm, about 3,700mm, about 3,800mm, about 3,900mm, about 4,000mm, about 4,100mm, about 4,200mm, about 4,300mm, about 4,400mm, about 4,500mm, about 4,600mm, about 4,700mm, about 4,800mm, about 4,900mm, about 5,000mm, about 5,100mm, about 5,200mm, about 5,300mm, about 5,400mm, about 5,500mm, about 5,600mm, about 5,700mm, about 5,800mm, about 5,900mm, about 6,000mm, about 6,100mm, about 6,200mm, about 6,300mm, about 6,400mm, about 6,500mm, about 6,600mm, about 6,700mm, about 6,800mm, about 6,900mm, about 7,000mm or even more.

[0037] Typically, the elongate body may be of a length so as to retain the two front or rear wheels of at least one vehicle.

[0038] Of course, a person skilled in the art will appreciate that the elongate body may be manufactured to any suitable length to accommodate a number of vehicles parked in a side-by-side arrangement. For example, the elongate body may have a length of between about 4,000mm to about 6,500mm so as to retain two vehicles parked in a side-by-side arrangement.

[0039] The elongate body may be of unitary construction or may be formed from two or more body pieces joined together.

[0040] In some embodiments, the elongate body may be adjustable to adjust a length of the device to accommodate two or more vehicles parked in a side-by-side arrangement. For example, the elongate body may include two or more body pieces movable relative to each other to adjust a length of the elongate body. Advantageously, this may enable the portable vehicle retaining device to accommodate vehicles of differing wheel track length and/or multiple vehicles.

[0041] In some embodiments, the elongate body may include two or more body pieces arranged in a telescopic arrangement and slidable relative to each other between a retracted position and an extended position to thereby adjust a length of the elongate body.

[0042] In such embodiments, the elongate body may further include a retaining mechanism for retaining the two or more body pieces at a set length. For example, in some such embodiments, the body pieces may be locked relative to one another at a set length by a locking

pin or mechanical fastener extending through co-aligned holes in the body pieces.

[0043] In other embodiments, the two or more body pieces may be arranged in a pivoting or hinged arrangement in which the body pieces are pivoted or hingedly moved relative to each other to lengthen or shorten the elongate body.

[0044] In yet other embodiments, the elongate body may be configured to be connectable to a like elongate body in an end-to-end arrangement to lengthen the elongate body.

[0045] The ends of the elongate bodies may be connectable in any suitable way, preferably releasably.

[0046] For example, in some embodiments the ends of the elongate bodies may be connectable by a connecting mechanism or parts thereof. The connecting mechanism or parts thereof may or may not be of integral formation with each end of each respective elongate body.

[0047] In some such embodiments, the connecting mechanism may include a first part associated with an end of a first elongate body and a second part connectable to the first part associated with an end of a second elongate body.

[0048] The connecting mechanism may include mateable male and female portions that couple together, such as, e.g., by a threaded connection, an interference (snap-fit) connection, a friction fit-type connection or a bayonet-type connection.

[0049] In some such embodiments, the first part of the connecting mechanism associated with, or forming part of, the end of the first elongate body may include a male formation configured to be inserted into, or coupled with, a female formation of the second part of the connecting mechanism associated with, or forming part of, the end of the second elongate body.

[0050] Conversely, in other such embodiments, the first part of the connecting mechanism may include a female formation configured to at least partially receive, or be coupled with, a male formation of the second part of the connecting mechanism.

[0051] In other embodiments, the elongate bodies may be connectable in an end-to-end arrangement by overlapping end portions, each having an opening defined therein configured to be co-aligned when overlapped and have a mechanical fastener or pin received therethrough.

[0052] Generally, multiple elongate bodies may be connected end-to-end in a linear arrangement, although a person skilled in the art will appreciate that the bodies may be connected in a non-linear arrangement either directly or via one or more connecting pieces. For

example, it is envisaged that multiple elongate bodies may be connected in a non-linear arrangement to maximise a number of vehicles parked in a confined space.

[0053] As indicated, the device includes a channel defined in the top wall of the elongate body.

[0054] The channel may be of any suitable size and shape.

[0055] In some embodiments, the channel may extend entirely across the top wall of the body between the opposed sidewalls.

[0056] In other preferred embodiments, the channel may be centrally defined across the top wall. In such embodiments, substantially horizontal portions of the top wall may extend along either side of the channel between the channel and the upper edges of the respective sidewalls.

[0057] In some embodiments, the channel may have a substantially rectangular cross section defined by the pair of opposed sidewalls and the upper surface of the base. In such embodiments, the upper surface of the base may also constitute the top wall of the elongate body, or part thereof.

[0058] In other embodiments, the channel may have a triangular, polygonal, or curved cross-sectional shape. Preferably, the cross-sectional shape of the channel is curved. Most preferably, the cross-sectional shape of the channel is concave.

[0059] In preferred embodiments, the channel may have a concave curvature. The concave curvature may be defined by a constant or uniformly changing radius or some other suitable curve. Typically, the concave curvature may be defined by a gentle curvature configured to retain a vehicle wheel received therein and readily allow the wheel to roll out when the vehicle is being moved.

[0060] Typically, the device may include a single channel centrally and extending parallel to the opposed sidewalls, the base and the top wall.

[0061] However, in some embodiments, the device may include more than one channel. For example, the device may include two or more channels extending serially along a length of the elongate body. The two or more channels may be the same size and shape or may have differing sized and shaped channels to accommodate different vehicles, for example.

[0062] In some embodiments, the channel may further include one or more drainage holes defined at or near the bottom of the channel to allow drainage of any liquid fluids collected in the

channel. The one or more drainage holes may preferably be in fluid communication with corresponding drainage holes defined along the sidewalls and/or the base to provide a flow path for the egress of collected liquid fluids away from the device.

[0063] Likewise, in some embodiments, the elongate body may include one or more pairs of drainage holes defined on opposing sides of the elongate body, each pair in fluid communication with each other to facilitate the passage and drainage of liquid and debris from one side of the body to the other and thereby prevent the pooling of liquid or debris along one side of the device. Each pair of opposed drainage holes may define a drainage channel extending transversely relative to the channel.

[0064] In some embodiments, the channel may be open at either or both ends of the body. In other embodiments, the channel may be closed at one or both ends. If open, the channel may further include a grate or the mesh-like plate positioned at the end to at least minimise the ingress of debris into the channel from the open end.

[0065] In some embodiments, one or more portions of the outer surface of the opposing sidewalls and/or the top wall, including the channel, may include a liner or coating applied thereon to provide grip for a vehicle when entering and exiting the channel.

[0066] In other embodiments, the one or more portions may include a textured tread defined thereon to provide grip. The textured tread may include beading and/or ribs.

[0067] As indicated, in some embodiments, the elongate body may be substantially hollow. In such embodiments, the body may further include one or more internal ribs, gusseting or brackets to bolster the strength of the elongate body.

[0068] In some embodiments, the elongate body may further include one or more openings sized and shaped to receive the tines of powered material handling equipment therethrough to facilitate in the handling and movement of the device.

[0069] In some embodiments, the elongate body may further include one or more lifting or anchor points, or lugs, for attachment to a crane and/or a two chain. The one or more lifting or anchor points, or lugs, may be located in any suitable location on the body, preferably at or near each end.

[0070] In some embodiments, one or each end of the elongate body may be open and define a stowage cavity for receiving auxiliary parts therein, such as, e.g., towing chains and couplers. The stowage cavity may further include a cavity door for securing contents within the stowage cavity.

[0071] In some embodiments, the body may further include an anchoring mechanism for anchoring the body in a desired location, preferably releasably. The anchoring mechanism may be of any suitable size, shape and construction and may be associated with the body in any suitable way.

[0072] For example, the anchoring mechanism may be of unitary or separate construction with the elongate body, preferably separate.

[0073] For example, in some embodiments, the elongate body may further include one or more hinged anchors hingedly coupled to one or more of a sidewall or end of the elongate body and configured to be pivoted between an anchoring position and a free position in which the anchor is held clear of the supporting surface.

[0074] Typically, in such embodiments, at least part of the anchor may be sized and shaped for insertion into an unsealed supporting surface, preferably pointed.

[0075] In other embodiments, the anchoring mechanism may include one or more through holes defined along the sidewall and/or the ends of the elongate body and configured to receive ground engaging pins or pegs therethrough for anchoring the body in place.

[0076] In yet other embodiments, the anchoring mechanism may include one or more outwardly protruding flange portions protruding outwardly from the base, each having a through hole defined thereon for receiving a ground engaging pin or peg therethrough for anchoring the body in place.

[0077] In some embodiments, one or more parts or portions of device may include reflectors and/or reflective paint applied thereon to enhance visibility of the device, particularly at night. The reflectors may be affixed to either or both ends of the device. The reflective paint may be applied to the outer surface of each sidewall, for example. Preferably, the reflective paint may be applied in a pattern so as to indicate the inclined surface of the sidewall.

[0078] In some such embodiments, the reflective paint may further include glass bead paint. In such embodiments, the glass beads may further function to enhance the grip of the inclined surface of the sidewalls.

[0079] In some embodiments, the elongate body may further include one or more mounting sites located at one or both ends of body for the mounting of markers, such as, e.g., delineator posts, flags or cones. Typically, such mounting sites may include a protruding base on which the marker is configured to be positioned over. Alternatively, the mounting sites may include an opening through which the marker is configured to be partially received.

[0080] According to a second aspect of the present invention, there is provided a method of retaining a vehicle for use on a mining or construction site, said method including:

positioning an elongate body of a vehicle retaining device atop a supporting surface;
and

rolling a vehicle wheel into a channel defined in a top wall of the elongate body of the vehicle retaining device, wherein the channel is configured to retain the vehicle relative to the mining or construction site.

[0081] The method may include one or more features or characteristics of the portable vehicle retaining device as herein before described.

[0082] For example, in some embodiments, the positioning may further include towing the elongate body to a desired location.

[0083] The positioning may further include anchoring the elongate body in place. For example, the anchoring may include inserting one or more anchoring pins or pegs through anchoring holes defined in the elongate body.

[0084] In some embodiments, the method may include an intermediate step of marking the elongate body with one or more markers.

[0085] Any of the features described herein can be combined in any combination with any one or more of the other features described herein within the scope of the invention.

[0086] The reference to any prior art in this specification is not, and should not be taken as an acknowledgement or any form of suggestion that the prior art forms part of the common general knowledge.

BRIEF DESCRIPTION OF DRAWINGS

[0087] Preferred features, embodiments and variations of the invention may be discerned from the following Detailed Description which provides sufficient information for those skilled in the art to perform the invention. The Detailed Description is not to be regarded as limiting the scope of the preceding Summary of Invention in any way. The Detailed Description will make reference to a number of drawings as follows:

[0088] Figure 1 is an upper perspective view of a portable vehicle retaining device according to an embodiment of the present invention;

[0089] Figure 2 is a plan view of the portable vehicle retaining device as shown in Figure

1;

[0090] Figure 3 is a side view of the portable vehicle retaining device as shown in Figures 1 and 2;

[0091] Figure 4 is a flow chart showing steps in a method of deploying the portable vehicle retaining device as shown in any one of Figures 1 to 3.

DETAILED DESCRIPTION

[0092] Figures 1 to 4 show a portable vehicle retaining device (100) according to an embodiment of the present invention.

[0093] Referring to Figure 1, the portable vehicle retaining device (100) is for use on mining and construction sites and includes an elongate body (110) configured to rest atop a ground surface (i.e., a supporting surface) and a channel (210) defined in a top wall (112) of the elongate body (110) configured to receive a vehicle wheel therein for retaining the vehicle relative to the mining or construction site.

[0094] Generally, the device (100) is for use with light and medium vehicles, such as, for example, passenger vehicles, light commercial vehicles, haul vehicles, and trucks (up to 7.5 tonne).

[0095] The device (100) is formed from galvanized steel so as to be durable and minimise corrosion in rugged conditions.

[0096] The elongate body (110) is an extrusion. The body (110) includes a pair of opposed ends (114) and a top wall (112), an opposed base (116) and opposed sidewalls (118) extending longitudinally between the opposed ends (114).

[0097] Each sidewall (118) includes a lower edge and an opposed upper edge adjoining the top wall (112).

[0098] The lower edge together with the base (116) is configured to rest atop the ground surface and stabilise the elongate body (110) relative to the ground surface.

[0099] As shown, the base (116) is wider than the top wall (112) to enhance the stability of the device (100) when placed atop the ground surface.

[00100] Referring briefly to Figure 3, the base (116) further functions as a skid plate when dragging, or towing, the device (100) between locations and includes upwardly turned end edges

(119) to facilitate its dragging along a ground surface.

[00101] Referring back to Figure 1, the body (110) is substantially hollow as defined by the opposed ends (114), the top wall (112), the base (116) and the opposed sidewalls (118).

[00102] As shown, both sidewalls (118) angle inwards relative to the top wall (112) so as to function as an inclined surface or ramp for a wheel of a vehicle to ride up and down for engagement and disengagement with the channel (210). The sidewalls (118) angle inwards at an acute angle relative to the base (116) and extend inwards approximately one quarter of a width of the base (116) in a substantially linear direction.

[00103] Each sidewall (118) further includes reflective paint (130) applied on the outer surface of the sidewalls (118) to enhance the visibility of the device (100), particularly at night. Moreover, the outer surface of the sidewalls (118) further includes textured glass bead paint (140) to enhance a grip of the inclined surface of the sidewalls (118).

[00104] The adjoining upper edges of the sidewalls (118) with the top wall (112) are defined by a rounded corner.

[00105] Likewise, the adjoining lower edges of the sidewall (118) with the base (116) are defined by a rounded corner.

[00106] The elongate body (110) has a substantially uniform cross section when viewed from an end (114). The cross section is defined by the base (116), the opposed inwardly angled sidewalls (118) and the central top wall (112) with the channel (210) centrally defined thereon.

[00107] The device (100) has a weight of between about 100 and 400 kgs.

[00108] Likewise, the device (100) has a low profile, or height of between about 150mm and about 200mm, so as to minimise the risk of the device posing as a tripping hazard.

[00109] Lastly, the device (100) has a length, as defined between the opposed ends (114) of about 3,500mm. This is generally a length suitable for retaining the two front or rear wheels of two vehicles parked side-by-side.

[00110] As indicated, the channel (210) is centrally defined in the top wall (112) of the elongate body (110) thereby providing substantially horizontal portions (113) of the top wall (112) extending along either side of the channel (210) between the channel (210) and the upper edges of the respective sidewalls (118). Advantageously, the substantially horizontal portions (113) provide a gentle passage of the wheel into the channel (210) and prevent a tyre of the vehicle

being inadvertently damaged on a sharp edge.

[00111] The channel (210) has a concave curvature defined by a gentle curvature configured to retain a vehicle wheel received therein and readily allow the wheel to roll out when the vehicle is being moved.

[00112] While not shown, the bottom of the channel (210) includes one or more drainage holes defined therein in fluid communication with an underside of the device (100) to prevent the pooling of any liquid within the channel (210).

[00113] Referring to Figure 2, the elongate body (110) further includes a through hole (120) centrally defined at each respective end (114) for receiving a ground engaging pin therethrough for anchoring the body (110) in place on the ground surface.

[00114] Apart from anchoring the body (110), the through hole (120) also advantageously assists in connecting the body (110) with other like bodies in an end to end arrangement. In use, the respective ends (114) are overlapped so that respective holes (120) co-align. The ends (114) are then be pinned together with a ground engaging pin which simultaneously anchors both bodies (110) to the ground surface.

[00115] The connected elongate bodies (110) can be connected in a linear or non-linear arrangement. In regard to the latter, the like elongate body can be pivoted about the axis of the ground engaging pin relative to the body (110) thereby enabling the connected bodies to be gently curved, if needed.

[00116] Best shown in Figure 2, the elongate body further includes a pair of lifting lugs (220) at each end. The lifting lugs (220) can be used for attachment to a crane or a ground vehicle for respectively lifting or towing the device (100) to a desired position.

[00117] Although not visible, at least one end of the elongate body includes a stowage opening for receiving and stowing auxiliary parts, such as, e.g., towing chains and couplers. The stowage cavity further includes a cavity door for securing contents within the stowage cavity.

[00118] A method (400) of deploying the portable vehicle retaining device (100) as shown in Figures 1 to 3 is now described in detail with reference to Figure 4.

[00119] As an initial step, the method (400) may include selecting a desired area of the ground surface for deployment of the portable vehicle retaining device (100).

[00120] At step 410, the positioning includes moving and aligning the device (100) to the

desired area.

[00121] In some embodiments, the positioning may include utilising a crane connected to the device (100) via the lifting lugs (220) and carrying and lowering the device (100) to the desired area.

[00122] In preferred embodiments, the positioning may include dragging, or towing, the device (100) behind a vehicle to the desired area. Generally, the device (100) is coupled to the vehicle by chains coupled to lifting lugs (220).

[00123] In such embodiments, the base (116) functioning as a skid plate with upwardly turned ends (119) facilitates in the dragging of the device (110) behind the vehicle.

[00124] At step 420, one or more vehicles may be retained by the device (100) by rolling the vehicles up a respective sidewall (118) and into the channel (210) in a direction generally orthogonal to a longitudinal axis of the device (100).

[00125] In use, the rolling of the front or rear wheels of the vehicle into the channel (210) may provide tactile feedback to a driver that the wheels have engaged with the channel (210) and the vehicle retained in its position relative to the mining or construction site.

[00126] In the present specification and claims (if any), the word '*comprising*' and its derivatives including '*comprises*' and '*comprise*' include each of the stated integers but does not exclude the inclusion of one or more further integers.

[00127] Reference throughout this specification to '*one embodiment*' or '*an embodiment*' means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, the appearance of the phrases '*in one embodiment*' or '*in an embodiment*' in various places throughout this specification are not necessarily all referring to the same embodiment. Furthermore, the particular features, structures, or characteristics may be combined in any suitable manner in one or more combinations.

[00128] In compliance with the statute, the invention has been described in language more or less specific to structural or methodical features. It is to be understood that the invention is not limited to specific features shown or described since the means herein described comprises preferred forms of putting the invention into effect. The invention is, therefore, claimed in any of its forms or modifications within the proper scope of the appended claims (if any) appropriately interpreted by those skilled in the art.

CLAIMS

1. A portable vehicle retaining device for use on a mining or construction site including:
an elongate body configured to rest atop a supporting surface, said elongate body including a pair of opposed ends, a pair of opposed sidewalls extending longitudinally between the opposed ends, a top wall extending longitudinally at least partially between the opposed ends and a base configured to be larger than the top wall to support the elongate body relative to the supporting surface; and
a channel defined in a top wall of the elongate body and configured to receive a vehicle wheel at least partially therein for retaining the vehicle relative to the mining or construction site, wherein the base functions as a skid plate when moving the device between locations, said base have upwardly turned ends to facilitate said moving of the device in a direction parallel with its longitudinal axis.
2. The device of claim 1, wherein the opposed sidewalls angle inwards relative to the top wall to function as an inclined surface or ramp for a wheel of a vehicle to ride up and down relative thereto for engagement and disengagement with the channel.
3. The device of claim 2, wherein the opposed sidewalls angle inwards towards the top wall no more than approximately one quarter of a width of the base.
4. The device of any one of claims 1 to 3, wherein the elongate body is of a length so as to retain two front or rear wheels of at least one vehicle.
5. The device of any one of claims 1 to 4, wherein the elongate body is of an adjustable length to accommodate vehicles of differing wheel track length or multiple vehicles located side-by-side.
6. The device of claim 5, wherein the body includes two or more body pieces arranged in a telescopic arrangement and slidable relative to each other between a retracted position and an extended position to thereby adjust the length of the elongate body.
7. The device of claim 5, wherein the body includes two or more body pieces arranged in a pivoting or hinged arrangement in which the body pieces are pivoted or hingedly moved relative to each other to adjust the length of the elongate body.
8. The device of claim 5, wherein the elongate body is connectable to a like elongate body in an end-to-end arrangement to lengthen the elongate body.

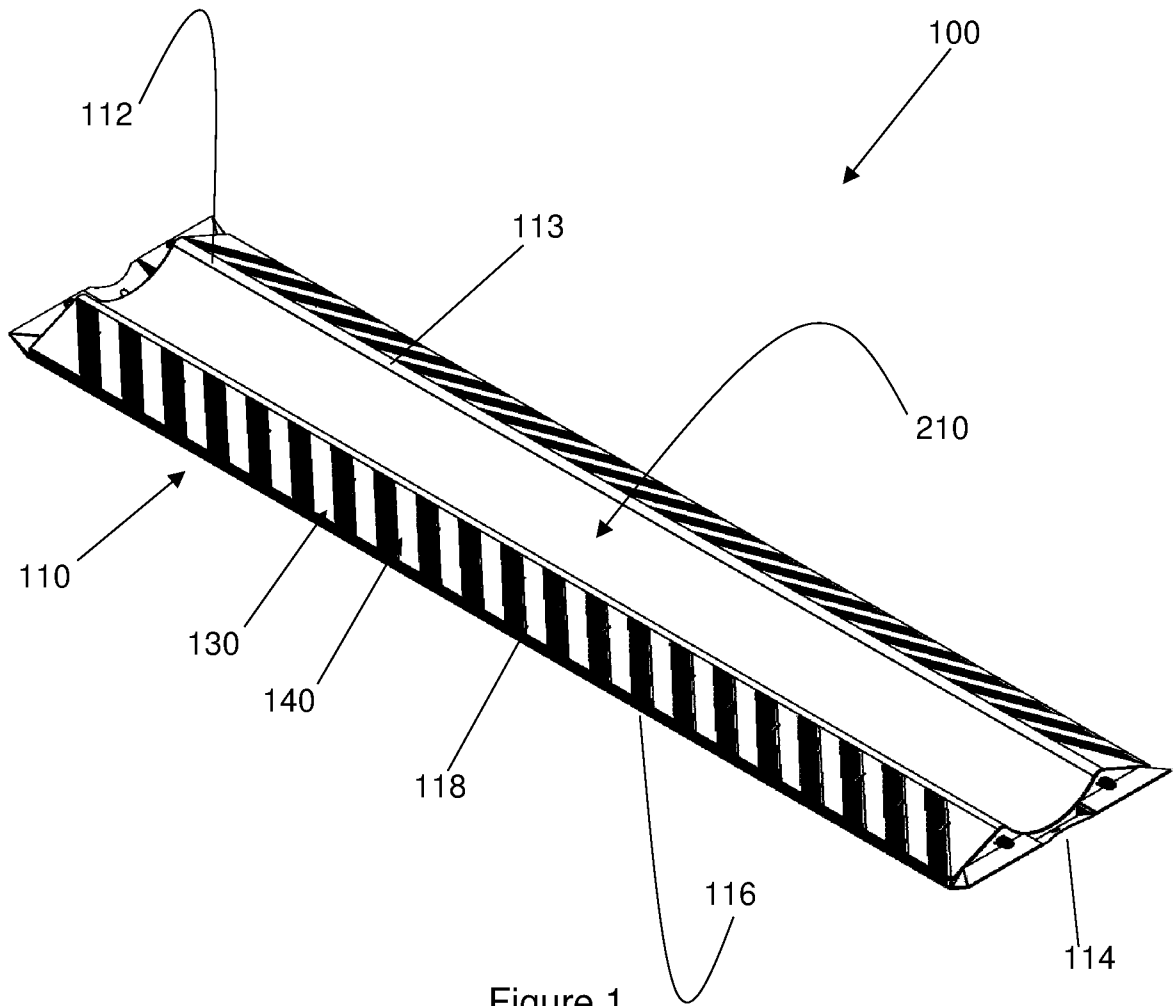
9. The device of any one of claims 1 to 8, wherein the channel extends entirely across the top wall of the elongate body between the opposed sidewalls.
10. The device of any one of claims 1 to 8, wherein the channel is centrally defined across the top wall of the elongate body.
11. The device of any one of claims 1 to 10, wherein the channel has a substantially rectangular cross section defined by inner surfaces of the opposed sidewalls and an upper surface of the base.
12. The device of any one of claims 1 to 10, wherein the channel has a concave curvature configured to retain a vehicle wheel at least partially received therein and readily allow the wheel to roll out when the vehicle is being moved.
13. The device of any one of claims 1 to 12, further including one or more drainage holes defined at or near a bottom of the channel to allow drainage of any liquid fluids collected therein.
14. The device of claim 13, wherein the one or more drainage holes are in fluid communication with corresponding drainage holes defined along the sidewalls and/or the base to provide a flow path for egress of collected liquid fluids away from the device.
15. The device of any one of claims 1 to 14, further including one or more pairs of sidewall drainage holes defined on the opposing sides of the elongate body, each pair in fluid communication with each other to facilitate passage and drainage of liquid and debris from one side of the body to the other and thereby prevent pooling of the liquid and the debris along one side of the device.
16. The device of claim 15, wherein each said pair of sidewall drainage holes defined on opposing said sides of the elongate body defines a drainage channel extending transversely relative to the channel.
17. The device of any one of claims 1 to 16, wherein the channel is open at at least one end of the elongate body and wherein the open said at least one end further includes a grate or mesh-like plate positioned therein to at least minimise ingress of debris into the channel from the open said at least one end.
18. The device of any one of claims 1 to 17, further including a lining or coating applied on one or more portions of an outer surface of the elongate body to provide grip for a vehicle when entering and exiting the channel.

19. The device of any one of claims 1 to 18, further including one or more tine openings defined on the elongate body for receiving tines of powered material handling equipment therethrough to facilitate in handling and movement of the device.

20. A method of retaining a vehicle for use on a mining or construction site, said method including:

positioning an elongate body of a vehicle retaining device as defined in any one of claims 1 to 19 atop a supporting surface; and

rolling a vehicle wheel at least partially into a channel defined in a top wall of the elongate body of the vehicle retaining device, wherein the channel is configured to retain the vehicle relative to the mining or construction site.



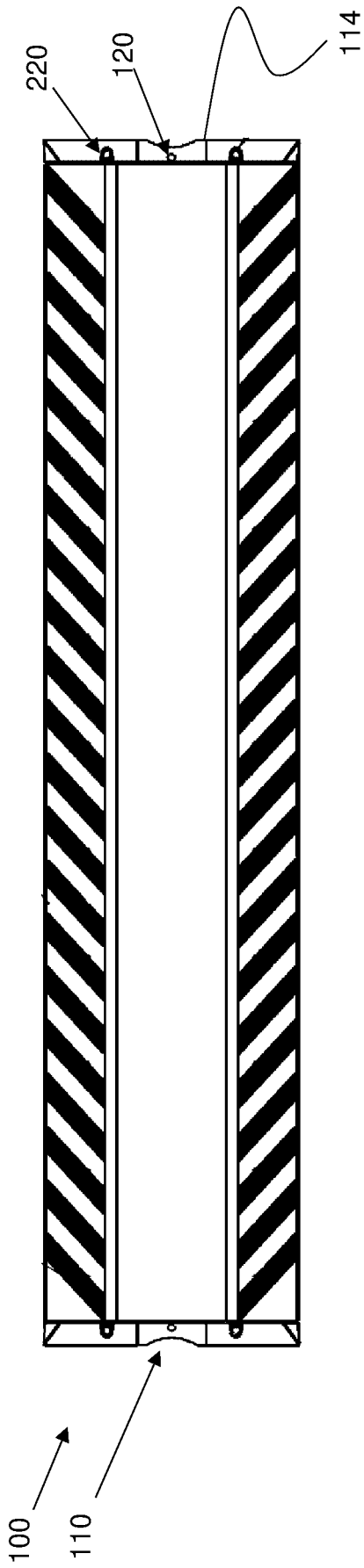


Figure 2

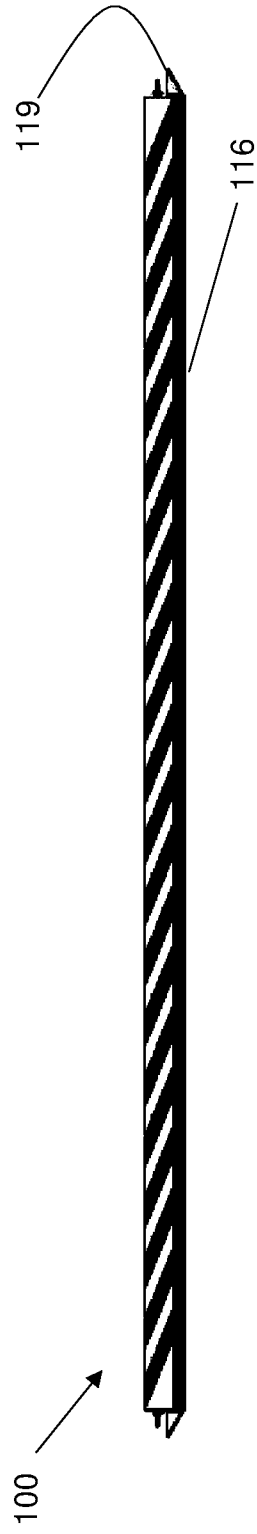


Figure 3

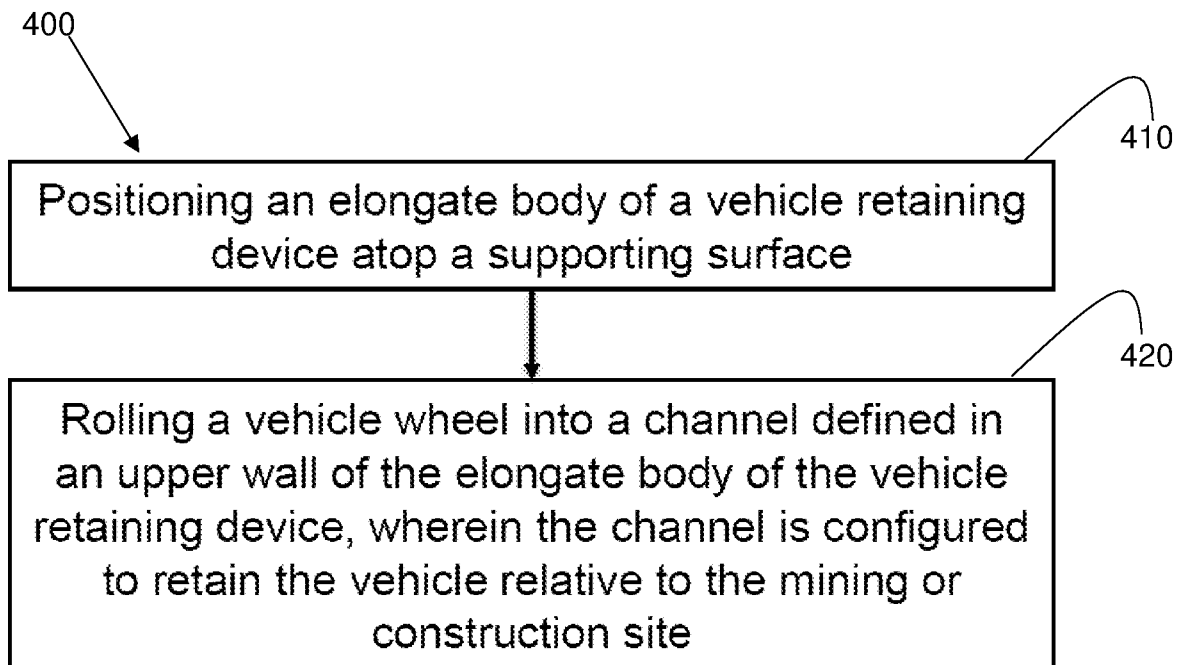


Figure 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2024/050584

A. CLASSIFICATION OF SUBJECT MATTER

B60T 3/00 (2006.01) B60P 3/077 (2006.01) B60P 7/08 (2006.01) B65G 69/00 (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)

PATENW/EPODOC/WPIAP/TXTE/Google Patents/Espacenet/Auspat/Google; IPC/CPC B60T3/00 and Keywords: wheel, chock, channel, elongate, plate, concave, metal, ramp, adjust, length, drainage, mining, stowage, reflect, marker, coating, skid, tow and similar terms; applicant/inventor names searched.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	

 Further documents are listed in the continuation of Box C See patent family annex

* Special categories of cited documents:		
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	
"D" document cited by the applicant in the international application	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family	
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

24 July 2024

Date of mailing of the international search report

24 July 2024

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INTERNATIONAL SEARCH REPORT		International application No.
C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		PCT/AU2024/050584
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2024/050584

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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End of Annex

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

Form PCT/ISA/210 (Family Annex)(July 2019)