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Description

This invention relates to blade-like attachments for armoured vehicles, and more particularly to dozer-like blades for attachment to armoured recovery vehicles, engineer/repair vehicles and the like.

It is well-established practice to provide armoured recovery or repair vehicles which incorporate both a crane and a winch for effecting the recovery and/or repair of bogged-in, disabled or broken down vehicles requiring rescue, while the provision of dozer blades on armoured vehicles for earth-moving purposes is also conventional practice.

When winching disabled vehicles, it is desirable for such recovery or repair vehicles to be firmly anchored relative to the ground to prevent loss of positive contact with said ground, while it is further desirable for the recovery vehicles to be provided with stabilising means such that lifting of a heavy load by the crane does not lead to instability of the vehicle itself.

According to the present invention there is provided an attachment for an armoured vehicle, the attachment comprising a dozer-like blade having an operative, earth-moving front surface and, at or adjacent the lower regions thereof, a flat, substantially rearwardly extending stabiliser surface, and a linkage adapted to react between the blade and the armoured vehicle to move the blade relative to the armoured vehicle, the linkage including a lower, fixed length link pivotally attached to, to extend between, the blade and the armoured vehicle, a hydraulic cylinder reacting between the vehicle and the lower link to alter the orientation of the blade relative to the vehicle, and an upper link pivotally attached to, to extend between, the blade and the vehicle, characterised in that the linkage is selectively adjustable to move the blade into:

a) a first, earth-moving position with the lower edge of the front surface of the blade just below ground level;

b) a second, anchorage position with the lower edge of the front surface of the blade further below ground level whereby a substantial proportion of the lower regions of the blade is below ground level;

c) a third, stabilising position in which said stabiliser surface of the blade contacts the ground, and

d) a fourth, storage position in which the operative surface of the blade lies in a substantially horizontal plane,

the upper link being adjustable between two lengths, a first, longer length associated with the first and second position of the blade, and a second, shorter length associated with the third and fourth positions of the blade.

It will be appreciated that, with such an attachment in said first position, the blade can be used for conventional earth-moving operations. In its second position, the blade serves as an anchor during winching operations, thus preventing

undesirable movement of the tracked hull of the vehicle on the application of substantial forces thereto during winching, while the blade can be located in its third position to act as a stabiliser for the vehicle during actuation of the crane and while heavy loads are being lifted thereby.

In the fourth position, the blade can be used for stowage purposes, as a transport bucket or as a workbench.

Conveniently there are two such linkages spaced transversely of the blade, one at or adjacent each end of said blade.

A preferred upper link comprises a pair of hinged arms, one pivotally attached to each of the blade and the armoured vehicle, said arms being lockable relative to one another in any of two or more positions to define a link of differing lengths.

An alternative upper link is of telescopic construction, the slidable components of which can be locked in any one of two or more different positions relative to one another to define a link of differing lengths.

By way of examples only, embodiments of the invention will now be described in greater detail with reference to the accompanying drawings, of which:

Fig. 1 shows an attachment according to the invention on an armoured vehicle;

Figs. 2 and 3 are a side view and a plan view from above respectively of the attachment of Fig. 1;

Figs. 4 to 7 show the blade of the attachment of Figs. 1 to 3 in each of four different positions;

Fig. 8 shows an alternative attachment according to the invention, and

Figs. 9 and 10 are a side view and a plan view from above respectively of the attachment of Fig. 8.

Referring to Figs. 1 to 3, there is shown an attachment indicated generally at 2 mounted on an armoured vehicle 4.

More particularly, the attachment 2 comprises a dozer blade 6 having a concave front surface 8, rearwardly from the lower edge of which extends a flat, stabiliser surface 10 for reasons to be detailed below.

The blade 6 is mounted on a bracket or mounting plate 12 adapted to be secured to the armoured vehicle 4, said mounting of the blade 6 being effected by means of two transversely-spaced linkages each indicated generally at 14. Each linkage 14 comprises a fixed length lower link 16 one end of which is pivotally connected to the rear surface of the blade 6 at a point intermediate the height of the blade and the other end of which is pivotally connected to the bracket 12.

Each linkage 14 further comprises an adjustable length upper link 18, said link 18 including hinged arms 20, 22, one end of the arm 20 being pivotally connected at 24 to the upper regions of the rear of the blade 6 and one end of the arm 22 being pivotally connected at 26 to the bracket 12, the other ends of said arms 20, 22 being hinged to one another at 28.

Hydraulic cylinders 30 mounted on the bracket 12 include pistons 32 the free ends of which are attached one to each of the fixed length lower links 16.

The upper link 18 shown in Fig. 2 is at its longer length, in that holes 34 in each arm 20, 22 are aligned, the link 18 being locked in this longer position by means of a pin 36 extending through the aligned holes 34 best seen in Fig. 1.

On attachment of the bracket 12 to the front of an armoured vehicle 4, and with the link 18 at this longer length, the hydraulic piston-cylinder arrangements 30, 32 can be actuated to locate the blade 6 in either of the two positions shown in Figs. 4 and 5.

In Fig. 4, the piston 32 is partly extended such that the blade 6 is in an earth-moving position with the lower edge thereof just below ground level.

In Fig. 5, the piston 32 is fully extended such that a substantial part of the blade 6 is below ground level whereby said blade acts as an anchor for the vehicle 4 during winching operations.

The upper link 18 can be altered to a shorter length by removing the pin 36 and pivoting the arms 20, 22 towards one another about the hinge point 28 until holes 38, 40, one adjacent the one end of each arm 20, 22 respectively, are aligned, a pin such as 36 then being located through the aligned holes 38, 40 to retain the link 18 at said shorter length.

With the link 18 at this shorter length, the piston 32 can be actuated to locate the blade 6 in either of the two positions shown in Figs. 6 and 7.

In Fig. 6, the piston 32 is partly extended such that the surface 10 on the blade 6 abuts the ground and whereby the blade 6 acts as a stabiliser during lifting operations by a crane mounted on the vehicle 4.

In Fig. 7, the piston 32 is fully retracted whereby the blade 6 is in an uppermost, substantially horizontal storage position in which it can be retained during travel of the vehicle 4.

When the blade is in its substantially horizontal position, it can be used for other purposes, such as a transport bucket for carrying earth and the like, or for extra storage space for carrying auxiliary equipment, or the surface 8 could be used as a workbench.

The attachment of Figs. 8 to 10 is similar to that of Figs. 1 to 3 and components equivalent to those of the attachment of Figs. 1 to 3 are similarly referenced. However, instead of hinged upper links 18, this embodiment includes telescopic links 18' comprising an outer box section 42 one end of which is pivotally mounted to the bracket 12 and in the other end of which is slidably mounted an inner section 44, the end of said section 44 remote from the section 42 being pivotally attached to, adjacent the upper regions of, the blade 6.

The section 44 is provided with a pair of axially-spaced holes, one of which is referenced

46, either of which can be aligned with a corresponding hole 48 through the section 42. Fig. 9 shows the upper link 18' at its longer length, enabling the blade 6 to be pivoted by means of the piston 32 into the positions shown in Figs. 4 and 5.

In order to achieve a shorter length link 18', the box section 44 is pushed further into the section 42 to align the other hole in said section 44 with the hole 48 in the section 42. This then enables the blade 6 to be located in positions equivalent to those of Figs. 6 and 7 by appropriate actuation of the piston 32 in the cylinder 30.

Thus there is provided a blade-like attachment for an armoured vehicle, which serves a four-fold purpose in that it comprises a dozer-blade capable of an earth-moving function, capable of acting as an anchor when winching by means of a winch mounted on the vehicle, capable of acting as a stabiliser when lifting loads by means of a crane mounted on the vehicle, and capable of a stowing function.

Clearly the precise construction of the attachment can vary from that illustrated and in particular the linkages 14 can be other than shown and could be such as to be located in an infinite number of positions by means other than hydraulic, for example pneumatic, mechanical, electronic and the like, while the means for locking the blade in a given position could comprise pins, stops, clamps or other mechanisms.

The attachment can be fitted to armoured recovery vehicles, repair/engineer vehicles, battle tanks and the like, while the attachment could be of modular construction to fit various vehicles or specially tailored to suit a particular vehicle.

The driving mechanisms for pivoting the blade could be self-contained within the attachment or located remote therefrom.

Other modifications and variations from the described arrangements will be apparent to those skilled in the art.

Claims

1. An attachment for an armoured vehicle (4) comprising a dozer-like blade (6) having an operative, earth-moving front surface (8) and, at or adjacent the lower regions thereof, a flat, substantially rearwardly extending stabiliser surface (10), and a linkage (14) adapted to react between the blade (6) and the armoured vehicle (4) to move the blade (6) relative to the armoured vehicle (4), the linkage (14) including a lower, fixed length link (16) pivotally attached to, to extend between, the blade (6) and the armoured vehicle (4), a hydraulic cylinder (30) reacting between the vehicle (4) and the lower link (16) to alter the orientation of the blade (6) relative to the vehicle (4), and an upper link (18) pivotally attached to, to extend between, the blade (6) and the vehicle (4), characterised in that the linkage (14) is selectively adjustable to move the blade (6) into:

a) a first, earth-moving position with the lower-

edge of the front surface (8) of the blade (6) just below ground level;

b) a second, anchorage position with the lower edge of the front surface (8) of the blade (6) further below ground level whereby a substantial proportion of the lower regions of the blade (6) is below ground level;

c) a third, stabilising position in which said stabiliser surface (10) of the blade (6) contacts the ground, and

d) a fourth, storage position in which the operative surface (8) of the blade (6) lies in a substantially horizontal plane,

the upper link (18) being adjustable between two lengths, a first, longer length associated with the first and second positions of the blade (6), and a second, shorter length associated with the third and fourth positions of the blade (6).

2. An attachment as claimed in claim 1 and comprising a pair of linkages (14) spaced transversely of the blade (6), one at or adjacent each end of said blade (6).

3. An attachment as claimed in claim 1 or claim 2 in which the upper link (18) comprises a pair of hinged arms (20, 22), one pivotally attached to each of the blade (6) and the armoured vehicle (4), said arms (20, 22) being lockable relative to one another in any one of two or more positions to define a line of differing lengths.

4. An attachment as claimed in claim 1 or claim 2 in which the upper link (18) is of telescopic construction, the slidable components (42, 44) of which can be locked in any one of two or more different positions relative to one another to define a link of differing lengths.

Patentansprüche

1. Zubehör für ein gepanzertes Fahrzeug (4), umfassend ein Planierschild (6), das eine wirk-
same, erdbewegende Vorderseite (8) und an oder
nahe seinem unteren Bereich eine ebene, im
wesentlichen nach hinten verlaufende Stabilisier-
fläche (10) aufweist, und ein Gelenkgetriebe, das
zwischen dem Schild (6) und dem gepanzerten
Fahrzeug (4) wirksam ist, um das Schild (6) relativ
zu dem gepanzerten Fahrzeug (4) zu bewegen,
wobei das Gelenkgetriebe (14) einen unteren
Lenker (16) mit fester Länge, der an dem Schild (6)
und an dem gepanzerten Fahrzeug (4) angelenkt
ist und sich zwischen diesen erstreckt, einen
Hydraulikzylinder (30), der zwischen dem Fahr-
zeug (4) und dem unteren Lenker (16) wirksam ist,
um die Orientierung des Schildes (6) relativ zu
dem Fahrzeug (4) zu verändern, und einen oberen
Lenker (18) enthält, der an dem Schild (6) und an
dem Fahrzeug (4) angelenkt ist und sich dazwi-
schen erstreckt, dadurch gekennzeichnet, daß das
Gelenkgetriebe (14) wahlweise einstellbar ist, um
das Schild (6) zu bewegen in:

a) eine erste, erdbewegende Stellung, in der die
Unterkante der Vorderseite (8) des Schildes (6)
knapp unter der Bodenoberfläche angeordnet ist;

b) eine zweite, Verankerungsstellung, in der die
Unterkante der Vorderseite (8) des Schildes (6)

weiter unter der Bodenoberfläche angeordnet ist,
wobei sich eine wesentlicher Anteil der unteren
Bereiche des Schildes (6) unter der Bodenoberflä-
che befindet;

c) eine dritte, Stabilisierstellung, in der die
besagte Stabilisierfläche (10) des Schildes (6) den
Boden berührt, und

d) eine vierte, Ruhestellung, in der sich die
wirksame Vorderseite (8) des Schildes (6) in einer
im wesentlichen horizontalen Ebene befindet,

wobei der obere Lenker (18) zwischen zwei
Längen verstellbar ist, nämlich einer ersten grö-
ßeren Länge, die der ersten und zweiten Stellung
des Schildes (6) zugeordnet ist, und einer zweiten
kürzeren Länge, die der dritten und vierten Stel-
lung des Schildes (6) zugeordnet ist.

2. Zubehör nach Anspruch 1, umfassend zwei
Gelenkgetriebe (14), die im Querabstand des
Schildes (6) an oder nahe jedem Ende des Schil-
des (6) angeordnet sind.

3. Zubehör nach Anspruch 1 oder 2, wobei der
obere Lenker (18) zwei scharnierartig verbundene
Arme (20, 22) umfaßt, die an dem Schild (6) und
an dem gepanzerten Fahrzeug (4) angelenkt sind,
wobei diese Arme (20, 22) in einer von zwei oder
mehr Stellungen relativ zueinander verriegelbar
sind, um einen Lenker mit unterschiedlichen Län-
gen zu bilden.

4. Zubehör nach Anspruch 1 oder 2, wobei der
obere Lenker (18) teleskopisch ausgebildet ist und
seine verschiebbaren Bestandteile (42, 44) in
einer oder mehreren verschiedenen Stellungen
relativ zueinander verriegelbar sind, um einen
Lenker mit unterschiedlichen Längen zu bilden.

Revendications

1. Outil pour un véhicule blindé (4) comprenant
une lame nivelleuse (6) ou analogue comportant
une surface avant (8) pour déplacer de la terre lors
de son fonctionnement et, sur ou à proximité des
parties inférieures de celle-ci, une surface de
stabilisation (10) s'étendant substantiellement
vers l'arrière et de forme plate ainsi qu'un méca-
nisme de liaison (14) pour agir entre la lame (6) et
le véhicule blindé (4) de façon à déplacer la lame
(6) par rapport au véhicule blindé (4), le méca-
nisme de liaison (14) comportant un élément de
liaison inférieur (16) fixé de façon pivotante et
attaché à la lame (6) et le véhicule blindé (4) de
manière à s'étendre entre ces derniers, un
cylindre hydraulique (30) réagissant entre le véhi-
cule (4) et l'élément de liaison inférieure (16) de
manière à faire varier l'orientation de la lame (6)
par rapport au véhicule (4), ainsi qu'un élément
de liaison supérieur (18) fixé de façon pivotante à
et s'étendant entre la lame (6) et le véhicule (4),
caractérisé en ce que le mécanisme de liaison (14)
est réglable à volonté de manière à déplacer la
lame (6):

dans une première position adaptée au dépla-
cement de la terre avec le rebord inférieur de la
surface avant (8) de la lame (6) située juste en
dessous du niveau de la terre;

dans une seconde position d'ancrage telle que le

rebord inférieur de la surface avant (8) de la lame (6) et situé à un nouveau encore plus bas sous la terre de manière qu'une proportion substantielle des régions inférieures de la lame (6) soit situé en dessous du niveau de la terre;

une troisième position de stabilisation dans laquelle ladite surface de nivellement (10) de la lame (6) est en contact avec le sol; et

une quatrième position de repos dans laquelle la surface fonctionnelle (8) de la lame (6) est disposée dans un plan substantiellement horizontal,

l'élément de liaison supérieur (18) étant ajustable entre deux longueurs, la première longueur plus élevée est utile dans les première et seconde positions de la lame (6), alors que la seconde longueur plus réduite est utilisée dans les troisième et quatrième positions de la lame (6).

2. Outil selon la revendication 1, caractérisé en ce qu'il comprend une paire d'éléments de liaison

(14) espacés selon la direction transversale de la lame (6), l'un de ceux-ci se trouvant sur, ou à proximité de, l'extrémité de ladite lame (6).

3. Outil selon la revendication 1 ou 2, caractérisé en ce que l'élément de liaison supérieur (18) comprend une paire de bras articulés (20, 22), l'un de ceux-ci étant fixé de manière pivotante à chacune des lames (6) du véhicule blindé (4), lesdits bras (20, 22) pouvant être verrouillés l'un par rapport à l'autre dans l'une quelconque des deux ou plusieurs positions de manière à définir un élément de liaison de longueurs variables.

4. Outil selon la revendication 1 ou 2, caractérisé en ce que l'élément de liaison supérieur (18) est une structure articulée, des composants coulissants (42, 44) faisant partie de cette structure pouvant être verrouillés dans l'une des deux ou plusieurs positions différentes de manière à définir un élément de liaison de longueurs variables.

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