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Description

[0001] The invention relates to fascines.

[0002] A fascine is used to fill a discontinuity in the ground such as a ditch or gully and provide a passage over such a discontinuity for, for example, vehicles. Fascines are most often used to facilitate the passage of military vehicles. One form of fascine uses a plurality of elongate members of generally circular cross section. Examples of fascines are shown in US-A-4566821 where the fascine is formed by a core of cylindrical pipes loosely disposed within a surrounding flexible sleeve formed by similar pipes. Alternatives using pipes are shown in US-A-4312601 and US-A-5215401. US-A-5406662 uses polyethylene tubes and inflatable core members.

[0003] The use of inflatable members in fascines has the advantage that the members have a smaller volume when uninflated and can thus be more easily transported. It is problem, however, that such inflatable members require inflation equipment to inflate them. Such inflation equipment may include a gas source and a valve which when opened inflates the member. The inflation equipment is carried on the outside of the member and is thus liable to damage when the inflatable member is deployed, particularly where the ground is hard or rocky. Such equipment can also be damaged when in situ by, for example, the traffic of vehicles over the fascine.

[0004] According to the invention a fascine comprises an assembly of elongate members, at least one member including an inflatable chamber and an inflation system for inflating said chamber, characterised in that said inflation system is located within said chamber.

[0005] By putting the gas source and the valve within the member, it is protected before, during and after deployment.

[0006] It is possible to form an inflatable member with an inflation chamber that defines a hollow tube. Such a hollow tube has the advantage of lower inflated volume over a cylindrical inflation chamber and allows easy passage through the tube of flowing water.

[0007] The plurality of elongate members forming a fascine are capable of moving relative to one another and tend to form themselves in an arrangement where the depression is filled providing a generally level upper surface that allows a passage to be made across the fascine. It is plainly advantageous that the surface providing the passage is as level as possible.

[0008] The following is a more detailed description of some embodiments of the invention, by way of example, reference being made to the accompanying drawings in which:

Figure 1 is a schematic side elevation of a gully containing a fascine formed by a plurality of larger diameter inflatable hollow pipes and a plurality of smaller diameter tubes,

Figure 2 is a schematic cross-section of part of a cross-thread fabric for forming the larger diameter

inflatable hollow pipes,

Figure 3 is detail at X of Figure 2,

Figure 4 shows a larger diameter pipe of the kind shown in Figure 1 in side elevation and end elevation and deflated,

Figure 5 shows the larger diameter pipe of Figure 1 in cross section elevation and end elevation and inflated,

Figure 6 shows a tube of the kind shown in Figure 1 in a deflated state and incorporating an inflation system,

Figure 7 is a similar view to Figure 6 but showing the inflation system actuated and the tube inflated.

[0009] Referring first to Figure 1, the fascine comprises a plurality of larger diameter inflated pipes 10 and a plurality of smaller diameter inflated tubes 11. The larger diameter inflated pipes 10 fill the lower portion of a gully 12 while the smaller diameter inflated tubes 11 overlie the larger diameter inflated pipes 10 to form a passage across the gully 12.

[0010] Referring next to Figures 2 and 3, each pipe 10 is elongate and is formed from a sheet of drop-thread fabric of the kind shown in Figures 3 and 4. As seen in this Figure, the fabric comprises a first textile layer 13 interconnected to a second textile layer 14 by a plurality of drop-threads shown schematically at 15. Both the first layer 13 and the second layer 14 are provided with an inner coating of polychloroprene, a textile chaffing layer 16 then an outer coating of polychloroprene. An elongate rectangular sheet of such drop-thread material has the side edges of the first textile layer 13 connected together and the side edges of the second textile layer 14 connected together to form a hollow pipe with a first end and a second end. The edges at the first and second ends are also closed so that a closed chamber is formed within the first textile layer 13 and the second textile layer 14. The first textile layer 13 thus forms an outer wall of the pipe 10 and the second textile layer 14 an inner wall of the pipe 10. Each pipe 10 may be provided with an outer cover of wear-resistant material.

[0011] Each pipe 10 carries an inflation system 18 formed by two inflation cylinders and associated valve systems. As seen in Figure 5, the inflation systems are located within the associated pipe 10 with one system being adjacent one end of the tube 10 and the other system adjacent an opposite end of the tube 10. The valve system 19a, when actuated, opens a valve and allows gas from the inflation cylinder 18 to inflate the chamber of the pipe 10. A switch 19b is provided for actuating the inflation systems. The switch may be manually operated or electrically operated. The electric operation may be remote via wire or be by wireless connection 19c.

[0012] Inflatable pipes of this kind are described in more detail in GB-A-2 401 640, and do not illustrate the present invention.

[0013] Each smaller diameter inflatable tube 11 is formed from a conventional coated fabric material. Each

tube 11 is provided with an inflation system 20 that, as seen in Figures 6 and 7, is located within the associated tube 11. Each inflation system 20 comprises a gas cylinder 21 and a valve system 22 carried by a mounting plate 23. The mounting plate 23 allows the inflation system 20 to be removed and replaced easily. On operation of the valve system 22, gas from the gas cylinder 21 leaves the valve system 22 through an outlet 27 to inflate the tube 11. The inflation system 20 may be actuated by a switch 28 located within the tube 11. The switch 28 may be manually operated or electrically operated. The electric operation may be remote via wire or by a wireless connection 29.

[0014] The inflation system 20 could incorporate an aspiration system (shown in broken line at 30) by which ambient air is drawn into the tube 11 as gas from the cylinder 21 inflates the tube. This increases the speed of inflation. Such aspiration systems are known and will not be described in detail.

[0015] The advantage of locating the gas cylinder 21 within the associated tube 11 is to provide protection for the gas cylinder 21 and the other parts of the inflation system in the post-inflation phase. There is a significantly reduced chance of the inflation system being damaged after the tube 11 has been inflated. The system will give faster inflation with fewer problems of icing if the gas is vented directly from the cylinder without needing to pass down pipes. There are fewer components and valve parts which give increased reliability and improve performance. It gives the fascine a reduced radar image and possibly a reduced thermal image because it is screened by the tube 11. If an aspiration system 30 is provided it allows a smaller gas cylinder to be used. This reduces bulk and cost.

[0016] The exterior diameter of the pipes 10, when inflated, may be between 0.5m and 1.0m. The exterior diameter of the tubes 11, when inflated, may be between 0.2m and 0.5m.

[0017] The tubes 11 may be covered with a wear-resistant cover. In addition, the tubes 11 may be double skinned to provide resistance to puncturing.

[0018] In use, the pipes 10 are deflated and vacuum packed separately from one another as seen in Figure 4. Likewise, the tubes 11 are deflated and vacuum packed separately from one another. In this way, the fascine components can be readily transported as they are lightweight and compact. When a discontinuity is reached that needs to be filled by the fascine, an estimate is made of the number of pipes 10 required to fill the discontinuity. In the example shown in Figure 1, five such pipes 10 are required. The required number of pipes are placed in the discontinuity and the walls inflated using the cylinders 18 and valve systems 19. Inflation can be either be via an initiation cable or electronically, perhaps by remote signal. On inflation, the valve systems 19 open and gas from the inflation cylinders 18 passes into the pipes 10 to inflate the walls of the pipes 10.

[0019] Once the pipes 10 are inflated, an estimate is

also made of the number of tubes 11 required to cover the pipes 10 and form a trackway across the discontinuity. In the example shown in Figure 1, eight such tubes 11 are required. The tubes 11 are placed in the discontinuity and are then inflated by operation of the valve systems 22 to open the gas cylinders and inflate the tubes 11. The inflated tubes 11 then form the trackway over the inflated pipes 10.

[0020] It would be possible to inflate the trackway tubes 11 away from the discontinuity and then locate them over the pipes 10 to form the trackway.

[0021] The trackway may be covered by additional members (not shown) such as a heavy duty layer of material such as Kevlar as well as a chaffing layer.

[0022] It will be appreciated that the feature of locating the inflation system within the inflation chamber of the tubes 11 may also be applied to the pipes 10. The feature need not be used with both the larger diameter pipes 10 and smaller diameter tubes 11. It could be used with either one or the other.

Claims

1. A fascine comprising an assembly of elongate members (10, 11), at least one member (10, 11) including an inflatable chamber and an inflation system (18, 20) for inflating said chamber **characterised in that** said inflation system (18, 20) is located within said chamber.
2. A fascine according to claim 1 wherein said chamber when inflated, defines a cylindrical tube (11).
3. A fascine according to claims 1 or claim 2 and including switch means (19b, 28) activatable to operate said inflation system (18, 20),
4. A fascine according to claim 3 wherein said switch means (19b, 28) is manually actuated.
5. A fascine according to claim 3 wherein the switch means (19b, 28) is electrically actuated.
6. A fascine according to claim 5 wherein said switch means (19b, 28) is remotely actuated.
7. A fascine according to claim 6 wherein said remote actuation is via a wire.
8. A fascine according to claim 6 wherein said remote actuation is wireless (19c, 29).
9. A fascine according to any one of claims 3 to 9 wherein said inflation system (18, 20) includes a rupturable component, activation of said switch means (19b, 28) rupturing said component to inflate said at least one member.

10. A fascine according to any preceding claim wherein said at least one member (10, 11) includes a second inflation means (30).
11. A fascine according to claim 10 wherein said second inflation means (30) includes aspiration means operative to draw into said at least one member (10, 11) air from outside said at least one member (10, 11).
12. A fascine according to any preceding claim wherein said at least one member (10, 11) has an outside cover of wear resistant material.
13. A fascine according to any preceding claim wherein said at least one member (10, 11) is one of a plurality of such members.

Patentansprüche

1. Faschine, enthaltend eine Anordnung länglicher Elemente (10, 11), von denen wenigstens ein Element (10, 11) eine aufblasbare Kammer und ein Aufblas-system (18, 20) enthält, um die Kammer aufzublas-sen, **dadurch gekennzeichnet, dass** sich das Auf-blassystem (18, 20) in der Kammer befindet.
2. Faschine nach Anspruch 1, bei der die Kammer, wenn sie aufgeblasen ist, einen zylindrischen Schlauch (11) definiert.
3. Faschine nach Anspruch 1 oder 2 und enthaltend eine Schalteinrichtung (19b, 28), die aktiviert werden kann, um das Aufblasystem (18, 20) zu betätigen.
4. Faschine nach Anspruch 3, bei der die Schaltein-richtung (19b, 28) manuell betätigt wird.
5. Faschine nach Anspruch 3, bei der die Schaltein-richtung (19b, 28) elektrisch betätigt wird.
6. Faschine nach Anspruch 5, bei der die Schaltein-richtung (19b, 28) entfernt betätigt wird.
7. Faschine nach Anspruch 6, bei der die entfernte Be-tätigung über eine Drahtleitung erfolgt.
8. Faschine nach Anspruch 6, bei der die entfernte Be-tätigung drahtlos (19c, 29) erfolgt.
9. Faschine nach einem der Ansprüche 3 bis 9, bei der das Aufblasystem (18, 20) eine Bruchkomponente enthält, wobei die Aktivierung der Schalteinrichtung (19b, 28) zum Bruch der Komponente führt, um das wenigstens eine Element aufzublasen.
10. Faschine nach einem der vorhergehenden Ansprü-

che, wobei das wenigstens eine Element (10, 11) ein zweite Aufblaseinrichtung (30) enthält.

11. Faschine nach Anspruch 10, bei der das zweite Auf-blaselement (30) eine Ansaugereinrichtung enthält, die so betätigt werden kann, dass sie in das wenig-stens eine Element (10, 11) Luft von außerhalb des wenigstens einen Elementes (11, 11) einsaugt.
12. Faschine nach einem der vorhergehenden Ansprü-che, bei der das wenigstens eine Element (10, 11) eine Außenabdeckung eines abnutzungsfesten Ma-terials hat.
13. Faschine nach einem der vorhergehenden Ansprü-che, bei der das wenigstens eine Element (10, 11) eines aus einer Vielzahl derartiger Elemente ist.

Revendications

1. Fascine comprenant un ensemble d'éléments (10, 11) allongés, au moins un élément (10, 11) compre-nant une chambre gonflable et un système de gon-flage (18, 20) pour gonfler ladite chambre, **caracté-risée en ce que** ledit système de gonflage (18, 20) est situé dans ladite chambre.
2. Fascine selon la revendication 1, dans laquelle ladite chambre, lorsqu'elle est gonflée, définit un tube cy-lindrique (11).
3. Fascine selon la revendication 1 ou la revendication 2 et comprenant des moyens formant commutateur (19b, 28) pouvant être actionnés pour mettre en oeuvre ledit système de gonflage (18, 20).
4. Fascine selon la revendication 3, dans laquelle les-dits moyens formant commutateur (19b, 28) sont ac-tionnés manuellement.
5. Fascine selon la revendication 3, dans laquelle les moyens formant commutateur (19b, 28) sont action-nés électriquement.
6. Fascine selon la revendication 5, dans laquelle les-dits moyens formant commutateur (19b, 28) sont ac-tionnés à distance.
7. Fascine selon la revendication 6, dans laquelle ledit actionnement à distance s'effectue par l'intermédi-aire d'un fil.
8. Fascine selon la revendication 6, dans laquelle ledit actionnement à distance s'effectue sans fil (19c, 29).
9. Fascine selon l'une quelconque des revendications 3 à 9, dans laquelle ledit système de gonflage (18,

20) comprend un composant fracturable, l'activation desdits moyens formant commutateur (19b, 28) fracturant ledit composant pour gonfler ledit au moins un élément.

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- 10.** Fascine selon l'une quelconque des revendications précédentes, dans laquelle ledit au moins un élément (10, 11) comprend des deuxièmes moyens de gonflage (30).

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- 11.** Fascine selon la revendication 10, dans laquelle lesdits deuxièmes moyens de gonflage (30) comprennent des moyens d'aspiration pouvant être utilisés pour aspirer dans ledit au moins un élément (10, 11) de l'air de l'extérieur dudit au moins un élément (10, 11).

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- 12.** Fascine selon l'une quelconque des revendications précédentes, dans laquelle ledit au moins un élément (10, 11) comporte un élément de recouvrement extérieur en un matériau résistant à l'usure.

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- 13.** Fascine selon l'une quelconque des revendications précédentes, dans laquelle ledit au moins un élément (10, 11) est l'un d'une pluralité de ces éléments.

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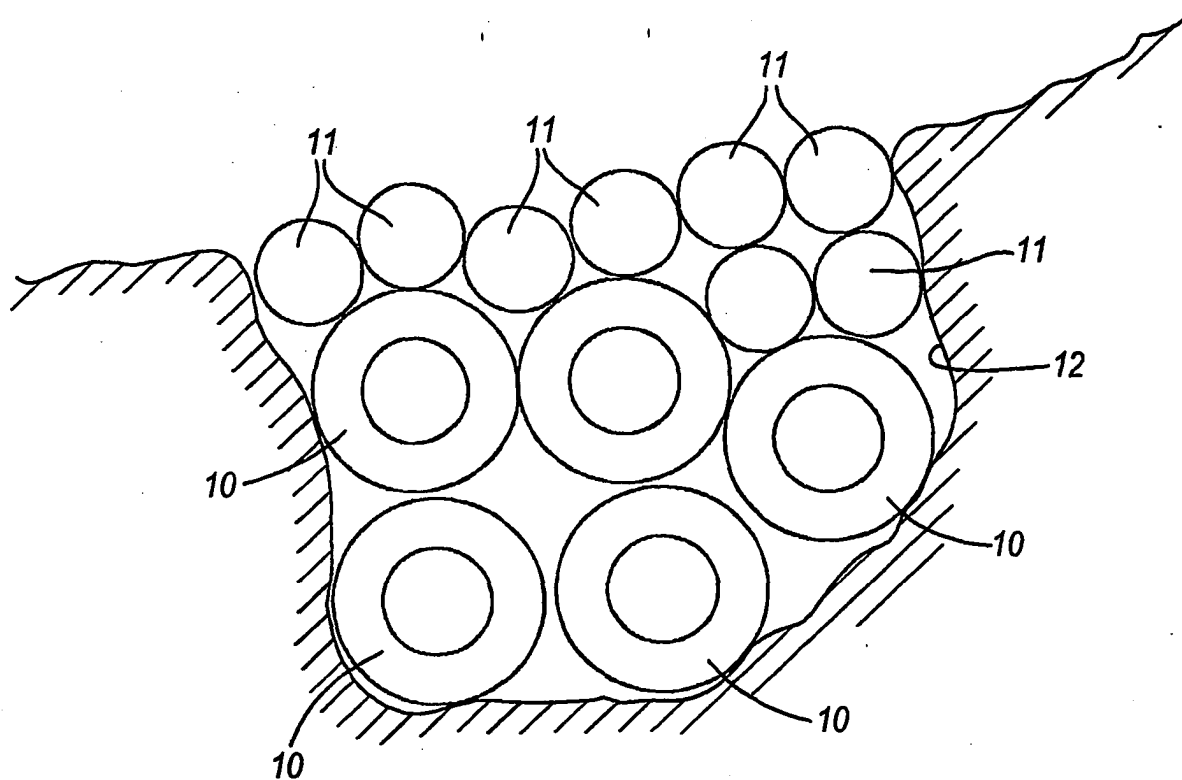


Fig.1

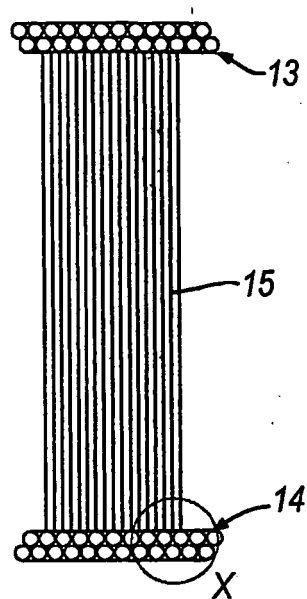


Fig. 2

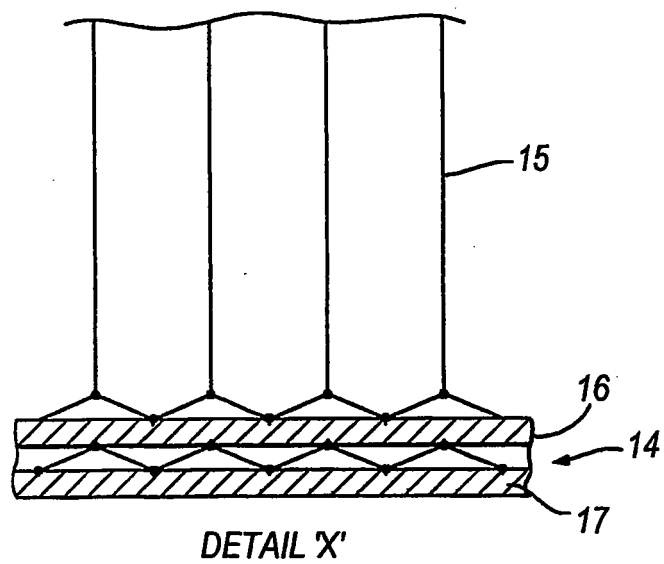


Fig. 3

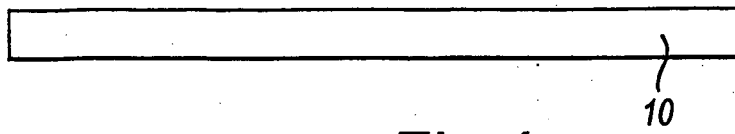


Fig. 4

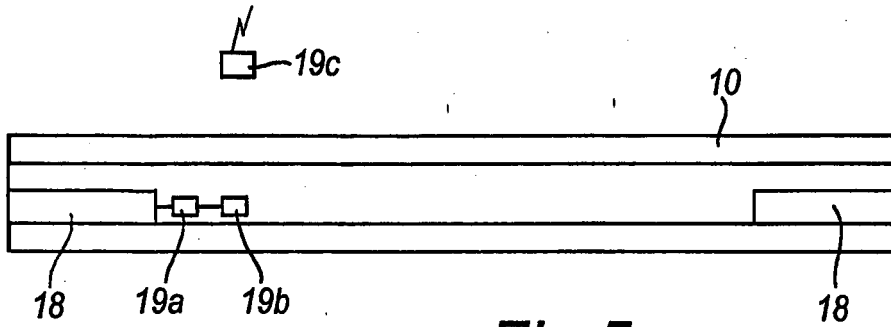


Fig. 5

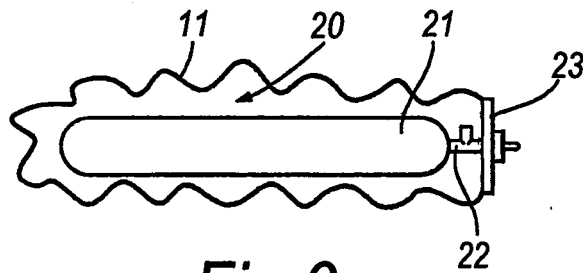
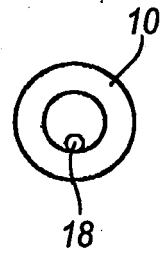


Fig. 6

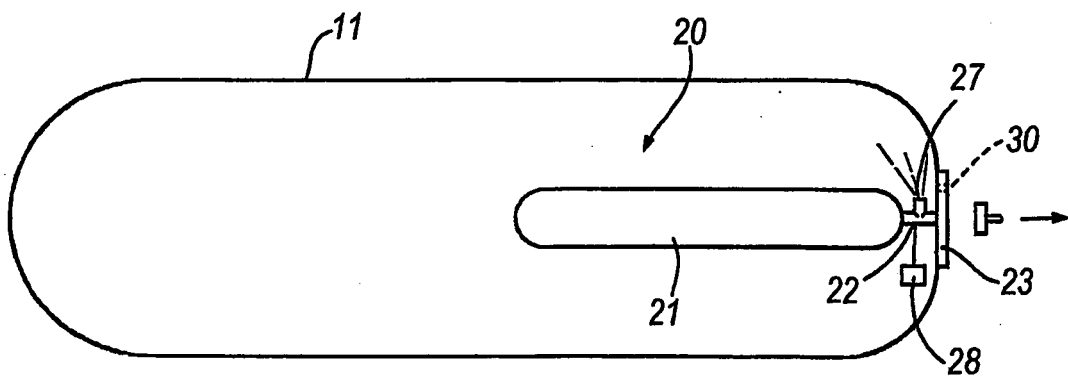
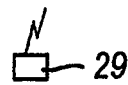


Fig. 7



REFERENCES CITED IN THE DESCRIPTION

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