A post assembly includes a mount, which is adapted to be placed in a substrate surface, and a post, which is releasably attached to the mount. The mount is firstly pushed into the substrate surface, and then deformed by a tool which outwardly pushes a deformable portion of the mount. The post is then inserted into the mount and releasably secured by an engagement means. By appropriately positioning a plurality of post assemblies in spaced apart location, and then by extending fencing material therebetween, a fence may be thereby constructed.
FIG. 3
POST, FENCE, AND METHOD AND APPARATUS FOR INSTALLING A POST OR FENCE

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a post, such as a fence post, and to a fence formed by a plurality of posts. The present invention also relates to a method of installing a fence or post, and, to various tools for use in the installation of a post or fence. In particular, the present invention provides a post, which has a deformable portion, which may be splayed outwardly for securement of the post to a substrate surface, and to tools for installing such a post in the substrate surface.

DESCRIPTION OF THE PRIOR ART

[0002] 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 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.

[0003] The installation of fences has not altered for decades. When installing a fence, of the type having a plurality of posts with wire or mesh spanned therebetwehen, each fence post is typically driven into the ground using a hammer, mallet or the like, such that a substantial height of the post is below the substrate surface, so that sideways movement of the post is therefore substantially prevented. Once a plurality of such posts are installed, the wire, mesh or the like is typically spanned therebetwehen.

[0004] It will be appreciated that considerable physical effort is typically required to drive the fence post into the ground, and, that the length of the post below the ground surface level is necessarily considerable to avoid transverse movement of the post. The need to drive posts to a significant depth is wasteful, and is also prone to problems such as hitting rock or service lines (e.g. electricity, gas, etc) buried below the ground.

SUMMARY OF THE INVENTION

[0005] The present invention seeks to provide a post, post mount or post assembly, and/or a fence formed of a plurality of such posts, post mounts or post assemblies, which overcome the disadvantages of the prior art.

[0006] The present invention also seeks to provide a tool for installation of a post, post mount or post assembly.

[0007] The present invention also seeks to provide a method of installing a post, post mount or post assembly and/or a fence.

[0008] In one broad form, the present invention provides a post assembly, including: a mount, adapted to be installed in a substrate surface; and, a post, adapted to be releasably attached to the mount.

[0009] Preferably, the post assembly includes engagement means, for releasable attachment of said post to said mount.

[0010] Also preferably, the engagement means includes at least one biased pin adapted to normally extend outwards of said post to engage an orifice in said mount.

[0011] Preferably, said mount includes a longitudinal member with a deformable portion which is adapted to be deformed after insertion of said mount in said substrate surface.

[0012] Also preferably, said deformable portion is adapted to extend transverse to a longitudinal direction of said mount.

[0013] Preferably, said deformable portion is deformed by inserting a tool within said post, said tool being adapted to push said deformable section outwards of the remainder of said mount.

[0014] Preferably, said mount and said post are of similar square, round, rectangular or other shape in cross-section, with one of said post or mount being of slightly smaller dimension than the other, such that, said post is adapted to snuggly fit within said mount, or vice versa.

[0015] Also preferably, said tool includes an elongate body adapted to be received with said mount, a first end of said body having at least one movable arm adapted to extend transversely outwards of said body, and, a second end of said body having a handle to operate said arm(s).

[0016] In a further broad form, the present invention provides a post adapted to be installed in a substrate surface, including a deformable portion adapted to be outwardly deformed.

[0017] Preferably, said post being formed of metal or like deformable material, and including a substantially hollow core.

[0018] Also preferably, said deformable portion is deformed by inserting a tool within said post, said tool being adapted to push the deformable portion outwards of the remainder of said mount.

[0019] In a further broad form, the present invention provides a post mount installation tool adapted to install a post mount into a substrate surface, said tool including:

[0020] a drill bit;

[0021] an engagement surface, adapted to engage a first end of said post mount;

[0022] such that, upon operation of said tool, said drill bit is adapted to drill into said substrate surface and said engagement surface simultaneously drives said post mount through said substrate surface.

[0023] Preferably, after said post mount is driven into said substrate surface, said drill bit is withdrawn, leaving said post mount in said substrate surface.

[0024] In yet a further broad form, the present invention provides a tool for installing a post or post mount, said tool including: a substantially elongate body adapted to be inserted within said post or post mount; at least one movable arm at a first end of said elongate body, adapted to extend transversely outwards of said body so as to deform at least a portion of said post or post mount.

[0025] Preferably, the tool further includes a handle at a second end of said elongate body to operate said arm(s).

[0026] Preferably, the tool further includes drive means, to drive said post or post mount downwards into a substrate surface.

[0027] Preferably, the tool further includes locating means, to identify the location for installation of said post or post mount in a substrate surface using GPS or like navigational means.

[0028] In yet a further broad form, the present invention provides a method for installing a post or post mount, including the steps of: identifying the location for installation of said post or post mount; driving said post or post mount downwards into a substrate surface; and, outwardly deforming a deformable portion of said post or post mount.

[0029] Preferably, said outwardly deforming step is formed by inserting a tool inside said post and pushing said deformable portion outwards.
Also preferably, the method includes inserting a post within said post mount.

Preferably, said post is attached to said post mount by releasable engagement means.

In yet a further broad form, the present invention provides a method of installing a fence, including the steps of: identifying the location for installation of each of a plurality of posts or post assemblies; driving said posts/post assemblies into a substrate surface; and, outwardly deforming a deformable portion of each of said posts/post assemblies.

In yet a further broad form, the present invention provides a method of installing a fence, including the steps of: identifying the location for installation of each of a plurality of posts or post assemblies; driving said posts/post assemblies into a substrate surface; and, outwardly deforming a deformable portion of each of said posts/post assemblies.

In a further broad form, the present invention provides a post mount, adapted to be installed in a substrate surface, the mount further including engagement means for releasable attachment of a post thereto, to thereby form a post assembly.

In yet a further broad form, the present invention provides a post assembly, after installation of said post mount in a substrate surface, to thereby form a post assembly.

BRIEF DESCRIPTION OF THE DRAWINGS

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

FIG. 1 shows a perspective view of a first embodiment of a post assembly in accordance with a preferred embodiment of the present invention;

FIG. 2 illustrates a cross-section through a longitudinal direction of the post assembly of FIG. 1;

FIG. 3 shows an elevational view of the post assembly of FIG. 1;

FIG. 4 shows another elevational view of the post assembly of FIG. 1, orthogonal to the view shown in FIG. 3;

FIG. 5 details a cross-sectional view of the assembly of FIG. 4;

FIG. 6 details a cross-sectional view through lines D-D of the assembly shown in FIG. 4;

FIG. 7 illustrates an enlarged view of portion E shown in FIG. 6, showing the details of the engagement means for engaging the post to the mount;

FIG. 8 shows a perspective view of a second embodiment of the post assembly in accordance with the preferred embodiment of the present invention;

FIG. 9 illustrates a cross-section through a longitudinal direction of the post assembly of FIG. 8;

FIG. 10 shows an elevational view of the post assembly of FIG. 8;

FIG. 11 shows another elevational view of the post assembly of FIG. 8, orthogonal to the view shown in FIG. 10;

FIG. 12 details a cross-sectional view through lines F-F of the assembly of FIG. 10;

FIG. 13 details a cross-sectional view through the lines D-D of the assembly of FIG. 11;

FIG. 14 illustrates an enlarged view of portion E shown in FIG. 13, showing details of the engagement means for engaging the post of FIG. 8 to the mount;

FIG. 15 shows, in FIGS. 15(a) and 15(b) respectively, components of the drilling system which may be used to install the mount of the post assembly in accordance with the present invention;

FIG. 16 illustrates in FIGS. 16(a) and 16(b) respectively, an assembled and an exploded view of the drill, within the mount of the post assembly of the present invention;

FIG. 17 shows a perspective view of a further tool which may be used to install the post/post mount, having its arms in the insertion position;

FIG. 18 shows another perspective view of the tool shown in FIG. 17, but with the arms in the outwards position;

FIG. 19 illustrates an elevational view of the tool with the arms in the insertion position;

FIG. 20 illustrates an elevational view of the tool with the arms in the outwards position; and,

FIG. 21 illustrates a cross-sectional view of the tool shown in FIG. 17; and,

FIG. 22 illustrates a cross-sectional view of the tool shown in FIGS. 22(a) and 22(b) respectively, perspective and cross-sectional views showing certain steps in the method of installation of the post assembly in accordance with the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Throughout the drawings, like numerals will be used to identify similar features, except where expressly otherwise indicated.

FIGS. 1 to 7 illustrate a first embodiment of the post assembly formed in accordance with the present invention, whilst FIGS. 8 to 14 illustrate a second embodiment of the post assembly of the present invention.

The post assembly, generally designated by the numeral 1, includes a mount 2 which is adapted to be installed in a substrate surface, and a post 3, which is adapted to be releasably attached to the mount 2. An engagement means 4 may be used to releasably attach the post 3 to the mount 1. The engagement means may be embodied in a variety of ways; but in one version, the engagement means 4 may include a biased pin 5 (see FIGS. 7 and 14) which normally extends outwards of the post 3 to engage an orifice 6 in the mount 2.

As depicted in the drawings, the mount 2 is formed as a substantially longitudinally extending member, which has a deformable portion 7 intermediate its ends. The deformable portion is adapted to be deformed once the post mount is situated in a substrate surface, such that it provides stability for later insertion of the post 3 therein. It will be appreciated that by utilizing such a deformable portion 7, the length of post mount 2 installed in a substrate surface will be somewhat shortened (compared with a traditionally installed post), as extra anchoring and stability of the post mount is provided by having such a splayed or bulbous portion along the length of the post. The means for deforming the deformable portion 7 will be described hereinafter in conjunction with the description of the tool described in FIGS. 17 to 21.

It will be appreciated at the post mount 2 and the post 3 are preferably of complementary shape such that one component can be slidably inserted within the other to provide a snug fit. Any desired shape may be utilised including the square shape depicted in FIGS. 1 to 7, a round shape, rectangular shape or any other desired shape. Likewise, it will be appreciated that other means for engaging the post 3 to the post mount 2 may become obvious to persons skilled in the
art, and these modifications should be considered to fall within the scope of the present invention.

[0064] Whilst the post assembly shown in FIGS. 1 to 7, being a first embodiment of the present invention show a mount which has cut or spayed portions, the second preferred embodiment of the present invention, as shown in FIGS. 8 to 14, show an alternative form of the invention wherein when the post mount 2 is exploded or expanded or deformed, the post itself is not torn or cut apart but rather just expanded in a bulbous manner such that it anchors to the surrounding substrate surface. The embodiment of FIGS. 8 to 14 may be particularly usefully used if, for example, the post mount 2 may be formed of metal material, but it is preferable that the metal is not cut, which may be prone to rust, as shown in the first embodiment.

[0065] As shown in FIGS. 15 and 16, there is provided a drilling system/tool, generally designated by the numeral 20 used for drilling a hole in the substrate surface, for installation of the mount 2. The drill tool may be attached to any known drilling apparatus to rotate the drill head 22 as required into the substrate surface. The drill typically includes a drill bit 21, a drill head 22, and a shaft 23, which is attachable by known means to an apparatus such that the drill 20 is rotated as required. The mount 2 is forced into the substrate surface by an attachment 24 which is releasably secured to the shaft 23, and which incorporates an abutment end 24 which is adapted to engage the top end of the mount 2 to force the mount into the substrate surface as the drill 20 is rotated.

[0066] As shown in FIGS. 17 to 21, there is provided another tool, generally designated by the numeral 10 which is formed as a substantially elongate body portion 11 which is adapted to be received within the post mount 2. The first end of the body has at least one movable arm 12 thereon and a second end of the body 11 has a handle 13.

[0067] Each arm 12 is adapted to extend transversely outwards of the body 11, operable by the handle 13. It will be seen in FIG. 17 that the arms 12 are in their folded position, wherein they extend in the longitudinal direction of the body 11, whilst in FIG. 18, the arms 12 extend outwards in a direction which is transverse to the longitudinal direction of the body 11. In use, the tool 10 is inserted within the post mount 2, the arms 12 are then operated to deform the deformable section 7 of the post mount 2 to the position of the deformable section 7 as shown in FIGS. 1 to 7 of FIGS. 1 to 14. The tool 10 may be operated in a variety of manners, including using hydraulics, electric motors, or the like. Such embodiments will become apparent to persons skilled in the art. The tool 10 is also adapted to insert the post mount 2 into the substrate surface.

[0068] In use therefore it will be appreciated that the post mount which is initially of substantially uniform square or other shape, is pushed into the substrate surface in that shape, and then the arms 12 are operated to outwardly extend and deform the deformable section 7 such that instead of the uniform shape being maintained, an expanded or exploded bulbous or spayed appearance is created.

[0069] Some of the steps performed in the method of installing the fence assembly in accordance with the present invention are shown in FIG. 22.

[0070] FIG. 22(a) illustrates various perspective views of the tools used to insert certain components of the post assembly into a substrate surface, whilst FIG. 22(b) illustrates for further clarity, some cross-sectional views corresponding to the perspective views of FIG. 22(a).

[0071] In particular, it will be seen in steps (i) and (ii) of FIG. 22 the use of the drill tool for installation of the post mount 2 into the substrate surface. In particular, step (i) of FIG. 22 shows the drill having been inserted in the substrate surface before it is withdrawn, whilst step (ii) of FIG. 22 shows the same tool withdrawn from the substrate surface, but leaving the mount 2 in the substrate surface.

[0072] Steps (iii), (iv), (v) and (vi) of FIG. 22 then show various steps in using the tool shown in FIG. 17 to then splay apart the deformable portion of mount 2. In particular, in step (iii) of FIG. 22, the tool 10 is shown ready to be inserted into the mount 2, step (iv) of FIG. 22 shows the tool 10 inserted into the mount 2, step (v) of FIG. 22 shows the movement of the arms 12 of tool 10 being forced against the interior walls of the post mount 2 to splay the walls of the mount 2 apart, whilst step (vi) of FIG. 22 shows the mount remaining in the substrate surface the deformable portion 7 having been formed and the tool 10 withdrawn from the mount 2.

[0073] The present invention also seeks to provide a method of installing posts to form a fence by providing a plurality of such posts into a substrate surface, and thereafter extending wire mesh or other like material between the post assemblies. For instance, an orifice 8 as shown in FIGS. 1 to 7 and in FIGS. 8 to 14 may be provided for the provision of fence wire. Other orifices or other suitable engagement means may alternatively be provided to provide other fencing material theerebetween.

[0074] The present invention also provides a means of automating the installation of such post assemblies by utilising an appropriately driven vehicle or the like which may utilise GPS or other navigation equipments to identify its location and, as it drives, it automatically installs the post mounts in the substrate surface, and then supplies the posts into the post mounts to form the post assembly. Numerous variations and modifications to such a vehicle or the like will become apparent to persons skilled in the art.

[0075] Whilst an embodiment of the invention utilising separate post mounts and posts has been hereinbefore described, it will be appreciated by persons skilled in the art, that instead of using two releasable components, a single fence post may be formed which has a deformable portion thereon at a lower end of the post. Such a variation should be considered to fall within the scope of the present invention.

[0076] It will be therefore appreciated that the present invention provides a post, a post mount, a post assembly, a fence formed from a plurality of post assemblies, tools for installation of the posts, post mounts or post assemblies, and, a method of automating the installation of a plurality of post assemblies utilising GPS or other navigational equipment on a suitably driven vehicle for installation of such posts.

[0077] It will be appreciated that the present invention provides a number of distinct advantages over prior art fence posts in both the stability of the fence posts provided, their ease and time savings in installation, etc.

[0078] It will also be appreciated that whilst the present invention has been specifically described in relation to fence posts, that posts for any desired use may be provided, for instance, other sign posts. Such variations should also be considered to be within the scope of this invention.

[0079] All such variations and modifications should be considered to fall within the scope of this invention.
and including a deformable portion between first and second ends thereof; and,

a post, adapted to be attached to said post mount;

wherein said post assembly is adapted to be installed in said substrate by:

- driving said first end of said post mount into said substrate such that said deformable portion is below a surface of said substrate;
- inserting a tool within said post mount;
- operating said tool to outwardly extend an arm of said tool to thereby cause said deformable portion of said post mount to expand outwardly in a bulbous manner such that said post mount becomes anchored in said substrate; and, attaching said post to said post mount.

27. A post assembly as claimed in claim 26, including:

- engagement means, for releasable attachment of said post to said post mount.

28. A post assembly as claimed in claim 27, wherein said engagement means includes at least one biased pin adapted to normally extend outwards of said post to engage an orifice in said mount.

29. A post assembly as claimed in claim 26, wherein said post mount and said post are of similar square, round, rectangular or other shape in cross-section, with one of said post or mount being of slightly smaller dimension than the other, such that, said post is adapted to snugly fit within said mount, or vice versa.

30. A post assembly as claimed in claim 26, wherein said tool includes an elongate body adapted to be received within said mount, a first end of said body having the said at least one movable arm adapted to extend transversely outwards of said body, and, a second end of said body having a handle to operate said arm(s).

31. A post, adapted to be anchored in a substrate, including an elongate body with a substantially hollow core and including a deformable portion between first and second ends thereof, said post being adapted to be installed in said substrate by:

- driving said first end of said post into said substrate such that said deformable portion is positioned below a surface of said substrate;
- inserting a tool in said post;
- operating said tool to outwardly extend an arm of said tool to thereby cause said deformable portion to be expanded outwardly in a bulbous manner such that said post becomes anchored in said substrate; and
- removing said tool.

32. A post as claimed in claim 31, said post being formed of metal or like deformable material, and including a substantially hollow core.

33. A tool for installing a post or post mount, said tool including:

- a substantially elongate body adapted to be inserted within said post/post mount;
- at least one movable arm at a first end of said elongate body, adapted to extend transversely outwards of said body so as to deform at least a portion of said post/post mount, and,
- a handle at a second end of said elongate body to operate said arm(s);

wherein said post or post mount is adapted to be installed in a substrate surface by:

- driving said first end of said post mount into said substrate such that said deformable portion is below a surface of said substrate;
- causing said deformable portion of said post mount to expand outwardly in a bulbous manner such that said post mount becomes anchored in said substrate; and,
- attaching said post to said post mount.

34. A tool for installing a post or post mount as claimed in claim 33, further including:

- locating means, to identify the location for installation of said post/post mount in a substrate surface using GPS or like navigational means.

35. A method for installing a post or post mount, including the steps of:

- identifying a location for installation of said post/post mount;
- driving said post/post mount downwards into a substrate;
- inserting a tool into said post/post mount;
- operating said tool to outwardly extend an arm of said tool to thereby outwardly deform a deformable portion of said post/post mount in a bulbous manner such that said post/post mount becomes anchored in said substrate; and
- removing said tool from said post/post mount.

36. A method for installing a post as claimed in claim 35, further including the step of:

- inserting a post within said post mount.

37. A method for installing a post mount as claimed in claim 36, wherein said post is attached to said post mount by releasable engagement means.

38. A fence including:

- a plurality of post assemblies as hereinbefore claimed in claim 26, and,
- wire, mesh, or other like material extending between said posts for post assemblies.

39. A method of installing a fence, including the steps of:

- identifying the location for installation of each of a plurality of posts, as hereinbefore claimed in claim 26;
- driving said posts into a substrate surface; and,
- outwardly deforming a deformable portion of each of said posts.

40. A post mount, adapted to be anchored in a substrate and adapted to receive a post therein, said post mount including an elongate body with a substantially hollow core, including a deformable portion between first and second ends thereof, said post mount adapted to be installed in a substrate by:

- driving said first end of said post mount into said substrate such that said deformable portion is positioned below a surface of said substrate;
- inserting a tool within said post mount;
- operating said tool to outwardly extend an arm of said tool to thereby cause said deformable portion of said post mount to outwardly expand in a substantially bulbous manner such that said post mount becomes anchored in said substrate; and
- removing said tool from said post mount.

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