BIO-ACCESS MAT

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ABSTRACT

Disclosed are stable bases comprising: a plurality of members, a plurality of poles, and a plurality of dowels, where the combination provides a stable, biodegradable mat. Also disclosed are methods of constructing the above device with biodegradable materials.
Figure 4
BIO-ACCESS MAT

FIELD OF THE INVENTION

[0001] The present invention is in the field of ground surfaces, and specifically in the field of devices that provide a moveable stable base, comprised of biodegradable materials.

BACKGROUND OF THE DISCLOSURE

[0002] When using heavy equipment in locations with snow or soft ground, a stable base, or access mat, is needed to prevent the equipment and persons from sinking into the snow or soft ground. Normally, these mats must be removed from the site after use to reduce the environmental impact, greatly increasing costs. Thus, new mats are needed that are less costly and have negligible environmental impact.

SUMMARY OF THE INVENTION

[0003] Disclosed are stable bases comprising: a plurality of members, a plurality of poles, and a plurality of dowels, where the combination provides a stable, biodegradable mat. Also disclosed are methods of constructing the above device with biodegradable materials.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] FIG. 1 is a schematic drawing of an embodiment of the completed assembly of the disclosed bio-access mat.

[0005] FIG. 2 is a cut away view showing the internal components of an embodiment of the mat assembly.

[0006] FIG. 3 is a schematic drawing showing the features of an embodiment of an end member.

[0007] FIG. 4 is a schematic drawing showing the features of an embodiment of a middle member.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0008] Disclosed herein are devices and methods for the creation of a stable platform, better known as an access mat. The construction of the mat takes advantage of biodegradable materials. The mats disclosed herein can be left in place after their use, or the mats can be broken up, burned, or mulched into the soil in the event of site reclamation.

[0009] FIG. 1-4 show schematic drawings of one embodiment of the devices disclosed herein. The devices and the methods are described with reference to FIG. 1-4, but those of skill in the art recognize that variation, including those described herein, are still within the scope of the present disclosure.

[0010] Referring to FIG. 1, disclosed herein is a platform 100. The device 100 is composed of a number of end members 102 and middle members 104.

[0011] Each end member 102 and middle member 104 is an elongated piece made from a biodegradable material, as discussed below. In some embodiments, the middle member is a rectangular cube having a length that is several times greater than the width or the height. In some embodiments, the end members 102 and middle members 104 comprise regular or irregular geometric shapes. By way of example only, the shapes can include: rectangular, square, circular, triangular, trapezoidal, hexagonal, octagonal, or other polygonal shapes. In some embodiments, the shape of the end members 102 and middle members 104 for a particular unit 100 is similar.

[0012] The illustrated embodiment uses two end members 102 and twelve middle members 104. However, it is apparent to the skilled artisan that other embodiments having additional end members 102 and/or additional middle members 104 are consistent with the present disclosure and are fully contemplated herein.

[0013] In some embodiments, a number of poles 106 run through the end members 102 and middle members 104. The poles 106 hold the members 102 and 104 in place and do not allow the members to move relative to each other.

[0014] In some embodiments, a number of dowels 108 are inserted into each pole 106. In some embodiments, two dowels 108 per pole 106 are provided, where one dowel 108 is inserted near the each end of each pole 106. The dowels 108 prevent the members 102 and 104 from slipping out of the pole 106 or from becoming loose, so that extra space is created between the middle members 104.

[0015] Referring to FIG. 2, each pole 106 runs through the end members 104 and middle members 102. In this embodiment, each pole 106 extends from one end member 102 through each middle member 104 to another end member 102. This embodiment uses one dowel 108 to secure each end of each pole 106 to each end member 102.

[0016] Referring to FIG. 3, the end member 102 features a number of openings 302 and alternate openings 304. This embodiment features seven openings 302 which are intersected by seven alternate openings 304. In this embodiment, each opening 302 receives a pole 106, and each alternate opening 304 receives a dowel 108.

[0017] In some embodiments, there is no difference in structure between an end member 102 and a middle member 104. In these embodiments, all the members are the same, each one having all the requisite number of openings 302 and 304. Any member that is a the edge of the unit 100 is considered an end member 102 and any member that is not at the edge is considered a middle member 104.

[0018] Referring to FIG. 4, the middle member features a number of openings 402. This embodiment features seven openings 402. In this embodiment, each opening 402 allows passage of a pole 106.

[0019] With respect to the devices disclosed herein, “top” and “top surface” refer to the surface of the access mat that comes into contact with the persons or equipment being moved over the mat. “Bottom” and “bottom surface” refer to the surface of the access mat that comes into contact with the ground over which the mat is placed.

[0020] In some embodiments, the top surface comprises a texture suitable for pedestrian or equipment traffic. That is, the top surface provides a proper traction for equipment, such as automobiles or other wheeled vehicles, or pedestrians to move over the access mat without slipping. In some embodiments, the bottom surface comprises a texture suitable to grip the ground. That is, the bottom surface provides proper traction so that the access mat does not slip on the ground and provides a stable surface. In other embodiments, the top and bottom surfaces may feature the same texture to allow the unit to be used in either orientation.

[0021] In some embodiments, the elements of the assembly 100 may be entirely, or in combination, composed of biodegradable materials. By way of example only, the elements may be composed of wood or biodegradable polymers or plastics. Examples of biodegradable plastics include, but are not limited to, those having aliphatic polyesters, whose ester bonds are hydrolyzable and are amenable to microbial attack.
Some examples include, but are not limited to, polyhydroxyalkanoates (PHAs), such as the poly-3-hydroxybutyrate (PHB), polyhydroxyvalerate (PHV) and polyhydroxyhexanoate (PHH). Other examples include, but are not limited to, polyactic acid (PLA), polybutylene succinate (PBS), polycaprolactone (PCL), polyvinyl alcohol, starch derivatives, cellulose esters, such as cellulose acetate, nitrocellulose and their derivatives (celluloid).

In some embodiments, the pole 106 may extend along a different direction than the disclosed embodiment. In some embodiments, the number of dowels 108 may differ from the number of poles 106. By way of example only, a single dowel may extend through more than one pole 106. For example, the dowel 108 may extend horizontally, or in the direction of the length of middle members 104, thereby running through a plurality of poles 106.

In other embodiments, the dowels 108 may be omitted. By way of example only, the end of each pole may be capped or secured by another means.

In some embodiments, multiple units 100 may be placed adjacent to create a larger area or a pathway.

In some embodiments, the multiple units 100 will not feature a connecting mechanism. In other embodiments, a separate connecting mechanism will bind the units 100. By way of example only, a connecting mechanism could span from the opening 302 or alternate opening 304 of the end member of one unit 100 to the opening 302 or alternate opening 304 of another unit 100.

In some embodiments, the poles 106 are of variable length. In some of these embodiments, the poles 106 are telescopic, such that their length can be increased or decreased depending on the use. In other embodiments, two or more poles 106 can be attached to each other end-to-end to increase the length of the resulting pole 106. In some of these embodiments, the two poles 106 that connect to each other are of the same length whereas in other embodiments, the two poles 106 are of different length. By increasing or decreasing the length of the poles 106, the user can increase or decrease, respectively, the width of the unit 100 that is used for a particular application.

In some embodiments, two or more units 100 can be shaped so as to interlock with one another.

In some embodiments, the unit 100 comprises a regular or irregular geometric shape. By way of example only, the shapes can include: rectangular, square, circular, triangular, trapezoidal, hexagonal, octagonal, or other polygonal shapes.

In some embodiments, the openings 302 and alternate openings 304 are of the same size to allow the end member 102 to change orientation.

In some embodiments, the end member 102 can replace the middle member 104. By way of example only, the number of members 102 used can change the size or shape of the unit 100.

As those of ordinary skill in the art appreciate, the presently disclosed devices and methods provide an access mat to be placed on the ground. Further, the materials of the access mat are biodegradable, allowing greater sensitivity to the environmental impact and disturbance to the natural surroundings.

what is claimed is:
1. An access mat comprising:
   a plurality of middle members, each middle member comprising a plurality of openings;
   two end members, each end member comprising a plurality of openings; and
   a plurality of poles, wherein each pole traversing the plurality of middle members and the plurality of end members through one set of aligned plurality of openings.
2. The access mat of claim 1, further comprising a plurality of dowels, each dowel inserted into an end of each of the plurality of poles, thereby preventing the pole from sliding out of the plurality of openings.
3. The access mat of claim 1, having a top surface and a bottom surface.
4. The access mat of claim 3, wherein the top surface comprises a texture configured for pedestrian or equipment traffic.
5. The access mat of claim 3, wherein the bottom surface comprises a texture suitable to grip the ground.
6. The access mat of claim 1, wherein the access mat is composed of biodegradable material.
7. The access mat of claim 6, wherein the biodegradable material is selected from the group consisting of wood, biodegradable polymers, and biodegradable plastics.
8. The access mat of claim 6, wherein the biodegradable material is selected from the group consisting of a polyhydroxyalkanoate (PHA), poly-3-hydroxybutyrate (PHB), polyhydroxyvalerate (PHV) polyhydroxyhexanoate (PHH), polylactic acid (PLA), polybutylene succinate (PBS), polycaprolactone (PCL), a polyanhydride, polyvinyl alcohol, a starch derivative, a cellulose ester, cellulose acetate, nitrocellulose, and celluloid.
9. A method of providing a stable access mat, the method comprising:
   providing a plurality of middle members, each middle member comprising a plurality of openings;
   providing two end members, each end member comprising a plurality of openings;
   providing a plurality of poles, inserting each pole through one set of aligned plurality of openings of the plurality of middle members and the plurality of end members.
10. The method of claim 9, further comprising inserting a dowel into an opening at an end of each pole.
11. The method of claim 9, wherein the access mat is composed of biodegradable material.
12. The method of claim 11, wherein the biodegradable material is selected from the group consisting of wood, biodegradable polymers, and biodegradable plastics.
13. The method of claim 11, wherein the biodegradable material is selected from the group consisting of a polyhydroxyalkanoate (PHA), poly-3-hydroxybutyrate (PHB), polyhydroxyvalerate (PHV), polyhydroxyhexanoate (PHH), polylactic acid (PLA), polybutylene succinate (PBS), polycaprolactone (PCL), a polyanhydride, polyvinyl alcohol, a starch derivative, a cellulose ester, cellulose acetate, nitrocellulose, and celluloid.