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ANCHORED SYNTHETIC TURF

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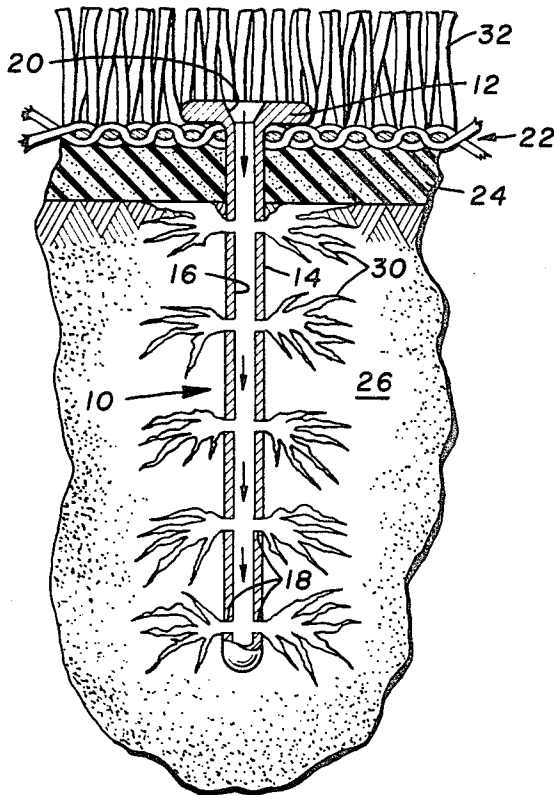


FIG. 1.

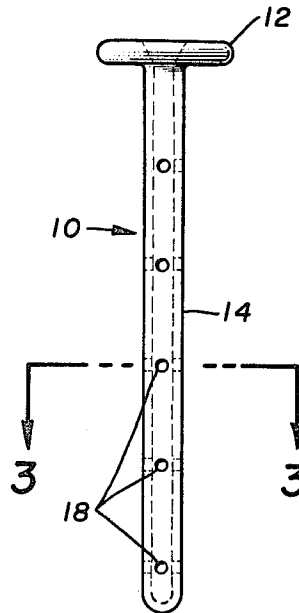


FIG. 2.

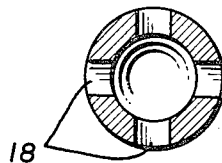


FIG. 3.

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ANCHORED SYNTHETIC TURF

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ABSTRACT OF THE DISCLOSURE

A fastening device for anchoring a synthetic turf to a base wherein the synthetic turf is positioned, wrinkle-free, on a base and tubular members having an enlarged head at one end and closed at the other end are inserted thru prepunched holes in the turf and driven into the base. A solidifiable synthetic resin in liquid state, is injected into the tubular members and forced thru spaced apertures in the walls of the tubular members into crevices in the base. The enlarged heads overlying the turf and fingers of solidified resin penetrating the crevices in the base firmly anchor the turf to the base.

The present invention relates to a method for anchoring synthetic turf to the underlying earth and a device which may be employed to secure the synthetic turf in place.

Recently the installation of synthetic turf on athletic fields and recreational areas as a substitute for natural grass has become prominent. There are numerous new problems involved with these installations. The large localized forces imparted to the turf by the players of such sports as football, baseball, tennis, and volleyball requires that the turf be firmly anchored to the underlying surface which is generally the earth. If the turf is not anchored securely to the underlying base, wrinkling or bunching will occur which is obviously objectionable in recreational surfaces for sports events because of the distorted rebound that will be imparted to a playing ball when it strikes an uneven surface. Attempts to overcome these problems have proved to be difficult. A problem encountered by conventional anchoring practices is that the anchoring means work loose when subjected to large localized forces and the devices become dangerous projections.

It is therefore an object of the present invention to provide a method for securing a synthetic turf to a dirt base in a manner similar to the way natural grass roots provide anchorage. Another object is to provide a method for anchoring a synthetic turf to a dirt base so that large localized forces do not stretch or move the turf. Another object is to provide an anchoring device which facilitates the extrusion of a liquid material into sub-layers of soil where solidification thereof occurs to simulate natural grass roots which retain the anchoring device in place. A further object of the invention is to provide means for anchoring synthetic turf to a dirt base which will not be forced loose and become a dangerous projection. Other objects and advantages of the present invention will become apparent from the following description and accompanying drawings.

In a preferred embodiment contemplated by the present invention, the anchoring device is comprised of an elongate, tubular member having a plurality of selectively spaced apertures in the body portion of said member to facilitate the extrusion of a liquid material and being provided with a head portion at one end thereof which is countersunk to accommodate the injection nozzle of a hydraulic pressure unit that may be employed to dispense a liquid material into the bore of said tubular member.

The process of this invention is carried out by covering the desired area of dirt base with synthetic turf, removing

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all of the wrinkles from the turf, punching holes through the turf at selected intervals with a sharp instrument, inserting into each hole a tubular member having apertures in the side walls thereof and a retainer head at one end to halt penetration of the member into the base, pressing the retainer head against turf to force the backing thereof firmly against the base, and injecting a liquid material into the tubular member under sufficient pressure to cause extrusion thereof through the apertures and penetration into the surrounding dirt base where solidification of said material occurs to form root-like structures in situ that as that capable of permanently anchoring the turf.

A better understanding of the invention may be had with reference to the accompanying drawing, in which:

FIGURE 1 is a vertical cross-sectional view which represents a portion of synthetic grass anchored in the ground to illustrate the present invention;

FIGURE 2 is a pictorial view of the anchoring device in an embodiment preferred for this invention; and

FIGURE 3 is a cross-sectional view of the anchoring device of FIGURE 2 taken at lines 3—3 to illustrate the bore and apertures that communicate therewith.

With reference to the drawing there is shown in FIGURES 1 and 2 an anchoring device 10 which is comprised of a head portion 12 and an elongate body 14. The body portion 14 is provided with a centrally disposed bore 16 and a plurality of apertures 18 in the walls thereof which communicate with the bore 16. The head portion 12 is provided with a countersink 20 to accommodate a fluid pressure dispensing unit (not shown) for communication with bore 16. Preferably, the head portion 12 is substantially flat and has a diameter substantial greater than the body portion 14 to provide a large retaining surface that will guard against the head being pulled through the turf.

The anchoring device of this invention has application primarily as means for anchoring synthetic turf to a dirt base as shown in FIGURE 1. Prior to the installation of synthetic grass or turf for sports events and recreational surfaces, the soil is usually conditioned by using materials such as cinders or sawdust to produce a porous base which is somewhat spongy. This sponginess of the preconditioned base and the resilience of the synthetic turf produce rebound properties which closely simulate natural turf. The porous structure of the preconditioned soil provides a series of small channels which are advantageous as will be explained later herein.

As shown in FIGURE 1, an area of synthetic turf 22 having a resilient backing 24 is spread upon an area of preconditioned soil or ground 26. The anchoring device 10 penetrates the turf 22 and soil 26 to a depth sufficient to bring the backing 24 against the surface of the soil 26. The root-like formations of plastic material 30 (which were injected in liquid form) hold the anchoring device 10 permanently in place and thereby anchor the turf 22 firmly against the dirt base 26. In addition to anchoring the device 10 into the soil 26, the liquid plastic flowing through the apertures nearest the turf backing 24 flows against said backing the solidifies to prevent movement of the device 10 with respect to the turf and thus obviates a potential dangerous projection which occurs with conventional anchoring devices that work loose from the turf.

Installation of synthetic grass as illustrated in FIGURE 1 is accomplished by preconditioning the soil with materials such as cinders or the like mixed with topsoil to provide a porous base which facilitates drainage and has a slight amount of resilience to simulate that of natural turf. The synthetic grass or turf 22 is spread upon the dirt base 26 with care being taken to remove all wrinkles from the face thereof. The turf 22 is then perforated with a sharp instrument (not shown) to provide access for the

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anchoring device **10** which is inserted through the perforation in the turf and pushed into the soil **26** until the head portion **12** forces the backing firmly against said soil. Then the outlet nozzle of a conventional fluid pressure unit (not shown), or a dispensing means capable of developing sufficient pressure, is placed against the countersink **20** and a flowable material capable of hardening is dispensed into the enclosed bore **16** from which large amounts of the material is forced through the several apertures **18** causing the material to penetrate into the porous structure of the preconditioned soil **26** to form artificial roots **30** upon solidification of the material. The number of anchoring devices necessary to secure a particular area of synthetic turf depends upon the activity planned for the covered surface and the number of "roots" extruded from each anchoring device. By roots is meant a globular mass of relatively pliable material which supports a multiplicity of fiber-like formations caused by the penetration of the flowable material into the surrounding soil.

The present invention provides a cheap and simple method for permanently anchoring synthetic turf or grass to a dirt base. The anchoring device **10** may be constructed from any material which has sufficient strength and will not deteriorate. While the device does not have to be limited to any particular size or shape, the head portion **12** should be relatively small so that it will not be too obvious through the ribbons **32**. Therefore, the body portion **14** must be very slender to insure that a large retaining area under the head portion is available to prevent the head from pulling through the perforation in the turf **22**. The flowable material used to form the roots may be any material that is capable of penetrating the preconditioned soil **26** and thereafter solidifying to form artificial roots. The relatively pliable plastics are preferred, and particularly the polyesters.

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It is to be understood that the embodiments of the invention shown and described herein are merely preferred forms thereof which have been disclosed for purposes of illustration and that other shapes, sizes and forms may be resorted to without departing from the teachings herein and the scope of the appended claims.

What is claimed is:

1. A device for anchoring a synthetic turf to a base, comprising;

- (a) an elongated tubular member extending through the synthetic turf into the base, said tubular member having a flat head positioned above the turf to hold said turf against the base, said tubular member having therein a plurality of spaced apertures,
- (b) and a solidified plastic material filling the tubular member and extending through the apertures therein outwardly in a random pattern into crevices in the base.

2. The device of claim 1 wherein the lower end of the tubular member is closed and the solidified plastic material extending therefrom is in the form of fingers penetrating the base.

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