

# United States Patent [19]

Greene

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[54] ARTIFICIAL SKI SLOPE

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[73] Assignee: Snow Products, Inc., Atlanta, Ga.

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161/21, 67, 162, 164, 168

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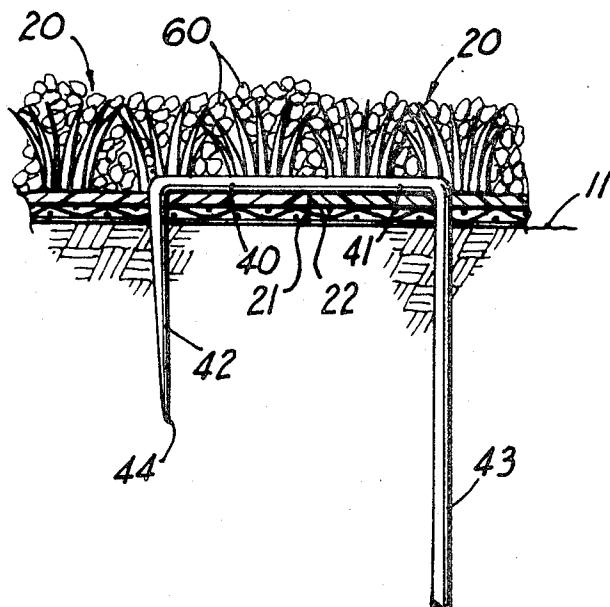
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## ABSTRACT

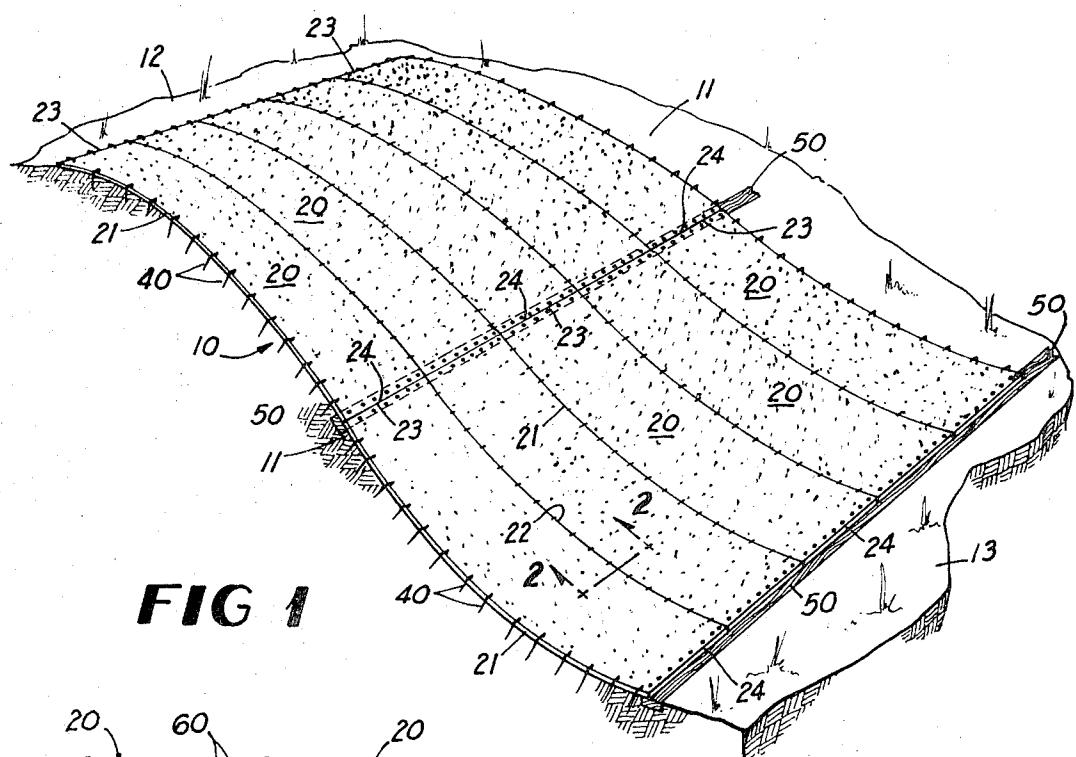
An artificial ski slope made of plastic artificial grass in which is retained granular plastic material.

10 Claims, 4 Drawing Figures

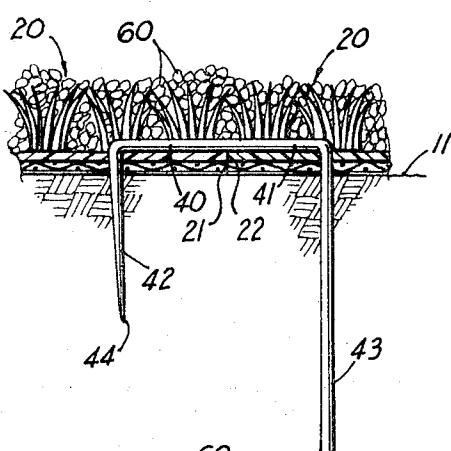


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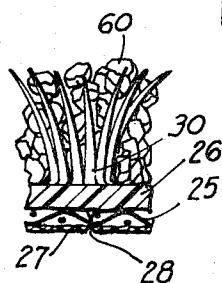
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**FIG. 1**



**FIG 2**



**FIG 3**

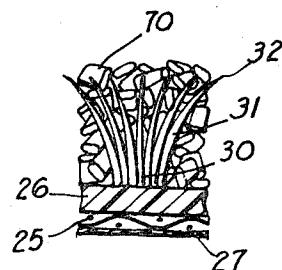


FIG 4

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## ARTIFICIAL SKI SLOPE

## BRIEF SUMMARY OF THE INVENTION

This invention relates to an artificial ski slope and is more particularly concerned with a ski slope formed of artificial grass having granules of plastic material retained by the grass.

In the past numerous artificial ski slopes have been devised. Certain of these have rollers which permit the skis to move along the upper periphery of the rollers, others have provided hard bristles which support the ski as it moves thereover. Still others have distributed layers of prescribed plastic granules impregnated with lubricant. All of these ski slopes have inherent disadvantages.

The roller type of ski slope, for example, provides a very hard and unnatural surface for the skier and does not permit the maneuvering of the skis as on a natural ski slope. The bristle type slope, while providing some improvement over the roller type slope still provides an unnatural surface which, while permitting maneuvering of the skis, does not provide a simulated natural slope and is expensive both from an upkeep standpoint and from an initial investment standpoint.

The natural grass and coated plastic type ski slope, such as is typified by U.S. Pat. No. 3,400,643, has numerous disadvantages including requiring approximately 3 inches of artificial flakes which soon become mixed with the dirt and dust from the ground. The natural cleavage of the plastic material on the grass and on the ground tends to pull the grass out and move the entire mass downhill.

Briefly described, the present invention, which overcomes the difficulties described above, includes a denuded ground surface on an incline, over which is disposed a plurality of longitudinal strips of artificial turf or grass. The lengths of plastic which form the blades of the tufts of the artificial grass, extend up from the base sheet of the grass, and are quite flexible being approximately one inch long so as to retain therein, the soft plastic granules or aggregates to a depth of approximately one inch. Spaced stakes, driven into the ground, retain the strips of artificial turf in place while transversely extending struts, which are imbedded in the ground, receive fastening means and serve to join the tandem strips together.

By such an arrangement, an artificial ski slope is provided which simulates, quite closely, the ground conditions and appearance of a natural ski slope with natural snow thereon. The base sheet of artificial turf being impervious obviates any problem of grass growing up through the plastic material while, at the same time, preventing the dust and dirt of the denuded ground, from accumulating and mixing with the artificial snow i.e., the granules of plastic.

The upstanding lengths of plastic material in the artificial turf, serve as a natural cleavage for the granules of plastic material and thus prevent the mass movement of these granules downhill. The tufts, themselves, are quite securely anchored to the base and hence there is little chance of the tufts being removed from the base. The upper surface formed by the combination of the tufts and the granules of plastic, serve to enhance the speed and control of the skier on the slope. In use, a slope constructed in accordance with the present invention costs very little to maintain, requires little or no

cleaning, presents a uniform appearance, and permits more control while skiing.

Accordingly, it is an object of the present invention to provide an artificial ski slope which is inexpensive to produce and maintain, is durable in structure, and efficient in operation.

Another object of the present invention is to provide an artificial ski slope which will permit a skier using the slope, optimum speed and maneuverability.

Another object of the present invention is to provide a ski slope which, in use, need not be cleaned to any great extent and is made of material so anchored to the ground that there is little mass movement of the material downhill, when the slope is in use.

Another object of the present invention is to provide an artificial ski slope which does not require the growing of natural grass on the slope.

Other objects, features and advantages of the present invention will become apparent from the following description when taken in conjunction with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views and wherein:

## BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a prospective vertical sectional view of a ski slope constructed in accordance with the present invention;

FIG. 2 is an enlarged vertical sectional view taken substantially along line 2-2 in FIG. 1;

FIG. 3 is an enlarged fragmentary vertical sectional view of a portion of the slope illustrated in FIG. 1 and utilizing one form of granular plastic material; and

FIG. 4 is a view similar to FIG. 3 but illustrating still another form of granular plastic material used as the artificial snow.

## DETAILED DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENTS

Referring now in detail to the embodiments chosen for the purpose of illustrating the present invention, numeral 10 denotes generally the ground on which the ski slope of the present invention is disposed. This ground is denuded of all growing foliage including natural grass so as to provide an inclined sloping surface 11 to receive the remainder of the artificial ski slope. Conventional defoliants and other poisons can be utilized in producing the denuded surface 11. The surface 11 is an incline at about the same angle as a conventional natural ski slope, starting at a relatively level upper area 12 and progressing to the lower ground area 13.

The artificial portion of the slope is formed by a plurality of juxtaposed and tandem arranged artificial grass or turf areas 20. A suitable artificial turf is known as "CH-1 Astro-Turf". In more detail, each turf area 20 is a narrow longitudinal strip having a pair of opposed parallel sides 21 and 22 as well as upper and lower parallel ends 23 and 24, defining a rectangular square which is approximately 3 feet wide and 100 feet long.

The area 20, itself, includes a laminated base which has a central wire gauze sheet or layer 25, seen best in FIGS. 3 and 4. This wire gauze sheet 25 is formed of warp and filling wire strands spaced apart approximately one-eighth inch. If desired, the strands can be of

nylon or fiberglass in place of the wire. Other reinforcing such as fiberglass fabric could be substituted for the gauze sheet 25, if desired. The upper plastic base sheet or layer 26 is disposed over the wire gauze sheet 25 and is a unitary flexible impervious layer in which the wire gauze is, at places imbedded. An unwoven fabric scrim bottom sheet 27 is adhered through the openings of the gauze 25 to the plastic base sheet 26 along spaced parallel longitudinal score lines or areas, indicated by numeral 28 in FIG. 3.

Disposed in transverse and longitudinal row alignment and spaced approximately three-eighths inch from each other are the tufts of artificial grass, denoted generally by numeral 30. Each turf has a plurality, such as eight, upstanding blades or lengths of plastic 31 which terminate in rounded ends 32. Each length 31 simulates a natural blade of grass and is a thin flat narrow flexible smooth surfaced member, approximately 1 inch long. The proximal end of each blade 31 is clustered to have a common origin with the other blades 31 of that tuft 30. Each tuft 30 is integrally joined to the base sheet 26.

The blades 31 are sufficiently long and close together, extending in random fashion, so as to conceal and protect the base sheet 26 and give an appearance of natural grass.

In assembling the areas 20 together, to form a slope over the surface 11, a side 21 is disposed in abutting adjacent juxtaposition with respect to a side 22 of a next sidewise adjacent area 20. In like manner, an end 24 of an area 20 is disposed in tandem abutting relationship to an end 23 of a next subsequent area 20 in an longitudinal line. Thus the areas 20 are formed in longitudinal and transverse rows.

For joining the abutting sides or side edges 21 and 22 together, a plurality of spaced U-shaped stakes 40 project through the selvages of the areas 20. A typical U-shaped stake 40 is formed of cylindrical metal bent at spaced locations to provide a central shank 41 from which a pair of parallel legs 42 and 43 extend, in the same direction. The arm 43 is longer than the arm 42 and both are pointed to provide a sharpened end, such as end 44 seen in FIG. 2. The shank 41 is received between the tufts 30 of the edge portions of two sidewise adjacent areas 20 and hence extends transversely over the abutting edges 21 and 22, while leg 42 passes through one area 20 and leg 43 passes through another area 20. The diameter of stake 40 is sufficiently small that the shank 41, which extends across the upper surface of the base sheet 26, is imbedded well below the ends 32 of the blades 31 and hence, there is no appreciable danger of a ski being engaged by the stake 40.

The stakes 40 are disposed in spaced longitudinal relationship so as to stitch the edges 21 and 22 together, as illustrated in FIG. 1. In like manner, the stakes 40 are employed at spaced intervals along the length of the outer edges 21 and 22 of the outer most areas 20.

Disposed beneath the abutting ends 23 and 24 of the tandem arranged areas 20 are transversely extending wooden struts 50 which are imbedded in the ground 10 so that the upper surface of the struts 50 are approximately parallel to the surface 11. The struts 50 extend transversely beneath the entire width of the ski slope

areas 20 and conventional fastening means, such as nails, staples, or the like, denoted by numeral 51, are employed for securing the end portions of each area 20 to a strut 50. Hence, the intermediate struts 50 receive two abutting ends 23 and 24 over the exposed surface of the struts, these ends being secured in place so as to provide a continuous length of longitudinally extending turf.

Preferably, the upper ends 23 of the upper areas 20, forming the beginning of the ski slope, are secured by the stakes 40, as illustrated in FIG. 1, while the bottom portion of the slope, that is the lower most edges 24 are secured on a common strut 50, as illustrated in FIG. 1. Fastening means, such as staples 52 are employed for securing the ends 24 against the upper surface of the imbedded strut 50.

It is now seen that I have provided an inclined area consisting of upstanding juxtaposed flexible blades 31, each of which is approximately 1 inch long. Between these blades 31 and on top of sheet 26 are disposed granules of plastic material aggregates to a depth of from about three-fourths inch to about 1 1/2 inches. The granules may be irregularly shaped, such as granules 60, seen in FIG. 3 or cylindrical granules, such as granules 70 seen in FIG. 4. In some cases, the granules 60 or 70 may be spherical. It is important, according to the present invention that the granules 60 or 70 be distributed evenly throughout the areas 20 and imbedded between the blades 31 to approximately at least and preferably 1 inch in depth so as to provide a cushioning effect and permit the sliding of the skis over the turf. The major dimension or size of the plastic granules 60 or 70 should be between one-sixteenth inch and three-sixteenth inch and have a specific gravity of approximately 0.75. The granules 60 or 70 are composed of polyester, polypropylene, polyethylene, nylon 6 or nylon 66. Each of these plastics is sufficiently slick along its surface to permit the easy sliding of the skis 40 granules 60 or 70 with respect to each other and of the ski passing over the granules 60 or 70.

The artificial turf areas 20, i.e., the base sheet 26 and the blades or length 31 are formed of integral polypropylene, although other plastics could be substituted. The length of each blade 31 should be from approximately 1 inch to approximately 1 1/2 inches. If the blade is of a length less than approximately three-fourths inch, the granules have a tendency to move down hill, passing over these blades as the slope is repeatedly used. If the blades 31 are much over 1 1/2 inches in length, there is a tendency of the ski to become imbedded in the blades 31 and an accompanying lack of maneuverability, as a result thereof. Also, it necessitates the distribution of additional granules 60 or 70 to such a height that these granules tend to move down hill. Therefore, there is a critical length from approximately three-fourths inch to approximately 1 1/2 inches for the blade 31 to provide a ski slope of maximum efficiency.

In use, the ski slope is used as a conventional natural slope covered with snow would be used. The blades 31 which are seen by the skier give the appearance of natural grass while the granules of plastic materials 60 or 70 give the appearance of snow to the skier. Hence, the skier feels quite at home on this artificial ski slope, just as if he were skiing on natural grass containing snow.

I claim:

1. An artificial ski slope comprising a flat flexible base sheet, means for securing said base sheet to the ground, a plurality of upstanding lengths of plastic material secured at their proximal ends to said sheet and having smooth surfaces, said lengths of plastic material being arranged in spaced clusters with the lengths of material in each cluster being substantially in contact with each other at their proximal ends and spreading outwardly toward their distal ends to such an extent that they substantially cover the spaces between the bases of the spaced clusters and form a continuous cover for the base sheet and a plurality of plastic aggregates of dimensions less than the length of said lengths of plastic material received on said sheet, some of said aggregates resting on said sheet and others resting on the outwardly spreading lengths of plastic material, the depth of said aggregates being sufficient to protect the base sheet from a ski passing thereover, said lengths of plastic material being sufficiently close to each other to prevent appreciable sliding of said aggregates over said base sheet.

2. The artificial ski slope defined in claim 1 wherein said base sheet is polyethylene.

3. The artificial ski slope defined in claim 1 wherein said lengths of plastic are each approximately three-fourths inch to approximately 1½ inches long.

4. The artificial ski slope defined in claim 1 wherein said aggregates each have a major dimension between approximately one-sixteenth inch and three-sixteenths inch.

5. The artificial ski slope defined in claim 1 wherein aggregates are of plastic selected from the group consisting of: polyester, polyethylene, polypropylene, and nylon.

6. The artificial ski slope defined in claim 1 including wire gauze over said ground, said base sheet being secured over said gauze and being adhered thereto.

7. The artificial ski slope defined in claim 1 wherein said base sheet is plastic and said lengths of plastic are integrally joined thereto.

8. The artificial ski slope defined in claim 6 including unwoven fabric on the side of said wire gauze opposite said base sheet, said unwoven fabric being joined through the spaces in said gauze to said base sheet.

9. The artificial ski slope defined in claim 1 wherein said base sheet includes a plurality of rectangular areas with their edges abutting each other.

10. The artificial ski slope defined in claim 9 wherein said fastening means includes U-shaped stakes passing simultaneously through the abutting edges of said areas.

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