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SYNTHETIC SKI SLOPE

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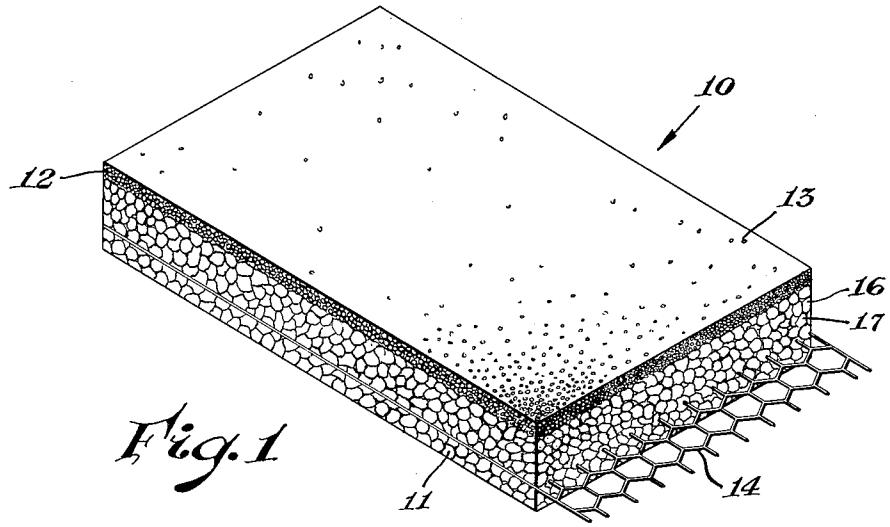

Fig. 1

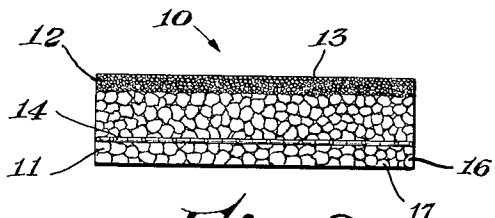

Fig. 2

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SYNTHETIC SKI SLOPE

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This invention relates to a new synthetic sheet adaptable to provide the surface for a ski or toboggan slope and a ski or toboggan slope prepared therefrom. More particularly, the present invention relates to a ski or toboggan slope surface, a top coat of hard generally spherical particles bonded together.

Ski or toboggan enthusiasts who wish to pursue their sport throughout the year usually must travel many miles to find suitable locations, oftentimes at great personal inconvenience and expense, where natural snow exists. In order to provide skiing enjoyment on a year-round basis, attempts have been made to provide synthetic ski slopes. Such expedients as employing brushes oriented with their bristles facing substantially vertically upward have been resorted to. In addition, attempts have been made to use both natural and synthetic thatching to provide a suitable slope surface. Such slopes have not become popular or in general utilization. This, possibly is because of their high cost and their excessive lack of similarity to natural ski-packed snow.

It would be advantageous if a synthetic sheet or surface material were available which would be satisfactory for all-season skiing.

It would also be advantageous if such a surface could be readily fabricated from materials easily transported to a construction site.

It would be additionally advantageous if such a surface were long-wearing and would give a generally similar reaction and sensation to the skier as that obtained from natural ski-packed snow.

It would be further advantageous if such a surface could be employed to replace or underlay snow at points of severe wear and melting, such as hill crowns and the like in conventional ski runs or slopes.

These advantages and other benefits may be obtained by constructing a ski slope having a surface comprising a base layer having a skiing surface layer superimposed thereover, said surface layer being of a thickness of at least about ⅛ inch presenting an upwardly facing surface of generally spherical smooth-surfaced particles having a diameter of from about 0.01 inch to about 0.375 inch, or even up to 2 inches in diameter if the slope is to be employed exclusively for toboggan use; said spherical particles being bonded to each other and to said base layer by an adhesive therefor.

Further advantages of the invention will be manifest in the following specification and description taken in connection with the accompanying drawing, wherein:

FIGURE 1 illustrates a ski slope surface constructed in accordance with the invention; and

FIGURE 2 shows a cross-section of the ski slope surface of FIGURE 1.

Delineated in FIGURE 1 is a section of ski slope surface designated by the general reference numeral 10. It is composed of a base layer of expanded flexible plastic sheet 11 having contained therein a wire reinforcement or netting 14 of the type that is frequently known as "chicken wire." Covering the upper surface of the layer 11 is a skiing surface layer of generally spherical smooth surfaced particles 13, such as granular synthetic resin beads bonded with a synthetic resin latex.

FIGURE 2 depicts a cross-sectional view of the ski slope surface shown in FIGURE 1. The layer 11 is composed of cell walls 16 encompassing a plurality of cells 17. The wire reinforcement 14 is illustrated passing through the lower portion of the layer 11. The upper layer 12, having ski contacting surface 13, is composed of a layer of granular bead-like synthetic resin particles bonded together with a synthetic resin latex, such as a styrene butadiene copolymer containing about 60 weight percent of polymerized styrene and about 40 weight percent of polymerized butadiene copolymerized in the copolymer molecule.

Many materials are suitable to be employed in the practice of the invention. These include expanded polystyrene, expanded polyethylene, expanded polypropylene, expanded vinyl chloride resins, expanded polyurethane resins, plywood, wood planking, metal plate or sheet, concrete, or other flat surface to which the topcoat will adhere and have a compressive strength of at least 4 pounds per square inch.

Advantageously, for constructional convenience and resiliency, the lower layer 11 may be prepared from foamed expanded thermoplastic resinous plank or sheet stock fabricated with or without wire or other included reinforcing. Alternately, it may be prepared by foaming a granular expanded bead of the desired polymer around a reinforcing mesh, if such a mesh is desired. Beneficially, such a backing layer may be prepared by prefoaming or expanding the beads or granular resinous material, then coating the beads by spraying or other suitable techniques with an air-drying or air-hardening flexible resin coat.

The upper layer 12 of the ski slope, may be formed from generally spherical particles such as are obtained from bead or pearl polymerization of styrene or unexpanded polystyrene granules. By lightly coating such granules or particles, then forming the coated material into a layer or other desired configuration and finally subjecting them to drying conditions, a top coat with a pebbled surface having very low coefficient of friction is obtained. Other beads, such as glass, steel, synthetic, polymeric materials, and the like may be employed for the top coat.

Ski slope surfaces in accordance with the invention may be readily prepared on the site of installation by the use of pre-foamed granules or foamable wetting solutions. Or, if preferred, they can be pre-fabricated into large sections at a location remote from the intended installation, then transported to the site and assembled. Alternately the upper layer 12 may be supported directly by any sheet having a compressive strength of at least 4 pounds per square inch and to which the upper layer 12 may adhere.

Joints and scars (as from use) in a ski slope may be readily covered by application of a mixture of beads and suitable binder. A suitable slope may be installed regardless of the local topography or method of fabrication.

By way of further illustration, a skiing slope was prepared by fastening a 1-inch mesh "chicken wire" anchor layer to sheets of ½ inch "marine-grade" plywood. This anchor wire mesh was spaced about ½ inch above the plywood base. The base and anchor wire were covered with a 2-inch layer of a mixture of 40 weight percent (based on latex solids) "Dow Latex 512R" (a synthetic latex copolymer of about 60 parts by weight of polymerized styrene and 40 parts by weight of polymerized butadiene, which product is obtained from The Dow Chemical Company of Midland, Michigan) and 60 weight percent expanded (i.e., foamed) polystyrene granules having a density of about 2 pounds per cubic foot. This base coat was air dried at a temperature of approximately 75° F. for a period of 48 hours.

A ski contacting layer was prepared from a mixture of about 75 percent unfoamed polystyrene beads approxi-

mately 0.041 inch in diameter and about 25 percent by weight of "Dow Latex 512R." This mixture was applied and dried in a manner similar to the foamed granules. Thus, a layer of unfoamed beads approximately ¼ of an inch thick was formed.

A plurality of these panels was joined together to form a slope having an angle of approximately 14°. The entire assembly was allowed to dry for a further 48-hour period. Evaluation of this slope by several experienced skiers demonstrated that it was a very satisfactory and an eminently enjoyable substitute for conventional snow.

The experimental slope was also tested and found very satisfactory for use as a toboggan slide.

In a similar manner, ski slopes of any desired dimensions may be readily prepared by any of the possible methods and means disclosed herein.

Surfaces prepared in accordance with the invention have been inserted into conventional ski runs and were very satisfactory to protect these portions of the runs subject to high wear and localized melting.

Certain changes and modifications in the practice of the present invention can be readily entered into without substantially departing from its intended spirit and scope. Therefore, it is to be fully understood that the invention is not to be considered as being limited or in any way restricted to or by the preferred didactic embodiments thereof which are set forth in the foregoing description and specification. Rather, it is to be interpreted and construed liberally in the light of what is set forth and defined in the hereto appended claims.

What is claimed is:

1. A synthetic ski and like slope comprising

a base layer and having a skiing surface layer superimposed thereover, said base layer being an expanded flexible thermoplastic sheet,

said surface layer being of a thickness of at least about ⅛ inch and comprised of generally spherical smooth-surfaced particles having a diameter of from about 0.01 inch to about 0.375 inch, and an adhesive,

said adhesive securely bonding said particles to each other and to said base layer and

said generally spherical particles projecting above said adhesive to provide a skiing surface.

2. A sheet adaptable as a surface for a synthetic ski and the like slope comprising

a base layer of an expanded flexible thermoplastic resinous material,

a skiing surface layer superimposed thereover, said surface layer having a thickness of about ⅛ inch and comprising generally spherical smooth surfaced particles having a diameter of from about 0.01 inch to about 0.375 inch, and

an adhesive, said adhesive securely bonding said particles to each other and to said base layer, and

said generally spherical particles projecting above said adhesive to provide a skiing surface.

3. The sheet of claim 2, wherein the base layer contains a reinforcing wire mesh.

4. The sheet of claim 2, wherein the base layer is composed primarily of expanded polystyrene beads.

5. The sheet of claim 2, wherein said adhesive is a polystyrene-butadiene copolymer.

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