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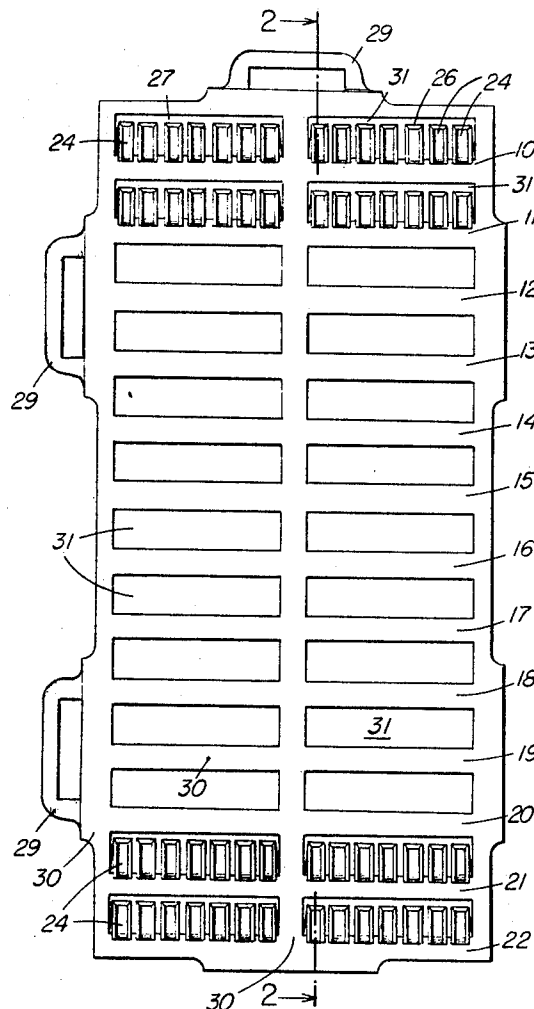
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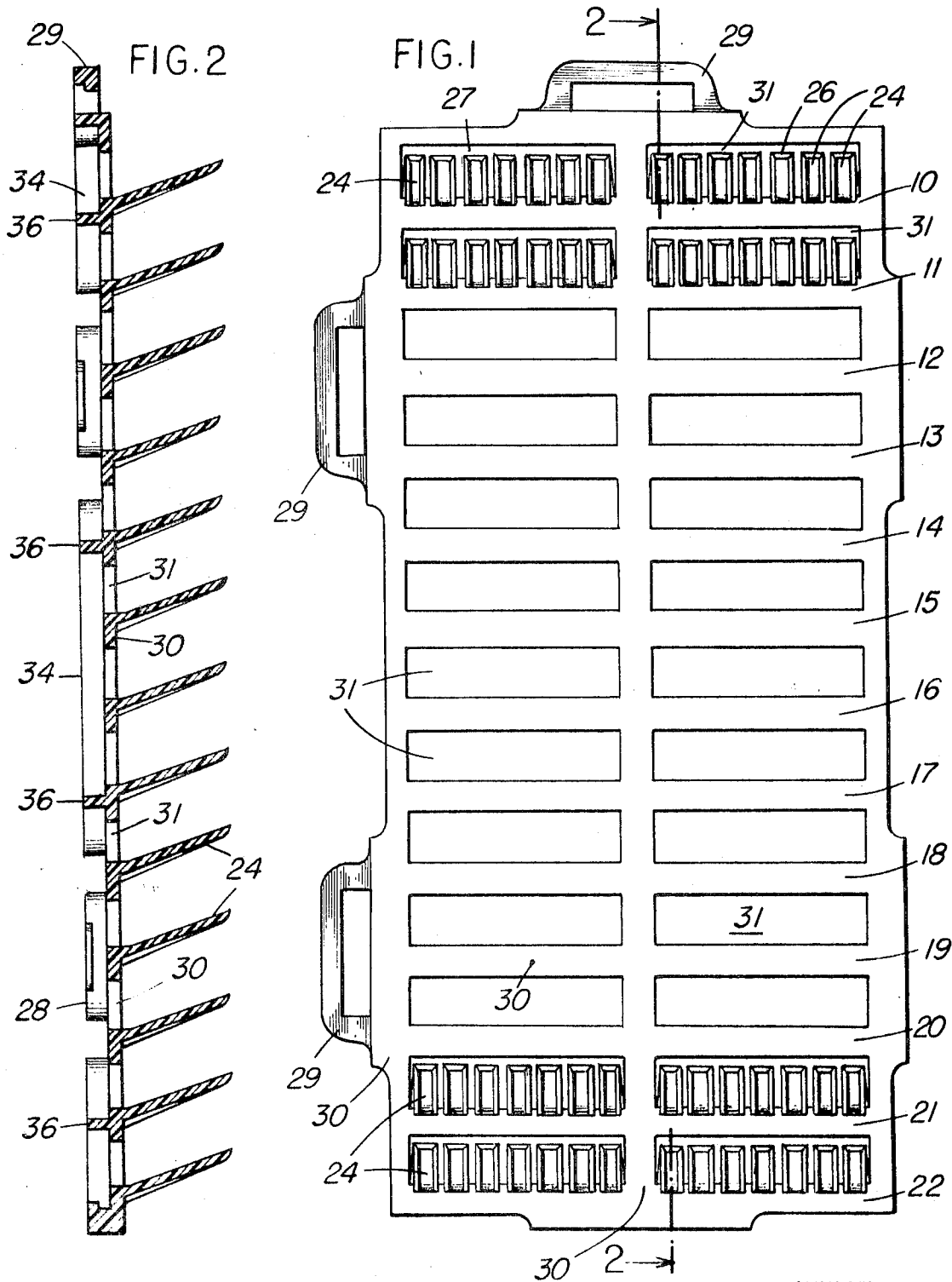
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[54] **PLASTIC SKI TRACK**
8 Claims, 6 Drawing Figs.

[52] U.S. Cl..... **94/3, 94/7,**
94/13
 [51] Int. Cl..... **E04c 1/24**
 [50] Field of Search..... **94/7, 13,**
11; 272/56.5; 273/33, 176

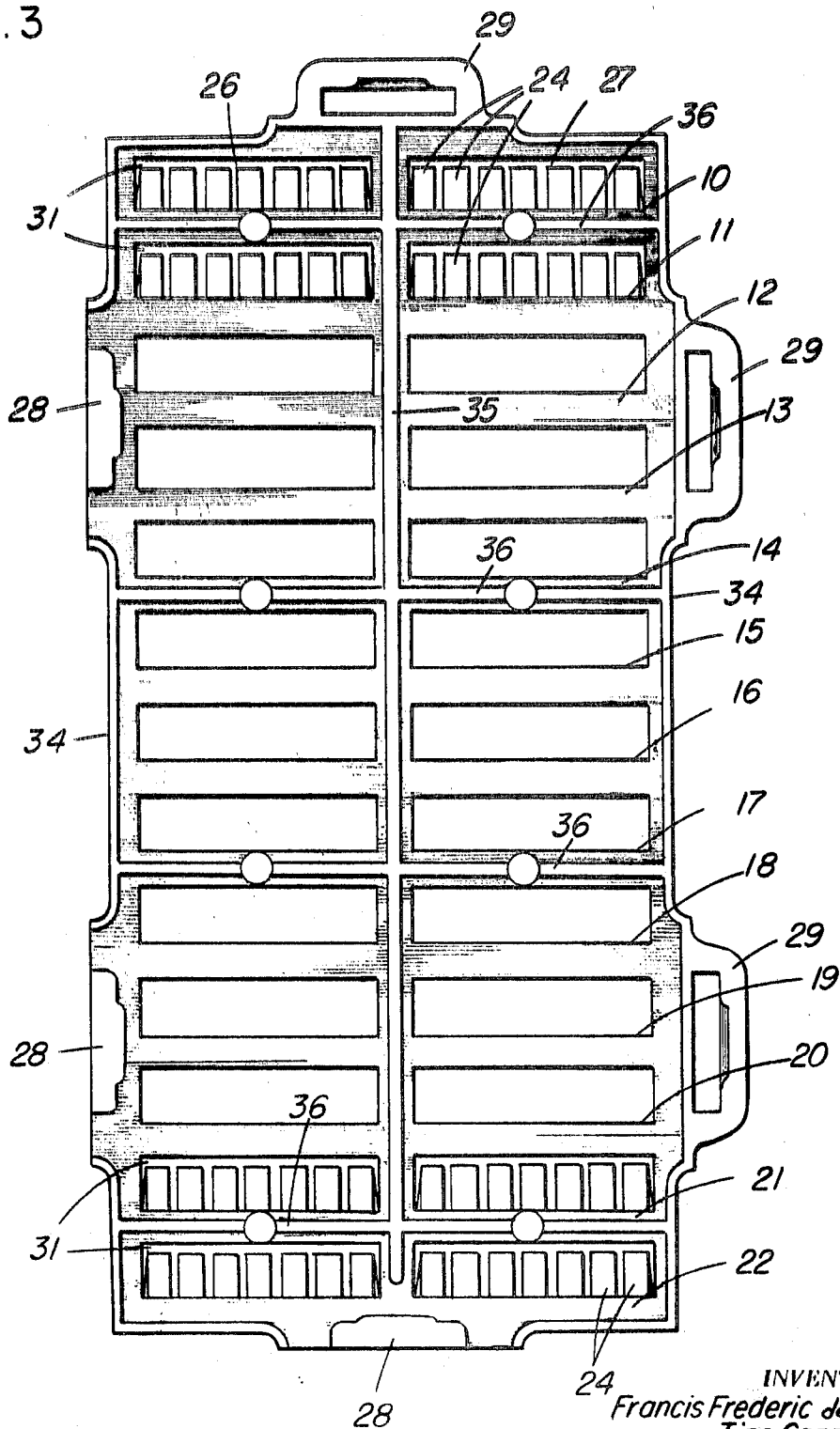
ABSTRACT: The specification describes a plastic ski track composed of interlocking track elements roughly rectangular in shape. Each track element contains a plurality of parallel rows of upright support members inclined from the vertical at an angle in the direction of the ski course. The elements may be fabricated by injection molding of a plastic composition, such as polyethylene-based compound.



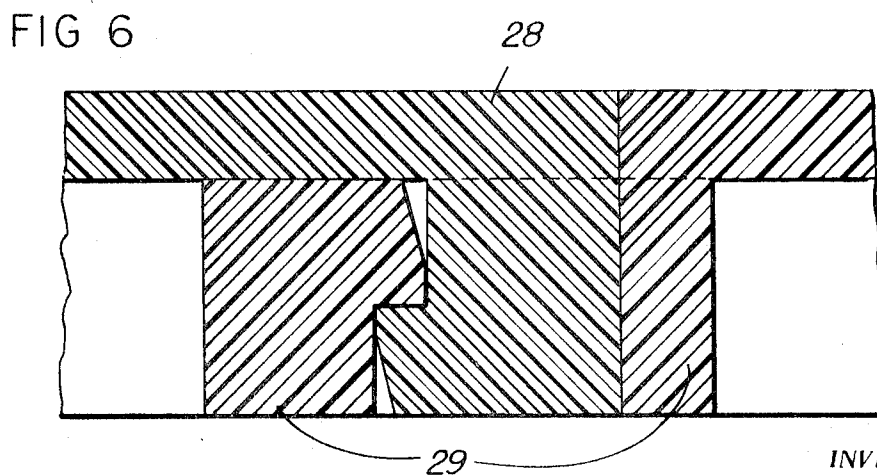
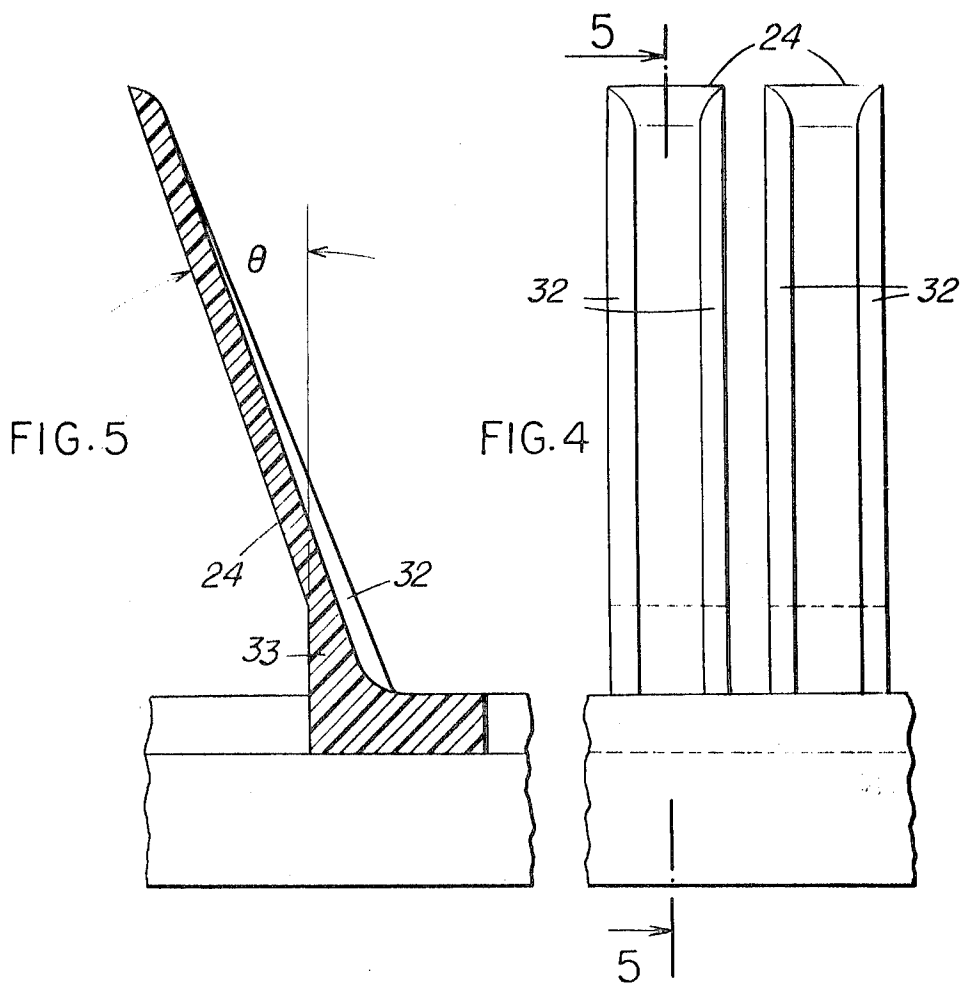


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FIG. 3



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PLASTIC SKI TRACK

DESCRIPTION OF THE INVENTION

The present invention relates to a plastic ski track suitable for all-weather skiing, for location on soil, grass or other sloping surface. In particular, the instant ski track is most suitable for locations where straight skiing is contemplated, such as on ski jumps or under ski lifts. In this respect, among others, the present track elements are distinguishable from the track elements disclosed in our copending application, Ser. No. 726,137, filed May 2, 1968, now U.S. Pat. No. 3,443,493. The track elements of our copending application are suitable for all types of skiing, while the present track elements are to be preferred for straight skiing, for reasons that will become apparent hereafter. Nevertheless, both elements in their preferred forms are interlocking and may be used interchangeably, or adjacent one another.

The present track is composed of interlocking track elements roughly rectangular in outline and having a plurality of parallel rows of upright support members inclined from the vertical at an angle in the direction of the ski course (that is, in the direction normally taken in straight skiing along the course). Preferably, the interlocking elements are made by injection molding of a polyethylene-based composition, described more particularly hereafter. The track elements may be readily assembled by interlocking to cover the entire skiing surface of any desired area. Each of the preferred elements covers about one-half square foot of surface.

It is an objective of this invention to provide interlocking ski track elements, readily fabricated by injection molding of a plastic composition, which may be locked together to form a ski track on a surface of any desired area, and which in place will simulate a snow surface for skiing.

The invention will be clearly understood by reference to the attached drawings, illustrating the preferred embodiment of the track elements, wherein:

FIG. 1 is a top plan view of one of the interlocking track elements with only a portion of the upright support members being shown;

FIG. 2 is a cross-sectional view of the track element, taken along the plane 2-2 of FIG. 1;

FIG. 3 is a bottom plan view of the track element of FIG. 1;

FIG. 4 is an enlarged elevated view of two upright support members;

FIG. 5 is an enlarged, cross-sectional view, taken along plane 5-5 of FIG. 4, of a single upright support member showing in detail its construction and angle of inclination; and

FIG. 6 is a cross-sectional view of the interlocking portions of two joined track elements.

With reference to FIGS. 1-3 it can be seen that the interlocking track element is roughly rectangular and comprises a plurality of parallel rows 10-22 of identical upright support members 24, in two parallel columns 26 and 27, having 7 support members per column per row. For simplicity, in FIGS. 1 and 3, support members 24 are shown for rows 10, 11, 21 and 22 only, although support members are present in each of the 13 rows. Given two columns of 13 rows of seven support elements per column per row, there are thus 182 support members 24 in each track element.

The track element has three studs 28 and three grooves 29 for interlocking with adjacent elements (FIGS. 1 and 3). An interlocked stud and groove combination is shown in FIG. 6. The particular means of interlocking is not critical, but the illustrated means is preferred, for the elements are thereby readily locked together by downward pressure on stud 28. The interlocked elements form a virtually solid flat track surface.

Each track element has a flat supporting surface 30 and a number of openings 31 under the forward parts of the upright support members 24. The surface 30 supports the rows of upright support members 24. The openings 31 permit drainage of water through the track elements, and permit grass to grow and lock the elements more securely to the ground.

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The inclination of the support members in the skiing direction makes the present ski track ideal for skiing in a straight direction. Thus the present track elements are best suited for use in ski jumps, or under ski lifts or tow bars. In use under tow bars the elements have the added advantage of preventing backward movement of the skis, as the inclined support members catch the rear of the skis and act as a brake to backward movement, without hampering forward movement.

The rows of upright support elements are tough and somewhat rigid, but deflect further downward under pressure from skis. Preferably, as shown in FIGS. 4 and 5, the support members 24 are constructed with ribbings 32 and foundation 33 to provide greater resistance to deflection. The support elements shown in FIG. 5 are inclined from the vertical by an angle θ , in the direction of the ski track, that is, to the left in the view of FIG. 5. The preferred value of angle θ is about 20°-25°, but values from about 10° to 45° are also suitable.

The underside of the track element is provided with a large-ly open network of vertical ribs for support. The network of vertical ribs permits the track elements, while being lightweight, to be readily anchored to a supporting surface, to maintain the flat surface and support members of the elements at the desired angle and elevation. As shown best in FIGS. 2 and 3, the vertical ribs comprise an outer peripheral rib 34, longitudinal rib 35 and four transverse ribs 36. These ribs in combination provide both elevated support for the flat surface and upright support members, and anchoring means for the track elements on ground or similar surfaces, such as grass or snow. Installation on grass is particularly suitable, for the growth of grass will serve even more to anchor the track to the ground. Further, the grass may be cut at regular intervals (with the exercise of due care, of course, to avoid cutting the support members) or controlled with suitable chemicals or defoliants. It will be appreciated that the particular location or number of support ribs is not critical, but that shown is generally symmetrical and preferred.

The ski track is fabricated by locking the individual track elements together in two dimensions over the supporting surface or ground. The track is laid out as is the track shown in our copending application, Ser. No. 726,137 (see especially FIG. 6 thereof), and the track elements of both the copending and the present applications are desirably interlocking. The ski surface assumes the same contour as the supporting surface. The track when installed may be permanent, for use for many seasons, both summer and winter. If individual elements become damaged, they may be readily replaced without dislocation of the track.

The track elements may be fabricated by injection molding of any suitable plastic material, such as the preferred polyethylene-based plastic described fully below, such molding techniques being within the skill of the art. The actual dimensions of the elements are not critical, but the approximate, preferred dimensions are length, 13¼ inches; width, 6½ inches; and height, 1¼ inches. As shown in the figures, it is preferred that the support members cover substantially all of the functional surface of the track element. In the illustrated track element, drawn substantially to scale, the support members cover an area of about 5½ by 12½ inches, or on the order of about 80 percent of the total area of the element (assuming the area between the support members to be covered). It is preferred that the support members (including the area between the individual members) cover at least about 75 percent of the area of the track element. It follows, then that the support members will likewise preferably cover at least 75 percent of the total ski track.

The composition of the plastic used to fabricate the track elements is important in order to obtain the desired effects. Thus the composition must provide sufficient compressive strength and attrition resistance for the support members, supporting surface and ribs to withstand continued use in a ski track. Further, the surface of the track elements must be sufficiently inert to atmospheric conditions to obtain a substantial

life of service. Also, it is important that the composition be sufficiently selflubricating to permit unhindered skiing and to avoid damage to the skis. Further, the composition must provide sufficient flexibility and resilience to the support members, to allow fast straight skiing and to permit use on ski jumps, particularly at the landing point. It will be appreciated that the ideal composition or compositions will at least in part depend on the dimensions of the elements, in that the two factors are somewhat interrelated.

The composition, having the desired properties, may be comprised—in part, predominantly or substantially completely—of any of the several tough, flexible plastic materials, including polyolefins such as polyethylene, polypropylene, polybutenes, polyisobutylene; halogenated olefin polymers such as polytetrafluoroethylene or polyvinyl chloride; polystyrene; synthetic rubbers such as polybutadiene, styrene-butadiene rubber, neoprenes, butyl rubber, polyisoprene and ethylene-propylene rubber; and the like. Preferably, the composition comprises at least a major proportion of a polyolefin—polyethylene or polypropylene, preferably—compounded with others of the tough, flexible plastics referred to above. The preferred component is polyethylene, and the preferred compositions contain at least about 90 percent polyethylene, such compositions here being called “polyethylene-based.” The various components of the composition may be combined in any convenient method, including blending and copolymerization. Other components, such as lubricants, antioxidants, stabilizers and the like, may also be added to the composition, as desired. Preferably, an antioxidant and a lubricant are employed.

One composition found particularly suitable for use in fabricating the present track elements is the following:

Component	Parts by weight	Percent
Linear high density polyethylene.....	95.000	92.0
Polyisobutylene (Esso).....	7.500	7.3
“Tinuvin” 326 ¹ (Geigy).....	0.180	.17
“Cyasorb” UV531 ² (Nimco).....	0.361	.35
“Irganox” 565 ³ (Geigy).....	0.090	.09
“Armid” 0 ⁴ (Italcoldoid).....	0.040	.04
Total.....	103.171	99.95

¹ A trademark of Geigy Chemical Corp., for substituted hydroxyphenyl benzotriazoles, used as ultraviolet absorbers.

² Apparently a trademark for an ultraviolet absorber.

³ A trademark of Geigy Chemical Corp., for complex high-molecular-weight stabilizers, used to inhibit oxidation and thermal degradation.

⁴ A trademark of Armour Industrial Chemical Co. for high-melting amides derived from fatty acids, used here as a lubricant.

It will be understood that equivalent lubricants or antioxidants may be utilized, and that the percentages of the in-

dividual components may vary considerably. Preferably, however, the composition contains, in addition to the tough, flexible plastic above described, about 0.25—1 percent of a lubricant and about 0.20—1 percent of an antioxidant or other stabilizers.

It will be evident that the interlocking elements of this invention, the shape and composition of which are above described in full, may be readily locked together and combined with the track elements of our copending application to form a unique track surface ideal for all types of skiing under any conditions of weather. The track is light and inexpensive, and may be readily installed in any location, on all surfaces, such as snow, ground or grass. The track may be used even indoors.

We claim:

1. An interlocking track element, for combination with like or dissimilar elements to form a ski track, which comprises: a flat supporting surface and a number of openings; a large number of upright support members in parallel rows extending from said surface and partially overhanging over at least some of said openings, said support members being inclined in a single direction at an angle of between about 10° and about 45° from the vertical; means for interlocking said element with adjacent elements; and a largely open underside having a network of vertical ribs for support.

2. The interlocking track element of claim 1, wherein the upright support members cover at least about 75 percent of the area of the element and are inclined at an angle of about 20°—25° from the vertical.

3. The interlocking track element of claim 1, wherein the dimensions of a single element are about 13¼ inches in length, about 6½ inches in width, and about 1¾ inches in height.

4. The interlocking track element of claim 1, wherein the network of vertical ribs comprises a peripheral rib, a longitudinal rib and a number of transverse ribs.

5. The interlocking track element of claim 1, wherein the element is fabricated by injection molding of a plastic material, selected from the group consisting of polyolefins, halogenated olefin polymers, polystyrene synthetic rubbers, and combinations thereof.

6. The interlocking track element of claim 5, wherein the plastic material is polyethylene-based.

7. The interlocking track element of claim 5, wherein the plastic material contains a lubricant and an antioxidant.

8. The interlocking track element of claim 1, wherein the element is fabricated by injection molding of a plastic material comprising about 90—95 percent high density polyethylene, about 5—10 percent polyisobutylene, about 0.25—1 percent of a lubricant and about 0.25—1 percent of an antioxidant, ultraviolet absorber or other stabilizer.