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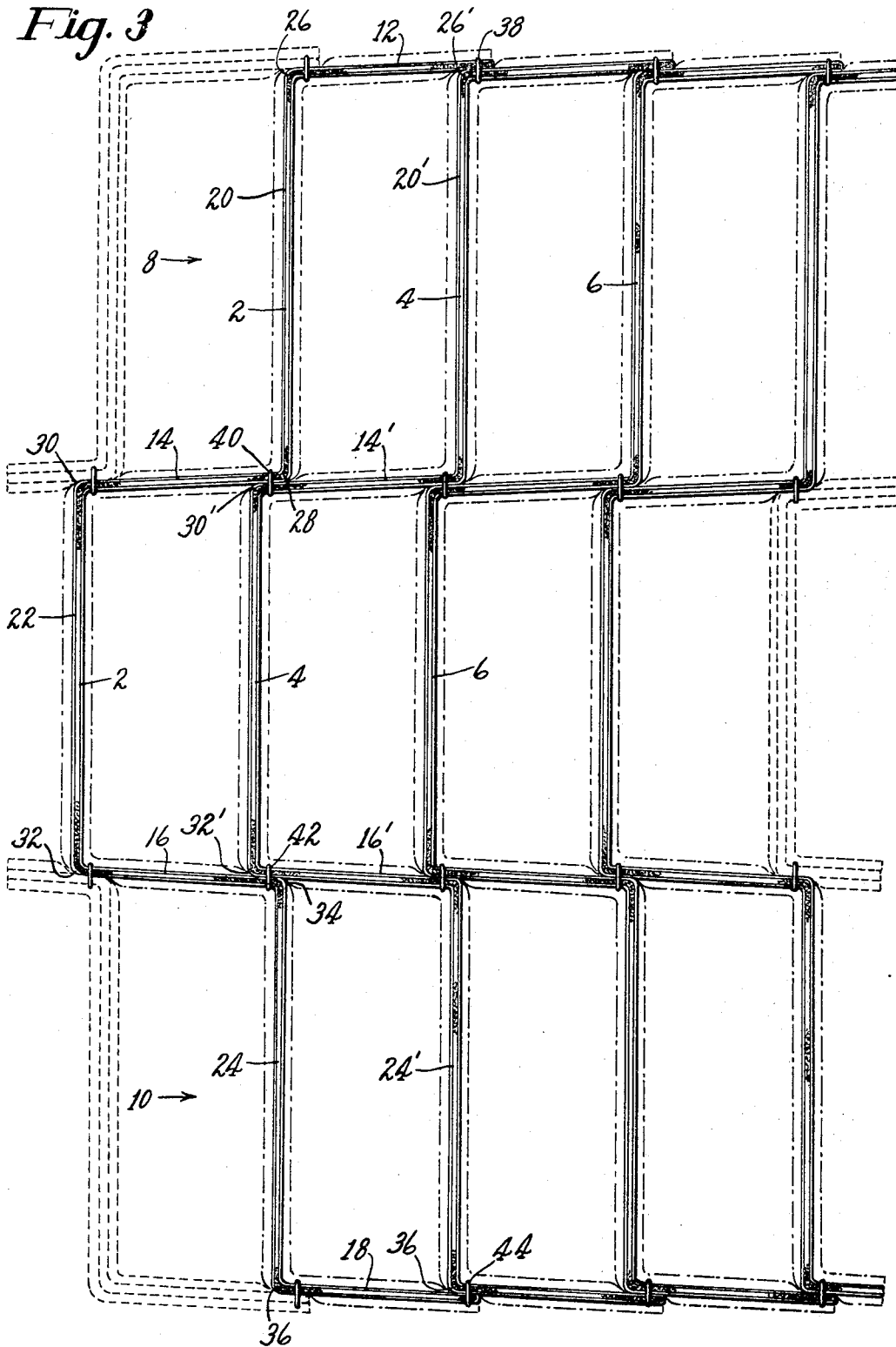
3,385,229

ARTIFICIAL SKIING SURFACES

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Fig. 3



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ARTIFICIAL SKIING SURFACES

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ABSTRACT OF THE DISCLOSURE

An artificial skiing surface comprising a network of strip members joined together in mesh forming relationship. The upper surfaces of the strip members are provided with brush bristles or other resilient projections for forming a non-continuous sliding surface having properties similar to natural snow.

This invention relates to an artificial skiing surface and is directed more particularly to such a surface for use under ski tows.

The use of artificial skiing surfaces has become popular in areas which are likely to suffer from an inadequate supply of natural snow or which are desirous of extending the ski season beyond its normal limits. The most widely used surface comprises a mesh network made up of brush strips having the brush bristles turned upward (see Patent No. 3,047,292, issued July 31, 1962 to P. Acquaderni). It has been found that the brush bristles provide a surface having characteristics similar to snow. These characteristics permit skiing on such surfaces in a manner approximating skiing on natural snow. To enable a skier to turn and maneuver on the artificial surface as readily as in snow, the brush type artificial surfaces produced thus far have comprised a mesh of strip brush members formed in a series of diamond-shaped configurations which afford the proper angular resistance to the skier moving down hill to enable him to change his direction of movement as he would in snow.

One of the areas where artificial skiing surfaces have found particularly wide acceptance is as a supporting surface under ski tows which pull skiers uphill. Because of the high rate of usage over substantially the same path, the snow under ski tows is likely to wear through rather quickly. In practice, many ski tow operators find it necessary to have snowmaking machines in operation almost continuously to provide snow under the ski tow. Other operators employ shovelers who manually place additional snow under the tow line. The use of brush-type skiing surfaces of present design have been helpful in such circumstances but have provided some problems which prove bothersome to skiers and ski tow operators. Skiing surfaces in use thus far, utilizing diagonally arranged brush portions, afford excellent maneuvering characteristics for downhill runs but have proved bothersome in uphill towing.

When brush-type skiing surfaces of the prior art have been used under ski tows the diagonal brush strips have tended to cause a pair of skis to travel a diagonal course. Thus, a skier being towed uphill must struggle somewhat to prevent his skis from colliding with one another, or to prevent their separating in a manner other than graceful, or to prevent being drawn diagonally toward or away from the tow line.

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Another objection to the use of known brush-type skiing surfaces under ski tows is the relatively high frictional resistance occasioned by the relatively dense arrangement of brush portions. The resistance factor is important in uphill towing where the skier is being pulled in a direction having a vector directly into the hillside.

Still another objection to the use of the known brush-type ski mats under a ski tow is the unwarranted expense involved. For uphill towing it is not necessary that the mesh design be as dense as it is in presently known surfaces. In addition, the known surfaces comprising diagonally placed brush elements require a connecting member at each point of each diamond, thereby necessitating a rather large number of connectors for each ski mat. Inasmuch as the coupling of the various components contributes a substantial portion of the total cost of a surface, it is desirable to reduce the required number of connections. Other factors contributing to the expense of brush-type surfaces, such as the one above referred to, include the relatively large number of bends in the strip members, which require several bending operations and occasion waste of material, as will be further explained below.

It is, therefore, an object of the present invention to provide an improved brush-type skiing surface for use under ski tows and the like.

It is a further object of the invention to provide a surface for use under ski tows which will not precipitate the movement of skis toward or away from each other or at an angle to the desired line of travel, but instead will facilitate straight line movement.

It is still another object of the present invention to provide such a surface suitable for use under ski tows and having a mesh less dense than heretofore known, thereby lowering frictional resistance and decreasing manufacturing costs.

A still further object is to provide a surface requiring a substantially lesser number of couplings between adjacent brush members, thereby further reducing manufacturing costs.

It is still another object of the invention to provide a surface as above described which has fewer bends per strip member than present known surfaces of the same type and which may be manufactured with substantially less waste of material, whereby there may be realized a still further reduction in manufacturing costs.

With the above and other objects in view, as will hereinafter appear, the present invention contemplates the provision of an artificial ski surface comprising a network of strip members which are arranged in mesh forming relationship with each other. Each of the strips is bent to a step-like configuration with half the length of a strip being symmetrical to the other half. Each strip is joined to the adjacent strips by connections proximate to the points of the steps. There is accordingly provided a surface having portions running generally straight uphill and other portions adjoining, but substantially normal to, the uphill portions.

It is to be understood that the present invention is by no means limited to the particular construction shown in the drawings, but also comprises any modifications within the scope of the appended claims.

In the drawings:

FIG. 1 is a perspective view of one form of skiing

surface embodying the invention and showing a skier being towed uphill thereon;

FIG. 2 is a sectional view of two brush strips held together by a connector; and

FIG. 3 is a plan view of the skiing surface shown in FIG. 1.

Referring to the drawings, it may be seen that the illustrative skiing surface includes a series of strip brush members 2, 4, 6, etc., joined together to form a mesh design, and having their bristles extending upwardly to provide a surface for supporting the movement of skiers thereon. Referring particularly to the strip member 2, it will be seen that the strip members are bent to a step-like configuration with one half of the member identified by the numeral 8 being symmetrical to the other half of the strip member identified by the numeral 10. The steps are such that portions of the brush 12, 14, 16 and 18 are substantially normal to other portions of the brush 20, 22, 24. The juncture of the portion 12 and the adjoining portion 20 forms a point 26. In like manner, the junctures of adjoining portions 20 and 14 form a point 28. Other points 40, 32, 34 and 36 are similarly formed.

The strip member 4 is formed in the same manner as the strip member 2 and is attached to strip member 2 by connectors 38, 40, 42, 44, which are proximate to points 26', 30', 32' and 36', respectively these points being contiguous to the adjacent strip member 2. The connectors may be wire, clips, rivets, staples or the like, an illustrative staple being shown in FIG. 2. A portion 14' of the strip member 4 is essentially an extension of the portion 14 of the adjacent strip member 2. In like manner a portion 16' of the strip member 4 is essentially an extension of portion 16 of strip member 2. Substantially normal to the strip members 14, 14' and 16, 16' and normal to a ski tow line L are portions 20, 20' and 24, 24'. By affording brush portions only in line with and normal to the tow line the surface is particularly well suited to straight line travel. In addition, because of the relatively low density of the surface design, resistance to ski movement thereon is proportionately less, a factor which is of particular importance in uphill movement.

A typical surface constructed in accordance with the present invention might be about 4 feet by 6 feet, or the approximate size of the surface shown in the above cited patent. However, the surface herein described, usually comprising about twelve strip members, has only about fifty percent of the total length of brush material as a like size of the cited prior art surface, and only about thirty percent as many connectors. In addition, the present surface has only about half as many bends per strip member as the cited prior art surface and each bend is substantially a ninety degree bend, requiring fewer motions in manufacture which account for about a seventy percent reduction in the time spent effecting proper bending of the strip members. Still further, all bends in the present surface are a substantial distance away from the ends of the strip members, the length between a strip member end and the first bend facilitating the bending operation. In the patented surface above referred to, bending must be done so near the ends of the strip members that an additional length of strip member is required merely to facilitate the last bend toward each end; after the bending operation is completed, the extra length is cut off.

Thus, it may be seen that the present design, as compared to the brush-type surface of U.S. Patent No. 3,047,292, provides a surface better adapted for straight line motion and offering less frictional resistance. In short, the present invention provides a surface more nearly approximating natural snow in the uphill ski tow situation. In addition to improved operating characteristics, the invention provides a surface which is substantially less expensive to manufacture.

In operation, several of the surfaces are joined end-

to-end to form an extended artificial skiing surface under a tow line which is caused to move generally axially by a power source (not shown). The surface is so designed that skiers may be towed in pairs, one on either side of the tow line. Thus, one skier may use the half 8 of the surface while a second skier along side, or close by, the first skier uses the half 10 of the surface. The mesh design permits easy movement of the skis over the surface and in the same direction as the tow line without the individual skier's skis tending to part or collide and without the skiers themselves tending to collide or to be carried away from the tow line.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. An artificial skiing surface comprising a network of strip members, said strip members being arranged in mesh forming relationship with each other, each of said members being bent in a step-like configuration throughout its length, portions of each of said members being substantially normal to adjoining portions of the same strip member, the adjoining portions normal to each other having a juncture at a common bend in the strip member, each strip member being bound to at least one adjacent strip member by connections proximate to the bends of the strip member contiguous with said adjacent strip member, each strip member having an upper surface, and a bunched plurality of adjoining resilient and laterally bendable projections upstanding from the upper surfaces for forming a non-continuous sliding surface.

2. An artificial skiing surface comprising a network of strip members, said strip members being arranged in mesh forming relationship with each other, each of said strip members having a step-like configuration throughout a first half of its length, each of said strip members having a second half substantially symmetrical to the first half, each strip member having a plurality of points formed by the junctures of adjoining portions of the member which are substantially normal to each other, each strip member being joined to at least one adjacent strip member by connections proximate to the points of the strip members contiguous with said adjacent strip member, each member having an upper surface, and a bunched plurality of adjoining upright resilient and laterally bendable projections upstanding from the upper surfaces for forming a non-continuous sliding surface.

3. An artificial skiing surface comprising a network of strip members, said strip members being arranged in mesh forming relationship with each other, each of said strip members being bent in a step-like configuration throughout a first half of its length, each of said strip members having a second half bent whereby to be substantially symmetrical to the first half, portions of each of said members being substantially normal to adjoining portions of the same member, adjacent strip member portions normal to each other having a juncture at a common bend in the member, each strip member being bound to at least one adjacent strip member by connections proximate to the bends of the strip member contiguous with said adjacent strip member, each strip having an upper surface, and a bunched plurality of adjoining resilient and laterally bendable projections upstanding from the upper surfaces for forming a non-continuous sliding surface.

4. The invention according to claim 3 in which said upstanding projections comprise brush bristles.

5. A ski tow system comprising a tow line for pulling a skier uphill and an artificial skiing surface under the tow line for supporting a skier being towed uphill, said artificial surface comprising a network of strip members arranged in mesh forming relationship with each other, each of said strip members being bent in a step-like configuration throughout its length, portions of each of said members being substantially parallel to said tow line, said portions being substantially normal to adjoining

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portions of the same member, each strip member being joined to at least one adjacent strip member by connections proximate to the bends of the strip member contiguous with said adjacent strip member, each strip member having an upper surface, said upper surface comprising a bunched plurality of adjoining upstanding bendable projections.

6. The invention according to claim 5 in which half the length of a strip member is symmetrical to the other half of the strip member.

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