PORTABLE RINK ASSEMBLY

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Filed: Sept. 15, 1971

Appl. No.: 180,686

U.S. Cl. ............................................. 404/40
Int. Cl. ........................................... E01c 5/00
Field of Search .................. 94/3, 7, 13; 404/72, 404/83, 44; 52/227, 228

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ABSTRACT

An artificial ice skating rink is formed of square panels of plastic sheet material joined together by cooperating tongues and grooves formed on the edges of the panels. The panels are clamped together by pairs of opposing channel members retained around the periphery of the rink and drawn together by steel straps running along the underside of the rink.

1 Claim, 8 Drawing Figures
PORTABLE RINK ASSEMBLY

BACKGROUND OF THE INVENTION

The field of the invention is synthetic ice skating surfaces, and particularly, synthetic ice skating rinks which are portable and which can be easily assembled.

Synthetic ice skating surfaces such as that disclosed in U.S. Pat. No. 3,508,945, issued Apr. 28, 1970 and entitled "Artificial Skating Surface" include a rigid sheet of polymeric material with cavities in its upper surface and over which a lubricant such as silicone oil is spread. Such synthetic skating surfaces may be provided as permanent installations by cementing or otherwise permanently securing sheets of the polymeric material directly to the subsurface. However, when synthetic skating surfaces are used in traveling skating shows and the like, where a permanent installation is neither possible nor desirable, it is necessary to provide a means for assembling a rink from a plurality of portable sections. The means for accomplishing such an assembly must be capable of easy installation, using reusable portable elements so that the rink can be assembled, disassembled, and transported to a new site. Furthermore, the sections when assembled must present an uninterrupted surface free from openings or ridges at the joints of the sections caused by misalignment of the sections or movement of the sections by either the forces exerted by a skater or expansion and contraction of the polymeric material. Such defects would, of course, be dangerous for the skater.

SUMMARY OF THE INVENTION

The present invention comprises a means of joining together flat portable panels having an upper, synthetic ice skating surface to form a skating rink. More particularly, the invention comprises a synthetic ice skating rink formed by combining such panels with tongue-and-groove connections between panels and by clamping the panels together by means of opposing pairs of channel members disposed around the peripheral edge of the rink and attached to one another by means of straps extending across the underside of the rink. Adjustable fasteners engage the straps and are operable to draw the straps taut between opposing channel members and to thereby provide the clamping force necessary to retain the panels.

It is a general object of the invention to provide a portable synthetic ice skating rink formed from easy-to-handle panels. Each panel is relatively thick and rectangular in shape. The panels may be formed of solid sheets of synthetic skating material or the synthetic skating material may form only the top layer of the panel. Grooves are formed along two adjacent edges of each rectangular panel, and tongues are formed along the remaining two edges. The panels are connected by engaging the tongues and grooves of adjacent panels. The tongue-and-groove connection thus made between panels provides a reliable and rapid means of aligning the panel edges and prevents the formation of dangerous ridges caused by vertical displacement of adjoining panel edges.

Another object of the invention is to prevent the formation of cracks in the skating surface caused by separation of adjoining panels. The skating surface is formed by assembling the panels over a grid of straps which span the distance between opposing peripheral edges of the rink. The ends of each strap pass through slots in channel members which bear against the outer edge of the rink, and at least one of each strap is connected to an adjustable fastener. The adjustable fastener is adapted to tighten the strap and thereby draw the opposing pair of channel members toward one another to effectively clamp the panels between them, thereby preventing the panels from separating.

A further object of the invention is to provide a synthetic ice skating rink formed of reusable, transportable parts including, in addition to the panels, channel members which may be of a size not exceeding the largest dimension of the panels, thin straps which can be coiled for transportation, and removable, adjustable fasteners.

Other objects and advantages of the invention will appear from the following description. In the description reference is made to the accompanying drawings, which form a part hereof, and in which there is shown by way of illustration several presently preferred embodiments of the invention. Such embodiments do not necessarily represent the full scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a rink constructed according to the present invention,
FIG. 2 is a perspective view of a portion of the rink shown in FIG. 1,
FIG. 3 is a partial cross sectional view taken along the plane of the line 3-3 shown in FIG. 1,
FIG. 4 is a partial cross sectional view taken along the plane of the line 4-4 shown in FIG. 2,
FIG. 5 is a partial cross sectional view taken along the plane of the line 5-5 shown in FIG. 2,
FIG. 6 is a perspective view of an adjustable fastener with the rink of the invention,
FIG. 7 is a perspective view of an alternative form of adjustable fastener, and
FIG. 8 is a cross sectional view taken along the plane of the line 8-8 shown in FIG. 7.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. 1 and 2, a skating rink 1 is formed on a solid horizontal surface by joining flat, three-foot square panels 2 of solid, synthetic material. Each panel 2 is preferably made of one-half inch thick polymeric material such as that described in the above-cited U.S. Pat. No. 3,508,945. A tongue 3 is formed along the entire length of two adjoining edges of each panel 2, and a groove 4 is formed along the entire length of each of the two remaining edges. The panels 2 are joined together to form the rink 1 by engaging the tongues 3 and grooves 4 of adjacent panels. A series of longitudinal seams 5 is thus formed between rows of assembled panels 2, and a series of lateral seams 6 is formed between columns of assembled panels 2. The tongue-and-groove edges of the panels 2 are carefully machined for precise fit, so that when they are joined together, no cracks or ridges are formed at the seams 5 and 6.

Referring to FIGS. 1–3, the rink 1 is held together by a grid of straps 7 comprising a series of longitudinal straps 7a running across the underside of the rink 1 parallel to the longitudinal seams 5, and a series of lateral straps 7b running across the underside of rink 1 parallel to the lateral seams 6. The straps 7 are preferably made of stainless steel to resist corrosion, and each
should extend at least 3 inches beyond the perimeter of the rink 1. Disposed around the outer edge, or perimeter, of the rink 1 are a series of identical channel members 8. Each channel member 8 has a length which is equal to or slightly less than the length of a side of a panel 2. The channel members 8 may also be formed from stainless steel, and each has an upper flange 9 which extends approximately one inch inward along the top surface of the rink 1, a lower flange 10 which extends approximately one inch inward along the underside of the rink 1, and an integrally formed web 11, which joins the flanges 9 and 10 and which butts against the outer edge of the rink 1.

The channel members 8 are disposed around the periphery of the rink 1 in opposing pairs, each pair of channel members 8 being arranged to straddle a seam 5 or 6 with their midpoints approximately aligned with the seam. A pair of slots 12 are formed in the web portion 13 of each channel member 8 adjacent the lower flange 10. The slots 12 are disposed about two inches to each side of the channel member midpoint.

As shown best in FIGS. 2 and 3, the end of each strap 7 is inserted through one of the slots 12 in a channel member 8 and is secured thereto by means of an adjustable fastener 13. In the first embodiment, a screw type adjustable fastener 13 is slipped over the end of each strap 7 and brought to bear against the web portion 11 of the channel member 8. The end of each strap 7 has a series of equally spaced slots 14 which pass beneath a feed screw 15 on the fastener 13. The feed screw 15 has a slotted hexagonal head at one end so that it can be engaged by either a screw driver or a wrench. Its other end is rotatably connected to a plate 16. The plate 16 is pivotally mounted between a pair of fastener side plates 17 by a pair of ears 18 which extend through holes 19 formed in the side plates 17. The feed screw 15 is pivoted downward until its threads engage the slots 14 in the straps 7 and it is then rotated to draw the strap 7 through the slot 12 and to thereby draw the front edge of the fastener tightly against the web 11 of the channel member 8. Thus, by rotating the feed screws 15 at either end of a strap 7, the strap 7 is drawn tightly between opposing channel members 8 to clamp the panels 2 between them. The adjustable fastener 13 is a variant of commercially available fasteners for hose clamps, and the like, which could also be used in the present invention.

The preferred sequence of assembly of the rink 1 begins with laying out the required number of straps 7a forming the longitudinal series of straps. The leftmost one of the straps 7b (as viewed in FIG. 1) is then laid at right angles over the straps 7a. The first panel 2 in the left column and in the bottom row is then placed over the strap 7b and a strap 7a. The next panel 2 in the left column is engaged with the first panel and a channel member 8 is installed against the left edge of the two panels 2. The left column of panels 2 is completed by adding the necessary number of panels 2 one-by-one and by installing a channel member 8 along the left edge as each panel is added. The second strap 7b is then laid, and the second column of panels 2 is built up one-by-one beginning with the panel 2 in the bottom row. A pair of opposing channel members 8 are installed on the leftmost strap 7b and an adjustable fastener 13 is slid onto each end of such strap 7b and the first two columns are locked together by tightening the fasteners 13 against the channel members 8. Successive columns of panels 2 are similarly installed and locked together in the lateral direction until all panels have been laid. Then, the adjustable fasteners 13 are connected to the projecting ends of the longitudinal series of straps 7a and tightened against the respective channel members 8 to lock the panels 2 in the longitudinal direction.

By placing the straps 7 offset from the seams 5 and 6 it becomes unnecessary to carefully align each edge of each panel along the center of a strap as the rink is assembled. Further, the panels 2 as they are laid on the grid of straps 7 will tend to keep the straps 7 in place. For example, the first panel 2 laid down in the above described sequence will completely overlie two straps 7 and restrict accidental displacement of the straps 7 during assembly.

The tongue-and-groove connections between the panels 2 help to prevent the rink 1 from buckling and also prevents the formation of ridges along the seams 5 and 6. The clamping action provided by the opposing pairs of channel members 8 prevents separation of the panels 2 and the formation of openings along the seams 5 and 6. Additionally, each channel member 8 is positioned to straddle a seam 5 and 6 to clamp two adjacent rows or columns of panels. The fasteners 13 can be adjusted as required to compensate for actual or anticipated expansion and contraction of the panels 7 due to changes in the temperature of the environment.

Referring to FIGS. 6 and 7, an alternative embodiment of the invention is shown which includes an adjustable fastener 20 that does not require the use of slotted straps 7. Instead, solid straps 7 are fed beneath a knurled drum 21 rotatably and slidably mounted between a pair of fastener side plates 22. The drum 21 is rotatably attached to a shaft 23, and the shaft 23 is slidably retained within a pair of inclined slots 24 formed in the fastener side plates 22. The inclined slots 24 slant downward and away from a rod 25 rigidly suspended between the fastener side plates 22, and towards the forward end of the adjustable fastener 20. The fastener 20 is tightened by rotating the drum 21 with an instrument 26 such as a screw driver. The instrument 26 is braced against the rod 25 and pivoted in a prying motion to rotate the drum 21 and force it down the inclined slots 24. The drum’s rotation draws the strap 7 through the slot 12 in the channel member 8, thereby drawing the front edge of the fastener 20 against the web 11. The wedging action of the sliding drum 21 securely holds the tightened strap 7.

It will be appreciated that the invention provides a synthetic ice skating rink which is simple to assemble, disassemble, and transport. No element save the straps 7 need exceed in dimension the size of the individual panels 2, and the straps can be coiled for transportation and storage.

While the preferred form of the invention utilizes solid panels of polymeric material, the panels may be formed with an upper layer of polymeric material defining the skating surface and with sublayers formed of chipboard, plywood or similar materials. Rather than using channel members 8 which clamp two adjacent rows or columns of panels, only two pairs of continuous channel members could be used with one pair engaging the longitudinal edges of the rink and with the other pair engaging the lateral edges. The use of continuous channel members would, however, result in a sacrifice
in the portability, flexibility and ease of assembly of the rink.

We claim:

1. A synthetic ice skating rink formed by combining flat panels having an upper skating surface with tongue-and-groove connections between panels and by clamping the panels together by means of opposing channel members disposed around and receiving the peripheral edge of the rink and attached to one another by means of flat straps disposed along the underside of the panels;

said channel members having a web which abuts the peripheral edge of the panels and a pair of spaced flanges which bear against the top and bottom surface of the panels;

each end of each strap passing through a slot in the channel member web adjacent the bottom flange thereof; and

a fastener connected to each strap end to abut against the channel member web,

said fasteners being adjustable to clamp panels between opposing channel members by pulling the strap connecting said opposing channel members through said slots.

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