Nov. 23, 1971 W. R. ULLRICH 3,621,671

PORTABLE ICE SKATING RINK

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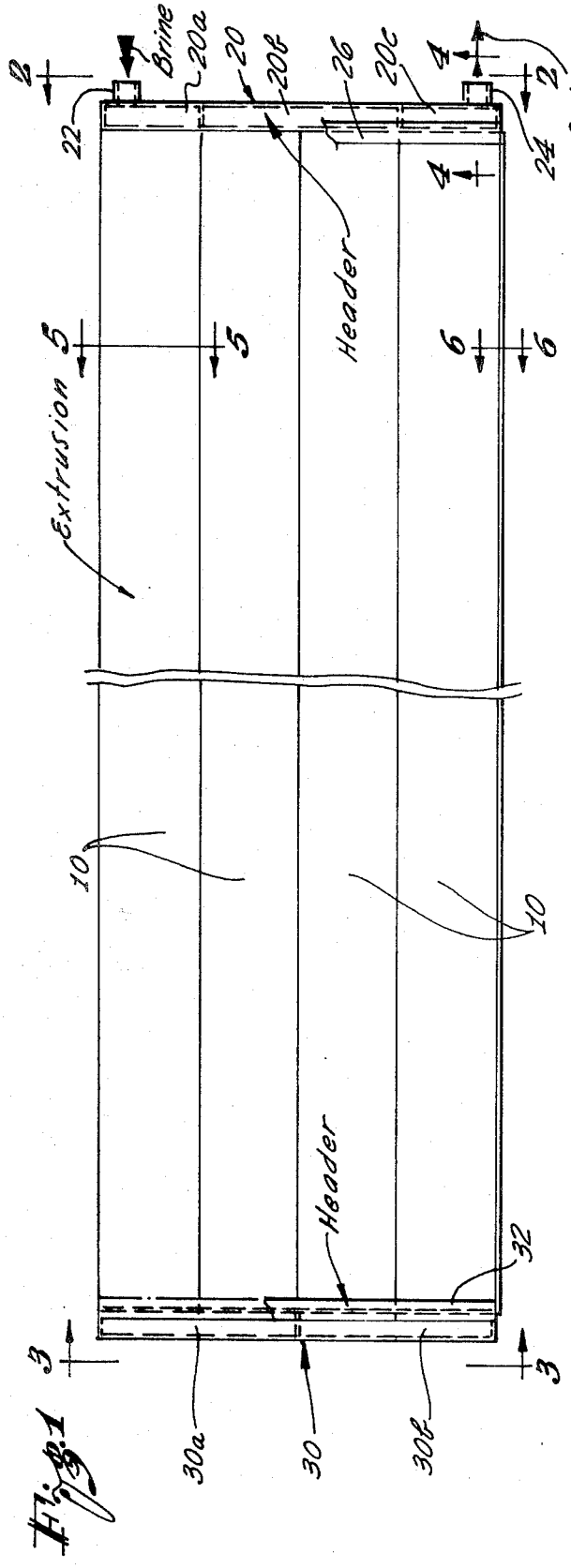


Fig. 1

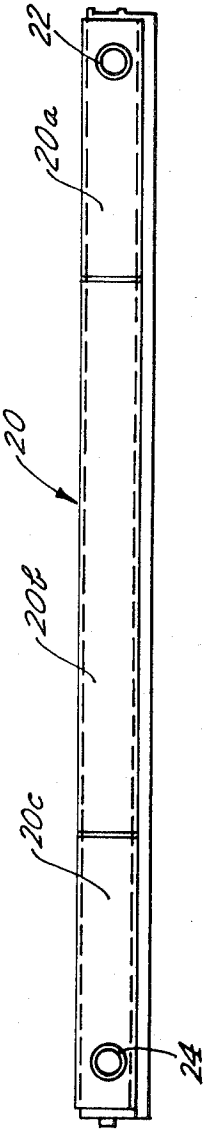


Fig. 2

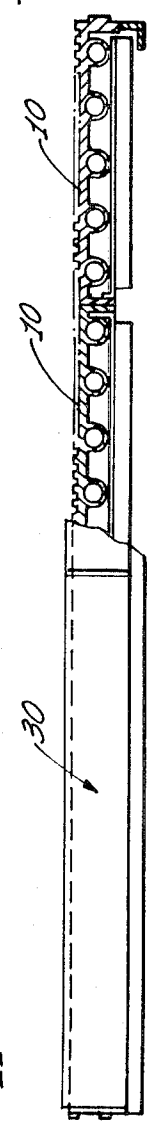


Fig. 3

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Fig. 4

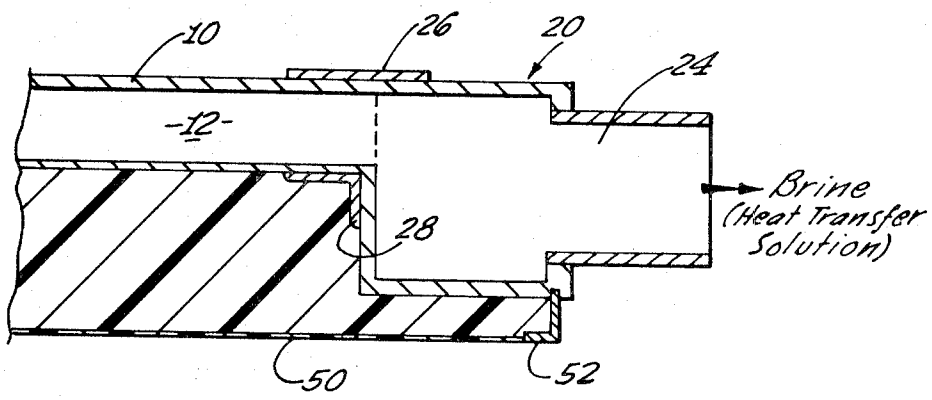


Fig. 5

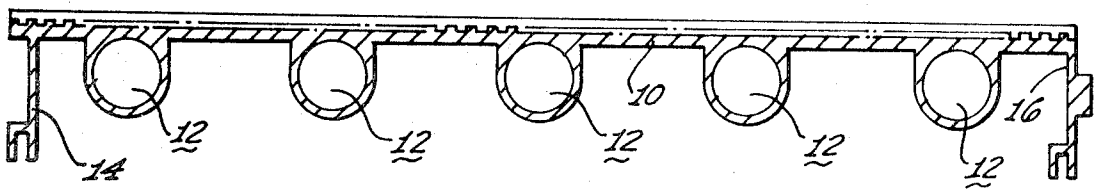
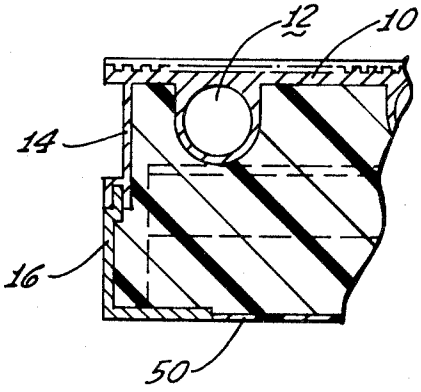


Fig. 6



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3,621,671

PORTABLE ICE SKATING RINK

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Int. Cl. A63c 19/10
U.S. Cl. 62—235 4 Claims

ABSTRACT OF THE DISCLOSURE

A portable ice skating rink is provided which includes a floor made up of a series of extruded panels placed adjacent one another. Tubular passageways for carrying the heat transfer solution are formed integrally with the extrusion. Appropriate headers are provided at each end of the panels so that the heat transfer solution may be circulated through the passageways in each of the panels and a freezing condition may be created to form ice on the top surface of the panels. Insulation and a bottom protective surface are applied to the underside of the panels to provide a complete ice rink system.

BACKGROUND OF THE INVENTION

Portable ice skating rinks of the general type with which the present invention is concerned are known. Specifically, ice skating rinks which include a plurality of freezing plates arranged horizontally in side-by-side relationship, and with refrigerant channels being provided under the plates, are known to the art. The prior art plates present a flat upper surface on which a layer of ice may be formed.

The particular structure and assembly of the present invention is advantageous over the prior art arrangements, in that individual freezing panels are formed as extruded members, with heat transfer, or exchange, solution channels, or passageways, formed directly integral with the freezing surface of the panels. The resulting assembly is one which can be produced simply and economically, and which can be more readily assembled and disassembled than the prior art portable skating rink structures. In addition, it provides superior heat exchange characteristics for the relatively rapid formation of ice with even and smooth consistency and good adhesion to the panel surface.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of the floor of an ice skating rink assembly which is formed of a multiplicity of panels placed adjacent one another, and which is constructed to incorporate the concepts of the present invention;

FIG. 2 is an end view of the assembly of FIG. 1, taken from the right of FIG. 1, and showing the header component which is mounted at one end of the assembly;

FIG. 3 is another end view of the assembly taken from the left of FIG. 1, and showing the header component which is mounted on the other end of the assembly, the latter header being shown as partially broken away to reveal the adjacent components of the assembly;

FIG. 4 is a sectional view taken essentially along the line 4—4 of FIG. 1;

FIG. 5 is a section of one of the extrusions forming the panels of the assembly, and taken essentially along the line 5—5 of FIG. 1; and

FIG. 6 is a fragmentary section, like FIG. 5, and showing additional mounting components of the assembly.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

As illustrated in FIG. 1, for example, the assembly of the present invention includes a plurality of similar panels

10 which are mounted adjacent one another. The panels each have flat tops to define a flat horizontal surface on which ice may be formed. Each of the panels 10, in accordance with the concepts of the present invention, and as shown, for example, in FIG. 5, is formed as an extruded component composed, for example, of aluminum, or of an appropriate aluminum alloy, or other suitable material. Each extruded component 10 is formed to define a plurality of refrigerant-carrying conduits 12, which are integral with the underside of the extrusion. The upper surface of the extrusion is generally flat, and is configured to define, for example, a plurality of adjacent grooves which extend longitudinally along the extrusion. The extrusion, such as the extrusion 10 each include integral side members 14 and 15 which are configured, for example, to be supported on L-shaped brackets 16 (FIG. 6).

A header 20 is provided at one end of the assembly (FIG. 1) and the supply header, for example, has a series of individual compartments 20*a*, 20*b* and 20*c*. The compartment 20*a* is coupled, for example, to the conduits 12 of the upper extrusion 10, the compartment 20*b* is coupled to the conduits 12 of the two central extrusions 10, and the compartment 20*c* is coupled to the conduits 12 of the lower extrusion 10. The header 20, for example, may be formed of aluminum, or other appropriate material, with partitions brazed, or otherwise attached, into the header to form the various compartments 20*a*, 20*b*, 20*c*.

The refrigerant, such as a brine solution, may be introduced into the compartment 20*a* through an appropriate tubular member 22, and the return refrigerant is discharged out from the compartment 20*c* to an appropriate tubular member 24. The header 20 may be secured to the right-hand ends of the extrusions 10 by means, for example, of an aluminum strip 26 which is brazed, or otherwise attached, to the header and to the extrusions, and by an L-shaped bracket 28 (FIG. 4) which may also be formed of aluminum, and which may also be attached to the extrusions and to the header.

A header 30 is mounted at the left-hand end of the assembly in FIG. 1, and the header 30 has a first compartment 30*a* which is coupled, for example, to the conduits 12 in the upper two extrusions 10, and a second compartment 30*b* which is coupled, for example, to the conduits 12 of the lower two extrusions. The two compartments of the header 30 are separated by an appropriate partition which is brazed, or otherwise attached, to the sides of the header. The header 30 is held in place by means, for example, of an aluminum strip 32 which is brazed, or otherwise attached, to the header and to the left-hand ends of the extrusion 10; and by, for example, an L-shaped bracket (not shown) which may be similar to the bracket 28 of FIG. 4.

In order to assemble the structure of the invention, for example, a fiber glass sheet 50 (FIGS. 4 and 6) may first be laid over the surface to be covered by the structure, and L-shaped brackets, such as the bracket 52 in FIG. 4 may be positioned around the periphery of the fiber glass sheet. The brackets 16 are placed along the sheet, or between strips of the sheet 50, and the extrusions 12 are placed on the brackets 16 in interlocking relationship as shown in FIG. 6, for example, with the bifurcated end of the side wall 14 engaging the upper edge of the bracket 16. The headers 20 and 30 are then mounted in place and attached to the assembly, and a quantity of foam plastic, such as polyurethane, is foamed into the area between the sheet 50 and the underside of the extrusions 10 and of the headers 20 and 30, so as to form a bed for the structure.

Then, when the refrigerant is introduced through the tubular member 22 it passes into the compartment 20*a*

of the header **20**, and through the conduits **12** of the upper extrusion panel member **10** to the compartment **30***a* of the header **30**. The refrigerant then passes into the left-hand ends of the conduits **12** in the second extrusion, and passes back to the right in FIG. 1 and into the compartment **20***b* of the header **20**. The refrigerant then passes to the left through the conduits of the third extrusion **10**, and returns through the conduits of the fourth extrusion **10** to be discharged through the tubular member **24**. In this way, the refrigerant is circulated through the conduits in all the panel members, and a freezing surface is provided on the upper sides of the panel member **10**, so that the skating rink may be formed.

A simple and relatively uncomplicated structure for a skating rink is provided, which has the feature of being relatively light so that it can be easily transported from place to place. The panel members **10** are formed as simple extrusions, as described, so that the various components of the assembly may be produced on an economical basis. Also, the structure can be easily assembled, merely by mounting the various components in their proper positions, and then brazing, or otherwise attaching the components together.

What is claimed is:

1. A freezing structure for ice rinks comprising a series of flat extruded members placed in side-by-side relation to form panels and a horizontal surface on which a liquid may be frozen to provide a skating surface, and in which each of said extruded members has at least one heat transfer solution carrying conduit formed integrally with the surface thereof, a bed of foamed plastic under said extruded panels; a bottom protective member; and bracket means enclosing said foamed plastic to provide a complete ice rink system.

2. The freezing structure defined in claim **1**, in which said extruded members are formed of an aluminum alloy.

3. The freezing structure defined in claim **1**, and which includes a header mounted at one end of said extruded members and having compartments coupled to groups of the aforesaid heat transfer solution carrying conduits, and a header mounted at the other end of said extruded members and having compartments coupled to groups of the refrigerant-carrying conduits so as to provide a circulating path for refrigerant through all the conduits.

4. The freezing structure defined in claim **1**, in which said bracket means comprises a plurality of L-shaped brackets; and in which said extruded members define side walls having lower edges in interlocked relationship with the upper edges of said L-shaped brackets.

References Cited

UNITED STATES PATENTS

2,162,083	6/1939	Higham	165—171
2,268,885	1/1942	McCullough	165—171
2,521,475	9/1950	Nickols	62—235
2,981,520	4/1961	Chadburn	165—170
2,469,021	5/1949	Vetter	62—235
2,615,308	10/1952	Thorns	62—235
3,108,454	10/1963	Raspen	62—235
3,384,167	5/1968	Jarkin	165—171

FOREIGN PATENTS

102,254	8/1965	Denmark	62—235

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U.S. Cl. X.R.

62—515, 525; 165—56, 170