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(54) **DIVIDER FOR AN ICE RINK**

(57) The invention relates to a divider (1) for an ice rink (2) comprising a main body (3) having a height of at least 10 cm and at least one anchor (8) embedded or to be embedded into the ice of the rink (2), wherein the anchor (8) is located on the bottom side of the main body (3).

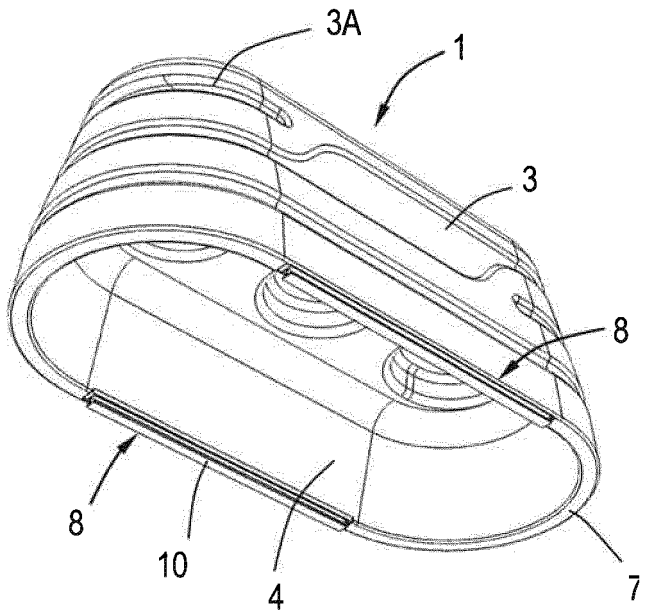

Fig.3

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Description

[0001] The invention relates to a divider for an ice rink comprising a main body having a height of at least 10 cm and to an ice rink, in particular a mobile ice rink, comprising a plurality of such dividers.

[0002] On the website of Engo Ltd. an "Ice Rink Devider" is disclosed, which, according to that website, is made of blow-resistant plastic, weighs 5.0 kg, measure 460 x 1,050 x 280 mm (H x L x W), and is available in the colours: white, red, blue, black, yellow and green. The embodiment shown on the website has a pen on one end of the Devider and a complementary opening on the other end to form a 'chain' of Deviders.

[0003] It is an object of the present invention to provide a versatile and secure divider for an ice rink, in particular for a mobile ice rink.

[0004] To this end, the divider comprises at least one anchor embedded or to be embedded into the ice of the rink, wherein the anchor is located on the bottom side, i.e. the side with which the divider is embedded or to be embedded in the ice, of the main body.

[0005] In an embodiment, the at least one anchor provides edge portions, e.g. the edges along flange of openings in a plate or strip, having a total length of at least 1 meter, preferably at least 1,5 meters, preferably in a range from 1,5 to 3 meters.

[0006] In a refinement, the anchor comprises a strip or profile, preferably a profile with an at least substantially horizontal flange embedded or to be embedded into the ice of the rink and an at least substantially vertical web. Examples of such anchors includes I-, (rotated) U-, or (reversed) T-profiles. Such strips and profiles are an efficient means to provide a suitable length of the edge portions. In a refinement, the at least one anchor, e.g. a strip or profile, is provided with openings, e.g. perforations, to increase the total length of the edges and/or to fine-tune the strength of the connection between the anchor(s) and the ice.

[0007] The dividers according to the present invention are, during use, fixed to the ice and thus no interconnection between the dividers or external support for the dividers is required. Further, the anchors can be selected or designed to provide a desired strength of the connection with the ice, e.g. to meet practical and safety requirements. The divider according to the present invention can be deployed temporarily, e.g. on a mobile ice rink, or for longer periods.

[0008] In an embodiment, the footprint of the divider is oblong. It is preferred that the at least one anchor extends at least along a long side of the divider, preferably comprises at least two anchors extending parallel to the long sides or comprises an anchor extending along the bottom circumference. In such a configuration, both the efficiency of dividing and the strength of the connection between the divider and the ice in the directions that matter most is improved.

[0009] In another embodiment, the at least one anchor is embedded in the ice of the rink and the moment, in particular the moment resulting from a force exerted on one of the partitioning sides, typically one of the long sides of the divider, at which the divider breaks from the ice is in a range from 150 to 400 Nm, preferably in a range from 200 to 350 Nm. In this range, the divider will yield in case of collision and yet will be sufficiently stable to lean on and e.g. assist inexperienced skaters in braking or stopping. A practical way of measuring the moment at which the divider breaks from the ice is exerting a force to the highest point of the divider or of an accessory mounted to or in the divider, measuring the force at which the divider breaks from the ice and multiplying the force at break with the effective arm.

[0010] In an embodiment, the at least one anchor is made of a material having a thermal conductivity of at least 15 W/mK (at 25 °C), preferably at least 40, preferably at least 100, preferably at least 180 W/mK (at 25 °C). Anchors of a material having a high thermal conductivity, such as metals, in particular aluminium, were found to more efficiently and reproducibly establish connection with the ice.

[0011] In another embodiment, the bottom side of the anchors is provided with spikes, such as the heads of bolts or screws with which the anchors are attached to the main body. The spikes enable quickly establishing a more temporary connection to the ice, e.g. during brief events or when testing a layout.

[0012] Another embodiment comprises e.g. in the sides or in the top of the main body, openings, such as slots, for securing, e.g. by means of clamp fitting, accessories, such as decorative elements, boards carrying e.g. advertisements or information, a device or a component of a device for registering time or to log into an event, such as a match or game, or simply one or more seats or a bench or part of a bench.

[0013] In a further embodiment, to provide good contrast with the ice and the surroundings, at least the main body is in a bright colour, such are orange, red, yellow, blue, or green.

[0014] In yet another embodiment, to facilitate storage and transport, the bottom side of the divider comprises a cavity for receiving the top of an identical divider, thus enabling nesting of the dividers, preferably over a height of at least one third of the height of the divider.

[0015] To be able to weight down the divider, in an embodiment, the main body is hollow and liquid-tight and comprises an opening for filling the divider with e.g. water or sand.

[0016] In another embodiment, the main body is made by rotary moulding or blow forming and/or of a thermoplastic material, such as polyethylene (PE), polypropylene (PP), a polyester, or a polyamide, or a polystyrene (PS) or polyurethane (PU) foam.

[0017] The invention further relates to an ice rink comprising a plurality of dividers according to any one of the preceding claims embedded in the ice of the rink.

[0018] In an embodiment, the dividers are arranged to

provide at least one of a speed lane, a track, a zone for specific user, such as children, a disco, and a sitting area.

[0019] US 5,465,964 relates to a curling hack comprising: a base adapted to be anchored in a sheet of ice; a grip pad of a material having a high coefficient of friction at low ambient temperatures; and means comprising interengaging formations on a top face of the base and a bottom face of the grip pad for detachably securing the grip pad to a top surface of the base.

[0020] US 5,620,395 method of installing an above ice surface curling hack is described. Firstly, embed a base member into a sheet of ice. The base member must be totally covered by ice thereby leaving an ice surface that is devoid of any hack depressions. The base member has at least two vertically oriented female receptacles. Secondly, drill the ice out of the female receptacles. Thirdly, mate the female receptacles of the base member with depending male members of a detachable foot pad.

[0021] US 2014/190100 discloses a rink divider raising and lowering system that is configured to raise and lower a rink divider utilizing a plurality of supports secured to existing trusses that support a roof of an ice rink.

[0022] The invention will now be explained in more detail with reference to the Figures, which show embodiments of the present divider and ice rink.

Figure 1 is a perspective view of a divider according to the present invention comprising two profiled and parallel anchors.

Figure 2 is a top view of the divider shown in Figure 1.

Figure 3 is perspective bottom top view of the divider shown in Figures 1 and 2.

Figure 4 is perspective bottom top view of divider comprising anchors having spikes.

Figure 5 is a perspective view of a divider according to the present invention in which an accessory is mounted.

Figure 6 shows an ice rink wherein a plurality of dividers are anchored to the ice to divide the rink in a main area, a children's area, and a speed lane.

[0023] Figures 1 to 3 show a preferred divider 1 for an ice rink 2 (shown in Figure 6), comprising a main body 3 made from a thermoplastic material, in this example PE, and by rotary moulding. Seen in side view and in front view, the main body 3 tapers in upward direction. The sides of the main body 3 are provided with grooves, at least the upper one of which provides handgrips 3A to facilitate lifting the divider. The bottom side of the divider is provided with a cavity 4 that is complementary in shape to the top of the main body and that has a depth that corresponds to about half the height of the divider, such that the dividers can be nested for storage and transport.

[0024] The top side of the divider 1 is provided with a slot 5 and a plurality of openings 6 for fitting accessories, as will be explained in more details below. The lower rim 7 of the main body 3 is provided with two anchors 8 extending along the long sides of the main body. The anchors are screwed, bolted or glued to the lower rim of the main body and each anchor comprises an I-profile. The profiles are made from aluminium having a thermal conductivity 205 W/mK (at 25 °C).

[0025] In this example, the dividers are 98 cm long, 45 cm wide, have rounded ends, and are 40 cm high. The anchors each have a length of 50 cm, providing four edge portions along the lower flanges of the profiles having a total length of about 200 cm. Tests showed that once embedded in the ice of a rink under average conditions, the divider withstood a force (exerted on and parallel to the top of the divider) of about 700 N before breaking from the ice, which corresponds to a moment of (0,4 x 700 =) 280 Nm.

[0026] Figure 4 shows an embodiment wherein the anchors 8 are screwed to the main body, with the heads of the screws 9 protruding from the lower flanges 10 of the profiles thus providing spikes. When the divider is placed on a sheet of ice without embedding, the spikes already provide a degree of connection to the ice. This facilitates use e.g. during brief events or when testing a layout and without significant damage to the ice.

[0027] Figure 5 shows a divider with an accessory, in this case a board 12 carrying an advertisement, decorations, or information or merely serving to enhance division, is clamp fitted in the slot 5 in the top if the divider 1.

[0028] Figure 6 shows an ice rink comprising a sheet of ice 11, a fence 13 surrounding the ice and, outside the ice, a sitting area 14 where users can put on their skates. A plurality of dividers 1 are embedded in the ice 11, dividing the ice in a main area 15, a speed lane 16, and an area 17 for children. Embedding was achieved by locally melting the ice, e.g. by means of hot water or a heater, placing the dividers in the resulting puddles, and allowing the water to freeze again. Alternatives include, heating the anchors (instead of or in addition to the ice) and positioning the dividers during installation of the (mobile) rink, before forming the sheet of ice.

[0029] The fence 13 provides one or more entrances 18, in this example two entrances, one for the main area and one for the children's area. In the latter area the dividers are used to provide further features, such as trees 19 and a tunnel 20 clamped in the dividers as described above. Dividers with trees are also positioned in the main area 15. In the speed lane 16, the dividers at the start and finish are provided with arches 21 and equipment (not shown) for issuing a start signal and measuring time. The dividers along the speed lane 16 are provided with boards 12. Further, in the sitting area 14 outside the ice 11, dividers 1 are weighted down by filling them with water and the dividers support benches 22 for users to sit on.

[0030] The invention is not restricted to the above-described embodiments, which can be varied in a number of ways within the scope of the claims. For instance, the dividers can be made of wood. Or arranged to form a track.

Claims

1. Divider (1) for an ice rink (2) comprising a main body (3) having a height of at least 10 cm and at least one anchor (8) embedded or to be embedded into the ice of the rink (2), wherein the at least anchor (8) is located on the bottom side of the main body (3).

2. Divider (1) according to claim 1, wherein the at least one anchor (8) provides edge portions having a total length of at least 1 meter, preferably at least 1,5 meters, preferably in a range from 1,5 to 3 meters.

3. Divider (1) according to claim 1 or 2, wherein the anchor comprises a strip or profile (8), preferably a profile (8) with an at least substantially horizontal flange (10) embedded or to be embedded into the ice (11) of the rink (2) and an at least substantially vertical web.

4. Divider (1) according to any one of the preceding claims, wherein the footprint of the divider (1) is oblong.

5. Divider (1) according to any one of the preceding claims, wherein the at least one anchor (8) extends at least along a long side of the divider (1), preferably comprises at least two anchors (8) extending parallel to the long sides of the divider (1) or comprises an anchor extending along the bottom circumference.

6. Divider (1) according to any one of the preceding claims, wherein the at least one anchor (8) is embedded in the ice (11) of the rink (2) and wherein the moment at which the divider (1) breaks from the ice (11) is in a range from 150 to 400 Nm, preferably in a range from 200 to 350 Nm.

7. Divider (1) according to any one of the preceding claims, wherein the at least one anchor (8) is made of a material having a thermal conductivity of at least 15 W/mK (at 25 °C), preferably at least 40, preferably at least 100, preferably at least 180 W/mK (at 25 °C).

8. Divider (1) according to any one of the preceding claims, wherein the bottom side (10) of the anchors (8) is provided with spikes, such as the heads of bolts or screws (9) with which the anchors (8) are attached to the main body (3).

9. Divider (1) according to any one of the preceding claims, comprising in its sides or top openings (5, 6) for securing accessories (12; 19; 20; 21; 22).

10. Divider (1) according to any one of the preceding claims, wherein at least the main body (3) is in a bright color, such are orange, red, yellow, blue, or green.

11. Divider (1) according to any one of the preceding claims, wherein the bottom side of the divider (1) comprises a cavity (4) for receiving the top of an identical divider (1).

12. Divider (1) according to any one of the preceding claims, wherein the main body (3) is hollow and liquid-tight and comprises an opening for filling the divider (1) with e.g. water or sand.

13. Divider (1) according to any one of the preceding claims, wherein the main body (3) is made by rotary moulding or blow forming and/or of a thermoplastic material.

14. Ice rink (2) comprising a plurality of dividers (1) according to any one of the preceding claims embedded in the ice (11) of the rink (2).

15. Ice rink (1) according to claim 14, wherein the dividers (1) are arranged to provide at least one division, preferably at least one of a speed lane (16), a track, a zone (17) for specific users, such as children, a disco, and a sitting area (14).

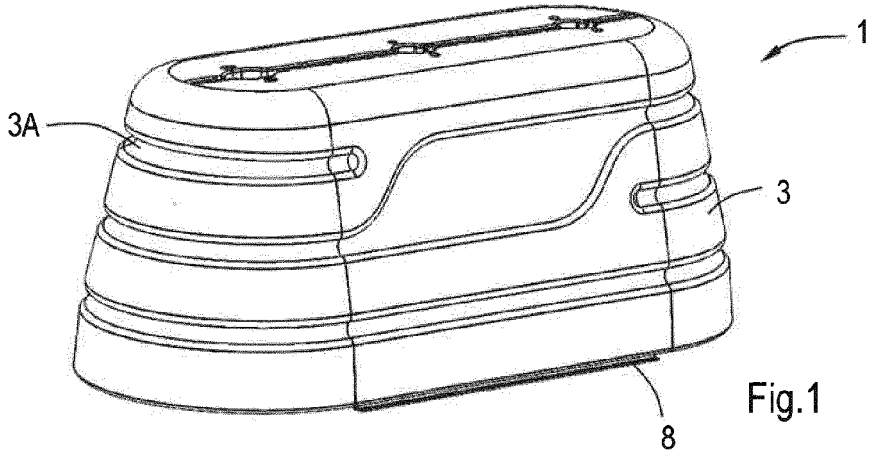

Fig.1

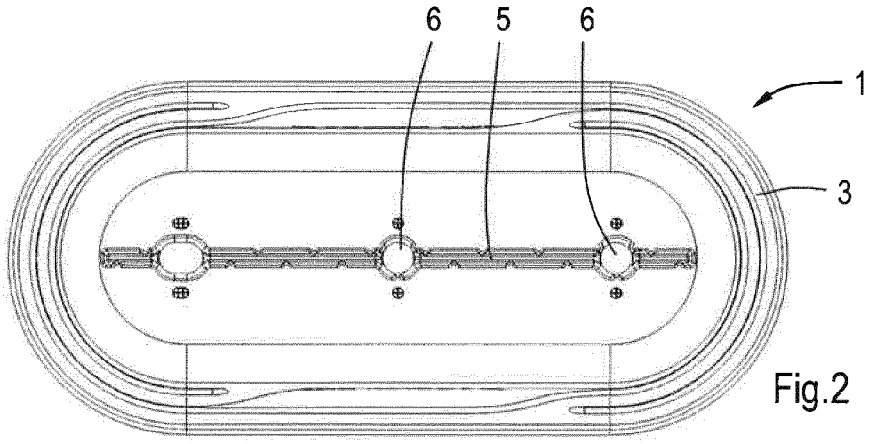

Fig.2

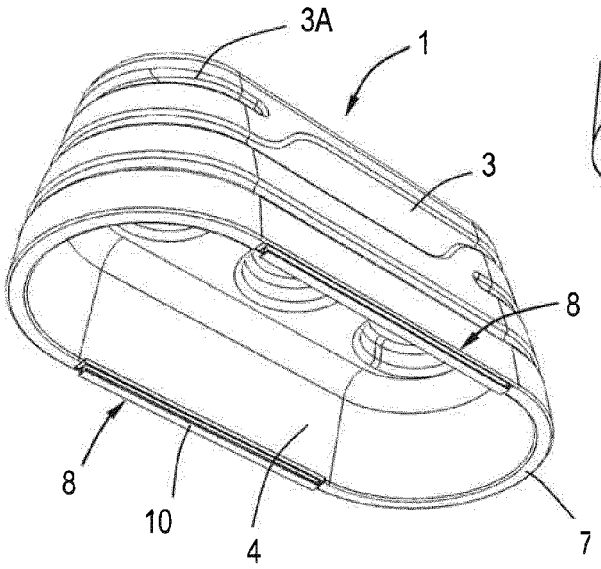

Fig.3

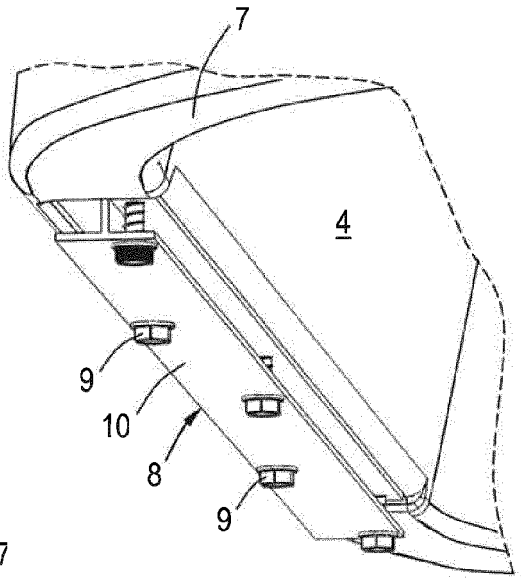

Fig.4

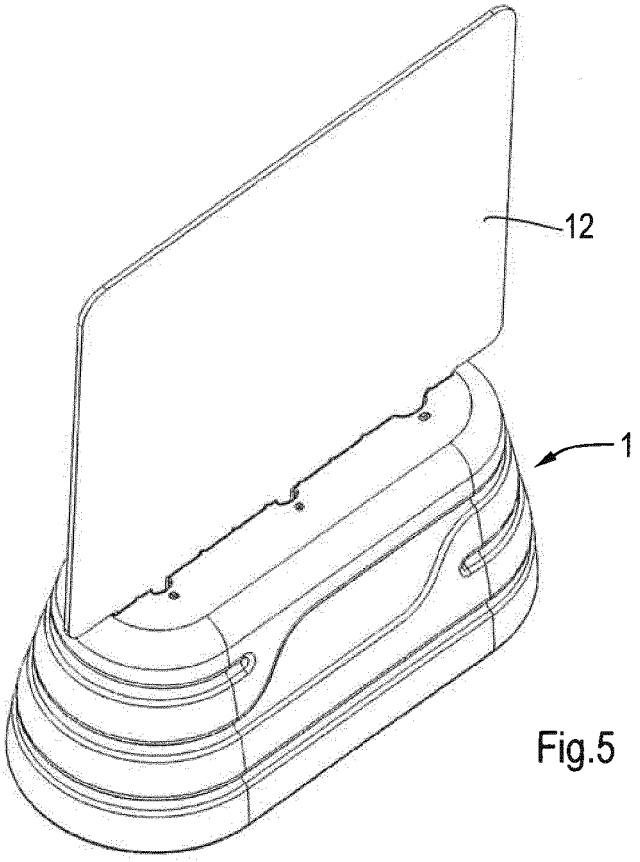

Fig.5

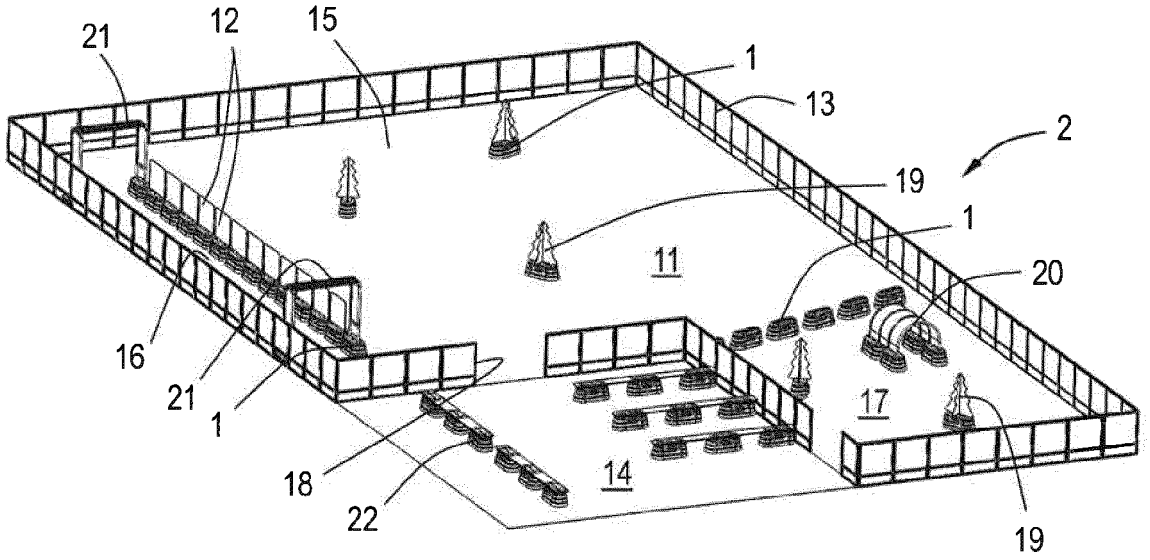

Fig.6

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EUROPEAN SEARCH REPORT

Application Number
EP 15 19 3509

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	US 4 497 483 A (AHLGREN GOERAN [SE]) 5 February 1985 (1985-02-05) * column 3, line 35 - column 4, line 14; figures 1,4a,8 * -----	1,4,14, 15 2,3,5-13	INV. A63C19/10 A63C19/06 A63B63/00 A63C19/08
X A	US 3 979 120 A (DIETRICH JOHN STUART) 7 September 1976 (1976-09-07) * column 3, line 4 - column 3, line 42; figures 1,2 * -----	1,4,6,7, 14 2,3,5, 8-13,15	A63B102/24

TECHNICAL FIELDS SEARCHED (IPC)

A63C
A63B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	11 April 2016	Murer, Michael

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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11-04-2016

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- US 5620395 A **[0020]**
- US 2014190100 A **[0021]**