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APPARATUS FOR RENEWING THE ICE SURFACE IN RINKS

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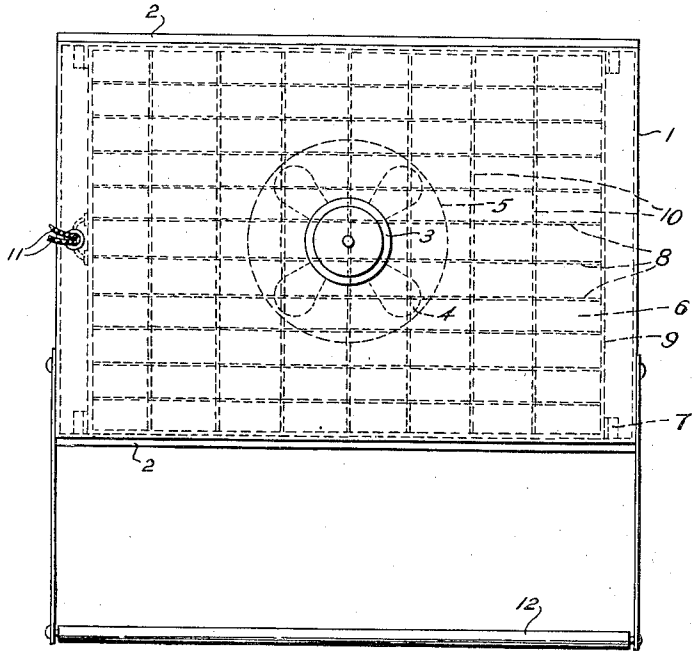


Fig. 1

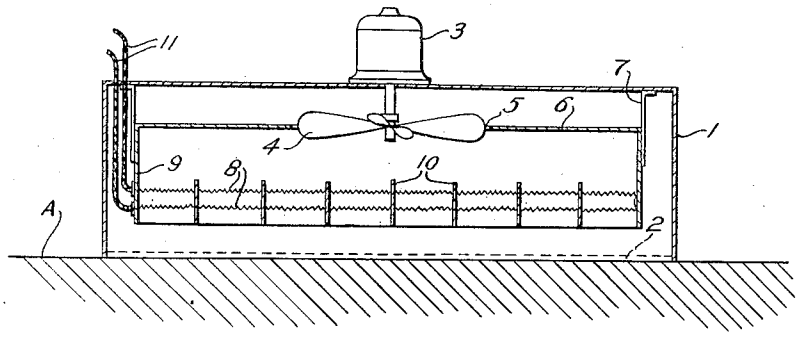


Fig. 2

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APPARATUS FOR RENEWING THE ICE SURFACE IN RINKS

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4 Claims. (Cl. 62—12)

This invention relates to renewing the ice surface in rinks, used for skating, hockey and curling and to apparatus therefor.

The modern trend in ice rinks is to use artificial refrigeration to provide the ice and the refrigerating pipes are placed on the floor or base on which the sheet of ice is to be formed. Water is applied and frozen to build up the sheet of ice of the desired thickness over the pipes. The thicker the sheet of ice, the less efficient is the refrigerating plant in freezing water sprinkled on the surface of the sheet of ice, owing to the insulation provided by the ice between the coils and water. This is an important consideration in the economical operation of a rink. The act of skating forms ridges or grooves in the surface of the sheet of ice and gradually accumulates flakes of ice or snow on the surface. The skate markings or grooves are objectional and may be even dangerous in fancy or figure skating as well as in hockey. In figure or fancy skating and particularly in competitions it is frequently desirable if not necessary to treat the ice surface after even short intervals of use and in hockey rinks the usual practice is to remove the snow by scraping and or sweeping between, at least, normal playing periods. The mere removal of the snow does not obliterate the skate markings, except to the extent that these are filled with the snow. Water sprinkled on the surface to cover up and fill the markings is caused to freeze to replenish the surface. Snow remaining in the grooves or markings impairs the quality of the ice.

A sheet of ice having a thickness of about one and one half inches is normally the most efficient having regard to the load on the refrigerating apparatus. Available methods of maintaining the ice surface result in building up a sheet ten to twelve inches thick. To overcome the objectional insulation thus provided it has been proposed to periodically shave down the surface of the ice but the operation is expensive and does not provide the best quality of ice surface.

The object of the present invention is to provide a convenient and economical method for treatment and maintenance of ice surfaces in rinks, whereby a minimum amount of water is required, the effective thermal efficiency of the refrigerating unit is improved and a better ice surface is provided.

In carrying out the invention the snow formed on the ice by skating is melted in situ, and the water thus formed is allowed to fill the skate markings or grooves from which it came. At the same time the heat applied tends to round off edges of the grooves and other irregularities in the ice. No loose snow is allowed to remain in the grooves and thus they become uniformly filled with clear water, producing a well tempered ice surface when the water freezes.

The invention will now be described in relation to the accompanying drawing which shows one form of apparatus for carrying out the method and in which

Figure 1 is a plan view of the device and

Figure 2 is a sectional end elevation thereof.

In the drawing 1 is a box with an open bottom adapted to rest on the ice A, which forms a closure for the box. The lower edge of the ends of the box is shown as having an upturned lip 2. Mounted centrally on the top of the box is a motor 3 adapted to drive a fan 4 suspended in the box, a short distance below the top and within a circular opening 5 in a partition 6 which extends from end to end of the box but terminates a short distance from the sides thereof and which is supported on brackets 7. Electrical heating elements 8 are mounted on flanges 9 depending from the partition 6 and are located near the bottom of the box. Insulating supports 10 for the heating elements and power supply wires 11 are provided as shown. The insulating supports may be connected at their ends to the end walls of the box 1 or to flanges depending from the ends of the partition 6. A handle or the like 12 is provided for movement of the device. If desired suitable traction power means may be used for moving the device. It will be understood that electrical power for energizing the heating elements and the motor is supplied through a flexible cord from any convenient source.

In operation, with the heating elements 8 energized, the device is moved over the surface of the ice, the open bottom of the box 1 being substantially tightly closed by contact with the surface of the ice. The energized elements heat the air within the box and under the influence of the fan the heated air is forced into contact with the ice surface to melt the snow and ice. Substantially no outside air is admitted and the circulation of the air up from the ice surface and downwardly through the central heating zone insures maximum efficiency in heat transfer to the point of use at the ice surface. The partition and depending flanges direct the constant flow of the air directly within the box. When there is a substantial amount of snow on the ice there is a tendency for it to build

up against the front wall of the box. This acts as to further seal the box. If necessary the forward end of the box may be slightly elevated momentarily by pressure on the handle to permit such mass of snow to enter the box. Owing to the conservation of heat within the box the snow and irregular ice particles readily melt forming water to uniformly level off the surface when the water freezes under the influence of the refrigerating coils.

This procedure effects substantial economy over present methods and at the same time provides an improved ice surface. The "temper" of the ice is said to be improved. This appears to be due in part to the melting of all the particles of snow, leaving only clear water to be frozen to the ice bed and to fill the skate markings and in part to the direct application of the heated air to the ice surface. The "temper" of the ice is an important consideration in figure or fancy skating and in curling.

I claim:

1. A device for renewing the ice surface in rinks comprising an open boxlike container adapted to be applied to a portion of ice surface with the edges of the container opening in substantially sealing engagement with said ice surface, means for heating the confined air in said container, and means for continuously circulating the confined heated air.

2. A device for renewing the ice surface in rinks comprising an open boxlike container having the edges of the container opening in the same plane whereby the container may be applied to a portion of ice surface with said edges in substantially sealing engagement with the ice surface to form a confined air space within the container, electrical means for heating the confined air within the container, and means for continuously circulating the confined heated air within the container and to contact the ice surface portion.

3. A device for renewing the ice surface in rinks comprising an open boxlike container having the edges of the container opening in the same plane whereby the container may be applied to a portion of ice surface with said edges in substantially sealing engagement with the ice surface to form a confined air space within the container, an electrical heating element supported within said container above the ice surface, and a fan supported within said container above said heating element.

4. A device for renewing the ice surface in rinks comprising an open boxlike container having the edges of the container in the same plane whereby the container may be applied to a portion of ice surface with said edges in substantially sealing engagement with the ice surface to form a confined air space within the container, a partition in said container in parallel relation with the ice surface, said partition extending from end to end of the container and terminating a short distance from the sides thereof and having a central circular opening, a fan supported within the container and disposed within said opening, and an electrical heating element supported within said container and disposed between the partition and the ice surface.

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