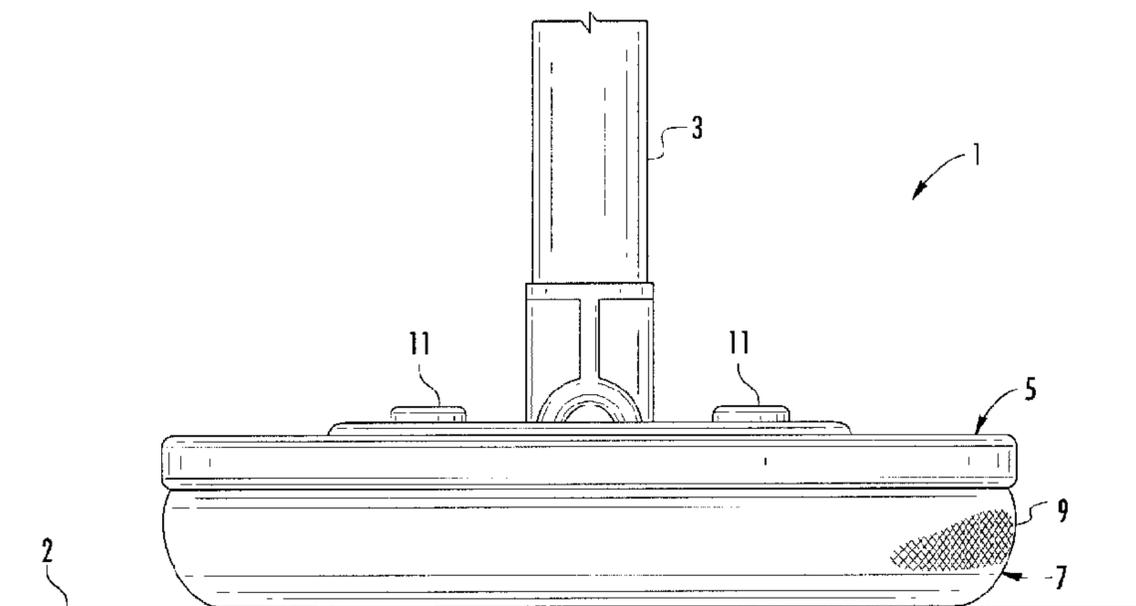




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(72) **Inventeur/Inventor:**
SVIRKLYS, FRED, CA
(73) **Propriétaire/Owner:**
SVIRKLYS, FRED, CA
(74) **Agent:** SIM & MCBURNEY

(54) **Titre : PLAQUE AVANT DE BALAI DE CURLING**
(54) **Title: CURLING BROOM FACE PLATE**



(57) **Abrégé/Abstract:**

A face plate for a curling broom and a curling broom having the same are provided. The face plate may have a support member configured to engage a curling broom head. The face plate may further include a fabric sheet coupled with the support member, so that the fabric sheet is configured to contact an ice surface to generate heat from friction between the fabric sheet and the ice surface. Additionally, the face plate may have at least one insulating and reflective component, where the at least one insulating and reflective component is configured to reflect at least a first portion of the heat, and where the at least one insulating and reflective component is further configured to maintain at least a second portion of the heat proximate the ice surface.



ABSTRACT

A face plate for a curling broom and a curling broom having the same are provided. The face plate may have a support member configured to engage a curling broom head. The face plate may further include a fabric sheet coupled with the support member, so that the fabric sheet is configured to contact an ice surface to generate heat from friction between the fabric sheet and the ice surface. Additionally, the face plate may have at least one insulating and reflective component, where the at least one insulating and reflective component is configured to reflect at least a first portion of the heat, and where the at least one insulating and reflective component is further configured to maintain at least a second portion of the heat proximate the ice surface.

CURLING BROOM FACE PLATE

FIELD OF THE INVENTION

[0001] The present invention is directed to an improved face plate for a curling broom. In particular, the present invention relates to a face plate for a curling broom having reflective, insulating, and/or hydrophobic qualities for improved durability and efficiency.

BACKGROUND

[0002] In the sport of curling, participants slide a curling stone, or "rock," along a sheet of ice towards a target area. Typically, two sweepers will use curling brooms to sweep the ice directly in front of the rock in order to smooth the ice surface and control the trajectory of the rock. Curling brooms work by melting a thin layer of ice along the path of the rock that subsequently refreezes into a smoother sliding surface. This sweeping technique may be used to cause the rock to travel farther, or to change the curl of the rock.

[0003] Originally, curling brooms were simple, household straw brooms, and as technology improved, the brooms became increasingly sophisticated. Modern curling brooms use a flatter, more elongated head in order to contact the ice surface more efficiently and generate more heat to melt the ice. The strength, stamina, and skill of the curler determine how effectively the sweeping action controls the trajectory of the rock. Thus, weaker individuals, such as young, elderly, or disabled persons, cannot typically generate enough heat to effectively smooth the ice surface. These existing curling brooms also tend to decline in performance during their lifespan because of wear and dirt buildup on the outer surface of the fabric.

[0004] In some instances, more advanced compounds and materials have been used to improve the performance of the curling brooms. For example, U.S. 8,677,548 discloses a curling broom head having a metallic layer for reflecting infrared radiation generated during the sweeping process towards the ice. However, this design also suffers from substantial heat losses due to convection and conduction. Moreover, these reflectors may unevenly concentrate the small amount of radiation that they do reflect, which may lead to poor performance. Even these newer designs are unable to provide adequate efficiency to allow weaker curlers to effectively participate in the

sport. Moreover, professional curlers would also gain a competitive edge with a more efficient and more durable curling broom.

[0005] Through applied effort, ingenuity, and innovation, many of these identified problems have been solved by developing solutions that are included in embodiments of the present invention, many examples of which are described in detail herein.

SUMMARY OF THE INVENTION

[0006] In order to solve the problems detailed above, and provide further benefits over existing curling broom face plates, embodiments of the present invention include various face plates for curling brooms and curling brooms including such a face plate.

[0007] In some embodiments, a face plate for a curling broom head may be provided that includes a support member configured to engage a curling broom head. The face plate may include a fabric sheet coupled with the support member. The fabric sheet may be configured to contact an ice surface to generate heat from friction between the fabric sheet and the ice surface. The face plate may include at least one insulating and reflective component. In some embodiments, the at least one insulating and reflective component may be configured to reflect at least a first portion of the heat. The at least one insulating and reflective component may be further configured to maintain at least a second portion of the heat proximate the ice surface.

[0008] In some embodiments, the at least one insulating and reflective component may be disposed between the support member and the fabric sheet. In some embodiments, the at least one insulating and reflective component comprises a ceramic ingredient. The at least one insulating and reflective component may comprise a ceramic layer. Some embodiments of the ceramic layer may comprise a ceramic film or fabric. In some embodiments, the at least one insulating and reflective component comprises a ceramic coating on the support member proximate the fabric sheet. The at least one insulating and reflective component may comprise a ceramic coating on the fabric sheet. In some embodiments, the ceramic coating may be disposed opposite an outer surface of the fabric sheet, and wherein the outer surface of the fabric sheet is configured to contact the ice surface.

[0009] In some embodiments, the support member may include the at least one insulating and reflective component, such that the support member at least partially comprises a ceramic ingredient. In some embodiments, the fabric sheet may include

the at least one insulating and reflective component, such that the fabric sheet at least partially comprises a ceramic ingredient.

[0010] In some embodiments of the present invention, the fabric sheet may be hydrophobic, such that the fabric sheet is configured to repel water. The fabric sheet may be coated with a combination of polyurethane and polyvinyl chloride. In some embodiments, the support member may comprise a rigid plate and a pad, such that the pad is disposed at least partially between the rigid plate and the fabric sheet.

[0011] In another embodiment of the present invention, a curling broom may be provided that includes a handle, a broom head disposed at one end of the handle, and a face plate fastened to the broom head. Some embodiments of the face plate may include a support member configured to engage a curling broom head. The face plate may also include a fabric sheet coupled with the support member. The fabric sheet may be configured to contact an ice surface to generate heat from friction between the fabric sheet and the ice surface. The face plate may include at least one insulating and reflective component. The at least one insulating and reflective component may be configured to reflect at least a first portion of the heat. The at least one insulating and reflective component may be configured to maintain at least a second portion of the heat proximate the ice surface. In some embodiments, the at least one insulating and reflective component may be disposed between the support member and the fabric sheet. The at least one insulating and reflective component may comprise a ceramic layer. In some embodiments, the ceramic layer may comprise a ceramic film or fabric.

[0012] In some embodiments of the present invention, the fabric sheet may be hydrophobic, such that the fabric sheet may be configured to repel water. The fabric sheet may be coated with a combination of polyurethane and polyvinyl chloride.

[0013] In some embodiments, the support member may comprise a rigid plate and a pad, such that the pad may be disposed at least partially between the rigid plate and the fabric sheet.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] Having thus described the disclosure in general terms, reference will now be made to the accompanying drawings, which are not necessarily drawn to scale, and wherein:

- [0015] FIG. 1 shows a front view of a curling broom having a face plate in accordance with an embodiment of the present invention;
- [0016] FIG. 2 shows an exploded view of the curling broom of FIG. 1;
- [0017] FIG. 3 shows a cross-sectional view of a face plate for a curling broom in accordance with an embodiment of the present invention;
- [0018] FIG. 4 shows a cross-sectional view of a face plate for a curling broom in accordance with an alternative embodiment of the present invention;
- [0019] FIG. 5 shows a cross-sectional view of a face plate for a curling broom in accordance with an alternative embodiment of the present invention; and
- [0020] FIG. 6 shows a cross-sectional view of a face plate for a curling broom in accordance with an alternative embodiment of the present invention.

DETAILED DESCRIPTION

[0021] The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in which some, but not all embodiments of the present invention are shown. Indeed, the present invention may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will satisfy applicable legal requirements. As used herein, terms such as “front,” “back,” “left,” “right,” “top,” “bottom,” “upper,” or “lower” are included for example purposes to show only a relative location of certain features and should not be construed to limit the scope of the invention to a single direction. Like numbers refer to like elements throughout.

[0022] Embodiments of the present invention may include reflective, insulating, and/or hydrophobic components, which may improve the efficiency and durability of a curling broom face plate.

[0023] Curling brooms are swept across the ice surface to generate heat. Heat may be caused by the friction between the broom and the ice surface that heats both surfaces and thereby melts the ice. The heat may transfer from the interface between the ice surface and the contacting surface of the broom to cooler regions near the two surfaces. Heat may transfer in the form of radiated heat or electromagnetic waves, such as infrared radiation. However, heat may also transfer through direct contact (e.g., conduction) or indirectly through the air or water (e.g., convection). In some

instances, heat loss due to conduction or convection may be greater than heat loss due to thermal radiation.

[0024] Some embodiments of the present invention may utilize one or more reflectors and one or more insulators to reduce or prevent heat losses from these causes. The reflectors may reflect radiated heat, such as infrared radiation, back towards the ice surface in order to improve heat retention and aid with melting the ice. The insulators may further prevent heat losses by concentrating the heat close to the ice surface. The insulators may also promote better heat distribution across the ice surface by preventing heat losses in a direction away from the ice but allowing the heat to transfer parallel to the plane of the ice surface. In this manner, the present invention may improve the sweeping efficiency of the broom by distributing the heat across the entire face plate of the broom, while keeping the heat concentrated near the ice surface.

[0025] Some embodiments of the present invention include a face plate for a curling broom having one or more components with both insulating and reflecting properties. For example, the at least one insulating and reflecting component of the present invention may be one or more ceramic components that both reflect thermal radiation and insulate the ice surface to prevent heat losses during sweeping. In some embodiments, the ceramic components may reflect more than 50% of the incident thermal radiation. Additionally or alternatively, the ceramic components may be configured to allow visible light to pass through while still reflecting infrared-wavelength radiation. As discussed in further detail below, the one or more ceramic components may include a ceramic film or sheet attached to the curling broom, a ceramic powder or ingredient formed into various components of the curling broom, or a ceramic plasma, coating, laminate, or paint applied to various components of the curling broom. In these embodiments, the ceramic components may be made of ceramic or nano-ceramic particles or fibers, and the ceramic components may be provided alone or combined with other materials. In some embodiments, for example, the ceramic components may include titanium nitride and/or titanium oxides either alone or in combination with other ingredients.

[0026] With reference to FIG. 1, a curling broom 1 according to the present invention may include a handle 3 connected to a broom head 5. A user may grasp the handle 3 to perform a sweeping motion with the broom 1. In some embodiments, a face plate 7 may be attached to the bottom of the broom head 5 via one or more

attachment screws 11, such that pressure applied to the broom handle 3 is transferred to the face plate 7 via the broom head. The face plate 7 may be configured to contact the ice surface 2 while the user is performing the sweeping motion, and the face plate 7 may have an outer fabric layer 9 for contacting the ice surface. In some embodiments, the junction between the handle 3 and the broom head 5 may allow the head to pivot with respect to the handle, for example using a hinge or universal joint, so that the face plate 7 remains flush with the ice surface 2. Allowing the broom head 5 to pivot relative to the handle 3 may ensure that the face plate 7 remains flush against the ice surface 2 throughout the entire range of motion of the broom handle, and may ensure that the ceramic component 21 (shown in FIGS. 2-6) is held close to the ice surface.

[0027] The curling broom head 5 may be any desired shape. For example, the embodiment shown in FIG. 2 depicts a partly oval shaped head, and the broom head may alternatively be completely oval shaped. The curling broom head 5 may also be, for example, at least partly rectangular, circular, or ellipsoidal in shape. In one example embodiment, the broom head may be an oval approximately 8.75 inches (~ 220 mm) along a longitudinal axis and approximately 2.58 inches (~ 66 mm) along a transverse axis.

[0028] Referring to FIG. 2, an exploded view of a curling broom 1 is shown in accordance with some embodiments of the present invention. The curling broom head 5 may attach to the face plate 7 (shown in FIG. 1) via one or more screws 11. The face plate 7 may define a support member 17, 19, at least one reflecting and insulating component 21, and a fabric sheet 9.

[0029] In some embodiments the support member 17, 19 may include holes 15 for engaging the screws 11. The support member 17, 19 may include one or more layers of material having different properties in order to optimize performance. For example, in the embodiment shown in FIG. 2, the support member includes a rigid plate 17 and a cushion layer 19. The rigid plate 17 may be made of a wood, polymer, metal, or other similar material and may provide the face plate 7 with additional rigidity. The cushion layer 19 may be constructed of a foam material or other material softer than the rigid plate 17. The cushion layer 19 may improve the contact of the curling broom with the ice surface by deforming to the contour of the ice so as to apply even pressure across the entire face plate. The density of the cushion layer 19 may be configured to maximize the heat generated from sweeping.

[0030] In some embodiments, the cushion layer 19 may be adhered or fastened to the rigid plate or may engage the screws 11. For example, with reference to FIG. 3, one embodiment of the screws 11 (shown in FIG. 2) may extend through the holes 15 in the rigid plate 17 and engage the cushion layer 19. In some alternative embodiments, the cushion layer 19 may be held at least partially within the face plate 7 by the outer fabric sheet 9. As described in greater detail below, the fabric sheet 9 may form the outer covering of the face plate 7 and may firmly engage the rigid plate 17 and/or the broom head 5 to hold the internal components of the face plate in place.

[0031] In some alternative embodiments, the support member 17, 19 may be a single plate of sufficient rigidity to firmly secure the face plate 7 to the broom head 5, while also being soft enough to smooth the ice effectively. In yet some other alternative embodiments, the support member may be a single plate with varying stiffness along its thickness such that the bottom of the support member is softer than the top.

[0032] The rigid plate 17 may have a shape similar to that of the broom head 5. Likewise the cushion layer 19 may be shaped similarly to the rigid plate 17 and/or broom head 5. In some embodiments, the face plate 7 may be tapered or may vary in shape. For example, with reference to FIG. 3, the cushion layer 19 may be tapered to allow the fabric 9 to wrap around the face plate 7 more securely. In some embodiments, the support layer 17, 19 may additionally or alternatively be configured to deform when the fabric 9 is pulled taught into a naturally curved shape.

[0033] In some embodiments, the support member, including the rigid plate 17 and/or the cushion layer 19 may have the same longitudinal and transverse dimensions as the broom head 5 but may vary in thickness. In some embodiments the rigid plate 17, cushion layer 19, and/or broom head 5 may be approximately the same thickness. For example, in some embodiments, the cushion layer 19 may be approximately .5 inches (~ 12 mm) thick and may have a density of approximately 1.5 lb/ft³ (~ 24 kg/m³).

[0034] In some embodiments, the fabric sheet 9 may be formed of nylon, polyester, polyethylene, or other polymeric or synthetic material. The fabric sheet 9 may be woven from 100 to 600 denier fibers of such material.

[0035] In the embodiments shown in FIGS. 2-3, a separate ceramic layer 21 is shown, such as a ceramic film. Embodiments of the ceramic film may include a polymer substrate with a ceramic component deposited thereon. In some

embodiments, the ceramic film may include one or more layers of ceramic material, and may include additional layers of various compositions. For example, in some embodiments, the ceramic film may include one or more ceramic layers, an anti-abrasion layer, and/or an anti-corrosion layer. In some embodiments, the ceramic film may include at least two layers of ceramic material in order to provide improved performance. Additionally or alternatively, the thickness of each layer may be varied to achieve the desired reflectivity and insulating properties. In some alternative embodiments, the ceramic layer may include a ceramic fabric.

[0036] The ceramic layer 21 may be attached to either or both of the fabric sheet 9 and the support member 17, 19. In some embodiments, the ceramic layer 21 may be adhered or laminated to at least the bottom of the cushion layer 19 of the support member 17, 19. In some other embodiments, the ceramic layer 21 may additionally or alternatively be adhered or laminated to the inner surface of the fabric sheet 9. The ceramic layer 21 may additionally or alternatively be attached to the rigid plate 17, such as by staples. Alternatively, the ceramic layer 21 may be held in place by tension created by the fabric 9 being pulled tight and attached to the support member 17, 19.

[0037] While FIG. 2 depicts the fabric sheet 9 and ceramic layer 21 as a rectangular shape, the fabric and ceramic sections may be any shape. With reference to FIG. 3, the shape of the fabric 9 and ceramic 21 portions may be cut to a size that fits the face plate 7. For example, the fabric 9 and ceramic 21 sheets may be attached, such as by sewing or stapling, to attachment points 23 on the rigid plate 17. The ceramic layer 21 may either be fastened with the fabric layer 9 or may be a smaller piece of material that does not reach the attachment points 23. For example, in some embodiments, the ceramic layer 21 may only cover the flat bottom surface of the cushion layer 19. As described above, the ceramic layer 21 may be held by numerous attachment means including, but not limited to, adhesion, lamination, pressure of the fabric layer, and/or staples.

[0038] The connection between the rigid plate 17 and the fabric 9 and/or ceramic 21 layers may be strengthened by sandwiching the ends of the layers 9, 21 between the rigid plate 17 and the broom head 5 (shown in FIGS. 1-2). As shown in FIG. 1, in some embodiments, the fabric layer 9 may be held between the top of the rigid plate 17 and the bottom of the broom head 5 in order to hold the face plate 7 securely together. Referring again to FIG. 3, the screws 11 (shown in FIGS. 1-2) may engage

at least the rigid plate 17 at the holes 15 in order to hold the fabric 9 and/or ceramic 21 layers in place.

[0039] With reference to FIG. 4, an alternative embodiment is shown in which the at least one reflective and insulating component is integrated with other components in the broom head 5 and/or face plate 7. For example, the ceramic component may be integrated with either or both of the support member 17, 19 and the fabric sheet 9. For example, in some embodiments, the cushion layer 19 of the face plate 7 may contain a ceramic powder mixed into a foam padding or may include a suspension of ceramic particles in the foam padding. Similarly, the fabric layer 9 may be woven at least partially with a ceramic fiber. By integrating the ceramic ingredient into the components of the face plate 7, assembly and maintenance of the broom head 5 and face plate may be simplified. This technique may be used concurrently with or as an alternative to the ceramic layer 21 shown in FIGS. 3, 5 and 6.

[0040] FIG. 5 depicts an embodiment of the present invention in which the at least one reflective and insulating component 21 is coated, painted, or laminated to the cushion layer 19. In this embodiment, for example, a ceramic coating 21 may be applied to the cushion layer 19 in order to create a layer of reflective and insulating material along at least the bottom of the cushion layer. As detailed above with respect to the ceramic film, multiple layers of ceramic material may be used, and other layers such as anti-corrosion and/or anti-abrasion layers may also be applied.

[0041] FIG. 6 depicts an alternative embodiment of the present invention in which the at least one reflective and insulating component 21 is coated, painted, or laminated to the inside of the fabric layer 9. The coating 21 may be applied to the inside of the fabric layer 9 (e.g., the portion facing the cushion layer 19), to the outside of the fabric layer (e.g., the portion configured to contact the ice), or both. Similarly, in some embodiments, the fabric layer may be soaked or coated in a ceramic component 21 so that the entire fabric layer has an insulating and reflective property. As detailed above with respect to the ceramic film, multiple layers of ceramic material may be used, and other layers such as anti-corrosion and/or anti-abrasion layers may also be applied.

[0042] In some embodiments of the present invention, the at least one reflective and insulating component 21 may be placed as close to the ice surface as possible. In order to protect the fabric sheet 9 and the at least one reflective and insulating component 21, and to allow the curling broom to be cleaned more easily, a

hydrophobic coating may be applied to the face plate 7. In some embodiments, the fabric sheet 9 may be constructed from and/or coated with a hydrophobic substance in order to prevent water and debris from damaging the curling broom. In some embodiments, the outer surface of the fabric sheet 9 (e.g., the surface facing the ice surface) may have a hydrophobic coating. For example, in the embodiment shown in FIG. 6, the outer surface of the fabric sheet 9 may have a hydrophobic coating, while the inside surface of the fabric sheet may have a ceramic coating 21. In this example, manufacturing may be simplified by applying each of the coatings to the fabric layer 9 before assembly. Additionally or alternatively, the inner surface of the fabric sheet 9 may be coated with a hydrophobic substance. The coating may give the surface of the face plate 7 a static water contact angle of between 100 and 160 degrees.

[0043] In contrast to traditional waterproofing, which merely prevents water from entering the face plate, hydrophobic curling broom face plates may resist wetting on the surface of the face plate as well. A hydrophobic fabric sheet 9 may allow the fabric to be easily wiped clean by the user and may protect the face plate 7 from wear and water damage. Moreover, the hydrophobic coating may be applied with or without antistatic additives.

[0044] In some embodiments, the hydrophobic properties of the fabric sheet 9 may be created using one or more hydrophobic materials including polyurethane, polyvinyl chloride (PVC), various waterproofing polymers, polysiloxanes, silicones, fluorocarbons, sol-gel coatings of titania, or proteins having a hydrophobic static water contact angle of 100 to 160 degrees. As discussed above, the fabric 9 may be treated with these hydrophobic coatings and/or the fabric itself may be composed of hydrophobic fibers.

[0045] In some embodiments, the fabric 9 may be double coated with hydrophobic coatings. In some embodiments, the same coating may be applied twice. This may serve to reduce the gaps between fibers in the fabric 9 and may limit the amount of dirt and water that collects in the fabric. The double coating may also allow a user to clean the fabric more easily, for example, by wiping the fabric 9 clean with their hand.

[0046] In some further embodiments, the fabric 9 may be coated with multiple, distinct coatings. For example, the fabric 9 in some embodiments of the present invention may be coated with a combination of polyurethane and PVC. In some embodiments, the fabric sheet 9 may be first coated with a polyurethane layer and

then coated a second time with PVC. The combination of polyurethane and PVC may amplify the hydrophobic properties of the fabric 9 while also reducing the fabric's porosity. Reducing porosity can make the face plate 7 easier to clean and can help keep it clean longer.

[0047] Many modifications and other embodiments of the invention set forth herein will come to mind to one skilled in the art to which this invention pertains having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. Therefore, it is to be understood that the invention is not to be limited to the specific embodiments disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for purpose of limitation.

WHAT IS CLAIMED IS:

1. A face plate for a curling broom head, the face plate comprising:
a support member configured to engage a curling broom head;
a fabric sheet coupled with the support member, wherein the fabric sheet is
configured to contact an ice surface to generate heat from friction
between the fabric sheet and the ice surface; and
at least one insulating and reflective component, wherein the at least one
insulating and reflective component is configured to reflect at least a
first portion of the heat, and wherein the at least one insulating and
reflective component is further configured to maintain at least a second
portion of the heat proximate the ice surface.
2. The face plate of Claim 1, wherein the at least one insulating and reflective
component is disposed between the support member and the fabric sheet.
3. The face plate of Claim 1, wherein the at least one insulating and reflective
component comprises a ceramic ingredient.
4. The face plate of Claim 1, wherein the at least one insulating and reflective
component comprises a ceramic layer.
5. The face plate of Claim 4, wherein the ceramic layer comprises a ceramic film
or fabric.
6. The face plate of Claim 1, wherein the at least one insulating and reflective
component comprises a ceramic coating on the support member proximate the
fabric sheet.
7. The face plate of Claim 1, wherein the at least one insulating and reflective
component comprises a ceramic coating on the fabric sheet.
8. The face plate of Claim 7, wherein the ceramic coating is disposed opposite an
outer surface of the fabric sheet, and wherein the outer surface of the fabric
sheet is configured to contact the ice surface.
9. The face plate of Claim 1, wherein the support member includes the at least
one insulating and reflective component, such that the support member at least
partially comprises a ceramic ingredient.
10. The face plate of Claim 1, wherein the fabric sheet includes the at least one
insulating and reflective component, such that the fabric sheet at least partially
comprises a ceramic ingredient.

11. The face plate of Claim 1, wherein the fabric sheet is hydrophobic, such that the fabric sheet is configured to repel water.
12. The face plate of Claim 11, wherein the fabric sheet is coated with a combination of polyurethane and polyvinyl chloride.
13. The face plate of Claim 1, wherein the support member comprises a rigid plate and a pad, such that the pad is disposed at least partially between the rigid plate and the fabric sheet.
14. A curling broom comprising:
 - a handle;
 - a broom head disposed at one end of the handle; and
 - a face plate fastened to the broom head, the face plate comprising:
 - a support member configured to engage a curling broom head;
 - a fabric sheet coupled with the support member, wherein the fabric sheet is configured to contact an ice surface to generate heat from friction between the fabric sheet and the ice surface; and
 - at least one insulating and reflective component, wherein the at least one insulating and reflective component is configured to reflect at least a first portion of the heat, and wherein the at least one insulating and reflective component is further configured to maintain at least a second portion of the heat proximate the ice surface.
15. The curling broom of Claim 14, wherein the at least one insulating and reflective component is disposed between the support member and the fabric sheet.
16. The curling broom of Claim 14, wherein the at least one insulating and reflective component comprises a ceramic layer.
17. The curling broom of Claim 16, wherein the ceramic layer comprises a ceramic film or fabric.
18. The curling broom of Claim 14, wherein the fabric sheet is hydrophobic, such that the fabric sheet is configured to repel water.
19. The curling broom of Claim 18, wherein the fabric sheet is coated with a combination of polyurethane and polyvinyl chloride.

20. The curling broom of Claim 14, wherein the support member comprises a rigid plate and a pad, such that the pad is disposed at least partially between the rigid plate and the fabric sheet.

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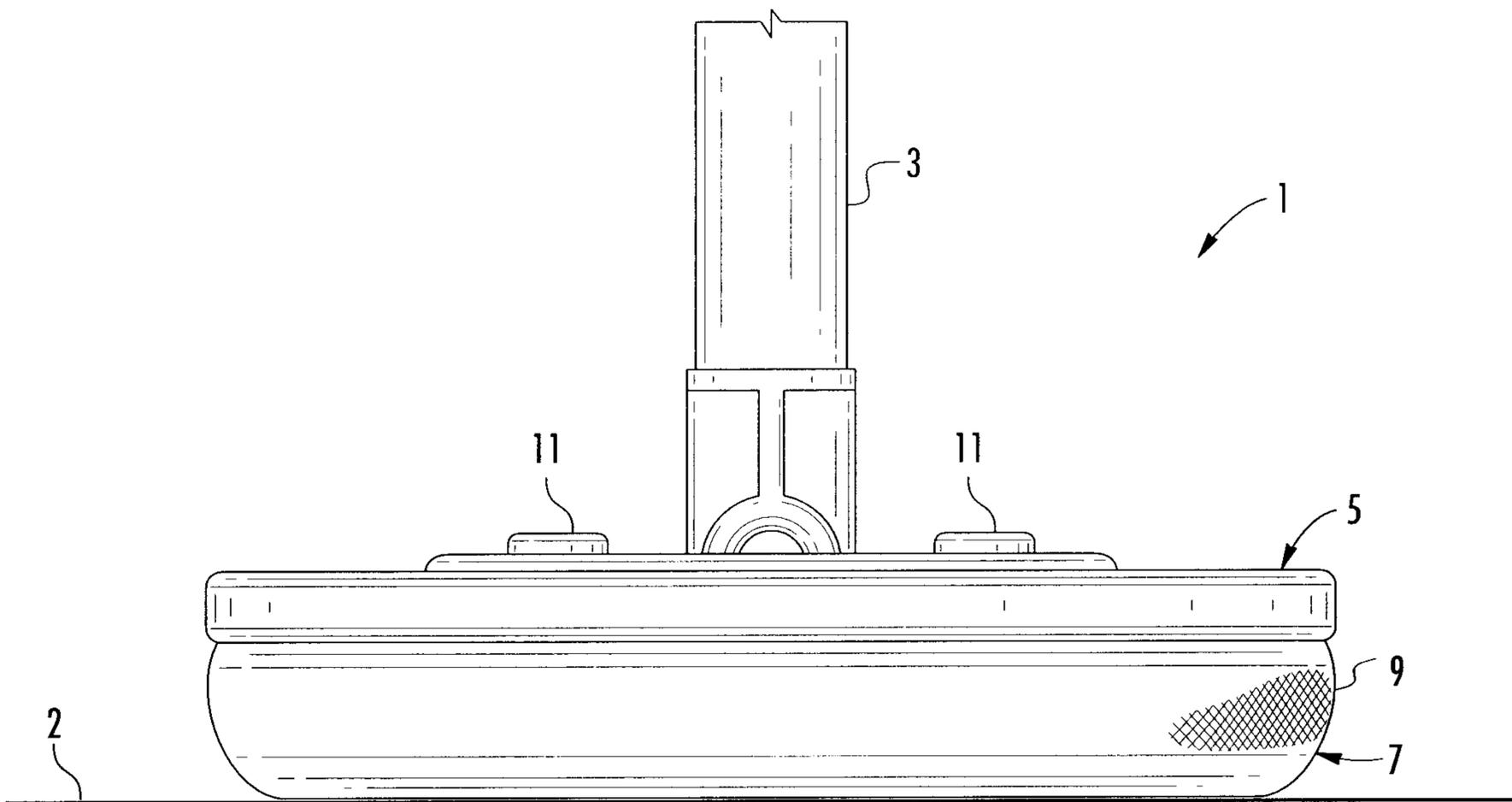


FIG. 1

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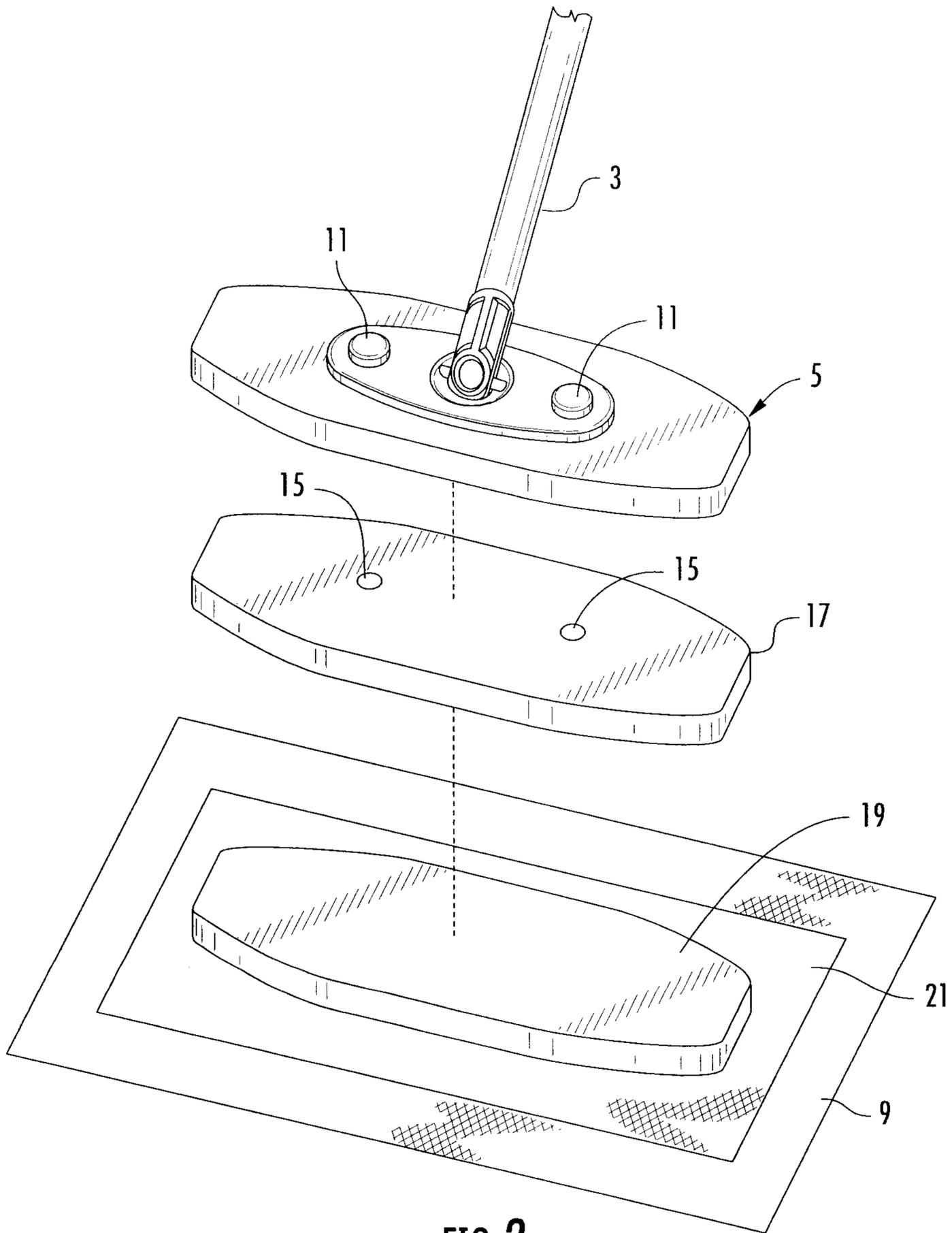


FIG. 2

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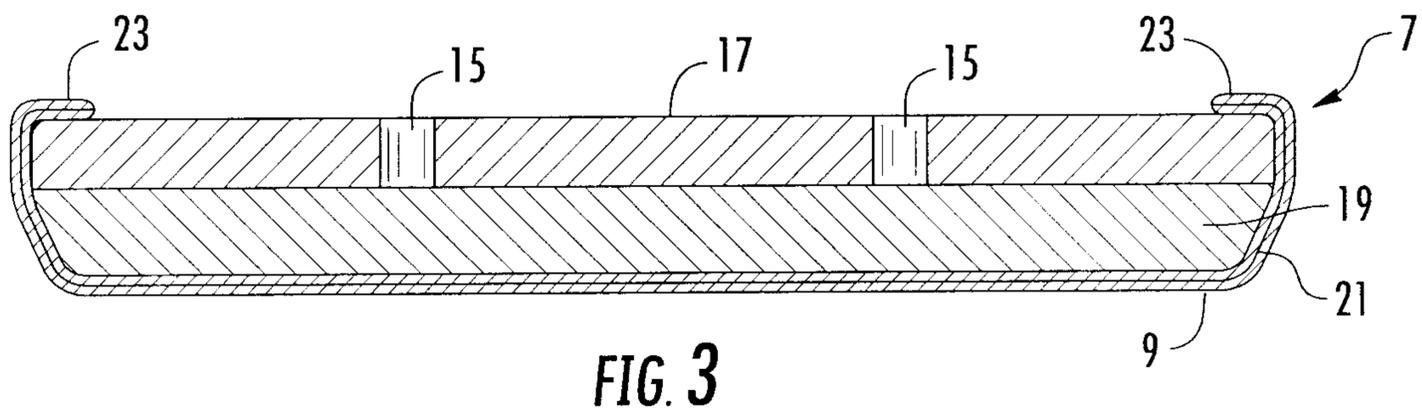


FIG. 3

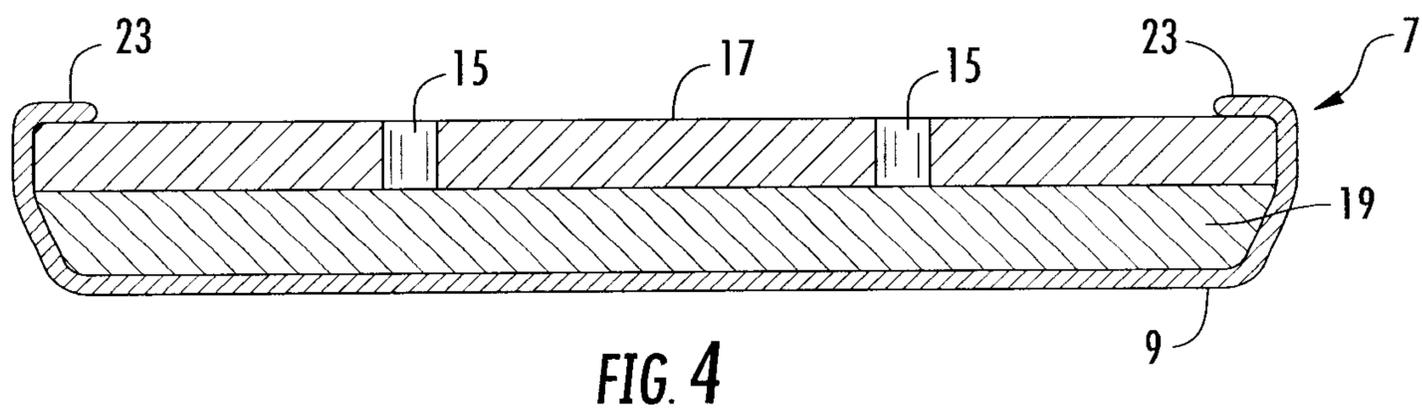


FIG. 4

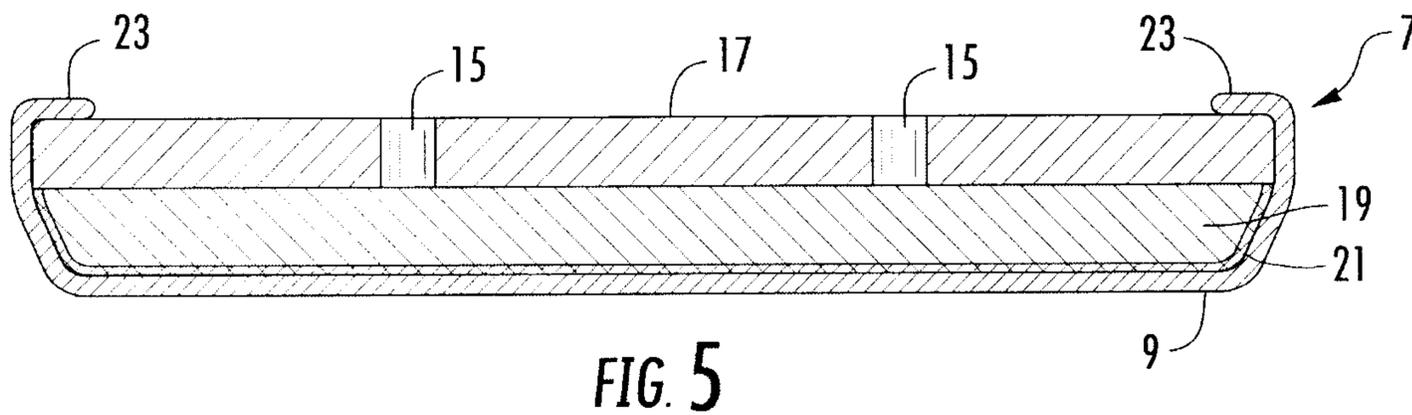


FIG. 5

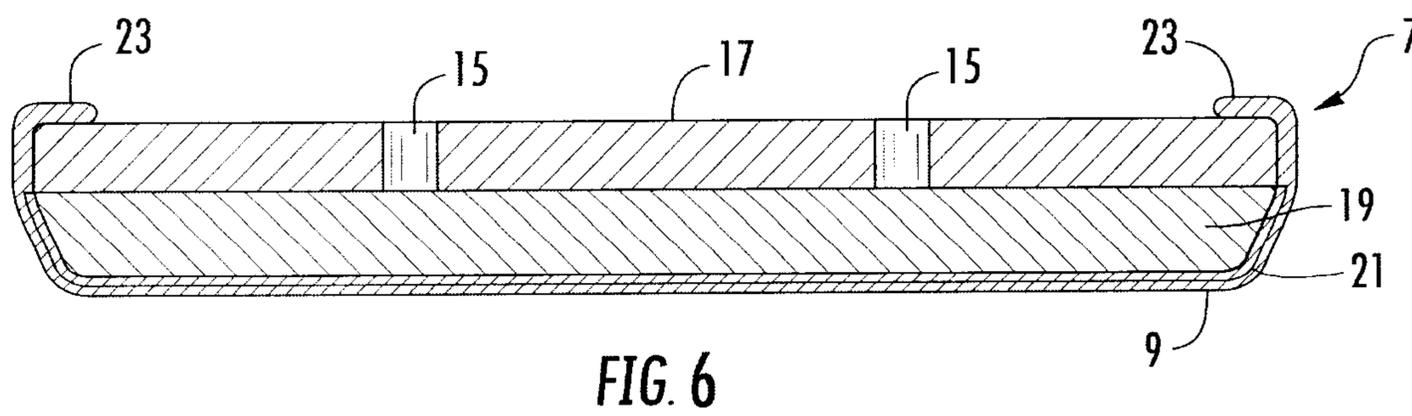


FIG. 6

