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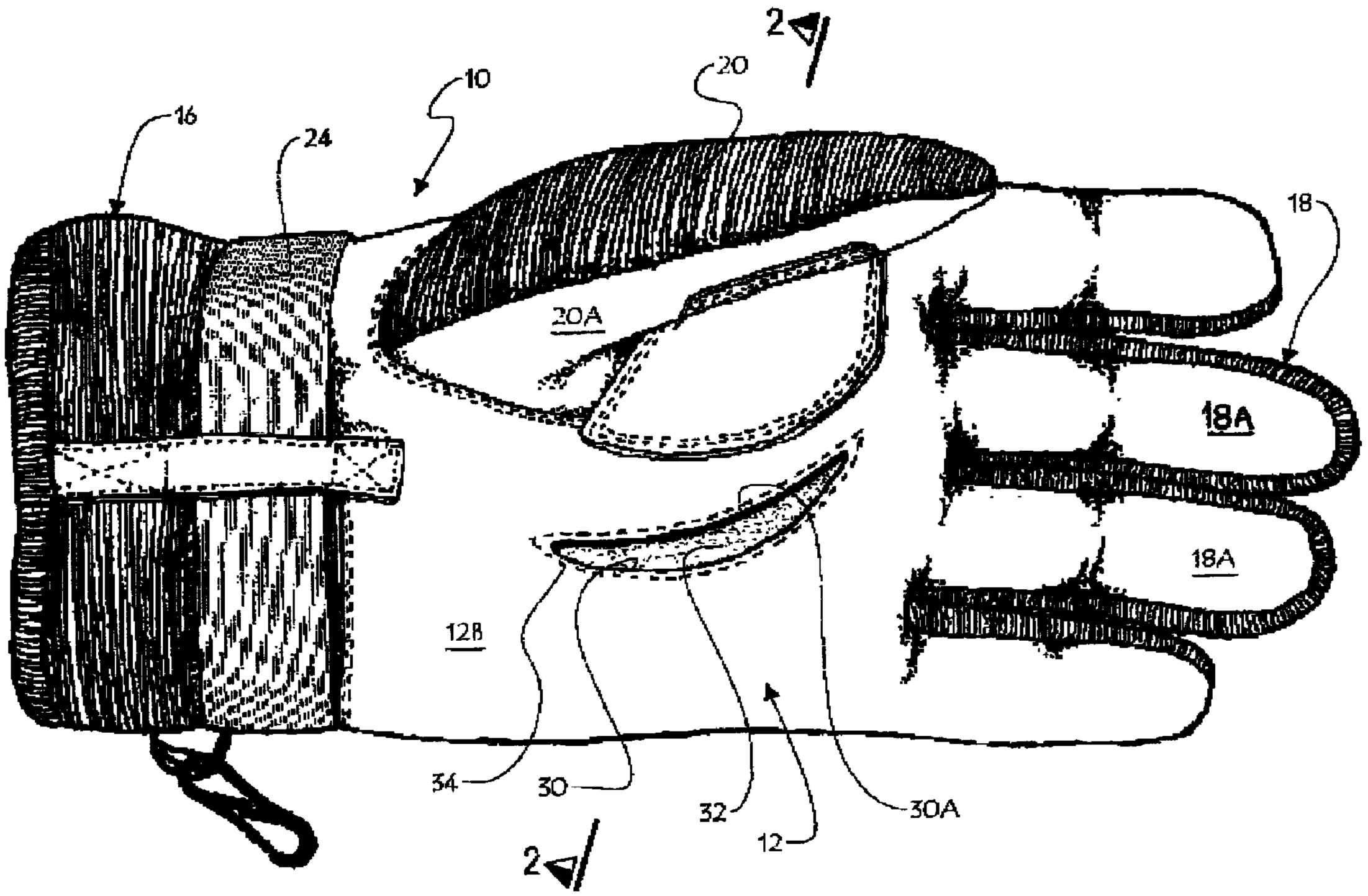
(54) Titre : GANT D'HIVER ISOLE A FENETRE DE RESPIRATION DANS LA PAUME
(54) Title: INSULATED WINTER GLOVE WITH AIR-BREATHING WINDOW IN PALM



(57) Abrégé/Abstract:
A thermally insulated hand glove for use in sporting activities. The hand glove has a main body for enclosing a user's hand, with a palm area having an exposed wall surface being substantially waterproof. A window aperture is made in a fraction of the palm area.

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(57) Abrégé(suite)/Abstract(continued):
A moisture permeable stretchable membrane is applied to fully close the window aperture, so as to provide an air vent system integral to the palm area for promoting moisture outflow generated from the user's hand palm perspiration outwardly from said glove main body, while controlling accidental moisture inflow seepage from outside weather conditions. The stretchable nature of the arcuate membrane pad biases the thumb finger part of the glove to a tilted location overhanging spacedly over the window, thus reducing the likelihood of accidental access of water or snow to the non waterproof membrane pad covering the window.

ABSTRACT

A thermally insulated hand glove for use in sporting activities. The hand glove has a main body for enclosing a user's hand, with a palm area having an exposed wall surface being substantially waterproof. A window aperture is made in a fraction of the palm area. A moisture permeable stretchable membrane is applied to fully close the window aperture, so as to provide an air vent system integral to the palm area for promoting moisture outflow generated from the user's hand palm perspiration outwardly from said glove main body, while controlling accidental moisture inflow seepage from outside weather conditions. The stretchable nature of the arcuate membrane pad biases the thumb finger part of the glove to a tilted location overhanging spacedly over the window, thus reducing the likelihood of accidental access of water or snow to the non waterproof membrane pad covering the window.

TITLE: INSULATED WINTER GLOVE WITH AIR-BREATHING WINDOW IN PALM

FIELD OF THE INVENTION

This invention relates to thermally insulated hand gloves for performing sporting activities in sub-freezing weather conditions.

BACKGROUND OF THE INVENTION

In subpolar countries such as Canada and Russia where wintertime weather conditions are harsh and can bring the outdoor temperatures down well below water freezing point, it is important during winter season to have proper thermally insulated garments if one is to stay outside for any length of time. When it becomes very cold, for example -30° Celsius or less, the body extremities (hands and feet) can in a matter of minutes begin to sustain chillblains unless the full of a person's body is very well insulated thermally in proper garments. Those active in winter sports, such as cross-country skiing, or alternately workers that work outdoors during winter time such as forestry workers, have the added problem of having to deal with moisture from perspiration generated from the skin by the physical exercise they generate during their sporting activities. This perspiration borne moisture can become trapped between the skin and the layers of insulating garments, if the garment does not allow selective outflow escape of moisture. This is usually not a major problem with a person's trunk or limbs (arms or legs), because the interior garment layer is usually a moisture absorbing material such as cotton. However, there is a problem with hand gloves in this respect.

It is recognized in the field that more body heat needs to be generated to warm up a body portion when perspiration borne moisture has been allowed to condense into a liquid volume that builds up over the person's skin. This condensate effectively introduces a "chill" to the person, affecting not only the thermal balance of his body but also his comfort.

Perspiration in hands is greatest at the palm area. Prior art hand gloves for sports activities in above-freezing temperatures have long ago included perforations or apertures at the single layered palm area of the gloves to enable evacuation of perspiration moisture from the hand. However, for multiple-layered insulated gloves for sports activities in below freezing temperatures, it is an entirely different matter. Indeed and unfortunately, most winterized hand gloves on the market comprise a palm area which is made from a waterproof material, usually natural leather (expensive and more supple and comfortable) or synthetic leather (cheaper and less durable). Condensation at a skier's hand palm is a leading cause of hand chill and discomfort, and eventual chillblains. Untreated, a chillblain of the hand can lead to amputation of one or more fingers, or worse.

OBJECTS OF THE INVENTION

The gist of this invention is therefore to improve thermal efficiency of winter hand gloves.

A corollary object of this invention is to improve upon user's comfort in winter hand gloves.

SUMMARY OF THE INVENTION

In accordance with the objects of the invention, there is disclosed a thermally insulated hand glove for use in sporting activities. The hand glove has a main body for enclosing a user's hand, with a palm area having an exposed wall surface being substantially waterproof. A window aperture is made in a fraction of the palm area. A moisture permeable stretchable membrane is applied to fully close the window aperture, so as to provide an air vent system integral to the palm area for promoting moisture outflow generated from the user's hand palm perspiration outwardly from said glove main body, while controlling accidental moisture inflow seepage from outside weather conditions. The stretchable nature of the arcuate membrane pad biases the thumb finger part of the glove to a tilted location overhanging spacedly over the window, thus reducing the likelihood of accidental access of water or snow to the non waterproof membrane pad covering the window.

More specifically, in a preferred embodiment of the invention, there is disclosed a winter glove comprising: a) a hand glove main body generally defining a palm wall, a back wall opposite said palm wall, a fingers' portion, and a wrist portion, said palm wall defining an interior face and an exterior exposed face, at least said palm wall exposed face being made from a substantially water-proof material, wherein a hand enclosure is formed for snugly receiving within said glove main body a user's hand, said fingers' portion including a thumb portion offset intermediately between said wrist portion and the remaining fingers of said fingers' portion; b) an open window, made

through a fraction of said palm wall in general transverse register with said thumb portion; c) a hydrophobic mesh sheet, fixedly applied to said palm wall and sized to fully cover said open window, said mesh sheet for enabling free outflow escape of moisture from the user's hand palm perspiration; and d) a thermal insulation sheath, loosely mounted inside said hand enclosure and freely abutting against at least said palm wall interior face, said insulation sheath enabling free moisture-laden air flow to circulate from said hand enclosure outwardly therethrough.

Preferably, said mesh sheet consists of an elastic stretchable membrane.

Said stretchable membrane could be made from a knitted material selected from the group comprising polyester and nylon. Said stretchable membrane could have a thickness ranging between about 0,3 and 1,0 millimetre. The peripheral edge portion of the stretchable membrane could be fixedly secured against a marginal portion of said interior face of said palm wall surrounding said open window, wherein said stretchable membrane extends in interiorly offset fashion relative to said palm wall. Said insulation sheath may be made from synthetic fibres.

Said open window could form a quarter moon shape having a concave side generally facing said thumb portion spacedly therefrom. Also, said palm wall could define a thickness substantially the same as that of said stretchable membrane. The resiliency of said stretchable membrane should preferably be selected to be such as to

effectively bias said thumb portion to a tilted position spacedly overhanging said open window, to at least partly shield said open window from outside weather conditions.

The invention also relates to a thermally insulated hand glove for use in sporting activities, said hand glove having a main body for enclosing a user's hand, said main body including a palm area, said palm area defining an exposed wall surface being substantially waterproof, and air vent means integral to said palm area, said air vent means promoting moisture outflow generated from the user's hand perspiration outwardly from said glove main body while controlling accidental water inflow seepage from outside weather conditions. Said glove main body could then include a thumb finger portion, and said air vent means includes an exposed air flow channel and integral resiliency means, wherein the resiliency of said integral resiliency means is selected to be such as to effectively bias said thumb finger portion to a tilted position spacedly overhanging said air flow channel, to at least partly shield said air flow channel from outside weather conditions.

Preferably, said air vent means includes an open window made into a fraction of said palm area, and a moisture outflow enabling membrane, fixedly secured to said palm area and fully closing said open window, wherein said membrane is interiorly offset relative to said open window.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a plan view of a glove according to a preferred embodiment of the invention, showing in particular the palm area thereof;

Figure 2 is an enlarged cross-sectional view of the glove, at the palm area thereof; and

Figure 3 is an enlarged view of the inside face of sheet assembly of the palm window area of figure 2.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE INVENTION

The hand glove is illustrated in figures 1 and 2 as 10. Glove 10 includes an outer flexible shell having exposed surfaces including a palm wall 12, a back wall 14 opposite the palm wall 12, a wrist area 16, a four fingers area 18 opposite the wrist area 16, and a thumb finger area 20 mounted on the palm area and located intermediate the wrist area 16 and the four fingers area 18. The palm wall 12 and back wall 14 merge with one another for example by lateral stitch lines 19. A thermal insulation sheath 22 is provided inside the glove 10, fitting loosely therein, to provide thermal insulation for the hand of a user, and preferably also for the fingers thereof. The insulating sheath 22 may be loosely attached by stitch lines 21 to the stitched portion 19 of the palm wall 12 with back wall 14, to prevent accidental release of the sheath 22 from the glove 10 outwardly through wrist area 16. The thermal insulation sheath 22 may be made from a synthetic fibre filler, for example from polyester fibres, provided the nature and density of this filler material are such as to enable free outflow of moisture from the inside of the glove 10 through the filler material.

The wrist area 16 preferably includes an elastic band 24, to seal the glove 10 around a user's wrist, so as to prevent accidental escape of warm air generated by the user's hand inside the air pocket enclosure formed inside the glove 10. The interior face of insulation sheath 22 may be covered by a soft cloth sheet 26, for example made from cotton, so that it is the soft cloth sheet 26 and not the insulation sheath 22 that comes into contact with the user's skin, for user's best comfort.

At least the palm face 12, and possibly the coextensive surface areas 18A, 20A, of fingers portion 18, 20, of glove 10 should be made from a substantially waterproof flexible yet sturdy material, for example a leather skin with silicone layered waterproofing treatment. The back face 14 and coextensive surface areas of the fingers portion 18A, 20A, may also be made from the same treated leather skin, or for reduced cost, they could be made from a waterproof nylon sheet.

In accordance with the teachings of the present institution, there is provided an aperture or window 30 in palm area 12. Window 20 is positioned to come in direct register with the user's palm when the glove is inserted fully over his hand. Window 30 is of a shape and size that allows free air outflow across palm wall 12, from the inside of glove 10 toward the outside. Window 30 represents only a fraction of the total surface area of palm area 12, and may have a variety of shapes, for example circular, quadrangular, or the like. However, a preferred shape for window 30 - for a reason outlined below - will be arcuate, and preferably quarter moon shaped, as illustrated in

figure 1, with the concave edge thereof 30A spacedly facing the thumb portion 20 of the glove 10.

As best illustrated in figure 3, a flexible membrane 32 is applied against a fraction of the interior face 12A of palm wall, opposite the exposed face 12B of the palm wall 12. Membrane 32 is sized to to fully close the window opening 30, and is fixedly mounted - for example by stitch lines 34 - to the palm wall interior face 12A at the marginal edge portion of window opening 30. That is to say, the plane of membrane 32 is interiorly offset (toward the inside of glove 10) relative to the plane of marginal edge portions of palm wall 12. Membrane 32 forms an air breathing membrane of such a type as to enable free outflow escape of body generated moisture from the user's hand inside the glove, toward the outside thereof. Membrane 32 facilitates egress of body moisture from the user's palm, while controlling accidental ingress of water, snow, and the like inside the glove 10. The thermal insulation sheath 22 and the window membrane 32 must be able to cooperate with one another in allowing moisture-laden air flow to freely escape from the user's hand palm, through sheath 22 and membrane 32, and outwardly toward ambient air.

Preferably, membrane 32 will be made from an elastically stretchable material. This stretchable membrane should be porous and made from hydrophobic material, preferably polyester or nylon. The thickness of the membrane 32 may range for example between 0,3 to 1,0 mm.

The elasticity of the stretchable membrane 32 brings about at least two important advantages. The first advantage is that membrane 32 provides better comfort for the user, in that the user can open wider his glove covered hand, i.e. the user will be able to tilt more fully his thumb portion 20 laterally outwardly, partly as a function of relative nature and thickness of wall 12 and membrane 32. The second, and more important advantage of membrane 32, is that it does provide an inherent inward bias for the thumb 20 to tilt toward and remain (at rest pre-tensioned condition) in spaced overhanging fashion relative to the window 30; this in turn unexpectedly provides at least a partial shield for the window 30 that at least partially blocks snow, melting ice and the like outdoor element from direct access to the membrane 32 closing the window 30. In any event, there will be a tendency for any ice or water flowing along the waterproof palm area exposed face 12B to simply flow over membrane 32, without engaging the latter (since the membrane 32 is interiorly offset relative to the marginal palm wall portion 12). Membrane 32 may be for example of the same thickness as palm wall 12.

This insulated glove will be of use in subfreezing temperatures for cross-country skiers, downhill skiing, trekkers, and other similar outdoor sporting activities; and for workers in forestry, in building construction sites, or the like work activities.

I CLAIM:

1. A winter glove comprising:

(a) a hand glove main body generally defining a palm wall, a back wall opposite said palm wall, a fingers' portion, and a wrist portion, said palm wall defining an interior face and an exterior exposed face, at least said palm wall exposed face being made from a substantially water-proof material, wherein a hand enclosure is formed for snugly receiving within said glove main body a user's hand, said fingers' portion including a thumb portion offset intermediately between said wrist portion and the remaining fingers' portion;

(b) an open window, made through a fraction of said palm wall in general transverse register with said thumb portion;

(c) a mesh sheet, fixedly applied to said palm wall and sized to fully cover said open window, said mesh sheet for enabling free outflow escape of moisture from the user's hand palm perspiration; and

(d) a thermal insulation sheath loosely mounted inside said hand enclosure and enabling free moisture-laden air flow to circulate from said hand enclosure outwardly therethrough.

2. A winter glove as in claim 1, wherein the mesh sheet is hydrophobic.

3. A winter glove as in one of claims 1 and 2 wherein said thermal insulation sheath freely abuts against at least said palm wall interior face.

4. A winter glove as in any one of claims 1 to 3, wherein said mesh sheet consists of an elastic stretchable membrane.

5. A winter glove as in claim 4, wherein said stretchable membrane is made from a hydrophobic knitted material selected from the group comprising polyester and nylon.

6. A winter glove as in one of claims 4 and 5, wherein said stretchable membrane has a thickness ranging between about 0,3 and 1,0 mm.

7. A winter glove as in any one of claims 4 to 6, wherein said stretchable membrane includes a peripheral edge portion fixedly secured against a marginal edge portion of said interior face of said palm wall surrounding said open window, wherein said stretchable membrane extends in interiorly offset fashion relative to said palm wall.

8. A winter glove as in any one of claims 1 to 7, wherein said insulation sheath is made from synthetic fibers.

9. A winter glove as in any one of claims 1 to 8, wherein said open window forms a quarter moon shape having a concave side generally facing said thumb portion spacedly therefrom.

10. A winter glove as in any one of claims 4 to 9, wherein said palm wall defines a thickness substantially the same as that of said stretchable membrane.

11. A winter glove as in any one of claims 4 to 10, wherein the resiliency of said stretchable membrane is selected to be such as to effectively bias said thumb portion to a tilted position spacedly overhanging said open window, to at least partly shield said open window from outside weather conditions.

12. A thermally insulated hand glove for use in sporting activities, said hand glove having a main body for enclosing a user's hand, said main body including a palm area, said palm area defining an exposed wall surface being substantially waterproof, and air vent means integral to said palm area and including an exposed mesh sheet, said air vent means promoting moisture outflow generated from the user's hand perspiration outwardly from said glove main body while controlling accidental water inflow seepage from outside weather conditions.

13. A hand glove as in claim 12 wherein said glove main body includes a thumb finger portion, and said air vent means includes an exposed arcuate air flow channel and integral resiliency means, wherein the resiliency of said integral resiliency means is selected to be such as to effectively bias said thumb finger portion to a tilted position spacedly overhanging said air flow channel, to at least partly shield said air flow channel from outside weather conditions.

14. A hand glove as in one of claims 12 and 13, wherein said air vent means includes an open window made into a fraction of said palm area, and a moisture outflow enabling membrane, fixedly secured to said palm area and fully closing said open window, wherein said membrane is interiorly offset relative to said open window.

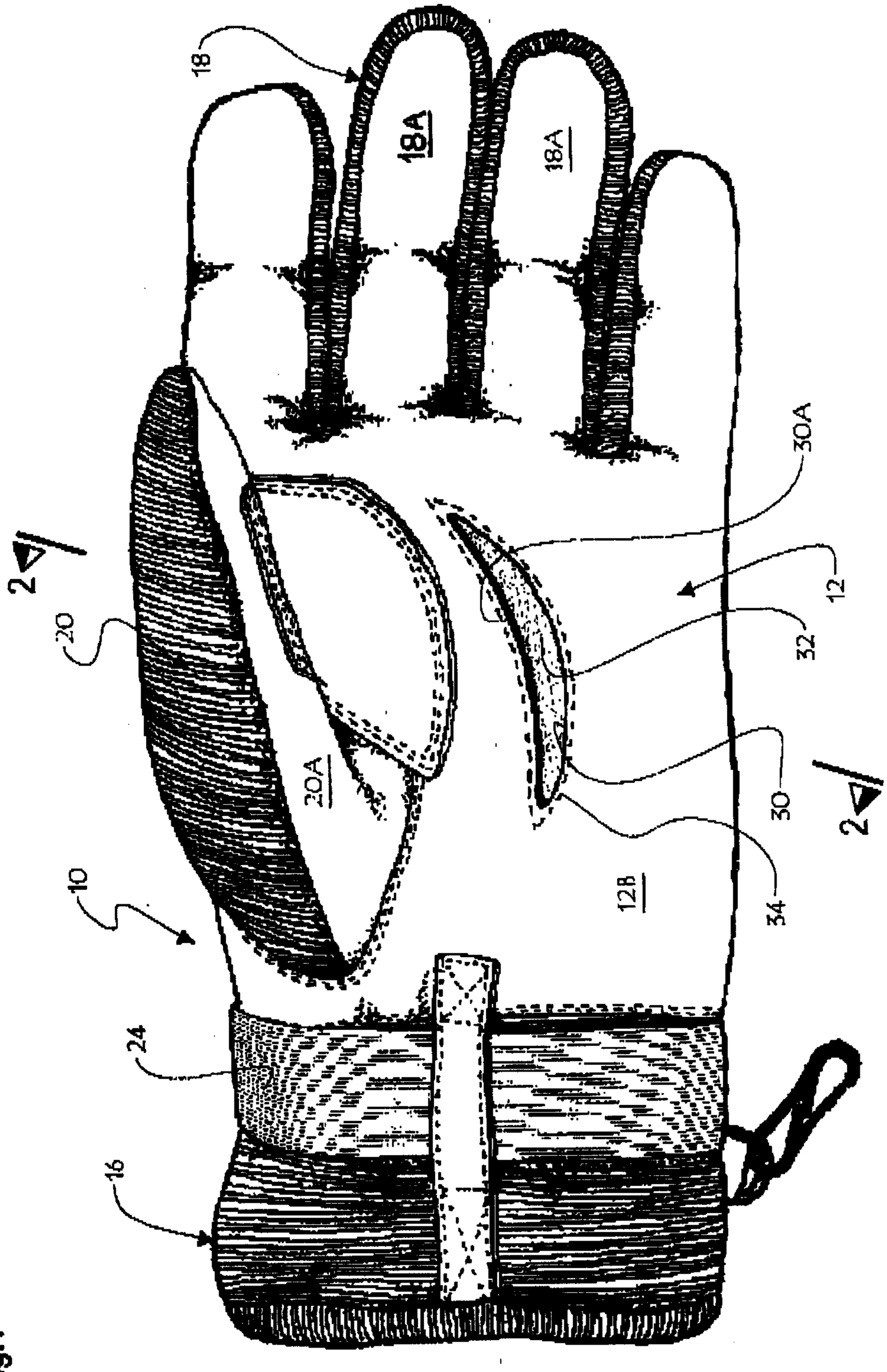


Fig.1

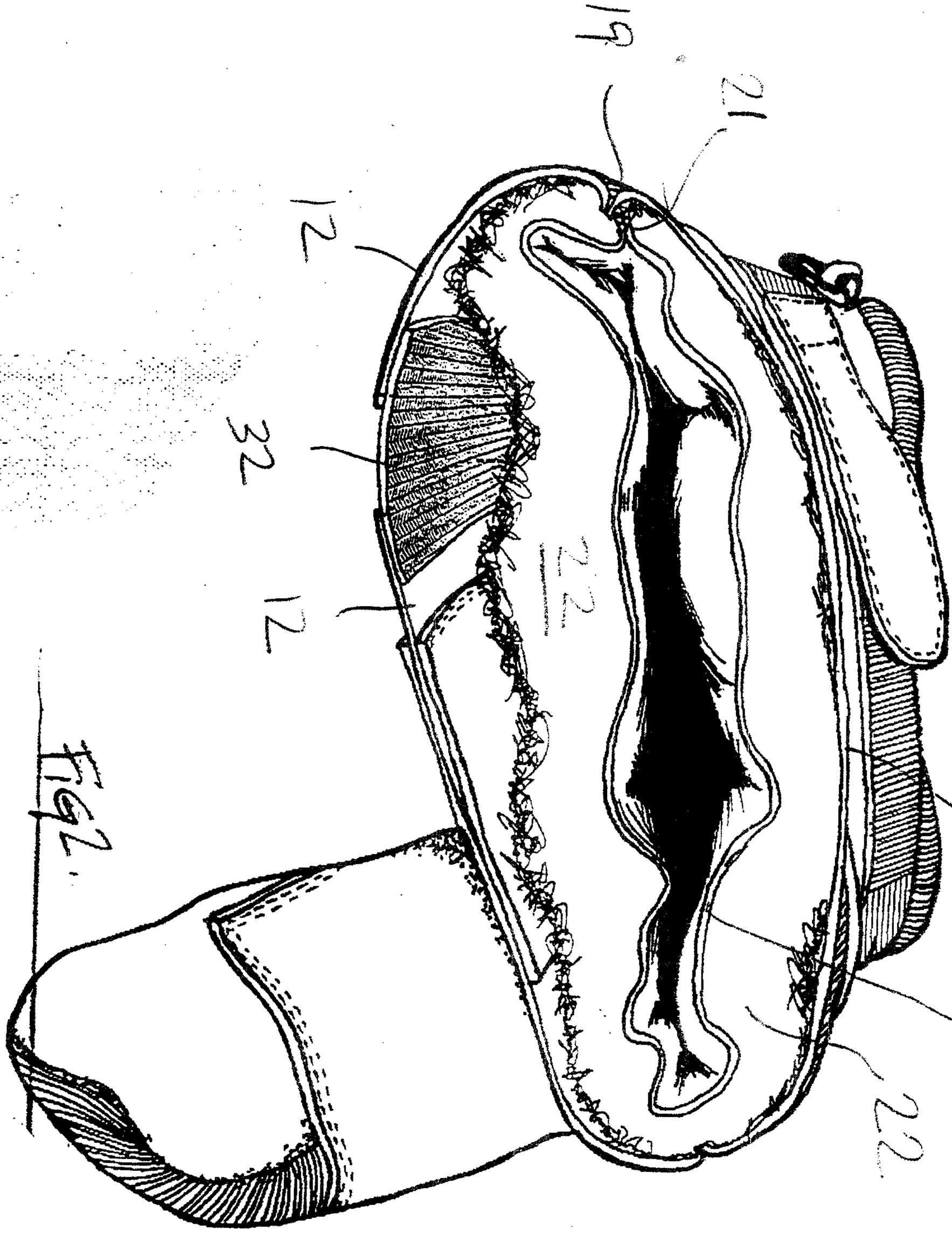


Fig 2.

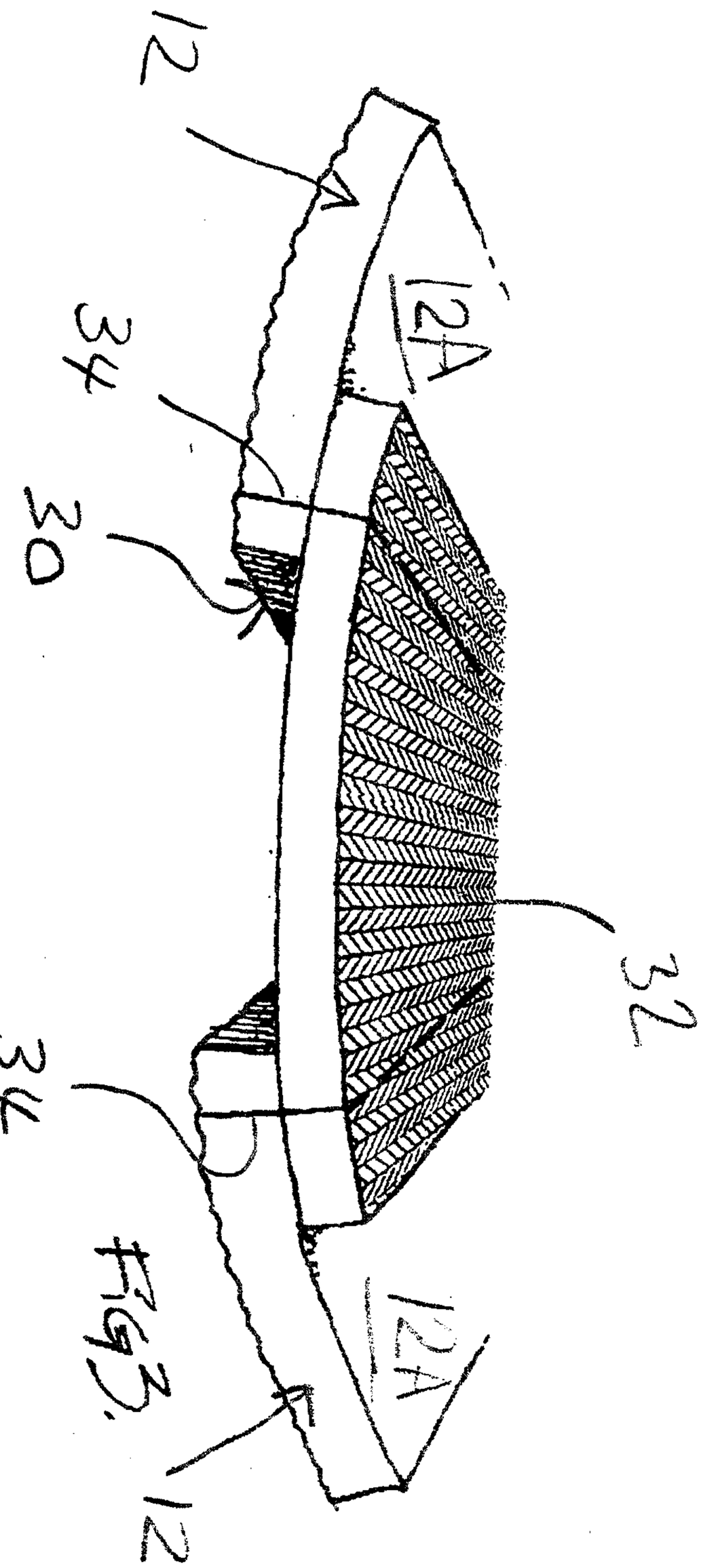
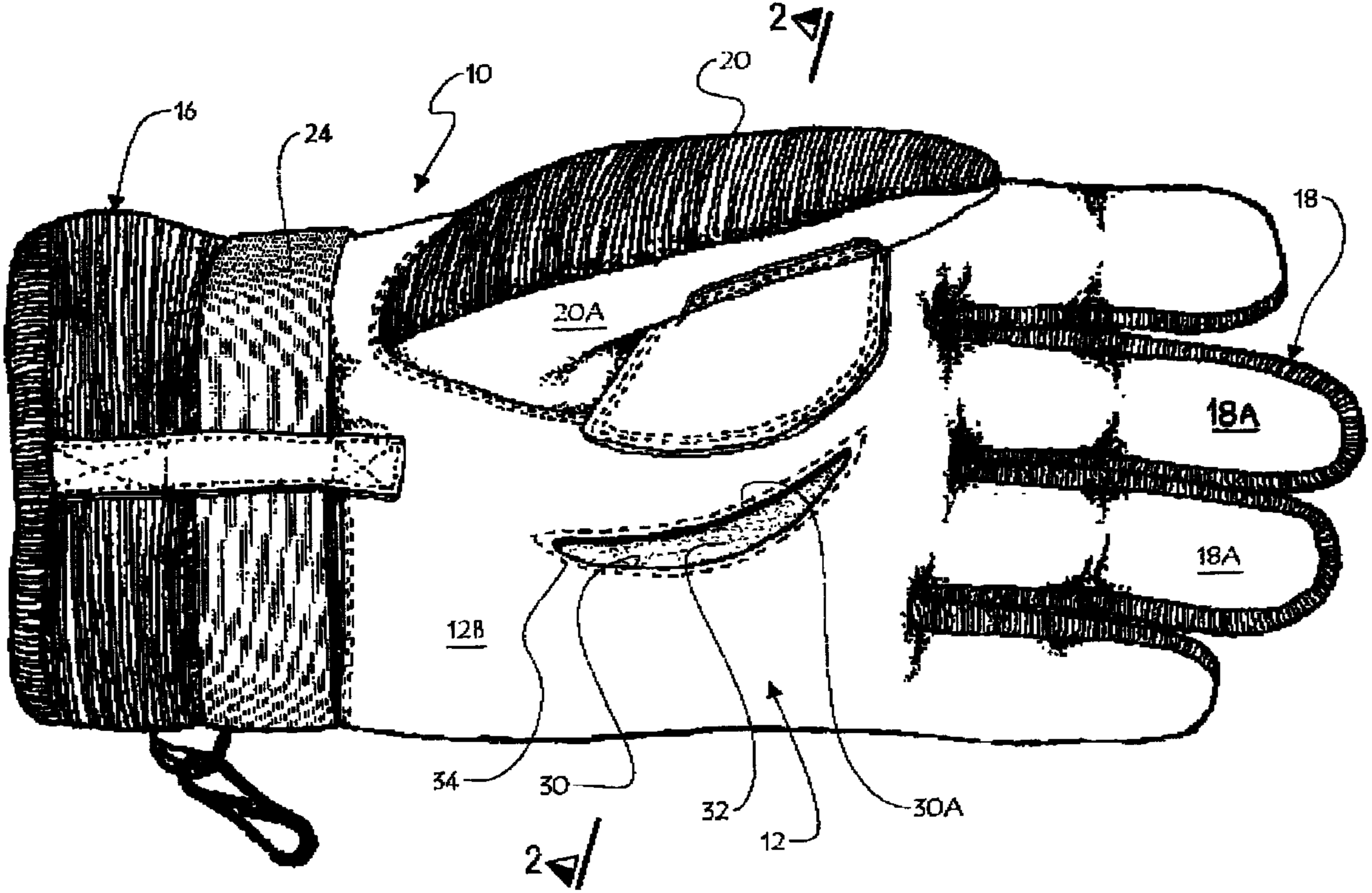


Fig. 4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