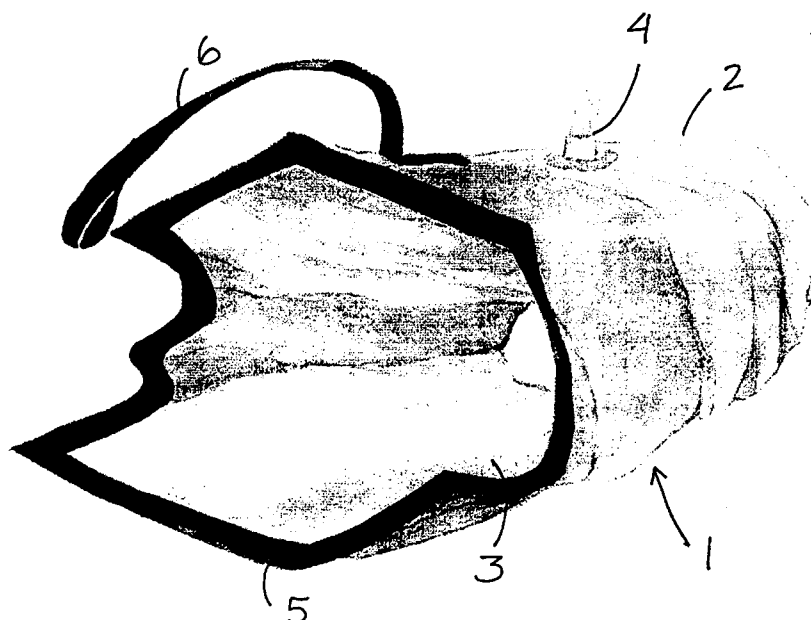




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁷ : A41D 13/00</p>	<p>A1</p>	<p>(11) International Publication Number: WO 00/33684 (43) International Publication Date: 15 June 2000 (15.06.00)</p>
<p>(21) International Application Number: PCT/NO99/00347 (22) International Filing Date: 18 November 1999 (18.11.99) (30) Priority Data: 19985380 19 November 1998 (19.11.98) NO (71) Applicant (for all designated States except US): FORSVARETS FORSKNING SINSTITUTT [NO/NO]; P.O. Box 25, N-2007 Kjeller (NO). (72) Inventor; and (75) Inventor/Applicant (for US only): MARTINI, Svein [NO/NO]; Sørmsgaten 52b, N-2004 Lillestrøm (NO). (74) Agent: HELGERUD, Jan, E.; Bryns Patentkontor A/S, P.O. Box 765, Sentrum, N-0106 Oslo (NO).</p>		<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report. In English translation (filed in Norwegian).</p>

(54) Title: HEAT-INSULATING AND MOISTURE-PROTECTING SLEEVE



(57) Abstract

A heat-insulating and moisture-protecting sleeve (1), which comprises: 1) an outer skin (2), facing away from the user and virtually impermeable to gas and moisture, which is in the form of Gore-tex® or a similar material; 2) an inner skin (3), facing towards the user and also virtually impermeable to gas and moisture, which is in the form of Gore-tex® or a similar material; 3) a structure-maintaining framework arranged between the skinlayers; and 4) an insulation material inserted between the skin layers and in the framework cavities: wherein the outer (1) and the inner (2) skin layers at each end of the sleeve are welded or by other means joined in a gas-tight and moisture-proof manner to one another. Furthermore, a set is described comprising a sleeve as disclosed above and a similarly insulating element of a corresponding type secured to the object.

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HEAT-INSULATING AND MOISTURE-PROTECTING SLEEVE

The present invention relates to a heat-insulating and moisture-protecting sleeve and a heat-insulating and moisture-protecting set, intended particularly for use in surrounding
5 the forearm and hand when operating devices and apparatuses in adverse and especially cold climatic conditions, without the invention being limited to such fields of use.

When, in extreme climatic conditions, members of, for example, the Armed Forces, rescue teams, the pilot service or the like must remain out of doors and be exposed to
10 the full impact of the climate whilst having to operate sophisticated, precision apparatuses where accuracy is a principal requirement, it is essential that the hand, and in certain cases also the leg, which is to operate the device is kept warm.

Of course, this can be taken care of by using gloves and/or various protective means, but
15 the use of gloves may be at the expense of the required sensitivity and precision, and the use of loose sleeves or the like on the forearm may be undesirable because of other tasks to be performed by the personnel.

One of the advantages of a thermal sleeve such as that suggested above will therefore
20 also be that it can engage, preferably in a heat- (and moisture-) proof manner, with a corresponding part on the apparatus or device that is to be operated.

These objectives are obtained by the inventive heat-insulating and moisture-protecting sleeve which is characterised in that it comprises:

25

- 1) an outer skin, facing away from the user, that is virtually impermeable to gas and moisture;
- 2) an inner skin, facing towards the user, that is also virtually impermeable to gas and moisture;
- 30 3) a structure-maintaining framework arranged between the skin layers; and
- 4) an insulating material inserted between the skin layers and in the framework cavities,

wherein the outer and inner skin layers at each end of the sleeve are welded or by other
35 means joined in a gas-tight and moisture-proof manner to one another.

In a preferred embodiment, both the outer and the inner skin layers are made of Gore-tex® or a similar material.

The insulation is preferably of a polyester fibre material, for both financial and technical
5 reasons.

It may be an advantage that the sleeve is equipped with a connection nipple for the introduction or removal of fluid as will be explained in more detail below.

10 In order to obtain heat and optionally moisture proofing against the surrounding environment, the sleeve of the invention at one end is equipped with flange, optionally extending around the entire circumference thereof, which in turn is equipped with a touch-and-close fastener and, as explained below, is intended to engage with a
15 corresponding element and preferably and touch-and-close fastener on the object that is to be operated.

The invention also relates to a heat-insulating and moisture-protecting set which is characterised in that it comprises a sleeve as described hereinabove and an element, optionally also insulating, attached to an object and equipped with a touch-and-close
20 fastener corresponding to the fastener as described above.

The invention will be described in more detail with reference to the attached figure which shows a sleeve according to the invention.

25 As mentioned above, the sleeve 1 comprises an outer skin 2, facing away from the user and virtually impermeable to gas and moisture, which is preferably made of Gore-tex® or a similar material.

Facing the user, the sleeve also has a skin layer 3 that is virtually impermeable to gas
30 and moisture, and which is also preferably made of Gore-tex® or a similar material.

Between these skin layers, to maintain a certain structure and rigidity in the sleeve, there is provided a non-illustrated, structure-maintaining framework, the cavities or air spaces of which are filled with an insulation material, also not illustrated, that is preferably a
35 polyester fibre material.

In the upper and lower end of the "cylinder"-configuration of the sleeve the two skin layers are, in some technically acceptable fashion, welded together in a gas-tight and moisture-proof manner.

- 5 In extreme conditions and in order optionally to give both the user and the operated apparatus a certain extra heat supply, the sleeve 1 is equipped with a connection nipple 4 for the introduction or removal of a fluid which as a rule will be hot air, should this be necessary.
- 10 In order to be able to obtain an enhanced sealing against the surroundings, both as regards and moisture and temperature, the sleeve 1 along the circumference of the apparatus-facing opening thereof is equipped with fastening means and preferably a flange 5 which in the preferred embodiment is a touch-and-close fastener.
- 15 The purpose of this fastener is that it should come into engagement with a corresponding touch-and-close fastener secured to the apparatus or device that is to be operated, wherein this touch-and-close fastener optionally may also be secured on a form of sleeve which in principle is constructed in the same way as the sleeve according to the invention.
- 20 The sleeve of the invention is intended in particular for the Norwegian Armed Forces' anti-aircraft weapon, Robot 70, which is operated or controlled by means of a so-called joystick or by other appropriate means.
- 25 It is precisely such devices which must inevitably be operated without any regard to the climatic conditions, and therefore an extra effort is often needed if the operator is to be able to maintain full bodily sensitivity and mobility.

30 However, it is quite conceivable that the inventive sleeve may also be used in areas other than the Armed Forces and rescue teams, for example, in the form of sleeves around handles on today's bicycles where the sleeves, often integrated, contain both brakes and gears.

35 Furthermore, the sleeves and sets according to the invention might conceivably be used in connection with paddles for both canoe and kayak paddling without these areas defining a limit for the application of the inventive subject.

Should it be necessary, under extreme conditions, to have extra heating, the sleeve is, as mentioned above, provided with a standard nipple 4 for connection to, for example, supply equipment for hot air.

- 5 To increase the heat capacity, it is possible, as an emergency measure, to have a supply of a liquid, although this does not represent a preferred embodiment.

The inventive sleeve may also possibly be used in connection with other heat sources, for example, a hand or foot warmer of a known type per can successfully be placed in
10 the sleeve or a supply of hot air from any heat source by means of feed hoses inside the sleeve itself.

In this case, it may be an advantage if the sleeve is made having a slightly conical shape so that it fits relatively tightly around the user's arm, or possibly the user's leg, should it
15 be appropriate to use the inventive thermal sleeve, for example, in connection with vehicles or the like.

The sleeve 1 according to the invention is in a known way per se equipped with a strap
6.

P a t e n t c l a i m s

1.

An arm protector comprising possible means of connection to or around objects which
5 are to be operated out of doors in cold and moist surroundings in the form of a sleeve
(1), characterised in that it comprises:

- 1) an outer skin (2), facing away from the user and virtually impermeable to gas
and moisture, which is in the form of Gore-tex® or a similar material;
- 10 2) an inner skin (3), facing towards the user and also virtually impermeable to
gas and moisture, which is in the form of Gore-tex® or a similar material;
- 3) a structure-maintaining framework arranged between the skin layers; and
- 4) an insulation material inserted between the skin layers and in the framework
cavities;

15

wherein the outer (1) and the inner (2) skin layers at each end of the sleeve are welded
or by other means joined in a gas-tight and moisture-proof manner to one another, and
wherein the sleeve (1) is equipped with a connection nipple (4) for the introduction or
removal of fluid.

20

2.

A sleeve according to claim 1, characterised in that the insulation is a polyester fibre
material.

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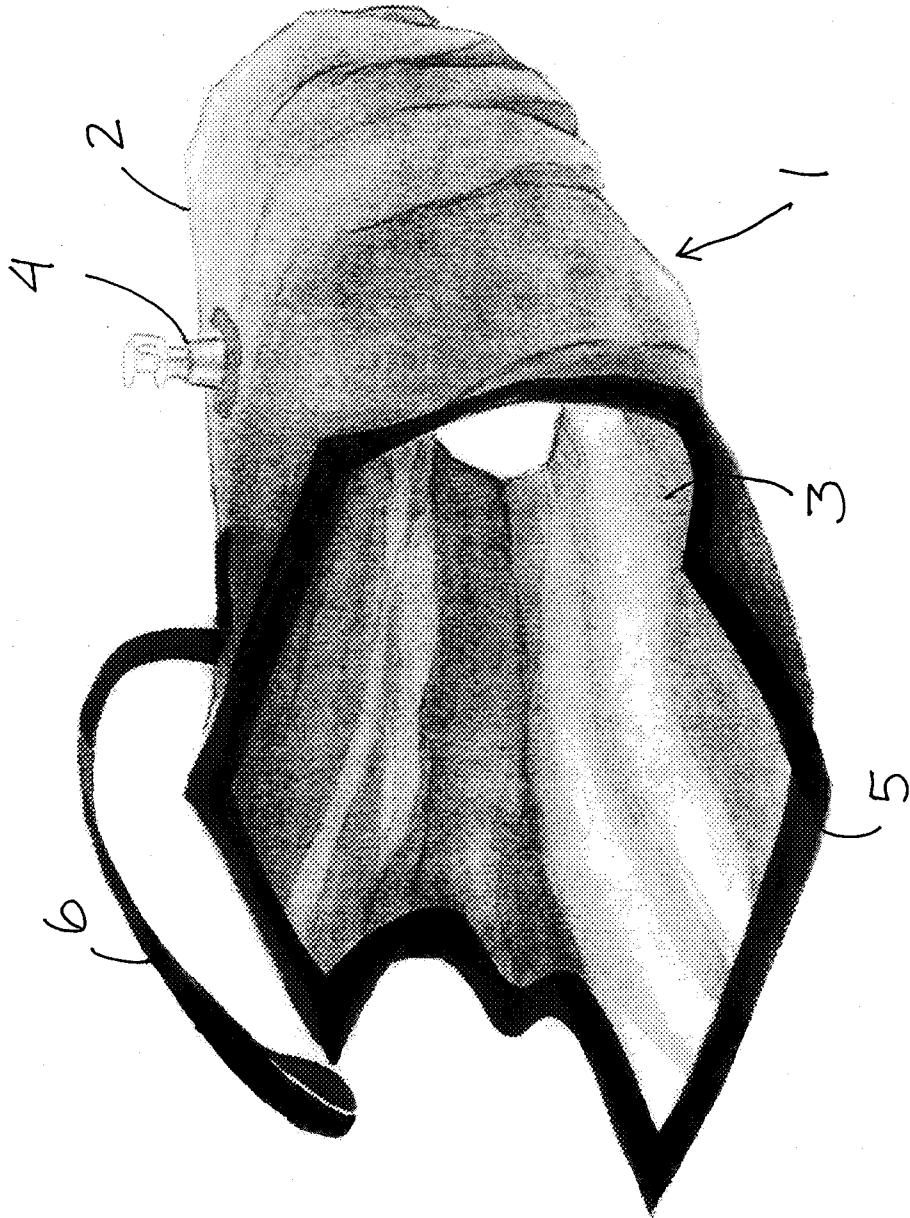
3.

A sleeve according to claim 1 or 2, characterised in that at one end it is equipped with a
flange, optionally extending around the entire circumference thereof, and which in turn
is equipped with a touch-and-close fastener.

30

4.

A sleeve according to any one of claims 1 to 3, characterised in that it is equipped with a
strap (6).



INTERNATIONAL SEARCH REPORT

International application No.

PCT/NO 99/00347

A. CLASSIFICATION OF SUBJECT MATTER		
IPC7: A41D 13/00 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC7: A41D		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
SE,DK,FI,NO classes as above		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5771490 A (D.D. REYNOLDS ET AL), 30 June 1998 (30.06.98)	1
A	--	2-4
A	US 4805338 A (G.G. SCHUBLOM), 21 February 1989 (21.02.89)	1-4
A	DE 3726221 A1 (GRIMM, G. ET AL), 16 February 1989 (16.02.89)	1-4
A	DE 4207931 A1 (ROTECNO AG), 16 Sept 1993 (16.09.93)	1-4
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3 March 2000		14-03-2000
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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International application No.

PCT/NO 99/00347

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5771490 A	30/06/98	CA 2206514 A EP 0800348 A WO 9620617 A US 5537688 A	11/07/96 15/10/97 11/07/96 23/07/96
US 4805338 A	21/02/89	NONE	
DE 3726221 A1	16/02/89	NONE	
DE 4207931 A1	16/09/93	AT 154495 T CA 2088806 A DE 59306760 D EP 0560376 A,B US 5335372 A US 5461724 A DE 4235168 A	15/07/97 13/09/93 00/00/00 15/09/93 09/08/94 31/10/95 21/04/94