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(54) **Multilayer protective gloves**

(57) The invention relates to a multilayer protective glove. The glove, according to invention has the base layer made by cutting and by completely sewing (3) entirely of leather (1) or of leather in combination with textile materials (2), that is afterwards entirely or partially coated by an elastomer overlay (4), with or without an inner lining.

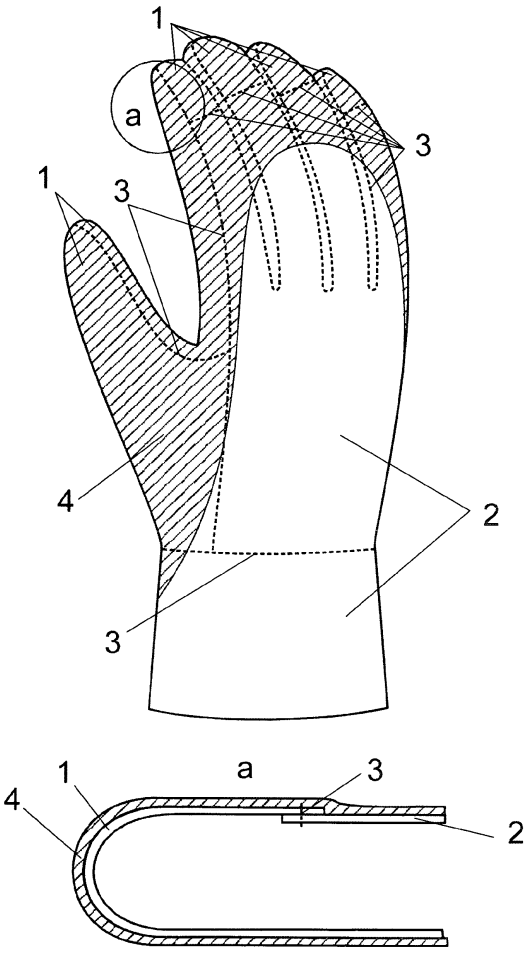

Fig 1

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Description

Technical field

[0001] The invention relates to a multilayer protective glove intended for excellently grip use against mechanical risks, humidity, liquid chemicals, heat or cold, present in all industries where human handling is involved.

Background

[0002] There is known as traditional and of common use the protective glove made by cutting and sewing entirely of leather or of split leather, or of these materials in combination with wooven or knitted fabrics.

[0003] This kind of glove is sometimes provided with a lining designed to improve the comfort, the thermal insulation or the shock absorbption.

[0004] This glove presents the disadvantages that does not provide protection against humidity and liquid chemicals, as being permeable through the material itself or through the stitching holes. Also, the leather, the split leather or the sewing thread, besides the fact that does not provide protection, also does not resist and does not conserve their properties in contact with humidity, grease or certain liquid chemicals.

[0005] Another shortcoming of this gloves is the poor adherence of the leather or of the split leather on any kind of surface, resulting in a low degree of grip and dexterity. This glove rapidly wear out as the exterior stitches are permanently exposed to abrasion by the handled objects in the contact areas.

[0006] There is also known as traditional and of common use the protective glove made of elastomers with or without textile support.

[0007] The main disadvantage of this glove is the low mechanical resistance against abrasion, cutting, tearing and puncture.

[0008] For the textile support there is possible to use synthetic fibers with higher abrasion, cut or tear resistance, at much higher costs without solving the perforation resistance problem. Also, some synthetic fibers used for the textile support induce discomfort in contact with the user's epidermis.

[0009] Another disadvantage is that this kind of glove has also a low thermal resistance.

[0010] From European Patent Application EP 20201 852 A1 it is known a chemical resistant glove made of 2 layers of nitrile-butadiene rubber and chloroprene rubber formed on a fabric base layer.

[0011] The disadvantage of this glove is that the base fabric layer does not provide enough mechanical resistance compared to a leather or split leather base layer.

[0012] It is known from international Application WO 99/30584 a glove made of impregnated polyurethane artificial leather with plain silicone printed pattern for consistent grip.

[0013] As the polyurethane impregnation and silicone printing are performed before cutting and stitching the glove, the glove presents the disadvantage that the sewing thread remains unprotected on the surface of the glove and the stitching holes allow liquids to penetrate inside the glove.

[0014] Another known document from prior art, DE 20302974 U1 describes a glove formed on a cotton yarn base layer coated by an elastomer, provided with 4 exterior leather patches glued on the elastomer layer, where the patches are placed on the most abrasion exposed areas, acting as local reinforcements.

[0015] This solution presents the disadvantage that the cotton base layer does not provide the same good mechanical resistance to the rest of the glove, because the leather is exposed directly to humidity, grease and chemicals contact that will rapidly damage it.

[0016] The technical problem that the invention is designed to solve is the achievement of multilayer protective glove that has good grip and high dexterity, that is simultaneously resistant and provides protection against humidity, grease, mechanical, chemical and thermal risks, at low cost conditions.

[0017] The multilayer protective glove according to invention, overcomes the above mention disadvantages by that it has the base layer made by cutting and by completely sewing (3) entirely of leather (1) or of leather in combination with textile materials (2), that is afterwards entirely or partially coated by an elastomer overlay (4), with or without an inner lining, where, the base layer is entirely or partially made of animal leather, synthetic leather, artificial leather, animal split leather, combinations of these materials or their combination with wooven, nonwooven or knitted textile fabrics and the leather base layer has a thickness between 0.1 and 3 mm.

[0018] According to invention, a combining textile materials have a specific weight between 50 and 500 grams/square meter, the elastomer overlay is made of polyvinylchloride, nitrile rubber, natural polyisoprene rubber (latex), polyurethane rubber, polychloroprene rubber (neoprene), butyl rubber, co-polymers or mixtures of these elastomers., elastomer overlay has a thickness between 0.01 and 3 mm, the elastomer overlay covers between 30% and 100% of the base layer and consists of 2 or more subsequent layers of the different said elastomers.

[0019] The invention presents the following advantages:

- a higher resistance and protection against humidity, grease and liquid chemicals
- a higher degree of dexterity and better grip ability
- a longer lifetime as the sewing thread is protected against direct contact with the handled objects.
- a higher level of resistance and protection against perforation, abrasion and cutting
- a higher level of resistance and protection against heat and cold
- a higher level of resistance against tearing.

Disclosure of the invention

[0020] In the following there is done an example of carrying out the glove, according to invention in relation to Fig 1 that shows a perspective view of the glove, where the numbers represent:

1 - the leather parts of the base layer
2 - the textile fabric parts of the base layer
3 - the stitchings assembling the base layer parts
4 - the elastomer overlay (lines darker area), where the detail (a) shows a longitudinal section cut through the forefinger tip of the glove.

Example

[0021] The object of the invention is a multilayer glove, made of 0.8 thick cow split leather parts 1 for the palm, finger nails, thumb backside in combination with 200 grams/square meter 100% cotton knitted fabric parts 2 for the backside of the glove and the cuff. The parts 1 and 2 are designed to be assembled in a 3 dimensional glove according to the European Norm 420:2003 requirements. Sometimes additional palm, forefinger and/or backside knuckle reinforcements could be used for supplementary protection. There is also possible to use an elastic strap for better fit on the wrist and/or an inner liner for better comfort, thermal insulation or shock absorber. The desired final length of the glove, up to 50 cm, is settled by choosing the adequate length of the cuff. The split leather parts number could be between 1 and 20, as well for the fabric parts 2, depending on the raw material/ production ratio costs, technology and intended morphology of the glove.

[0022] The leather and fabric parts are independently cut by sharp moulds, having each the part's shape, actioned by a hydraulic press equipment.

[0023] The leather 1 and fabric 2 parts are completely assembled by stitching with a polyester sewing thread (3) resulting the base layer of the glove. This semifinished product is then controlled for dimensional conformity and integrity.

[0024] Afterwards the base layer is pre-heated at 40-60 Celsius deg. temperature and then immediately partly dipped into a polyvinylchloride resin ("plastisol") bath for 2 minutes. After allowing the extra resin drops to gravitationally be eliminated for 5 minutes, the resin on the base layer is cured for 15 minutes at a 150-180 Celsius deg. temperature, then by natural cooling down to 18-25 Celsius deg. the final product is obtained with the coated elastomer overlay on it. The thickness of the final elastomer overlay 4 can be settled between 0.01 and 3 mm by controlling the polyvinylchloride resin's viscosity and eventually by repeating the dipping process. In this example an 0.8 mm thick elastomer overlay is obtained.

[0025] The partially elastomer coating allows the glove to be breathable through the backside uncoated fabric, smaller coating resulting in better breathability.

[0026] The size of the surface of the elastomer coating can be controlled by adjusting the angle of dipping the base layer between vertical (that corresponds to complete immersion) and horizontal (that corresponds only to a palmside coating that exceeds by 2-3 mm the fingertips top stitchings).

Claims

1. A multilayer protective glove **characterized in that** it has the base layer made by cutting and by completely sewing (3) entirely of leather (1) or of leather in combination with textile materials (2), that is afterwards entirely or partially coated by an elastomer overlay (4), with or without an inner lining.

2. The glove of claim 1 **characterized in that** the base layer is entirely or partially made of animal leather, synthetic leather, artificial leather, animal split leather, combinations of these materials or their combination with wooven, nonwooven or knitted textile fabrics.

3. The glove of claim 1 **characterized in that** the leather base layer has a thickness between 0.1 and 3 mm.

4. The glove of claim 1 **characterized in that** the possible combining textile materials have a specific weight between 50 and 500 grams/square meter.

5. The glove of claim 1 **characterized in that** the elastomer overlay is made of polyvinylchloride, nitrile rubber, natural polyisoprene rubber (latex), polyurethane rubber, polychloroprene rubber (neoprene), butyl rubber, co-polymers or mixtures of these elastomers.

6. The glove of claim 1 **characterized in that** the elastomer overlay has a thickness between 0.01 and 3 mm.

7. The glove of claim 1 **characterized in that** the elastomer overlay covers between 30% and 100% of the base layer.

8. The glove of claim 5 **characterized in that** the elastomer overlay consists of 2 or more subsequent layers of the different said elastomers.

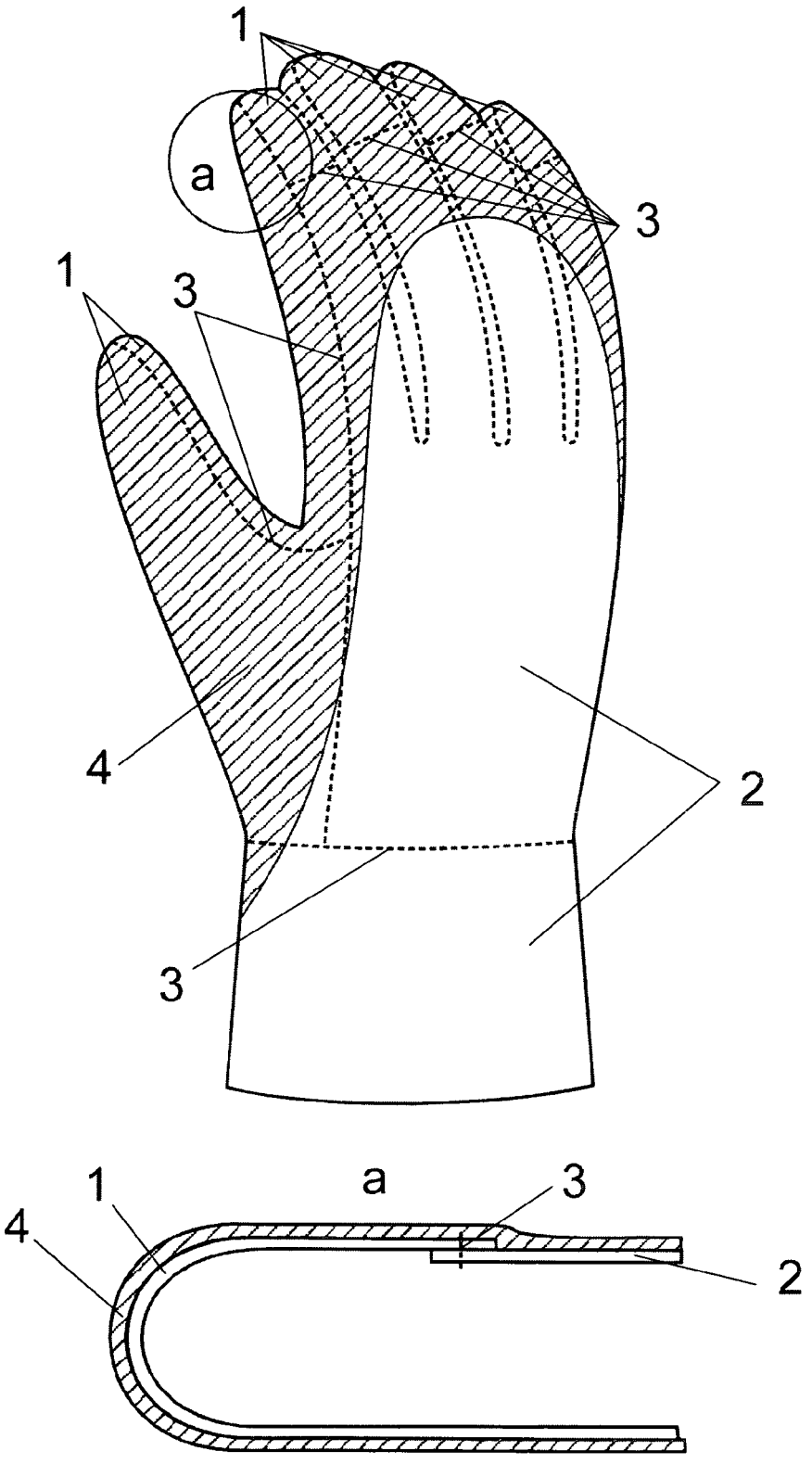

Fig 1

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 20201852 A1 **[0010]**
- WO 9930584 A **[0012]**
- DE 20302974 U1 **[0014]**