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(54) **Bistable glove**

Bistabiler Handschuh

Gant bistable

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Description

[0001] The present invention deals with a bi-stable glove. Such glove is made with of very thick membrane, equipped with mechanical characteristics that make its use easier. In particular, the invention can be used in the foodstuff field and for handling hot objects, such as containers for cooking foodstuffs.

[0002] The prior art deals with: gloves in general (A41D19/00: Gloves); instruments and accessories in the surgical field (A61B19/00: Instruments, implements or accessories for surgery or diagnosis); forming technique (B29C41/14: Shaping by coating a mould, core or other substrate); accessories for sports (A63B71: Games or sports accessories).

[0003] In the above categories, there is the ambidextrous glove, used for handling objects when cooking, freezing and storing foodstuffs, made of a very thick homogeneous material, partially or completely elastic.

[0004] The prior art, represented by document US-A-3148235, discloses both the shape of the glove with three fingers, and the use of an elastomer material (Adiprene made by Du Pont), Teflon, or silicone.

[0005] From the mechanical point of view, a glove with a very thick, homogeneous elastic material must also perform certain functions, remained unsolved depending on its structural and physical characteristics:

- a) difficulty in articulating the fingers of a hand, due to the high thickness and stiffness of the membrane composing the glove;
- b) formation of cumbersome membrane bending when pinching the objects.

[0006] The solution to one of these two problems is provided by a new glove, in particular a kitchen glove, that enables a safe handling of hot objects, doing without the precarious feeling of a tool that must operate in often dangerous and delicate conditions, in an ambient with a high temperature or in contact with hot or boiling substances.

[0007] According to US-A-5628069, in some sports, such as motorcycling and skiing, gloves of different material are used, reinforced with bi-stable steel plates, such plates being applied next to the finger joints of the hand, allowing to reach two stable positions:

- straight finger: the steel plate, longitudinally extended, forms a concave surface with two bent edges 30 and 32 in fig. 1;
- bent finger: the steel plate flexes along the longitudinal axis; simultaneously, the two edges 30 and 32 are bent, forming the curved plate having a plate section 28 in fig. 2.

[0008] DE-C-664 015 discloses a rubber glove with inner longitudinal ribs.

[0009] Object of the present invention is providing an

improved bi-stable glove, that, starting from the above described prior art, allows translating the bi-stability function to a glove made with a very thick elastic membrane, therefore free from invasive members, in particular of the type used in a kitchen, equipped with tubular recesses for containing the fingers of a hand, at least one of said tubular recesses having its cross section of an octagonal shape.

[0010] The above and other objects and advantages of the invention, as will appear from the following description, are obtained with a bi-stable glove as claimed in Claim 1. Preferred embodiments and non-trivial variations of the present invention are the subject matter of the dependent claims.

[0011] The present invention will be better described by some preferred embodiments thereof, provided as a nonlimiting example, with reference to the enclosed drawings, in which:

- figures 1 and 2 have already been previously described;
- figure 3 is an axonometric view of a bi-stable glove;
- figure 4 is a plan view and related cross section of the bi-stable glove;
- figure 5 is an orthogonal projection view and a plan section of the bi-stable glove.

[0012] The glove 1 of the invention is delimited by an external surface, that is smooth or equipped with protuberances or micro-projections 4, necessary for enabling to grasp the objects, and by an internal surface, that is smooth or coated with a layer of protecting material for the hand skin. The glove 1 is made of an approximately elastic, approximately homogeneous, very thick material (about 3 - 5 mm) and is formed of: a tubular portion 3 in which palm and back of the hand are housed; different tubular recesses 2 closed at their ends, projecting from the tubular portion 3, in a number that is equal to the number of the fingers or a smaller number. A glove of the present invention provides the classic forms with two, three or five tubular recesses 2.

[0013] The intrados surface of at least one of said tubular recesses 2 is tapered by means of: a slanted edge 6A and a slanted edge 8A, both being connected by a plate edge 5A. The tapered intrados surface formed of the edges 6A, 8A and 5A is connected to the extrados glove surface through the walls 7 and 9.

[0014] In order to allow the ambidextrous use of the glove, the extrados surface is tapered in the same way described for the intrados surface, obtaining a section of the recess 2 with an approximately octagonal shape, the intrados surface being formed of the edges 6A, 8A and 5A, the extrados surface being formed of the edges 6B, 8B and 5B, the walls 7 and 9 connecting the two extrados and intrados tapered surfaces. In order to reach the prefixed object, it is however enough to form a single, extrados or intrados tapered surface, corresponding to the tubular recess with an hexagonal shape.

[0015] The tapered surfaces of at least one tubular recess 2 and/or the tubular portion 3 of the glove therefore reach the objective of realising a bi-stable glove behaviour in the following way:

- straight finger: the intrados surface of at least one closed tubular recess 3 or the portion of glove recess 2, longitudinally stretched, forms a concave surface with two bent edges 6A and 8A;
- bent finger: the above intrados surface flexes along its own longitudinal axis; simultaneously, the two edges 6A and 8A are bent forming the curved intrados surface and assuming the plate sectional form (not shown) similarly to section 28 in fig. 2.

[0016] The configuration with straight finger and bent finger can be reached both through the octagonally shaped section and through the hexagonally shaped section (not shown).

[0017] The bi-stable glove 1 is preferably made of an elastic deformable material, of the known type in the foodstuff field according to directives in force. In particular, reference is made to a thermoplastic material, silicone, elastomer; in this case: platinum silicone, particularly adapted for freezing at -50°C and cooking at 300°C; peroxide silicone; elastomer adapted for cooking at 300°C and freezing at -50°C.

[0018] The thermoplastic material or elastomers, containing thermo-colouring pigments, allow realising a bi-stable glove 1 capable of pointing out the temperature of the environment in which the glove is immersed or the temperature of the object with which it is in contact.

[0019] The thermoplastic material or elastomers, suitably treated in the vulcanising (dynamic vulcanising) step, capable of embedding and keeping air with the result of obtaining a light and insulating structure, allow realising a bi-stable glove 1 with better insulating and lightness characteristics.

[0020] The thermoplastic material or elastomers, worked in a plate and suitably preformed and assembled with a glass fabric, allow realising a bi-stable glove 1 with high mechanical characteristics for resisting to engraving with cutting objects.

Claims

1. Elastic or semi-elastic glove (1), of a type particularly adapted for the foodstuff field, comprising a tubular portion (3) in which palm and back of a hand are adapted to be housed and a plurality of tubular recesses (2) closed at their ends and projecting from the tubular portion (3) adapted to house fingers of the hand, each tubular portion (3) having an extrados surface and an intrados surface connected through a first wall (7) and a second wall (9), **characterised in that:**

- the glove (1) is adapted to operate in a stable straight position in which the tubular portion (3) is longitudinally aligned with the tubular recesses (2), or in a stable bent position in which the tubular recesses (2) are at an angle with respect to a plane of the tubular portion (3);

- the intrados surface comprises at least one first intrados edge (6A) and one second intrados edge (8A), the first intrados edge (6A) and the second intrados edge (8A) being separated by a third intrados edge (5A), in the stable straight position the first intrados edge (6A) and the second intrados edge (8A) being bent so as to form a concave surface, while in the stable bent position the first intrados edge (6A) and the second intrados edge (8A) form a curved intrados surface having a plate section; and

- the extrados surface comprises at least one first extrados edge (6B) and one second extrados edge (8B), the first extrados edge (6B) and the second extrados edge (8B) being separated by a third extrados edge (5B), in the stable straight position the first extrados edge (6B) and the second extrados edge (8B) being bent so as to form a concave surface, while in the stable bent position the first extrados edge (6B) and the second extrados edge (8B) form a curved extrados surface having a plate section.

2. Glove (1) according to claim 1, **characterised in that** it is made of thermoplastic material.
3. Glove (1) according to claim 1, **characterised in that** it is made of silicone or platinum silicone or peroxide silicone.
4. Glove (1) according to claim 1, **characterised in that** it is made of elastomer material.
5. Glove (1) according to any one of the previous claims, **characterised in that** it is made of a resilient material adapted for cooking at 300°C and for freezing at -50°C.
6. Glove (1) according to any one of the previous claims, **characterised in that** thermo-colouring pigments, adapted for pointing out the temperature of the environment in which they are immersed or for pointing out the temperature of the material with which they are in contact, are additional ingredients to the basic material.
7. Glove (1) according to any one of the previous claims, **characterised in that** it is adapted to be made with a dynamic vulcanising treatment of a type that is capable of embedding and keeping air obtaining a light and insulating structure.

8. Glove (1) according to any one of the previous claims, **characterised in that** it is adapted to be made by joining a membrane composing the resilient material with a glass fabric, obtaining a composite structure with high mechanical characteristics against engraving with cutting objects.

Patentansprüche

1. Elastischer oder halbelastischer Handschuh (1), der sich besonders für die Nahrungsmittelbranche eignet, mit einem rohrförmigen Teil (3), der für die Aufnahme der Handfläche und des Handrückens dient, sowie mehreren rohrförmigen Hohlräumen (2), die an ihren Enden geschlossen sind und aus dem rohrförmigen Teil (3) herausragen, und für die Aufnahme der Finger der Hand dienen, jeder rohrförmige Teil (3) hat eine Rücken- und eine Leibfläche, die durch eine erste Wand (7) und eine zweite Wand (9) miteinander verbunden sind, der Handschuh ist **dadurch gekennzeichnet, dass:**

- der Handschuh (1) dazu dient, in einer festen gespannten Position, in der der rohrförmige Teil (3) in Längsrichtung mit den rohrförmigen Hohlräumen (2) ausgerichtet ist, oder in einer festen gebogenen Position zu funktionieren, in der sich die rohrförmigen Hohlräume (2) in einem bestimmten Winkel zu einer Ebene des rohrförmigen Teils (3) befinden;
- die Leibfläche mindestens einen ersten Streifen der Leibfläche (6A) und einen zweiten Streifen der Leibfläche (8A) einschließt, der erste Streifen der Leibfläche (6A) und der zweite Streifen der Leibfläche (8A) werden durch einen dritten Streifen der Leibfläche (5A) getrennt, in der festen gespannten Position werden der erste Streifen der Leibfläche (6A) und der zweite Streifen der Leibfläche (8A) gebogen, sodass sie eine konkave Fläche bilden, während der erste Streifen der Leibfläche (6A) und der zweite Streifen der Leibfläche (8A) in der festen gebogenen Position eine gebogene Leibfläche mit einem flachen Abschnitt bilden; und
- die Rückenfläche mindestens einen ersten Streifen der Rückenfläche (6B) und einen zweiten Streifen der Rückenfläche (8B) einschließt, der erste Streifen der Rückenfläche (6B) und der zweite Streifen der Rückenfläche (8B) werden durch einen dritten Streifen der Rückenfläche (5B) getrennt, in der festen gespannten Position werden der erste Streifen der Rückenfläche (6B) und der zweite Streifen der Rückenfläche (8B) gebogen, sodass sie eine konkave Fläche bilden, während der erste Streifen der Rückenfläche (6B) und der zweite Streifen der Rückenfläche (8B) in der festen gebogenen Position

eine gebogene Rückenfläche mit einem flachen Abschnitt bilden.

2. Handschuh (1) gemäß Patentanspruch 1, der **dadurch gekennzeichnet ist, dass** er aus thermoplastischem Material hergestellt wird.
3. Handschuh (1) gemäß Patentanspruch 1, der **dadurch gekennzeichnet ist, dass** er aus Silikon oder Platin-Silikon oder Peroxid-Silikon hergestellt wird.
4. Handschuh (1) gemäß Patentanspruch 1, der **dadurch gekennzeichnet ist, dass** er aus Elastomer hergestellt wird.
5. Handschuh (1) gemäß einem der vorhergehenden Patentansprüche, der **dadurch gekennzeichnet ist, dass** er aus elastischem Material hergestellt wird, das zum Backen bis 300°C und zum Tiefkühlen bis -50°C geeignet ist.
6. Handschuh (1) gemäß einem der vorhergehenden Patentansprüche, der **dadurch gekennzeichnet ist, dass** thermochromatische Pigmente, die sich dazu eignen, die Temperatur der Umgebung, in die sie eingetaucht werden, oder die Temperatur des Materials anzuzeigen, mit denen sie in Kontakt sind, Zusatzstoffe zum Basismaterial darstellen.
7. Handschuh (1) gemäß einem der vorhergehenden Patentansprüche, der **dadurch gekennzeichnet ist, dass** eine Behandlung durch dynamische Vulkanisation vorgesehen ist, die Luft aufnehmen und festhalten kann, sodass eine leichte und isolierende Struktur erhalten wird.
8. Handschuh (1) gemäß einem der vorhergehenden Patentansprüche, der **dadurch gekennzeichnet ist, dass** er durch Vereinigung einer Membran hergestellt wird, die das elastische Material mit Glastuch darstellt, sodass eine Verbundstruktur mit hohen mechanischen Beständigkeitseigenschaften gegen den Einschnitt durch scharfe Gegenstände erhalten wird.

Revendications

1. Gant (1) élastique ou semi élastique, d'un type particulièrement adapté dans le domaine alimentaire, comprenant une portion tubulaire (3) à l'intérieur de laquelle peuvent se glisser la paume et le dos de la main ainsi qu'une pluralité de cavités tubulaires (2) dont les extrémités fermées et dépassant de ladite portion tubulaire (3) peuvent accueillir les doigts de la main, chaque portion tubulaire (3) ayant une surface d'extrados et une surface d'intrados reliées au

moyen d'une première séparation (7) et d'une seconde séparation (9), **caractérisé en ce que**:

- le gant (1) est capable d'être efficient dans une position tendue stable où la portion tubulaire (3) est alignée dans le sens longitudinal avec les cavités tubulaires (2) ou bien dans une position pliée stable où lesdites cavités tubulaires (2) sont disposées à un certain angle par rapport au plan de la portion tubulaire (3);
- la surface d'intrados comprend au moins un premier panneau d'intrados (6A) et un second panneau d'intrados (8A), le premier panneau d'intrados (6A) et le second panneau d'intrados (8A) étant séparés par un troisième panneau d'intrados (5A), dans la position tendue stable le premier panneau d'intrados (6A) et le second panneau d'intrados (8A) étant pliés de manière à former une surface concave alors que dans la position pliée stable le premier panneau d'intrados (6A) et le second panneau d'intrados (8A) forment une surface d'intrados courbe avec une section plate; et
- la surface d'extrados comprend au moins un premier panneau d'extrados (6B) et un second panneau d'extrados (8B), le premier pan d'extrados (6B) et le second panneau d'intrados (8B) étant séparés par un troisième panneau d'extrados (5B), dans la position tendue stable le premier panneau d'extrados (6B) et le second panneau d'extrados (8B) étant pliés de manière à former une surface concave alors que dans la position pliée stable le premier panneau d'extrados (6B) et le second panneau d'extrados (8B) forment une surface d'extrados courbe avec une section plate.

2. Gant (1) selon la revendication 1, **caractérisé en ce qu'il** est réalisé en matière thermoplastique.
3. Gant (1) selon la revendication 1, **caractérisé en ce qu'il** est réalisé en silicone ou silicone platinique ou silicone peroxyde.
4. Gant (1) selon la revendication 1, **caractérisé en ce qu'il** est réalisé en matière élastomère.
5. Gant (1) selon une quelconque des revendications précédentes, **caractérisé en ce qu'il** est réalisé en matière élastique, adaptée à la cuisson à 300°C et à la congélation à -50°C.
6. Gant (1) selon une quelconque des revendications précédentes, **caractérisé en ce que** des pigments thermocolorants, capables d'indiquer la température du milieu ambiant dans lequel ils sont immergés ou pour relever la température de la matière avec laquelle ils entrent en contact, constituent des ingréd-

dients additionnels à la matière de base.

7. Gant (1) selon une quelconque des revendications précédentes, **caractérisé en ce qu'il** prévoit un traitement de vulcanisation dynamique d'un type capable d'englober et de retenir l'air en obtenant ainsi une structure légère et isolante.
8. Gant (1) selon une quelconque des revendications précédentes, **caractérisé en ce qu'il** peut être réalisé en unissant une membrane constituant la matière élastique avec une toile de verre, en vue d'obtenir une structure composite comportant de hautes caractéristiques mécaniques de résistance à l'incision avec des objets coupants.

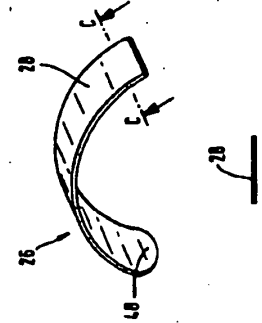
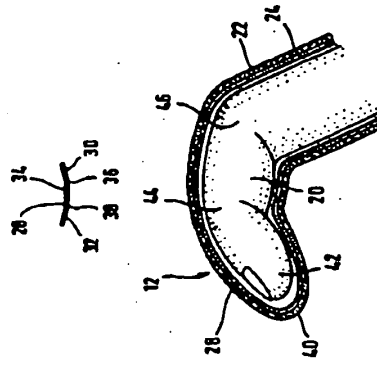
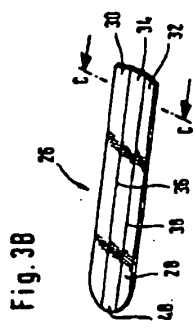
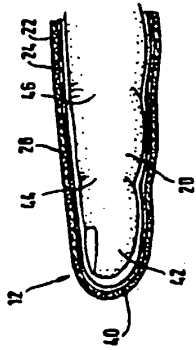


Fig. 1

Fig. 2

Prior Art

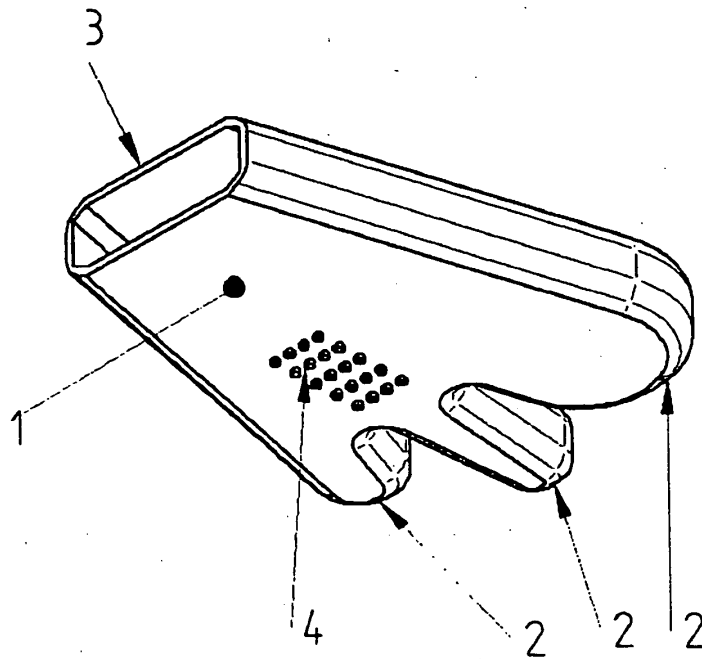


Fig. 3

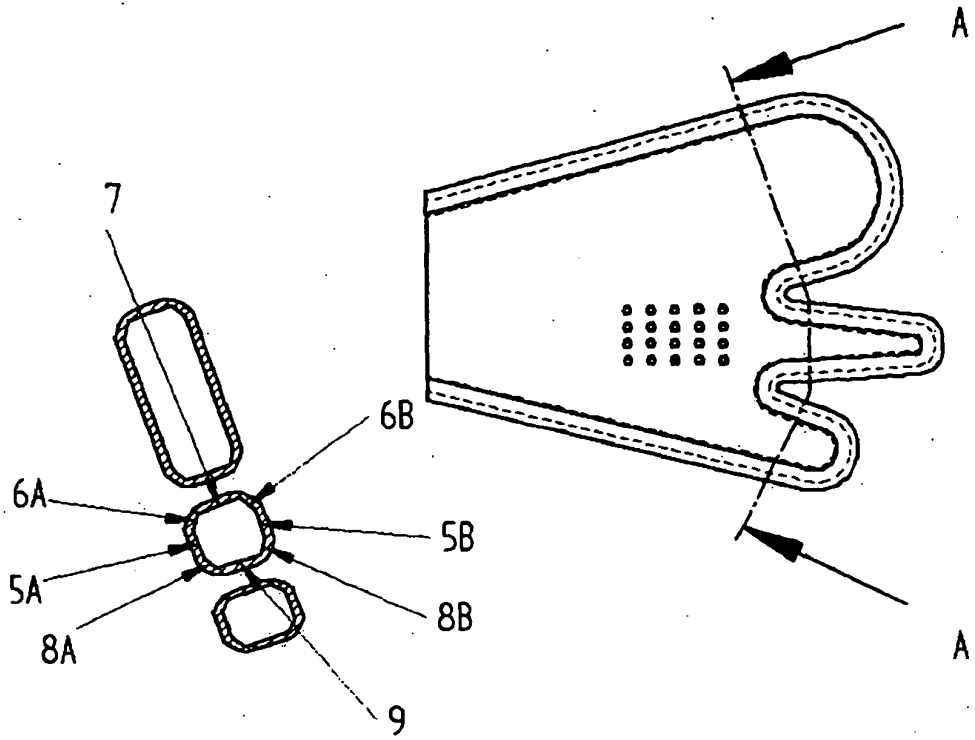


Fig. 4

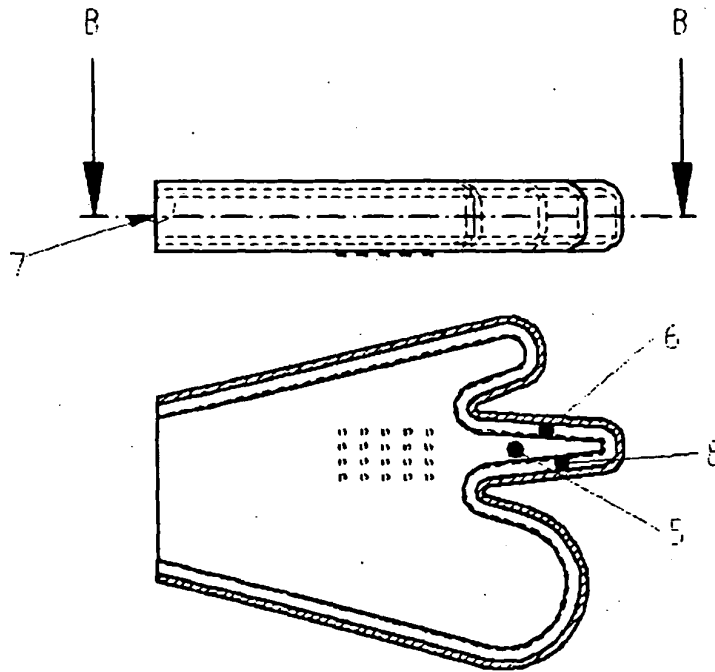


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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