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(54) **Waterproofed glove for applying specific substances**

(57) An impermeable glove for releasing specific substances formed by a palmar part (A or B) and dorsal part (A' or B') provided at least in the palmar part with an external layer of non-woven fabric (1), characterised in that it is waterproofed by coupling a layer of impermeable material (6) by means of hot-melt glue (3) to the non-woven material (1) layer, by means of
(I) a chemical or mechanical filming process on the non-woven fabric, or
(II) coupling of said non-woven fabric layer (1) to an impermeable material by means of ultrasounds.

FIG.4A

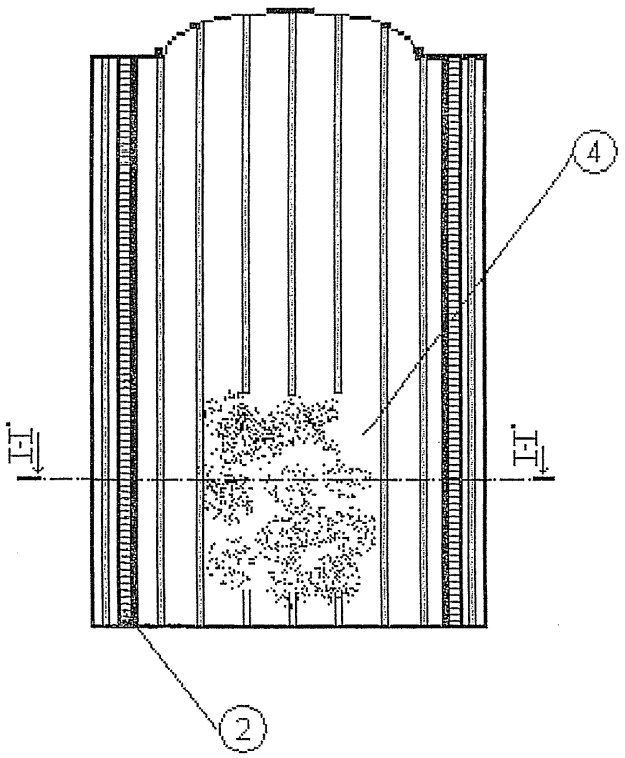

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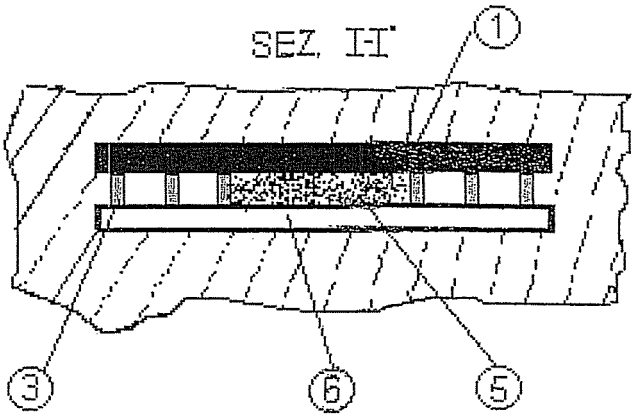
FIG. 4B



Description

FIELD OF THE INVENTION

[0001] The present invention relates to a glove for applying specific solid, liquid and/or colloidal substances on the body surface or on other types of surfaces.

BACKGROUND ART

[0002] Impermeable material gloves are traditionally used for cleaning objects and surfaces and for body hygiene, in human and veterinary fields, in order to protect the operator from contact with aggressive detergent agents or with the body. These gloves are always used along with accessories having absorbing function, for example sponges or cloths, and with detergents.

[0003] Over the past years, the traditional cleaning gloves have been perfected and a new type of glove has been developed in which the impermeable material is coated with a layer of non-woven fabric containing a detergent, and which therefore intrinsically comprise the protective, absorbing and detergent function. Such gloves considerably simplify hygiene and cleaning operations and make the operations more effective because they allow to reach body areas and surfaces which are hard to access with the use of sponges or cloths.

[0004] Italian patent 1326649 by the Applicant describes an impermeable material glove characterised in that the palmar part also contains a layer of non-woven fabric externally joined to said impermeable material to form one or more pockets, preferably at least two, adapted to contain a powder formulation of said substances, said powder having a medium grain size smaller than 1 mm.

[0005] This glove, while being an unquestionable improvement with respect to the commercial gloves, presents a considerable drawback caused by the fact that the internal impermeable layer and the external non-woven fabric layer are joined by bonding.

[0006] Firstly, when the pockets contain a powder, this must have grain size either equal to or smaller than 1 mm, otherwise, with powders of higher grain size, the possible presence of grains of powder in the bonding zones during the production process of the glove causes perforations of the impermeable layer.

[0007] Furthermore, the Applicant found that the perforation of the impermeable layer may occur not only by using powder of grain size larger than 1 mm, but may also occur in zones of the glove in which there are no pockets containing detergent powder.

[0008] Furthermore, the layer of non-woven fabric has a lower absorbency after bonding due to the flattening of the non-woven fabric fibres due to the high conduction heat and pressures during such operative step.

[0009] Due to the reduced absorbency following bonding of the impermeable layer to the non-woven fabric layer it is not possible to produce gloves with acceptable quality standards having the layer of non-woven fabric imbued in a liquid substance, for example an emollient and/or detergent for the hygiene of children and the elderly, for intimate hygiene, etc., for facial cleansing.

[0010] The need to solve the aforesaid drawbacks was therefore felt.

SUMMARYOF THE INVENTION

[0011] The Applicant has now found that the aforesaid drawbacks may be solved with a glove according to the present invention.

[0012] Object of the present invention is an impermeable glove for releasing a specific substance for the use for which said glove is intended, formed by a palmar part and by a dorsal part, provided at least in the palmar part with an external layer of non-woven fabric, characterised in that it is waterproofed by means of:

(I) coupling said non-woven fabric to an impermeable material, said materials being joined together by interposition of hot-melt glue, or
(II) chemical or mechanical filming process with an impermeable material performed directly on the non-woven fabric.

[0013] With the impermeable glove according to the present invention, the non-woven fabric fibres being no longer subjected to the high pressures of bonding and therefore being no longer flattened exhibit higher absorbing power. In particular, when the glove is waterproofed as shown in (I), the coupling of the non-woven fabric layer with the hot-melt glue creates a firm grip of the film to the non-woven fabric fibres without the need for applying the high temperatures and pressures of the heat-bonding process. For the objects of the present invention: "a chemical filming process" means one consisting in spray-drying a solution of a filming polymer; "mechanical filming process" means the gripping of an impermeable film to the non-woven fabric by forming a continuous series of infinitesimal pores obtained by punching with apparatuses already used for the production of sanitary towels and/or nappies and adapted to join an absorbing layer to an impermeable layer.

[0014] Filming (II) also does not flatten the non-woven fabric fibres, and consequently it does not reduce the respective absorbing power.

[0015] With system type (I) according to the present invention, the following gloves may be produced:

- glove type (i), wherein the non-woven fabric and the impermeable material on the palmar parts are joined together in areas so defined to leave at least a gap or a pocket, in which said materials are not joined together, said pocket being adapted to contain a solid powder formulation or a colloidal formulation,
- glove type (ii), wherein the non-woven fabric is imbued in a specific liquid substance for the use for

which said glove is intended, thus moistening it;
➢ glove type (iii) in which the non-woven fabric has incorporated within a substance or formulation specific for the use to which said glove is intended.

[0016] System (II) can be used to produce the aforesaid glove type (ii) but also glove type (iii).

DESCRIPTION OF THE DRAWINGS

[0017]

Figure 1 shows a schematic drawing of a preferred embodiment of the glove type (i) waterproofed with the system (I) according to the present invention, viewed from the top, and in particular of the palmar part (A).
Figure 2 shows a schematic drawing of a preferred embodiment of glove type (i) or (ii) waterproofed with system (I) according to the present invention, viewed from the top, and in particular of the dorsal part (A') or (B').
Figure 3 shows a schematic drawing of a preferred embodiment of the glove according to alternative (ii) waterproofed with system (I) according to the present invention, viewed from the top, and in particular of the palmar part (B).
Figures 4A and 4B show a section of the palmar part (A) taken along plane I-I' of a preferred embodiment of the glove type (i) waterproofed with system (I).

DETAILED DESCRIPTION OF THE INVENTION

[0018] The impermeable glove obtained according to system (I) is prepared by using any glue of the commercial type.
[0019] Hot-melt glue may be applied to the glove according to system (I) in the union zones either in continuous form to create a homogenous layer, or in a discontinuous, or discreet manner. The latter solution is preferred and more preferably is applied in the form of equally distanced strips. In this way, a high absorbency embossing motive is conferred to the non-woven fabric layer.
[0020] For the objects of the present invention, the palmar part of the glove is the part of the glove in which the palm of the hand is accommodated, while the dorsal part is the part of the glove in which the back of the hand is accommodated.
[0021] For the objects of the present invention, "glove" means an object adapted to receive the full length of a hand, or a reduced length glove adapted to receive some or all the fingers.
[0022] The glove according to the present invention may:

➢ be shaped as a hand and therefore present housing for each of the five fingers or the hand,
➢ present a single housing for all fingers or part of the fingers, such shape is particular indicated for the reduced sized gloves mentioned above,
➢ or two separate housings, usually one for the thumb and one for the other four fingers.

[0023] According to a preferred embodiment, the glove according to the present invention exhibits a single housing for the five fingers, this glove being particularly suitable for the aforesaid reduced length gloves.
[0024] In this case, in a particularly preferred embodiment of the impermeable glove obtained according to system (I) or (II) according to the present invention the palmar part and the dorsal part are provided with the external layer made of non-woven fabric. Also, in this case the palmar and dorsal part do not present identical length but on the contrary the palmar part is longer and ends with a central protrusion while the second ends with central recess, this to allow the user to easily open and easily accommodate the hand.
[0025] In particular, in the impermeable glove according to system (I) or (II) of type (i) the longer part is also the one provided with a pocket in which the solid formulation in the form of powder or the colloidal formulation is accommodated. This to protect as far as possible the user's hand from the detergent substances, foams, etc., possible polluting or infecting substances.
[0026] The solid powder formulation of type (i) gloves preferably consists of detergent powders chosen from the class consisting of non-ionic type surfactants or ionic type surfactants (such as for example soaps) which in contact with water develop foam.
[0027] This type of glove presents a further advantage with respect to those described in previous Italian Patent 1326649. The powdered soap which falls from the pockets in general with fine grain size smaller than 1 mm tends to be dispersed in the environment. In order to solve this drawback, the internal layer of waterproof material in the glove according to the present invention is preferably electrostatically charged.
[0028] Glove (i) according to the present invention preferably contains a ionic or non-ionic type surfactant formulation powder suitable for personal hygiene and is particularly employed by personnel in charge of the hygiene of the elderly, the disabled, etc.
[0029] The glove (i) may contain ionic or non-ionic surfactant based powder formulations for cleaning the surfaces of any material, for example metals, metal alloys, ceramic, plastic, steel, etc., and in this case may be used for domestic cleaning and hygiene, for cleaning cars, workplaces, hospitals, ornamental plants, etc.
[0030] The colloidal formulation possibly contained in glove (i) according to the present invention generally consists of dispersions, suspensions, emulsions, aqueous emulsions, water-in-oil or oil-in-water emulsions, hydrogel, etc., of ionic or non-ionic surfactants and/or of emollient substances of synthetic or natural origin and in this case is essentially used in cosmetics (for example for

applying facial masks, body masks, for example for the treatment of cellulite), but may also consist of dispersions, suspensions, non-aqueous emulsions of detergent and/or polishing substances adapted to the field of detergence and/or polishing of leather, wood, metals, such as for example silver and/or metallic alloys, for example brass, bronze, etc.

[0031] Glove type (ii) in which said external non-woven fabric layer present at least in the palmar zone is preferably imbued with a detergent and/or emollient liquid substance.

[0032] Such detergent and emollient liquid substances are those already in commercial use and employed in the production of moist towels marketed for personal and/or intimate hygiene, especially for the personal and/or intimate hygiene of children and adults where, for example, water is not easily available, or the personal and/or intimate hygiene of the elderly and of the bedridden.

[0033] Glove (ii) may also be imbued with emollient and/or detergent liquid substances of those commonly used in the production of moist paper towels for cosmetic use and therefore, for example, may be used for facial cleansing, eye contour cleansing, etc.

[0034] Preferably, in this case, the glove according to the present invention for convenience of use presents a reduced length so as to accommodate all or only some of the fingers, even preferably only some.

[0035] For the objects of the present invention, impermeable gloves according to system (I) or (II) also belong to this class, which are moistened at the moment of use, thanks to the insertion in the commercial box of gloves of a container which at the moment of use by exerting a manual pressure releases on the glove a substance which moistens it even before opening the aforesaid commercial box.

[0036] Glove type (iii) may preferably incorporate inside the same type of solid substances employed in glove (i), or may be wet either with the same type of colloidal substances used again in glove type (i), or with liquid substances used to moisten glove (ii). In the latter two cases, the solvent must be removed after moistening or wetting the glove.

[0037] Preferably, this type of glove is waterproofed according to system (II).

[0038] Glove type (iii) differs from previous types also in that the formulation is added directly to the preparation bath of the non-woven fabric. Non-woven fabric for the objects of the present invention means a non-woven fabric or also paper, of the natural or artificial type. Preferably, a non-woven fabric containing from 50 to 100% by weight of viscose and from 0 to 50% of polyester is used, even more preferably, a non-woven fabric consisting of 100% of viscose is used. Preferably, the non-woven fabric used has a surface weight from 30 to 150 g/m^2.

[0039] The material used for waterproofing the glove according to the present invention of type (I) or (II) is in general an impermeable polymeric material which may also be transpiring for easily eliminating sweat from the skin but not allowing liquid through.

[0040] For ecological reasons, such impermeable material may possibly also be biodegradable or water-soluble, where water-soluble means a material which is decomposed in water after a certain time, longer than the time of use of the glove. According to a particularly preferred embodiment, this material is a polyethylene film.

[0041] Figure 1-4 shows by the way of non-limiting example some preferred embodiments of the glove according to the present invention.

[0042] In particular, figure 1 shows the palmar part (A) of the impermeable glove with system (I) and of type (i). Figure 2 shows the dorsal part (A') of the glove according to the present invention waterproofed with system (I) and of type (i) or the dorsal part (B') of the impermeable glove with system (I) and type (ii). Figure (3) shows the palmar part (B) of the impermeable glove with system (I) and of type (ii).

[0043] In these figures, (1) indicates the external layer of non-woven fabric, (2) indicates the bonding joining respectively the palmar part (A) or (B) to the dorsal part (A') or (B'), (3) indicates the strips of hot-melt glue which confer the embossed effect to the non-woven fabric, (4) indicates the pocket or gap which contains the specific substance (5), (6) indicates the internal layer of impermeable material.

[0044] In particular, figure 2 clearly shows the opening of glove (7), delimited by the protrusion of palmar part (A) or (B) underneath and the recess of dorsal part (A') or (B') and the internal layer of impermeable material (6).

[0045] The preferred embodiment according to the present invention waterproofed with system (I) and type (i) shown in figure 1, 2 and 4 is preferably prepared with a process which comprises:

a) a powder and/or colloidal material formulation (5) is loaded onto an impermeable material film (6) in a certain zone of the film (4),

b) hot-melt glue is applied in the form of equally distance strips (3) onto the non-woven fabric (1) along the entire length of the film with the exclusion of the zone where the powder and/or colloidal material formulation was loaded,

c) the non-woven fabric (1) from step (b) is applied onto the impermeable material film (6), from step (a),

d) the impermeable material (1) and the non-woven fabric (6) joined as described in step (c) are cut on the shorter sides so that, only in the central zone, the first side is provided with a protrusion, and the other side, again in the central zone, is provided with a recess, complementary to said protrusion;

e) said material is folded obtaining a sheet folded in two so that laterally the two folded parts present the same length in the two lateral zones and do not present the same length in the central zone;

f) the two folded parts are joined by heat-bonding or by ultrasounds obtaining the bonding (2) along the

entire length of the two folded parts only in the two lateral zones of equal length, by means of heat-bonding or ultrasounds.

[0046] The preferred embodiment of the glove according to the present invention waterproofed with system (I) of type (ii) shown in figure 2 and 3 includes in particular the following steps:

a') hot-melt glue in the form of equally distanced strips (3) is applied on the non-woven fabric (1) for the entire length of the film,
b') an impermeable material film (6) of the same dimensions as the non-woven fabric is applied on the non-woven fabric (1) from step (a'),
c) the impermeable material and the non-woven fabric joined as described in step (b') are cut on the shorter sides so that the first side is provided, only in the central zone, with a protrusion and the other side, again in the central zone, is provided with a recess, complementary to said protrusion,
d') said material is folded obtaining a sheet folded in two so that laterally the two folded parts present the same length in the lateral zones and do not present the same length in the central zone,
e') the two folded parts are joined by heat-bonding or by ultrasounds (2) along the entire length of the two folded parts only on the two side zones of equal length,
f) the glove obtained in step (e') is moistened.

[0047] The processes for obtaining impermeable gloves with the system (I) of type (i) and (ii) may be produced in series; moreover, for the fact they present some common steps, such as the application of glue on one of the materials and the coupling with the other material, cutting, folding and bonding of the two folded parts, allow the use of the same type of machinery. The only difference between the two processes resides in the fact that the first includes the loading of the solid or colloidal formulation, while the second includes the final step of moistening the glove, steps which may be automated themselves.

Claims

1. An impermeable glove for releasing a specific substance for the use for which said glove is intended, formed by a palmar part (A) or (B) and by a dorsal part (A') or (B'), provided at least in the palmar part (A) or (B) with an external layer of non-woven fabric (1), **characterised in that** it is waterproofed by means of:

   (I) coupling said non-woven fabric (1) to an impermeable material (6), said materials being joined together by interposition of hot-melt glue (3),
   (II) chemical or mechanical filming process with an impermeable material performed directly on the non-woven fabric (1).

2. A glove according to claim 1, waterproofed with (I) chosen from the class consisting of:

   ➢ glove type (i), in which the non-woven fabric (1) and the impermeable material (6) on the palmar parts are joined together in areas so defined to leave at least a gap or a pocket (4), in which said materials are not joined together, said pocket being adapted to contain a solid powder formulation or a colloidal formulation (5), adapted for the use for which said glove is intended;
   ➢ glove type (ii) in which the non-woven fabric (1) is imbued in a specific liquid substance for the use for which said glove is intended, thus moistening it;
   ➢ glove type (iii) in which the external layer of the non-woven fabric (1) has incorporated within a substance or formulation specific for the use to which said glove is intended.

3. A glove according to claim 1, waterproofed with (II) chosen from the class consisting of:

   ➢ glove type (ii) in which the non-woven fabric (1) is imbued in a specific liquid substance for the use for which said glove is intended, thus moistening it;
   ➢ glove type (iii) in which the external layer of the non-woven fabric (1) has incorporated within a substance or formulation specific for the use to which said glove is intended.

4. A glove according to claim 2, **characterised in that** the hot-melt glue may be applied in the union zones in discontinuous manner.

5. A glove according to claim 4, **characterised in that** said hot-melt glue is applied in the form of equally distanced strips (3).

6. A glove according to any of the claims 1-5, **characterised in that** it presents a single accommodation for the fingers.

7. A glove according to claim 6, **characterised in that** both the palmar part (A) or (B) and the dorsal part (A') or (B') are provided with the external layer of non-woven fabric (1).

8. A glove according to claim 7, **characterised in that** the palmar part (A) or (B) is longer than the dorsal part (A') or (B').

9. A glove according to claim 8, **characterised in that** the palmar part centrally ends with a protrusion, while the dorsal part centrally ends with a recess.

10. A glove according to claim 2, of type (i) wherein the powdered solid material consists of detergent powders chosen in the class consisting of non-ionic surfactants, ionic surfactants, which in contact with water, develop foam.

11. A glove according to claim 2, **characterised in that** when the glove of type (i) contains powder with grain size smaller than 1 mm, the internal layer of impermeable material is electrostatically charged.

12. A glove according to any one of the claims 2, 10 or 11, **characterised in that** said formulation is based on ionic or non-ionic surfactants adapted for personal hygiene.

13. A glove according to claim 2, 10 or 11, **characterised in that** said formulation is based on ionic or non-ionic surfactants adapted for cleaning surfaces of materials chosen from ceramic, metal alloys, plastic, steel.

14. A glove according to claim 2 of type (i), **characterised in that** the colloidal material is selected from dispersions, suspensions, aqueous type emulsions, water-in-oil and oil-in-water emulsions, hydro gel, etc. of ionic or non-ionic type surfactants and/or emollient substances adapted for cosmetic use.

15. A glove according to claim 2 of type (i), **characterised in that** said colloidal material consists of dispersions, suspensions or emulsions in a non-aqueous solution, oil-in-water emulsions of polishing and/or detergent substances for leather, metal or metallic alloys, wood.

16. A glove according to any of the claims 2 and 3 of type (ii), **characterised in that** said non-woven fabric is imbued in an emollient and/or detergent liquid substance adapted for personal and/or intimate hygiene.

17. A glove according to any of the claims 1-16, **characterised in that** the material used for waterproofing according to (I) or (II) is an impermeable polymeric material.

18. A glove according to claim 17, **characterised in that** said material is transpiring.

19. A glove according to claim 17 or 18, **characterised in that** said material is either biodegradable or water-soluble.

20. A glove according to any of the claims 1-19, **characterised in that** said impermeable material is polyethylene.

21. A glove according to any of the claims 1-20, **characterised in that** the non-woven fabric contains from 50 to 100% by weight of viscose and from 0 to 50% of polyester.

22. A glove according to claim 21, wherein in the non-woven fabric consists of 100% viscose.

23. A glove according to any of the claims 1-22, **characterised in that** it presents a specific weight from 30 to 150g/m^2.

24. A process for preparing the glove of type (i) according to claim 9 comprising the following steps:

a) a powder and/or colloidal material formulation (5) is loaded onto an impermeable material film (1) in a certain zone (4) of the film ;
b) hot-melt glue is applied in the form of equally distanced strips (3) onto the non-woven fabric (1) along the entire length of the film with the exclusion of the zone (4) where the powder and/or colloidal material formulation was loaded,
c) the non-woven fabric (1) from step (b) is applied onto the impermeable material film (6), from step (a),
d) the impermeable material (6) and the non-woven fabric (1) joined as described in step (c) are cut on the shorter sides so that, only in the central zone, the first side is provided with a protrusion, and the other side, again in the central zone, is provided with a recess, complementary to said protrusion;
e) said material is folded obtaining a sheet folded in two so that laterally the two folded parts present the same length in the two lateral zones and do not present the same length in the central zone;
f) the two folded parts are joined by heat-bonding (2) along the entire length of the two folded parts only on the two side zones of equal length,

25. A process for preparing the glove of type (ii) according to claim 9, comprising the following steps:

a') hot-melt glue in the form of equally distanced strips (3) is applied on the non-woven fabric (1) for the entire length of the film,
b') an impermeable material film (6) of the same dimensions as the non-woven fabric is applied on the non-woven fabric (1) from step (a'),
c) the impermeable material and the non-woven fabric joined as described in step (b') are cut on

the shorter sides so that the first short side is provided, only in the central zone, with a protrusion and the other, again in the central zone, is provided with a recess, complementary to said protrusion,

d') said material is folded obtaining a sheet folded in two so that laterally the two folded parts exhibit the same length in the lateral zones and do not present the same length in the central zone,

e') the two folded parts are joined by heat-bonding along the entire length of the two folded parts only on the two side zones of equal length,

f) the glove obtained in step (e') is moistened.

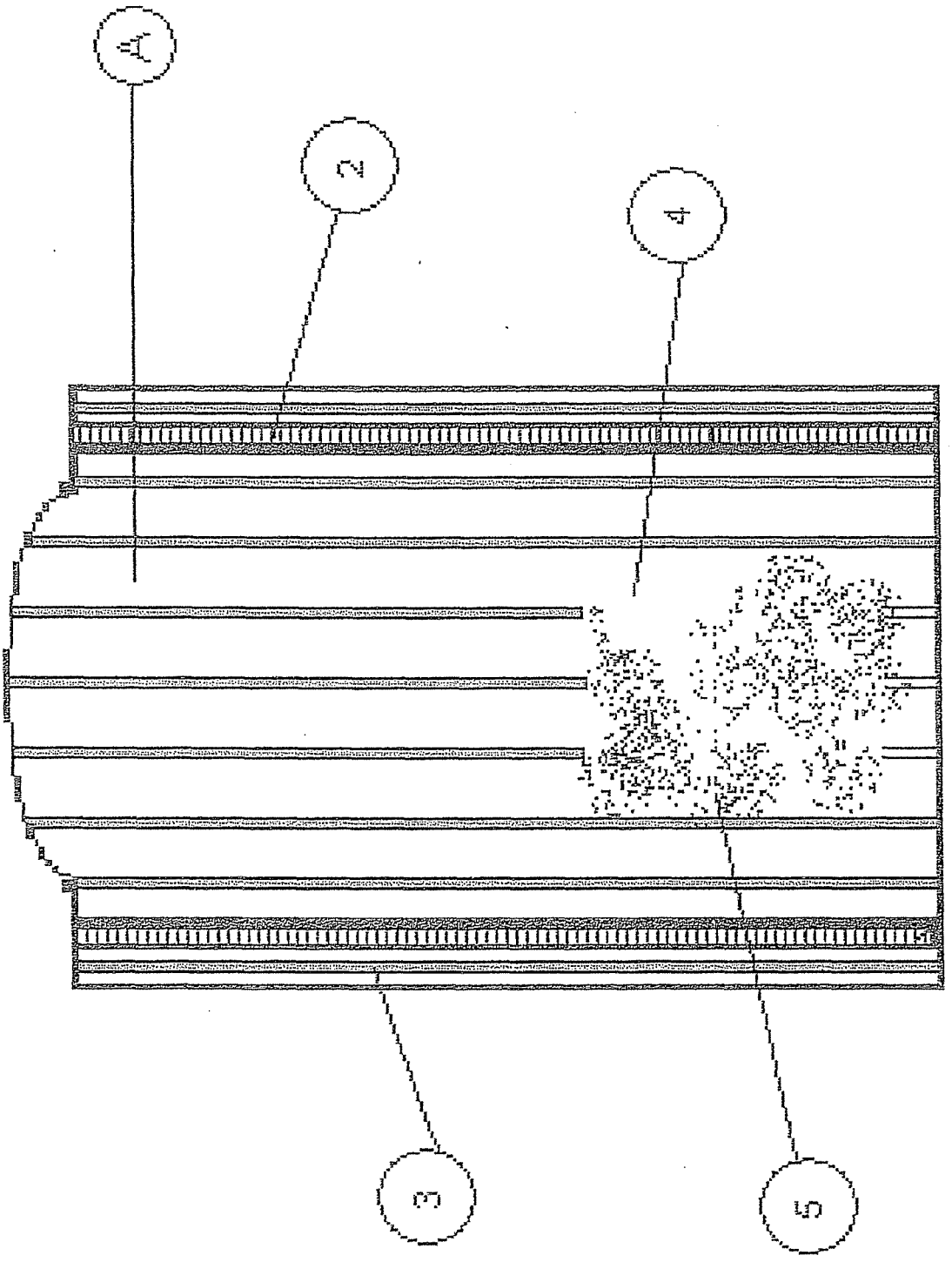


FIG. 1

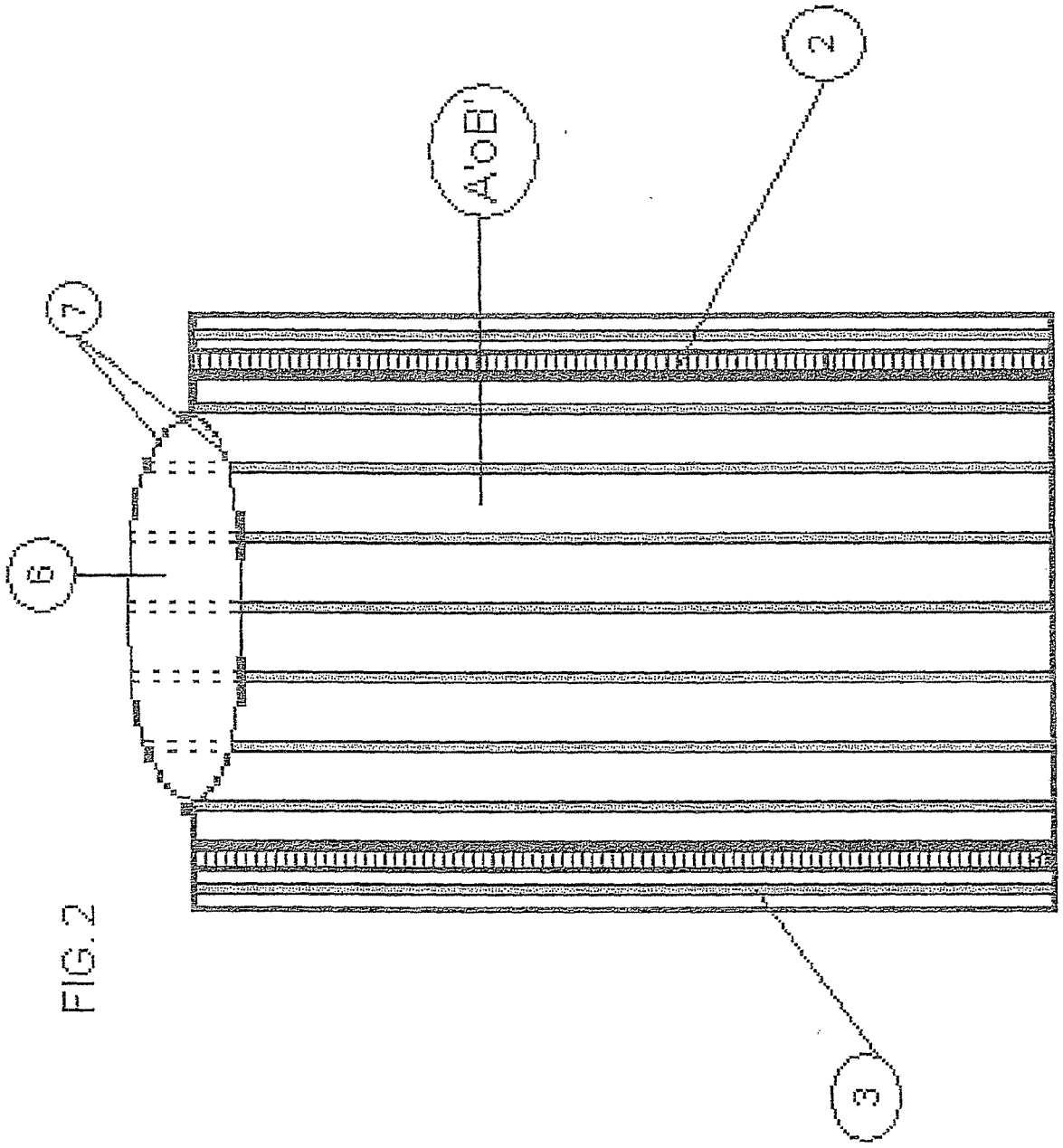


FIG. 2

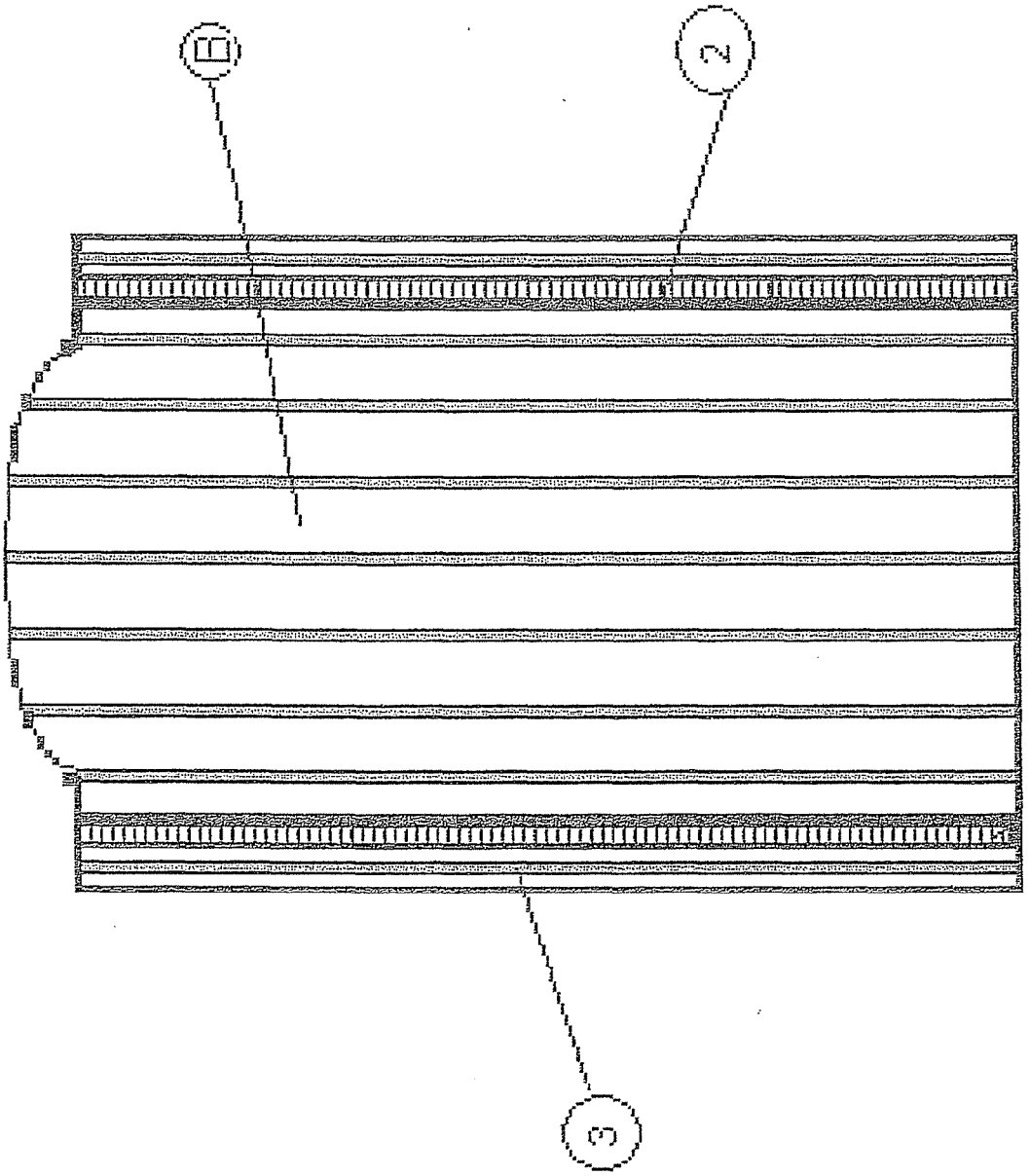


FIG.3

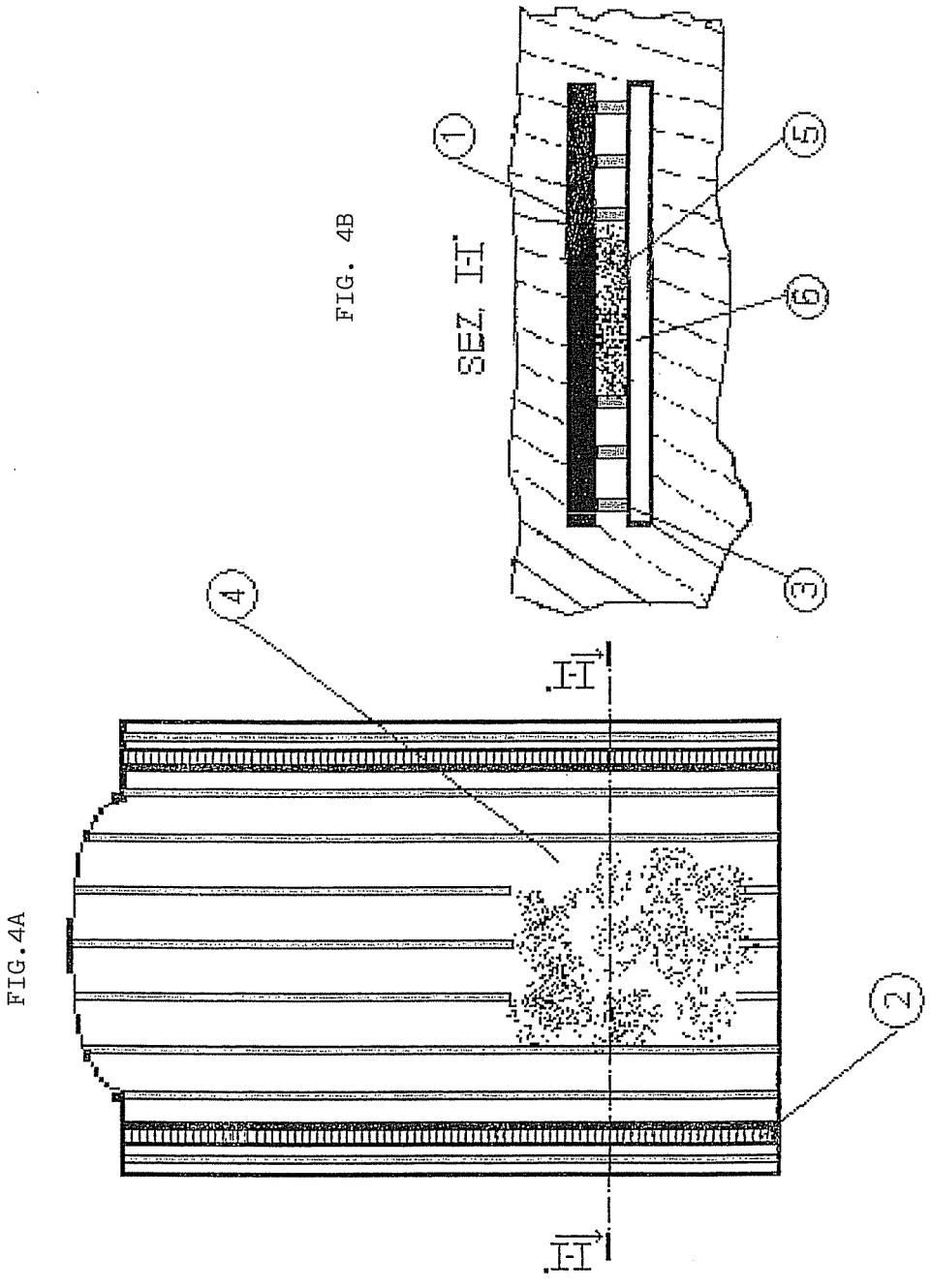


FIG. 4B

FIG. 4A

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT 1326649 **[0004] [0027]**