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(71) Applicant: **Transfermania International Srl**
00015 Monterotondo (IT)

(72) Inventor: **CIANCIARUSO, Enzo**
00015 Monterotondo (RM) (IT)

(74) Representative: **Leone, Mario et al**
Cantaluppi & Partners S.r.l.
Viale della Tecnica, 205
00144 Roma (IT)

(54) PROCESS FOR MANUFACTURING NETS WITH STRASSES APPLIED THEREON AND SO OBTAINED NET-LIKE FABRIC

(57) A process for manufacturing a net with strasses allows obtaining nets equipped with strasses in a single solution wherein the interlacement of the net and the application of the strasses is implemented, in a quick way, without using settings, and by implementing nets of any type, even with wide meshes with respect to the sizes of the strasses and with complex drawings, and it comprises the steps of: arranging a plurality of strasses distributed according to a predetermined scheme on a support (3) with the exposed adhesive bases (2); stretching on a frame (5) one or more threads (10) so as to obtain a net wherein the crossings correspond to through openings (8) of the frame arranged according to said predetermined scheme; applying the support (3) on the frame by making to adhere the adhesive bases (2) of the strasses to the crossings of the net, by determining the adhesion of the crossings (11) with a permanent connection.

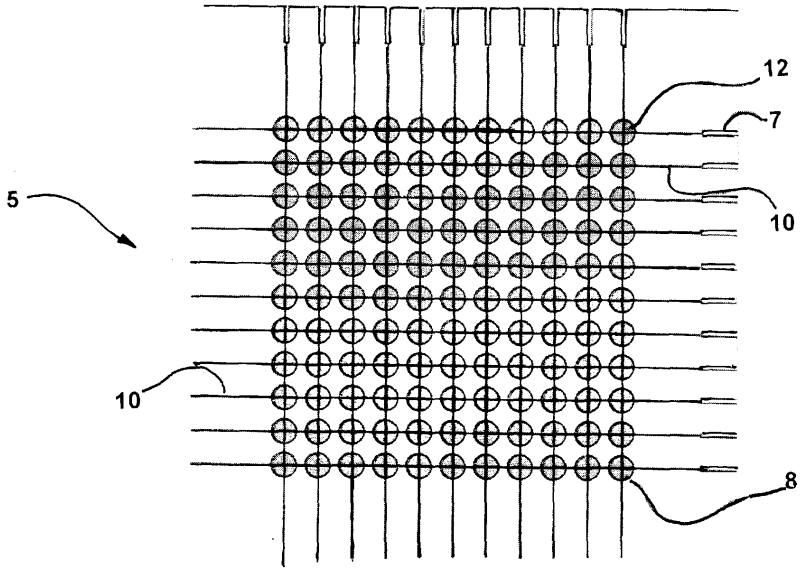

Fig.6

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Description

[0001] The present invention has as object a process for applying strasses so as to obtain a net having strasses applied thereon, so as to implement a net or a net-like fabric provided with strasses.

[0002] Under strasses, herein and hereinafter, all elements with small sizes are meant which are suitable to be applied on fabrics, threads or nets to obtain chromatic and brilliant effects; the word strass is used herein even to designate spangles, paillettes, beads, flints, metallic small plates, tesserae and so on.

[0003] The application of strasses and the like is well known in the textile environment, it allows obtaining fabrics and nets of great value for the brilliant optical effects and light refraction and reflection they allow. The strasses, in particular, are used for high fashion clothes, inserts to be applied on clothes, portions of clothes, evening bags and so on.

[0004] The fabric refinement is also linked to the preciousness of the applied elements: they can be made of precious material such as crystals of various nature and colour, pearly or metallic materials, imitations of precious stones, ambers and so on.

[0005] In order to allow the textile industry to implement more and more varied and refined fabrics, strasses have been devised having a base thereon a layer of thermoadhesive glue is applied, that is which becomes soft upon applying heat and adheres to the surface thereto it is applied. These strasses or stones often assume the denomination of *hotfix element, hotfix rhinestone,* to designate the presence of a thermo-setting fixing.

[0006] It is to be meant that the base thereon the glue is applied generally is a plane surface with small sizes, whereas the remaining portion of the strass has curved and/or carved shapes; the thickness of the adhesive layer is minimum.

[0007] However, if the application to a fabric can be relatively simple, the application to a net or a net-like fabric can have difficulties even if it is a kind of widely requested application for the flexibility and the softness of the end product.

[0008] In order to obtain this effect, nets are known having settings already fastened to the net threads, in case at the net knots.

[0009] Such settings, usually in the form of metallic small plates, can receive the strasses by fixing or adhesion of the above-mentioned glue layer. However, the presence thereof makes the net stiff and heavy, and it limits very much the elasticity thereof.

[0010] According to other techniques, it is possible obtaining the adhesion of the single strasses to the knots of the net, but this process generally is complicated, complex and it requests high skill and dexterity of the operator performing the application, thereto an extremely repetitive job is imposed. However, the presence of knots at the net crossings makes it however heavy and less flexible, even in absence of settings.

[0011] US patent Nr. 2,102,746 describes settings with particular shape having suitable holes for the passage and assembly of threads in a net.

[0012] US patent Nr. 3,634,917 describes an application of strass to a net, wherein, at the net knots, a plurality of settings equipped with suitable small tooth and a corresponding plurality of strasses adapted to receive said small teeth are coupled by a suitable apparatus.

[0013] US patent Nr. 4,323,611 describes the application of strasses equipped with thermoadhesive glued to nets or threads, by using opposite rollers to adhere the strasses onto the receiving material. However, this document does not raise the problem of centring the strass, in case with small sizes, on receiving sites with small sizes in a net which can even have wide meshes.

[0014] British patent Nr. 1,123,797 A describes a process for the production of a net with strasses by means of settings.

[0015] The technical problem underlying the present invention is to provide a process for applying strasses allowing to obviate the drawback mentioned with reference to the known art.

[0016] The solution idea consists in manufacturing the net during the application of the strasses, then the process according to the invention will consist in a process for manufacturing a net equipped with strasses.

[0017] Such problem is solved by a process as specified above characterizing in that it comprises the steps of:

- arranging a plurality of strasses, equipped with an adhesive layer at one base thereof, on a side of a sheet-like support, so that the bases of the strasses are exposed, the strasses being distributed on the sheet-like support according to a predetermined scheme;
- providing a frame comprising a laminar element having an edge thereon fixing seats for a thread are obtained and a plurality of through openings obtained in said laminar element, said through openings being distributed on the laminar element according to said predetermined scheme, so that the strasses and the openings can be perfectly overlaid;
- stretching on one side of the laminar element between said fixing seats one or more threads so as to obtain, on said laminar element, a net or a net-like fabric, wherein each one of said through openings is crossed by crossings of threads and in case by a tract of thread;
- applying said sheet-like support on said laminar element, so that the side of the sheet-like support with the exposed bases of the strasses adheres to the opposite side of the laminar element with respect to the side thereon said threads are stretched, so as to obtain that the bases of the strasses are received through said through openings and are in contact

with the corresponding crossings of thread and possible tracts of thread;

- adhering the strasses to said crossings so as to determine the adhesion between the threads at the crossing so as to implement the permanent connection of the threads in a net and in case to said tracts of thread; and

- separating the net so obtained from the frame.

[0018] The above-mentioned technical problem is also solved according to the same inventive concept by a process as specified above which characterizes in that it comprises the steps of:

- arranging a plurality of strasses, equipped with an adhesive layer at one base thereof, on a side of a sheet-like support, so that the bases of the strasses are exposed, the strasses being distributed on the sheet-like support according to a predetermined scheme;

- providing a frame comprising a laminar element having an edge thereon fixing seats for a thread are obtained;

- stretching, on one side of the laminar element between said fixing seats, one or more threads so as to obtain, on said laminar element, a net or a net-like fabric, the crossings thereof between threads are distributed on the laminar element according to said predetermined scheme, so that strasses and crossings can be perfectly overlaid;

- applying said sheet-like support on said laminar element, so that the side of the sheet-like support with the bases of the strasses adheres to the side of the laminar element thereon said threads are stretched;

- adhering the strasses to said crossings so as to determine the adhesion between the threads at the crossing so as to implement the permanent connection of the threads in a net, and in case to said tracts of thread; and

- separating the net so obtained from the frame.

[0019] The main advantage of the process according to the present invention lies in the fact of allowing to obtain nets equipped with strasses in a single solution wherein the interlacement of the net and the application of the strasses is implemented, in a quick way, without using settings, and by implementing nets of any type, even with wide meshes with respect to the sizes of the strasses.

[0020] The present invention will be described hereinafter according to a preferred embodiment thereof, provided by way of example and not for limitative purpose by referring to the enclosed drawings wherein:

* figure 1 shows a sheet-like support with a plurality of strasses;

* figure 2 shows one side of a frame for forming a net;

* figure 3 shows the opposite side of the frame of figure 2 in a first step for forming a net;

* figure 4 shows the side of the frame of figure 2 in said first step for forming a net;

* figure 5 shows the side of the frame of figure 2 in a second step for forming net determining the application of strasses;

* figure 6 shows the opposite side of the frame of figure 2 in said second step;

* figure 7 shows a front side of a net with strasses obtained according to the process of the present invention;

* figure 8 shows a rear side of a net with strasses obtained according to the process of the present invention; and

* figures 9, 10 and 11 show different frames upon forming nets with various shapes, with strasses with several forms.

[0021] By referring to figure 1, a sheet-like support is represented having a surface, in particular an adhesive surface, whereon a plurality of strasses is arranged, singularly designated with 1.

[0022] Again, it is specified that under the term strasses all elements with small sizes will be designated suitable to be applied on fabrics, threads or nets to obtain chromatic and brilliant effects; the term strass then is to be considered equivalent to spangle, paillette, bead, flint, metallic small plate, tessera and so.

[0023] The strass type represented in figure is of the type known under the term *rhinestone,* of the type implemented with an even precious crystal imitating a diamond. However, it is to be meant that this representation is purely by way of example.

[0024] The herein represented strass 1 is of the type having a flat base 2, thereon an adhesive layer is placed, formed by thermoadhesive glue, that is which can be activated by applying heat.

[0025] This type of strass is also known as *hotfix element* or even *hotfix rhinestone*.

[0026] Apart from the base, each strass has a faceting constituting the strass head, that is the strass portion suitable to be exposed and which can have different shapes and colours.

[0027] In figure 1, the head of each strass is adhered

to the adhesive surface of the sheet-like support 3. It is to be noted that the adhesive of the sheet-like support is of not permanent type, remaining adhered to the support and not to the strass faceting when it is separated from the sheet-like support 3.

[0028] In this way all bases 2 of the strasses 1 are exposed on the side for applying the sheet-like support 3.

[0029] Furthermore, said plurality of strasses 1 is arranged on the support 3 with a distribution meeting a predetermined scheme, which can be constituted in any arrangement, even representing a drawing. Such scheme conveniently can have the outline of a paper pattern for implementing a dress portion.

[0030] It is to be noted that the constraint that the strasses 1 have to be all equal therebetween is not provided, on the contrary they can have different shapes, sizes and colours with the maximum graphic freedom.

[0031] However, the scheme according thereto they are distributed is a known factor of the present process. In the state of art there are several techniques to adhere a plurality of strasses to an adhesive sheet as herein described, but such application is not subject of the present invention.

[0032] The supporting sheet 3 with the strasses 1 applied as described is protected, on the side made adhesive, by a protective sheet which will be then removed.

[0033] The sheet-like support 3 can comprise, on the adhesive surface thereof, even traces 4 which are suitable to detect the position of the target strass, even by way of check.

[0034] By referring to figure 2, a frame 5 is represented, constituted by a laminar element which preferably is flat.

[0035] It is defined by edges 6 which in the present example describe a rectangular or square shape but such shape can be anyone.

[0036] At said edge through notches, opened on said edge, are obtained constituting fixing seats 7 for a thread which will be described hereinafter.

[0037] The laminar element even comprises a plurality of through openings 8 obtained therein; said through openings are distributed on the laminar element according to the predetermined scheme therewith the strasses 1 are distributed on the respective support 3.

[0038] Therefore, the strasses 3 and the openings 8 can be perfectly overlaid during the process according to the invention.

[0039] The openings 8 can be moulded through the laminar element for example thanks to a laser punching machine, which is able to implement openings with any shape and in any distribution through a laminar element made of stiff or half-stiff material, for example a plastic material. The same is valid for the seats 7; in this way the drawing which can be obtained is very accurate.

[0040] In an additional step, a thread or several threads 10 is/are applied on one side 9 of the laminar element. This procedure is performed by stretching the thread or threads from a seat 7 to another one, on an opposite or adjacent side, in case by knotting the threads together for the fixing thereof or by using the teeth which are created between two adjacent seats 7, as illustrated in figures 3 and 4.

[0041] By arranging the threads 10 in this way a plurality of crossings is obtained to form a real net on such side of the laminar element.

[0042] It is to be noted that the relationship existing between the positions of the seats 7 and of the openings 8 allows without difficulties to make that the crossings 11 between the threads 10 fall at the openings 8, so that even the crossings will be distributed according to the same scheme already mentioned previously.

[0043] According to a preferred version of the process, an opening will correspond to each crossing and vice-versa, but even a scheme can be implemented wherein not all crossings fall on an opening and/or wherein at a opening there is a thread tract instead of a crossing.

[0044] The procedure for stretching the thread or the threads can be performed manually and in case it can comprise even the implementation of knots or seams.

[0045] In particular, at the edges 6 fabric strips could be applied, to facilitate the subsequent manual treatment of the net.

[0046] In a subsequent step, the support 3 with the strasses 1 is applied on the side of the laminar element opposite to that thereon all threads 10 were stretched (figure 5).

[0047] The overlapping between strass and openings allows each base 3 to pass through the respective opening 8 and to come in contact with the crossing of target threads, or in case with a thread tract.

[0048] Therefore, the single adhesive layers 12 (figure 6) not only can allow the adhesion of the strass 1 to the target surface, but they can even implement the connection between the threads of each crossing.

[0049] In order to implement this step, it is sufficient arranging the coupling between sheet-like support 3 and frame 5 between the surfaces of a press by applying heat. The presses already used to apply the strasses to fabrics can be used, according to a conventional technique.

[0050] They implement a heating under pressure up to 170°C, which does not ruin the threads or the strasses, but it causes the softening of the adhesive layers 12 which will solidify upon stopping the heat application.

[0051] In this way, the adhesion between the threads at the crossing is implemented and the permanent connection of the threads in a net, and in case to said thread tracts, is implemented.

[0052] At this point, the net formation is completed: it is sufficient to wait for a minimum time range to guarantee the solidification of the glue of *hot melt* type and the removal of the sheet-like support 3 from the frame 5; the net (figures 7 e 8) then can be separated from the frame 5 in case by exploiting the intrinsic elasticity of the threads, which was not compromised by the application of the strasses.

[0053] It is to be meant that even different adhesion systems can be provided which do not use heat and *hot*

melt glue, but different glues, for example of photosensible and/or pressure type.

[0054] The so-formed net will have the strasses 1 on one single side (figure 7) and it will have a direction (figure 8) with the crossings between the threads connected by the adhesive layers 12 of the bases 2.

[0055] It is to be noted that the threads can be made of any textile material, for example cotton or even elasticized cotton. With elasticized threads it is possible obtaining an elastic and deformable net.

[0056] The so-obtained net can be cut and seamed to implement a dress or a portion thereof, or an insert or still an accessory.

[0057] It is also to be noted that, without modifying the above-described process, it is also possible applying strasses to both faces of a net, by using always the same distribution scheme.

[0058] In a simplified version of the process, it is sufficient that the frame is implemented so as to implement the crossings according to said pre-established scheme. The massive application of the strasses could take place on any side of the net, in case even without exploiting the presence of openings on the laminar element.

[0059] By referring to figure 9, it is to be noted that the threads 10 can be stretched according to schemes wherein the net does not have warp and weft perpendicular therebetween, but with an apparently casual arrangement.

[0060] By referring to figure 10, it is to be noted that the threads can be stretched on the frame diagonally, between adjacent sides, by remaining within the scope of the present process.

[0061] By referring to figures 10 and 11, it is to be noted that the strasses applied on the threads can have different shapes and sizes, provided that they fall according to said predetermined scheme.

[0062] To the above-described process a person skilled in the art, with the purpose of satisfying additional and contingent needs, could introduce several modifications and variants, all however within the protective scope of the present invention, as defined by the enclosed claims.

Claims

1. A process for manufacturing a net with strasses **characterizing in that** it comprises the steps of:

   • arranging a plurality of strasses (1), equipped with an adhesive layer (12) at one base thereof (2), on a side of a sheet-like support (3), so that the bases (2) of the strasses (1) are exposed, the strasses (1) being distributed on the sheet-like support (3) according to a predetermined scheme;
   • providing a frame (5) comprising a laminar element having an edge (6) thereon fixing seats (7) for a thread (10) are obtained and a plurality of through openings (8) obtained in said laminar element, said through openings (8) being distributed on the laminar element according to said predetermined scheme, so that the strasses (1) and the openings (8) can be perfectly overlaid;
   • stretching on the laminar element between said fixing seats (7) one or more threads (10) so as to obtain, on said laminar element, a net or a net-like fabric, wherein each one of said through openings (8) is crossed by crossings (11) of threads and in case by a tract of thread (10);
   • applying said sheet-like support (1) on said laminar element, so that the side of the sheet-like support (3) with the exposed bases (2) of the strasses (1) adheres to the opposite side of the laminar element with respect to the side thereon said threads (10) are stretched, so as to obtain that the bases (2) of the strasses (1) are received through said through openings (8) and are in contact with the corresponding crossings (11) of thread and possible tracts of thread (10);
   • adhering the strasses (1) to said crossings so as to determine the adhesion between the threads (10) at the crossing (11) so as to implement the permanent connection of the threads (10) in a net and in case to said tracts of thread (10); and
   • separating the net so obtained from the frame (5).

2. The process for manufacturing a net with strasses **characterizing in that** it comprises the steps of:

   • arranging a plurality of strasses (1), equipped with an adhesive layer (12) at one base thereof (2), on a side of a sheet-like support (3), so that the bases (2) of the strasses (1) are exposed, the strasses (1) being distributed on the sheet-like support (3) according to a predetermined scheme;
   • providing a frame (5) comprising a laminar element having an edge (6) thereon fixing seats (7) for a thread (10) are obtained;
   • stretching, on one side of the laminar element between said fixing seats, one or more threads (10) so as to obtain, on said laminar element, a net or a net-like fabric, the crossings thereof (11) between threads (10) are distributed on the laminar element according to said predetermined scheme, so that strasses (1) and crossings (11) can be perfectly overlaid;
   • applying said sheet-like support (3) on said laminar element, so that the side of the sheet-like support (3) with the bases (2) of the strasses (1) adheres to the side of the laminar element thereon said threads (10) are stretched,
   • adhering the strasses (1) to said crossings (11)

so as to determine the adhesion between the threads (10) at the crossing (11) so as to implement the permanent connection of the threads (10) in a net; and

• separating the net so obtained from the frame (5).

3. The process according to claims 1 or 2, wherein said adhesive layer is formed by thermoadhesive glue, the adhesion between the threads (10) at the crossing (11) by means of said adhesive layer (12) being implemented by applying heat.

4. The process according to claims 1 or 2, wherein the strasses (1) are adhered on the sheet-like support (3) on one adhesive surface thereof, wherein the adhesive is of not permanent type.

5. The process according to claims 1 or 2, wherein said predetermined scheme has the outline of a paper pattern for implementing a dress portion.

6. The process according to claim 1, wherein a through opening (8) corresponds to each crossing (11) and viceversa.

7. The process according to claim 3, wherein the threads are made of cotton or stretch cotton.

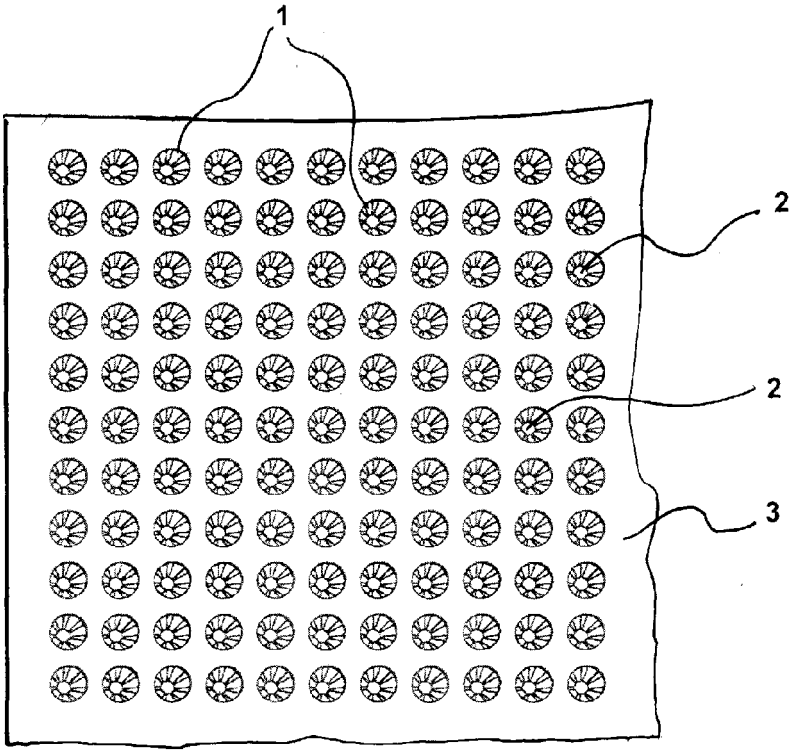

Fig.1

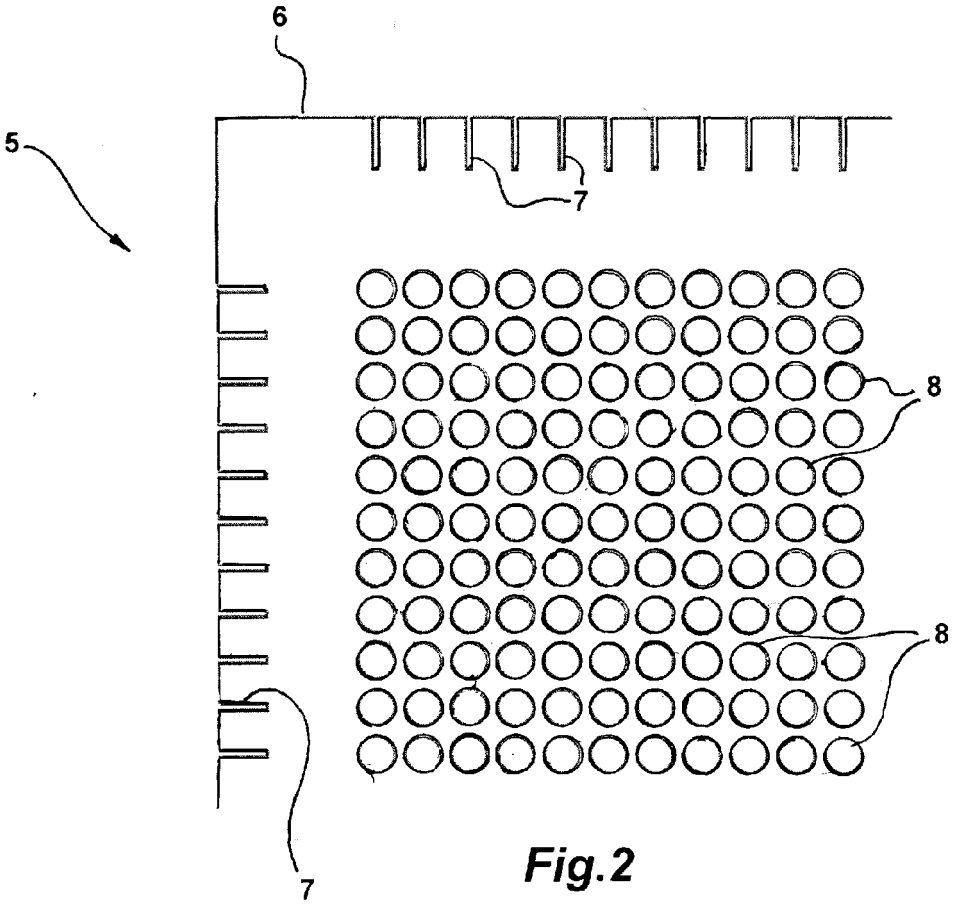

Fig.2

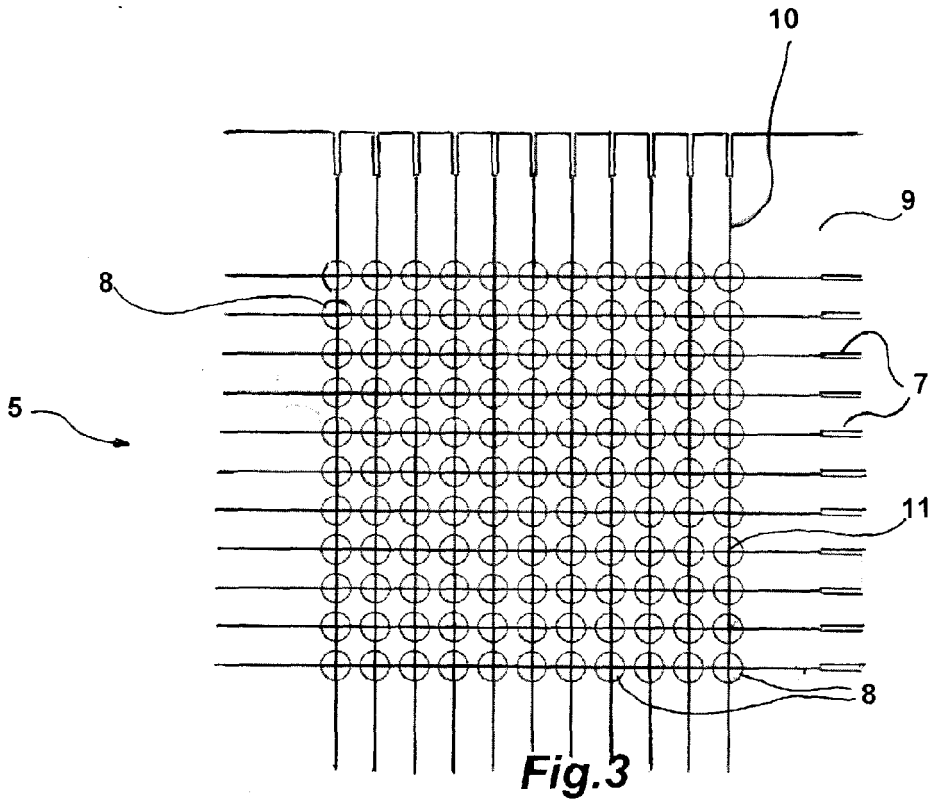

Fig.3

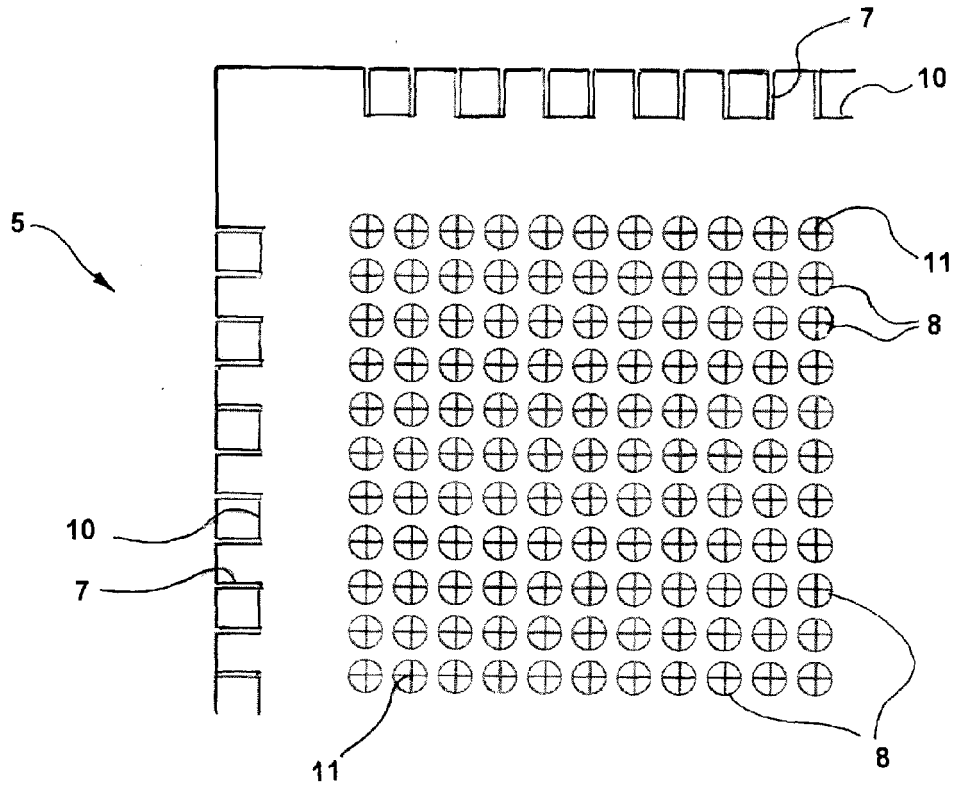

Fig.4

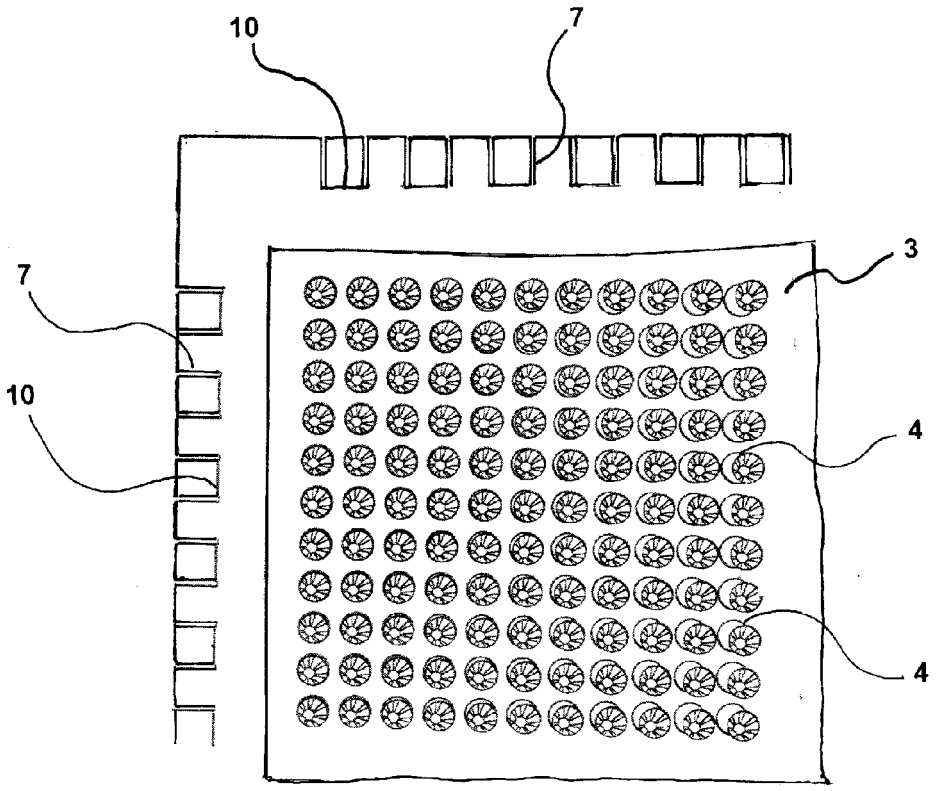

Fig.5

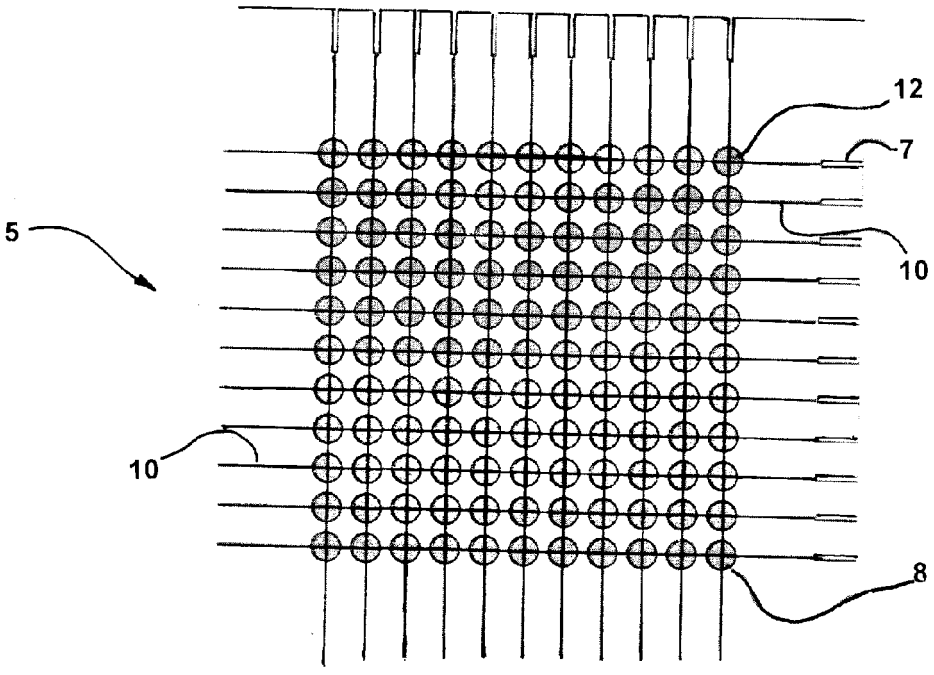

Fig.6

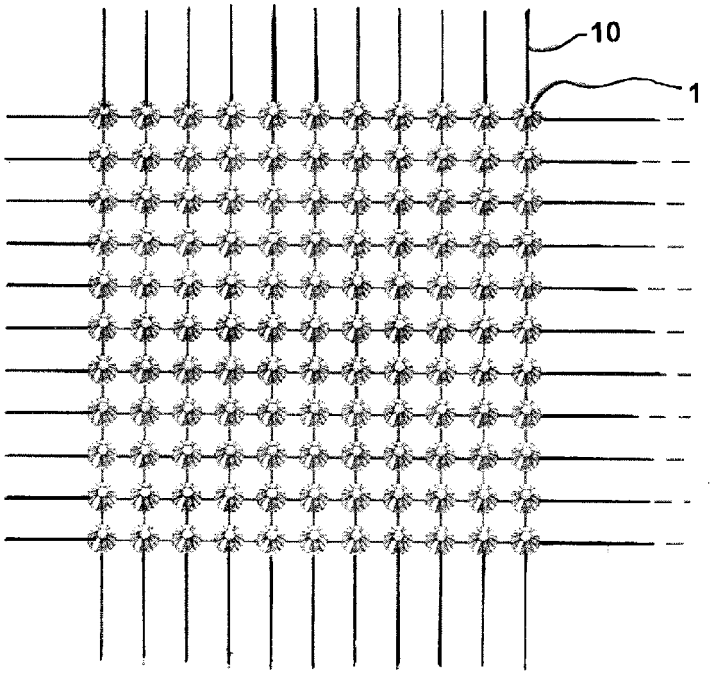

Fig.7

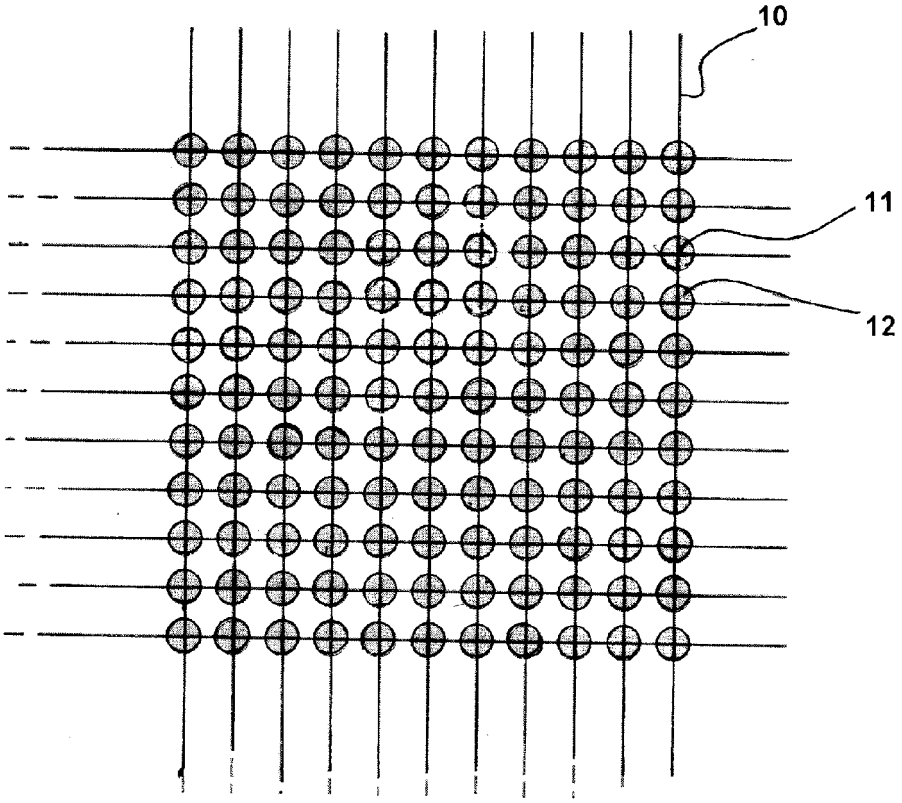

Fig.8

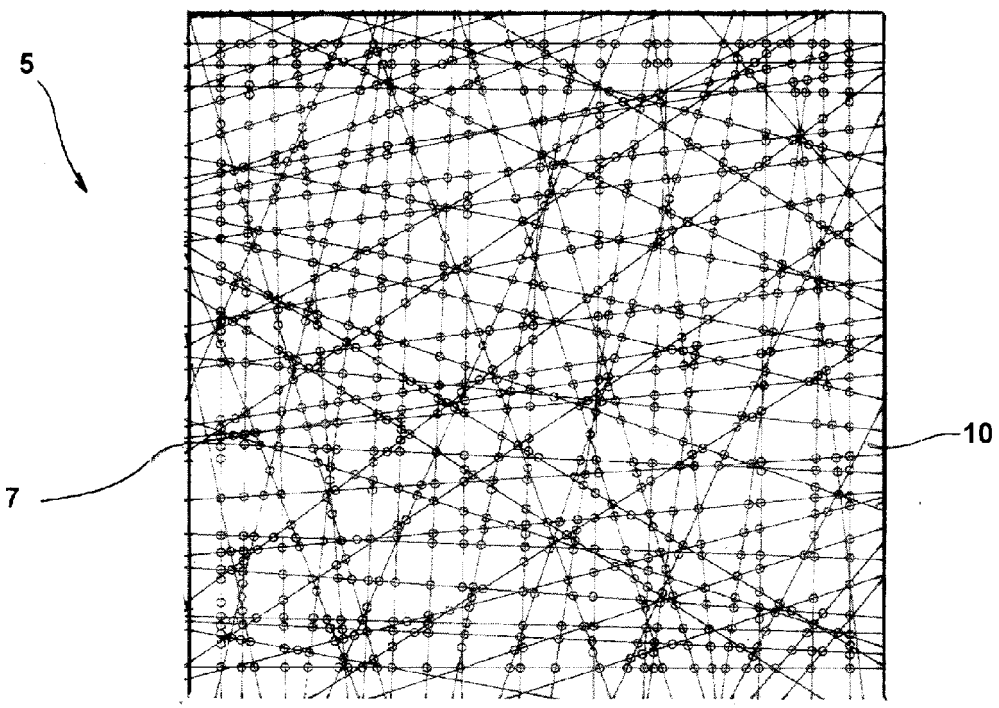

Fig.9

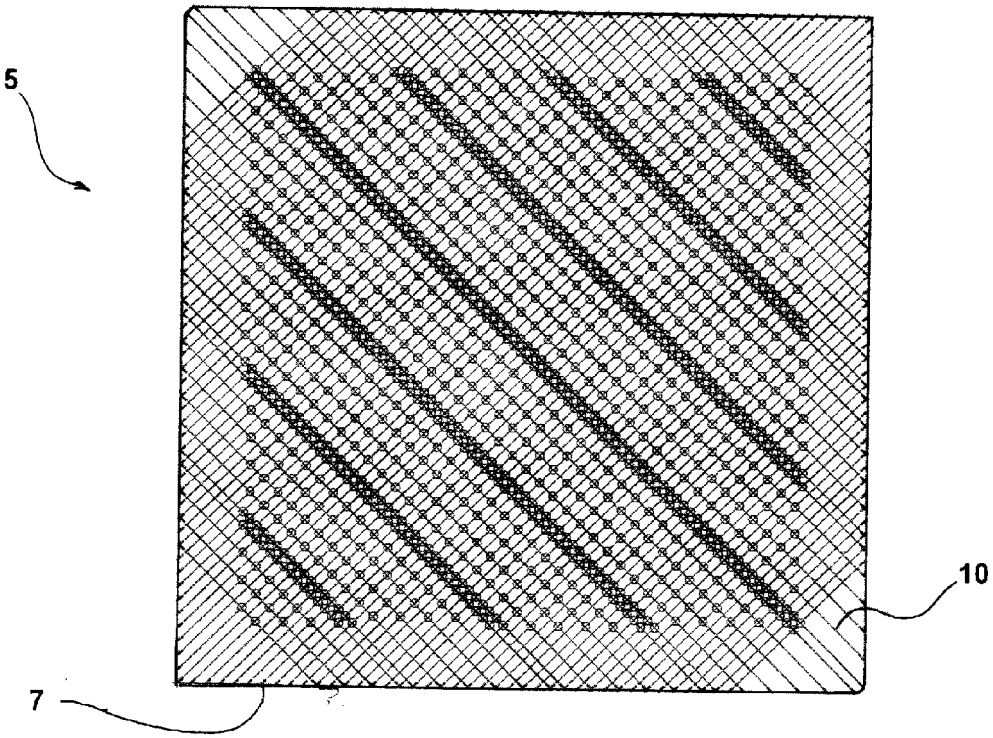

Fig.10

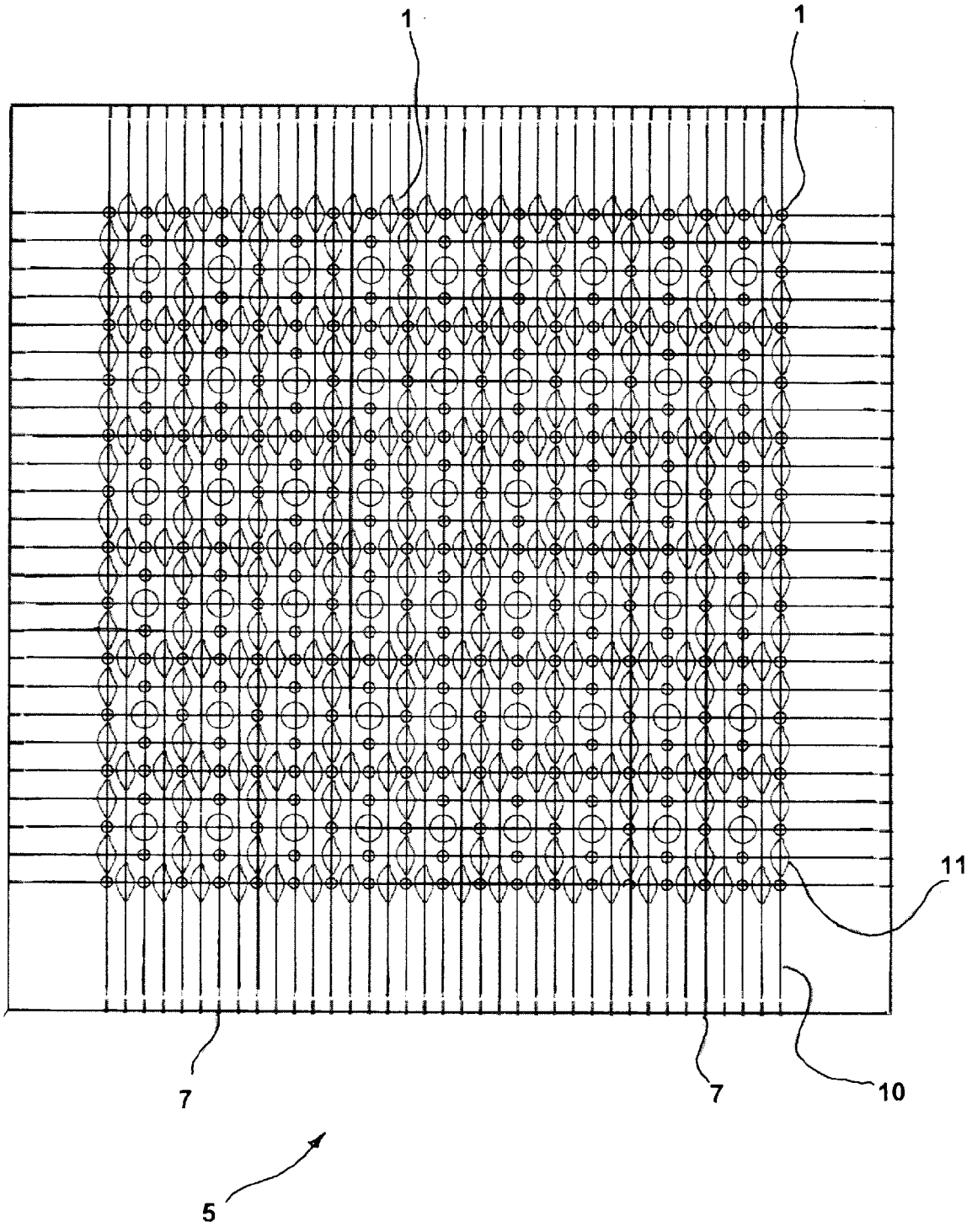

Fig.11

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EUROPEAN SEARCH REPORT

Application Number
EP 15 17 7737

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	GB 1 123 797 A (ROBERT FREY; DANIEL SWAROVSKI; MANFRED SWAROVSKI) 14 August 1968 (1968-08-14) * page 2, line 33 - page 2, line 74; figures 1-3 *	1-7	INV. B44C1/28 B44C3/00 A44C17/00 A44C27/00
A	DE 29 01 728 B1 (SWAROVSKI & CO [AT]) 20 September 1979 (1979-09-20) * the whole document *	1-7	
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A	GB 966 339 A (ROBERT FREY; WILHELM SWAROVSKI; DANIEL SWAROVSKI; MANFRED SWAROVSKI) 12 August 1964 (1964-08-12) * page 2, line 23 - page 2, line 90; figures 1-8 *	1-7	

TECHNICAL FIELDS SEARCHED (IPC)
B44C
A44C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	8 October 2015	Sartor, Michele

CATEGORY OF CITED DOCUMENTS

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