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(54) **METHOD FOR ATTACHING A LINE TO A BOOM AND LINE FOR USE IN SUCH A METHOD**

VERFAHREN ZUR BEFESTIGUNG VON EINER LEINE AN EINEN AUSLEGER UND LEINE DAFÜR
PROCEDE DE FIXATION D'UN FIL A SECHER LE LINGE A UNE BARRE ET FIL DESTINE A ETRE
UTILISE DANS CE PROCEDE

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**EP-A- 0 134 253 GB-A- 755 619
NL-A- 6 713 882 US-A- 2 508 491
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Description

ing.

[0001] The invention relates to the production of equipment such as rotary clothes dryers, drying racks and the like. This equipment has booms to which lines are attached for hanging up the washing. In the case of rotary clothes dryers there are a large number of such lines, which have to be attached one by one to the arms of the rotary clothes dryer in a labour-intensive manner.

[0002] Such a state of affairs is fairly inconvenient, whilst the associated costs are also fairly high. The aim of the invention is, therefore, to provide a method by means of which the lines can be attached more easily and at lower cost and to enable a more streamlined production of said equipment. EP 0 134 253 A1 discloses a method for attaching a line for a washing line to a boom, such as the arm of a rotary clothes dryer, according to the preamble of claim 1.

[0003] EP 0 134 253 A1 is related to a clothes dryer having lines which at one end have a holding buffer or retainer that could be viewed as a barbed form. This retainer is introduced into a hole and then displaced along the opening so as to be held behind the wall in question. When the retainer is moved in the opposite direction after being introduced into the hole, no connection would take place. Instead, the retainer would first of all have to be moved along the length direction of the boom in question before a holding action can take place. It can therefore become disconnected easily.

[0004] The barbed form can be obtained in many different ways. A clasp with a barb, which clasp is fastened to the relevant end of the line, is mentioned as an example. The barb of the clasp, for example consisting of a unit made of metal or plastic, ensures that the line is retained after it has been inserted into the relevant opening. The clasp can also have more than one barb, for example two barbs located opposite one another that point away from one another.

[0005] The aim of the invention is achieved by means of a method for attaching a line for a washing line to a boom, such as the arm of a rotary clothes dryer, characterized by comprising the following steps:

- folding over the line so as to form a folded-over head and a free section of line extending from the head along the portion of the line adjoining the head,
- fitting a clasp between the head and the free section of line,
- providing a boom provided with an opening which has dimensions that approximately correspond to those of the head of the line,
- moving the boom and the line towards one another for taking up the head in one end of the opening over a distance such that the head and the section of line have emerged completely from the other end of the opening,
- hooking the free section of line behind the portion of the boom that surrounds the other end of the open-

[0006] With the method according to the invention fitting the lines on the boom can be mechanised and automated to a substantial extent. Insertion of the head of the line is an operation that is not very susceptible to malfunction because the head guides itself into the opening after it has been brought into the correct position by a robot or in some other way. The final fixing, obtained by simply pulling back the line, such that the head and the free section of line automatically hook securely, is also an operation that is easy to mechanise.

[0007] The clasp can be formed by crimping on, winding around or otherwise fitting a squeeze piece, such as a crimp piece, for example made of plastic, copper or steel. A piece of metal strip or metal wire can be used in this operation; specially manufactured clasps can also be used. These clasps can optionally have a securing lip that is hooked into the hole in the head to further increase the stability of the join.

[0008] The invention furthermore relates to a line for use in the method described above, and having a barbed form at one end of the line. Such a line, according to the preamble of claim 4, is known from EP 0 134 253 A1. It discloses a retainer, that could be viewed as a barbed form, at the end of the line. However, that retainer is not suited to be used in the method according to the invention. GB 755 619 A and US 2,508,491 disclose hooks and clips, and fasteners and thimbles, respectively, which are also not suited to be used in the method according to the invention.

[0009] For use in the method according to the invention, the invention further provides for a line according to the preamble of claim 4, which further has a folded-over head at said one end of the line, a free section of line that extends from the head along the portion of the line adjoining the head and a clasp between the head and the section of line.

[0010] The line can comprise a fibre core that is enclosed in a plastic sheath. The sheath of the line can consist of polyvinyl chloride. Such a material is fairly flexible per se and consequently does not contribute to the rigidity of the line. As a consequence of clamping the head with a crimp sleeve, the tensile forces in the line can nevertheless be transmitted to the boom without any problem, without the flexibility of the sheath playing a role here.

[0011] Reference is made to the prior art as disclosed in EP-A 134 253. This patent discloses a rotary clothes dryer that has arms provided with keyhole-shaped holes. The end of the lines provided with a retaining clamp is inserted in the wide part of these holes. The end of the line with the retaining clamp is then slid into the narrow end of the hole, by which means the join between line and arm is produced. Attaching of the line to the arm by means of a barbed form is not what is concerned here.

[0012] US-A 5 240 128 discloses a rotary clothes dryer of this type, wherein the arms carry slider members that

are provided with slot-shaped holes with a wide and a narrow part. The lines of the rotary clothes dryer have clamps at the ends thereof which clamps are inserted in the wide parts of the slot-shaped holes. The lines are then moved to the narrow parts of the slot-shaped holes, such that the clamps are securely hooked. It is not barbed forms that are concerned here.

[0013] GB-A 755 619 shows wire clamps for clamping the free end of a wire that has been bent through 180°. The form of the wire thus obtained is not used as a barbed form.

[0014] The invention will be explained in more detail below with reference to an illustrative embodiment shown in the figures.

Figure 1 shows a line for use in the method according to the invention.

Figure 2 shows a clamp for use with this method.

Figure 3 shows a line as produced using the method according to the invention.

Figure 4 shows a first stage in attaching the line to a boom.

Figure 5 shows a first view of the attached line with boom.

Figure 6 shows a second view.

[0015] The line indicated in its entirety by 1 in Figure 1, which has a fibre core 2 and a plastic sheath 3 made of, for example, polyvinyl chloride, can be used in the method according to the invention. The fibres 2 have a high tensile strength and high tensile rigidity. Consequently, the line used as washing line will not give too much and droop when heavy items are hung on it. The purpose of the polyvinyl chloride sheath 3 is merely to protect the bundle of fibres 2 and to facilitate hanging up the washing. However, the flexibility of such a sheath 3 is fairly high and therefore also does not contribute to the rigidity and strength of the line 1.

[0016] With regard to the method according to the invention the line 1 is bent over at one end, as a result of which a head 4 is produced (Fig. 3), as well as a free section 5 of line adjoining the latter. This form is fixed by the squeeze piece or crimp piece indicated in its entirety by 6, the initial form of which is indicated by 7 in Figure 2a. This crimp piece is U-shaped and has two arms 8, 9 as well as an intermediate section 10. When deforming the crimp piece the arms are shaped to give the two curls indicated by 11 and 12, which are joined by the intermediate section 10 as shown in Figure 2b. The crimp piece 6 is shown in this latter state in Figure 3. In this embodiment the arms 8, 9 are each pushed through the line 4, such that one half of the line in each case runs in the two spaces as defined by the curls 11, 12. Firm mechanical fastening of the line 4 is thus ensured. This fastening can also be obtained by allowing the line in its entirety, that is to say not split, to run through both spaces as defined by the curls.

[0017] According to the invention a line 1 prepared in

this way is inserted in the hole 13 of the boom indicated in its entirety by 14, in this case in the arm of a rotary clothes dryer (Fig. 4). This boom is likewise U-shaped and has the arms 15, 16 shown in Figure 5, which are joined by an intermediate section (not visible).

[0018] During the first stage of insertion the head 4 enters the hole. Then the portion of the line 1 around which the crimp piece 6 has been clamped and then the free section of line 5 that points outwards under the effect of crimping.

[0019] After the entire head, crimp piece 6 and the free end 1 of the line have been inserted through the hole, the line is pulled back to some extent, as a result of which the situation as shown in the view in Figure 5 is produced. In this situation both the end 5 of the line and the head 4 bear firmly against the surroundings of the hole 13, which yields a very stable fixing between the line 1 and the arm 14, as is also shown in the view in Figure 6.

[0020] Although reference has been made in the description to a line with a fibre core and a sheath, a wide variety of other types of lines can also be used. Rotary clothes dryers and the like have also been mentioned. This covers any equipment in which lines are attached to booms.

Claims

1. Method for attaching a line (1) for a washing line to a boom, such as the arm (14) of a rotary clothes dryer, comprising the following steps:

- providing a barbed form (4 - 6) at one end of the line (1),
- providing a boom (14) provided with an opening (13) which has dimensions that approximately correspond to those of the barbed form (4 - 6) of the line (1),
- moving the boom (14) and the line (1) towards one another for taking up the barbed form (4-6) in one end of the opening (13) over a distance such that the barbed form (4-6) has emerged from the other end of the opening (13),
- moving the line (1) and the boom (14) in opposing directions with respect to one another such that the barbed form (4 - 6) is held securely by hooking behind the portion of the boom (14) that surrounds the other end of the opening (13),

characterized by comprising the following steps:

- folding over the line (1) so as to form a folded-over head (4) and a free section of line (5) extending from the head (4) along the portion of the line (1) adjoining the head (4),
- fitting a clasp (6) between the head (4) and the free section of line (5),
- providing a boom (14) provided with an opening

- (13) which has dimensions that approximately correspond to those of the head (4) of the line (1),
 - moving the boom (14) and the line (1) towards one another for taking up the head (4) in one end of the opening (13) over a distance such that the head (4) and the free section of line (5) have emerged completely from the other end of the opening (13),
 - hooking the free section of line (5) behind the portion of the boom (14) that surrounds the other end of the opening (13).
2. Method according to Claim 1, comprising hooking the head (4) behind the section of the boom (14) that surrounds the other end of the opening (13).
3. Method according to Claim 1 or 2, wherein the clasp (6) is formed by crimping on a crimp piece. Line (1) for use in the method according to one of the preceding claims, having form (4 - 6) at one end.
4. Line (1) for use with the method according to one of Claims and having a barbed form at one end of the line, **characterized by** : 1-3 having a folded-over head (4) at said one end, a free section of line (5) that extends from the head (4) along the portion of the line (1) adjoining the head, and a clasp (6) between the head (4) and the section of line (5).
5. Line (1) according to Claim 4, wherein the clasp (6) is a crimp sleeve.
6. Line (1) according to Claim 4 or 5, wherein a fibre core (2) is accommodated in a plastic sheath (3).
7. Line (1) according to Claim 6, wherein the sheath (3) comprises polyvinyl chloride.

Patentansprüche

1. Verfahren zum Anbringen einer Leine (1) für eine Wäscheleine an einem Ausleger, beispielsweise an dem Arm (14) eines drehbaren Wäschetrockners, wobei das Verfahren folgende Schritte aufweist:
- Vorsehen einer Widerhakenform (4 - 6) an dem einen Ende der Leine (1),
 - Vorsehen eines Auslegers (14) mit einer Öffnung (13), die Abmessungen besitzt, welche ungefähr denen der Widerhakenform (4 - 6) der Leine (1) entsprechen,
 - der Ausleger (14) und die Leine (1) werden aufeinander zu bewegt, um die Widerhakenform (4 - 6) in dem einen Ende der Öffnung (13) über eine Strecke aufzunehmen, so dass die Widerhakenform (4 - 6) aus dem anderen Ende der Öffnung (13) ausgetreten ist,

- Bewegen der Leine (1) und des Auslegers (14) in entgegengesetzten Richtungen zueinander, so dass die Widerhakenform (4 - 6) sicher gehalten wird, und zwar durch Einhaken hinter dem Bereich des Auslegers (14), der das andere Ende der Öffnung (13) umgibt,

dadurch gekennzeichnet,

dass das Verfahren folgende Schritte umfasst:

- Herumfalten der Leine (1), um einen herumgefalteten Kopf (4) und einen freien Bereich (5) der Leine zu bilden, der sich von dem Kopf (4) längs des Bereiches der Leine (1) erstreckt, der an den Kopf (4) angrenzt,
- Anbringen einer Klammer (6) zwischen dem Kopf (4) und dem freien Bereich (5) der Leine,
- Vorsehen eines Auslegers (14), der mit einer Öffnung (13) versehen ist, welche Abmessungen besitzt, die ungefähr denen des Kopfes (4) der Leine (1) entsprechen,
- der Ausleger (14) und die Leine (1) werden aufeinander zu bewegt, um den Kopf (4) in dem einen Ende der Öffnung (13) über eine Strecke aufzunehmen, so dass der Kopf (4) und der freie Bereich (5) der Leine vollständig aus dem anderen Ende der Öffnung (13) ausgetreten sind, und
- Einhaken des freien Bereiches (5) der Leine hinter dem Bereich des Auslegers (14), der das andere Ende der Öffnung (13) umgibt.

2. Verfahren nach Anspruch 1, wobei der Kopf (4) hinter dem Ende des Auslegers (14) eingehakt wird, der das andere Ende der Öffnung (13) umgibt.
3. Verfahren nach Anspruch 1 oder 2, wobei die Klammer (6) durch Crimpen auf einem Crimpteil gebildet wird.
4. Leine (1) zur Verwendung bei dem Verfahren nach einem der Ansprüche 1 bis 3, die eine Widerhakenform an dem einen Ende der Leine besitzt, **dadurch gekennzeichnet,** **dass** sie folgendes aufweist: einen herumgefalteten Kopf (4) an dem einen Ende, einen freien Bereich (5) der Leine, der sich von dem Kopf (4) längs des Bereiches der Leine (1) erstreckt, der an den Kopf angrenzt, und eine Klammer (6) zwischen dem Kopf (4) und dem freien Bereich (5) der Leine.
5. Leine (1) nach Anspruch 4, wobei die Klammer (6) eine Crimphülse ist.
6. Leine (1) nach Anspruch 4 oder 5, wobei ein Faserkern (2) in einer Kunststoffumhüllung (3) untergebracht ist.

7. Leine (1) nach Anspruch 6,
wobei die Umhüllung (3) Polyvinylchlorid aufweist.

le collier (6) est formé par sertissage d'une pièce à sertir.

Revendications

1. Procédé pour attacher une corde (1) servant de corde à linge à une barre telle que le bras (14) d'un sèche-linge rotatif, comprenant les étapes suivantes :

- prévoir une forme barbelée (4 - 6) à une extrémité de la corde (1),
- prévoir une barre (14) munie d'une ouverture (13) ayant des dimensions qui correspondent approximativement à celles de la forme barbelée (4 - 6) de la corde (1),
- déplacer la barre (14) et la corde (1) l'une vers l'autre pour engager la forme barbelée (4 - 6) dans une extrémité de l'ouverture (13) sur une distance telle que la forme barbelée (4 - 6) émerge de l'autre côté de l'ouverture (13),
- déplacer la corde (1) et la barre (14) dans des directions opposées l'une par rapport à l'autre de telle manière que la forme barbelée soit solidement retenue en s'accrochant derrière la partie de la barre (14) qui entoure l'autre extrémité de l'ouverture (13),

caractérisé par les étapes consistant à :

- replier la corde (1) de manière à former une tête repliée (4) et un segment de corde libre (5) qui part de la tête (4) et s'étend le long de la partie de la corde (1) qui est adjacente à la tête (4),
- placer un collier (6) entre la tête (4) et le segment libre de la corde (5),
- prévoir une barre (14) munie d'une ouverture (13) ayant des dimensions qui correspondent approximativement à celles de la tête (4) de la corde (1),
- déplacer la barre (14) et la corde (1) l'une vers l'autre pour engager la tête (4) dans une extrémité de l'ouverture (13) sur une distance telle que la tête (4) et le segment libre de la corde (5) émergent entièrement de l'autre extrémité de l'ouverture (13),
- accrocher le segment libre de la corde (5) derrière la partie de la barre (14) qui entoure l'autre extrémité de l'ouverture (13).

2. Procédé selon la revendication 1, comprenant l'étape consistant à accrocher la tête (4) derrière le segment de la barre (14) qui entoure l'autre extrémité de l'ouverture (13).

3. Procédé selon la revendication 1 ou 2, dans lequel

4. Corde (1) destinée à être utilisée dans le procédé selon une des revendications 1 à 3 et possédant une forme barbelée à une extrémité, **caractérisée en ce qu'elle** présente une tête repliée (4) à ladite extrémité, un segment libre de corde (5) qui part de la tête (4) et s'étend le long de la partie de la corde (1) qui est adjacente à la tête, et un collier (6) entre la tête (4) et le segment de corde (5).

5. Corde (1) selon la revendication 4, dans laquelle le collier (6) est une douille sertie.

6. Corde (1) selon la revendication 4 ou 5, dans laquelle une âme en fibre (2) est enfermée dans une gaine de plastique (3).

7. Corde (1) selon la revendication 6, dans laquelle la gaine (3) comprend du chlorure de polyvinyle.

Fig 1

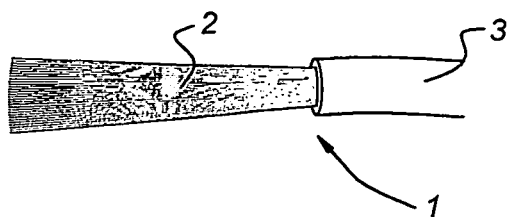


Fig 2a

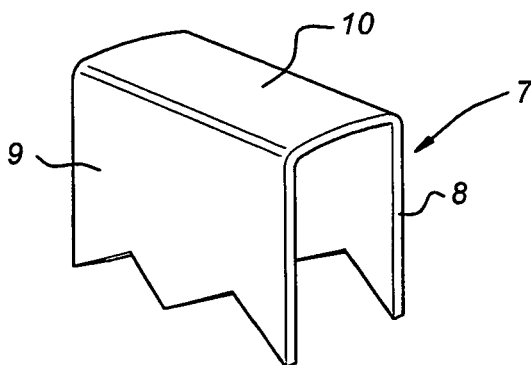


Fig 2b

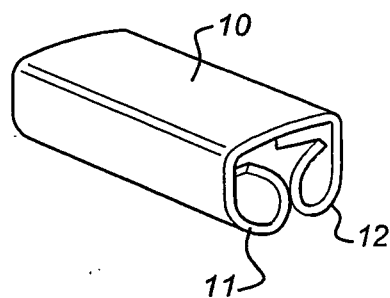


Fig 3

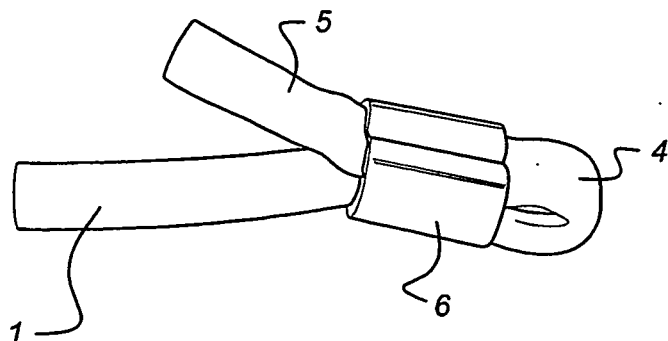


Fig 4

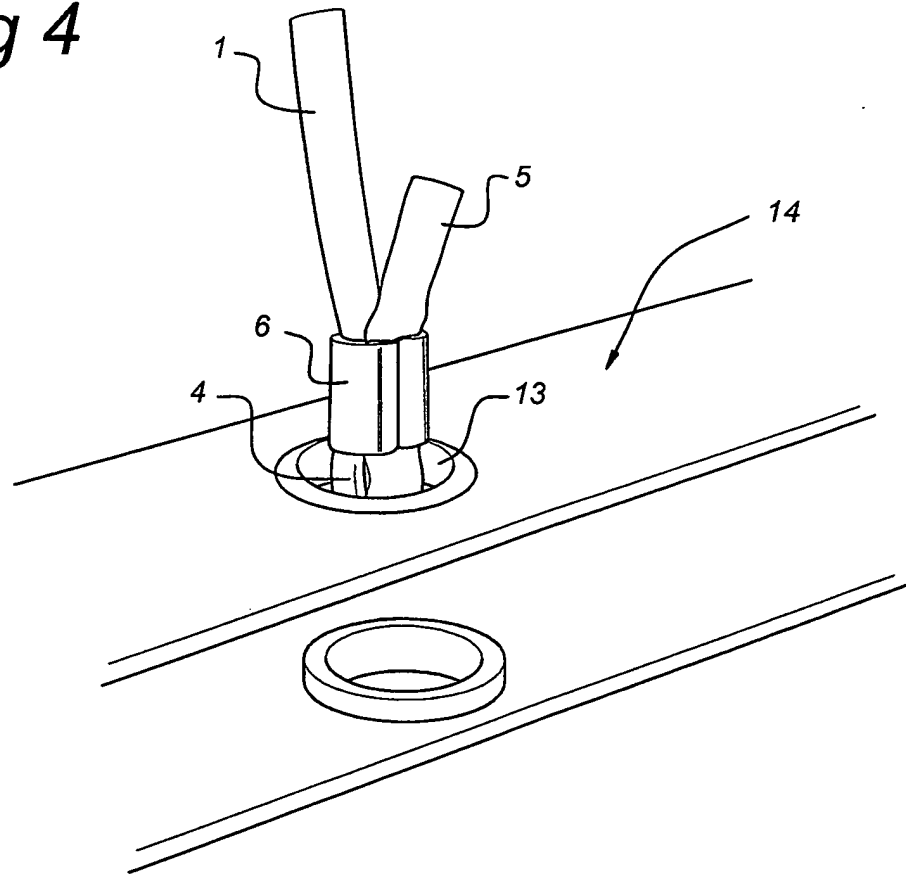


Fig 5

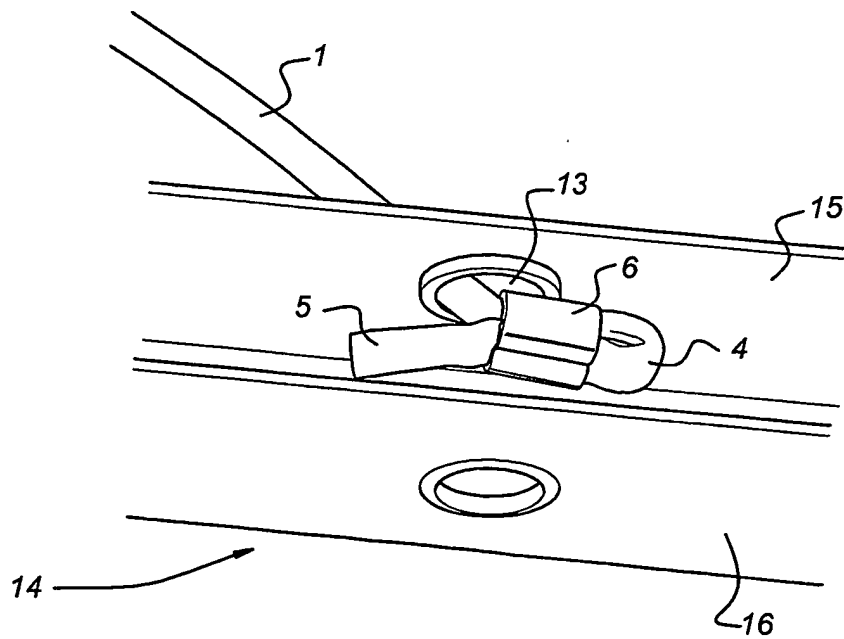
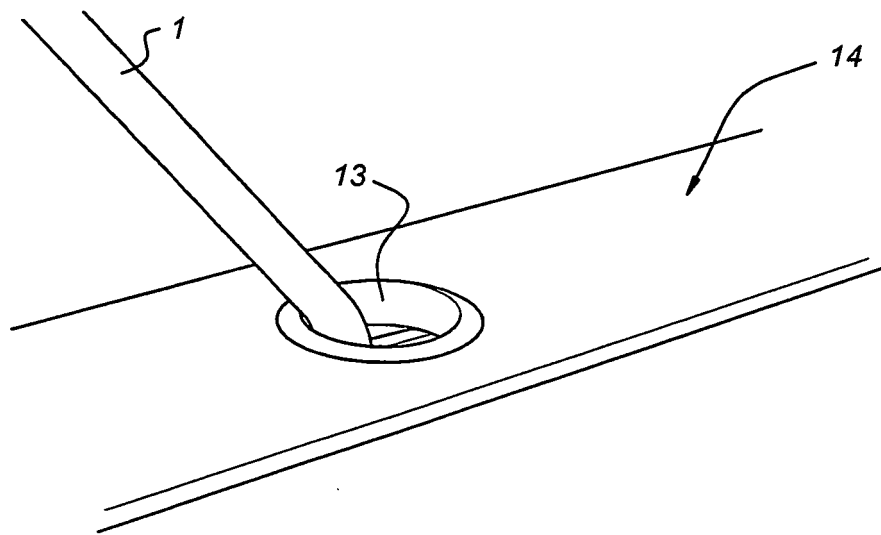


Fig 6



REFERENCES CITED IN THE DESCRIPTION

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