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(54) GUIDE DEVICE FOR A RAPIER IN A GRIPPER WEAVING MACHINE

FÜHRUNGSVORRICHTUNG EINES GREIFERS IN EINER GREIFERWEBMASCHINE

DISPOSITIF DE GUIDAGE POUR LANCE DANS UN MÉTIER À TISSER À PINCE

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Description

TECHNICAL FIELD AND PRIOR ART

[0001] The invention relates to a guide device for a rapier in a gripper weaving machine, a gripper weaving machine with such a guide device and a method for cooling such a guide device.

[0002] In prior art gripper weaving machines, also referred to as rapier weaving machines, a gripper is attached at the front end of a rapier for moving the gripper through a shed. The rapier is driven by a drive wheel arranged next to the shed. The rapier is kept into contact with the drive wheel by guide blocks. The rapier is guided between the shed and the drive wheel by straight stationary guides from and to the shed. The rapier is guided between the drive wheel and the lower side of the gripper weaving machine by a guide device from and to the lower side of the gripper weaving machine. In this case the guide device guides the rear end of the rapier, this is the end of the rapier located opposite to the front end of the rapier at which the gripper is attached.

[0003] Such guide devices can be designed in several shapes, for example a circular guide device as described in US 4,060,104, a straight guide device as described in EP 0 126 497 B1 or GB 1396492 or a curved guide device as described in EP 0 412 453 B1. In this case the rapier is flexible allowing for guiding the rapier around the drive wheel and along the guide device. The changes in direction of the rapier by means of the guide devices have the disadvantage that a friction arises between the rapier and the guide device whereby a relatively large amount of heat is generated, which is particularly disadvantageous in wide and fast gripper weaving machines. BE 1000506 A4 discloses an arrangement comprising a first guide device arranged at an entry and a second guide device arranged at an exit of a drive wheel, wherein the first and second guide device are provided with cooling fins, and an airstream can be directed towards the cooling fins. CN 2161626 Y also shows guide devices arranged at an entry and an exit of a drive wheel.

SUMMARY OF THE INVENTION

[0004] It is an object of the invention to provide a guide device which can be applied in wide and/or fast weaving machines. It is further an object of the invention to provide a gripper weaving machine with such a guide device. It is further an object of the invention to provide a method for cooling such a guide device.

[0005] These objects are solved by a guide device with the features of claim 1, a gripper weaving machine with the features of claim 8, a method with the features of claim 13, and by the dependent claims.

[0006] According to a first aspect of the invention a guide device for guiding a rapier in a gripper weaving machine is provided, wherein in use the guide device is arranged adjacent to a drive wheel for driving the rapier

at a side opposite to the shed in order to guide the rapier between the drive wheel and a lower side of the gripper weaving machine, wherein the guide device comprises a first straight part that in use is arranged adjacent to the drive wheel and comprises a second straight part that in use is arranged farther away from the drive wheel at an angle to the first straight part, in particular arranged more adjacent to the lower side of the gripper weaving machine, wherein the first straight part and the second straight part are connected to each other via a curved transition section, wherein the guide device comprises a cooling device in order to cool the guide device at least the area of the curved transition section, and wherein the guide device is provided with at least one channel for the cooling fluid running near a guiding surface for guiding the rapier.

[0007] The invention offers the advantage that during weaving the operating temperature of the guide device can be limited by a forced cooling of the guide device. Also the friction between the rapier and the guide device can be limited by making use of a guide device with straight parts which also results in a lower operating temperature. In this case the friction and the associated heat generation is more locally at the height of the transition section, however, this heat can be removed with high efficiency by the cooling. The forced cooling can be carried out both during the operation of the gripper weaving machine and during a stop of the gripper weaving machine. Due to the limited temperature of the guide device, the temperature of the flexible rapier guided by the guide device can also be limited. Due to the cooling of the guide device, heat generated by friction with the rapier can be removed, this means both local rises of temperature as overall rises of temperature are to be limited. The cooling of the guide device, and thus also the cooling of the rapier, is advantageous in order to limit wear of the rapier and wear of the guide device. This is also advantageous in order to limit degeneration of the rapier, so that the material properties of the rapier can be maintained optimal. This is advantageous because wear and degeneration of the rapier occur faster at a high operating temperature of the rapier. The guide device also functions as a protection for the rapier for oil or dust, so that the rapier can be guided under the gripper weaving machine.

[0008] Preferably, the guiding surface is cooled, where most heat is generated by friction with the rapier.

[0009] According to an embodiment the guide device is formed by a first elongated profile and a second elongated profile which form together a tubular guide for the rapier. A tubular guide device allows to completely enclose and to completely catch the rapier in the guide device. According to a variant the guide device can enclose the rapier not completely or only almost completely.

[0010] According to an embodiment the guide device comprises a first elongated profile with a first guiding surface that cooperates with an outer surface of the curved rapier and which is provided with at least one channel for the cooling fluid, this means one or more channels

for the cooling fluid which are part of the cooling device. Such cooling allows to remove the heat that is locally generated by friction between the rapier and the first guiding surface of the guide device near the first guiding surface where a relatively large amount of heat is generated. As the friction is the largest at the height of the outer surface of the rapier, most heat is also generated by locally guiding the outer surface of the rapier against the first guiding surface of the first profile. The first profile is made of good conductive material such that sufficient heat can be removed, so that the guide device together with the rapier warm-up relatively slightly. Preferably, to this end the at least one channel for the cooling fluid is provided near the first guiding surface for the rapier in order to be able to remove sufficient heat.

[0011] According to an embodiment the guide device comprises a second elongated profile with a second guiding surface that cooperates with an inner surface of the curved rapier and which is attached to the first elongated profile. In this case also the second elongated profile can be provided with at least one channel for the cooling fluid. According to an alternative the first elongated profile and the second elongated profile are made in one piece that is provided with at least one channel for the cooling fluid.

[0012] According to an embodiment the at least one channel for the cooling fluid extends over almost the full length of the guide device in order to cool the guide device.

[0013] According to an embodiment the first straight part of the guide device in use is arranged tangentially with respect to the drive wheel in order to guide the rapier from and to the drive wheel. In this case the rapier preferably is bent around the drive wheel.

[0014] Preferably, the cooling fluid is oil, for example lubricating oil for the gripper weaving machine. Lubricating oil is available in each gripper weaving machine and each gripper weaving machine comprises a system allowing to circulate the lubricating oil.

[0015] According to an alternative the cooling fluid may also consist of water, compressed air or another cooling fluid, such as humidified compressed air. In case of use of air, the guide device can be provided for example with cooling fins along which the air is guided. According to another alternative, the guide device can be cooled by a cooling device which cooperates with a contact surface of the guide device, for example a profile provided with cooling channels which is arranged against a contact surface of the guide device.

[0016] According to a second aspect of the invention a gripper weaving machine is provided comprising a rapier, a drive wheel for driving a rapier, wherein in use a gripper is arranged at the front end of the rapier, wherein the gripper weaving machine comprises a guide device according to the invention with a first straight part and a second straight part connected to each other via a curved transition section in order to guide the rapier between the drive wheel and a lower side of the gripper weaving machine. In this case the guide device comprises a first

straight part, a second straight part and a curved transition section that connects the first straight part and the second straight part. The rapier is bent around the drive wheel and the guide device is arranged adjacent to the drive wheel opposite to the front end of the rapier at which the gripper is arranged.

[0017] According to a preferred embodiment the guide device comprises a first elongated profile for guiding an outer surface of the rapier, which first elongated profile is provided with at least one channel for the cooling fluid. The guide device can also comprise a second elongated profile attached to the first elongated profile.

[0018] According to an embodiment the first straight part of the guide device is arranged tangentially with respect to the drive wheel in order to guide the rapier from and to the drive wheel. In this case according to an embodiment the rapier is bent around the drive wheel.

[0019] According to an embodiment the guide device is arranged between the drive wheel and a horizontally arranged guide for the rapier. The horizontally arranged guide allows to further guide the rear end of the rapier in case of wide weaving machines. The horizontally arranged guide also allows to further guide the rapier below the shed.

[0020] According to a third aspect of the invention a method is provided for cooling a guide device for a rapier in a gripper weaving machine, wherein the method comprises cooling the guide device according to the invention. The method for cooling comprises guiding a cooling fluid for cooling a guiding surface for the rapier at least in the area of the curved transition section of the guide device. According to an embodiment the method for cooling makes use of oil as cooling fluid, in particular lubricating oil of the gripper weaving machine.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] Further characteristics and advantages of the invention will emerge from the following description of the embodiments schematically illustrated in the drawings. Throughout the drawings, the same elements will be denoted by the same reference numerals. In the drawings:

Figure 1 is a schematic view of a part of a gripper weaving machine with a guide device according to the invention;

Figure 2 is a perspective view of the guide device according to figure 1;

Figure 3 is a dismantled perspective view of a guide device according to the invention and a rapier;

Figure 4 is a section along line IV-IV in figure 2 on an enlarged scale;

Figure 5 is a variant of figure 4;

Figure 6 is another variant of figure 4;

DETAILED DESCRIPTION OF EMBODIMENTS

[0022] Figure 1 is a schematic view of a part of a gripper weaving machine with a rapier 1 at which in use a gripper 2 is attached at the front end 25 of the rapier 1. The gripper 2 is either a so-called bringer gripper, or a so-called receiver gripper. Further a drive wheel 3 is illustrated for driving the rapier 1 to and fro, that is driven by driving means (not illustrated). The rapier 1 is kept into contact with the drive wheel 3 by means of guide blocks 4 and 5 assigned to the drive wheel 3. The rapier 1 is flexible in order to allow the rapier 1 to bend around the drive wheel 3. Past the guide block 5 the rapier 1 is guided in a guide device 6 according to the invention in order to guide the rapier 1 to the lower side of the gripper weaving machine and/or below the shed 8 (indicated schematically). In this case the guide device 6 guides the rear end 26 of a rapier 1, this is the end of the rapier 1 located opposite to the front end 25 at which the gripper 2 is attached. Furthermore, another stationary guide 7 for the rapier 1 is provided between the drive wheel 3 and the shed 8 to guide the rapier 1 from and to the shed 8. The stationary guide 7 and the guide device 6 are attached to a frame (not shown) of the weaving machine. Optionally also a horizontally arranged guide 9 for the rapier 1 is provided that is arranged such that the guide device 6 is arranged between the drive wheel 3 and the horizontally arranged guide 9. The guide 9 is connected via a connecting element 43 to the guide device 6. In this case the guide device 6 is arranged with respect to the drive wheel 3 at the side of the drive wheel 3 that is opposite to the side of the drive wheel 3 at which the gripper 2 is arranged. The rapier 1 can also cooperate with a guide 29 arranged opposite to the drive wheel 3. The rapier 1 can also cooperate with a lubrication pin 30 and/or a lubrication pin 31 in order to lubricate the rapier 1.

[0023] The guide device 6 in use is arranged at the side of the drive wheel 3 opposite to the shed 8 in order to guide the rapier 1 from the drive wheel 3 to the lower side of the gripper weaving machine. The guide device 6 in use is arranged tangentially with respect to the drive wheel 3 in order to further guide the rapier 1 from the drive wheel 3. The guide device 6 comprises a first straight part 10 that in use is arranged adjacent to the drive wheel 3. The first straight part 10 of the guide device 6 is arranged tangentially with respect to the drive wheel 3 in order to further guide the rapier 1 from the drive wheel 3. The guide device 6 also comprises a second straight part 11 that in use is arranged farther away from the drive wheel 3 and adjacent to the lower side of the gripper weaving machine. The first straight part 10 and the second straight part 11 form an angle A with each other and are connected to each other via a curved transition section 12. The guide device 6 according to the invention comprises at least one cooling device 13 intended to cool the guide device 6 at least in the area of the curved tran-

sition section 12. The cooling near the curved transition section 12 allows for cooling in an area where most heat is generated by friction between the rapier 1 and the guide device 6, because at the height of the curved transition section 12 the rapier 1 pushes most on the guide device 6. Due to the curved transition section 12 the guide device 6 is bent allowing to guide the rapier 1 along the guide device 6 to the lower side of the gripper weaving machine.

[0024] As can be seen in figures 1, 2, 3 and 4 the guide device 6 comprises a cooling device 13 which is formed by a channel 14 for a cooling fluid arranged in the guide device 6. The guide device 6 comprises a first elongated bended profile 15 in which the channel 14 for the cooling fluid is provided. The first elongated bended profile 15 cooperates with the outer surface 16 of the rapier 1, this is the surface of the curved rapier 1 located at the outer side of the shaped arch in the rapier 1 and that can make contact with the profile 15 of the guide device 6 as can be seen in figure 1. The guide device 6 comprises a second elongated bended profile 17 attached to the first profile 15 and cooperating with the inner surface 18 of the rapier 1, this is the surface of the curved rapier 1 located at the inner side of the shaped arch of the rapier 1 and that can make contact with the profile 17 of the guide device 6 as can be seen in figures 1 and 4. As can best be seen in figure 4 the first profile 15 and the second profile 17 are connected relative to one another by connections 19 and form together a tubular guide device 6 in which the rapier 1 can be guided with play. The shape of the profile 15 and of the associated profile 17 is such that the profiles 15 and 17 form together the first straight part 10, the second straight part 11 and the curved transition section 12.

[0025] The cooling device 13 with the channel 14 cooperates with the lubricating system 20 of the gripper weaving machine, so that for cooling the guide device 6 use is made of lubricating oil of the gripper weaving machine as the cooling fluid. The lubricating system 20 is connected via lines 21 and 22 with the channel 14. As indicated in figure 1 the channel 14 for the cooling fluid extends over almost the full length of the guide device 6 in order to cool the guide device 6, more in particular extends between the connector 41 for the line 21 and the connector 42 for the line 22. By cooling the guide device 6 also the rapier 1 is cooled.

[0026] As can be seen in figure 4 the profile 15 is provided with a guiding surface 27 for the outer surface 16 of the rapier 1 and the profile 17 is provided with a guiding surface 28 for the inner surface 18 of the rapier 1. In this case the guide device 6 is provided with a channel 14 for the cooling fluid running near the guiding surface 27. In this case the guide device 6 is formed by the first profile 15 and the second profile 17 which form together a tubular guide for the rapier 1. The sides of the rapier 1 are hereby guided by guiding elements 32 and 33 provided at the profile 15 and for example are designed in the shape of a collar.

[0027] According to the invention the guide device 6

with the first straight part 10, the second straight part 11 and the curved transition section 12, that connects the first straight part 10 and the second straight part 11, is cooled by guiding a cooling fluid through the channel 14 located near the guiding surface 27 for the rapier 1. Preferably, this cooling can take place over almost the full length of the guide device 6. As the heat is mainly generated in the area of the curved transition section 12, it may be sufficient to cool the guide device 6 in the area of the curved transition section 12.

[0028] Figure 5 is a variant of figure 4 wherein the cooling device 13 comprises two channels 14, 24 for the cooling fluid associated with the first bended profile 15. The cooling device 13 also comprises a channel 23 for the cooling fluid associated with the second bended profile 17. In this case the sides of the rapier 1 are guided by guiding elements 34 and 35 provided at the second profile 17.

[0029] Figure 6 is a variant of figure 4 wherein the guide device 6 is formed by a bended tubular profile 36. The cooling device 13 is formed by a housing 37 cooperating with at least one contact surface 38 of the guide device 6 formed by the profile 36. As illustrated in figure 6 the housing 37 is provided with two cooling channels 39, that for example are provided with cooling fluid via the lubricating system 20 (illustrated in figure 1) of the gripper weaving machine. The housing 37 is arranged against the contact surfaces 38 of the profile 36 of the guide device 6 in order to cool the guide device 6.

[0030] It is clear that in case the gripper weaving machine comprises a bringer gripper and a receiver gripper, at the height of each side of the gripper weaving machine a drive wheel 3 for a rapier 1 and associated guide device 6 according to the invention can be arranged for the rapier 1.

[0031] The guide device, the gripper weaving machine and the method according to the invention are not limited to the embodiments described by way of example and shown in the drawings. Variants and combinations of the described and shown embodiments that fall under the claims are also possible.

Claims

1. Guide device for guiding a rapier (1) in a gripper weaving machine, wherein in use the guide device (6) is arranged adjacent to a drive wheel (3) for driving the rapier (1) at a side opposite to the shed (8) in order to guide the rapier (1) between the drive wheel (3) and a lower side of the gripper weaving machine, wherein the guide device (6) comprises a first straight part (10) that in use is arranged adjacent to the drive wheel (3) and comprises a second straight part (11) that in use is arranged farther away from the drive wheel (3) at an angle (A) to the first straight part (10), and wherein the first straight part (10) and the second straight part (11) are connected

to each other via a curved transition section (12), **characterized in that** the guide device (6) further comprises a cooling device (13) in order to cool the guide device (6) at least in the area of the curved transition section (12), wherein the guide device (6) is provided with at least one channel (14, 23, 24) for a cooling fluid running near a guiding surface (27, 28) for guiding the rapier (1).

2. Guide device according to claim 1, **characterized in that** the guide device (6) comprises a first elongated profile (15) and a second elongated profile (17) that together form a tubular guide for the rapier (1).
3. Guide device according to claim 1 or 2, **characterized in that** the guide device (6) comprises a first elongated profile (15) with a first guiding surface (27) for guiding an outer surface (16) of the rapier (1), which first elongated profile (15) is provided with at least one channel (14, 24) for the cooling fluid.
4. Guide device according to claim 2 or 3, **characterized in that** the guide device (6) comprises a second elongated profile (17) with a second guiding surface (28) for guiding an inner surface (18) of the rapier (1) and that is attached to the first elongated profile (15).
5. Guide device according to claim 4, **characterized in that** the second elongated profile (17) is provided with at least one channel (23) for the cooling fluid.
6. Guide device according to any one of claims 1 to 5, **characterized in that** the at least one channel (14, 23, 24) for the cooling fluid extends over almost the full length of the guide device (6) in order to cool the guide device (6).
7. Guide device according to any one of claims 1 to 6, **characterized in that** the cooling fluid is oil for the gripper weaving machine.
8. Gripper weaving machine comprising a rapier (1), a drive wheel (3) for driving a rapier (1), wherein in use a gripper (2) is arranged at the front end (25) of the rapier (1), **characterized in that** the gripper weaving machine comprises a guide device (6) according to any one of claims 1 to 7 with a first straight part (10) and a second straight part (11) connected to each other via a curved transition section (12) in order to guide the rapier (1) between the drive wheel (3) and a lower side of the gripper weaving machine.
9. Gripper weaving machine according to claim 8, **characterized in that** the rapier (1) is bent around the drive wheel (3) and **in that** the guide device (6) is arranged adjacent to the drive wheel (3) at a side opposite to the side of the drive wheel (3) at which

the gripper (2) is arranged.

10. Gripper weaving machine according to claim 8 or 9, **characterized in that** the guide device (6) comprises a first elongated profile (15) for guiding an outer surface (16) of the rapier (1), which first elongated profile (15) is provided with at least one channel (14, 24) for the cooling fluid.
11. Gripper weaving machine according to any one of claims 8 to 10, **characterized in that** the first straight part (10) of the guide device (6) is arranged tangentially with respect to the drive wheel (3) in order to guide the rapier (1) from and to the drive wheel (3).
12. Gripper weaving machine according to any one of claims 8 to 11, **characterized in that** the guide device (6) is arranged between the drive wheel (3) and a horizontally arranged guide (9) for the rapier (1).
13. Method for cooling a guide device (6) according to any one of claims 1 to 7 with a first straight part (10) and a second straight part (11) connected to each other via a curved transition section (12) in order to guide the rapier (1) between the drive wheel (3) and a lower side of the gripper weaving machine, **characterized in that** the method comprises cooling the guide device (6), wherein the cooling comprises the guiding of a cooling fluid at least in the area of the curved transition section (12) of the guide device (6).
14. Method according to claim 13, **characterized in that** the cooling fluid is an oil of the gripper weaving machine.

Patentansprüche

1. Führungsvorrichtung zum Führen eines Rapiers (1) in einer Greiferwebmaschine, wobei im Gebrauch die Führungsvorrichtung (6) anliegend zu einem Antriebsrad (3) zum Antreiben des Rapiers (1) an einer dem Webfach (8) gegenüberliegenden Seite angeordnet ist, um das Rapier (1) zwischen dem Antriebsrad (3) und einer Unterseite der Greiferwebmaschine zu führen, wobei die Führungsvorrichtung (6) einen ersten geraden Teil (10) umfasst, der im Gebrauch anliegend zum Antriebsrad (3) angeordnet ist und einen zweiten geraden Teil (11) umfasst, der im Gebrauch weiter vom Antriebsrad (3) entfernt in einem Winkel (A) zum ersten geraden Teil (10) angeordnet ist, und wobei der erste gerade Teil (10) und der zweite gerade Teil (11) über einen gekrümmten Übergangsabschnitt (12) miteinander verbunden sind, **dadurch gekennzeichnet, dass** die Führungsvorrichtung (6) weiter eine Kühlvorrichtung (13) umfasst, um die Führungsvorrichtung (6) mindestens im Bereich des gekrümmten Übergangsab-

schnitts (12) zu kühlen, wobei die Führungsvorrichtung (6) mit mindestens einem Kanal (14, 23, 24) für ein Kühlfluidum versehen ist, der in der Nähe einer Führungsfläche (27, 28) zum Führen des Rapiers (1) läuft.

2. Führungsvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Führungsvorrichtung (6) ein erstes längliches Profil (15) und ein zweites längliches Profil (17) umfasst, die zusammen eine Rohrführung für das Rapier (1) bilden.
3. Führungsvorrichtung nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Führungsvorrichtung (6) ein erstes längliches Profil (15) mit einer ersten Führungsfläche (27) zum Führen einer Außenfläche (16) des Rapiers (1) umfasst, welches erste längliche Profil (15) mit mindestens einem Kanal (14, 24) für das Kühlfluidum versehen ist.
4. Führungsvorrichtung nach Anspruch 2 oder 3, **dadurch gekennzeichnet, dass** die Führungsvorrichtung (6) ein zweites längliches Profil (17) mit einer zweiten Führungsfläche (28) zum Führen einer Innenfläche (18) des Rapiers (1) umfasst, das am ersten länglichen Profil (15) befestigt ist.
5. Führungsvorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** das zweite längliche Profil (17) mit mindestens einem Kanal (23) für das Kühlfluidum versehen ist.
6. Führungsvorrichtung nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** der mindestens eine Kanal (14, 23, 24) für das Kühlfluidum sich fast über die gesamte Länge der Führungsvorrichtung (6) erstreckt, um die Führungsvorrichtung (6) zu kühlen.
7. Führungsvorrichtung nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass** das Kühlfluidum Öl für die Greiferwebmaschine ist.
8. Greiferwebmaschine umfassend ein Rapier (1), ein Antriebsrad (3) zum Antreiben eines Rapiers (1), wobei im Gebrauch ein Greifer (2) am vorderen Ende (25) des Rapiers (1) angeordnet ist, **dadurch gekennzeichnet, dass** die Greiferwebmaschine eine Führungsvorrichtung (6) nach einem der Ansprüche 1 bis 7 mit einem ersten geraden Teil (10) und einem zweiten geraden Teil (11) umfasst, die über einen gekrümmten Übergangsabschnitt (12) miteinander verbunden sind, um das Rapier (1) zwischen dem Antriebsrad (3) und einer Unterseite der Greiferwebmaschine zu führen.
9. Greiferwebmaschine nach Anspruch 8, **dadurch gekennzeichnet, dass** das Rapier (1) um das An-

triebsrad (3) gebogen ist, und dass die Führungsvorrichtung (6) anliegend zum Antriebsrad (3) an einer Seite gegenüber der Seite des Antriebsrades (3) angeordnet ist, an der der Greifer (2) angeordnet ist.

10. Greiferwebmaschine nach Anspruch 8 oder 9, **dadurch gekennzeichnet, dass** die Führungsvorrichtung (6) ein erstes längliches Profil (15) zum Führen einer Aussenfläche (16) des Rapiers (1) umfasst, welches erste längliche Profil (15) mit mindestens einem Kanal (14, 24) für das Kühlfluidum versehen ist.
11. Greiferwebmaschine nach einem der Ansprüche 8 bis 10, **dadurch gekennzeichnet, dass** der erste gerade Teil (10) der Führungsvorrichtung (6) tangential zum Antriebsrad (3) angeordnet ist, um das Papier (1) von und zum Antriebsrad (3) zu führen.
12. Greiferwebmaschine nach einem der Ansprüche 8 bis 11, **dadurch gekennzeichnet, dass** die Führungsvorrichtung (6) zwischen dem Antriebsrad (3) und einer horizontal angeordneten Führung (9) für das Papier (1) angeordnet ist.
13. Verfahren zum Kühlen einer Führungsvorrichtung (6) nach einem der Ansprüche 1 bis 7 mit einem ersten geraden Teil (10) und einem zweiten geraden Teil (11), die über einen gekrümmten Übergangsabschnitt (12) miteinander verbunden sind, um das Papier (1) zwischen dem Antriebsrad (3) und einer Unterseite der Greiferwebmaschine zu führen, **dadurch gekennzeichnet, dass** das Verfahren das Kühlen der Führungsvorrichtung (6) umfasst, wobei das Kühlen das Führen eines Kühlfluidums mindestens im Bereich des gekrümmten Übergangsabschnitts (12) der Führungsvorrichtung (6) umfasst.
14. Verfahren nach Anspruch 13, **dadurch gekennzeichnet, dass** das Kühlfluidum ein Öl der Greiferwebmaschine ist.

Revendications

1. Dispositif de guidage pour guider une lance (1) dans une machine à tisser à pinces, dans lequel en usage le dispositif de guidage (6) est disposé adjacent à une roue de commande (3) pour entraîner la lance (1) sur un côté opposé à la foule (8) afin de guider la lance (1) entre la roue de commande (3) et un côté inférieur de la machine à tisser à pinces, dans lequel le dispositif de guidage (6) comprend une première partie droite (10) qui, en usage, est disposée adjacente à la roue de commande (3) et comprend une deuxième partie droite (11) qui, en usage, est disposée plus loin de la roue de commande (3) selon un angle (A) par rapport à la première partie droite

(10), et dans lequel la première partie droite (10) et la deuxième partie droite (11) sont reliées l'une à l'autre par une section de transition incurvée (12), **caractérisé en ce que** le dispositif de guidage (6) comprend en outre un dispositif de refroidissement (13) afin de refroidir le dispositif de guidage (6) au moins dans la zone de la section de transition incurvée (12), dans lequel le dispositif de guidage (6) est prévu d'au moins un canal (14, 23, 24) pour un fluide de refroidissement circulant à proximité d'une surface de guidage (27, 28) pour guider la lance (1).

2. Dispositif de guidage selon la revendication 1, **caractérisé en ce que** le dispositif de guidage (6) comprend un premier profil allongé (15) et un deuxième profil allongé (17) qui forment ensemble un guide tubulaire pour la lance (1).
3. Dispositif de guidage selon la revendication 1 ou 2, **caractérisé en ce que** le dispositif de guidage (6) comprend un premier profil allongé (15) avec une première surface de guidage (27) pour guider une surface extérieure (16) de la lance (1), lequel premier profil allongé (15) est prévu d'au moins un canal (14, 24) pour le fluide de refroidissement.
4. Dispositif de guidage selon la revendication 2 ou 3, **caractérisé en ce que** le dispositif de guidage (6) comprend un deuxième profil allongé (17) avec une deuxième surface de guidage (28) pour guider une surface intérieure (18) de la lance (1) et qu'est attaché au premier profil allongé (15).
5. Dispositif de guidage selon la revendication 4, **caractérisé en ce que** le deuxième profil allongé (17) est prévu d'au moins un canal (23) pour le fluide de refroidissement.
6. Dispositif de guidage selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** l'au moins un canal (14, 23, 24) pour le fluide de refroidissement s'étend sur presque toute la longueur du dispositif de guidage (6) afin de refroidir le dispositif de guidage (6).

7. Dispositif de guidage selon l'une quelconque des revendications 1 à 6, **caractérisé en ce que** le fluide de refroidissement est de l'huile pour la machine à tisser à pinces.
8. Machine à tisser à pinces comprenant une lance (1), une roue de commande (3) pour entraîner une lance (1), dans laquelle en usage une pince (2) est disposée à l'extrémité avant (25) de la lance (1), **caractérisée en ce que** la machine à tisser à pinces comprend un dispositif de guidage (6) selon l'une quelconque des revendications 1 à 7 avec une première partie droite (10) et une deuxième partie droite (11)

reliées l'une à l'autre par une section de transition incurvée (12) afin de guider la lance (1) entre la roue de commande (3) et un côté inférieur de la machine à tisser à pinces.

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9. Machine à tisser à pinces selon la revendication 8, **caractérisée en ce que** la lance (1) est pliée autour de la roue de commande (3) et **en ce que** le dispositif de guidage (6) est disposé adjacent à la roue de commande (3) d'un côté opposé au côté de la roue de commande (3) sur lequel la pince (2) est disposée. 10
10. Machine à tisser à pinces selon la revendication 8 ou 9, **caractérisée en ce que** le dispositif de guidage (6) comprend un premier profil allongé (15) pour guider une surface extérieure (16) de la lance (1), lequel premier profil allongé (15) est prévu d'au moins un canal (14, 24) pour le fluide de refroidissement. 15
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11. Machine à tisser à pinces selon l'une quelconque des revendications 8 à 10, **caractérisée en ce que** la première partie droite (10) du dispositif de guidage (6) est disposée tangentiellement par rapport à la roue de commande (3) afin de guider la lance (1) de et vers la roue de commande (3). 25
12. Machine à tisser à pinces selon l'une quelconque des revendications 8 à 11, **caractérisée en ce que** le dispositif de guidage (6) est disposé entre la roue de commande (3) et un guide (9) disposé horizontalement pour la lance (1). 30
13. Procédé pour refroidir le dispositif de guidage (6) selon l'une quelconque des revendications 1 à 7 avec une première partie droite (10) et une deuxième partie droite (11) reliées l'une à l'autre par une section de transition incurvée (12) afin de guider la lance (1) entre la roue de commande (3) et un côté inférieur de la machine à tisser à pinces, **caractérisé en ce que** le procédé comprend le refroidissement du dispositif de guidage (6), dans lequel le refroidissement comprend le guidage d'un fluide de refroidissement au moins dans la zone de la section de transition incurvée (12) du dispositif de guidage (6). 35
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14. Procédé selon la revendication 13, **caractérisé en ce que** le fluide de refroidissement est une huile de la machine à tisser à pinces. 50

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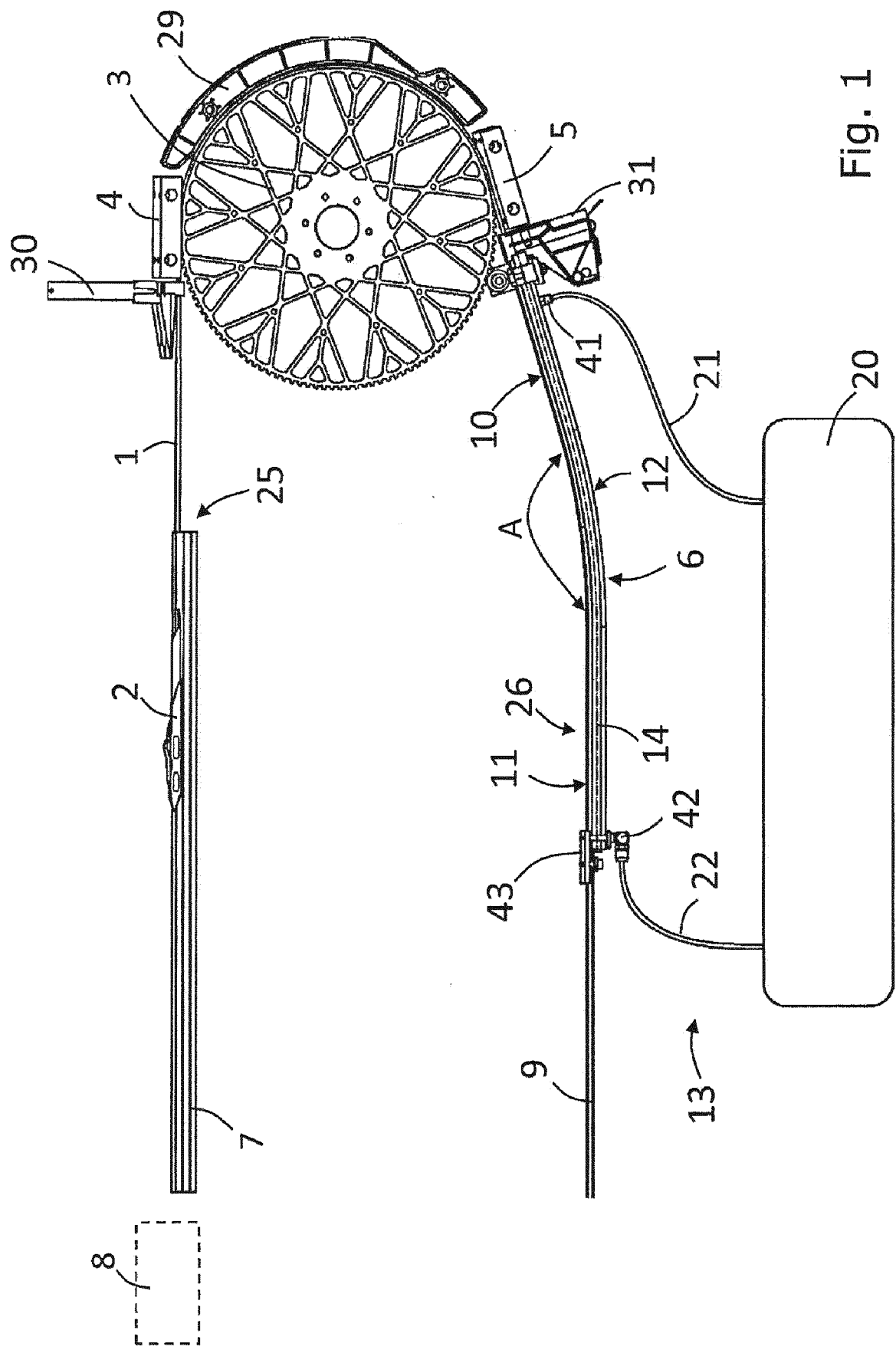
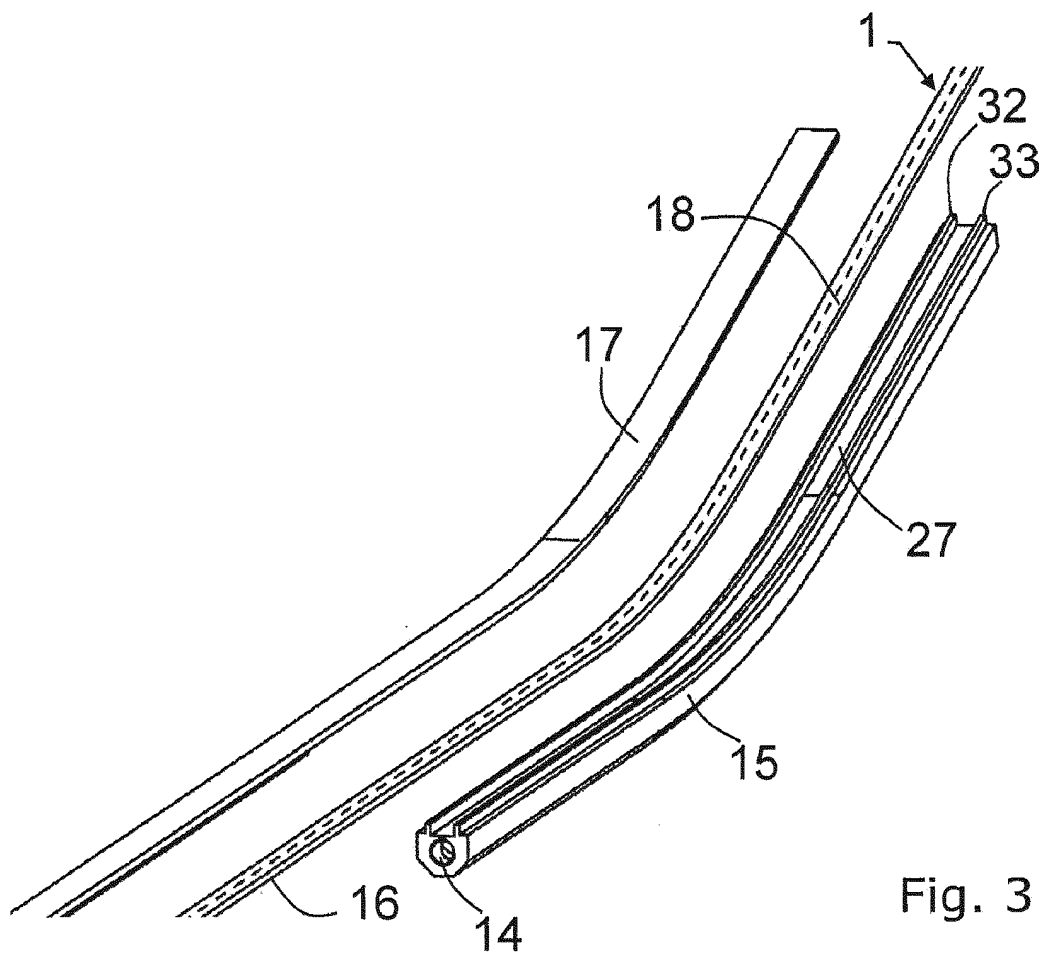
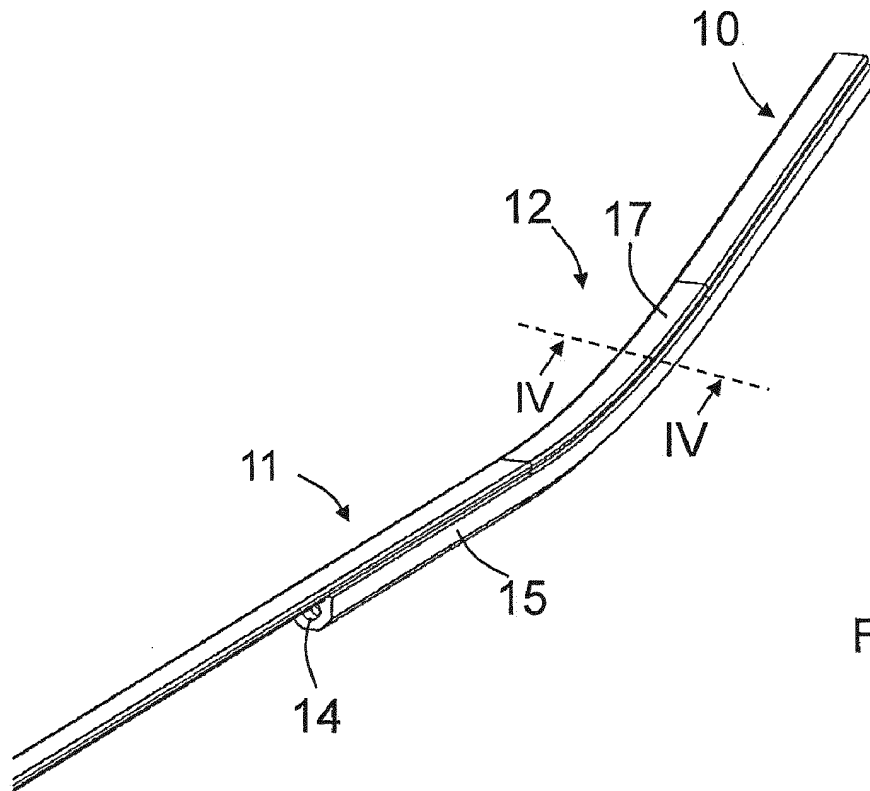
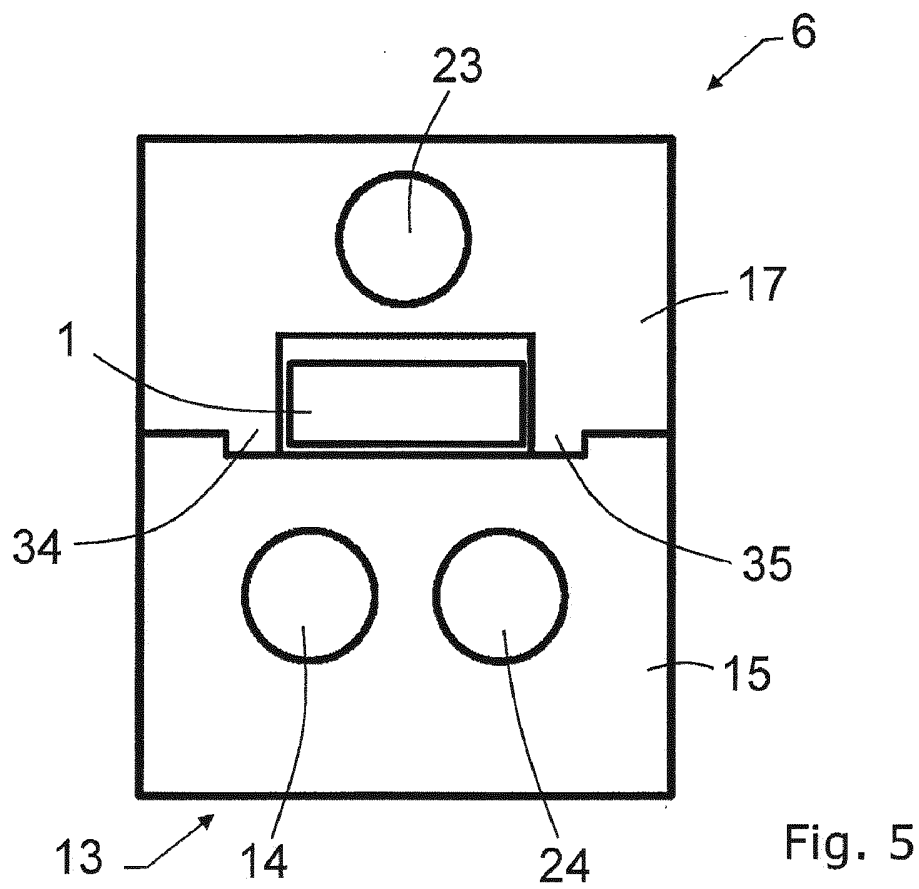
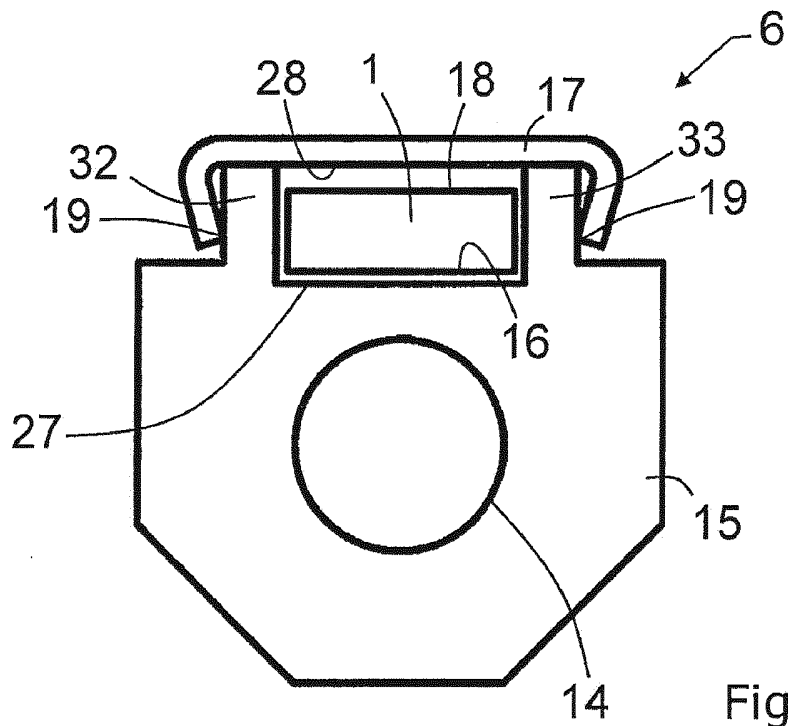


Fig. 1





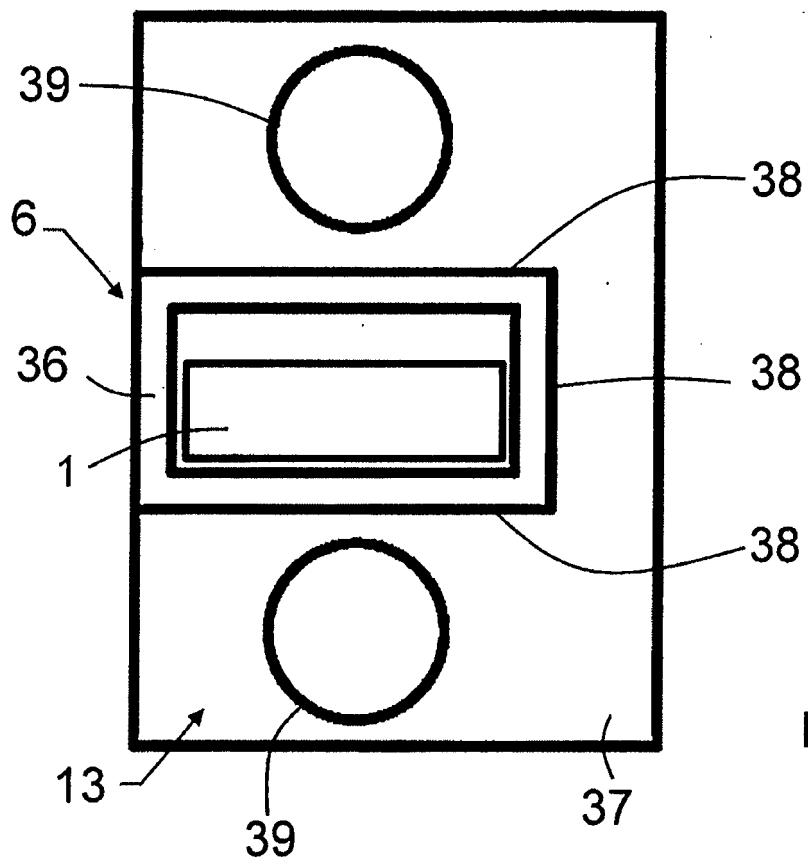


Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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