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(54) **DEVICE AND METHOD FOR CUTTING THE PILE YARNS TO BE WOVEN IN AN AXMINSTER WEAVING MACHINE**

VORRICHTUNG UND VERFAHREN ZUM SCHNEIDEN VON FLORFÄDEN ZUR VERWEBUNG MIT EINER AXMINSTER-WEBMASCHINE

DISPOSITIF ET PROCÉDÉ DE DÉCOUPE DES FILS DE VELOURS À TISSER DANS UNE MACHINE DE TISSAGE AXMINSTER

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Description

[0001] The present invention on the one hand relates to a weaving device of the Axminster-type and on the other hand to a method for weaving pile fabrics in such a weaving device.

[0002] An Axminster weaving machine is provided with:

- pile yarn loaders on a loader system which are driven by a jacquard device;
- pile yarn grippers which are arranged on a gripper bar;
- a pile yarn cutting system.

[0003] Pile yarn loaders and pile yarn grippers are both present in equal numbers in the weft direction and this number determines the density of the fabric in the weft direction. The pile yarn loaders on the loader system are driven by a jacquard device in order to present the desired pile yarns in accordance with the pattern to be woven to the pile yarn grippers. These grippers in each case securely hold the pile yarn selected by the corresponding pile yarn loader, following which a drive mechanism ensures that the pile yarn grippers perform a relative movement with respect to the loader system until the selected yarns are pulled through the pile yarn loaders along the desired length. The pile yarn cutting system cuts at the location of the pile yarn loaders so that the part of the pile yarn between the grippers and the pile yarn loaders is cut and remains clamped in the pile yarn grippers and the other part of the pile yarn between the pile yarn loader and the weaving creel from which it is supplied to the weaving machine retains its position, clamped in the pile yarn loader. The part of the pile yarn which was cut and is clamped in the pile yarn grippers, is taken to the base fabric by rotation of the gripper bar in order to be tied up as pile tuft over a weft thread introduced in the base fabric and is beaten in together with the weft thread against the fabric line using the weaving reed.

[0004] Traditionally, the pile yarn cutting system consists of one or more (number = n) cutting members (also referred to as cutting bits) which are arranged next to one another, at a certain distance apart, in the weft direction on the Axminster weaving device and in which the cutting members, during the cutting movement, are first presented at the location of the selected pile yarns and subsequently move across a distance of at least L/n in the weft direction, with L being equal to the width of the fabric. In this method, each selected pile yarn is cut by at least one cutting member.

[0005] In order to ensure that the cutting movement is carried out efficiently, a counter-blade is usually provided which pushes onto the pile yarns, which are held by the pile yarn grippers and are in one line against the cutting members, in order to position (clamp) the pile yarns in a cutting position during cutting. This counter-blade is preferably provided with a toothing, with the toothing preferably being distributed in such a way that each pile yarn is positioned between two teeth of the toothing.

[0006] The cutting of the pile yarns in combination with the friction against the counter-blade results in rapid wear of the cutting members and also of the counter-blade, due to which the cutting quality deteriorates significantly and the surface of the cut pile in the fabric becomes irregular. As a consequence, more pile yarn has to be removed during shearing of the carpet which is a waste of expensive raw materials.

[0007] In addition, the various cutting members have to be replaced after a short time and the counter-blade also has to be replaced after a certain time. This results in significant costs and the weaving device is not available for production purposes during the time which is required to replace the cutting members or the counter-blade.

[0008] In order to increase the life of the cutting device on an Axminster weaving device, which also leads to a more uniform cutting quality, it is known from BE 1 017 107 to provide the pile yarn cutting system with means for applying a suitable lubricant to the pile yarn cutting system. The described pile yarn cutting system comprises a-usually serrated - counter-blade which is adapted to arrange selected pile yarns in a cutting position during cutting, and a cutting device which can be moved along the counter-blade and comprises a number of cutting members (cutting bits) which are adapted to cut the selected pile yarns. In such an embodiment, therefore, components have to be provided on the one hand for moving the cutting members to the pile yarns, and furthermore the blade-and-counter-blade-embodiment still causes significant wear, resulting in a loss in cutting quality, machine down time and increased costs for regrinding the various cutting members. Moreover, the added application of lubricant to the cutting members leads to a risk of soiling, which in turn has an associated risk of second-choice fabrics and possibly additional costs for cleaning.

[0009] British patent publication GB 710305 describes a pile yarn cutting system which uses a reciprocating carriage on which a substantially round blade, which is connected to a spindle, is rotatably arranged, and in which a sprocket wheel which is connected to this spindle, meshes with a fixed chain and causes the circular blade to rotate when the carriage moves. During movement of the carriage, a projection on the carriage passes the pile yarns to be cut to the blade which, in cooperation with a counter-blade fixedly arranged on the carriage, cuts the pile yarns. The device described in GB 710305 therefore also uses a blade and counter-blade which again has an adverse effect on wear.

[0010] It is now an object of the present invention to find a solution to simplify the design of the pile yarn cutting system on an Axminster weaving machine, as a result of which the reliability is increased and the costs for the replacement of the cutting members are reduced.

[0011] The object of the invention is achieved by providing a weaving device of the Axminster type comprising

one or more driven pile yarn loaders for the selection, according to a pattern to be woven, of one or more pile yarns which are presented in a selected position to grippers which are driven by an oscillating gripper bar and which are configured to pull the selected pile yarn out of the pile yarn loader along a desired length by rotation of the gripper bar before it is cut by a pile yarn cutting device, in which the pile yarn cutting device comprises a cutting device which reciprocates at least across the width of the weaving device and which comprises, as the only cutting member, one or more single cutting blades which are fastened to the reciprocating cutting device and are configured to cut the pulled-out pile yarns. As said one or more cutting blades are very sharp, they can be used as the only cutting member for cutting the pile yarns in an efficient manner without use having to be made of a blade and counter-blade.

[0012] In the context of the present invention, the term single is understood to mean that each of the one or more cutting blades is adapted to be able to cut the pile yarn in flight due to the very sharp edge of the cutting blade, and is able to do this in at least one direction of movement of the cutting device. This is in contrary with the prior art where use is made of a blade and a counter-blade which move relative to one another, as is typically the case with a pair of scissors. The latter can be viewed as a multiple cutting solution.

[0013] It is, however, possible for several single blades to be arranged next to one another in the direction of movement of the cutting device in order to guarantee that cutting takes place even when, for example, one of the (single) cutting blades is damaged or if one cutting blade is adapted to cut pile yarns in one direction of movement of the cutting device and a second one is adapted to cut them in the other direction of movement. This would then, for example, make it possible to use simpler cutting blades which only have to be provided with a sharp cutting edge on one side.

[0014] In order to keep said one or more cutting blades very sharp, the weaving device, in a preferred embodiment, furthermore comprises at least one grinding device for sharpening said one or more cutting blades. Such a weaving device results in a more consistently good cutting quality of the pile yarns and an even pile surface of the fabric. This eliminates the usage costs and the regrinding costs of the cutting bits and of the counter-blade.

[0015] In a preferred embodiment of the weaving device according to the invention, the weaving device comprises guide means for the cutting device to guide the reciprocating cutting device and the at least one cutting blade attached thereto in its movement and to determine the position of the cutting blade with respect to the pile yarns to be cut. Preferably, said guide means are fixedly arranged in the weaving device. The expression "fixedly arranged" is understood to mean that the guide means have a fixed position in the weaving device and consequently they do not move concomitantly with any component of the weaving device.

[0016] With a more preferred embodiment of the weaving device according to the invention, the weaving device comprises means which are configured to keep the pulled-out pile yarns in a cutting position. In particular, the pile yarns to be cut can be secured by means of an additional clamp between the position where they are cut and their yarn stock. In an alternative embodiment, a stop member may also be provided which extends in the direction of movement of the blade and which is adapted to prevent a movement of the pile yarn away from the blade.

[0017] According to a particular embodiment of the weaving device according to the invention, said cutting blade is adjustable in a direction perpendicular to the direction of movement of the reciprocating cutting device. Preferably, the cutting blade is made of sheet steel as a result of which it can be produced in a simple and inexpensive manner. As the cutting blade is adjustable in a direction perpendicular to the direction of movement, it can be adjusted periodically in view of wear of the cutting blade. This increases the degree of utilization of the Axminster weaving machine as no cutting bits have to be replaced. Preferably, the cutting edge of said cutting blade has a virtually convex profile.

[0018] In a more particular embodiment of the weaving device according to the invention, the device comprises two grinding devices which are provided on opposite sides of the weaving machine.

[0019] In an advantageous embodiment of the weaving device according to the invention, the grinding device comprises displaceable grinding means. Preferably, the grinding device comprises flat or round grinding stones arranged in pairs. These flat or round grinding stones (the grinding means) are movable in particular counter to a spring force.

[0020] The weaving device according to the present invention preferably comprises driving means for the cutting device. In particular, said driving means comprise an individually controlled motor. The individually controlled motor makes it possible to select the grinding frequency completely independently from the cutting frequency.

[0021] The driving means preferably consist of a servomotor or of a linear motor. The drive mechanism of the cutting movement comprising a servomotor or a linear motor facilitates the pulling-through of pile, for example in the case of yarn changes.

[0022] In a particular embodiment, the weaving device comprises fixedly arranged detection means which are configured to detect non-cut pile yarns, preferably by means of a detection system such as for example a camera system. The detection means also have a fixed position in the weaving device and therefore do not move concomitantly with a component of the weaving device. The detection means, preferably a strip light, are in particular fixedly connected to the frame of the weaving device.

[0023] Another subject of the present invention relates to a method for weaving pile fabrics in a weaving device of the Axminster type, comprising at least two individually driven pile yarn loaders for the selection, according to a pattern to be woven, of one or more pile yarns which are presented in a selected position to grippers which are driven by an oscillating gripper bar and which are configured to pull the selected pile yarn out of the pile yarn loader along a desired length by rotation of the gripper bar, said weaving device furthermore comprising a pile yarn cutting system for cutting the selected pile yarn after selection and said pile yarn being introduced into the fabric after the pile yarn has been cut, and the pulled-out pile yarns only being cut during the weaving process by means of at least one or more single cutting blades which have been attached to a cutting device which reciprocates at least across the width of the weaving device. By only cutting the pulled-out pile yarns by means of the one or more single cutting blades, a counter-blade is no longer required, thus eliminating, inter alia, the usage costs and the re-grinding costs of the cutting bits and of the counter-blade compared to the known weaving devices of the Axminster type.

[0024] In a preferred method, the cutting blade is sharpened on at least one grinding device in order to keep the one or more cutting blades very sharp.

[0025] In a more preferred method according to the invention, the cutting blade follows a predetermined movement path, and the at least one grinding device is situated in the movement path of the cutting blade.

[0026] In an alternative method according to the invention, the cutting blade comes to a standstill after the pulled-out pile yarns have been cut and is then sharpened by a grinding device which is displaceable in the direction of the cutting blade.

[0027] According to a particular method according to the invention, the cutting blade will cut the pulled-out pile yarns during a cutting cycle, and the cutting blade is sharpened on a grinding device after at least two cutting cycles have been performed. The number of cutting cycles is preferably between two and twenty, and more particularly between two and six.

[0028] By sharpening the cutting blade only after the cutting device has moved to and fro across the width of the weaving device a number of times, the frequency of the grinding cycle is smaller than the frequency of the pile-introduction cycle and the load on the motor is reduced.

[0029] In a more particular method according to the invention, the weaving device comprises two grinding devices and the cutting blade will cut the pulled-out pile yarns during a cutting cycle, and the cutting blade is sharpened on one of these grinding devices after each cutting cycle.

[0030] The method according to the present invention is in particular suitable to be carried out on the above-described weaving device.

[0031] The present invention will now be explained in more detail with reference to the following detailed description of a weaving device of the Axminster type according to the invention. The sole aim of this description is to give an illustrative example and to indicate further advantages and particulars of the present invention, and can therefore not be interpreted as a limitation of the area of application of the invention or of the patent rights defined in the claims at all.

[0032] In this detailed description, reference numerals are used to refer to the attached drawings, in which:

- *Fig. 1 shows a cross section of a part of the weaving device according to the invention in which in particular the pile yarn selection system, the pile yarn grippers, the cutting device and the grinding device are visible;*
- *Fig. 2 shows a perspective view of a part of the weaving device in which the frame (indicated by reference numeral 14), the pile yarn cutting system and the pile yarn grippers are represented;*
- *Fig. 3 shows a detail view of the area A which is circled in Fig. 2, being a part of the pile yarn grippers;*
- *Fig. 4 shows a detail view of the cutting device and the grinding device, in which the grinding device comprises round grinding stones;*
- *Fig. 5 shows a side view of the cutting device and the grinding device, in which the grinding device comprises flat grinding stones;*
- *Fig. 6 shows a detail view of the cutting device and the grinding device, in which the grinding device comprises flat grinding stones;*
- *Fig. 7 shows a detail view of the cutting blade.*

[0033] The invention consists of cutting the pile yarns loose of the pile yarn stock on an Axminster weaving machine which is provided with a pile yarn selection system (1) (see Fig. 1), in which pile yarn loaders (2) are controlled in order to present pile yarns (3) to pile yarn grippers (4) which are arranged on a gripper bar (5) and which the selected pile yarns grip in order to pull these out of the pile yarn loaders over a tuft length according to the fabric to be produced, by means of only one or more cutting blades (6) which move at least across the entire weaving width. Preferably, the pile yarns (3) are cut by means of a single cutting blade (6) which moves at least across the entire weaving width.

[0034] The cutting blade (6) is arranged on a cutting device, for example a blade carriage (7) which moves along one or more guide means (8). In one movement, the blade (6) cuts all yarns which have been gripped by the pile yarn grippers and pulled out of the pile yarn loaders according to the desired tuft length. This is necessary as the cut pile yarn is then conveyed to a different position in the weaving machine by the pile yarn grippers in order to then be woven into the pile fabric to be produced. With the known face-to-face weaving devices, it is not necessary for all pile yarns to be cut in one movement as a pile leg which has not been cut can still be cut during the next

return movement.

[0035] During this cutting movement, the pile yarns (3) are only under a slight tension, which is produced only by the frictional resistance built up in the clamping devices in the pile yarn loaders (2) and by the frictional resistance of the pile yarn up to the pile yarn stock (not shown).

[0036] Additional auxiliary means may be provided in order to guarantee that the pile yarns (3) are cut by the blade. If desired, the pile yarns to be cut can be held by means of an additional clamp between the position where they are cut and their yarn stock. Alternatively, it is also possible to provide a stop member which extends in the direction of movement of the blade (6) and which prevents a movement of the pile yarn away from the blade.

[0037] As illustrated in Fig. 7, the blade has a substantially convex shape, preferably along its cutting edge (9), with the cutting of the pile yarns being carried out by the lateral parts of the cutting edge of this blade. The convex shape could result in the pile yarns carrying out a movement in the direction of and beyond the tip (10) of the blade (6). (a stop member can stop such a movement) However, the additional clamp or the stop member should not be in the way of the pile yarn grippers when these come to take the selected pile yarns. Therefore, the pile yarn loaders may perform an additional movement in the direction of the additional clamp or the stop member after the selected pile yarns have been pulled out. On the other hand, the additional clamp or the stop member may carry out a movement in the direction of the selected pile yarn.

[0038] It is also possible, instead of auxiliary means, to provide a guide element across the width of the machine which does not bear against the blade and is connected to the blade carriage. The pile yarn to be cut is then brought into the range of the blade by this guide element.

[0039] The weaving device according to the invention and the method connected thereto result in a more consistently good cutting quality of the pile yarns and an even pile surface in the fabric. This eliminates the usage costs and the re-grinding costs of the cutting bits and of the counter-blade, while the blade (6) as provided in the invention can be made of sheet steel in a simple and inexpensive manner. The blade (6) only has to be adjusted periodically in a direction substantially perpendicular to the direction of movement of the blade carriage and substantially perpendicular to the length direction of the part of the pile yarns to be cut, after this part has been pulled out of the pile yarn loaders by the pile yarn grippers. This blade then has to be replaced after several adjustment operations which also increases the degree of utilization of the Axminster weaving machine, as no cutting bits have to be replaced. In many respects, the invention contributes to increasing the quality of the fabric and reducing the cost price of the fabric.

[0040] The one or more cutting blades (6) are kept sharp by one or more grinding devices (11) which are situated in the movement path of the blade, outside the fabric. In order to make lateral cutting of the pile yarns possible, the lateral cutting edge of the blade (6) has to be sharpened.

[0041] Both flat (16) and round (15) grinding stones which are movable counter to a spring force can be used as grinding device (11) (see Figs. 4 to 6), in which case the movement away from the cutting blade is counteracted by springs (17), in each case two for sharpening the upper and lower side of the cutting edge of the blade (6). The round grinding stones may be driven by a motor so that, during a subsequent grinding operation, a different part of the grinding stones comes into contact with the cutting edge of the blade. The shape and the angle adjustment of the grinding stones is adjustable, depending on the desired cutting edge. In concrete terms this means that, viewed in side view, the shape of the grinding zone of the grinding stones (15; 16) together with the adjustment of the grinding stones is such that the blade and the grinding stones are in contact across a large part of the edge of the blade during sharpening and are therefore substantially parallel. The length of the cutting edge of the blade after projection on a plane perpendicular to the direction of movement of the blade carriage (7) may be between 5 and 25 mm, and is preferably between 10 and 20 mm.

[0042] In an alternative embodiment, the blade (6) may first come to a standstill, after having moved through the zone in which the pile yarn is cut, and thereafter be sharpened by means of an adapted grinding installation with dedicated drive mechanism, the grinding parts of which displace towards the blade while the blade (6) is at a standstill and carry out the grinding operation, in order then to displace away therefrom before the start of the next cutting movement.

[0043] In principle, with each cutting movement, both from left to right and from right to left, the distance of movement of the blade carriage (7) is slightly greater than the chosen fabric width, so that the blade carriage (7) passes by a grinding device (11) where the blade (6) is in each case sharpened. Alternatively, if the pile yarn quality permits, it is also possible to provide a grinding device just on one side, either to the left or to the right of the pile yarn loaders.

[0044] If desired, the grinding frequency can also be chosen completely independently from the cutting frequency, for example by driving the blade (6) using a servomotor (see Fig. 2) (12). Likewise, it is possible to use a separate grinding cycle which is carried out, for example, during start-up or during standstill of the weaving machine.

[0045] In the case that the Axminster weaving device according to the invention weaves according to the triple weave principle, in which one pile row is formed at every three pick cycles, the cutting movement will normally have performed a complete cutting cycle after six weaving cycles (pick cycles). If the double weave principle is followed, the cutting cycle will therefore normally comprise four weaving cycles (pick cycles). With other weav-

ing principles, the cutting cycle will therefore normally always be twice as long as the pile row-forming cycle.

[0046] The blade carriage (7) may be moved to and fro by various means. This may be carried out, for example, by means of a combination of belts which are guided over gear wheels, with at least one of the gear wheels being driven. On the other hand, this can also be carried out by means of a combination of a cable or string with adapted return wheels, in which case the drive mechanism is produced by means of a drum to which the ends of the cable or string are attached and the drum has several spiral-shaped turns onto which the cable or string is wound. It is also possible to use a drive mechanism by means of a spindle and a nut for this purpose. The movement can then be achieved by means of a connection to the weaving machine and an intermediate movement converter, such as a 3D mechanism or a cam mechanism, if desired combined with intermediate gear wheels in order to achieve the desired frequency. In addition, a separate drive mechanism by means of a servomotor may also be provided, the movement of which is adapted to the movement of the weaving machine. The blade carriage (7) can also be driven by means of a linear motor, either directly or indirectly.

[0047] The cutting device of the Axminster weaving device according to the invention has other additional advantages: in contrast to the known solutions using a serrated counter-blade, the blade carriage and the guide means do not have to be presented as far as against the pile yarns to be cut, which makes the construction of the weaving machine simpler and less expensive. When no cutting operation is being carried out, the blade carriage (7) according to the invention is situated outside the operating zone of the pile yarn grippers, i.e. to the left or to the right of the weaving zone, and the guide means are fixedly arranged in the device.

[0048] The fixed arrangement of these guide means, and thus the absence of the mechanism for presenting the cutting parts, makes it possible to improve the detection of pile yarns (3) which have not been taken along by the pile yarn grippers (4). In the device according to the prior art, the strip light, for example an infra-red strip light which is situated opposite the detection system, for example a camera system, with respect to the pile yarns to be detected, had to be attached to the pile yarn grippers due to lack of space. The device according to the invention makes it possible to fixedly arrange the detection means (13), preferably a strip light. This means that the detection timing is not limited by the movement of the pile yarn grippers and also that, when the desired tuft length changes, in which case the pile yarn grippers and their associated gripper bar (5) assume a different angular position, the strip light does not have to be adjusted again. Such an improved arrangement of the strip light reduces the risk of erroneous detections of missing pile yarns and of pile yarns which have not been cut.

[0049] All types of rectilinear guides may be considered as guide means (8) for the blade carriage (7), such as shafts on which ball bearing bushes or sliding bearings run. In an alternative embodiment, the rectilinear guide is configured as a rectilinear element having a cross section in the shape of a dovetail (see for example Figs. 5 and 6). The blade carriage (7) then has adapted guide pieces which are, for example, covered with a plastic having good sliding properties and good wear resistance, such as for example Rulon or Carbon. In order to ensure good stability of the blade carriage (7), the guide means may be tilted about an axis which coincides with the direction of movement of the blade carriage (7). Such a tilt may increase the width of the dovetail within the available space in the zone between the gripper bar, the pile yarn loaders and the movement space of the pile yarn grippers.

[0050] An increase in width results in a stable blade carriage and improved cutting quality.

[0051] In addition, the drive mechanism of the cutting movement with a servomotor or with a linear motor makes it possible to facilitate pulling-through of pile, for example during yarn changes. The yarns are pulled out of the pile yarn loaders (2) by the pile yarn grippers (4), after which no cutting movement follows, so that the pulled-out pile yarns can now be pulled further manually.

[0052] Furthermore, the combination using a servomotor also makes it possible to program the movement of the blade carriage freely, so that for example a more or less even cutting speed is achieved across the entire fabric width.

Claims

1. Weaving device of the Axminster type comprising one or more driven pile yarn loaders (2) for the selection, according to a pattern to be woven, of one or more pile yarns (3) which are presented in a selected position to grippers (4) which are driven by an oscillating gripper bar (5) and which are configured to pull the selected pile yarn out of the pile yarn loader (2) along a desired length by rotation of the gripper bar (5) before it is cut by a pile yarn cutting device, **characterized in that** the pile yarn cutting device comprises a cutting device (7) which reciprocates at least across the width of the weaving device and which comprises, as the only cutting member, one or more single cutting blades (6) i.e. cutting blades for cutting the pile yarns in flight in at least one direction of movement of the cutting device and without a counter blade, wherein the single cutting blades are fastened to the reciprocating cutting device (7) and are configured to cut the pulled-out pile yarns (3).

2. Weaving device according to Claim 1, **characterized in that** the weaving device furthermore comprises at least one grinding device (11) for sharpening said one or more cutting blades (6).

3. Weaving device according to Claim 1 or 2, **characterized in that** the weaving device comprises guide means (8) for the cutting device (7) to guide the reciprocating cutting device (7) and the at least one cutting blade (6) attached thereto in its movement and to determine the position of the cutting blade (6) with respect to the pile yarns (3) to be cut.

4. Weaving device according to one of the preceding claims, **characterized in that** the weaving device comprises means which are configured to keep the pulled-out pile yarns in a cutting position.

5. Weaving device according to one of the preceding claims, **characterized in that** the cutting edge (9) of said cutting blade (6) has a virtually convex profile.

6. Weaving device according to one of the preceding claims, **characterized in that** the device comprises two grinding devices (11) which are provided on opposite sides of the weaving machine.

7. Weaving device according to one of Claims 2 to 6, **characterized in that** the grinding device (11) comprises displaceable grinding means.

8. Weaving device according to one of the preceding claims, **characterized in that** the weaving device comprises driving means for the cutting device.

9. Weaving device according to one of the preceding claims, **characterized in that** the weaving device comprises fixedly arranged detection means (13) which are configured to detect pile yarns which have not been cut.

10. Method for weaving pile fabrics in a weaving device of the Axminster type, comprising at least two individually driven pile yarn loaders (2) for the selection, according to a pattern to be woven, of one or more pile yarns (3) which are presented in a selected position to grippers (4) which are driven by an oscillating gripper bar (5) and which are configured to pull the selected pile yarn out of the pile yarn loader (2) along a desired length by rotation of the gripper bar (5), said weaving device furthermore comprising a pile yarn cutting system for cutting the selected pile yarn after selection and said pile yarn being introduced into the fabric after the pile yarn has been cut, **characterized in that** the pulled-out pile yarns are only cut during the weaving process by means of at least one or more single cutting blades (6) i.e. cutting blades for cutting the pile gangs in flight in at least one direction of movement of the cutting device and without a counter blade, wherein the single cutting blades have been attached to a cutting device (7) which reciprocates at least across the width of the weaving device.

11. Method according to Claim 10, **characterized in that** said cutting blade (6) is sharpened on at least one grinding device (11).

12. Method according to Claim 11, **characterized in that** the cutting blade (6) follows a predetermined movement path, and **in that** the at least one grinding device (11) is situated in the movement path of the cutting blade.

13. Method according to Claim 10, **characterized in that** the cutting blade (6) comes to a standstill after the pulled-out pile yarns have been cut and is then sharpened by a grinding device (11) which is displaceable in the direction of the cutting blade (6).

14. Method according to Claim 11, **characterized in that** the cutting blade (6) will cut the pulled-out pile yarns during a cutting cycle, and **in that** the cutting blade is sharpened on a grinding device after at least two cutting cycles have been performed.

15. Method according to Claim 11, **characterized in that** the weaving device comprises two grinding devices and **in that** the cutting blade (6) will cut the pulled-out pile yarns during a cutting cycle, and **in that** the cutting blade is sharpened on one of these grinding devices after each cutting cycle

Patentansprüche

1. Webmaschine vom Axminster-Typ, umfassend eine oder mehrere angetriebene Polgarnlader (2) für die Auswahl eines oder mehrerer Polfäden (3) nach Maßgabe eines zu webenden Musters, welche in einer ausgewählten Position Greifern (4) präsentiert werden, die von einer oszillierenden Greiferstange (5) angetrieben sind und die dazu eingerichtet sind, den ausgewählten Polfaden um eine gewünschte Länge aus der Polgarnlader (2) durch Rotieren der Greiferstange (5) herauszuziehen, bevor er von einer Polfadenschneideinrichtung geschnitten wird, **dadurch gekennzeichnet, dass** die Polfadenschneideinrichtung eine Schneideinrichtung (7) umfasst, welche sich wenigstens über die Breite der Webmaschine hin- und herbewegt und welche als das einzige Schneidelement eine oder mehrere einzelne Schneideklingen (6) umfasst, d.h. Schneideklingen zum Schneiden der Polfäden im Flug in wenigstens einer Bewegungsrichtung der Schneideinrichtung und ohne eine Gegenklinge, wobei die einzelnen Schneideklingen an der sich hin- und herbewegenden Schneideinrichtung (7) befestigt sind und dazu eingerichtet sind, die herausgezogenen Polfäden (3) zu schneiden.

2. Webmaschine nach Anspruch 1, **dadurch gekenn-**

zeichnet, dass die Webmaschine ferner wenigstens eine Schleifeinrichtung (11) zum Schärfen dieser einen oder mehreren Schneideklingen (6) umfasst.

3. Webmaschine nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Webmaschine Führungsmittel (8) für die Schneideinrichtung (7) umfasst, um die sich hin- und herbewegende Schneideinrichtung (7) und die daran angebrachte wenigstens eine Schneideklinge (6) in ihrer Bewegung zu führen und um die Position der Schneideklinge (6) bezüglich der zu schneidenden Polfäden (3) zu bestimmen.

4. Webmaschine nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Webmaschine Mittel umfasst, welche dazu eingerichtet sind, die herausgezogenen Polfäden in einer Schneidposition zu halten.

5. Webmaschine nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Schneidkante (9) der Schneideklinge (6) ein nahezu konvexes Profil aufweist.

6. Webmaschine nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Maschine zwei Schleifeinrichtungen (11) umfasst, welche an gegenüberliegenden Seiten der Webmaschine bereitgestellt sind.

7. Webmaschine nach einem der Ansprüche 2 bis 6, **dadurch gekennzeichnet, dass** die Schleifeinrichtung (11) verlagerbare Schleifmittel umfasst.

8. Webmaschine nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Webmaschine Antriebsmittel für die Schneideinrichtung umfasst.

9. Webmaschine nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Webmaschine fest angeordnete Detektionsmittel (13) umfasst, welche dazu eingerichtet sind, Polfäden zu detektieren, die nicht geschnitten worden sind.

10. Verfahren zum Weben von Polgeweben in einer Webmaschine vom Axminster-Typ, umfassend wenigstens zwei individuell angetriebene Polgarnlader(2) für die Auswahl eines oder mehrerer Polfäden (3) nach Maßgabe eines zu webenden Musters, welche in einer ausgewählten Position Greifern (4) präsentiert werden, die von einer oszillierenden Greiferstange (5) angetrieben sind und die dazu eingerichtet sind, den ausgewählten Polfaden um eine gewünschte Länge aus der Polgarnlader (2) durch Rotieren der Greiferstange (5) herauszuziehen, wobei die Webmaschine ferner ein Polfadenschneidsystem zum Schneiden des ausgewählten Polfadens nach der Auswahl umfasst und wobei der Polfaden in das Gewebe eingeführt wird, nachdem der Polfaden geschnitten worden ist, **dadurch gekennzeichnet, dass** die herausgezogenen Polfäden nur während des Webvorgangs mittels wenigstens einer oder mehrerer einzelner Schneideklingen (6) geschnitten werden, d.h. Schneideklingen zum Schneiden der Polfäden im Flug in wenigstens einer Bewegungsrichtung der Schneideinrichtung und ohne eine Gegenklinge, wobei die einzelnen Schneideklingen an einer Schneideinrichtung (7) angebracht worden sind, weiche sich wenigstens über die Breite der Webmaschine hin- und herbewegt.

11. Verfahren nach Anspruch 10, **dadurch gekennzeichnet, dass** die Schneideklinge (6) an wenigstens einer Schleifeinrichtung (11) geschärft wird.

12. Verfahren nach Anspruch 11, **dadurch gekennzeichnet, dass** die Schneideklinge (6) einem vorbestimmten Bewegungspfad folgt und dass die wenigstens eine Schleifeinrichtung (11) in dem Bewegungspfad der Schneideklinge angeordnet ist.

13. Verfahren nach Anspruch 10, **dadurch gekennzeichnet, dass** die Schneideklinge (6) stehen bleibt, nachdem die herausgezogenen Polfäden geschnitten worden sind und dann durch eine Schleifeinrichtung (11) geschärft wird, welche in der Richtung der Schneideklinge (6) verlagerbar ist.

14. Verfahren nach Anspruch 11, **dadurch gekennzeichnet, dass** die Schneideklinge (6) die herausgezogenen Polfäden während eines Schneidezyklus schneiden wird und dass die Schneideklinge an einer Schleifeinrichtung geschärft wird, nachdem wenigstens zwei Schneidezyklen ausgeführt worden sind.

15. Verfahren nach Anspruch 11, **dadurch gekennzeichnet, dass** die Webmaschine zwei Schleifeinrichtungen umfasst und dass die Schneideklinge (6) die herausgezogenen Polfäden während eines Schneidezyklus schneiden wird und dass die Schneideklinge nach jedem Schneidezyklus an einer dieser Schleifeinrichtungen geschärft wird.

Revendications

1. Dispositif de tissage du type Axminster comprenant un ou plusieurs chargeurs de fil de poil entraînés (2) pour la sélection, selon un motif à tisser, d'un ou plusieurs fils de poil (3) qui sont présentés dans une position sélectionnée à des griffes (4) qui sont actionnées par une barre oscillante de griffe (5) et qui sont configurées pour tirer le fil de poil sélectionné

hors du chargeur de fil de poil (2) le long d'une longueur souhaitée par la rotation de la barre de griffe (5) avant qu'il ne soit coupé par un dispositif de coupe de fil de poil, **caractérisé en ce que** le dispositif de coupe de fil de poil comprend un dispositif de coupe (7) qui va et vient au moins d'un bout à l'autre de la largeur du dispositif de tissage et qui comprend, en tant que seul élément de coupe, une ou plusieurs lames de coupe simples (6) c'est-à-dire des lames de coupe pour couper les fils de poil à la volée dans au moins une direction de déplacement du dispositif de coupe et sans une contre-lame, dans lequel les lames de coupe simples sont attachées au dispositif de coupe à va-et-vient (7) et sont configurées pour couper les fils de poil tirés (3).

2. Dispositif de tissage selon la revendication 1, **caractérisé en ce que** le dispositif de tissage comprend en outre au moins un dispositif d'affûtage(11) pour aiguiser lesdites une ou plusieurs lames de coupe (6).

3. Dispositif de tissage selon la revendication 1 ou 2, **caractérisé en ce que** le dispositif de tissage comprend un moyen de guidage (8) pour le dispositif de coupe (7) pour guider le dispositif de coupe à va-et-vient (7) et l'au moins une lame de coupe (6) attachée à ce dernier dans son déplacement et pour déterminer la position de la lame de coupe (6) par rapport aux fils de poil (3) à couper.

4. Dispositif de tissage selon une des revendications précédentes, **caractérisé en ce que** le dispositif de tissage comprend des moyens qui sont configurés pour maintenir les fils de poil tirés dans une position de coupe.

5. Dispositif de tissage selon une des revendications précédentes, **caractérisé en ce que** le tranchant (9) de ladite lame de coupe (6) a un profil pratiquement convexe.

6. Dispositif de tissage selon une des revendications précédentes, **caractérisé en ce que** le dispositif comprend deux dispositifs d'affûtage (11) qui sont disposés sur des côtés opposés de la machine à tisser.

7. Dispositif de tissage selon une des revendications 2 à 6, **caractérisé en ce que** le dispositif d'affûtage (11) comprend un moyen d'affûtage pouvant être déplacé.

8. Dispositif de tissage selon une des revendications précédentes, **caractérisé en ce que** le dispositif de tissage comprend un moyen d'entraînement pour le dispositif de coupe.

9. Dispositif de tissage selon une des revendications précédentes, **caractérisé en ce que** le dispositif de tissage comprend des moyens de détection (13) agencés de manière fixe qui sont configurés pour détecter des fils de poil qui n'ont pas été coupés.

10. Procédé pour tisser des tissus de poil dans un dispositif de tissage du type Axminster, comprenant au moins deux chargeurs de fil de poil individuellement entraînés (2) pour la sélection, selon un motif à tisser, d'un ou plusieurs fils de poil (3) qui sont présentés dans une position sélectionnée à des pinces de préhension (4) qui sont actionnées par une barre oscillante de pince de préhension (5) et qui sont configurées pour tirer le fil de poil sélectionné hors du chargeur de fil de poil (2) le long d'une longueur souhaitée par la rotation de la barre de pince de préhension (5), ledit dispositif de tissage comprenant en outre un système de coupe de fil de poil pour couper le fil de poil sélectionné après sélection et ledit fil de poil étant introduit dans le tissu après que le fil de poil a été coupé, **caractérisé en ce que** les fils de poil tirés sont seulement coupés pendant le processus de tissage au moyen d'au moins une ou plusieurs lames de coupe simples (6) c'est-à-dire des lames de coupe pour couper les fils de poil à la volée dans au moins une direction de déplacement du dispositif de coupe et sans une contre-lame, dans lequel les lames de coupe simples ont été attachées à un dispositif de coupe (7) qui va et vient au moins d'un bout à l'autre de la largeur du dispositif de tissage.

11. Procédé selon la revendication 10, **caractérisé en ce que** ladite lame de coupe (6) est aiguisée sur au moins un dispositif d'affûtage (11).

12. Procédé selon la revendication 11, **caractérisé en ce que** la lame de coupe (6) suit un chemin de déplacement prédéterminé, et **en ce que** l'au moins un dispositif d'affûtage(11) est placé dans le chemin de déplacement de la lame de coupe.

13. Procédé selon la revendication 10, **caractérisé en ce que** la lame de coupe (6) parvient à un arrêt après que les fils de poil tirés ont été coupés et est ensuite aiguisée par un dispositif d'affûtage (11) qui peut être déplacé dans la direction de la lame de coupe (6).

14. Procédé selon la revendication 11, **caractérisé en ce que** la lame de coupe (6) va couper les fils de poil tirés pendant un cycle de coupe, et **en ce que** la lame de coupe est aiguisée sur un dispositif d'affûtage après qu'au moins deux cycles de coupe ont été effectués.

15. Procédé selon la revendication 11, **caractérisé en ce que** le dispositif de tissage comprend deux dispositifs d'affûtage et **en ce que** la lame de coupe (6)

va couper les fils de poil tirés pendant un cycle de coupe, et **en ce que** la lame de coupe est aiguisée sur un de ces dispositifs d'affûtage après chaque cycle de coupe.

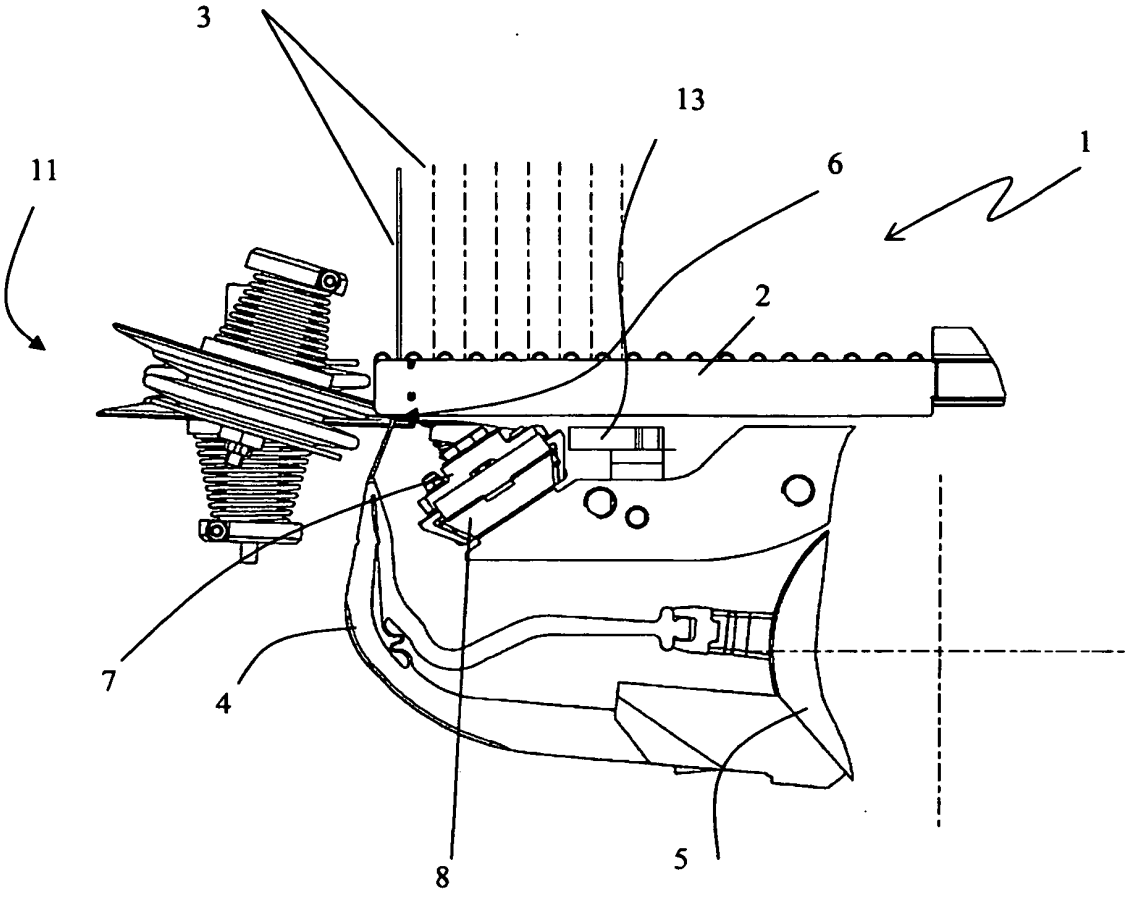

Fig. 1

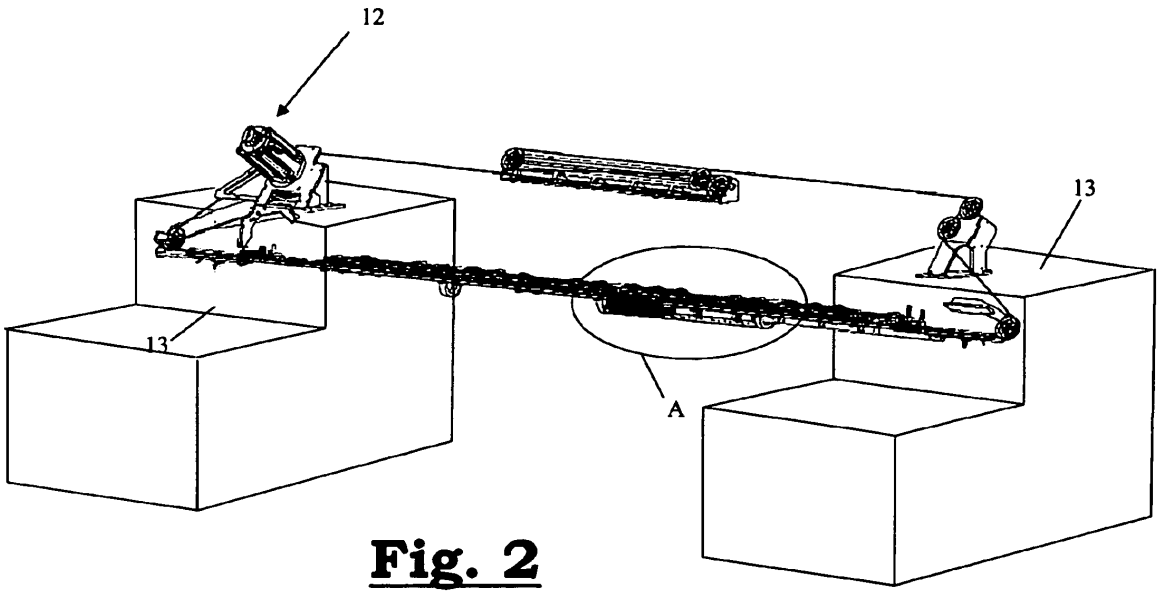

Fig. 2

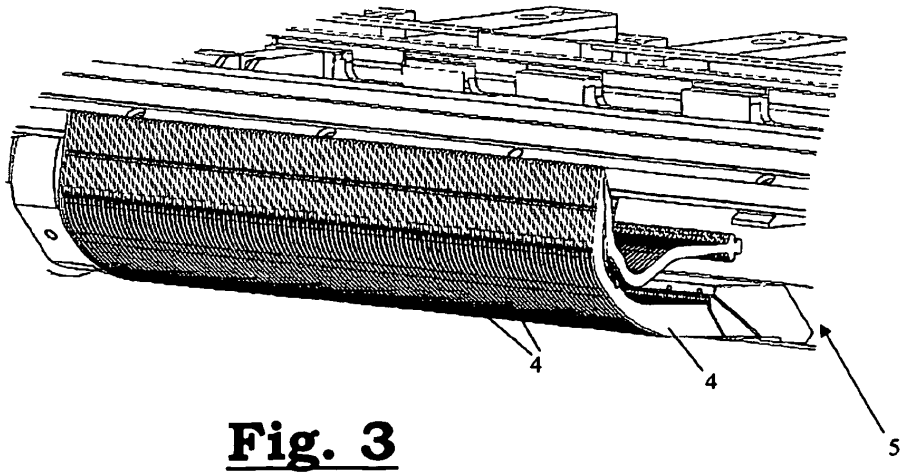

Fig. 3

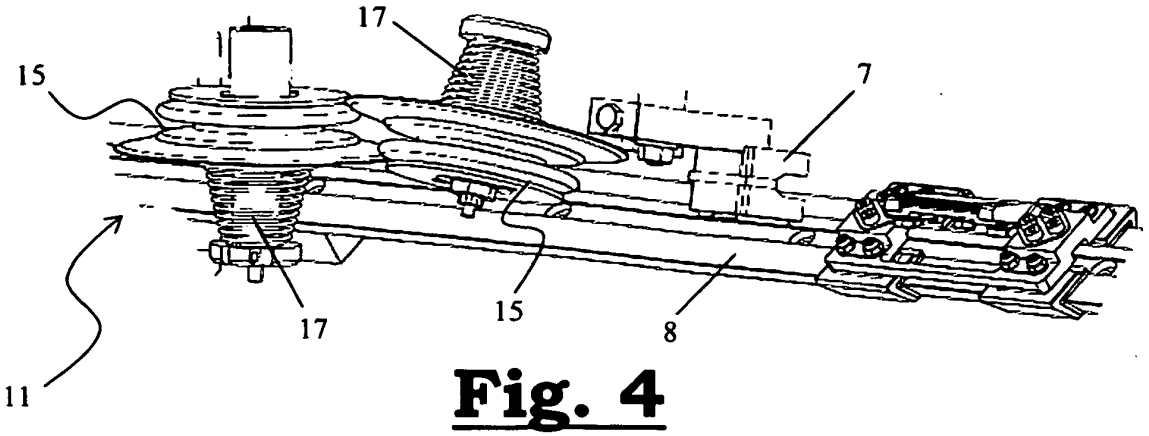

Fig. 4

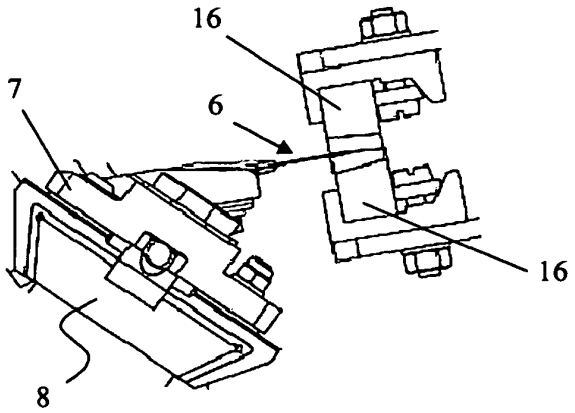

Fig. 5

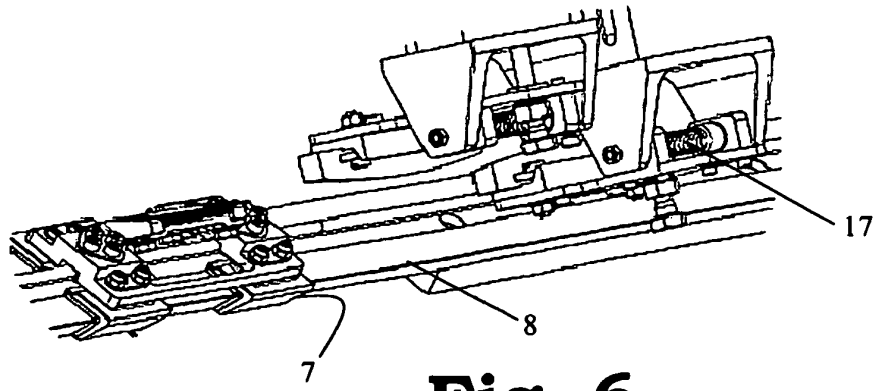

Fig. 6

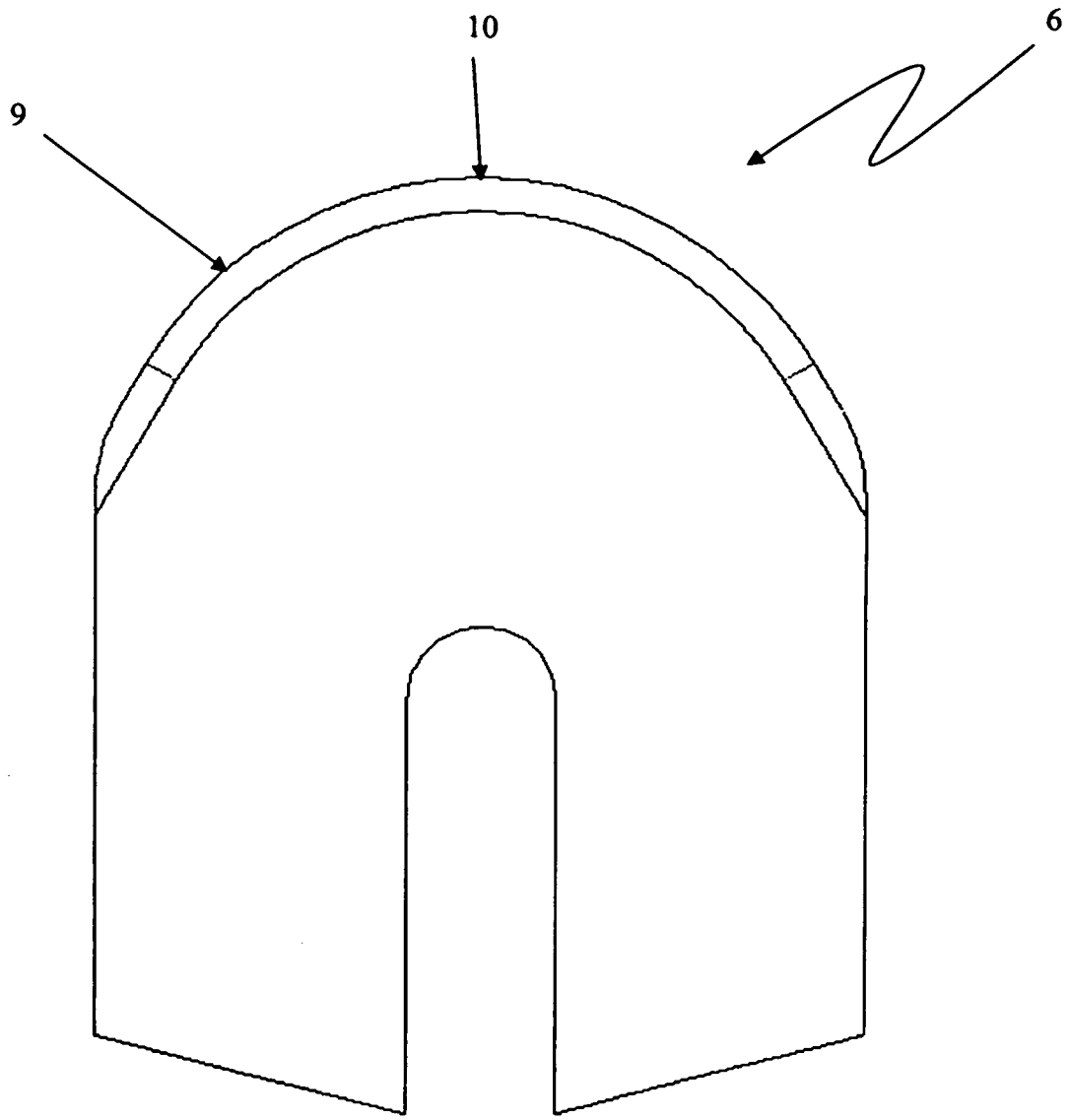

Fig. 7

REFERENCES CITED IN THE DESCRIPTION

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