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(54) **SAFETY FABRIC, PROTECTIVE GARMENT AND METHOD FOR MANUFACTURING A SAFETY FABRIC**

(57) This invention relates to the safety fabric (1) for protective clothing, in particular chainsaw safety clothing, comprising: a knitted fabric (2), and a number of cut-resistant inlay threads (9) incorporated in the knitted fabric (2), wherein the inlay threads (9) are configured to be pulled out of the fabric (2) upon contact with a running chainsaw. The invention further relates to protective garment comprising multiple layers of said safety fabric (1) and a method for manufacturing said safety fabric (1).

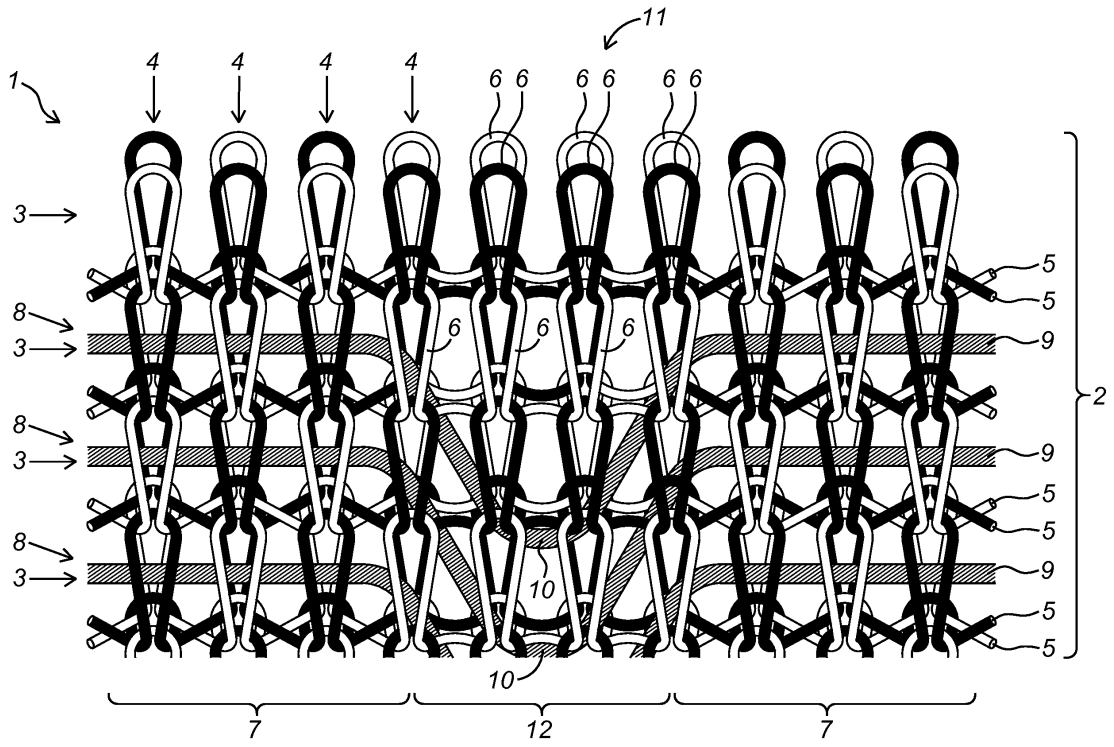


*Fig. 1*

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## Description

**[0001]** The invention relates to a safety fabric for protective clothing. More particularly the invention relates to a safety fabric for chainsaw safety clothing, which is specially adapted to resist chainsaws or other sawing machines from entering through the fabric and potentially come into contact with a person wearing the protective clothing (wearer), while the chain saw or sawing machine is still moving. The invention further relates to protective garment comprising multiple layers of said safety fabric and a method for manufacturing said safety fabric.

**[0002]** Sawing machines, and especially chainsaws, are notorious for their danger in use and potential injuries to their users. In order to reduce the danger of a chainsaw and other sawing machines injuring their user, various protective fabrics have been proposed. One class of protective fabrics contain a layer of relative loose fibre material of high tensile strength. In the further part of this patent application when reference is made to a chain saw also other types of saws are included and referred to. When a chainsaw comes in contact with this material, a plurality of fibres is caught by the chain links of the saw and entangle and wrap around the saw and get stuck into the drive sprocket, blocking the chain and sprocket from any further motion. The fibre layer may be a non-woven, relative loose layer of fibres in between two woven or knit fabric layers. An example of such fabric may be found in the European patent application EP 2 409 585.

**[0003]** In a further improvement, the fibres of high tensile strength are knitted as inlays in between knitted layers. By inserting the high tensile fibres as inlays, the fibres are connected with the fabric, such that the quality throughout the fabric may be more precisely determined. Furthermore the amount of high tensile fibres may be well distributed and well defined over the entire fabric. However, a drawback of incorporating such high tensile inlay fibres directly into the fabric, is that the elasticity of the knit fabric is reduced. This is especially true for the elasticity in the direction parallel to the inlay fibres. Because of this reduced elasticity, the garments made of said fabric are less comfortable to wear and adhere less well to the shapes and motion of the wearer.

**[0004]** Accordingly it is the object of the invention to improve the protective fabric as proposed in the state of the art or mitigating or solving the problems related to the state of the art while maintaining the advantages thereof. More specifically, the objective of the invention is to provide a fabric that offers well-defined and reliable protection to the wearer and at the same time is comfortable to wear.

**[0005]** The invention thereto proposes a safety fabric for protective clothing, in particular chainsaw safety clothing, comprising: a knitted fabric, and a number of cut-resistant inlay threads incorporated in the knitted fabric, wherein the inlay threads are configured to be pulled out of the fabric upon contact with a running chainsaw, characterised in that the inlay threads are at predetermined intervals provided with loop portions. A knitted fabric has good stretchability and therefore moulds and moves easily with body movements. By using a knitted fabric, the fabric possesses an inherent elasticity which adds to the wearing comfort of garments comprising such fabric. Due to the incorporation of inlay threads, commonly made from fibres with a high tensile strength, directly into the fabric, the placement and orientation of the fibres may be closely determined. This results in a fabric that is of constant quality and guarantees a certain level of safety for the wearer. At the same time, the loops, which may be formed by portions of overfed floating inlay threads, provide a slack in the inlay threads that are otherwise non-elastic and unable to stretch with the naturally stretchy knitted fabric in at least a direction parallel to the inlay fibres. The slack in the inlay threads thus allows the fabric material (which acts as the carrier /substrate for the inlay threads) to stretch also in a direction parallel to the inlay fibres. The stretchability of the fabric provides protective garments, into which this fabric is incorporated, to closely follow the bodily curves or shapes as well as the movements of the wearer, allowing for a good fit and articulation to provide enhanced range-of-motion. This renders the fabric according to the invention more comfortable to wear, while the effect of the high tensile inlay fibres upon contact with a chainsaw getting entangled in the chain and the sprocket of the chainsaw is being maintained.

**[0006]** In an embodiment of a safety fabric according to the invention, the inlay threads may run weftwise across the fabric, following adjacent courses of the fabric. Herein, the weftwise direction is equivalent to the width direction of the fabric, which is to be understood as the direction in the plane of the fabric, perpendicular to the length of the knitted fabric. The length of the knitted fabric is commonly understood as the direction in which the fabric is produced. As the weftwise inlayed threads follow the courses of the fabric, the threads are relatively loosely arranged in the fabric, which ensures that the inlay threads are easily pulled out of the fabric upon contact with a (chain)saw. In order to let the inlay threads run weftwise across the fabric, the inlay threads are generally inlayed weftwise into the fabric layer during the knitting process. This allows for the inlay threads to be inlayed after each knitted course, which simplifies the feeding of the inlay threads and therefore the production process. Moreover, due to the weftwise application of the inlay threads, the inlay thread density that is employed may be easily varied in lengthwise direction of the fabric by changing the inlay frequency during knitting.

**[0007]** In a further embodiment of a safety fabric according to the invention, the fabric may comprise a weft knitted fabric. In weft knitting, the knitted loops of thread making up the fabric are formed across the width of the fabric, wherein each weft thread is fed approximately at a right angle to the direction in which the fabric is formed. An important advantage of the weft knitted fabric layer is

that it possess stretchability in both weft (width) and warp (length) direction, contrary to warp knitted fabrics that are commonly less elastic and wherein stretch is mainly limited to a single direction of the fabric. The application of a weft knitted fabric layer thus allows for the construction of protective clothing that is more elastic and therefore conforms better to (i.e better follows) the shape of the wearer and the wearer's movements. In addition, it is commonly understood that weft knitting is a more versatile method of fabric production in terms of both the range of fabric structures that may be produced and the yarn types that may be utilized. Weft knitted fabric may therefore be engineered to give a variety of properties and structures, thus allowing for various knitting constructions. Last, weft knitting involves compared to warp knitting a less complicated process leading to less expensive manufacturing processes.

**[0008]** In yet another embodiment of a safety fabric according to the invention, the fabric may comprise a double knitted fabric. A double knitted fabric is eminently suited to act as a carrier layer or substrate for the inlay threads as it essentially comprises two fabric layers, one directly behind the other, that form the outer faces of the fabric and enclose a space in which an inlay thread may be inlayed. Double knitted fabric differs from two layers of single knitted fabric in that at certain intervals dependent on the specific knitting pattern used, stitches of the front face of the fabric are interconnected with stitches on the rear face of the fabric by means of yarns that cross over between the two fabric layers, thereby crosslinking the opposing fabric layers. Commonly this crosslinking is the result of knitting with a single yarn on the needles of opposing (cylinder and dial) needle beds. The crosslinks that result herefrom define channels that run in width direction across the fabric and form pockets that may hold one or more floating inlay threads. The width of the pockets (which width is defined in a lengthwise direction of the fabric) may be varied based on whether each subsequent course of the front and rear fabric layers are interconnected with a course of the opposing fabric layer (which results in pockets of small width) or that each set of opposed interconnected courses is alternated with one or more sets of opposed non-connected courses (which results in pockets of larger width). The width of these widthwise extending pockets is based amongst others on the thickness of the inlay threads and the number of inlay threads incorporated in a single pocket. Pockets of larger width are necessary to accommodate multiple inlay threads or thicker inlay threads to ensure low-friction movement of the inlay threads in their pockets. The wider the pockets, the easier the inlay threads are able to move inside the pockets, resulting in a more elastic fabric, and the easier the inlay threads can be pulled out of the fabric upon contact with a (chain)saw. In a further embodiment of a safety fabric according to the invention, the double knitted fabric may in a weft direction be alternated with portions of single knitted fabric, configured to form pockets extending in a warp (length) direction of the fabric to accommodate the loop portions of the inlay threads. Single knitted fabric, also known as single jersey fabric or single fabric, is a weft knitted fabric that has one side consisting of face stitches and the opposing side consisting of back stitches. Where double knitted fabric portions comprise crosslinks that connect the front and rear fabric layers, the portions of single knitted fabric are formed by two opposing, unconnected single knitted fabric layers. When the double knitted parts of the fabric layer are alternated with two layers of single knitted fabric, knitted back to back, a fabric thus results that has a consistent appearance on both sides of the fabric, but lacks along the single knitted fabric parts the crosslinking stitches that interconnect the opposing fabric layers along the double knitted fabric parts. The alternating of double knitted fabric with portions of single knitted fabric in a weft direction creates pockets or channels running in lengthwise direction through the fabric. The width of these lengthwise extending pockets can be varied by changing the number of stiches knitted between two consecutive crosslinking stitches. The pockets may accommodate the (floating) loop portions of the inlay threads in a loose fashion, ensuring that the inlay threads possess a certain slack and/or freedom of movement in their lengthwise direction at least within the pockets of single knitted fabric, which allows the fabric to remain stretchable in weftwise direction. By having the loops of the inlay threads in dedicated pockets, the distribution of the loops of the inlay threads and thus the properties of the material such as the wearing comfort, the stretch and the safety effect may be kept constant throughout the material.

**[0009]** The inlay threads may comprise fibres selected from the group consisting of: polypropylene fibres, polyester fibres, polyamide fibres, aramid fibres, Kevlar fibres and Dyneema fibres and/or any other suitable inlay fibres and any combination of the before listed fibres. Suitable inlay fibres are to be understood here as a fibres that may be worked into threads of relatively high tensile strength, meaning that their tensile strength is (considerably) higher than the yarns out of with the surrounding fabric layer is constructed. Moreover, the inlay fibres preferably have a smooth, slick surface that minimizes friction between the inlay threads and the fabric substrate upon their relative movement. Such inlay threads are capable of being easily drawn out of the surrounding fabric layer(s) and wrapping around a chainsaw's drive sprocket, locking it solid and halting the chain, limiting damage to the operator.

**[0010]** In addition a face and/or a back of the fabric may also comprise fibres selected from the group consisting of: polypropylene fibres, polyester fibres, polyamide fibres, aramid fibres, Kevlar fibres and Dyneema fibres or a combination thereof to benefit from their relatively high tensile strengths and/or other specific beneficial properties.

**[0011]** The invention also relates to a protective garment comprising multiple superimposed layers of safety

fabric according to the invention. The stacking of various layers may provide additional security and may thus be applicable for e.g. higher chain saw speeds or coexisting, more stringent safety classes. In an alternate embodiment of the protective garment, the inlay threads of adjacent fabric layers have mutually different orientations. Together with the changing orientation of the inlay threads, the courses and wales of the different fabric layers hereby generally run in mutually different directions as well. Due to the mutually different orientations of the inlay threads in each of the adjacent fabric layers, a fine mesh of inlay threads is formed that provides a proper and homogeneous protection layer against incoming chainsaws, irrespective of the angle at which the chainsaw may contact the safety fabric.

**[0012]** The invention further relates to a method for manufacturing a safety fabric, comprising the following steps: A) feeding at least one yarn to a set of needles contained within at least one needle bed; B) knitting with the fed yarn at least one course of stitches that forms part of a face side and/or a back side of the fabric; C) feeding at least one inlay thread onto the unconnected stitches of the knitted courses, thereby inlaying the inlay thread between said unconnected stitches; D) knitting at least one new course of stitches, wherein the unconnected stitches of the previous knitted course are connected to the new course of stitches wherein the inlay thread is incorporated in the fabric; E) repeating step C) and D); wherein during manufacturing of the safety fabric, a tension on the yarn is applied, which tension exceeds a tension applied on the inlay thread. The just described method allows for the manufacturing of a weft knitted safety fabric according to the invention in a straightforward and efficient manner. By differentiating between the tension applied on the yarn that makes up the fabric (substrate) and the tension applied on the inlay thread during the manufacturing of the safety fabric, wherein the tension applied on the yarn exceeds the tension applied on the inlay thread, excess inlay thread is created upon release of the tension on the fabric after manufacturing, which excess of inlay thread forms loop portions in the inlay thread. This difference in tension could also be the result of overfeeding the inlay thread during inlaying, thereby providing the inlay thread with a negative tension. Overfeeding should hereby be understood as a process wherein the feeding rate (i.e. the feeder throughput rate) of the inlay thread exceeds the velocity of the feeder relative to the needle bed(s). Due to these loop portions, stretch portions are created that allow the fabric to retain its inherent elasticity in lengthwise direction of the inlay threads. At the same time, by performing the above described method, the inlay threads are directly incorporated into the fabric layer. This creates a homogeneous product that behaves in a predictable manner upon contact with a running chainsaw or other sawing equipment, guaranteeing a certain level of safety for the wearer.

**[0013]** It is conceivable that the inlay threads are not inlayed after the knitting of every new course, but are inlayed after the knitting of every other course or any other frequency in order to change the density of inlay threads in the resulting safety fabric. In this case, steps B) and D) are performed directly after each other for a number of times without performing step C) in between. It is also possible that multiple courses of stitches are knitted simultaneously by the use of multiple feeders and corresponding threads.

**[0014]** It is possible that during knitting a safety fabric according to the invention, the feeder courses are knit on the needles of opposing needle beds over at least a part of a weft direction of the fabric, thereby forming a double knitted row of stitches. In order to perform the just described method, two sets of opposed needles, contained within opposing needle beds, may be provided, wherein two feeders may be provided to feed separate yarns to separate opposing needles. As is mentioned before, it is advantageous if the fabric layer comprises a double knitted fabric, as such a fabric provides easy accommodation of the inlay threads.

**[0015]** In addition, it is possible that during knitting the feeder courses are knit on the needles of a single needle bed only over at least a part of a weft direction of the fabric, thereby forming a single knitted row of stitches. The single knitted rows of stitches of consecutive courses are hereby connected to each other to form one or more pockets or channels running in lengthwise (warp) direction through the fabric. Pockets like these may accommodate the loop portions of the inlay threads and add to the stretchability of the fabric as is explained earlier.

**[0016]** In an embodiment of the method for manufacturing a safety fabric according to the invention, the safety fabric is knitted by means of circular knitting. Circular knitting is to be understood as the knitting technique that is used by all those weft knitting machines whose needle beds are arranged in circular cylinders and/or dials, including latch, bearded or compound needles machinery. A circular knitting process results in a tubular knit that may be cut open to obtain a flat fabric. The advantage of circular knitting is that large production volumes may be obtained in a relatively efficient manner, for example by using multiple feeders and corresponding threads during the knitting process. It is however also conceivable that other knitting techniques performed by other knitting machines such as flat knitting machines are applied to manufacture a safety fabric according to the invention.

**[0017]** In order to further elucidate the invention, exemplary, non-limitative embodiments will be described with reference to the figures. In the figures:

- figure 1 shows a front view of a part of a safety fabric according to an embodiment of the invention;
- figure 2 shows a cross-sectional view of a part of a safety fabric according to an embodiment of the invention;
- figure 3 shows a schematic three-dimensional view of a part of a knitting machine suited for the manufacture of a safety fabric according to the invention;

and

- figure 4 shows a knitting notation for a safety fabric according to an embodiment of the invention.
- figure 5 shows a knitting notation for a safety fabric according to another embodiment of the invention.

**[0018]** The figures represent specific exemplary embodiments of the invention and should not be considered limiting the invention in any way or form. Throughout the description and the figures corresponding reference numerals are used for corresponding elements.

**[0019]** The expression "inlay threads" used herein is to be understood as, though not to be considered limited to fibres or threads of relative high tensile strength when compared to the fibres of the material itself. Examples of suitable fibre materials are polypropylene, polyester, polyamide, Dyneema/Spectra, Carbon, Aramid and Kevlar. However other suitable fibres and/or combinations may be applied as well.

**[0020]** In figure 1, a front view of a part of a safety fabric 1 according to an embodiment of the invention is presented. The safety fabric 1 comprises at least one knitted fabric 2, composed of multiple courses 3 and multiple wales 4, which respectively run in a width (weft) direction and a length (warp) direction of the fabric. Each of the courses 3 comprises yarn 5 being formed into a number of stitches 6, concatenated in both the width direction and length direction of the fabric. As a part of the fabric 2 of the shown embodiment of the safety fabric 1 comprises a double knitted fabric (which in this specific example is an interlock knit fabric), a single course 3 hereby comprises multiple threads or yarns 5. The yarns 5 in these double knitted (interlock) portions 7 of the fabric 2 cross over each other between wales 4, thereby forming consecutive stitches 6 of a single course 3, which stitches 6 alternately form part of the front face and the rear face of the fabric. The width-wise concatenated stitch portions enclose channels 8 that run in width direction through the fabric 2. These channels 8 are situated between the front face and the rear face of the fabric and are at least along the double knitted (interlock) portions 7 mutually separated by the crosslinking yarns 5. Each channel 8 may contain one or more inlay threads 9, which inlay threads 9 are at predetermined intervals provided with loop portions 10. The loop portions 10 of the inlay threads 9 are contained within pockets 11 that run in a length direction of the fabric 2. The pockets 11 are a result of alternating the interlock portions 7 with portions of single knitted fabric 12, also referred to as single (jersey) fabric. The plain fabric portions 12 of the fabric 2 are characterised by the lack of cross-over yarns that crosslink the front face and rear face of the fabric. This creates single and continuous pockets 11 that run parallel to the wales of the fabric and accommodate the loop portions 10 of the inlay threads 9. Within these pockets 11, the inlay threads 9 are able to freely move between the front face and the rear face of the fabric. This creates elastic portions within the fabric that allow the fabric 2 to stretch in a width direction (which corresponds to the direction of the inlay threads 9). Furthermore note that as the safety fabric 1 in this specific embodiment comprises interlock knit portions 7, which are reversible balanced, and a back-to-back knitted plain fabric portions 12, the front face and the rear face of the fabric 2 have an identical appearance.

**[0021]** Figure 2 depicts a cross-sectional view of a part of a safety fabric 1 according to an embodiment of the invention, showing features of the safety fabric 1 similar to those shown in figure 1. Clearly shown are the channels 8 that run width-wise across the fabric 2 between the front face and the rear face of the fabric and each contain an inlay thread 9. It should be noted that it is likewise possible that each of the channels 8 contain multiple inlay threads 9. As the depicted fabric 2 is an interlock knit, the sinker loops of opposing stitches 6 contained within a single course 3 cross over each other, thereby crosslinking the front face and the rear face of the fabric and mutually separating the channels 8.

**[0022]** Figure 3 depicts a schematic three-dimensional view of a part of a knitting machine suited for the manufacture of a safety fabric according to the invention. The part of the knitting machine shown could be part of a circular or tube knitting machine, or a flat knitting machine, also referred to as a flatbed or V-bed knitting machine. In figure 3, multiple needles 13 are shown, that are either part of a first set of needles slideably mounted in a trick 14 of a first needle bed 15, in a circular knitting machine also referred to as a cylinder, or part of a second set of needles slideably mounted in a trick 14 of a second needle bed 16, in a circular knitting machine also referred to as a dial. In the shown embodiment the needles are placed directly opposite to each other in interlock gating. It is however also conceivable that the mutual alignment of the needles is different, based on the specific knitting pattern that is used to obtain a safety fabric according to the invention. The position of the needles 13 as shown in figure 3 represent the "knock over" position, after the needles 13 are withdrawn into their tricks 14 so that the old loops 17 are knocked over and the new loops 18 are drawn through them. It is in this position that one or more inlay threads 9 may be inlayed between the new, unsecured loops 18 in a width direction of the fabric. The inlaying of the inlay threads 9 and the feeding of yarns 5 to the hooks 19 of the needles 13 is performed by means of feeders (not shown) in any manner commonly known in the textile industry.

**[0023]** Figure 4 depicts a knitting notation of a stitching pattern, for generating a safety fabric 1 according to an embodiment of the invention, wherein double knitted (interlock knit) portions 7 of the fabric layer 2 are in a weft direction alternated with portions of single knitted fabric 12. The stitching pattern shows the use of two yarn feeds: the even feeder 20 and the odd feeder 21. Each feeder 20, 21 provides a separate yarn 5 that knits on separate alternate opposing needles 13 to form double knitted portions 7. The single knitted fabric portions 12 are knit by

providing the separate yarns 5 on adjacent needles 13 mounted in a single needle bed 15, 16. A inlay feeder 22 for the inlay threads 9 is positioned between the even yarn feeds 20 and the odd yarn feeds 21, to inlay an inlay thread 9 between the unsecured loops of a course 3. Upon formation of the course 3 the inlay thread 9 is trapped between the stitches of both surfaces of the fabric, incorporating the inlay threads 9 directly into the fabric 2. Due to the application of a tension force on the yarn 5 that exceeds a tension force applied on the inlay thread 9 during manufacturing of the fabric, loop portions 10 are created in the inlay threads 9 at predetermined intervals. Although figure 4 shows a stitching pattern for a weft knitted fabric layer comprising both double knitted (interlock) portions 7 and single knitted fabric portions 12, wherein an inlay thread 9 is incorporated in each of the courses 3, it is to be understood that either the knitting technique or the density of inlay threads 9 may be varied without deviating from the invention.

**[0024]** Figure 5 shows a knitting notation for a stitching pattern, for generating a safety fabric 1 according to another embodiment of the invention. Analogous to the stitching pattern in figure 4, the herein shown stitching pattern comprises double knitted portions 7 that are in a weft direction alternated with portions of single knitted fabric 12. Inlay threads 9 are again incorporated in the fabric 2 and provided with loop portions 10. A difference with the stitching pattern depicted in figure 4 is the interval at which the front and the rear fabric layer are interconnected by means of crosslinking stitches 23.

**[0025]** In addition, the invention is to be understood not to be limited to the exemplary embodiments shown in the figures and described in the specification. For instance the further layers may be knitted, and further layers of inlay threads may be added as well. Also, various knitting techniques and patterns may be used to obtain a knitted fabric layer in which cut-resistant inlay threads are incorporated according to the invention. These and other modifications and variations that are considered part of the scope of the invention as outlined in the following claims.

**List of reference signs**

**[0026]**

1. Safety fabric
2. Fabric
3. Course
4. Wale
5. Thread/yarn
6. Stitch
7. Double knitted portion
8. Channel
9. Inlay thread
10. Loop portion
11. Pocket
12. Single knitted (single jersey) fabric portion
13. Needle
14. Trick
15. First needle bed (cylinder)
16. Second needle bed (dial)
17. Old loop
18. New loop
19. Hook
20. Even feeder
21. Odd feeder
22. Inlay feeder
23. Crosslinking stitch

**Claims**

**1.** Safety fabric for protective clothing, in particular chainsaw safety clothing, comprising:

- a knitted fabric, and
- a number of cut-resistant inlay threads incorporated in the knitted fabric,

wherein the inlay threads are configured to be pulled out of the fabric upon contact with a running chainsaw,

**characterised in that** the inlay threads are at predetermined intervals provided with loop portions.

**2.** Safety fabric according to claim 1, wherein the inlay threads run weftwise across the fabric, following adjacent courses of the fabric.

**3.** Safety fabric according to claim 1 or 2, wherein the fabric comprises a weft knitted fabric.

**4.** Safety fabric according to claim 1-3, wherein the fabric comprises a double knitted fabric.

**5.** Safety fabric according to claim 4, wherein the double knitted fabric is in a weft direction alternated with portions of single knitted fabric, configured to form pockets extending in a warp direction of the fabric to accommodate the loop portions of the inlay threads.

**6.** Safety fabric according to any of the preceding claims, wherein the inlay threads comprise fibres selected from the group consisting of: polypropylene fibres, polyester fibres, polyamide fibres, aramid fibres, Kevlar fibres and Dyneema fibres or a combination thereof.

**7.** Safety fabric according to any of the preceding claims, wherein a face and/or a back of the fabric comprises fibres selected from the group consisting of: polypropylene fibres, polyester fibres, polyamide fibres, aramid fibres, Kevlar fibres and Dyneema fibres or a combination thereof.

8. Protective garment comprising multiple superimposed layers of safety fabric according to any of the preceding claims.

9. Protective garment according to claim 8, wherein the inlay threads of adjacent fabric layers have mutually different orientations.

10. Method for manufacturing a safety fabric, comprising the following steps:

A) feeding at least one yarn to a set of needles contained within at least one needle bed;
B) knitting with the fed yarn at least one course of stitches that forms part of a face side and/or a back side of the fabric;
C) feeding at least one inlay thread onto the unconnected stitches of the knitted course, thereby inlaying the inlay thread between said unconnected stitches;
D) knitting at least one new course of stitches, wherein the unconnected stitches of the previous knitted course are connected to the new course of stitches wherein the inlay thread is incorporated in the fabric;
E) repeating step C) and D);

wherein during manufacturing of the safety fabric, a tension on the yarn is applied, which tension exceeds a tension applied on the inlay thread.

11. Method for manufacturing a safety fabric according to claim 10, wherein during knitting the feeder courses are knit on the needles of opposing needle beds over at least a part of a weft direction of the fabric, thereby forming an double knitted row of stitches.

12. Method for manufacturing a safety fabric according to claim 10 or 11, wherein during knitting the feeder courses are knit on the needles of a single needle bed only over at least a part of a weft direction of the fabric, thereby forming a single knitted row of stitches.

13. Method for manufacturing a safety fabric according to any of the preceding claims, wherein the safety fabric is knitted by means of circular knitting.

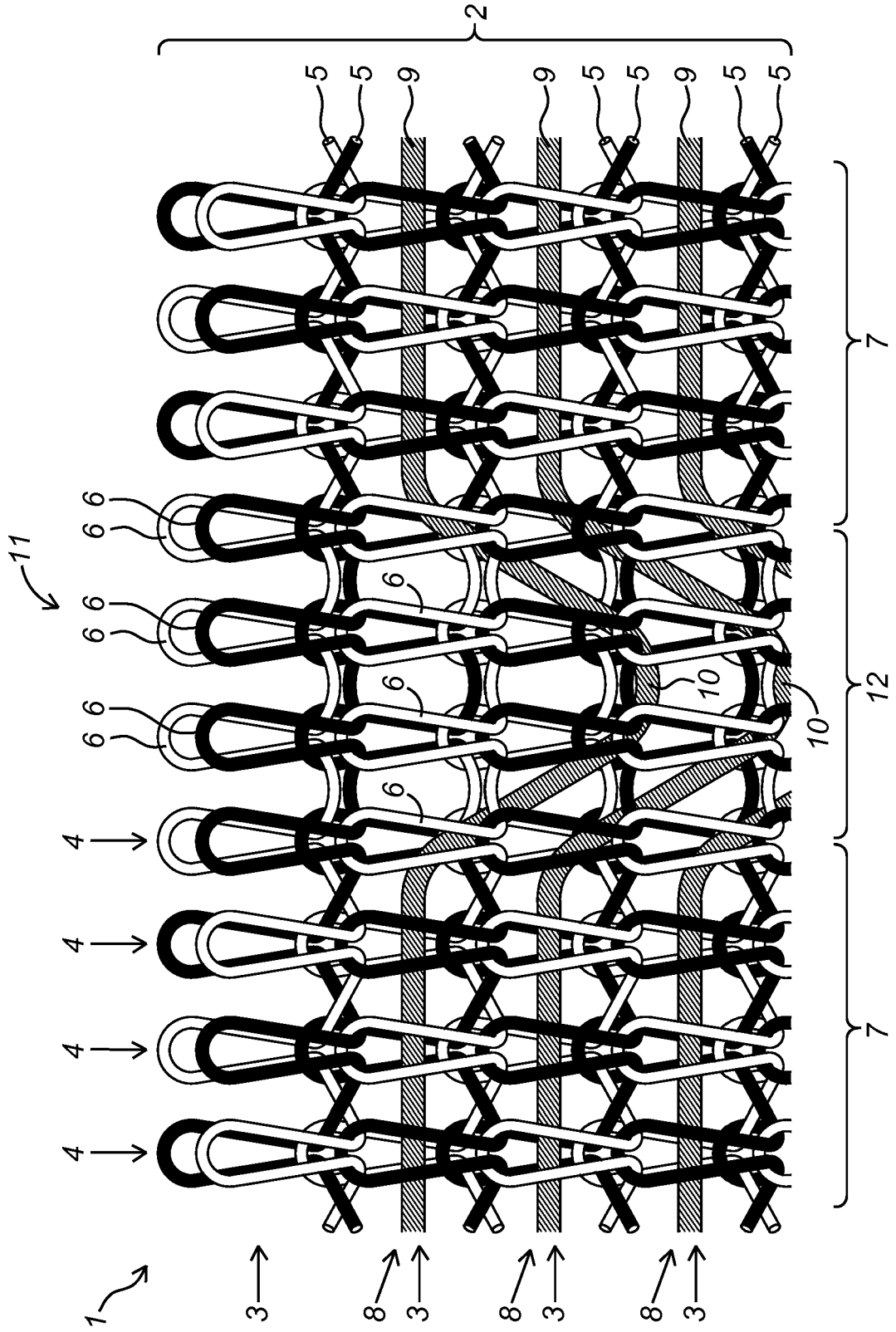


Fig. 1

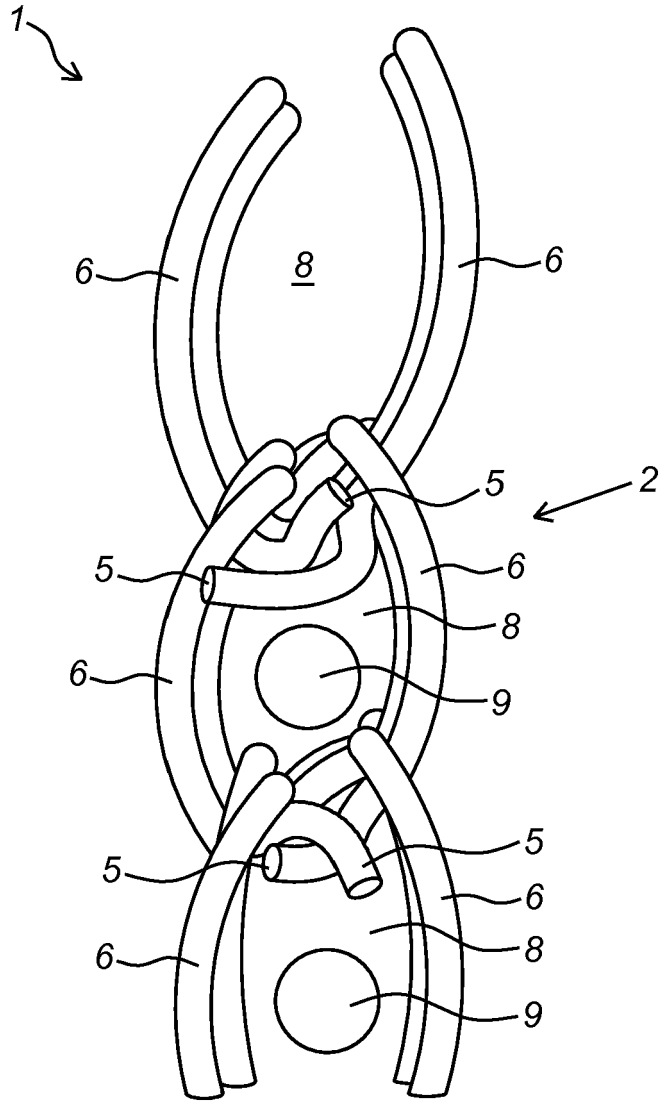


Fig. 2

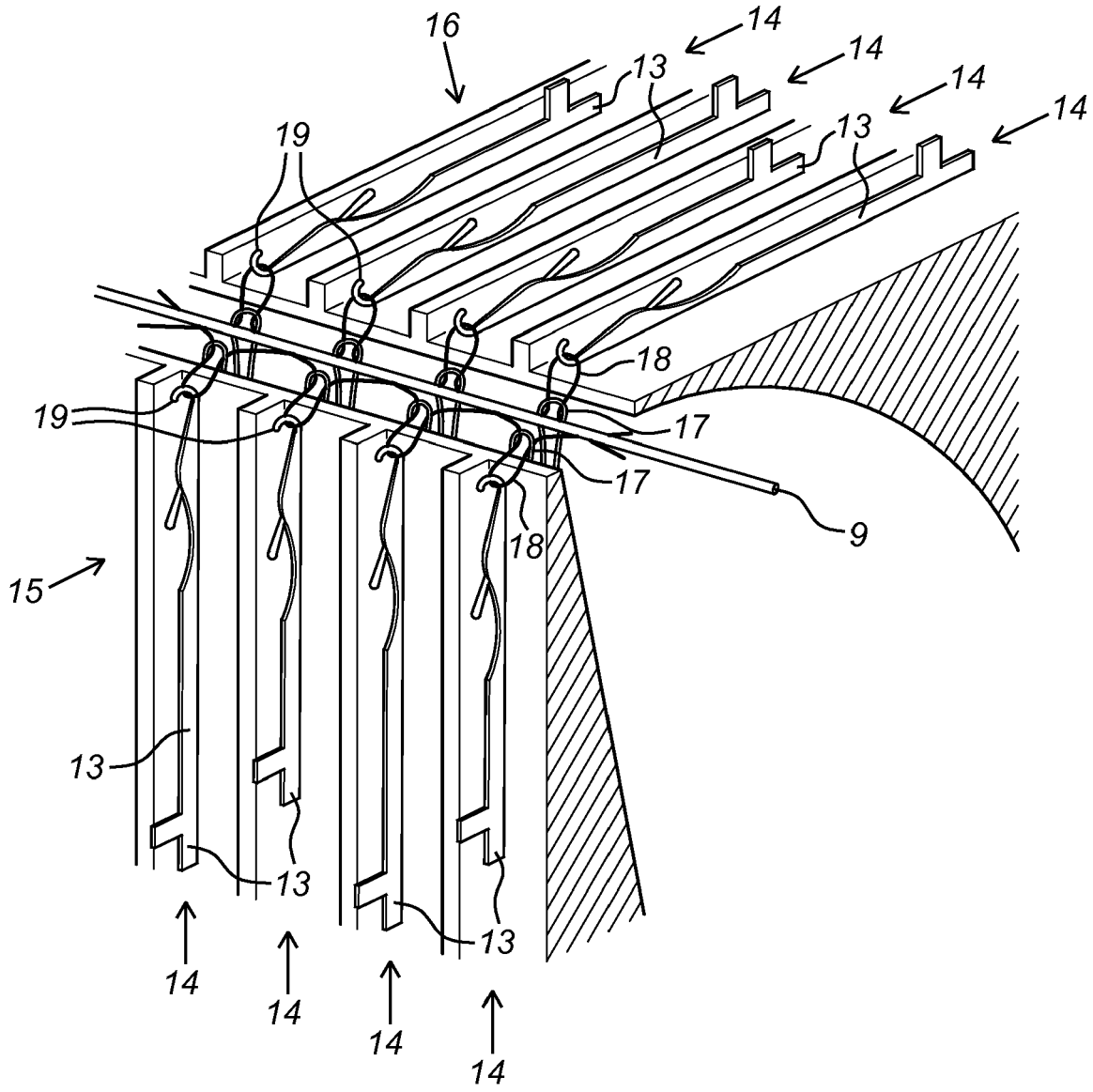


Fig. 3

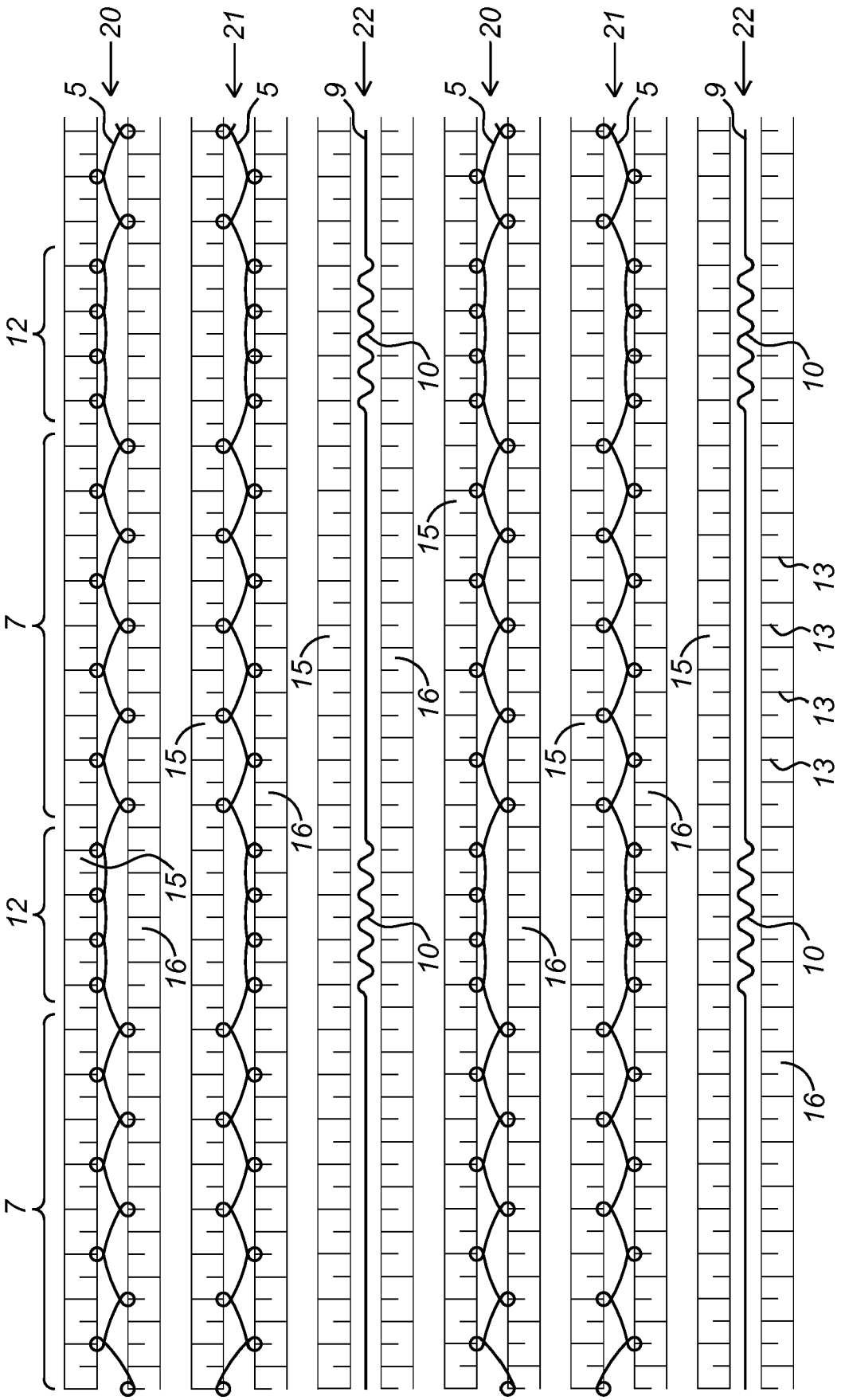


Fig. 4

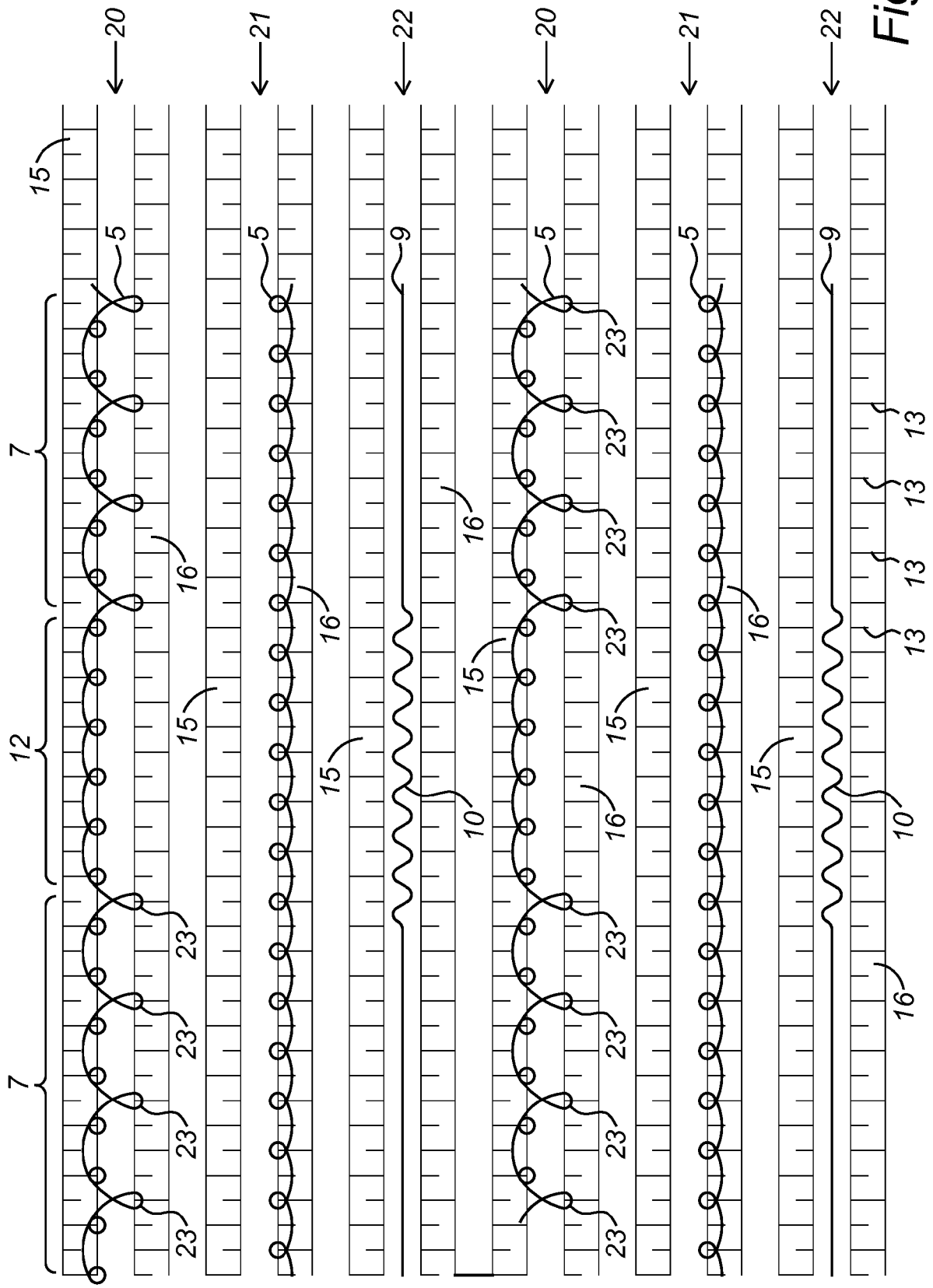


Fig. 5

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# EUROPEAN SEARCH REPORT

Application Number
EP 17 16 5949

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
|---|---|---|---|
| X | DE 88 13 939 U1 (STIHL)<br>22 December 1988 (1988-12-22)<br>* figure 1 *<br>----- | 1-13 | INV.<br>A41D13/00<br>A41D31/00<br>D04B21/16 |
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