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(54) **BARB CLIP FOR A WIRE FENCE**

(57) The invention relates to a barb clip that can be installed on an erected wire fence. The barb clip (20) comprises a mounting portion (24) designed to be fixed about a wire intersection (10) of the wire fence. In one embodiment, the barb clip consists of a length of wire (22) shaped in such a way as to engage intersecting wire portions. The wire is configured such that, upon mounting on the fence, one or both wire free ends form a barb end (30) protruding substantially perpendicularly to the fence.

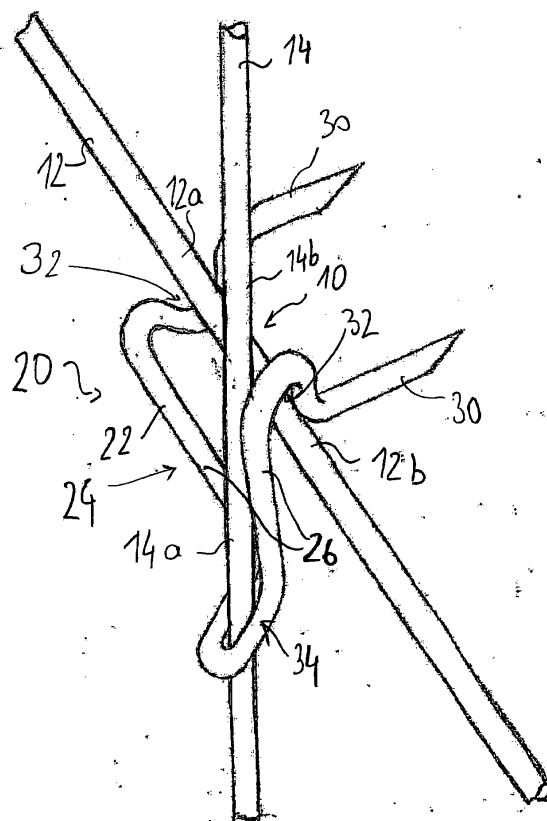


Fig. 1

Description

FIELD OF THE INVENTION

[0001] The present invention generally relates to the field of fencing and in particular to field fences. More specifically, the invention relates to a barb clip for a wire fence.

BACKGROUND OF THE INVENTION

[0002] Wire fences of various types are largely used in agriculture, in particular for maintaining livestock in a confined area.

[0003] A typical steel wire fence is formed from a plurality of generally parallel line wires, which will extend generally horizontally when the fence is set in position between fence posts, and lengths of stay wire, which extend laterally across the line wires at regular intervals (and generally vertically when the fence is set in position). Such wire assembly thus forms a mesh that may have rectangular or square shape. In general, the wires are joined together at each intersection, forming a joint or a knot.

[0004] The fixed knot wire fence utilizes a separate piece of wire tightly wrapped around the line wire and stay wire, increasing the fence's vertical strength allowing for increased post spacing and making it very resistant to animal damage.

[0005] In the so-called hinge joint wire fence, the end portions of the vertical stay wire pieces are wrapped around the line wires at each intersection. This design can absorb animal impact without damage and is the most economical joint choice available.

[0006] Wire fences are often used in combination with barbed wire, which typically consists of two wire strands twisted together with either two or four point barbs placed at predetermined intervals.

[0007] For cow fencing for example, one wire of barbed wire may be attached along the top wire line of a hinge joint wire fence, or installed within 10 to 50 cm inside the fencing, at about the same height. The barbed wire line prevents cows from heavily leaning against the fence, helping in protecting the fence.

[0008] Hence, animal fencing, as carried out today remains a multi-step operation, where the hinge joint wire fence is first installed; and barbed wire is installed in a second step. Barbed wire manipulation remains burdensome, since great care is required to avoid operator injury. Furthermore, when the barbed wire is simply rolled around the top of the wire fence, it also protrudes on the external side of the fencing, causing a risk of injury for persons (strollers...) approaching too close.

OBJECT OF THE INVENTION

[0009] Against the above-cited problems of conventional fencing, it is an object of the present invention to

provide a handy way of installing a barbed protection on a wire fence, in particular for animal containment.

SUMMARY OF THE INVENTION

[0010] The present invention concerns a barb clip, which is designed to be fixed on an already erected wire fence comprising a plurality of wires arranged in an intersecting manner to form a multiplicity of apertures. The barb clip comprises a mounting portion designed to be fixed about a wire intersection of a wire fence, by stably engaging with wire portions extending in at least two different directions. At least one barb-forming sharp point extends relative to the mounting portion so as to, upon mounting on the fence, protrude on the side of the fence, preferably substantially perpendicularly thereto.

[0011] The present invention thus provides a barb clip that can be installed on an already erected fence. It can be generally designed as an article that can be manipulated by hand, and positioned on the fence without any tool. The aggressive barbs being preferably directed on one side only, it can be more easily manipulated than a coil of barbed wire. Furthermore, the clip is positioned on the fence so that the barbs are directed towards the animals. Accordingly, there are no aggressive barbs protruding on the outer side of the side that may risk injuring persons passing nearby.

[0012] The mounting portion can be generally designed so that the barb clip is removable, or not, from the joint/knot on which it is mounted.

[0013] In this connection, a stable mounting of the clip on the respective wire portions can be obtained by an appropriate shape/configuration of the mounting portion, or by additional locking means, depending on the embodiments.

[0014] The mounting portion is advantageously designed as a part having a fixed configuration/geometry, in the sense that the general configuration remains the same before and after mounting to the wire fence. In particular, the mounting portion can be designed to be stably fixed about a wire intersection by form fitting. In other words, the mounting portion is a rigid part of fixed shape that is not changed upon mounting. The mounting part may include with locking means for fixing the mounting part in place.

[0015] In one embodiment, the barb clip mounting portion consists of a wire shaped to be fixed on a wire intersection by engaging respective intersecting wire portions. The barb clip is further configured such that, upon mounting on the fence, one and preferably both free ends of the clip wire form a barb end (or spike) extending and protruding on the side of the fence, preferably substantially perpendicularly thereto.

[0016] Such barb clip is easily obtained by bending, forming and/or shaping a single wire strand (preferably made from metal, in particular steel), and leaving the wire extremities as free ends that will extend, upon mounting on the fence, substantially perpendicular to the fence

plane. The mounting portion is designed to attach the clip to the fence by engaging the wires adjacent to a joint/knot. Preferably, the mounting portion is designed to engage with 3 wire portions leading to a joint/knot, which will typically be the converging point of 3 or 4 wires portions in a fence with parallelogram shaped mesh.

[0017] The instant barb clip can be easily installed by an user on an existing fence, without any tools or accessories. As it will appear, such clip design can be easily removed by the user, but is nevertheless adapted to resist strong solicitation by animals leaning against the wire fence.

[0018] Preferably, the clip wire in the mounting portion is generally V or U-shaped, the branches thereof lying, in use, generally in the fence plane, and the apex region of the V or U section being adapted to engage a first wire portion converging to the joint/knot, e.g. a vertical, stay wire.

[0019] The barb ends are preferably obtained by bending the open ends of the branches of the U or V-shaped mounting portion, to form an angle of between 70 and 110° therewith, preferably about 90°.

[0020] Advantageously, each of the main section branches is shaped, opposite the apex, to form a locking section configured to engage a respective wire intersecting at a joint/knot, before said barb-forming free ends.

[0021] By virtue of this design principle, the clip of the invention can be mounted on a wire intersection, connecting 3 or 4 intersecting wires portions, and can thus be used on a variety of wire fence types with rectangular, square or diamond fence mesh, be it a fixed knot, hinged or woven type joint, or a welded knot.

[0022] In another embodiment, the mounting portion comprises a main body having a front side and an opposite rear side, the rear side of the main body being configured so that the clip can engage with respective wire portions at a wire intersection; and at least one metal wire portion is embedded in the main body and protrudes on the front side, preferably sensibly perpendicularly, so that the free end of the metal wire portion forms a barb end (spike). In particular, the metal wire portion is may be a U-shaped wire, the base of which is embedded in the body, and the branches of the U-shaped wire protruding out from front side, so that the free ends of the branches form barb ends.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

[0023] The present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Fig.1: is a perspective view of a preferred embodiment of the present barb clip mounted on a joint of a steel wire fence with rectangular mesh; and

Fig.2: is principle diagram of another embodiment of

the present barb clip, where a) is a front view of the clip mounted on a wire fence intersection; and b) is a section view along line A-A.

[0024] In Fig.1, for simplicity, the fence is omitted and only one joint 10 is shown, formed as the intersection of a horizontal, line wire 12 and a vertical, stay wire 14. It will be understood that this is a principle design of a wire intersection of a wire fence comprising a plurality of wires arranged in an intersecting manner to form a plurality of apertures. The intersecting wires 12 and 14 are united at the intersection, and such intersection may therefore also be called joint or knot depending on the connecting solution. Hence, in practice the joint may be formed in various manners, depending on the fence type.

[0025] The fence may be of a rather rigid type, with the horizontal and vertical wires welded at their intersection.

[0026] For animal fencing, wire fences with fixed or hinge joint knots are preferred. In the case of fixed knots, the two wires are attached by means of an additional, short length wire wrapped and knotted around the intersecting wires.

[0027] In the conventional design of hinge joint fences, the horizontal lines are maintained in spaced apart relationship by vertical stay wire pieces. The stay wire end portions are helicoidally wrapped around the intersecting line wires.

[0028] It may be noted here that depending on the mesh design, a joint/knot is at the intersection of either:

- two wires, in the case of a welded or fixed knot, or in the case of a hinge joint on a selvedge line;
- three wires, in the case of a hinge joint: the horizontal line and two stay wires.

[0029] Referring to Fig.1, two horizontal wire portions 12a and 12b and two vertical wire portions 14a and 14b converge to, and intersect at, joint 10. This reference to "wire portions" is used herein whether two wire portions on opposite sides of the joint belong to the same wire or not, and irrespective of their relative angular positions.

[0030] As it will be understood, if joint/knot 10 was on the top line of the fence (selvedge line), wire portion 14b would be absent.

[0031] In the present variant, barb clip 20 is designed to engage with 3 wire portions intersecting at joint 10.

[0032] Barb clip 20 is made from a single wire strand 22 that is shaped, by bending or other appropriate forming operation, into a mounting portion 24 configured to engage respective mesh wire portions at joint 10. In the mounting portion 24, the wire 22 is generally shaped as a V (or U alternatively), the branches 26 thereof lying, in use, sensibly in the fence plane. The apex region of the V is adapted to engage a first wire portion 14a converging to the knot 10.

[0033] The open ends of the branches 26 of the V-shaped mounting portion 24 are bent to form an angle of about 90° therewith, in such a way that the free ends 30

of wire 22 form barbs extending and protruding substantially perpendicularly to the fence. The barb / spike forming free ends 30 of wire 22 are therefore sharpened / pointed.

[0034] As it can be understood from the Fig.1, the mounting portion 24 rests on one side of the fence, and the bent branches 26 extend through the fence to protrude on the opposite side. The barb ends extend on the same fence side, and may have a length of at least 0.75 cm, preferably at least 1.5 cm, by which they protrude from the fence plane. In general, the length of the barb end is less than 2.2.5 cm.

[0035] Furthermore, each of the branches 26 of the mounting portion 24 is shaped, remote from the apex and before the barb-forming free ends 30, to form a half-loop locking section 32 configured to engage a respective wire portion converging to the joint 10. As can be seen, the half loops 32 are turned in opposite directions: a first half loop 32 is open upwards and engages a second wire portion 12a from below, whereas the second half-loop 32 engages a third wire portion 12b from above.

[0036] Preferably, the apex region of the V-shaped section is bent in a direction away from the barb ends 30, and is designed as a narrow section 34 to closely engage with wire portion 12a.

[0037] With the present design, the wire clip is stably locked in place by means of the narrow section 34 and half-loops 32, i.e. by way of form-fitting. It resists tilting around horizontal wire 12 and twisting around vertical wire 14.

[0038] Wire 22 may generally be a smooth metal wire, in particular a steel wire. Conventional carbon steel may be used. The wire 22 may e.g. have a diameter of between 1.3 and 2.5 mm, and a length (before bending) in the range of, e.g., between 10 and 20 cm, preferably between 11 and 16 cm.

[0039] Wire 22 may be provided with a corrosion protective coating and/or a coloured coating. Typically, the wire may be covered with a galvanized coating (or the like), on top of which a bright colored organic coating (e.g. paint, or a thermoplastic polymer such as polyethylene) can be provided for ease of identification.

[0040] Turning now to Fig.2, a second embodiment of the present barb clip 50 is shown, mounted on a wire fence intersection between a wire line 12' and a stay wire 14'. The clip 50 comprises a mounting portion 52 formed by a main solid body having front side 54 and an opposite rear side 56. The front side 54 here has a triangle shape, but this is only an example and other shapes can be envisaged such as square, rectangle, circle, or more complex shapes.

[0041] The body may e.g. be made from plastic material such as e.g. PVC and a U-shaped steel wire portion 60 has its base 61 incorporated in the plastic body. The branches 62 of the U protrude out of the body, sensibly perpendicularly to the front side, so that the free ends 64 of the branches form barb ends. Therefore, the free ends 64 are preferably formed as sharp points.

[0042] The rear side 56 of the body is configured so that the clip 50 can engage with the wires 12' and 14' at their intersection/joint. For example, two perpendicular grooves 66 are provided in the rear side of body 52, to engage with a joint of 3 or 4 wire portions. The grooves 66 are dimensioned to accommodate the wires 12, 14' with some fitting play, possibly providing a broader groove area about the wire intersection itself to take into account the different types of joints: hinged, welded, fixed knot etc. The trace of the grooves 66 are indicated by dashed lines 66a in Fig.2 a

[0043] The cross shapes of the grooves 66 permit a stable positioning of the clip 50 on the joint: it cannot pivot about the horizontal or vertical axes defined by the wires.

[0044] Any appropriate locking solution can be adopted to firmly fix the clip 50 in position on the wire joint. For example, a cover 68 can be arranged on the rear side over the groove intersection, the cover comprising snap fit pins engaging corresponding bores in the body (not shown).

[0045] Alternatively, one could use locking pins extending transversally through the grooves, above the wires. Such locking pins can be inserted manually in through bores appropriately positioned in the body, upon the body is put in place on the wire intersection.

[0046] As will be understood, in the shown embodiment the barb clip has a fixed configuration that remains the same before and after mounting. The barb clip is not (plastically) deformed to be fixed onto the wire fence. The mounting portion is designed to be stably fixed about a wire intersection by form fitting. In the embodiment of Fig.2, the mounting portion further comprises locking means.

[0047] These are only examples and should not be considered limiting in any manner. Those skilled in the art may devise a variety of appropriate locking means, whether unlockable or not.

Claims

1. A barb clip for a wire fence comprising a plurality of wires arranged in an intersecting manner to form a multiplicity of apertures, said barb clip (20; 50) comprising a mounting portion (24; 52) designed to be fixed about a wire intersection (10) of the wire fence, by stably engaging with wire portions (12a, 12b, 14a, 14b) extending in at least two different directions; and at least one barb-forming sharp point (30; 64) extends relative to the mounting portion so as to, upon mounting on the fence, protrude on the side of the fence, preferably substantially perpendicularly thereto.
2. The barb clip according to claim 1, wherein said mounting portion is designed to be fixed about a wire intersection by form fitting.

3. The barb clip according to claim 1 or 2, wherein said mounting portion has the same general configuration before and after mounting to the wire fence.
4. The barb clip according to claim 1, 2 or 3, wherein said mounting portion is designed so that the barb clip is removable from the joint/knot on which it is mounted.
5. The barb clip according to any one of claims 1 to 4, wherein said mounting portion (24) consists of a length of wire (22) shaped in such a way as to engage intersecting wire portions (12a, 12b, 14a, 14b); wherein said wire (22) is configured such that, upon mounting on the fence, one or both wire free ends (30) form a barb end protruding substantially perpendicularly to the fence.
6. The barb clip according to claim 5, wherein in said mounting portion (24), said wire (22) is generally shaped as a V or U, the branches (26) thereof lying, in use, generally in the fence plane, the apex region of the V or U being adapted to engage a first wire portion (14a) at the wire intersection.
7. The barb clip according to claim 6, wherein said barb ends (30) are obtained by bending the open ends of the branches of the U or V-shaped mounting portion to form an angle of about 75° to 105° therewith, preferably about 90°; and preferably wherein, in use, the mounting portion (24) rests against one side of the fence whereas the bent open end portions extend through the fence, with the barb ends (30) protruding on the opposite side of the fence.
8. The barb clip according to any one of the preceding claims, wherein said barb ends (30) have a length of at least 0.75 cm, preferably at least 1.5 cm.
9. The barb clip according to any one of claims 5 to 8, wherein each of the mounting portion branches is shaped, remote from the apex and before said barb-forming free ends, to form a locking section (32) configured to engage a respective mesh wire portion of the wire intersection; and preferably wherein the locking sections (32) are obtained by shaping the wire as a half loop; and preferably wherein the half loops of the two locking sections are open in opposite directions, in particular to engage, in use, one wire portion (12b) from above and the other wire portion (12a) from below.
10. The barb clip according to claim 9, wherein the locking sections (30) engage respective wire portions on different sides of the wire intersection, and which are preferably substantially aligned.
11. The barb clip according to any one of claims 5 to 10, wherein said apex region of said V or U-shaped mounting portion is bent opposite the barb-forming free ends.
12. The barb clip according to any one of claims 5 to 11, wherein said U or V-shaped mounting portion comprises, towards the apex region, a narrow section engaging a respective wire portion at said wire intersection.
13. The barb clip according to any one of claims 5 to 12, wherein said clip consists of a single piece of wire, preferably a smooth steel wire; and said wire is preferably provided with a corrosion protective and/or colored coating.
14. The barb clip according to claim 1, 2, 3 or 4, wherein the mounting portion comprises a main body (52) having a front side (54) and an opposite rear side (56), the rear side of the main body being configured so that the clip (50) can engage with respective wire portions at a wire intersection; and at least one metal wire portion (60) is embedded in the main body and protrudes on the front side, preferably sensibly perpendicularly, so that the free end (64) of said metal wire portion forms a barb end.
15. The barb clip according to claim 14, wherein said at least one metal wire portion (60) is a U-shaped wire, the base (61) of which is embedded in the body, and the branches (62) of the U shaped wire (60) protruding out from front side, so that the free ends of the branches form barb ends (64).

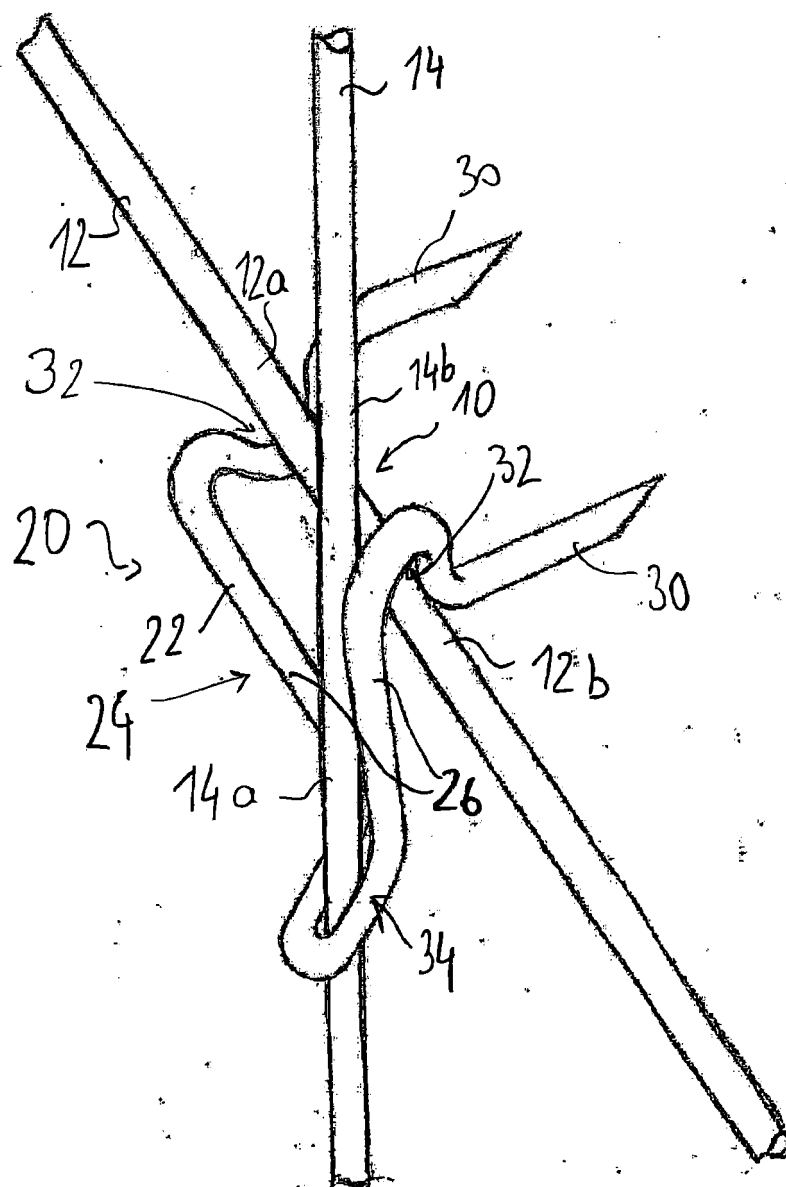
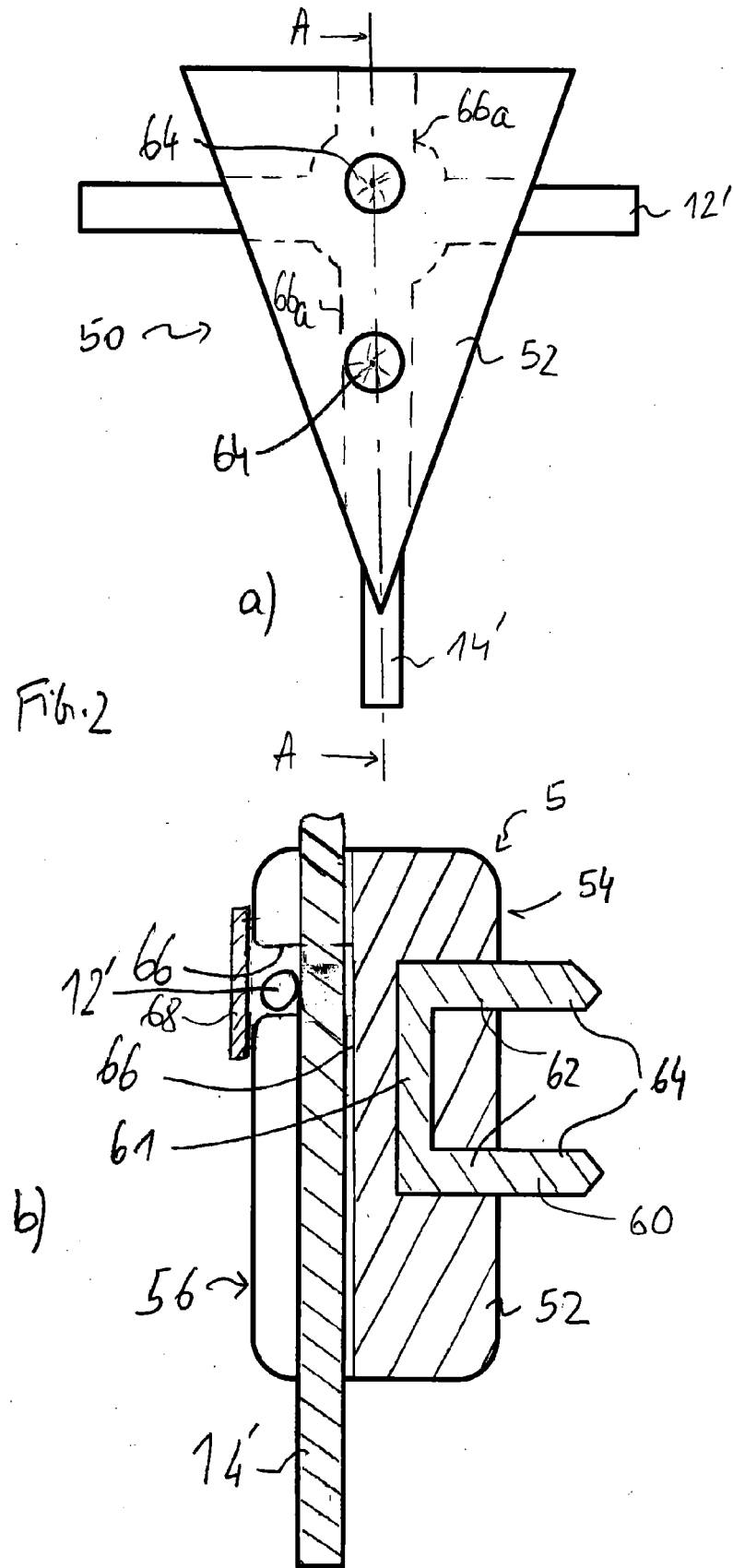


FIG. 1





EUROPEAN SEARCH REPORT

Application Number
EP 16 17 5731

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DOCUMENTS CONSIDERED TO BE RELEVANT			
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A	DE 27 21 901 A1 (BAYER AG) 23 November 1978 (1978-11-23) * claim 3; figure 3 * -----	14	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 25 October 2016	Examiner Rosborough, John
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 16 17 5731

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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25-10-2016

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82