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(54) **An eye fastener**

Ösenverschluss

Agrafe à oeillet

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(73) Proprietor: **Texco Hook & Eye Tape Ltd**
Hong Kong (CN)

(72) Inventor: **Fung, Wing Leung**
Cheung Sha Wan
Kowloon, Hong Kong (CN)

(74) Representative: **Ward, David Ian**
Marks & Clerk LLP
Alpha Tower
Suffolk Street
Queensway
Birmingham B1 1TT (GB)

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Description

[0001] This invention relates to an eye fastener, in particular such a fastener suitable for forming an eye connector for use (but not exclusively) in garments items.

[0002] Many garment items, in particular lingerie (including brassieres), include connectors having hook and eye fasteners for providing flexible but firm coupling. In general, an array of hook fasteners (in rows and columns) is sewn onto a first tape, and a complementary array of eye fasteners is sewn into a second tape, and by engaging different hook fasteners and eye fasteners, a degree of lengthwise adjustment is allowed.

[0003] In such conventional hook and eye fasteners, both the eye fasteners and hook fasteners are typically formed of a stiff metal wire. The eye fasteners are generally C-shaped with two free ends sewn and received within the tape to form an opening, in which the plane defined by the opening of each eye fastener lies against the tape. It is found that when a user seeks to engage the eye fastener with a hook fastener, one has to slightly pivot the eye fastener away from the tape to further expose the plane of opening, to facilitate engagement with the hook fastener. This is relatively difficult, in particular in the case of brassieres, where the hook and eye fasteners are at the back of the user. An eye fastener according to the preamble of claim 1 is known from the document DE153833.

[0004] It is thus an object of the present invention to provide an eye fastener and a tape including at least one such eye fastener in which the above shortcoming is mitigated, or at least to provide a useful alternative to the trade and public.

[0005] According to a first aspect of the present invention, there is provided an eye fastener having all the features of claim 1.

[0006] According to a second aspect of the present invention, there is provided a tape including at least one eye fastener according to the first aspect of the present invention.

[0007] Preferably, the tape further includes a backing sheet (208) and at least one layer of padding material (210) on the backing sheet.

[0008] More preferably, the base of the eye fastener is between the backing sheet and the layer of padding material.

[0009] It is preferable that the base plane of the eye fastener is substantially parallel to the backing sheet.

[0010] Embodiments of eye fasteners and tapes including at least one fastener according to the present invention will now be described, by way of examples only, with reference to the present invention, in which:

Fig. 1 is a top perspective view of an eye fastener;
Fig. 2 is a bottom view of the eye fastener shown in Fig. 1;
Fig. 3 is a side view of the eye fastener shown in Fig. 2;
Fig. 4 is an end view of the eye fastener shown in Fig. 2;
Fig. 5 shows a row of eye fasteners shown in Fig. 1 sewn to a tape;
Fig. 6 shows two rows of eye fasteners shown in Fig. 1 sewn to the tape in Fig. 5;
Fig. 7 shows three rows of eye fasteners shown in Fig. 1 sewn to the tape in Fig. 6;
Fig. 8 is an enlarged side sectional view of the tape shown in Fig. 7;
Fig. 9 shows eye connectors formed out of the tape shown in Fig. 7;
Fig. 10 is a top perspective view of an eye fastener according to an embodiment of the present invention;
Fig. 11 is a bottom view of the eye fastener shown in Fig. 10;
Fig. 12 is a side view of the eye fastener shown in Fig. 11;
Fig. 13 is an end view of the eye fastener shown in Fig. 11;
Fig. 14 shows a row of eye fasteners shown in Fig. 10 sewn to a tape;
Fig. 15 shows two rows of eye fasteners shown in Fig. 10 sewn to the tape in Fig. 14;
Fig. 16 shows three rows of eye fasteners shown in Fig. 10 sewn to the tape in Fig. 15;
Fig. 17 is an enlarged side sectional view of the tape shown in Fig. 16; and
Fig. 18 shows eye connectors formed out of the tape shown in Fig. 16.

[0011] An eye fastener is shown in Figs. 1 to 4, and generally designated as 100. The eye fastener 100 is formed integrally of a wire (such as a metal wire), e.g. by bending. The eye fastener 100 has two anchor portions 102 (each being a free end of the eye fastener 100), two parallel leg portions 104 each extending from a respective of the anchor portions 102, and a generally C-shaped portion 106 joining, extending from and bent relative to the two leg portions 104.

[0012] The anchor portions 102 form a base, defining a base. plane P-P, on which the leg portions 104 also lie. The C-shaped portion 106, which extends from the base, forms an opening ("eye") through which a hook fastener may be releasably engaged. It can be seen from Fig. 3 that the plane Q-Q defined by the C-shaped portion 106 ("plane of opening") is displaced relative to the plane P-P defined by the anchor portions 102 and leg portions 104 ("base plane"), and the two planes P-P, Q-Q are joined *via* bent portions 120. Although the angle α between the plane of opening Q-Q and the base plane P-P is shown in Fig. 3 as being an obtuse angle, such may alternatively be a right angle or an acute angle. The distance d between the uppermost end of the C-shaped portion 106 and the leg portions 104 (and the anchor portions 102) is from 0.5mm to 5mm.

[0013] As shown in Fig. 5, to produce a tape with an

array of eye fasteners 100, a first row of eye fasteners 100 are assembled between a backing sheet 108 and a first layer of padding material 110. In particular, the first row of eye fasteners 100 are arranged along a straight line, with their anchor portions 102 fixed (e.g. by sewing) between the backing sheet 108 and the first layer of padding material 110, and with their leg portions 104 and C-shaped portions 106 exposed to the outside environment.

[0014] As shown in Fig. 6. a second row of eye fasteners 100 are assembled between the backing sheet 108 and a second layer of padding material 112. In particular, the second row of eye fasteners 100 are arranged along a straight line which is parallel to the straight line along which the first row of eyes 100 are arranged. Again, the anchor portions 102 of the second row of eye fasteners 100 are fixed between the backing sheet 108 and the second layer of padding material 112. The leg portions 104 and C-shaped portions 106 of the second row of eye fasteners 100 are also exposed to the outside environment

[0015] Finally, as shown in Fig. 7, a third row of eye fasteners 100 are assembled between the backing sheet 108 and a third layer of padding material 114. In particular, the third row of eye fasteners 100 are arranged along a straight line which is parallel to the straight lines along which the first and second rows of eye fasteners 100 are arranged. Again, the anchor portions 102 of the third row of eye fasteners 100 are fixed between the backing sheet 108 and the third layer of padding material 114. The leg portions 104 and C-shaped portions 106 of the third row of eye fasteners 100 are also exposed to the outside environment.

[0016] A tape 116 with three rows of eye fasteners 100 fixed thereto is thus formed. There is of course no definite restriction on the number of rows of eye fasteners 100 which may be carried by the tape 116. A manufacturer may decide on the number of rows of eye fasteners 100 for the tape 116 according to the use to which eye connectors formed from the tape 116 are to be put.

[0017] As shown in Fig. 8, the plane of the backing sheet 108 is parallel to the base plane P-P of the eye fasteners 100, and is displaced relative to the plane of opening Q-Q of the eye fasteners 100.

[0018] Turning to Fig. 9, it can be seen that eye connectors 118 each with an array of two-by-three eye fasteners 100 are formed from the tape 116. Such eye connectors 118 may be formed by cutting the continuous tape 116 transversely by a cutter vibrated ultrasonically at intervals. The eye connectors 118 so formed may then be sewn onto semi-finished brassieres for forming final products.

[0019] An eye fastener according to an embodiment of the present invention is shown in Figs. 10 to 13, and generally designated as 200. The eye fastener 200 is formed integrally of a wire (such as a metal wire), e.g. by bending. In particular, the eye fastener 200 has two anchor portions 202 (each being a free end of the eye fastener 200), two parallel leg portions 204 extending from and bent relative to the anchor portions 202, and a generally C-shaped portion 206 joining, extending from and bent relative to the two leg portions 204.

[0020] The anchor portions 202 form a base, defining a base plane R-R. The leg portions 204 and the C-shaped portion collectively form an opening ("eye") through which a hook fastener may be releasably engaged. The leg portions 204 define a first plane S-S and the C-shaped portion 206 defines a second plane T-T. The first plane S-S and the second plane T-T collectively form a plane of opening. It can be seen from Fig. 12 that the plane S-S defined by the leg portions 204 (i.e. the first plane) is displaced relative to the base plane R-R, and the plane T-T defined by the C-shaped portion 206 (i.e. the second plane) is displaced relative to the first plane S-S and is parallel to the base plane R-R. The base plane R-R and the first plane S-S are joined with each other *via* first bent portions 220a; and the first plane S-S and the second plane T-T are joined with each other *via* second bent portions 220b. The angle β between the first plane S-S and the base plane R-R is shown in Fig. 12 as being an obtuse angle. The distance *e* between the uppermost end of the C-shaped portion 206 and the anchor portions 202 is from 0.5mm to 5mm.

[0021] As shown in Fig. 14, to produce a tape with an array of eye fasteners 200, a first row of eye fasteners 200 are assembled between a backing sheet 208 and a first layer of padding material 210. In particular, the first row of eye fasteners 200 are arranged along a straight line, with their anchor portions 202 fixed (e.g. by sewing) between the backing sheet 208 and the first layer of padding material 210, and with their leg portions 204 and C-shaped portions 206 exposed to the outside environment.

[0022] As shown in Fig. 15, a second row of eye fasteners 200 are assembled between the backing sheet 208 and a second layer of padding material 212. In particular, the second row of eye fasteners 200 are arranged along a straight line which is parallel to the straight line along which the first row of eyes 200 are arranged. Again, the anchor portions 202 of the second row of eye fasteners 200 are fixed between the backing sheet 208 and the second layer of padding material 212. The leg portions 204 and C-shaped portions 206 of the second row of eye fasteners 200 are also exposed to the outside environment.

[0023] Finally, as shown in Fig. 16, a third row of eye fasteners 200 are assembled between the backing sheet 208 and a third layer of padding material 214. In particular, the third row of eye fasteners 200 are arranged along a straight line which is parallel to the straight lines along which the first and second rows of eye fasteners 200 are arranged. Again, the anchor portions 202 of the third row of eye fasteners 200 are fixed between the backing sheet 208 and the third layer of padding material 214. The leg portions 204 and C-shaped portions 206 of the third row of eye fasteners 200 are also exposed to the outside

environment.

[0024] A tape 216 with three rows of eye fasteners 200 fixed thereto is thus formed. It should of course be understood that a manufacturer may decide on the number of rows of eye fasteners 200 for the tape 216 according to the use to which eye connectors formed from the tape 216 are to be put.

[0025] As shown in Fig. 17, the plane of the backing sheet 208 is:

- parallel to the base plane R-R of each eye fastener 200,
- displaced relative to the first plane S-S of the plane of opening as defined by the leg portions 204 of each eye fastener 200, and
- parallel to the second plane T-T of the plane of opening as defined by the C-shaped portion 206 of each eye fastener 200.

[0026] Turning to Fig. 18, it can be seen that eye connectors 218 each with an array of two-by-three eye fasteners 200 are formed from the tape 216. Such eye connectors 218 may be formed by cutting the continuous tape 216 transversely by a cutter vibrated ultrasonically at intervals. The eye connectors 218 so formed may then be sewn onto semi-finished brassieres for forming final products.

[0027] It can be seen from the foregoing discussion and the accompanying drawings that as the plane of opening of the eye fastener 200 according to this invention is displaced relative to the base plane R-R (which lie against the backing sheet 208), such allows ensy engagement between eye connector 218 and complementary hook connector.

[0028] It should be understood that the above only illustrates examples whereby the present invention may be carried out, and that various modifications and/or alterations may be made thereto without departing from the scope of the invention as defined by the appended claims.

Claims

1. An eye fastener (200) formed integrally of a wire to define a first plane (S-S), a second plane (T-T), and a base plane (R-R), the eye fastener including:

   a base (202), formed from two anchor portions, defining the base plane (R-R), wherein each anchor point forms a free end of the eye fastener (200), and
   two parallel leg portions (204) extending from the base (202) and joined via a generally C-shaped portion (206) to collectively form an eye (206) extending from the base and defining an opening through which a hook fastener may be releasably engaged,
   wherein the two parallel leg portions (204) are bent relative to the base plane (R-R) via first bent portions (220a) and via second bent portions (220b) such that the two parallel leg portions (204) between the first bent portions (220a) and the second bent portions (220b) define the first plane (S-S), and such that the C-shaped portion defines the second plane (T-T),
   wherein the second plane (T-T) is displaced relative to the first plane (S-S), whereby the opening is displaced relative to the base plane (R-R),
   wherein the base plane (R-R) is parallel to the second plane (T-T), the eye fastener being **characterized in that** the first plane (S-S) and the base plane (R-R) define an obtuse angle (β) equal to that between the first plane (S-S) and the second plane (T-T).

2. A tape (216) including at least one eye fastener as claimed in claim 1.

3. The tape as claimed in claim 2, further **characterized in** including a backing sheet (208) and at least one layer of padding material (110, 210) on the backing sheet.

4. The tape as claimed in claim 3, further **characterized in that** the base of the eye fastener is between the backing sheet and the layer of padding material.

5. The tape as claimed in claim 2 or 3, further **characterized in that** the base plane of the eye fastener is substantially parallel to the backing sheet.

Patentansprüche

1. Ösenverschluss (200), der integral so aus einem Draht geformt ist, dass er eine erste Ebene (S-S), eine zweite Ebene (T-T) und eine Basisebene (R-R) definiert, wobei der Ösenverschluss Folgendes umfasst:

   eine Basis (202), die aus zwei Ankerabschnitten geformt ist, welche die Basisebene (R-R) definieren, wobei jeder Ankerpunkt ein freies Ende des Ösenverschlusses (200) bildet, und,
   zwei parallele Schenkelabschnitte (204), die sich von der Basis (202) aus erstrecken und über einen im Allgemeinen C-förmigen Abschnitt (206) verbunden sind, um gemeinsam eine Öse (206) zu bilden, die sich von der Basis aus erstreckt und eine Öffnung definiert, durch die ein Hakenverschluss lösbar in Eingriff gebracht werden kann,
   wobei die zwei parallelen Schenkelabschnitte (204) im Verhältnis zu der Basisebene (R-R) über erste gebogene Abschnitte (220a) und

über zweite gebogene Abschnitte (220b) derart gebogen sind, dass die zwei parallelen Schenkelabschnitte (204) zwischen den ersten gebogenen Abschnitten (220a) und den zweiten gebogenen Abschnitten (220b) die erste Ebene (S-S) definieren, und derart, dass der C-förmige Abschnitt die zweite Ebene (T-T) definiert,
wobei die zweite Ebene (T-T) im Verhältnis zu der ersten Ebene (S-S) verschoben ist, wodurch die Öffnung im Verhältnis zu der Basisebene (R-R) verschoben ist,
wobei die Basisebene (R-R) parallel zu der zweiten Ebene (T-T) ist, wobei der Ösenverschluss **dadurch gekennzeichnet ist, dass** die erste Ebene (S-S) und die Basisebene (R-R) einen stumpfen Winkel (β), gleich demjenigen zwischen der ersten Ebene (S-S) und der zweiten Ebene (T-T), definieren.

2. Band (216), das wenigstens einen Ösenverschluss nach Anspruch 1 einschließt.

3. Band nach Anspruch 2, ferner **dadurch gekennzeichnet, dass** es eine Trägerbahn (208) und wenigstens eine Lage von Polstermaterial (210) auf der Trägerbahn einschließt.

4. Band nach Anspruch 3, ferner **dadurch gekennzeichnet, dass** sich die Basis des Verschlusses zwischen der Trägerbahn und der Lage von Polstermaterial befindet.

5. Band nach Anspruch 2 oder 3, ferner **dadurch gekennzeichnet, dass** die Basisebene des Verschlusses im Wesentlichen parallel zu der Trägerbahn ist.

Revendications

1. Attache à œillet (200) formée d'un seul tenant à partir d'un fil métallique de façon à définir un premier plan (S-S), un second plan (T-T) et un plan de base (R-R), l'attache à oeillet incluant :

une base (202), formée de deux parties d'ancrage, définissant le plan de base (R-R), dans laquelle chaque point d'ancrage forme une extrémité libre de l'attache à oeillet (200), et
deux parties de branche parallèles (204) s'étendant à partir de la base (202) et reliées via une partie généralement en forme de C (206) pour former collectivement un oeillet (206) s'étendant à partir de la base et définissant une ouverture à travers laquelle une fermeture à crochet peut être mise en prise de façon détachable,
dans laquelle les deux parties de branche parallèles (204) sont coudées par rapport au plan de base (R-R) via des premières parties coudées (220a) et via des secondes parties coudées (220b), de telle manière que les deux parties de branche parallèles (204) entre les premières parties coudées (220a) et les secondes parties coudées (220b) définissent le premier plan (S-S), et de telle manière que la partie en forme de C définit le second plan (T-T),
dans lequel le second plan (T-T) est décalé par rapport au premier plan (S-S), au moyen de quoi l'ouverture est décalée par rapport au plan de base (R-R),
dans lequel le plan de base (R-R) est parallèle au second plan (T-T), l'attache à oeillet étant **caractérisée en ce que** le premier plan (S-S) et le plan de base (R-R) définissent un angle obtus (β) égal à celui entre le premier plan (S-S) et le second plan (T-T).

2. Bande (216) incluant au moins une attache à oeillet selon la revendication 1.

3. Bande selon la revendication 2, **caractérisée en outre en ce qu'**elle inclut une feuille de support (208) et au moins une couche de matériau de rembourrage (210) sur la feuille de support.

4. Bande selon la revendication 3, **caractérisée en outre en ce que** la base de l'attache à oeillet est entre la feuille de support et la couche de matériau de rembourrage.

5. Bande selon les revendications 2 ou 3, **caractérisée en outre en ce que** le plan de base de l'attache à oeillet est sensiblement parallèle à la feuille de support.

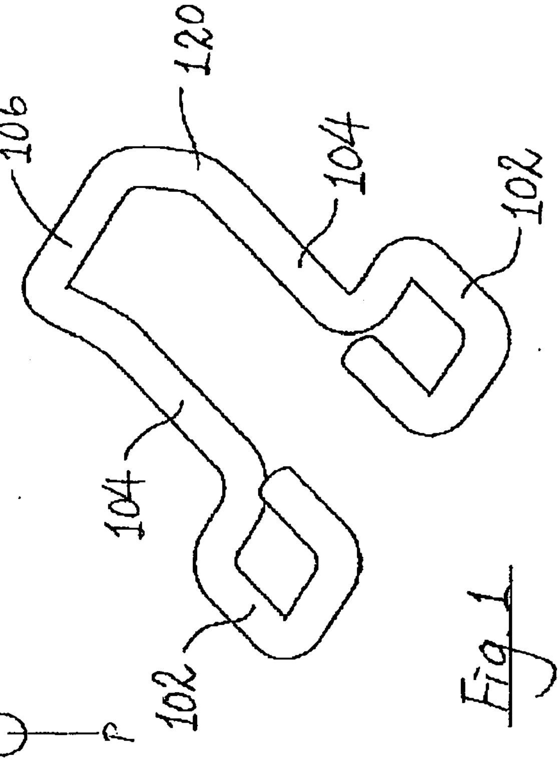

Fig 1

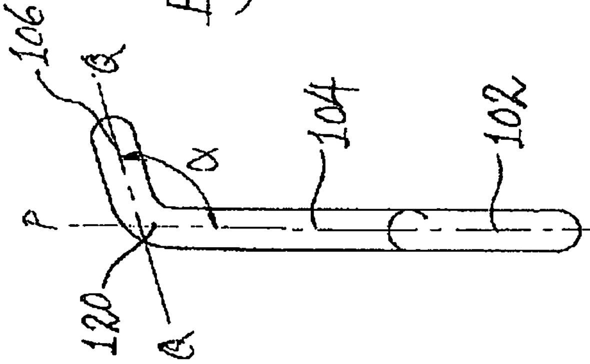

Fig 3

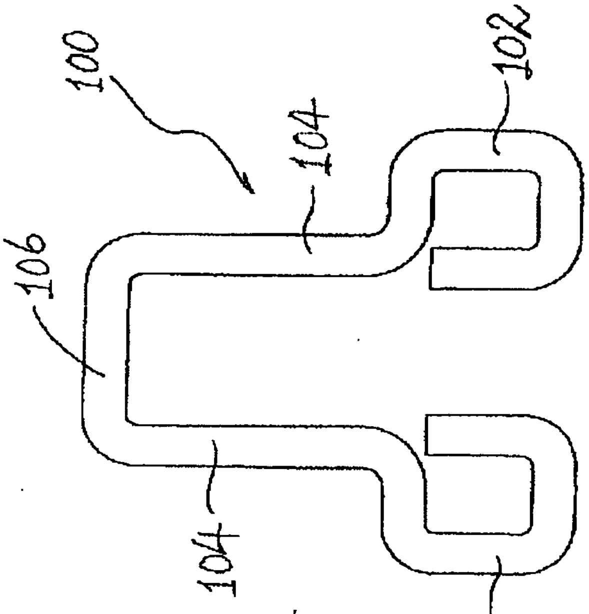

Fig 2

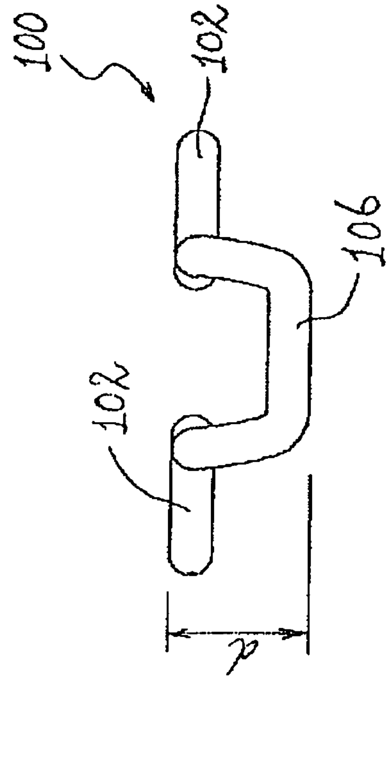

Fig 4

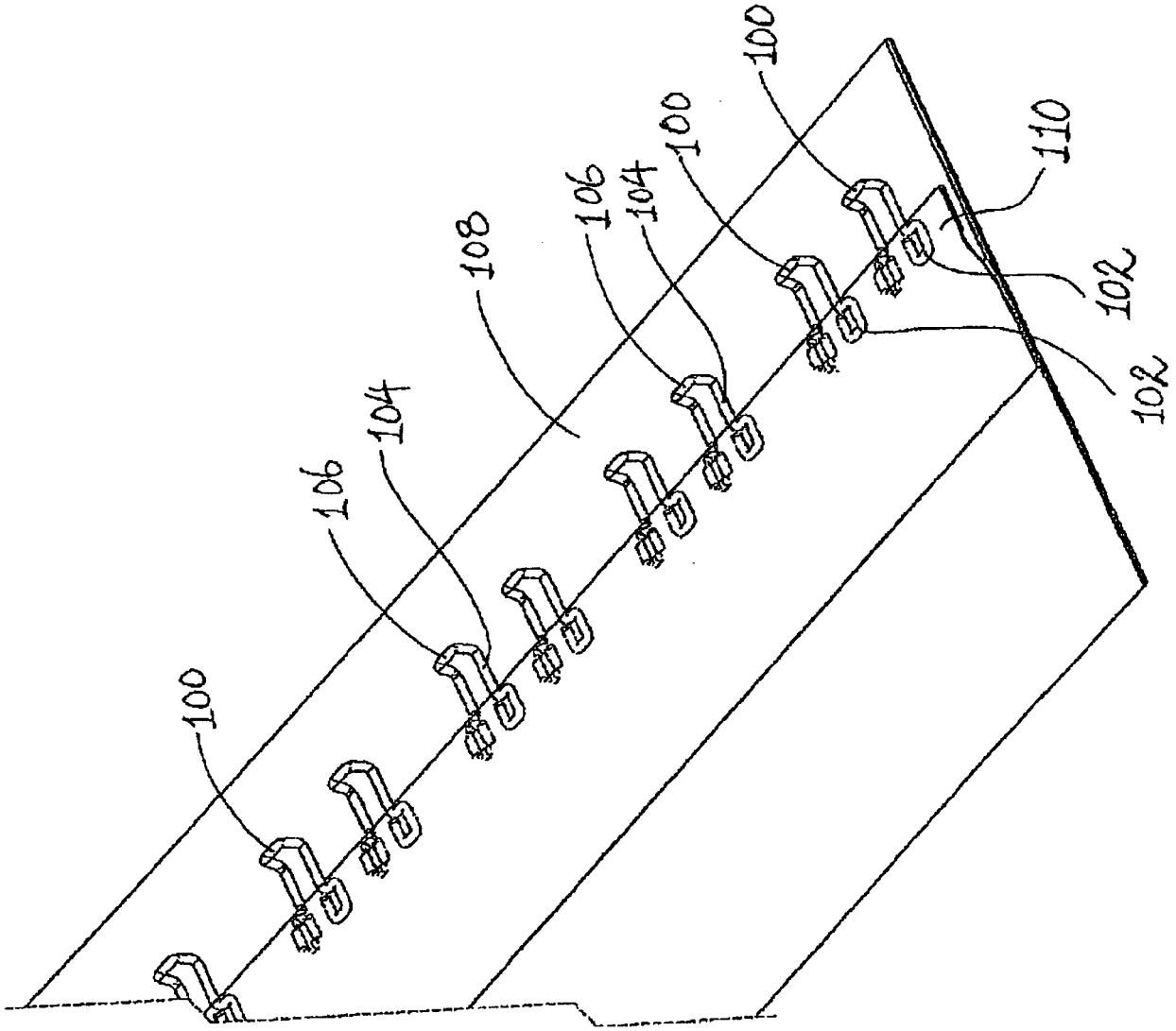

Fig. 5

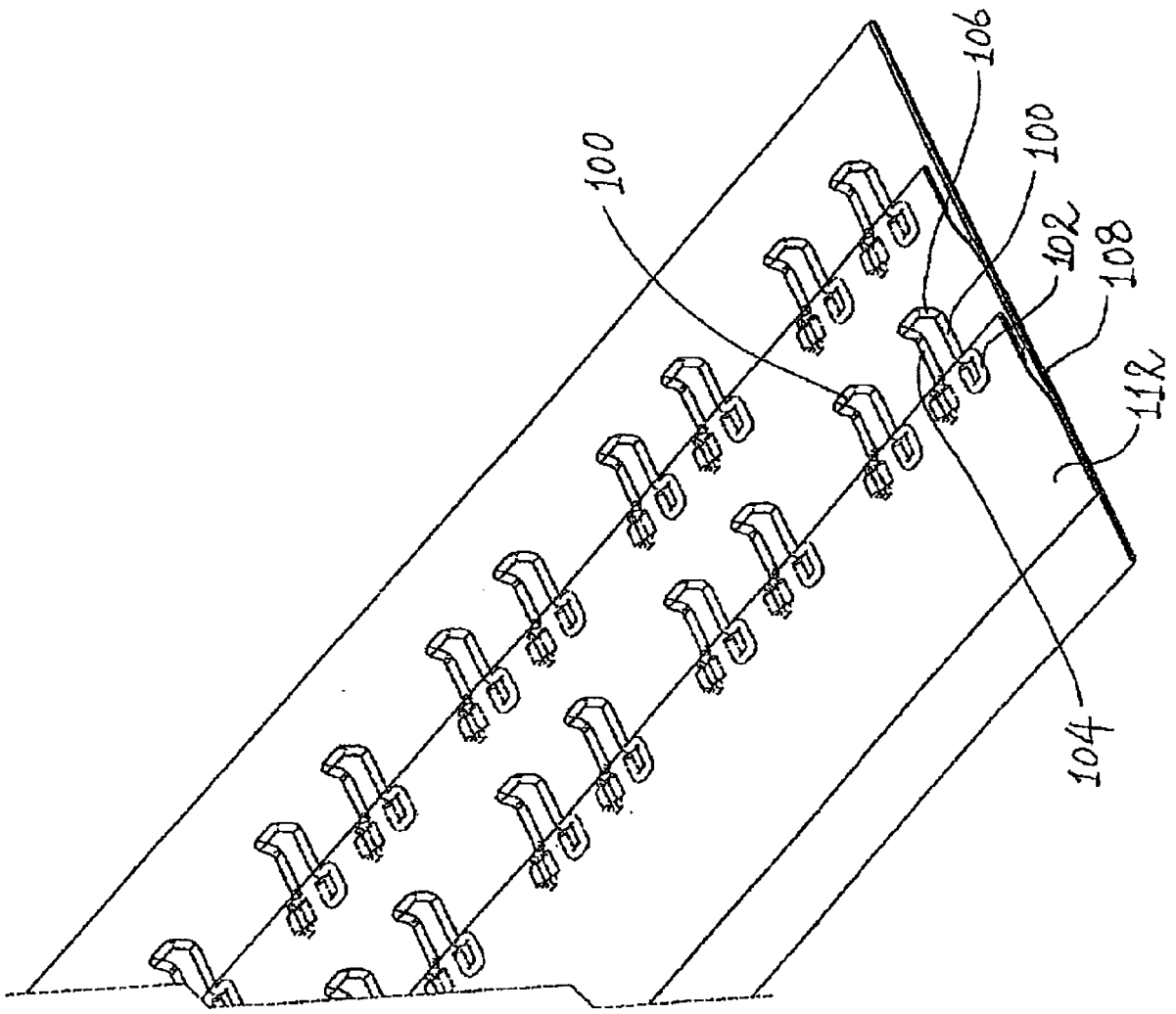

Fig. 6

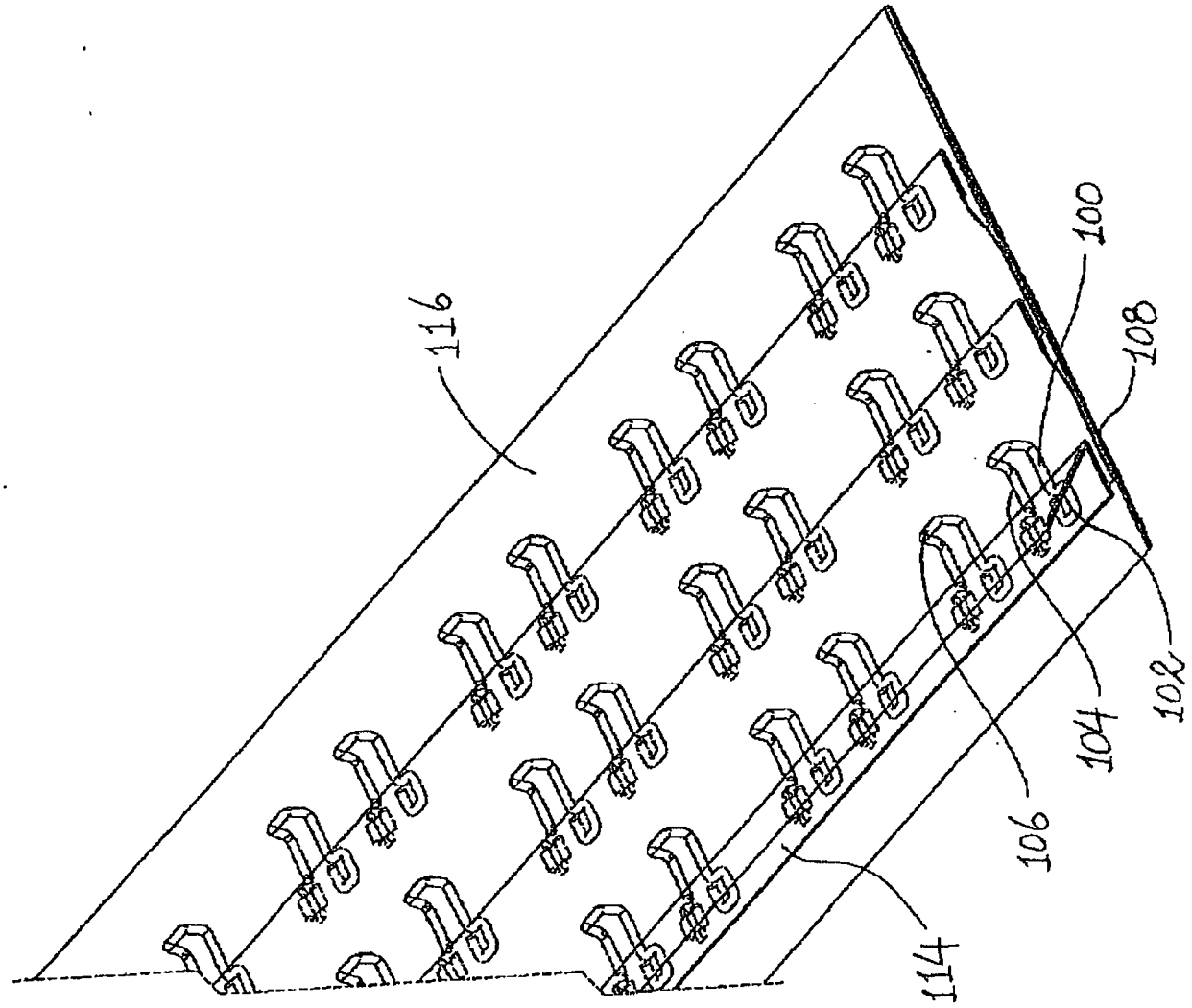

Fig. 7

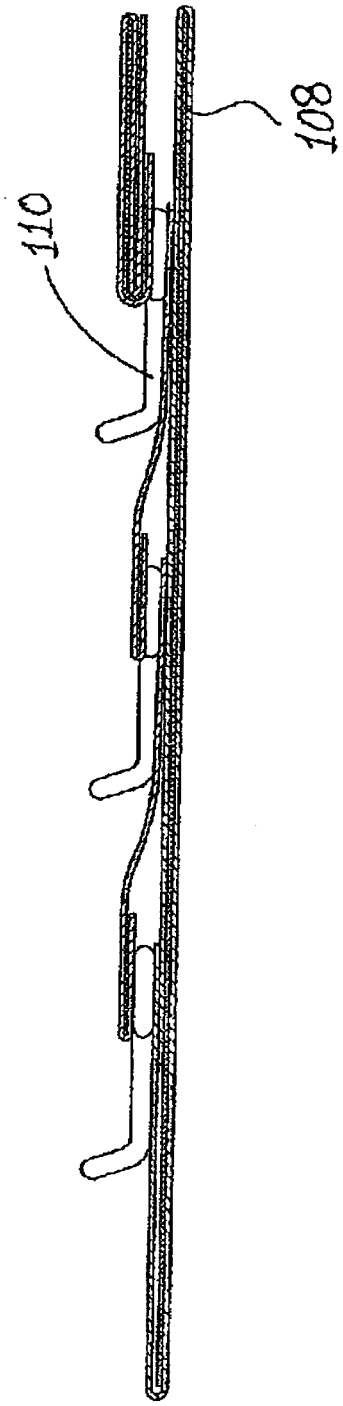

Fig 8

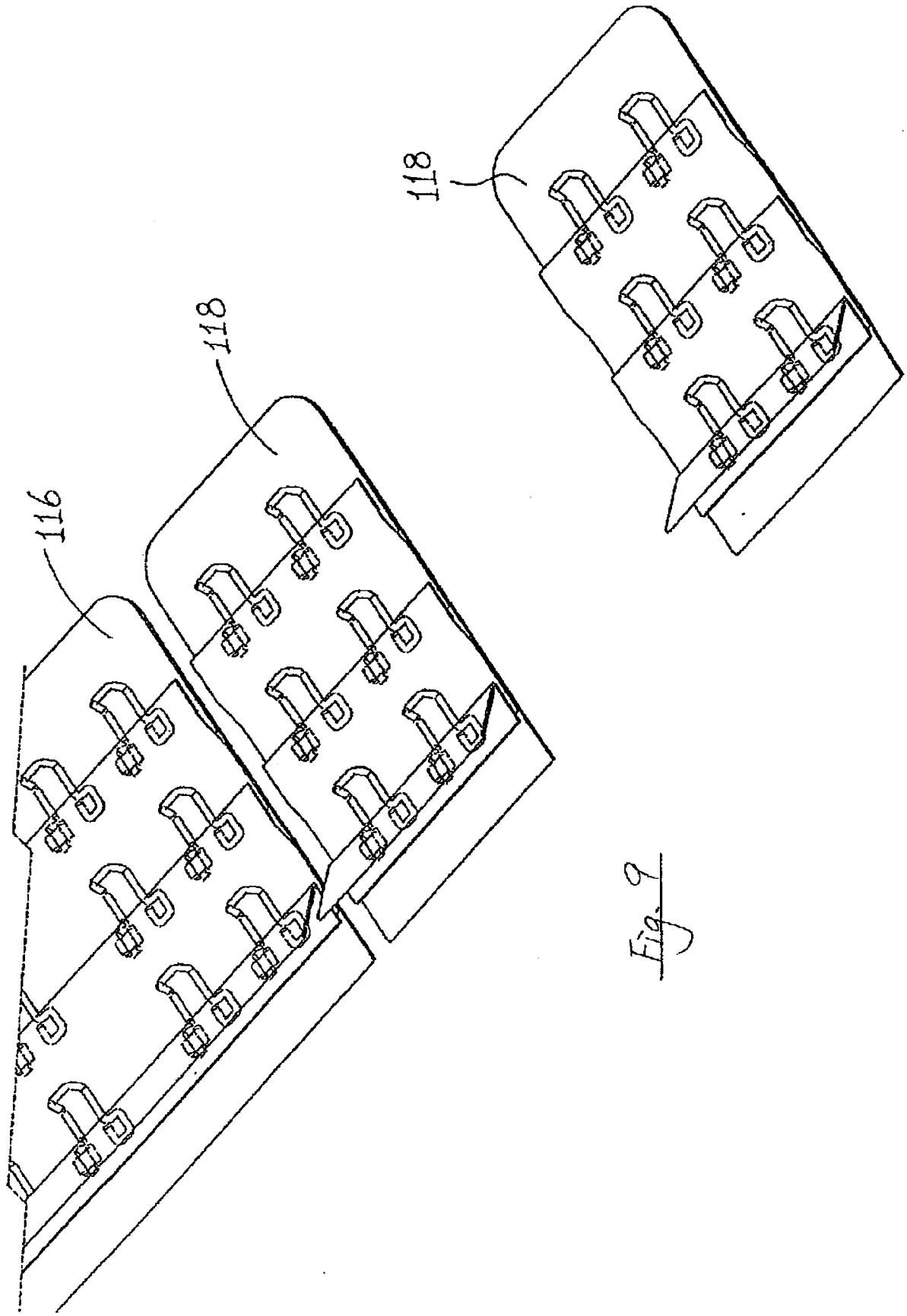

Fig. 9

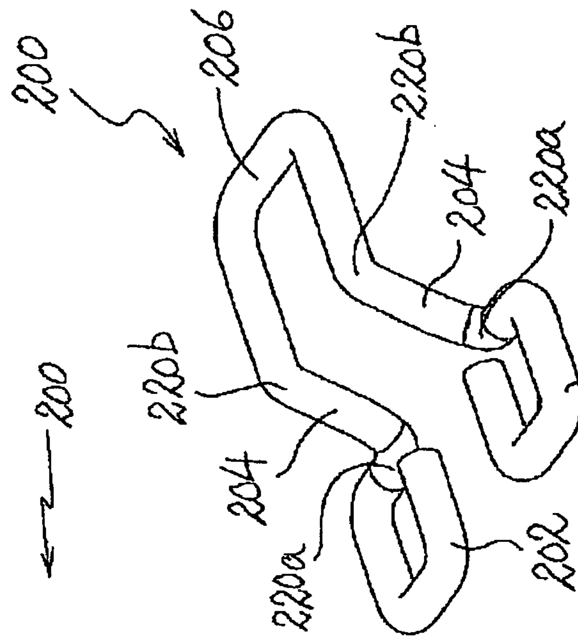

Fig. 10

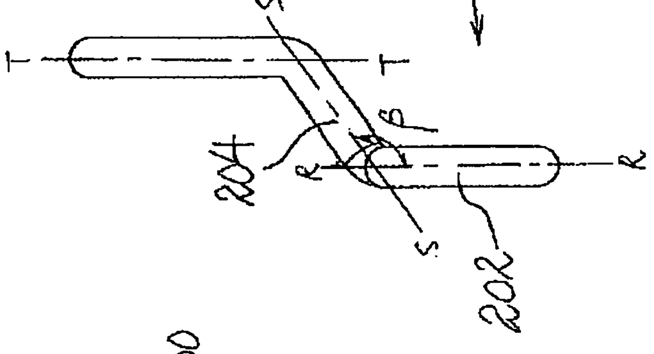

Fig. 12

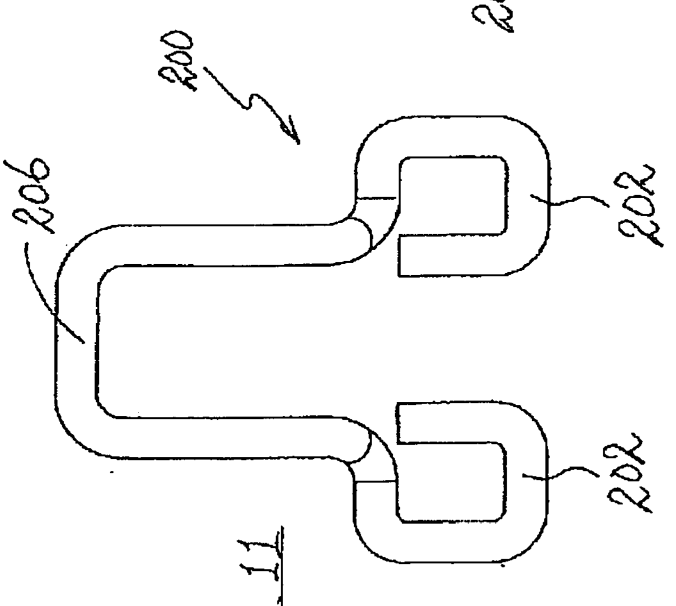

Fig. 11

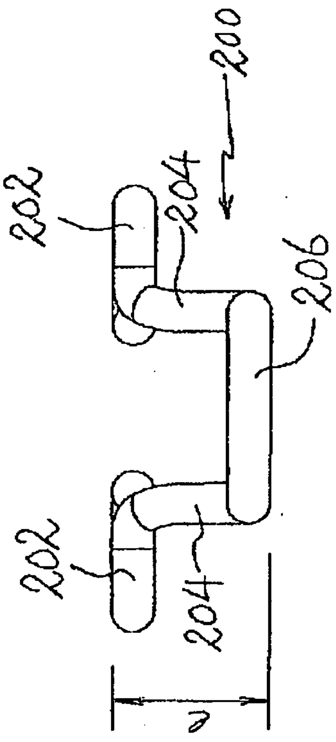

Fig. 13

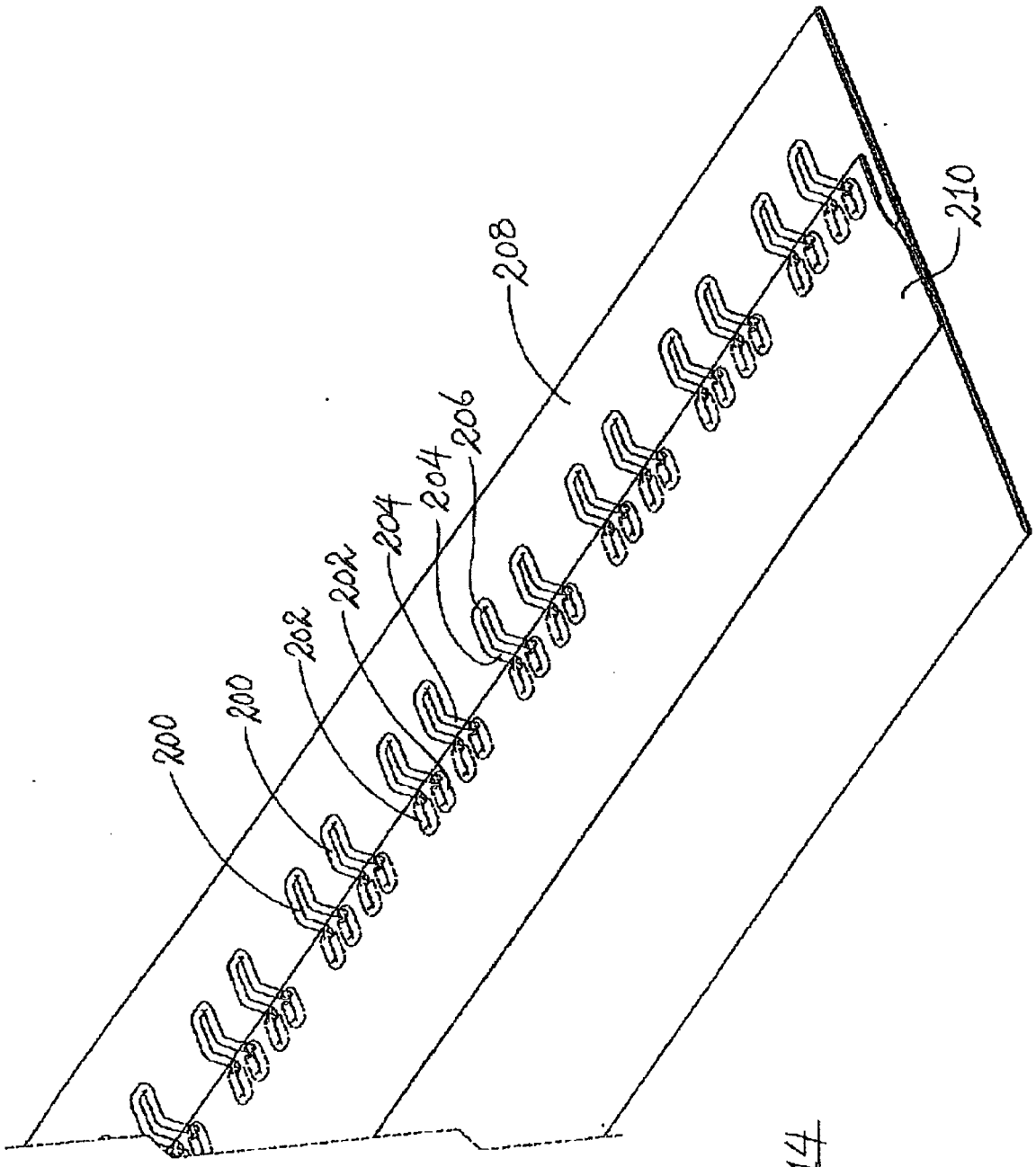

Fig 14

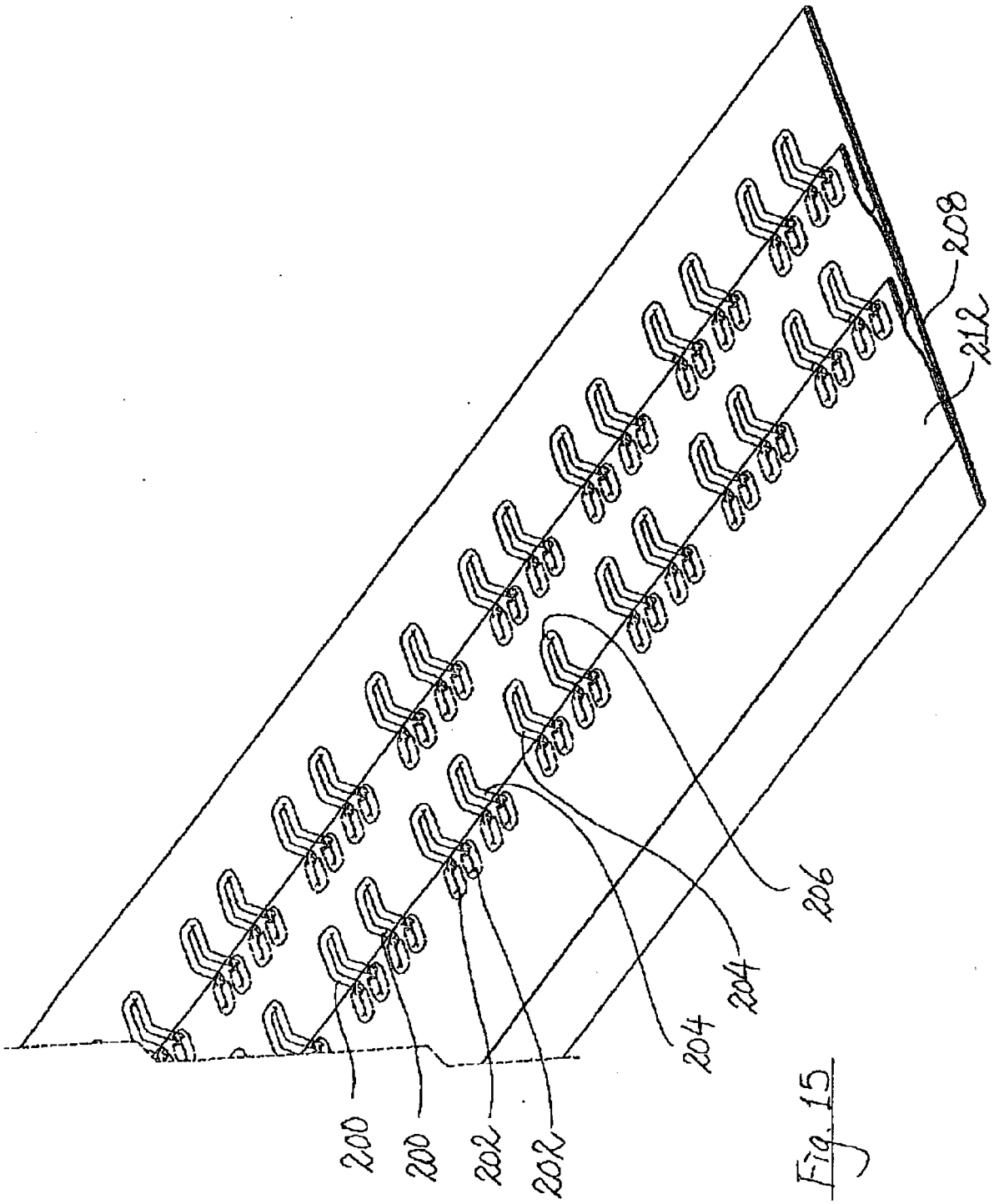

Fig. 15

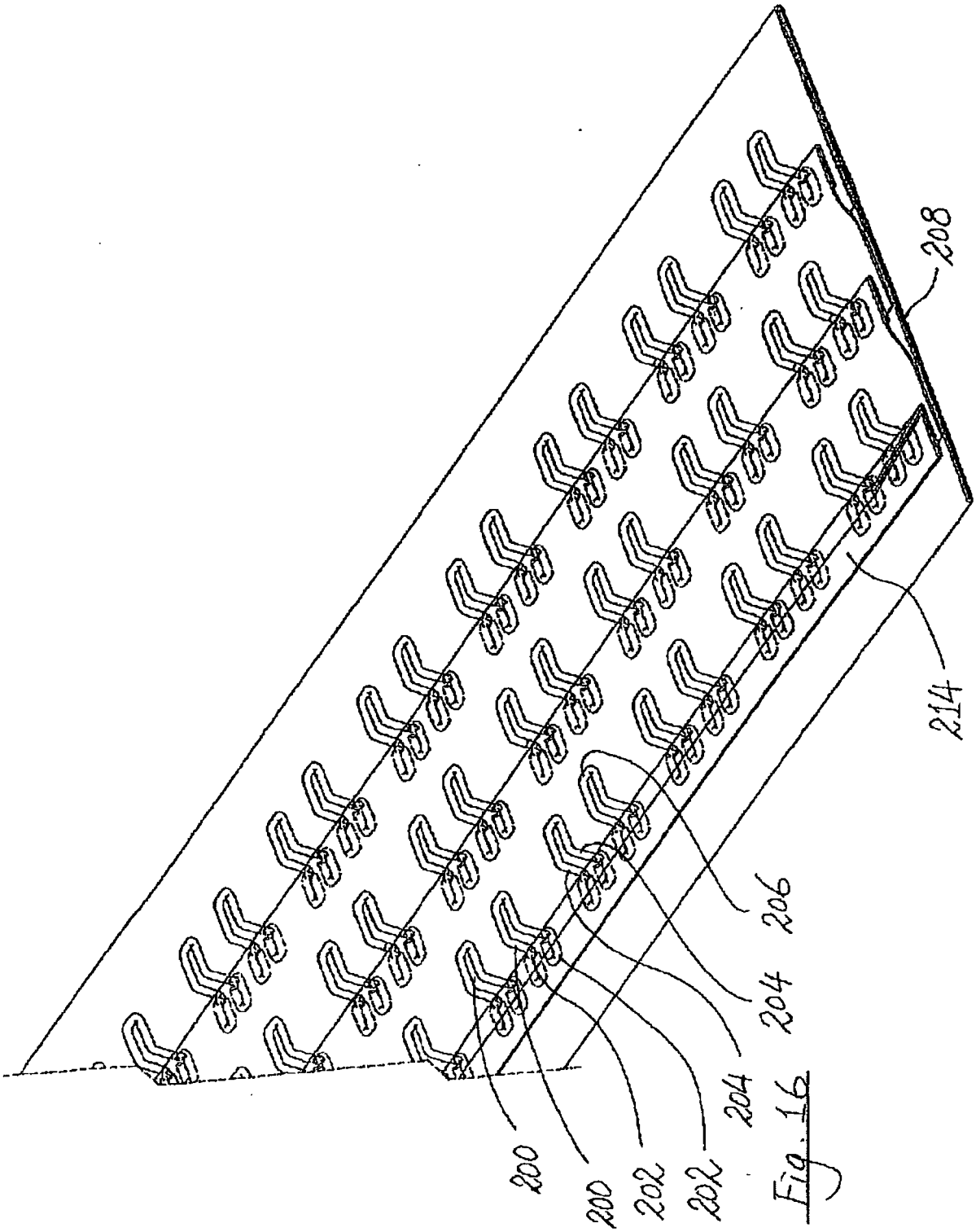

Fig. 16

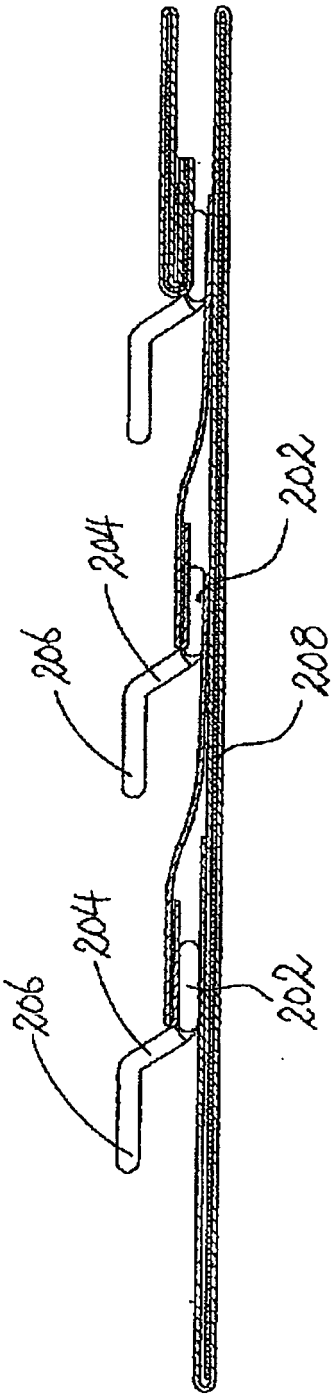

Fig. 17

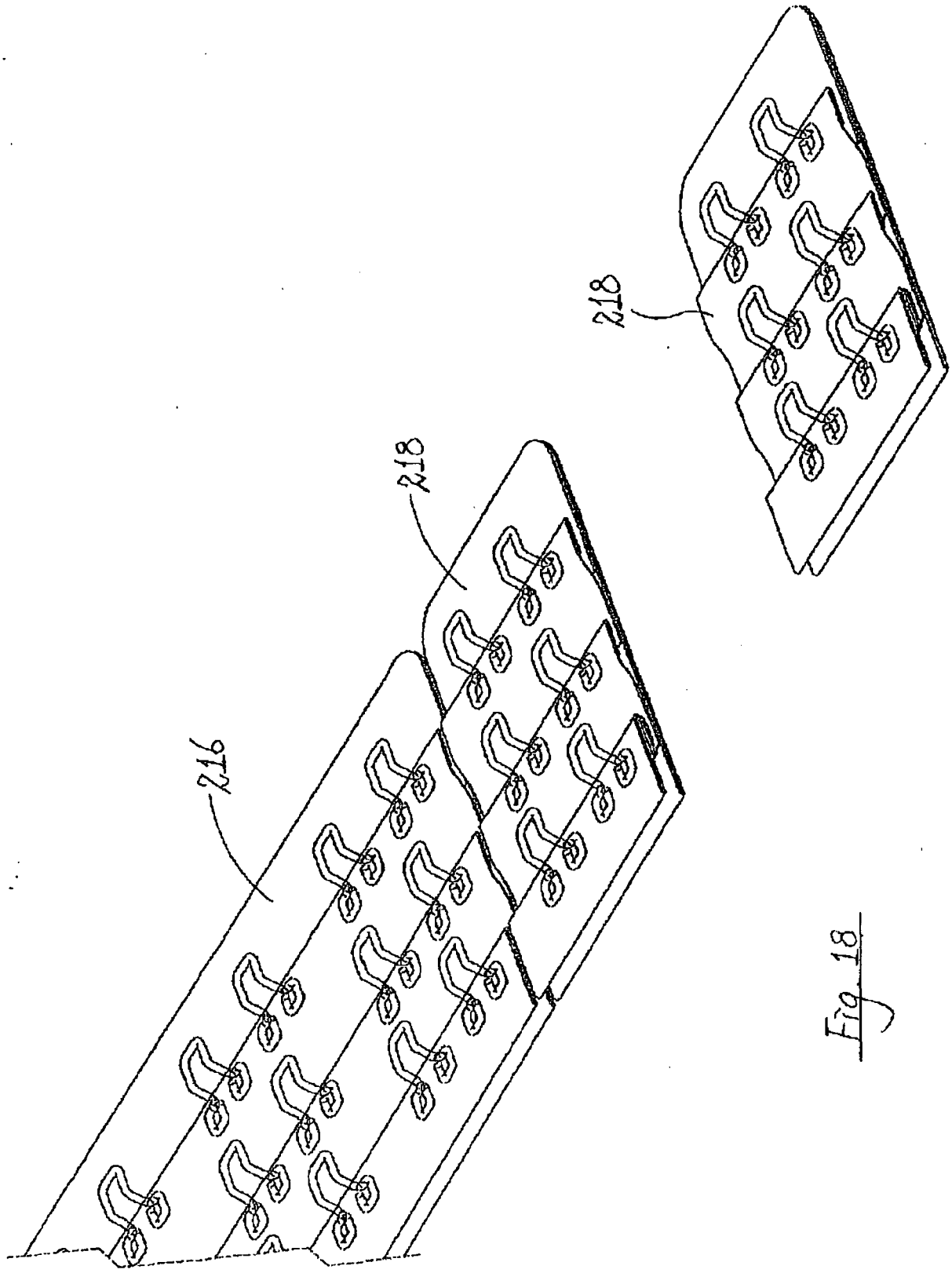

Fig. 18

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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