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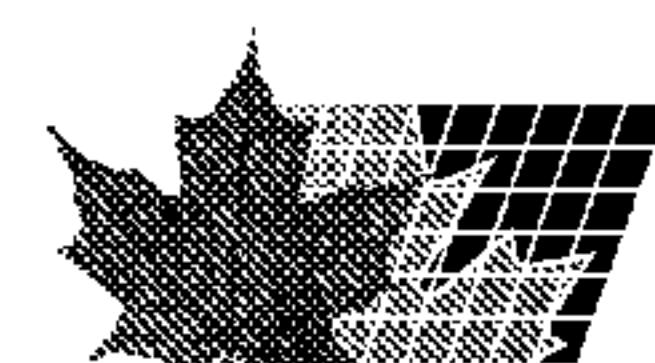
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(54) Titre : ELEMENT D'ANCRAGE DESTINE A DES COUPLAGES DE TUBES
(54) Title: ANCHORING ELEMENT FOR COUPLING TUBES

(57) **Abrégé/Abstract:**

The invention relates to an anchoring element (25) for coupling tubes which is used for non-positively connecting smoothly ended tubes and is provided with a housing and at least one sealing element made of a rubber-elastic material contained in the housing. The inventive anchoring element (25) has a L-shaped cross-section and is provided with a first leg (27) extending in an axial direction and a second leg (28) extending at an acute angle with respect to the first leg (27). In addition, said anchoring element (25) comprises slots (30) embodied in a longitudinal direction and extending on a transition between the legs (27, 28) until in the first leg (27).



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Abstract

The invention relates to an anchoring element (25) for
5 pipe couplings for frictional connection of smooth-
ended pipes, having a housing, and at least one sealing
element arranged therein and comprising rubber-elastic
material. The anchoring element (25) is substantially
L-shaped in cross-section and has a first limb (27)
10 extending in the axial direction and a second limb (28)
extending at an acute angle to the first limb and is
provided with slots (30) which run in the longitudinal
direction and extend beyond the transition between the
limbs (27, 28) into the first limb (27).

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(Fig. 6)

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Anchoring element for pipe couplings

The invention relates to anchoring elements for pipe couplings for frictional connection of smooth-ended pipes, having a housing, at least one sealing element arranged therein and comprising rubber-elastic material, the anchoring element being used for engaging at least one of the pipes to be connected, being formed substantially L-shaped in cross-section and having a first limb extending in the axial direction and a second limb extending at an acute angle to the first limb and the transition between the two limbs preferably being in the form of a radius, the second limb being provided at least partly with slots running in the longitudinal direction, and the slots extending beyond the transition or beyond the radius into the first limb.

Anchoring elements for pipe couplings transmit the forces acting as a result of internal pressure or from the outside on a pipeline between the individual pipes of the pipeline. These are primarily tensile or compressive forces. Depending on the loading of the pipe connections, however, transverse forces or torsional moments may also occur.

The production of the anchoring elements is very complicated since as a rule they have to be produced from spring steel and have to be cold-formed.

30

GB2 321 685 discloses anchoring elements which are formed substantially L-shaped in cross-section. The first limb extends approximately in the axial direction

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and a second limb at an acute angle thereto. The second limbs are provided with slots emanating from the free end. These slots give rise to individual teeth which can engage the surface of the pipes to be
5 connected. However, since the slots extend only over a part of the length of the second limbs, the flexibility of the teeth is relatively low.

In particular, in the case of ovalness of the pipes or
10 an unintentionally skew-mounted pipe coupling, the teeth cannot optimally engage the pipe.

It is the object of the invention to provide anchoring elements for pipe couplings, which anchoring elements
15 permit high flexibility and secure anchoring on the pipe.

According to the invention, this is achieved if the slots extend over the total width of the anchoring
20 element and have at least one web running substantially transversely to the slot. The slots extending beyond the transition or beyond the radius give rise to a multiplicity of individual teeth which are deformable virtually independently of one another. The entire
25 anchoring element is thus very flexible and can be produced and mounted in a simple manner. In addition, the flexibility or deflection of the individual teeth can be limited thereby.

30 The webs are advantageously elastically or plastically deformable and can, for example, be compressed or extended. By the deformation of the webs, the entire anchoring element is also radially deformable.

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To ensure that the limbs are dimensionally stable, it is expedient for them to have profiles in cross-section at least over a part of their length. Such profiles
5 may be in the form of ribs or continuous beads.

The first limbs are advantageously at least partly curved in the axial direction towards the pipe axis. As a result of this curvature, the free end of the
10 first limbs is directed radially outwards. These ends can thus come into contact with the inside of the housing or can engage therewith by friction. Thus, for example, undesired relative rotations between the anchoring element and the housing can be avoided.

15 An improvement of the contact between the anchoring element and the housing is advantageously achieved if the free ends of the first limb are provided with knobs or claws projecting radially outwards. Such knobs or
20 claws result in point-like contacts and thus relatively high contact pressures per unit area. This in turn leads to a good frictional connection.

Known pipe couplings generally have two anchoring
25 elements arranged as a rule symmetrically to one another. The force transmission is therefore effected via the housing. In an expedient solution, two elements which are arranged axially a distance apart, are directed opposite to one another and are L-shaped
30 in cross-section are connected integrally to one another via the first limbs extending in the axial direction. The axial force is no longer transmitted via the housing but directly in the anchoring element

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itself.

For flexibility in the production and the mounting of the anchoring element, the slots advantageously extend
5 over the entire width of the anchoring element. The anchoring element blank can therefore be produced continuously as a product sold by the metre and cut to the length corresponding to the circumference of the respective pipe coupling.

10

For the stability of the anchoring element, at least two webs arranged distributed over the length of the slots are expediently provided per slot. By means of two webs, the width of the slots is defined and the
15 stability of the anchoring element ensured.

3 webs arranged distributed uniformly over the length are advantageously provided at each slot. Thus, one web is present in the middle and the other two webs can
20 be arranged further outwards or inwards at the slots, depending on requirements.

The anchoring element is expediently substantially in the form of a slotted sleeve, one end being provided in
25 the region of the longitudinal slot with a tongue gripping over or under the other end. The tongue permits adaptation of the pipe coupling to different external pipe diameters and prevents the formation of an open slot through which the sealing element can be
30 pressed outwards.

When viewed in the circumferential direction, the tongue is advantageously curved. Consequently, the

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tongue can slide readily over or under the opposite end of the longitudinal slot.

5 The anchoring element according to the invention is expediently produced by first cutting out or stamping a contour, then applying any profiling, bending over the second limbs and then rounding the anchoring element.

10 The invention is to be explained in more detail below with reference to drawings which reproduce it by way of example.

Fig. 1 shows a pipe coupling having two anchoring elements according to the invention, shown in longitudinal section;
15

Fig. 2 shows an anchoring element of the pipe coupling shown in Fig. 1, in perspective view;

20 Fig. 3 shows a longitudinal section through a variant of the anchoring element shown in Fig. 1 and 2;

Fig. 4 shows a further variant of the anchoring element, in longitudinal section;
25

Fig. 5 shows a pipe coupling of an anchoring element according to the invention, shown in longitudinal section;

30 Fig. 6 shows an anchoring element according to Fig. 5, in perspective view.

The list of reference numerals is part of the

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disclosure.

The pipe coupling shown in Fig. 1 serves for connecting two smooth-ended pipes 1 and 2. The pipe coupling is mounted over the abutment point between the two pipes 1, 2. The pipe coupling consists of a housing 3 which is C-shaped in longitudinal section and a sealing element 4 arranged therein and likewise approximately C-shaped. The sealing element 4 consists of a rubber-elastic material which must be resistant to the pipe medium. Two anchoring elements 5, 6 are arranged between the sealing element 4 and the housing 3. The anchoring elements 5, 6 have, in longitudinal sectional, a first limb 7 extending in the axial direction and a second limb 8 extending at an acute angle to the first limb 7. The transition between the limbs 7, 8 is in the form of radius 9.

The anchoring elements 5, 6 serve for transmitting the axial forces and are supported in the axial direction on the lateral flanks on the housing 3. As shown in particular in Fig. 2, the anchoring elements 5, 6 are provided with slots 10 running in the longitudinal direction. These slots 10 extend from the second limb 8 beyond the radius 9 into the first limb 7 and provide high flexibility of the anchoring elements 5, 6. The anchoring elements 5, 6 thus consist of a multiplicity of tooth segments connected to one another. In order to obtain a certain dimensional stability of the anchoring elements 5, 6, deformable webs 11 are present in the region of the slots 10. These webs 10 can, if required, be compressed or extended and permit adaptation of the diameter to the pipes 1, 2 to be

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connected.

Fig. 3 shows a variant of an anchoring element 13 which has a first limb 14 and a second limb 15. The free end of the first limb 14 is provided with knobs 16. Instead of knobs 16, it is also possible to provide sharp claws. These knobs 16 or claws form a point-like contact or an engagement on the inside of the housing 3 and thus substantially prevent an unintended relative rotation between these two parts.

The anchoring element 17 shown in Fig. 4 has, in the longitudinal section, a first limb 18 and a second limb 19 connected thereto. The first limb 18 is provided with a curvature 29 towards the pipe axis. This curvature 20 has an effect similar to the knobs 20 in the embodiment shown in Fig. 3. On tensioning of the pipe coupling, the second limb 19 is moved in the clockwise direction. As a result of the point-like contact in the region of the transition between the two limbs 18, 19, the free end of the first limb 18 is also pressed outwards against the wall of the housing.

The embodiment shown in Fig. 5 for a pipe coupling for connecting two pipes 21, 22 likewise has a housing 23 and a sealing element 24 arranged therein. In contrast to the embodiments shown in Fig. 1 to 4, however only a single anchoring element 25 is provided. In principle this embodiment is formed by connecting two anchoring elements according to Fig. 1 to 4 integrally to one another. This has the advantage that the force transmission takes place within the anchoring element itself and the housing is therefore relieved. This

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permits the use of housings having a smaller wall thickness and hence a considerable saving of materials.

Fig. 6 clearly shows the sleeve-like, longitudinally
5 slotted formation of the anchoring element 25 having a
tongue 26 which bridges the longitudinal slot 32. The
tongue 26 can grip over or under the opposite side of
the longitudinal slot 32. This overlap makes it
impossible for the sealing element 24 to be pressed out
10 radially in the region of the longitudinal slot 32 by
the internal pressure. It is also clearly evident that
slots 30 arranged distributed over the total
circumference and running in the axial direction extend
substantially over the total width. Deformable webs 31
15 which produce the connection between the individual
first limbs 27 are arranged in the region of the slots
30. On tensioning of the pipe coupling, the webs 31
may be compressed or extended.

20 Fig. 7 shows the extended blank of an anchoring element
25 according to Fig. 5 and 6. This blank can be
produced, for example, by a continuous stamping
process. As a result of the slots 30 running between
the limbs 27, 28, the resulting strip is very flexible
and can be easily rolled up as a product sold by the
25 metre with deformation of the webs 31. For fabrication
of the anchoring elements, the length corresponding to
the circumference is then cut off the strip.

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List of reference numerals

1, 2	Pipe
3	Housing
4	Sealing element
5	Anchoring element (L-shaped)
6	Anchoring element (L-shaped)
7	First limb
8	Second limb
9	Radius
10	Slot
11	Web
12	Profile
13	Anchoring element (L-shaped)
14	First limb
15	Second limb
16	Knobs
17	Anchoring element (L-shaped)
18	First limb
19	Second limb
20	Curvature
21, 22	Pipe
23	Housing
24	Sealing element
25	Anchoring element (C-shaped)
26	Tongue
27	First limb
28	Second limb
29	Radius
30	Slot
31	Web

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Longitudinal slot

Patent claims

1. Anchoring element for pipe couplings for
5 frictional connection of smooth-ended pipes,
having a housing, at least one sealing element (4,
24), arranged therein and comprising rubber-
elastic material, the anchoring element being used
for engaging at least one of the pipes (1, 2, 21,
10 22) to be connected, being formed substantially L-
shaped in cross-section and having a first limb
(7, 14, 18, 27) extending in the axial direction
and a second limb (8, 15, 19, 28) extending at an
acute angle to the first limb, and the transition
15 between the two limbs preferably being in the form
of a radius (9, 29), the second limb (8, 15, 19,
28) being provided at least partly with slots (10,
30) running in the longitudinal direction, and the
slots (10, 30) extending beyond the transition or
20 beyond the radius (9, 29) into the first limb,
characterized in that the slots (10, 30) extend
over the total width of the anchoring element (5,
6, 25) and have at least one elastically or
plastically deformable web (11, 31) running
25 substantially transversely to the slot.
2. Anchoring element according to Claim 1,
characterized in that the limbs (7, 8, 14, 15, 18,
19, 27, 28) have, in cross-section, profiles (12)
30 at least over a part of the length.
3. Anchoring element according to Claim 1 or 2,
characterized in that the first limbs (7, 14, 18

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or 27) are at least partly curved in their axial direction towards the pipe axis.

4. Anchoring element according to any of the preceding Claims, characterized in that the free ends of the first limb (14) are provided with knobs (16) or claws projecting radially outwards.
5. Anchoring element according to any of the preceding Claims, characterized in that two anchoring elements (25) arranged axially a distance apart, directed towards one another and L-shaped in cross-section are integrally connected to one another via the first limbs (27) extending in the axial direction and/or the L-shaped anchoring elements (25) are substantially C-shaped overall in cross-section.
6. Anchoring element according to Claim 5, characterized in that the slots (30) extend over the total width of the anchoring element (25).
7. Anchoring element according to Claim 5 or 6, characterized in that at least two webs (31) arranged distributed over the length of the slots (30) are provided per slot (30).
8. Anchoring element according to Claim 9, characterized in that three webs (31) arranged distributed uniformly over the length are provided at each slot (30).
9. Anchoring element according to any of Claims 5 to

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8, characterized in that it is substantially in the form of a slotted sleeve, one end being provided in the region of the longitudinal slot (32) with a tongue (26) gripping over or under the other end.

10. Anchoring element according to Claim 9, characterized in that, when viewed in the circumferential direction, the tongue (26) is curved.

11. Method for the production of an anchoring element according to any of the preceding Claims, characterized in that first the contour is cut out or stamped, any profile is then applied, the second limbs are bent over and then the anchoring element is rounded.

Application number / numéro de demande: IB 06/50807

Figures: 1, 2, 5, 6

Pages: _____

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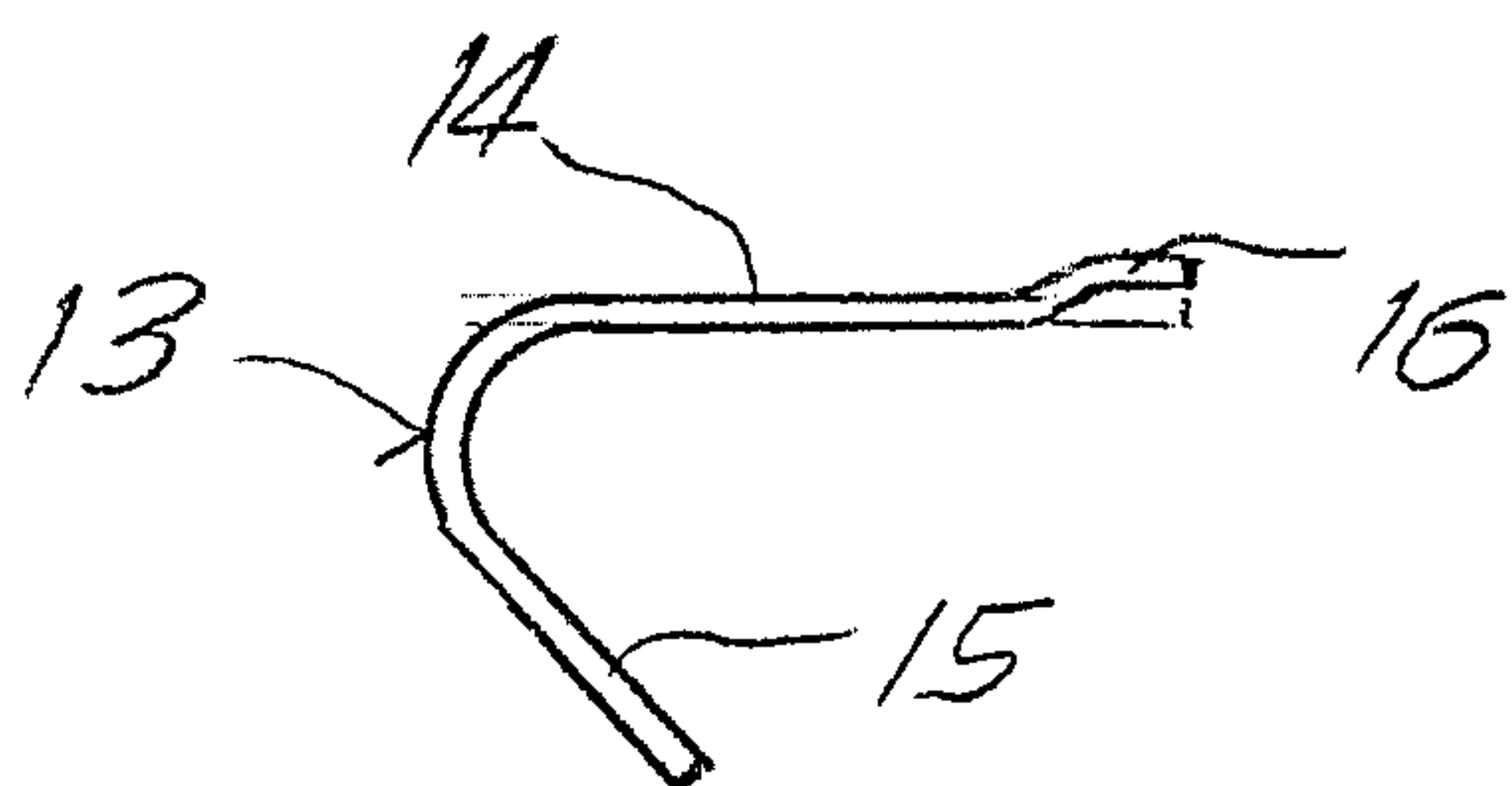


Fig. 3

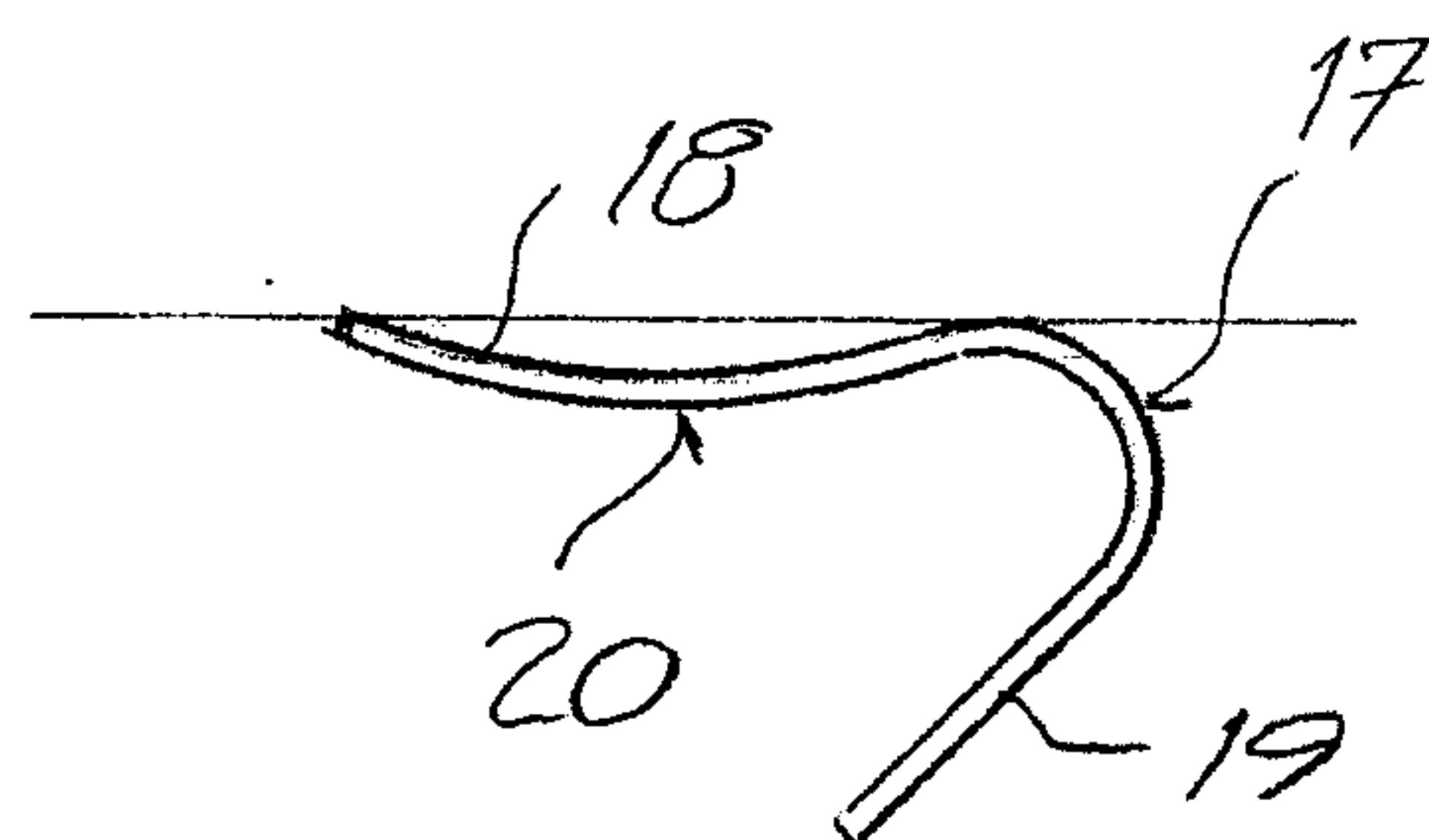


Fig. 4

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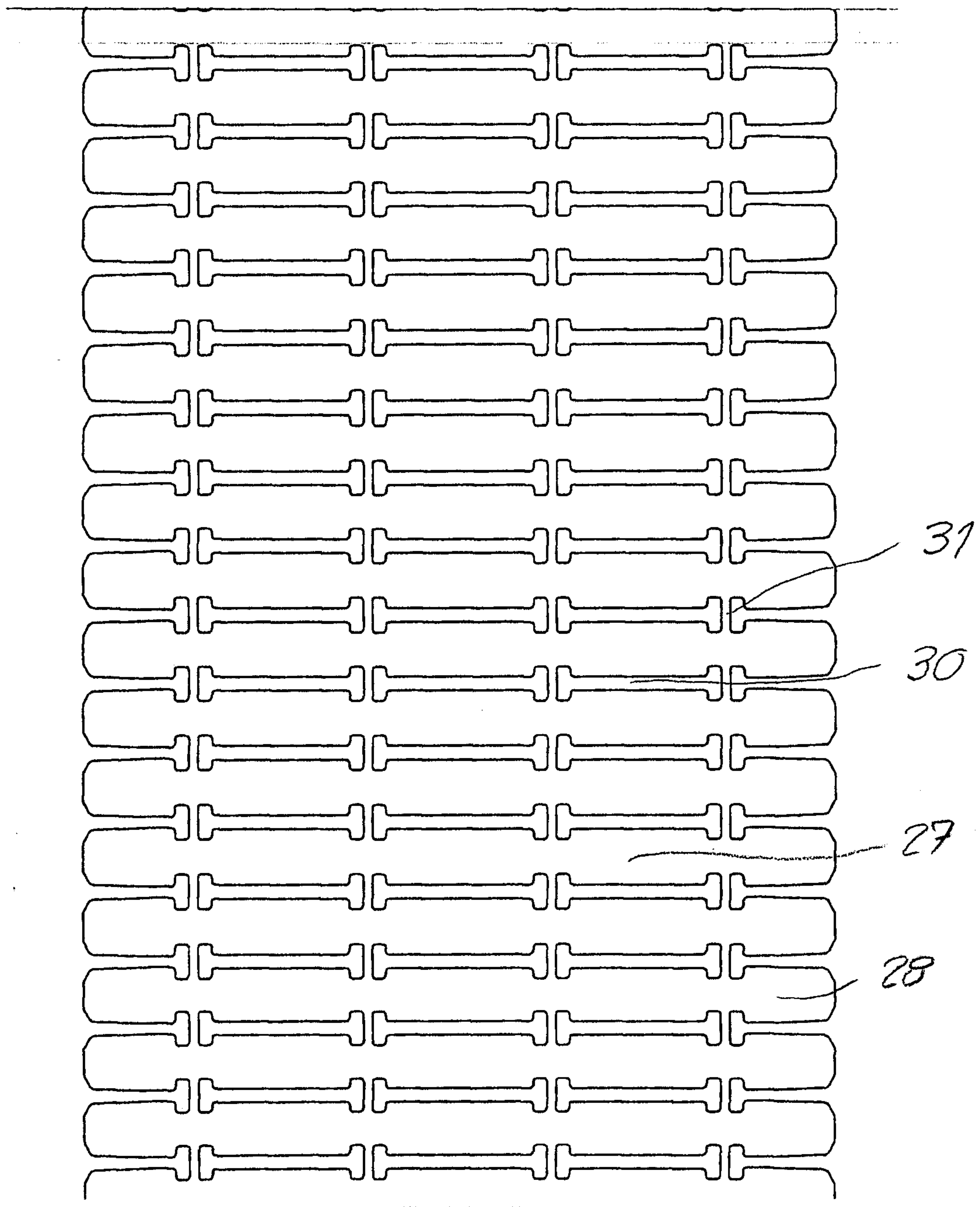


Fig. 7