(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 052 639 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
29.04.2009 Bulletin 2009/18

(51) Int Cl.:
A44B 19/02 *(2006.01)* ***A44B 19/42*** *(2006.01)*

(21) Application number: **07254217.8**

(22) Date of filing: **24.10.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

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(54) Zipper

(57) A zipper includes male female teeth elements 2, 3 each having a split tube-like base 22, 33 fastened to a cylindrical flange 11 at one side of a first zipper tape 1 and a hollow receiving portion 32 extending from the periphery of the respective split tube-like base 33 and provided with a hook hole 31 at an outer side, female teeth elements 3 each having a split tube-like base 33 fastened to the cylindrical flange 11 of a second zipper tape 1 and a hook strip 21 extending from the periphery of the respective split tube-like base 22, and a slider body 4 with a guide groove 41 for guiding the hook strips 21 of the male teeth elements 2 into and out of the hook holes 31 of the hollow receiving portions 32 of the female teeth elements 3 accurately without deviation.

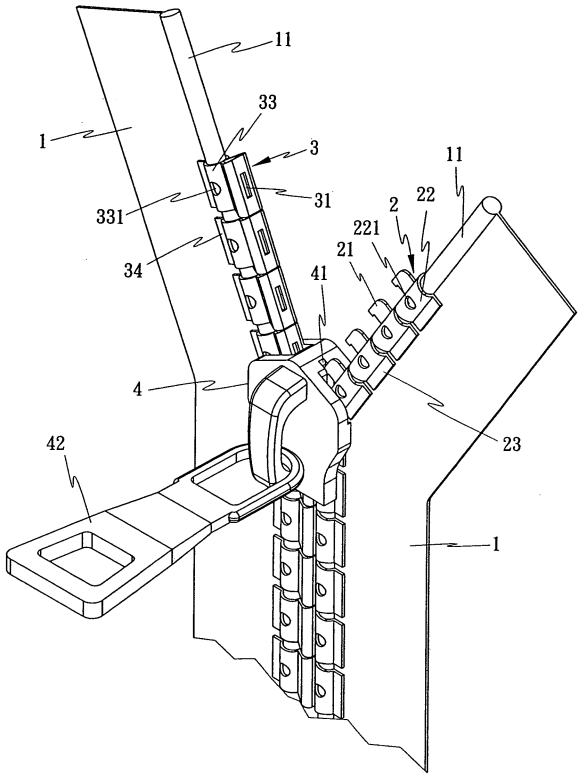

FIG. 2

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Description

[0001] The present invention relates to zippers and more particularly, to a metal zipper, which uses a guide groove in a slider body to guide hook strips of male teeth elements in and out of respective hook holes of female teeth elements, thereby closing or opening the zipper tapes.

[0002] A conventional zipper is generally comprised of two zipper tapes, a male teeth chain, a female teeth chain, a slider body, two pins, a top stop, and a bottom stop. When pulling the slider body, the male and female teeth chains are engaged together to close the zipper tapes or disengaged from each other to open the zipper tapes. The male and female teeth chains may be made of metal, plastics, nylon, or any of a variety of other materials. Further, a zipper can be made in any of a variety of forms, such as close end, open end, X type, or O type.

[0003] Despite how the material is, the male and female teeth chains of a conventional zipper are respectively comprised of a series of male tooth and a series of female tooth and driven by the slider body into the engaged position or disengaged position. Exemplars are seen in US PAT Nos. 7,036,191; 6,588,072; 4,099,301; 3,872,551; 1,934,084. Other conventional metal, resin, or nylon zippers have similar male and female teeth chain structures.

[0004] The present invention has been accomplished under the circumstances in view. According to one aspect of the present invention, the zipper is comprised of two zipper tapes, a series of male teeth elements provided at one zipper tape, a series of female teeth elements provided at the other zipper tape, and a slider body movable over the male teeth elements and the female teeth elements to lock the male teeth elements and the female teeth elements or to unlock the male teeth elements from the female teeth elements. The female teeth elements each have a receiving portion and a hook hole on the outer side of the receiving portion. The male teeth elements each have a hook strip guided by the slider body into and out of the hook holes of the female teeth elements.

[0005] According to another aspect of the present invention, the slider body has a guide groove on the inside for guiding the hook strips of the male teeth elements into and out of the hook holes of the receiving portions of the female teeth elements accurately without deviation when the slider body is moved over the male and female teeth elements.

[0006] According to still another aspect of the present invention, the male teeth elements and the female teeth elements can be independent elements separately fastened to the zipper tapes. Alternatively, the male teeth elements can be made in integrity and then affixed to one zipper tape, and the female teeth elements can be made in integrity and affixed to the other zipper tape.

[0007] According to still another aspect of the present invention, the male teeth elements and the female teeth elements can be made of a metal material so that the zipper cause a sense of ancient style beauty.

[0008] According to still another aspect of the present invention, the split tube-like bases of the female teeth elements cover the periphery of the cylindrical flange of the associating zipper tape such that the receiving portions of the female teeth elements are kept in an enclosed status relative to the cylindrical flange of the associating zipper tape.

[0009] According to still another aspect of the present invention, the clamping strips and/or split tube-like bases of the male teeth elements and female teeth elements have spurs for engaging into the zipper tapes to secure the respective male teeth elements and female teeth elements firmly to the respective zipper tapes.

FIG. 1 is an exploded view of a zipper in accordance with the present invention.

FIG. 2 is an elevational assembly view of the zipper in accordance with the present invention.

FIG. 3 is a cross sectional view of the zipper according to the present invention, showing the closed status of the zipper.

FIG. 4 is a schematic drawing of the present invention, showing one male teeth element and one female teeth element engaged together.

FIG. 5 is an elevational view of one male teeth element according to the present invention.

FIG. 6 is an elevational view, partially cutaway, of the zipper according to the present invention.

FIG. 7 is a schematic drawing of the present invention, showing the hook strip of one male teeth element guided into the guide groove of the slider body.

FIG. 8 illustrates the present invention made in the form of a close end zipper.

FIG. 9 illustrates the present invention made in the form of an open end zipper.

FIG. 10 is an elevational view of a part of an alternate form of the zipper in accordance with the present invention, showing the male teeth elements and the female teeth elements in a single piece form.

FIG. 11 is an elevational view of the zipper according to the embodiment of FIG. 10.

FIG. 12 is a cross sectional view in an enlarged scale of a part of the zipper of the embodiment shown in FIG. 11.

FIG. 13 is an extended out view of one male teeth element for zipper according to another alternate form of the present invention.

FIG. 14 is an extended out view of one female teeth element for zipper according to another alternate form of the present invention.

FIG. 15 is a schematic sectional view showing installation of the male teeth element of FIG. 13 in one zipper tape (I).

FIG. 16 is a schematic sectional view showing installation of the male teeth element of FIG. 13 in one zipper tape (II).

FIG. 17 is a schematic sectional view showing installation of the female teeth element of FIG. 14 in one zipper tape (I).

FIG. 18 is a schematic sectional view showing installation of the female teeth element of FIG. 14 in one zipper tape (II).

FIG. 19 is an extended out view of one male teeth element for zipper according to still another alternate form of the present invention.

FIG. 20 is an extended out view of one female teeth element for zipper according to still another alternate form of the present invention.

FIG. 21 is a schematic sectional view showing installation of the male teeth element of FIG. 19 in one zipper tape (I).

FIG. 22 is a schematic sectional view showing installation of the male teeth element of FIG. 19 in one zipper tape (II).

FIG. 23 is a schematic sectional view showing installation of the female teeth element of FIG. 20 in one zipper tape (I).

FIG. 24 is a schematic sectional view showing installation of the female teeth element of FIG. 20 in one zipper tape (II).

[0010] Referring to FIGS. 1 and 2, a zipper in accordance with the present invention is shown comprised of two zipper tapes 1, male teeth elements 2, female teeth elements 3, and a slider body 4.

[0011] Similar to the conventional designs, the zipper tapes 1 each have a cylindrical flange 11 extending along the length at one side.

[0012] Referring to FIG. 5 and FIGS. 1 and 2 again, the male teeth elements 2 are arranged in series along one side of one zipper tape 1, each comprising a split tube-like base 22 fastened to the cylindrical flange 11 of the associating zipper tape 1, a hook strip 21 perpendicularly extending from the periphery of the split tube-like base 22, and two clamping strips 23 extending from the split tube-like base 22 and clamped on the top and bottom surface of the associating zipper tape 1 to secure the split tube-like base 22 to the cylindrical flange 11 of the associating zipper tape 1 firmly. The split tube-like base 22 can be made having a hole 221 at one side or each of two opposite sides to enhance engagement between the split tube-like base 22 and the cylindrical flange 11 of the associating zipper tape 1. The hook strip 21 has a bend portion 211 extending from the periphery of the split tube-like base 22, and a hook portion 212 extending from one end of the bend portion 211 remote from the split tube-like base 22.

[0013] The female teeth elements 3 are arranged in series along one side of the other zipper tape 1 to match the male teeth elements 2, each comprising a split tube-like base 33 fastened to the cylindrical flange 11 of the associating zipper tape 1, a hollow receiving portion 32 protruded from the periphery of the split tube-like base 33 at one side, a hook hole 31 on the outer side of the hollow retaining portion 32, and two clamping strips 34 extending from the split tube-like base 33 and clamped on the top and bottom surface of the associating zipper tape 1 to secure the split tube-like base 33 to the cylindrical flange 11 of the associating zipper tape 1 firmly (the clamping strips 23 or 34 of the male teeth elements 2 or female teeth elements 3 may be eliminated). The split tube-like base 33 can be made having a hole 331 at one side or each of two opposite sides to enhance engagement between the split tube-like base 33 and the cylindrical flange 11 of the associating zipper tape 1.

[0014] The slider body 4 is movable over the male teeth elements 2 and the female teeth elements 3 to force the male teeth elements 2 into engagement with the female teeth elements 3 or to separate the male teeth elements 2 from the female teeth elements 3, having a guide groove 41 (see FIG. 2) for guiding the hook strip 21 of each male teeth element 2 into the hook hole 31 of the respective female teeth element 3. Further, a pull-tab 42 is coupled to the slider body 4.

[0015] Referring to FIGS. 3 and 4, when pulling the slider body 4 in one direction, the hook strips 21 of the male teeth elements 2 are respectively guided into the hook holes 31 of the female teeth elements 3 and kept engaged in the receiving portions 32 of the female teeth elements 3. On the contrary, when pulling the slider body 4 in the reversed directions, the hook strips 21 of the male teeth elements 2 are respectively forced away from the hook holes 31 of the female teeth elements 3.

[0016] Referring to FIGS. 6 and 7, the guide groove 41 of the slider body 4 is adapted for the passing of the hook strip 21 of each male teeth element 2 when the slider body 4 is moving over the male teeth elements 2 and the female teeth elements 3 and for guiding the hook strip 21 of each male teeth element 2 toward a predetermined direction so that the hook strips 21 of the male teeth elements 2 can be respectively and accurately forced into the hook holes 31 of the female teeth elements 3 and kept in positive engagement with the receiving portions 32 of the female teeth elements 3.

[0017] Referring to FIGS. 8 and 9, the invention can be made in the form of a close end zipper (see FIG. 8) or open end zipper (see FIG. 9).

[0018] In the aforesaid embodiment (see FIGS. 1-9), the male teeth elements 2 and the female teeth elements 3 are independent elements and separately fastened to the associating zipper tapes 1. As an alternate form of the present invention, the male teeth elements 2 and the female teeth elements 3 can be separately formed in integrity, i.e., the clamping strips 23a or 34a of the teeth elements 2 or 3 at the same side are formed integral with one another. Therefore, the teeth elements 2 or 3 can be independent elements and separately fastened to the zipper tapes 1, or made in one single piece and directly fastened to one zipper tape 1.

[0019] According to the present invention, the male teeth elements 2 and the female teeth elements 3 can be made of metal by means of metal stamping. When

the metal male teeth elements 2 and the metal female teeth elements 3 are fastened to the zipper tapes 1 to form a metal zipper, the metal zipper shows a sense of ancient style.

[0020] In case a metal material is used for making the male teeth elements 2 and the female teeth elements 3, the male teeth elements 2 and the female teeth elements 3 can be respectively stamped from a single metal sheet member. After stamping, the hook strips 21 of the male teeth elements 2 are bent into shape (see FIG. 5). Except the hook strips 21, the split tube-like bases 22 (33), the clamping strips 23 (34), the holes 221 (331), the hook shape of the hook strips 21 of the male teeth elements 2 and the hook holes 31 and hollow receiving portions 32 of the female teeth elements 3 are all formed by means of stamping. Therefore, the fabrication of the male teeth elements 2 and the female teeth elements 3 is easy and quick. After fabrication, the male teeth elements 2 and the female teeth elements 3 can be fastened to the cylindrical flanges 11 of the zipper tapes 1 quickly and tightly. Therefore, the invention is suitable for mass production.

[0021] The receiving portions 32 of the female teeth elements 3 cover the periphery of the cylindrical flange 11 of the associating zipper tape 1 such that the receiving portions 31 of the female teeth elements 3 are kept in an enclosed status relative to the cylindrical flange of the cylindrical flange 11 of the associating zipper tape 1 and the cylindrical flange 11 of the associating zipper tape 1 will never enter the receiving portions 31 of the female teeth elements 3 when the male teeth elements 2 and the female teeth elements 3 are stretched heavily.

[0022] Further, the zipper may be variously embodied without departing from the spirit and scope of the invention. FIGS. 10~12 show an alternate form of the zipper according to the present invention. According to this embodiment, the aforesaid clamping strips 23 and 34 are respectively eliminated from the male teeth elements 2 and the female teeth elements 3, and the split tube-like bases 22 and 33 are directly fastened to the cylindrical flanges 11 of the zipper tapes 1.

[0023] According to the aforesaid embodiments, the male teeth elements 2 and the female teeth elements 3 are fastened to the zipper tapes 1 by means of the split tube-like bases 22 and 33, or clamping strips 23 and 34.

[0024] According to another alternate form of the present invention, as shown in FIGS. 13 and 14, the clamping strips 23 and 34 of the male teeth elements 2 and the female teeth elements 3 each have a plurality of spurs 24 or 35 at an inner side for engaging into the zipper tapes 1 to affix the male teeth elements 2 and the female teeth elements 3 to the associating zipper tapes 1 (see FIGS. 15~18). The spurts 24 of the two clamping strips 23 of each male teeth element 2 are arranged in a staggered manner. The spurts 35 of the two clamping strips 34 of each female teeth element 3 are also arranged in a staggered manner.

[0025] According to still another alternate form of the present invention, as shown in FIGS. 19 and 20, the male teeth elements 2 and the female teeth elements 3 eliminate the aforesaid clamping strips 23 and 34, and the split tube-like bases 22 and 33 each have a plurality of spurs 24a or 35a for engaging into the zipper tapes 1 to affix the male teeth elements 2 and the female teeth elements 3 to the associating zipper tapes 1 (see FIGS. 21~24).

[0026] Although particular embodiments of the invention have been described in detail for purposes of illustration, various modifications and enhancements may be made without departing from the scope of the invention as set out in the claims, interpreted by the description and drawings.

Claims

1. A zipper comprising two zipper tapes, said zipper tapes each having a cylindrical flange extending along the length thereof at one side, a plurality of male teeth elements mounted on the cylindrical flange of one of said zipper tapes and arranged in series, a plurality of female teeth elements mounted on the cylindrical flange of the other of said zipper tapes and arranged in series corresponding to said male teeth elements, and a slider body movable over said male teeth elements and said female teeth elements in reversed directions to lock and unlock said male teeth elements and said female teeth elements, wherein:

   said female teeth elements each comprise a split tube-like base fastened to the cylindrical flange of the associating zipper tape, a hollow receiving portion extending from the periphery of the split tube-like base of the respective female teeth element, and a hook hole on an outer side of said hollow receiving portion;

   said male teeth elements each comprise a split tube-like base fastened to the cylindrical flange of the associating zipper tape, and a hook strip extending from the periphery of the split tube-like base of the respective male teeth element and guidable by said slider body into and out of the hook hole on the hollow receiving portion of the associating female teeth element.

2. The zipper as claimed in claim 1, wherein said male teeth elements each comprise two clamping strips extending from the respective split tube-like base and respectively clamped on top and bottom surfaces of the associating zipper tape to affix the respective male teeth element to the associating zipper tape.

3. The zipper as claimed in claim 1 or 2, wherein said male teeth elements each have at least one hole cut

through the periphery of the respective split tube-like base.

4. The zipper as claimed in claim 1, 2 or 3, wherein the hook strip of each of said male teeth elements has a bend portion extending from the periphery of the split tube-like base and a hook portion extending from one end of said bend portion remote from the split tube-like base of the respective male teeth element.

5. The zipper as claimed in any one of claims 1 to 4, wherein said female teeth elements each comprise two clamping strips extending from the respective split tube-like base and respectively clamped on top and bottom surfaces of the associating zipper tape to affix the respective male teeth element to the associating zipper tape.

6. The zipper as claimed in any one of claims 1 to 5, wherein said female teeth elements each have at least one hole cut through the periphery of the respective split tube-like base.

7. The zipper as claimed in any one of claims 1 to 6, wherein said slider body comprises a guide groove for guiding the hook strip of each of said male teeth elements in and out of the hook holes of the associating female teeth elements.

8. The zipper as claimed in any one of claims 1 to 7, wherein said male teeth elements and said female teeth elements are independent elements separately fastened to said zipper tapes.

9. The zipper as claimed in any one of claims 1 to 8, wherein said male teeth elements are formed integrally in a single piece; said female teeth elements are formed integrally in a single piece.

10. The zipper as claimed in any one of claims 1 to 9, wherein said male teeth elements are integrally connected together before installation in the associating zipper tape; said female teeth elements are integrally connected together before installation in the associating zipper tape.

11. The zipper as claimed in any one of claims 1 to 10, wherein said male teeth elements are made in integrity from a metal plate by means of metal stamping; said female teeth elements are made in integrity from a metal plate by means of metal stamping.

12. The zipper as claimed in any one of claims 1 to 11, wherein the split tube-like bases of said male teeth elements and said female teeth elements are respectively tightly clamped on the cylindrical flanges of said zipper tapes.

13. The zipper as claimed in any one of claims 1 to 12, wherein the split tube-like bases of said female teeth elements cover the periphery of the cylindrical flange of the associating zipper tape such that said receiving portions of said female teeth elements are kept in an enclosed status relative to the cylindrical flange of the associating zipper tape.

14. The zipper as claimed in any one of claims 1 to 13, wherein said clamping strips of said male teeth elements and said female teeth elements each have a plurality of spurs protruded from an inner surface thereof and respectively engaged into said zipper tapes.

15. The zipper as claimed in any one of claims 1 to 14, wherein the split tube-like bases of said male teeth elements and said female teeth elements each have a plurality of spurs protruded from two ends thereof and respectively engaged into said zipper tapes.

16. A zipper comprising two zipper tapes, a series of male teeth elements provided at one zipper tape, a series of female teeth elements provided at the other zipper tape, and a slider body movable over the male teeth elements and the female teeth elements to lock the male teeth elements and the female teeth elements or to unlock the male teeth elements from the female teeth elements wherein the female teeth elements each have a receiving portion and a hook hole on the outer side of the receiving portion and the male teeth elements each have a hook strip guided by the slider body into and out of the hook holes of the female teeth elements.

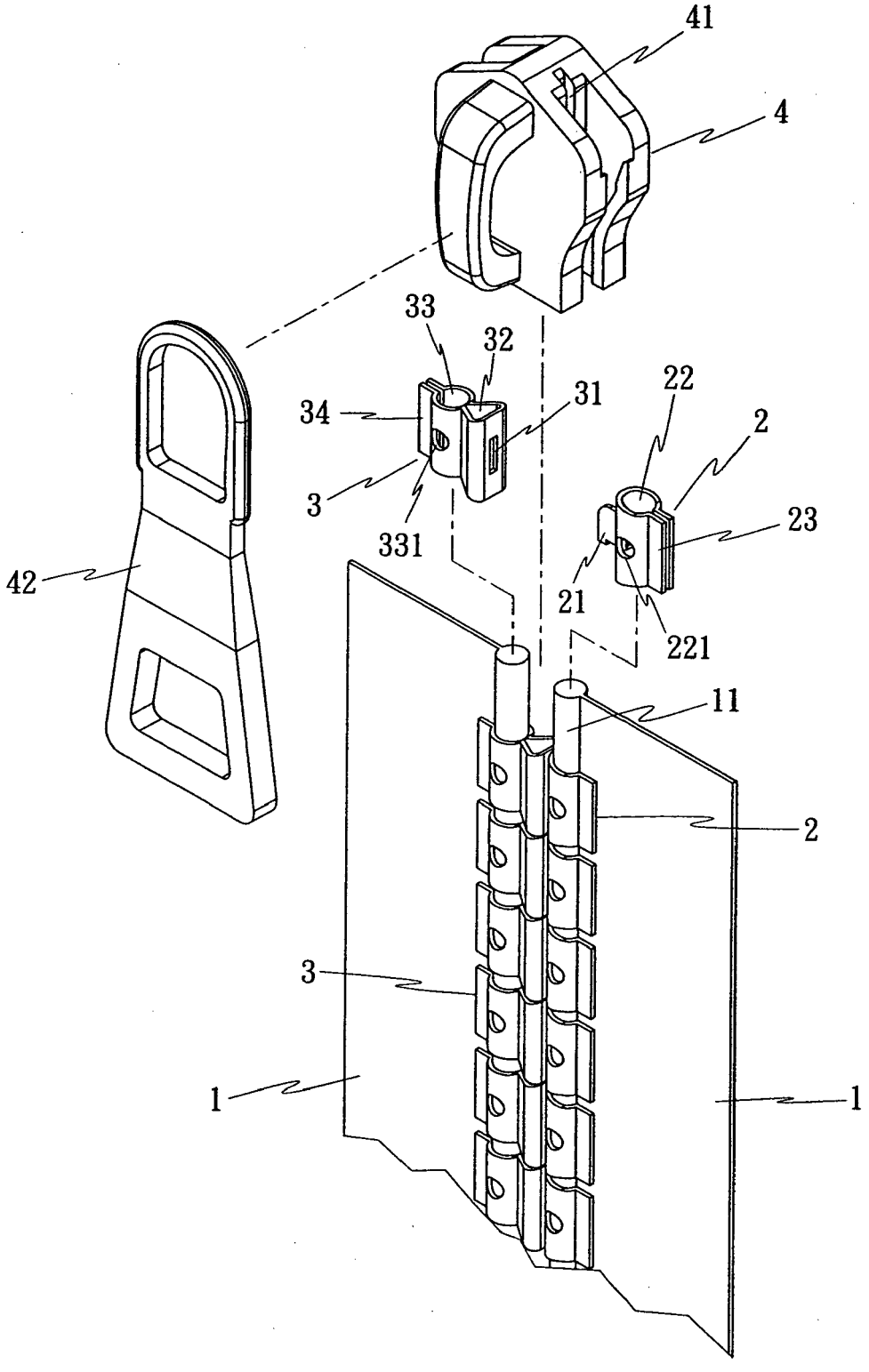


FIG. 1

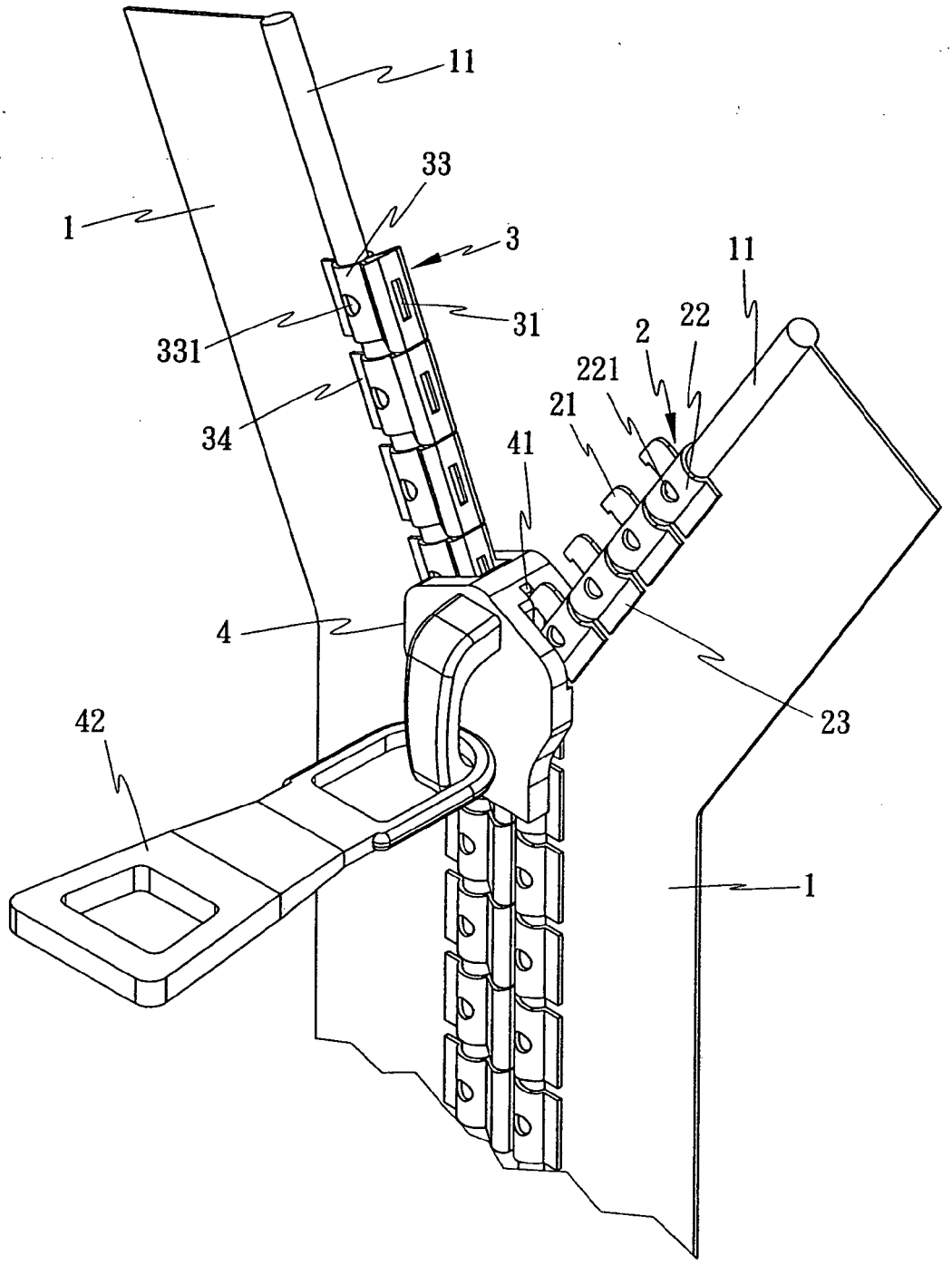


FIG. 2

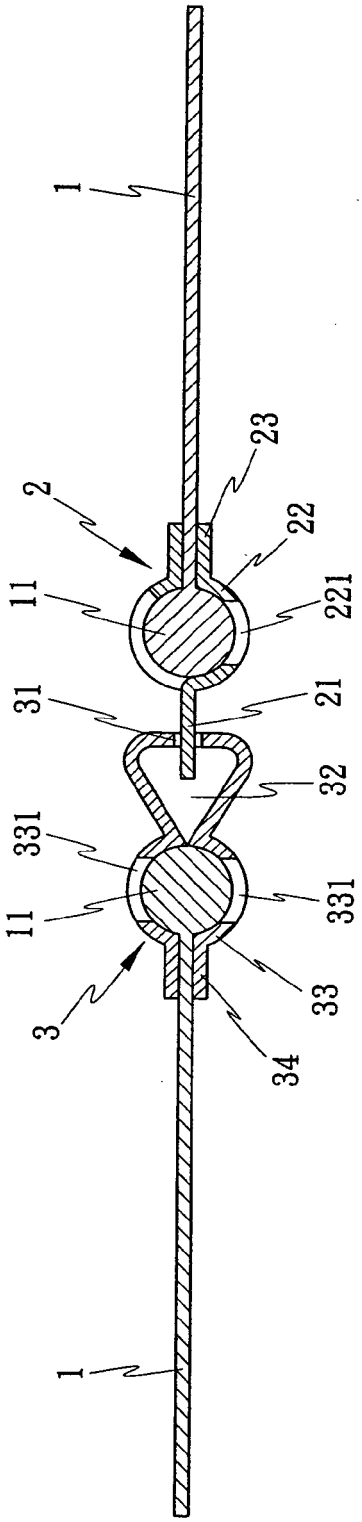


FIG. 3

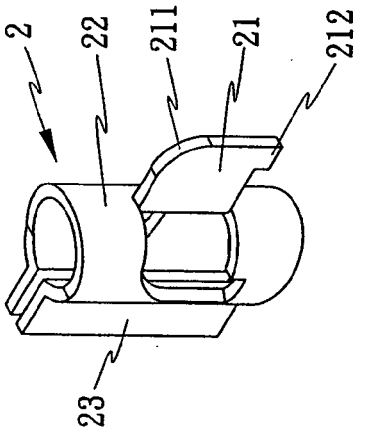


FIG. 5

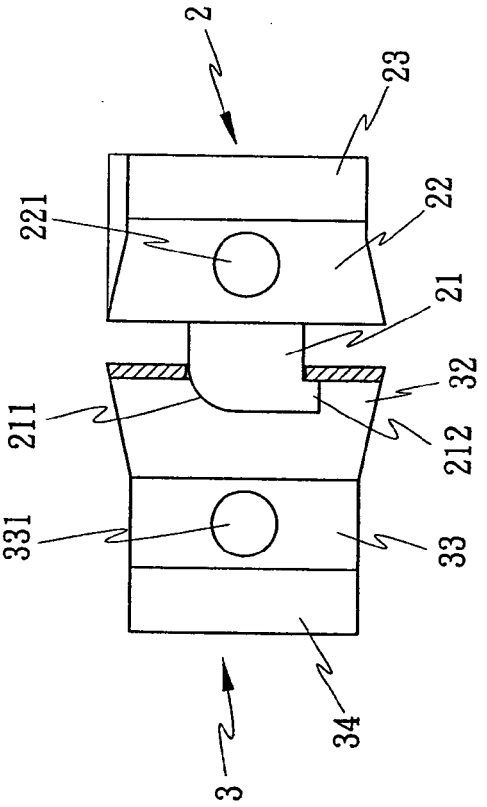


FIG. 4

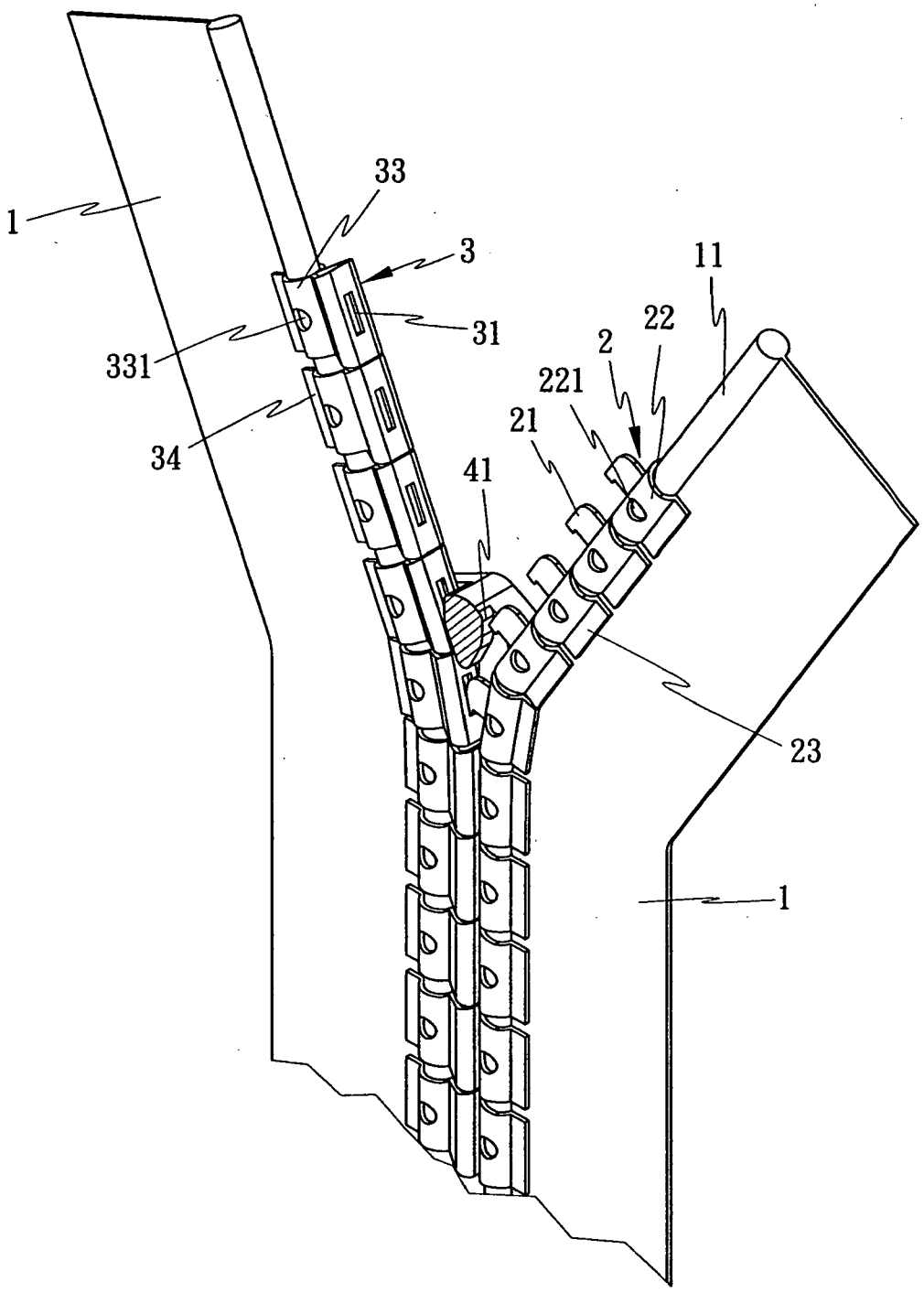


FIG. 6

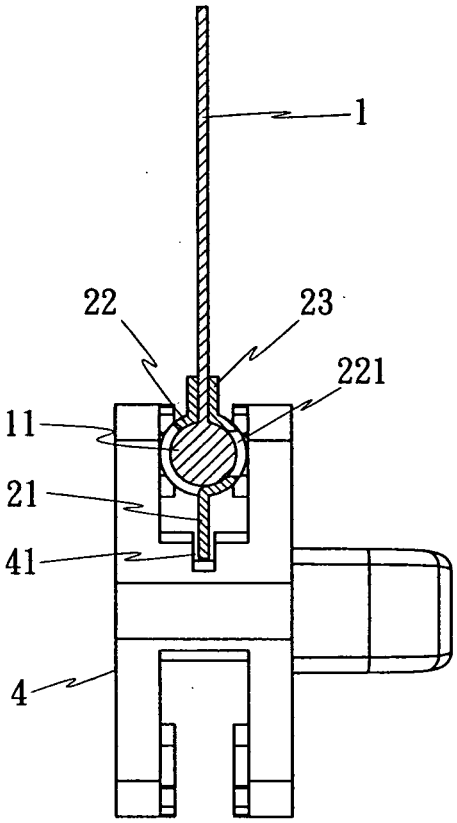


FIG. 7

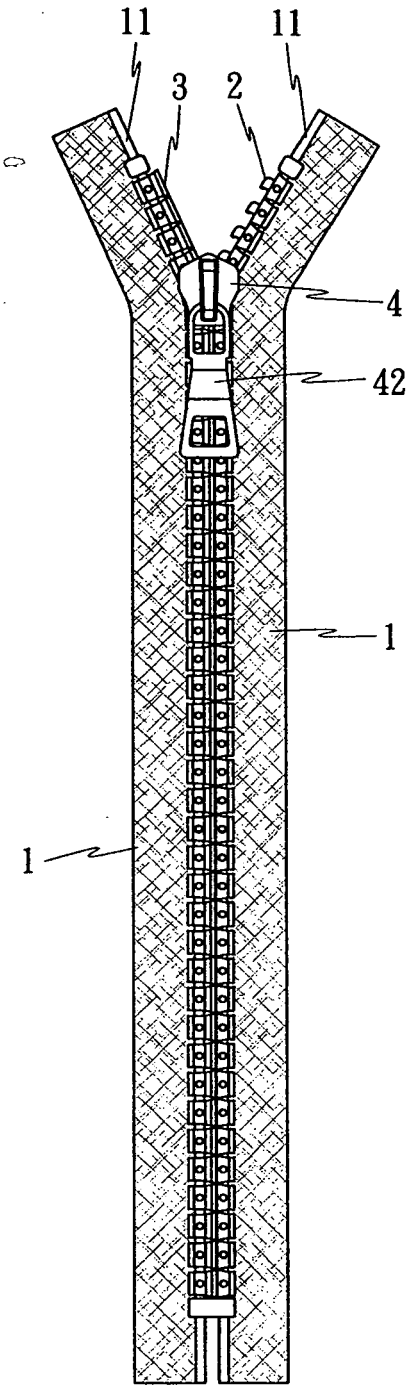


FIG. 8

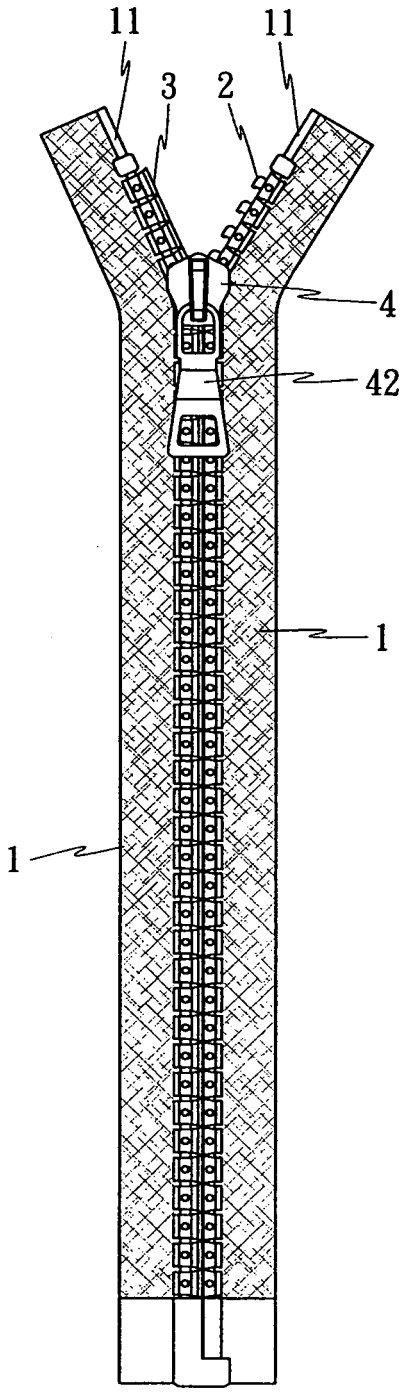


FIG. 9

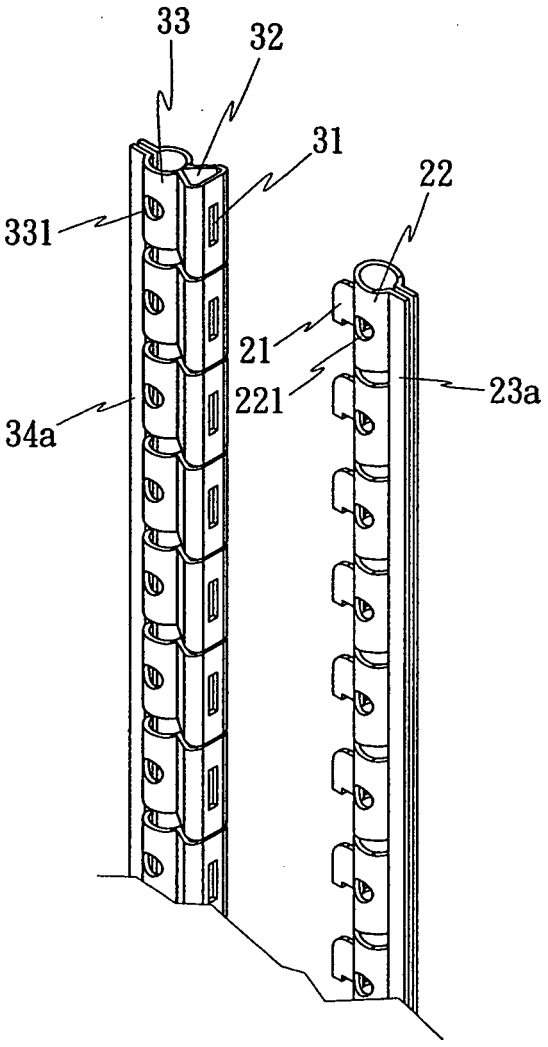
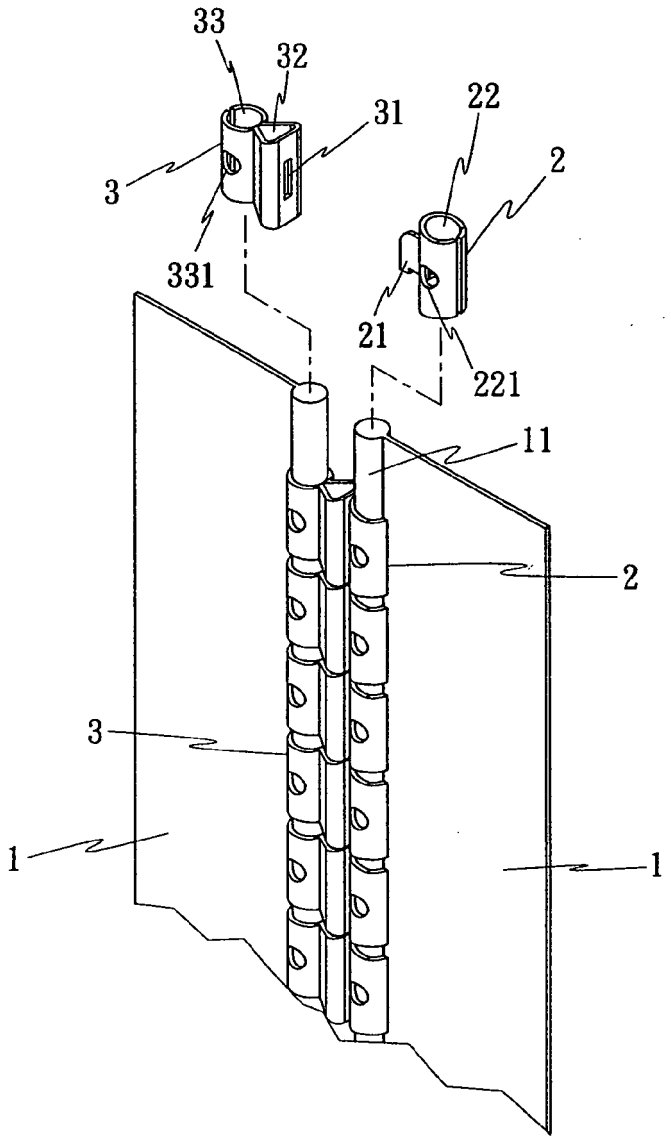


FIG. 10


33
32
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331
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221
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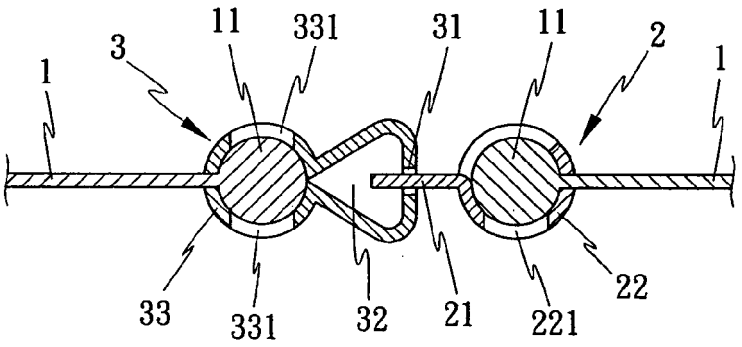
3
1
1

FIG. 11


11
331
31
11
2
1
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33
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221
22

FIG. 12

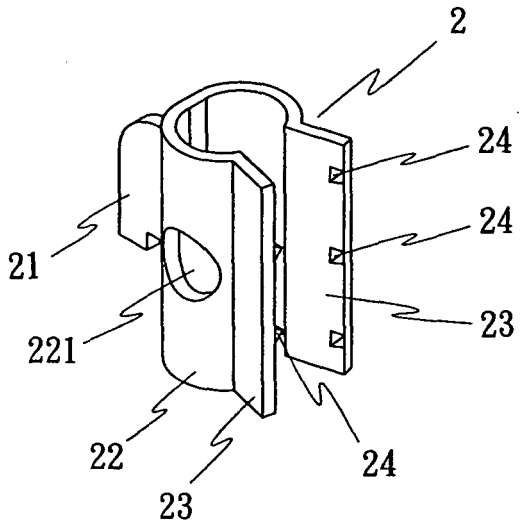

FIG. 13

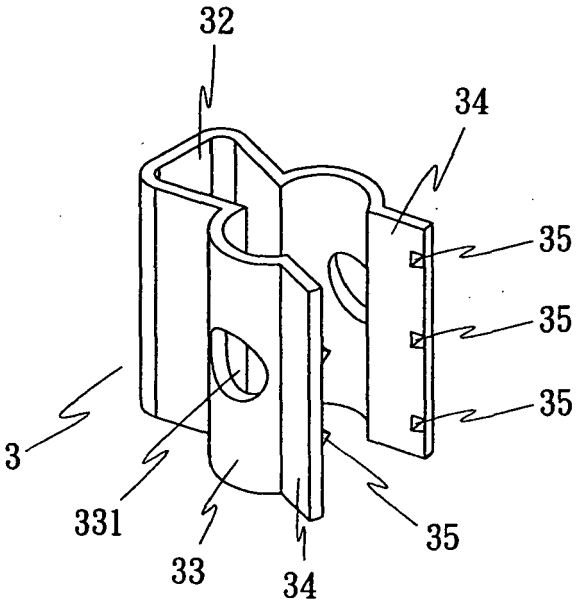

FIG. 14

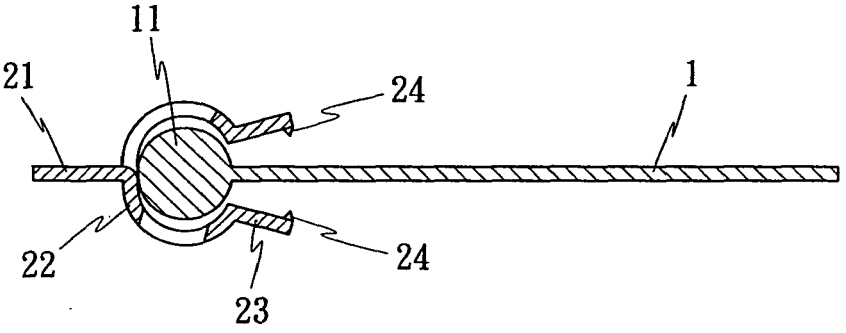

FIG. 15

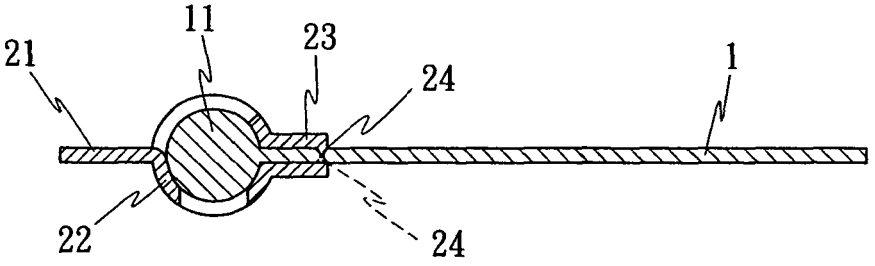

FIG. 16

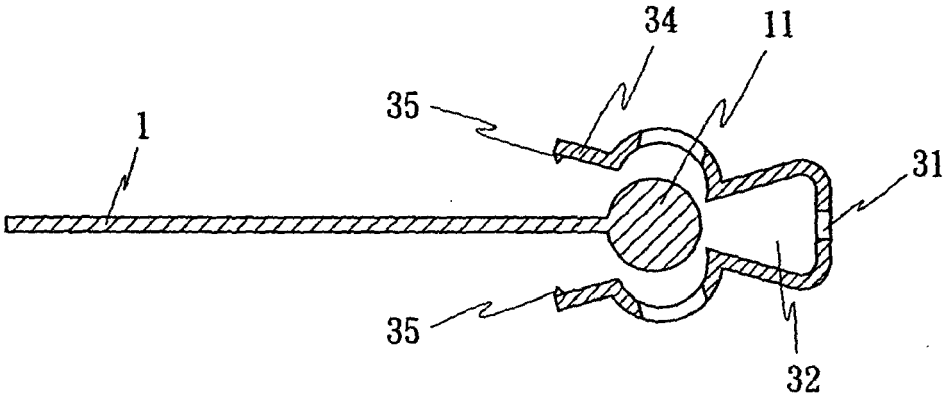

FIG. 17

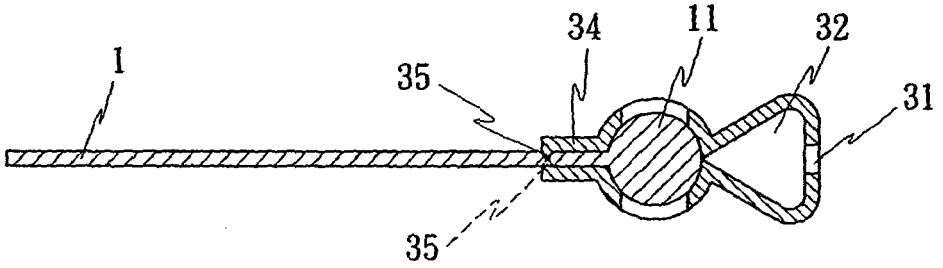

FIG. 18

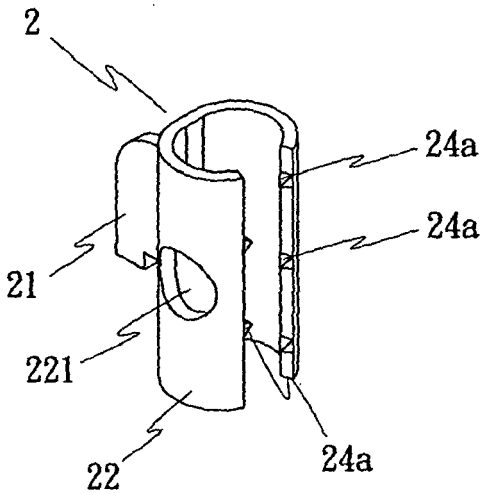

FIG. 19

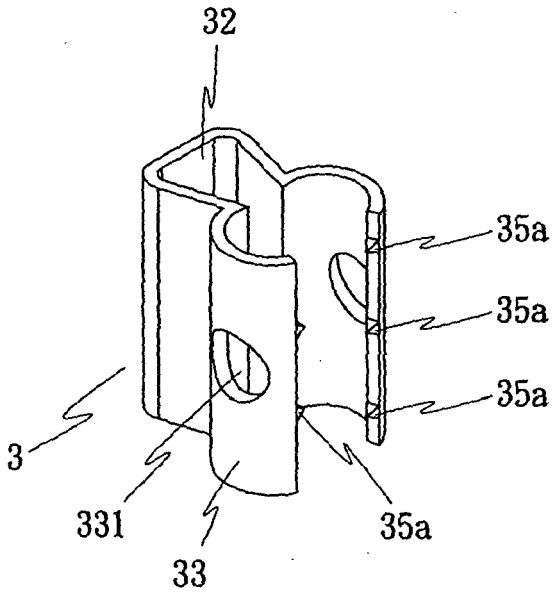

FIG. 20

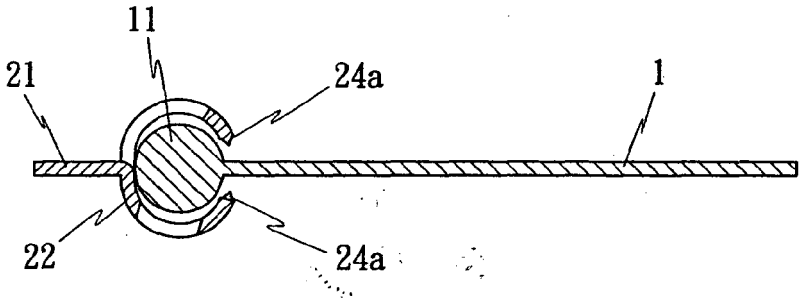

FIG. 21

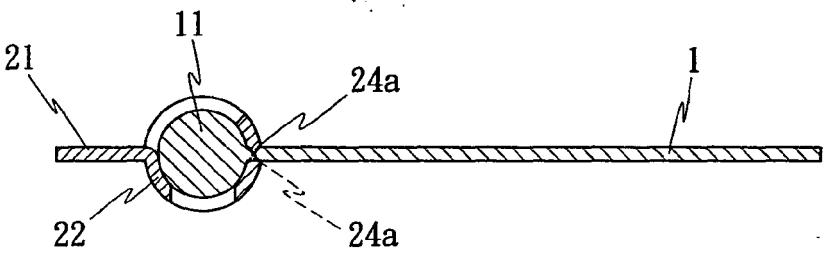

FIG. 22

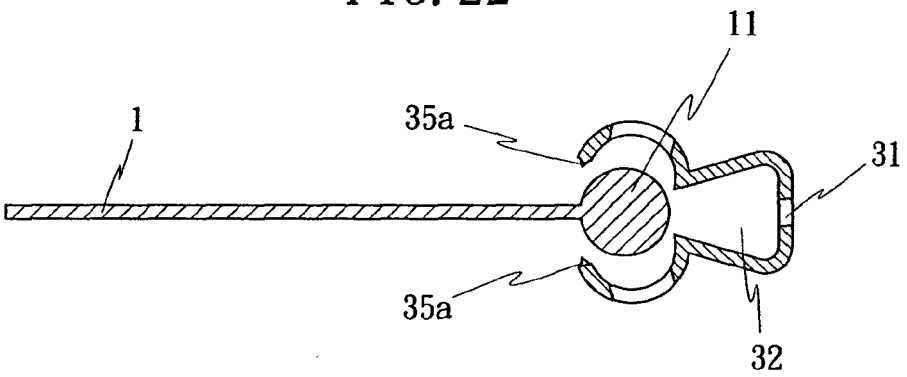

FIG. 23

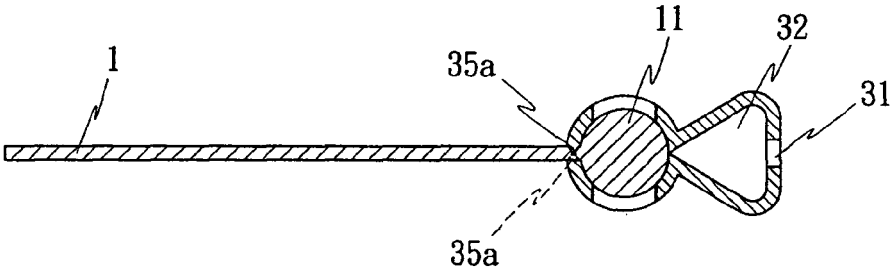

FIG. 24

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EUROPEAN SEARCH REPORT

Application Number
EP 07 25 4217

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A44B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 April 2008	Westermayer, Wilhelm

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1

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