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

(11) **EP 2 527 271 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
21.08.2013 Bulletin 2013/34

(51) Int Cl.:
B65D 63/10 *(2006.01)* ***B65D 63/14*** *(2006.01)*

(21) Application number: **11167967.6**

(22) Date of filing: **27.05.2011**

(54) **Cable tie**

Kabelbinder

Attache de câble

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(43) Date of publication of application:
28.11.2012 Bulletin 2012/48

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Printed by Jouve, 75001 PARIS (FR)

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a cable tie, especially to a cable tie that is able to be released from a locked and secured state and used again.

2. Description of Related Art

[0002] Generally, refer to Fig. 1, a cable tie 1 used for fastening and bundling is an integrated piece, including a slot base 11 and a belt 12. The slot base 11 is mounted with an insertion hole 111 while at least one securing tooth 112 is arranged at an inner surface of the insertion hole 111. The belt 12 extends along one side of the slot base 11. A plurality of locking teeth 121 is disposed on one side of the belt 12.

[0003] Thereby when the belt 12 is passed through the insertion hole 111 of the slot base 11, the securing tooth 112 on the inner surface of the insertion hole 111 is engaged with one of the locking teeth 121 on the surface of the belt 2 so as to lock and locate the belt 2.

[0004] Although the cable tie can be used for bundling and fixing things, the belt is unable to be released from the slot base once the belt is passed through the insertion hole of the slot base and the securing tooth on the inner surface of the insertion hole is engaged with one of the locking teeth. That means the cable tie is unable to be released once it is tied around something. The only way to release the cable tie is to cut the cable tie by cutting tools. The broken cable tie can't be used again anymore. This leads to a waste and the cost users spent on the cable tie is increased.

[0005] Refer to Fig. 2, there is another kind of reusable cable tie available on the market. An integrated cable tie 2 consists of a slot base 21, an elastic locking/releasing part 22, and a belt 23. The slot base 21 having an insertion hole 211 is connected to the elastic locking/releasing part 22. Two ends of the elastic locking/releasing part 22 are a locking end 221 and a releasing end 222 respectively. The locking end 221 is disposed corresponding to the insertion hole 211. The slot base 21 is connected to a part of the elastic locking/releasing part 22 between the locking end 221 and the releasing end 222 so that the locking end 221 and the releasing end 222 act like a seesaw. As to the belt 23, it extends from one side of the slot base 21. A plurality of regular locking teeth 231 is set on one side of the belt 23, corresponding to the locking end 221.

[0006] In use, the belt 23 is passed through the insertion hole 211 of the slot base 21 and the locking end 221 of the elastic locking/releasing part 22 is locked with one of the locking teeth 231 of the belt 23. Thus the belt 23 is looped around things and locked. Once a user intends to get the belt 23 off, the releasing end 222 of the elastic locking/releasing part 22 is pressed. Then the locking end 221 of the elastic locking/releasing part 22 is released from the locking teeth 231 of the belt 23. Thus the cable tie can be used again.

[0007] However, there is room for improvement of this cable tie 2. While a force is applied to pull the looped cable tie 2, the elastic locking/releasing part 22 is also pulled by the force due to the locking end 221 of the elastic locking/releasing part 22 locked with the locking teeth 231 of the belt 23. Thus the elastic locking/releasing part 22 is rotated to another direction, as shown in the Fig. 3. Therefore the cable tie 2 can't hold the things securely. Moreover, the rotated elastic locking/releasing part 22 is easily to get broken or damaged.

[0008] The documents US 2003/229972 Al, US 2007/234524 Al or GB 2 465 225 A disclose various reusable cable ties, and US 3,909,884 A discloses a wedge clamp without teeth.

[0009] The cable ties or wedge clamp according to these documents do not solve the problem of providing a reusable cable tie allowing easy release of the cable tie.

SUMMARY OF THE INVENTION

[0010] Therefore it is a primary object of the present invention to provide a cable tie in which a belt can be removed from an insertion hole after the belt being passed through the insertion hole and projecting teeth of a fastener engaged with locking teeth of the belt. Thus he belt is drawn out of the insertion hole and used for binding and fastening things again. Moreover, the more the looped cable tie is pulled, the tighter the cable tie wrapped around the object. The cable tie allows objects to be fastened more securely.

[0011] In order to achieve the above objects, a cable tie of the present invention includes a slot base disposed with at least one insertion hole, a belt and at least one fastener. At least one surface of the insertion hole is a slanted surface. A plurality of locking teeth is arranged at a surface on one side of the belt. The fastener is mounted into the insertion hole of the slot base. The fastener consists of a slanted surface corresponding to the slanted surface of the insertion hole and a plurality of projecting teeth corresponding to the locking teeth of the belt. In use, a free end of the belt is passed through the insertion hole of the slot base to bind objects and the fastener is mounted into the insertion hole of the slot base. Thus the projecting teeth of the fastener are engaged with the locking teeth of the belt correspondingly and the slanted surface of the insertion hole is in contact with the slanted surface of the fastener. Therefore, the belt is locked and fastened securely. The more the looped belt is pulled, the tighter the locking between the fastener and the belt and the objects are held tightly. If a free end of the belt is drawn out, the fastener is not against the belt anymore and the cable tie is released. The cable tie can be used again.

[0012] Furthermore, the slot base of the cable tie can

include two insertion holes and each insertion hole is mounted with a corresponding fastener.

[0013] The slot base can be disposed with a locking slot part and a releasing slot part, adjacent to each other while the fastener is disposed with a clamping part. By the clamping part of the fastener mounted in the locking slot part or the releasing slot part, the belt is locked by the fastener or the belt is released from the fastener.

[0014] A central part of the fastener is hollow so that there is a certain space allowing the two sides of the fastener to have elastic deformation. This helps the clamping part of the fastener to be mounted into or removed from the locking slot part or the releasing slot part smoothly.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The structure and the technical means adopted by the present invention to achieve the above and other objects can be best understood by referring to the following detailed description of the preferred embodiments and the accompanying drawings, wherein

Fig. 1 is a cable tie of a prior part;

Fig. 2 is a partial side view of a prior art looped around things;

Fig. 3 is a schematic drawing showing rotation of an elastic locking/releasing part of a cable tie according to a prior art;

Fig. 4 is a perspective view of an embodiment according to the present invention;

Fig. 5 is a schematic drawing showing the embodiment in Fig. 4 in a locked state according to the present invention;

Fig. 6A is a schematic drawing showing the embodiment in Fig. 4 being released according to the present invention;

Fig. 6B is a partial cross sectional view of the embodiment in Fig. 4 in a locked state according to the present invention;

Fig. 7 is an explosive view of another embodiment according to the present invention;

Fig. 8A is a partial cross sectional view of the embodiment in Fig. 7 being released according to the present invention;

Fig. 8B is a partial cross sectional view of the embodiment in Fig. 7 in a locked state according to the present invention;

Fig. 9 is an explosive view of a further embodiment in which a slot base and a belt are integrated according to the present invention;

Fig. 10 is a schematic drawing showing the embodiment in Fig. 9 that holds objects according to the present invention;

Fig. 11 is an explosive view of a further embodiment according to the present invention;

Fig. 12 is a schematic drawing showing the embodiment in Fig. 11 that holds objects according to the present invention;

Fig. 13 is an explosive view of a further embodiment according to the present invention;

Fig. 14 is a schematic drawing showing a further embodiment in which projecting teeth of a fastener are disposed on a slanted surface for holding objects according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0016] Refer to Fig. 4, a cable tie of the present invention includes a slot base 3, a belt 4 and a fastener 5. The slot base 3 is disposed with an insertion hole 31. At least one surface of the insertion hole 31 is a slanted surface 311. A plurality of locking teeth 41 is arranged at a surface on one side of the belt 4. The fastener 5 is mounted into the insertion hole 31 of the slot base 3 correspondingly. The fastener 5 includes a slanted surface 51 arranged corresponding to the slanted surface 311 of the slot base 3, and a plurality of projecting teeth 52 corresponding to the locking teeth 41 of the belt 4. The projecting teeth 52 are arranged on a surface of the fastener 5.

[0017] As shown in Fig. 5, thereby after the belt 4 being passed through the insertion hole 31 of the slot base 3 and fastening the at least one object A, the fastener 5 is mounted into the insertion hole 31 of the slot base 3 and the projecting teeth 52 of the fastener 5 are engaged with the locking teeth 41 of the belt 4 so as to lock the belt 4.

[0018] Due to the slanted surface 311 on the insertion hole 31 of the slot base 3, one end of the insertion hole 31 is a small hole while the other end thereof is a large hole. The fastener 5 also includes the slanted surface 51 corresponding to the slanted surface 311 on the insertion hole 31. Thus when a free end of the belt 4 is inserted through the insertion hole 31 of the slot base 3, the more the belt 4 moves toward the end of the insertion hole 31 with the small hole, the tighter the projecting teeth 52 of the fastener 5 is against the locking teeth 41 of the belt 4. The more pull put on the belt 4 that holds the object A, the tighter the fastener 5 locked with the belt 4. The object A is held securely and certainly, not falling out.

[0019] Once a user wants to release the projecting

teeth 52 of the fastener 5 from the locking teeth 41 of the belt 4, the belt 4 is drawn out from one end of the insertion hole 31 with the large hole. Together with the belt 4, the fastener 5 is also pulled and moved toward the large hole end of the insertion hole 31 of the slot base 3. Thus the projecting teeth 52 of the fastener 5 and the locking teeth 41 of the belt 4 are not locked with one another. The cable tie is released.

[0020] In accordance with the above design of the cable tie, a plurality of slot bases 3 is fixed on the belt 4 and the part of the belt 4 between the two adjacent slot bases 3 passes the objects A, as shown in Fig. 5.

[0021] Moreover, refer to Fig. 4, Fig. 6A and Fig. 6B, the slot base 3 further includes a locking slot part 32 and a releasing slot part 33 adjacent to each other while the fastener 5 is disposed with a clamping part 53. When the clamping part 53 of the fastener 5 is locked with the releasing slot part 33, the fastener 5 is on the large hole end of the insertion hole 31 of the slot base 3. Now the projecting teeth 52 of the fastener 5 are not engaged with the locking teeth 41 of the belt 4. While pushing the fastener 5 to make the fastener 5 move to the small hole end of the insertion hole 31 of the slot base 3, the clamping part 53 of the fastener 5 is locked with the locking slot part 32 and the projecting teeth 52 of the fastener 5 are engaged with the locking teeth 41 of the belt 4, in a locked state. Thus the belt 4 is tightened and secured. By the clamping part 53 of the fastener 5 mounted in the locking slot part 32 or the releasing slot part 33, the belt 4 is locked by or released from the fastener 5.

[0022] In the Fig. 4, Fig. 6A and Fig. 6B, the adjacent locking slot part 32 and the releasing slot part 33 are arranged at each of two corresponding inner surfaces of the insertion hole 31 of the slot base 3. The clamping part 53 is arranged at each of two side walls of the fastener 5.

[0023] Refer to Fig. 7, Fig. 8A and Fig. 8B, in this embodiment, the adjacent locking slot part 32 and the releasing slot part 33 are arranged at each of two outer surfaces correspondingly of the slot base 3. An arm 54 is extending from each of two sides of the fastener 5 and the clamping part 53 is on the rear end of the arm 54. The clamping part 53 is locked with the locking slot part 32 or the releasing slot part 33 of the slot base 3.

[0024] Back to Fig. 6A and Fig. 6B, a central part of the fastener 5 is hollow so that there is a certain space allowing the two sides of the fastener to have elastic deformation. This helps the clamping part 53 of the fastener 5 to be mounted into or removed from the locking slot part 32 or the releasing slot part 33 smoothly.

[0025] Refer to Fig. 9, in this embodiment, the slot base 3 and the belt 4 are connected to each other. Refer to Fig. 10, after binding objects A, the belt 4 is then inserted through the insertion hole 31 of the slot base 3. Then the fastener 5 is mounted into the insertion hole 31 and the belt 4 that loops the objects A is locked and tightened by the projecting teeth 52 of the fastener 5 engaged with the locking teeth 41 of the belt 4.

[0026] Refer to Fig. 11, a slot base 3 of this embodiment is further arranged with the other insertion hole 31 so that the slot base 3 includes two insertion holes 31 arranged correspondingly. At least one of the two insertion holes 31 is arranged with a slanted surface 311. Each of the insertion holes 31 has a corresponding fastener 5. A locking slot part 32 and a releasing slot part 33 are disposed on two corresponding surfaces of the insertions hole 31 while a clamping part 53 is arranged at each of two side walls of the fastener 5.

[0027] Refer to Fig. 12, in this embodiment, one end of the belt 4 is passed through one of the insertion holes 31 and then the fastener 5 is mounted into this insertion hole 31 to lock the belt 4. The other end of the belt 4 is inserted through the other insertion hole 31 to be secured by the other fastener 5. Objects A are bound within a looped space formed by the belt 4 passed through the two insertion holes 31.

[0028] Refer to Fig. 13, a further embodiment is revealed. A slot base 3 of this embodiment is arranged with two insertion holes 31, each having a corresponding fastener 5. A locking slot part 32 and a releasing slot part 33 are disposed on two corresponding outer surfaces of each insertions hole 31. As to the fastener 5, an arm 54 is extending from each of two sides of the fastener 5 and a clamping part 53 is disposed on a rear end of the arm 54. The clamping part 53 is locked with the locking slot part 32 or the releasing slot part 33 of the slot base 3.

[0029] Refer to Fig. 14, in this embodiment, the projecting teeth 52 of the fastener 5 are disposed on the slanted surface 51. In the embodiment shown in Fig. 4 and Fig. 5, the projecting teeth 52 of the fastener 5 are arranged at another surface opposite to the slanted surface 51.

[0030] Additional advantages and modifications will readily occur to those skilled in the art. Therefore, the invention in its broader aspects is not limited to the specific details, and representative devices shown and described herein.

Claims

1. A cable tie comprising:

a slot base (3) having at least one insertion hole (31); the insertion hole (31) having at least one slanted surface (311);
a belt (4) with a plurality of locking teeth (41) arranged on a surface at one side thereof; and
at least one fastener 5 that is mounted into the insertion hole (31) of the slot base (3); the fastener (5) including a slanted surface (51) corresponding to the slanted surface (311) of the insertion hole (31, and a plurality of projecting teeth (52) corresponding to the locking teeth (41) of the belt (4).

2. The cable tie as claimed in claim 1, wherein the slot base (3) is arranged with a locking slot part (32) and a releasing slot part (33), adjacent to each other; the fastener (5) is disposed with at least one clamping part (53) that is locked with the locking slot part (32) or the releasing slot part (33) of the slot base (3) correspondingly.

3. The cable tie as claimed in claim 2, wherein the adjacent locking slot part (32) and the releasing slot part (33) are disposed on two corresponding inner surfaces of the insertion hole (31) of the slot base (3) while the clamping part (53) is arranged at each of two sides of the fastener (5).

4. The cable tie as claimed in claim 3, wherein a central part of the fastener (5) is hollow so that there is a space allowing two sides of the fastener (5) to have elastic deformation.

5. The cable tie as claimed in claim 2, wherein the adjacent locking slot part (32) and the releasing slot part (33) are disposed on two corresponding outer surfaces of the insertion hole (31) of the slot base (3) while the clamping part (53) is arranged at a rear end of an arm (54) extending from each of two sides of the fastener (5).

6. The cable tie as claimed in claim 1, wherein the slot base (3) and the belt (4) are connected to each other.

7. The cable tie as claimed in claim 6, wherein the slot base (3) is arranged with a locking slot part (32) and a releasing slot part (33), adjacent to each other; the fastener (5) is disposed with at least one clamping part (53) that is locked with the locking slot part (32) or the releasing slot part (33) of the slot base (3) correspondingly.

8. The cable tie as claimed in claim 7, wherein the adjacent locking slot part (32) and the releasing slot part (33) are disposed on two corresponding inner surfaces of the insertion hole (31) of the slot base (3) while the clamping part (53) is arranged at each of two sides of the fastener (5).

9. The cable tie as claimed in claim 8, wherein a central part of the fastener (5) is hollow so that there is a space allowing two sides of the fastener (5) to have elastic deformation.

10. The cable tie as claimed in claim 7, wherein the adjacent locking slot part (32) and the releasing slot part (33) are disposed on two corresponding outer surfaces of the insertion hole (31) of the slot base (3) while the clamping part (53) is arranged at a rear end of an arm (54) extending from each of two sides of the fastener (5).

Patentansprüche

1. Kabelbinder, umfassend:

   eine Schlitzbasis (3) mit wenigstens einer Einsetzöffnung (31); wobei die Einsetzöffnung (31) wenigstens eine schräge Fläche (311) aufweist;
   ein Band (4) mit mehreren Verriegelungszähnen (41), die an einer Fläche einer Seite davon angeordnet sind; und
   wenigstens ein Befestigungsmittel (5), das in der Einsetzöffnung (31) der Schlitzbasis (3) angebracht ist; wobei das Befestigungsmittel (5) eine schräge Fläche (51), die der schrägen Fläche (311) der Einsetzöffnung (31) entspricht, und mehrere vorspringende Zähne (52), die den Verriegelungszähnen (41) des Bands (4) entsprechen, umfasst.

2. Kabelbinder nach Anspruch 1, wobei die Schlitzbasis (3) mit einem Verriegelungsschlitzteil (32) und einem Löseschlitzteil (33), die zueinander benachbart sind, ausgeführt ist; wobei das Befestigungsmittel (5) mit wenigstens einem Klemmteil (53) versehen ist, der entsprechend mit dem Verriegelungsschlitzteil (32) oder dem Löseschlitzteil (33) der Schlitzbasis (3) verriegelt wird.

3. Kabelbinder nach Anspruch 2, wobei der Verriegelungsschlitzteil (32) und der Löseschlitzteil (33), die zueinander benachbart sind, an zwei entsprechenden Innenflächen der Einsetzöffnung (31) der Schlitzbasis (3) angeordnet sind, während der Klemmteil (53) an jeder von zwei Seiten des Befestigungsmittels (5) eingerichtet ist.

4. Kabelbinder nach Anspruch 3, wobei ein Mittelteil des Befestigungsmittels (5) hohl ist, so dass dort ein Raum vorhanden ist, der zwei Seiten des Befestigungsmittels (5) eine elastische Verformung gestattet.

5. Kabelbinder nach Anspruch 2, wobei der Verriegelungsschlitzteil (32) und der Löseschlitzteil (33), die zueinander benachbart sind, an zwei entsprechenden Außenflächen der Einsetzöffnung (31) der Schlitzbasis (3) angeordnet sind, während der Klemmteil (53) an einem hinteren Ende eines Arms (54), der sich von jeder von zwei Seiten des Befestigungsmittels (5) erstreckt, eingerichtet ist.

6. Kabelbinder nach Anspruch 1, wobei die Schlitzbasis (3) und das Band (4) miteinander verbunden sind.

7. Kabelbinder nach Anspruch 6, wobei die Schlitzbasis (3) mit einem Verriegelungsschlitzteil (32) und einem Löseschlitzteil (33), die zueinander benachbart sind, ausgeführt ist; wobei das Befestigungsmit-

tel (5) mit wenigstens einem Klemmteil (53) versehen ist, der entsprechend mit dem Verriegelungsschlitzteil (32) oder dem Löseschlitzteil (33) der Schlitzbasis (3) verriegelt wird.

8. Kabelbinder nach Anspruch 7, wobei der Verriegelungsschlitzteil (32) und der Löseschlitzteil (33), die zueinander benachbart sind, an zwei entsprechenden Innenflächen der Einsetzöffnung (31) der Schlitzbasis (3) angeordnet sind, während der Klemmteil (53) an jeder von zwei Seiten des Befestigungsmittels (5) eingerichtet ist.

9. Kabelbinder nach Anspruch 8, wobei ein Mittelteil des Befestigungsmittels (5) hohl ist, so dass dort ein Raum vorhanden ist, der zwei Seiten des Befestigungsmittels (5) eine elastische Verformung gestattet.

10. Kabelbinder nach Anspruch 7, wobei der Verriegelungsschlitzteil (32) und der Löseschlitzteil (33), die zueinander benachbart sind, an zwei entsprechenden Außenflächen der Einsetzöffnung (31) der Schlitzbasis (3) angeordnet sind, während der Klemmteil (53) an einem hinteren Ende eines Arms (54), der sich von jeder von zwei Seiten des Befestigungsmittels (5) erstreckt, eingerichtet ist.

Revendications

1. Attache de câble comprenant :

une base à fente (3) ayant au moins un orifice d'insertion (31), l'orifice d'insertion (31) ayant au moins une surface inclinée (311) ;
une courroie (4) avec une pluralité de dents de blocage (41) agencées sur une surface sur un côté de celle-ci ; et
au moins un dispositif de fixation (5) qui est monté dans l'orifice d'insertion (31) de la base à fente (3), le dispositif de fixation (5) comprenant une surface inclinée (51) correspondant à la surface inclinée (311) de l'orifice d'insertion (31) et une pluralité de dents en saillie (52) correspondant aux dents de blocage (41) de la courroie (4).

2. Attache telle que revendiquée dans la revendication 1, dans laquelle la base à fente (3) est agencée avec une partie de fente de blocage (32) et une partie de fente de libération (33) adjacentes l'une à l'autre, le dispositif de fixation (5) est disposé avec au moins une partie de serrage (53) qui est bloquée avec la partie de fente de blocage (32) ou la partie de fente de libération (33) de la base à fente (3) de manière correspondante.

3. Attache telle que revendiquée dans la revendication 2, dans laquelle la partie de fente de blocage (32) et la partie de fente de libération (33) adjacentes sont disposées sur deux surfaces intérieures correspondantes de l'orifice d'insertion (31) de la base à fente (3) tandis que la partie de serrage (53) est agencée sur chacun des deux côtés du dispositif de fixation (5).

4. Attache telle que revendiquée dans la revendication 3, dans laquelle une partie centrale du dispositif de fixation (5) est creuse de sorte qu'il y a un espace permettant aux deux côtés du dispositif de fixation (5) d'avoir une déformation élastique.

5. Attache telle que revendiquée dans la revendication 2, dans laquelle la partie de fente de blocage (32) et la partie de fente de libération (33) adjacentes sont disposées sur deux surfaces extérieures correspondantes de l'orifice d'insertion (31) de la base à fente (3) tandis que la partie de serrage (53) est agencée à une extrémité arrière d'un bras (54) s'étendant à partir de chacun des deux côtés du dispositif de fixation (5).

6. Attache telle que revendiquée dans la revendication 1, dans laquelle la base à fente (3) et la courroie (4) sont reliées l'une à l'autre.

7. Attache telle que revendiquée dans la revendication 6, dans laquelle la base à fente (3) est agencée avec une partie de fente de blocage (32) et une partie de fente de libération (33) adjacentes l'une à l'autre, le dispositif de fixation (5) est disposé avec au moins une partie de serrage (53) qui est bloquée avec la partie de fente de blocage (32) ou la partie de fente de libération (33) de la base à fente (3) de manière correspondante.

8. Attache telle que revendiquée dans la revendication 7, dans laquelle la partie de fente de blocage (32) et la partie de fente de libération (33) adjacentes sont disposées sur deux surfaces intérieures correspondantes de l'orifice d'insertion (31) de la base à fente (3) tandis que la partie de serrage (53) est agencée sur chacun des deux côtés du dispositif de fixation (5).

9. Attache telle que revendiquée dans la revendication 8, dans laquelle une partie centrale du dispositif de fixation (5) est creuse de sorte qu'il y a un espace permettant aux deux côtés du dispositif de fixation (5) d'avoir une déformation élastique.

10. Attache telle que revendiquée dans la revendication 7, dans laquelle la partie de fente de blocage (32) et la partie de fente de libération (33) adjacentes sont disposées sur deux surfaces extérieures correspondantes de l'orifice d'insertion (31) de la base à fente

(3) tandis que la partie de serrage (53) est agencée à une extrémité arrière d'un bras (54) s'étendant à partir de chacun des deux côtés du dispositif de fixation (5).

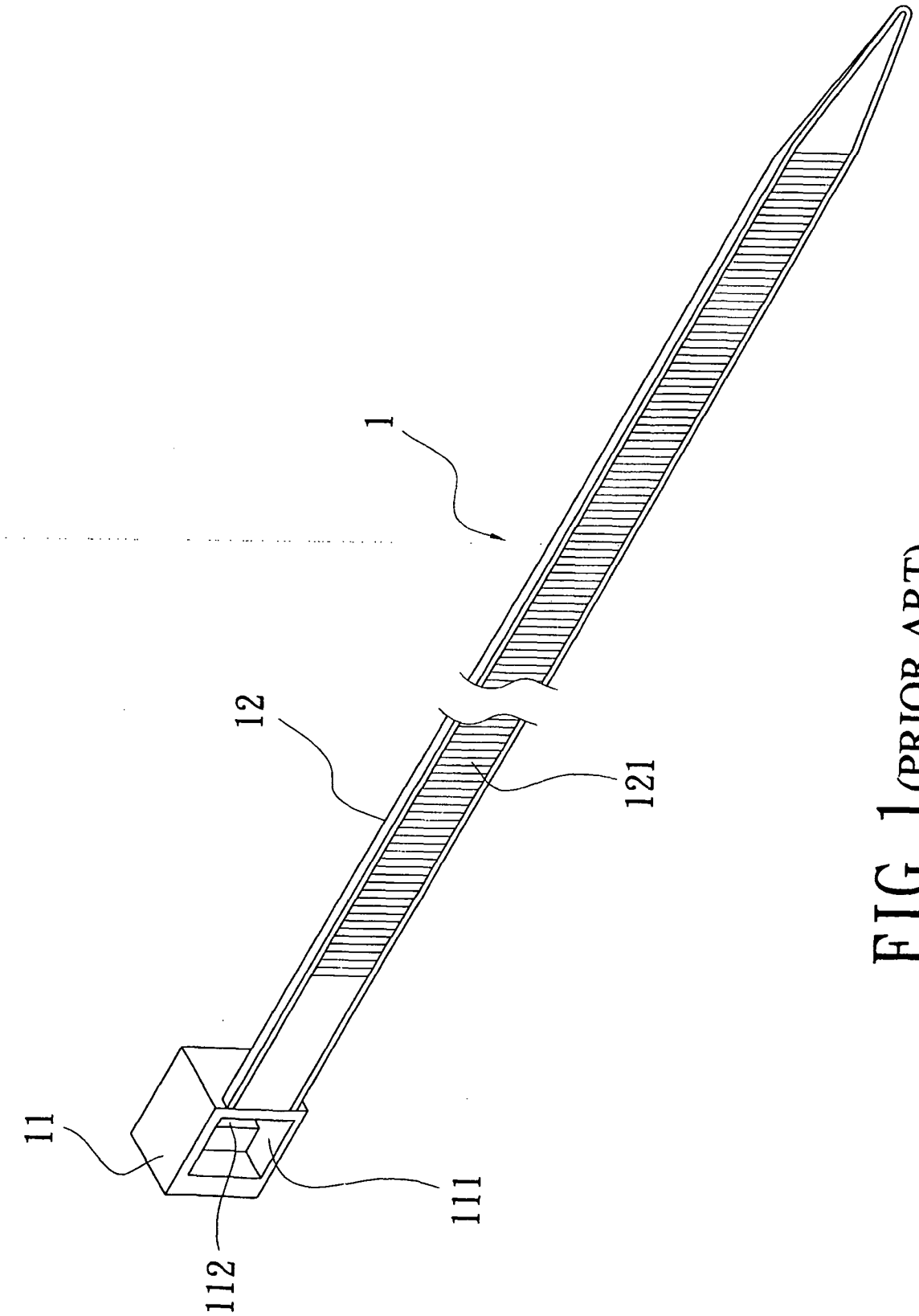


FIG. 1 (PRIOR ART)

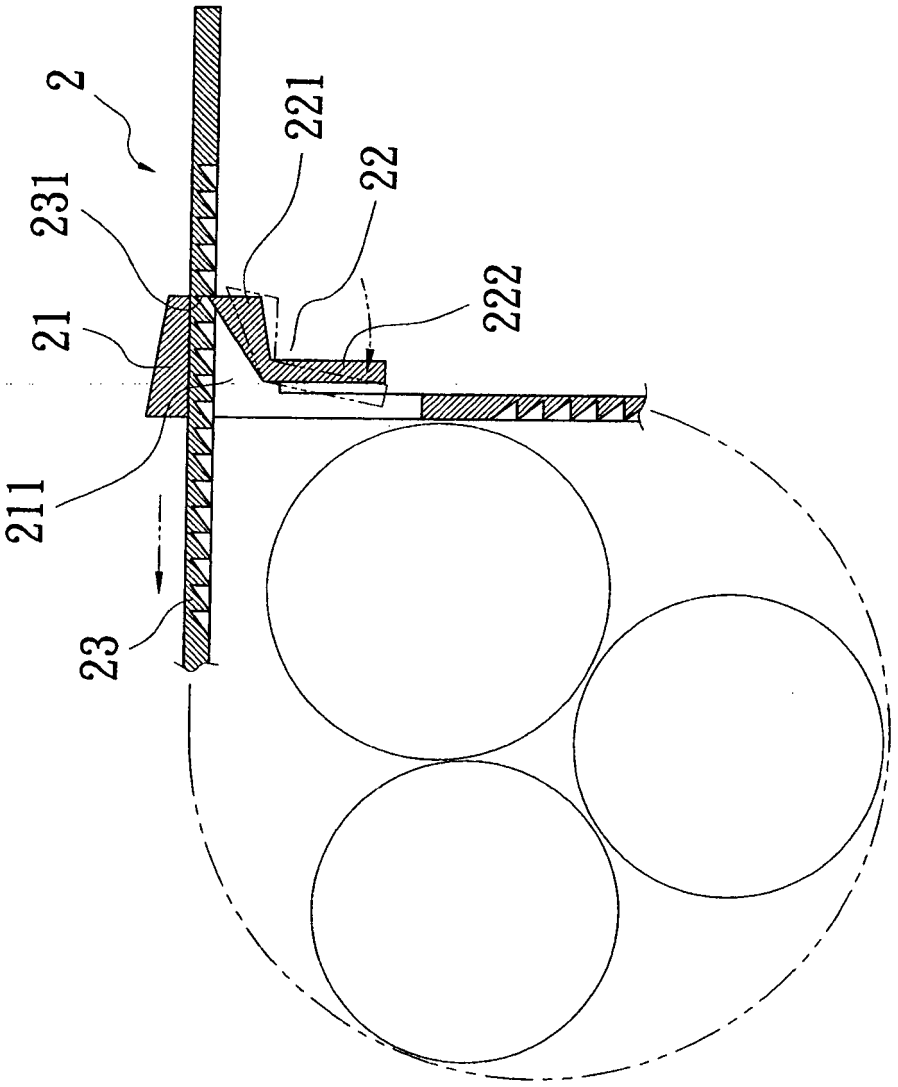


FIG. 2(PRIOR ART)

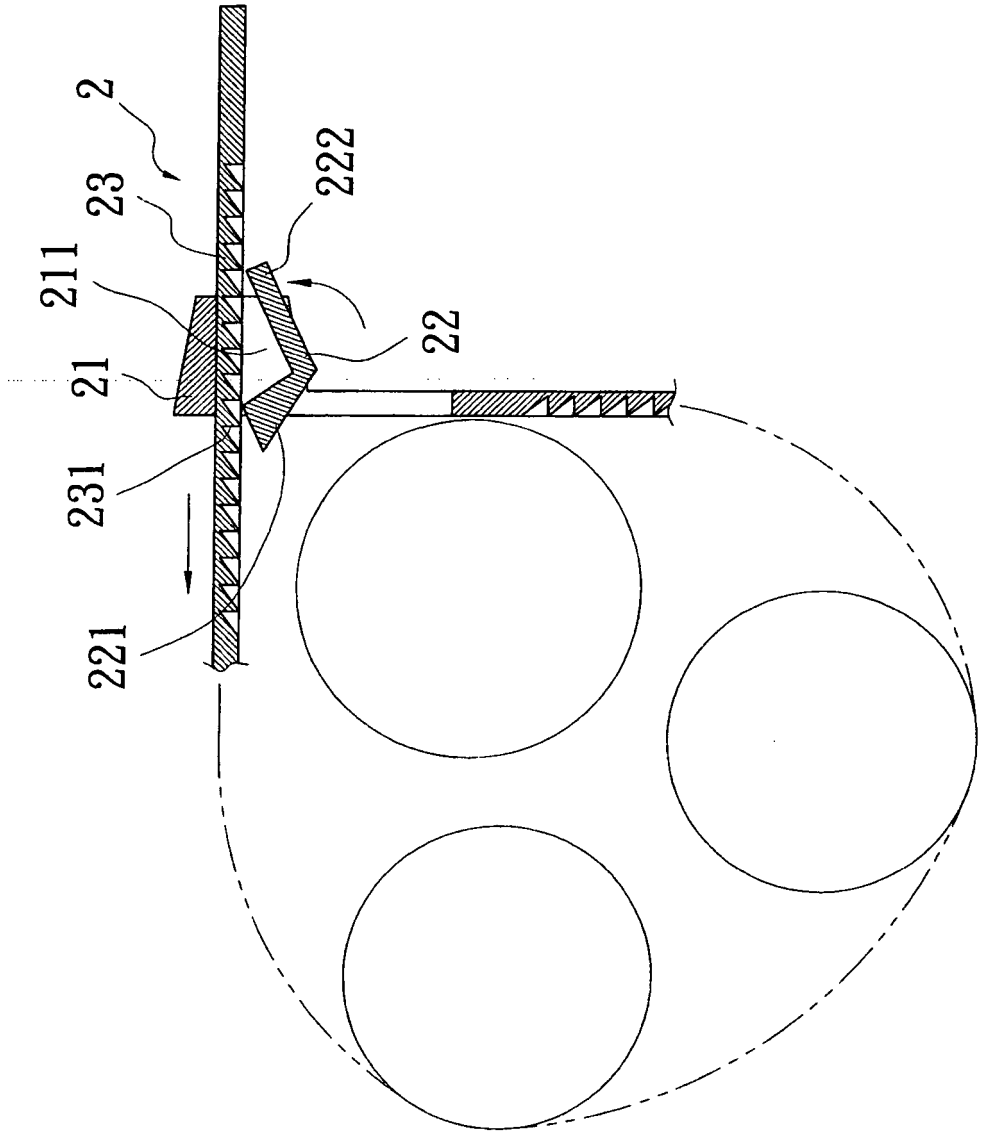


FIG. 3(PRIOR ART)

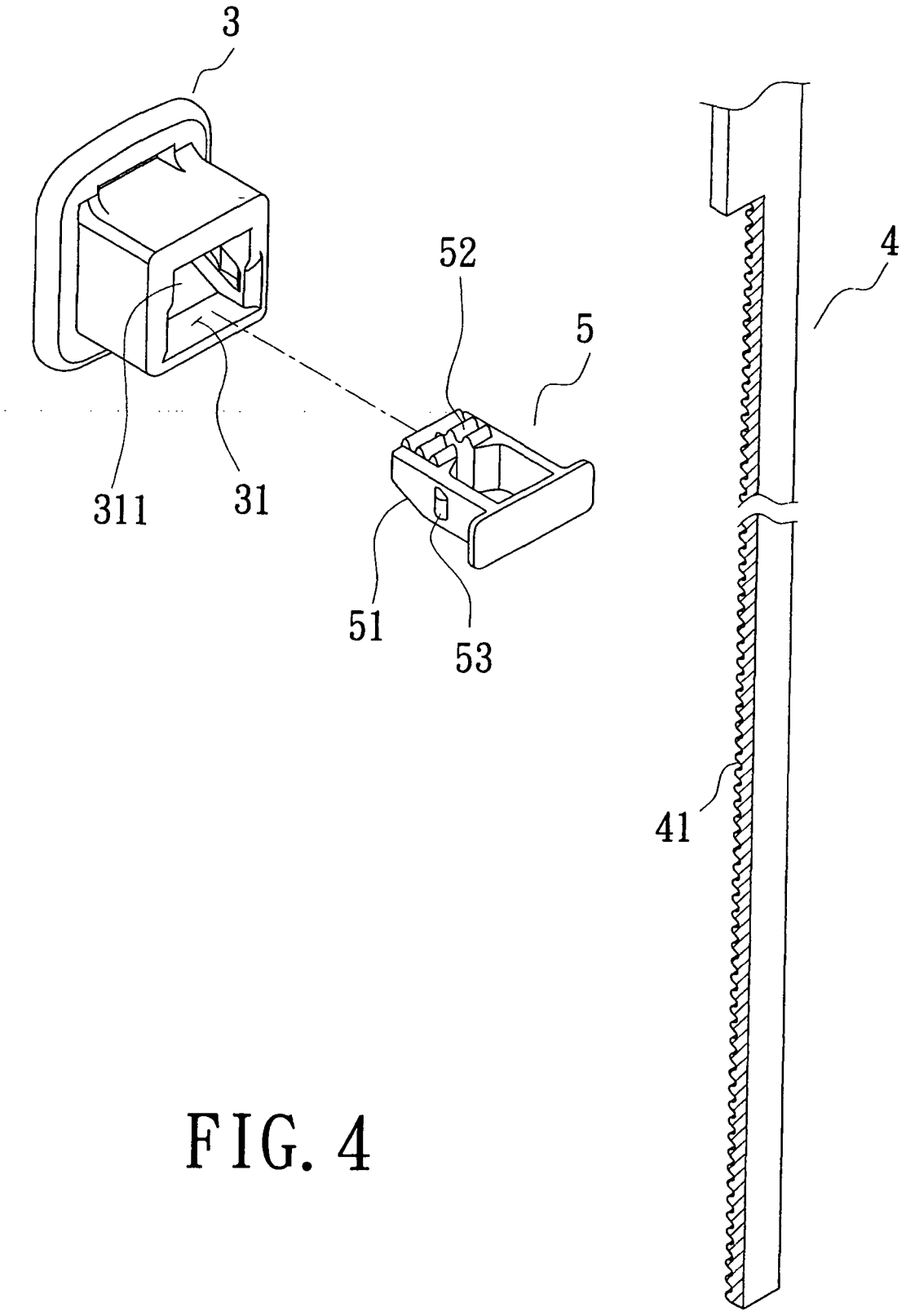


FIG. 4

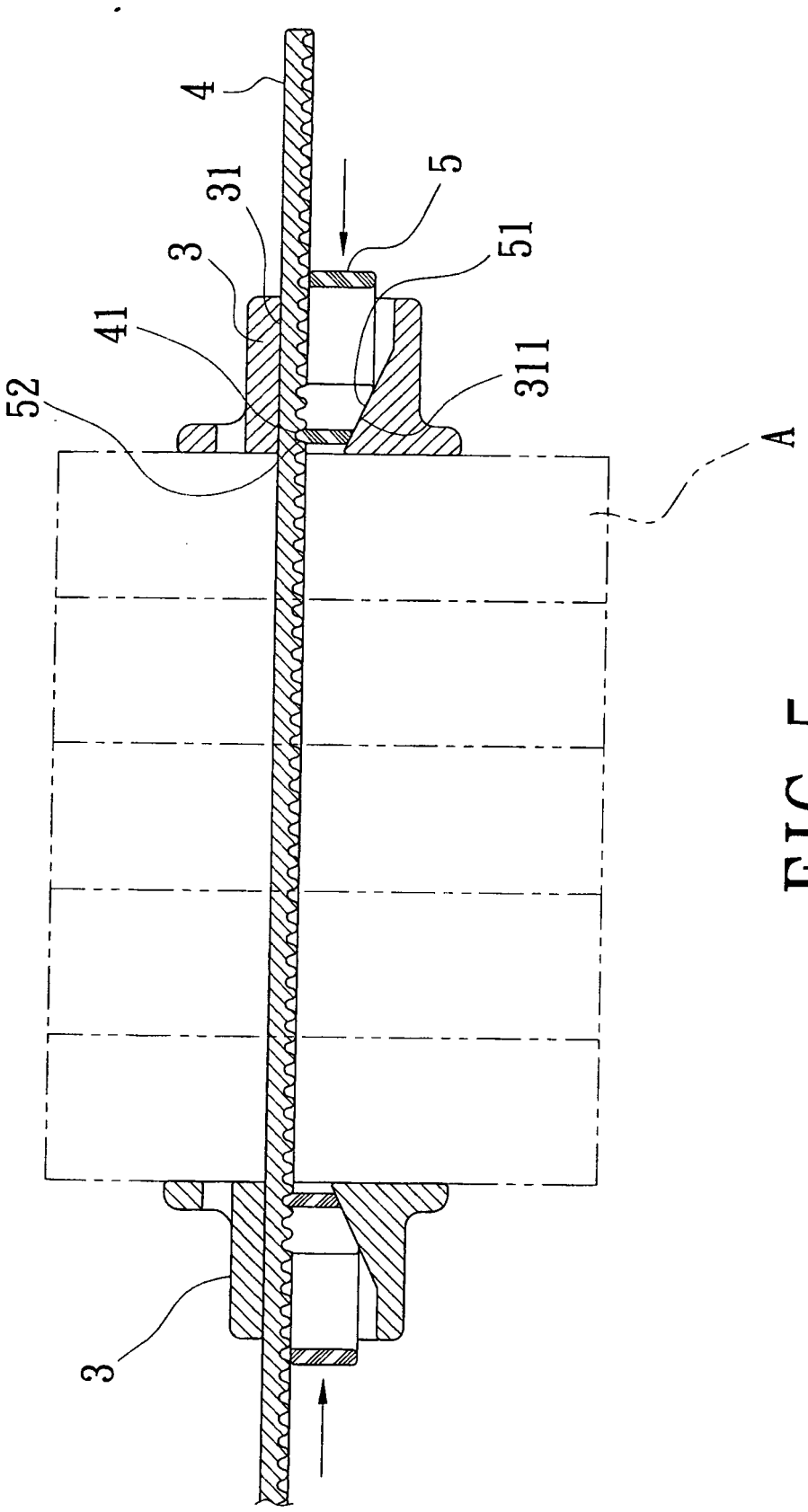


FIG. 5

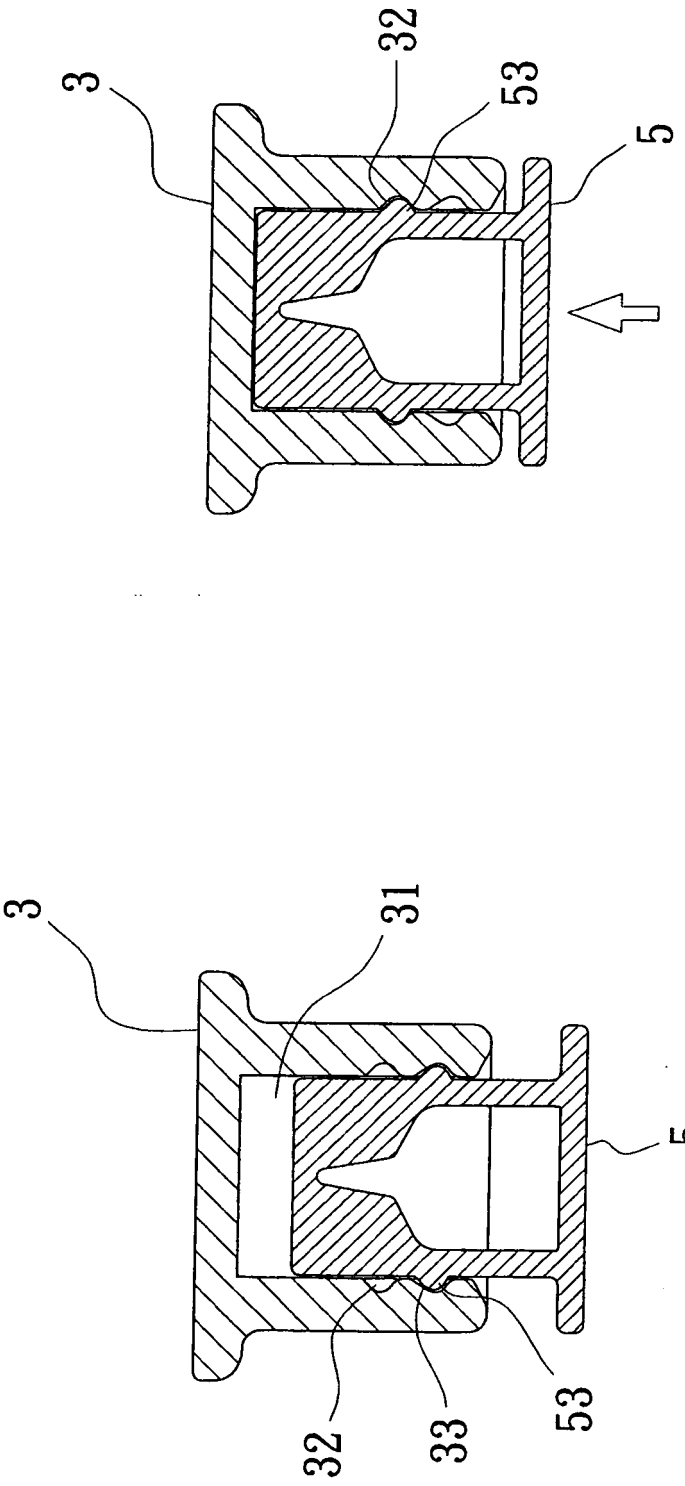


FIG. 6

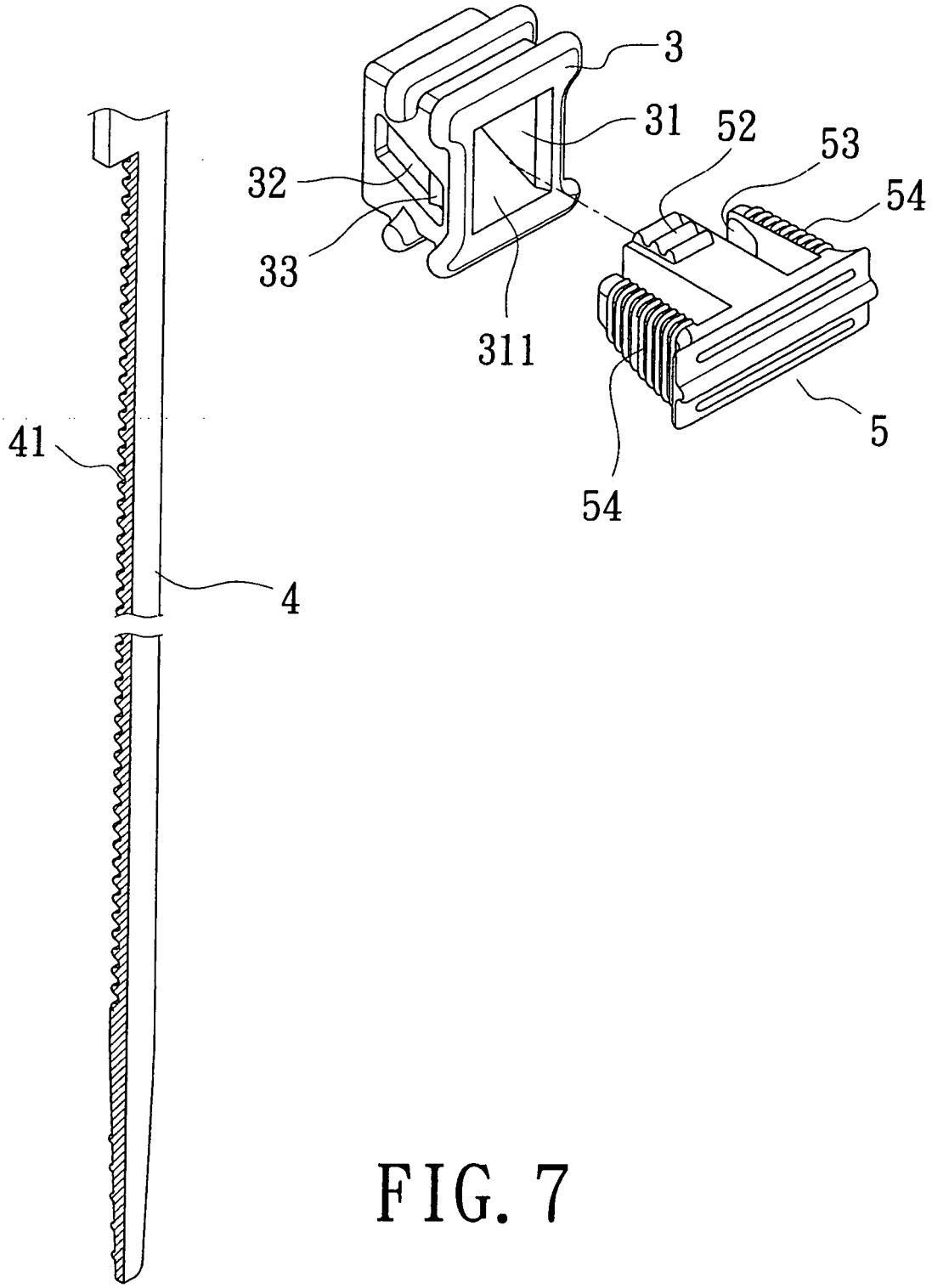
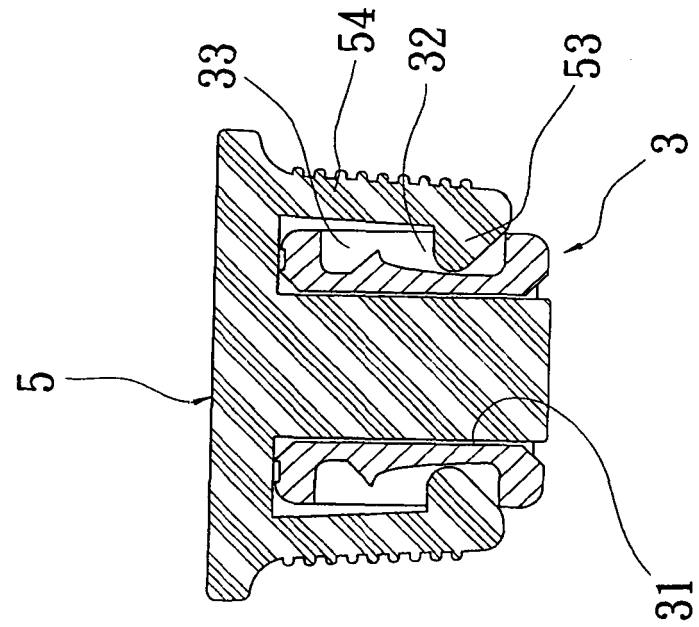


FIG. 7



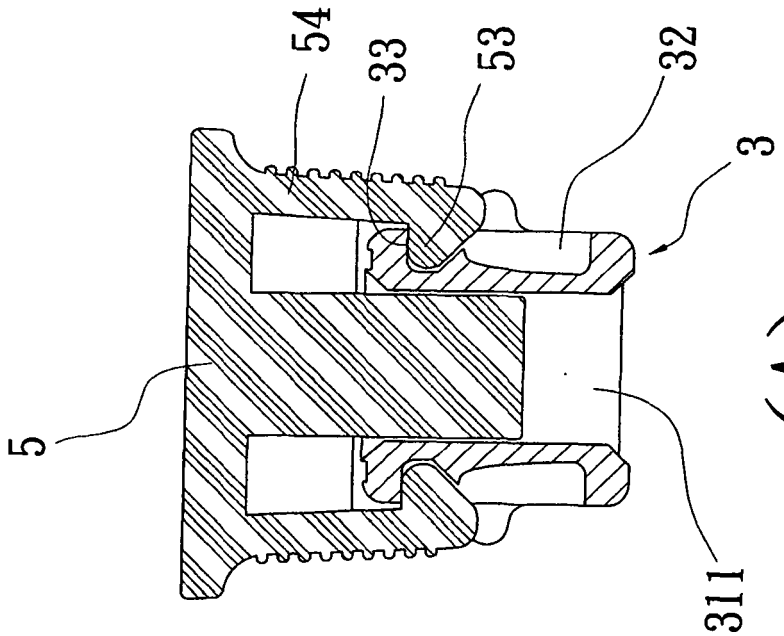


FIG. 8

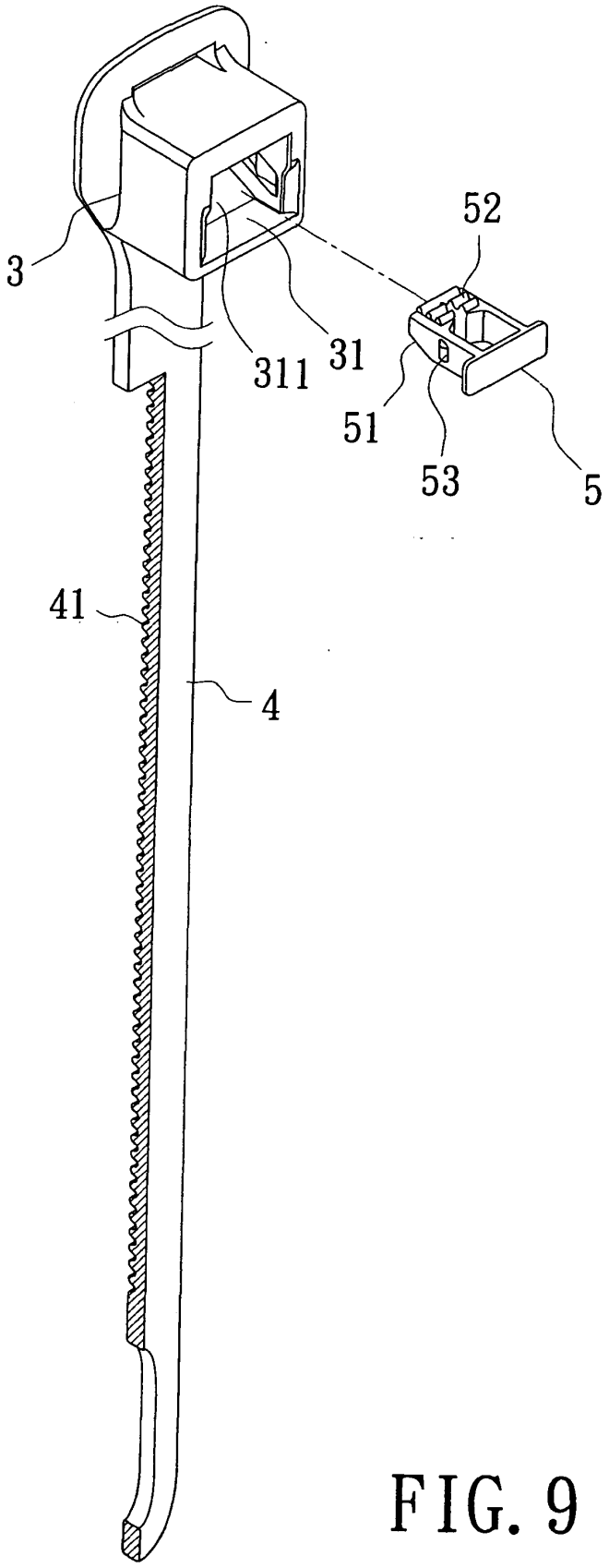


FIG. 9

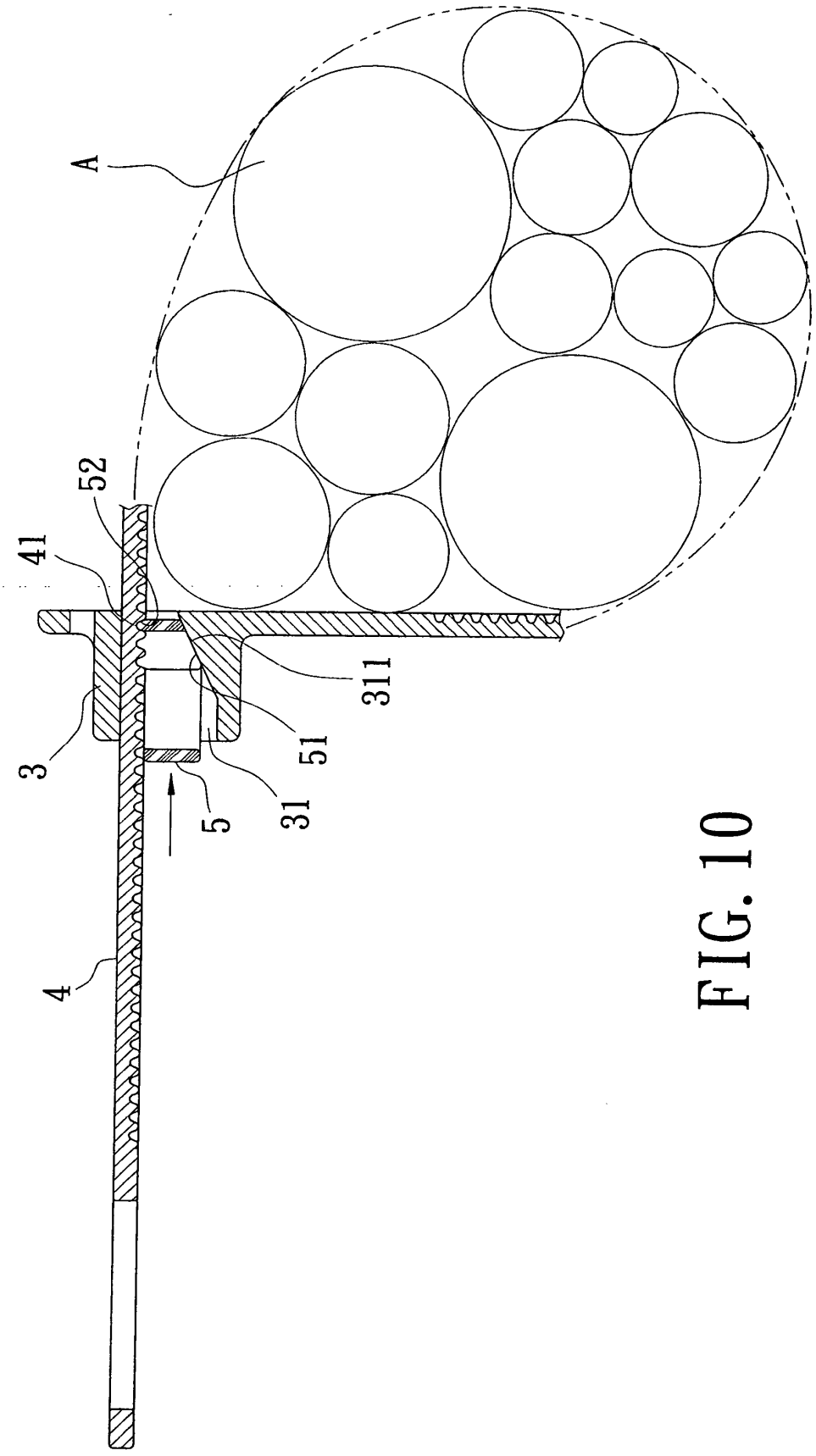


FIG. 10

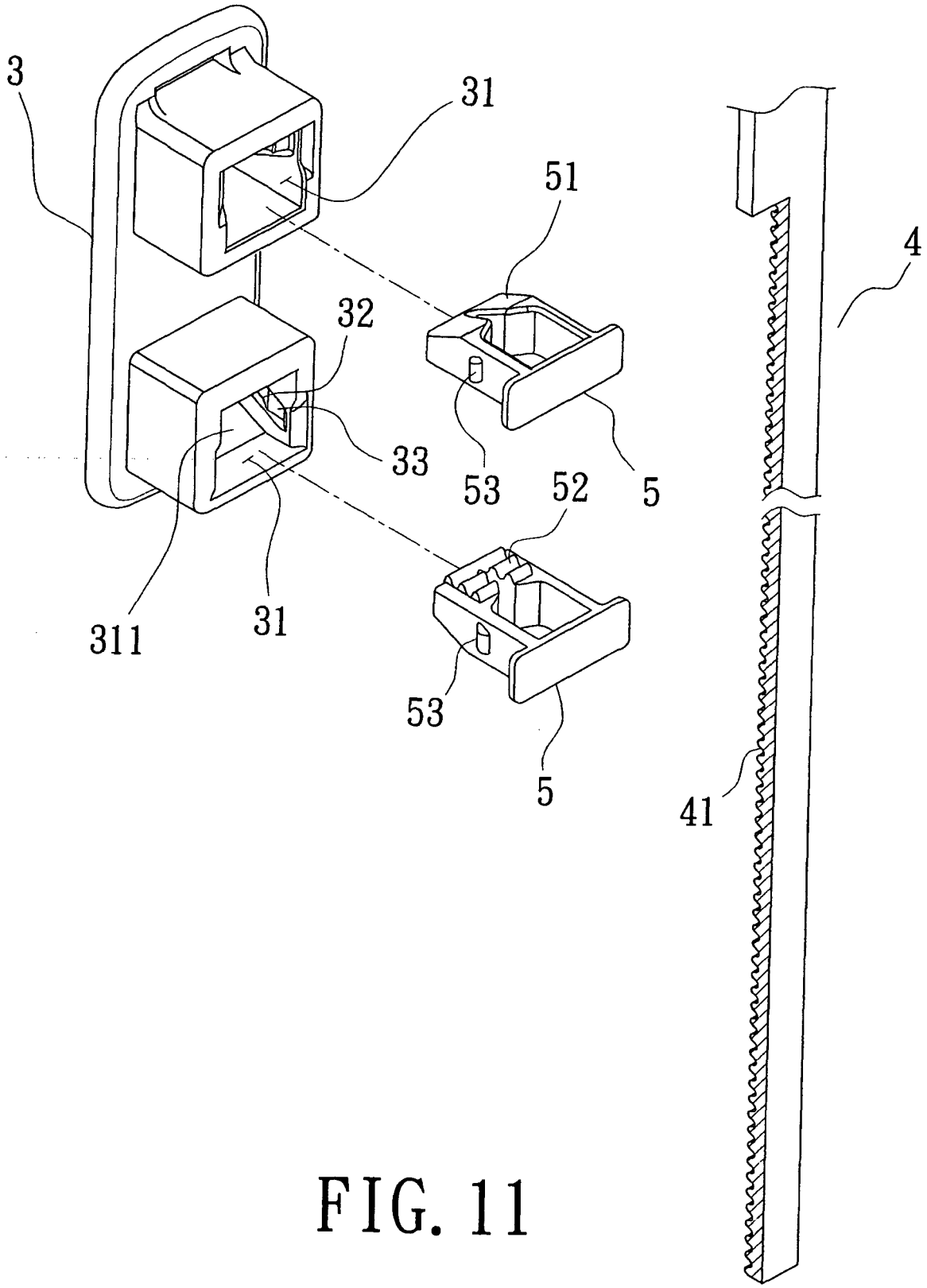


FIG. 11

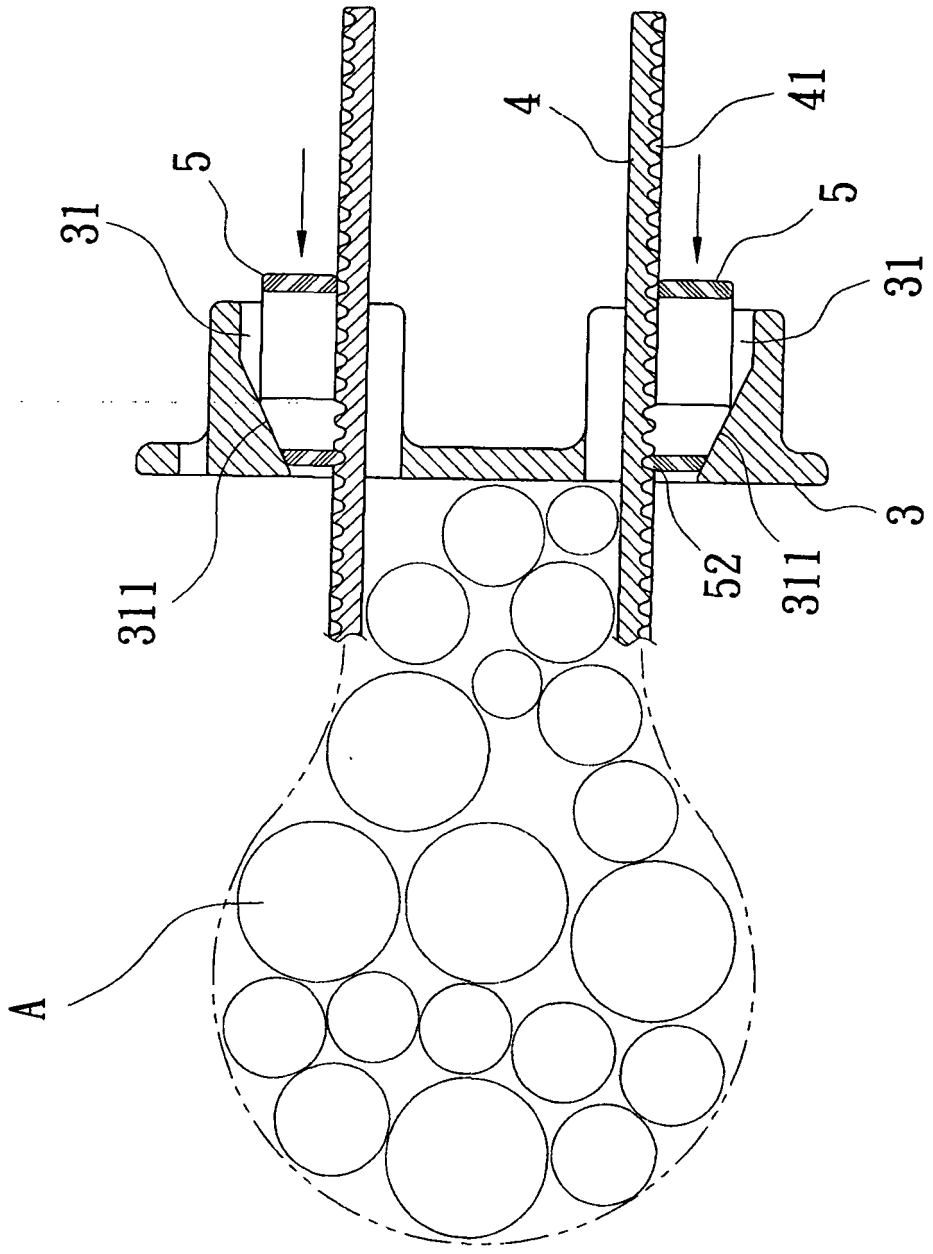


FIG. 12

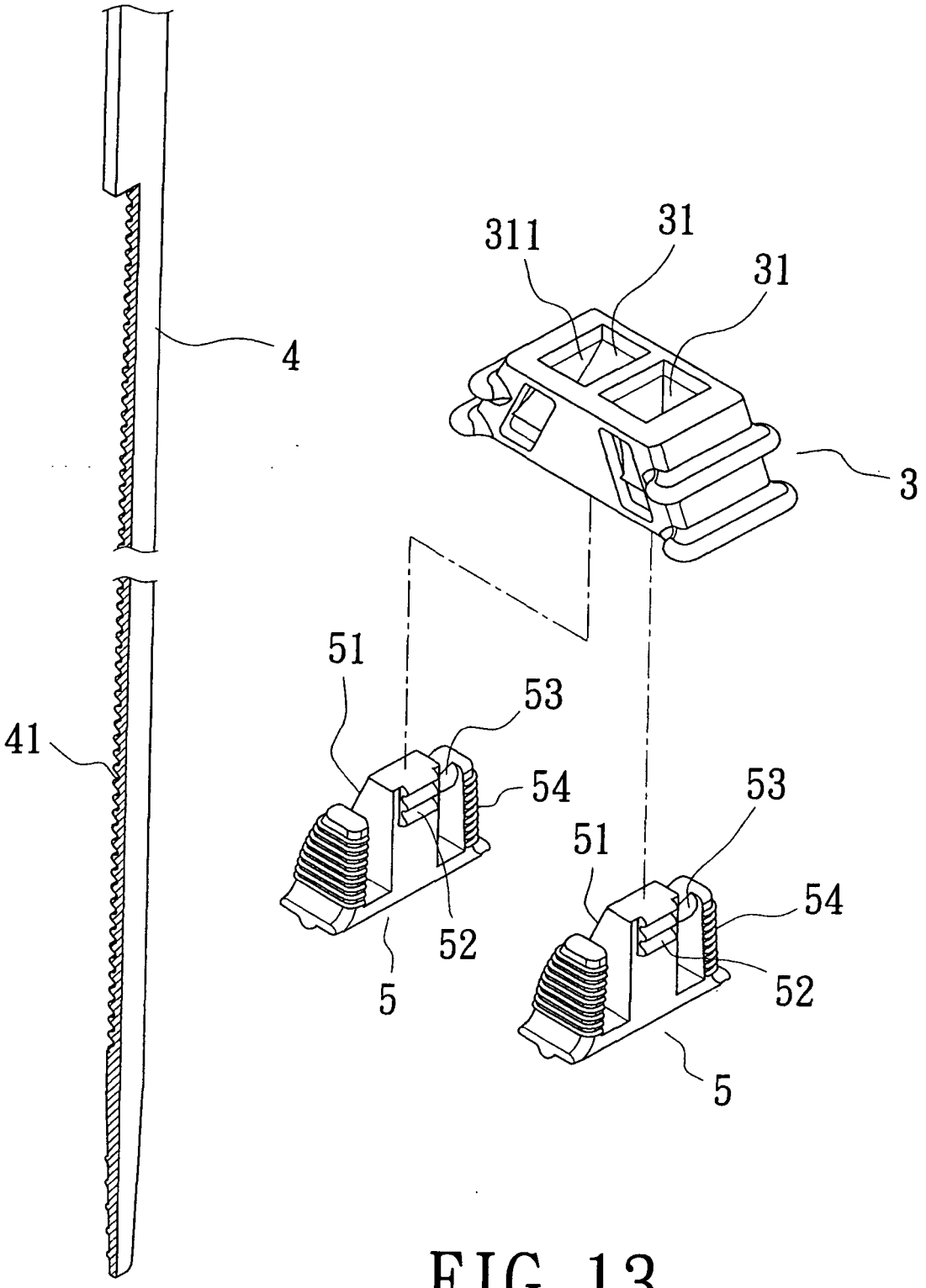


FIG. 13

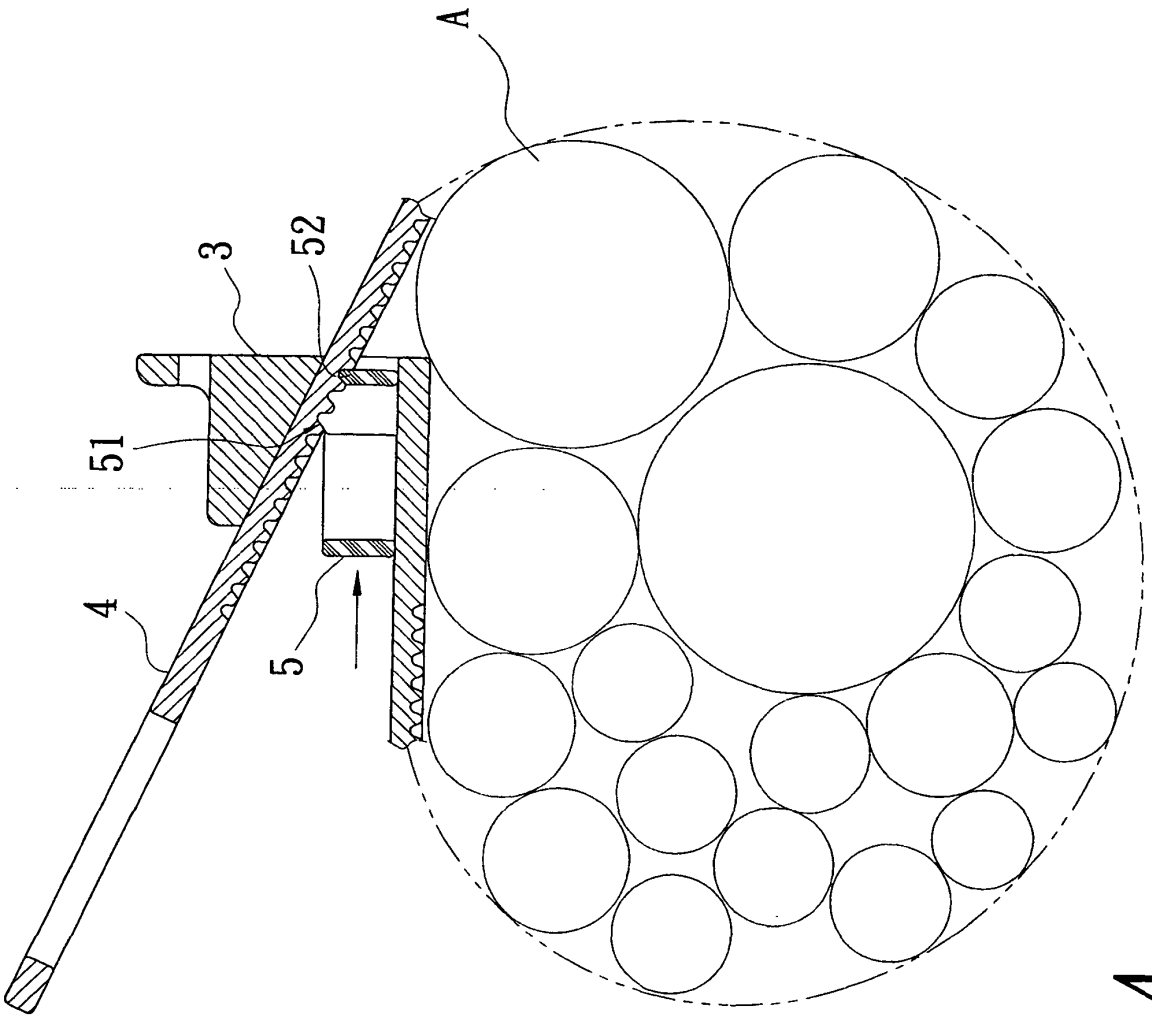


FIG. 14

REFERENCES CITED IN THE DESCRIPTION

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