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(54) **Device for changing orientation of tape of tape transfer device**

(57) A tape transfer device includes a device (3) for changing the orientation of a tape (S). The device includes a frame (10) including a first end (101) retained in a case (1) of the tape transfer device, and a second end (102) exposed outside the case and connected with an application head (40). The frame includes a first surface (11) and a second surface (12) wound by the tape. The device also includes a first guiding member (20) and a second guiding member (30) disposed on the first end 101 of the frame and on the first surface 11 and second surface (12), respectively. The first guiding member 20 changes the tape 5 from a first orientation to a second orientation. The second guiding member (30) changes the tape (5) from the second orientation to the first orientation. Further, the first 20 and second 30 guiding members prevent the tape 5 from deviating away from a predetermined path defined on the application head (40).

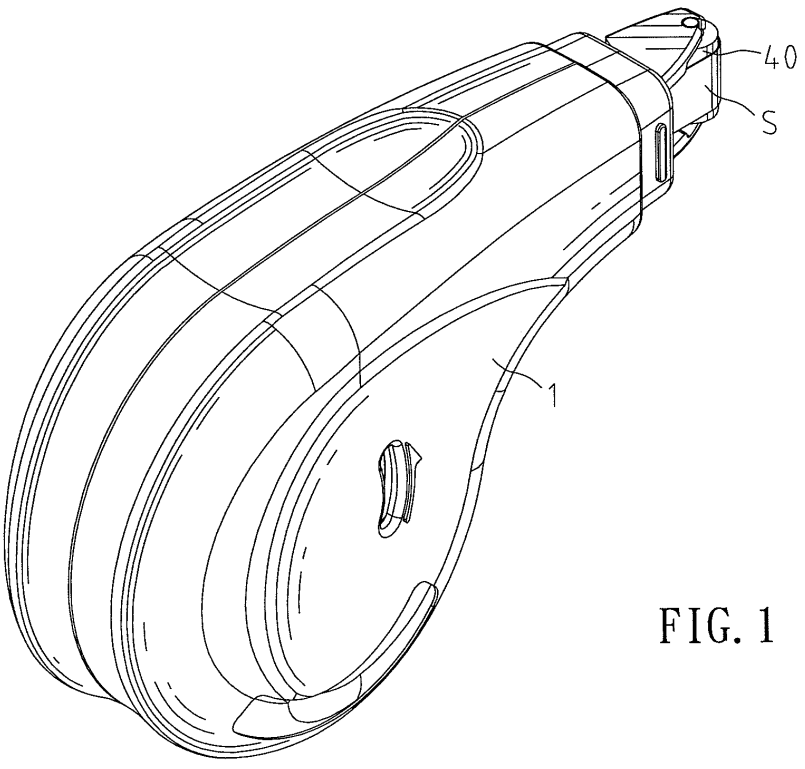

FIG. 1

EP 2 208 697 A1

Description

Background of the Invention

1. Field of the Invention

[0001] The present invention relates to a device for changing the orientation of a tape of a tape transfer device and, in particular, to a device that controls the moving direction of the tape on an application head.

2. Description of the Related Art

[0002] U.S. Pat. No. 7,228,882 entitled "TAPE DISPENSER WITH A CUSHIONED APPLICATOR TIP" shows a tape dispenser including an applicator tip 28 retained between two housings 47 and 49. The applicator tip 28 includes an end having two pivot shafts 90 extended from two lateral sides respectively. The housing 49 includes an open end and two forks 92 in proximity to the open end. Each fork 92 includes an arcuate recess, and the pivot shafts 90 of the applicator tip 28 are disposed in the arcuate recesses of the supporting members of the housing 49 in order to retain the applicator tip 28. A tape post 38 is utilized to direct a tape 32 from a supply spool 32 to the applicator tip 28 and twist the tape 32 to change its orientation and direct the tape 32 to a return spool 26.

[0003] The design of the tape post 38 suffers a problem that the tape 32 could stick with the lateral sides of the applicator tip 28, and the tape 32 on a tip 30 of the applicator tip 28 is unlikely to be maintained centrally and is likely to deviate undesirably. Further, the tape 32 can slide on the tape post 38, but the tape post 38 can not prevent the tape 32 from become entangled, and particularly, if the tape 32 is an adhesive tape. Thus, it is desirable to overcome these problems.

[0004] The present invention is, therefore, intended to obviate or at least alleviate the problems encountered in the prior art by providing a device for controlling the orientation of a tape of a tape transfer device. The device is durable and facilitates user to use the tape transfer device.

Summary of the Invention

[0005] According to the present invention, a tape transfer device includes a device for changing the orientation of a tape includes a frame, a first guiding member and a second guiding member. The first guiding member changes the tape from a first orientation to a second orientation. The second guiding member changes the tape from the second orientation to the first orientation. Further, the first and second guiding members prevent the tape from deviating away from a predetermined path defined on an application head of the tape transfer device.

[0006] It is an object of the present invention that the first guiding member directs and causes the change in orientation of the tape and the second guiding member guides and causes the tape to return to its original orientation. Furthermore, the first and second guiding members prevent the tape from deviating away from the predetermined path defined on the application head.

[0007] It is another object of the present invention that the first guiding member includes a first guiding section which is offset from the frame at an angle, and the first guiding section is adapted to twist the tape and enable the tape to move smoothly to the application head.

[0008] It is another object of the present invention that the frame defines an imaginary axis and the second guiding member is away from the axis at a distance, and the distance is modified in a manner that the tape is prevented from deviating away from the predetermined path defined on the application head.

[0009] It is a further object of the present invention that the first and second guiding members are spaced from the application head at a distance, and the tape has a width. The ratio of the distance to the width is an appropriate value so that the tape is twisted to a substantially flat surface at the application head.

[0010] Other objects, advantages, and new features of the present invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanied drawings

Brief Description of the Drawings

[0011]

Fig. 1 is a perspective view of a tape transfer device in accordance with the present invention.
Fig. 2 is an exploded, perspective view of the tape transfer device shown in Fig. 1.
Fig. 3 is a perspective view of a device for changing the orientation of a tape in accordance with the present invention.
Fig. 4 is a side view of the device shown in Fig. 3.
Fig. 5 is a rear view of the device shown in Fig. 3.
Fig. 6 is a perspective view of a reel device in accordance with the present invention, with the reel device incorporated with the device for changing the orientation of the tape.
Fig. 7 is a cross-sectional view of Fig. 6.
Fig. 8 is a front view of Fig. 6.
Fig. 9 is a rear view of Fig. 6.

Detailed Description of the Preferred Embodiment

[0012] While the best embodiments will be illustrated and described with reference to the drawings hereafter, numerous modifications come to mind without significantly departing from the spirit of invention, and the scope of invention is not limited by the specific embodiments.

[0013] Figs. 1 and 2 show a perspective and an exploded perspective view of a tape transfer device. The tape transfer device includes a case 1 housing a reel

device 2 and a device 3 for changing the orientation of a tape. The device 3 is retained in the case 1. A tape "S" is directed from a supply spool of the reel device 2 to the device 3 and to a return spool of the reel device 2 thereafter. The device 3 is adapted to twist the tape "S" through 90 degrees as it is unwound from the supply spool, and the tape transfer device applies the tape "S" to a surface to be covered in a way known as a "side-application". The tape "S" could be a tape that is known as a correction tape or a tape that can deliver a film that has an adhesive effect.

[0014] Figs. 3 through 5 show that the device 3 including a frame 10, a first guiding member 20, and a second guiding member 30. The frame 10 includes a first end 101 retained in the case 1 of the tape transfer device and a second end 102 connected with an application head 40, which presses against and moves over the surface to transfer the masking material of the correction tape and/or the adhesive film on the surface. The frame 10 includes a substantially flat first surface 11 and a substantially flat second surface 12 opposite to the first surface 11. The tape "S" is wound on the first and second surfaces 11 and 12. Additionally, the first surface 11 includes a protrusion 111 extending in an axial direction of the first surface 11 and the second surface 12 includes a protrusion 121 extending in an axial direction of the second surface 12, respectively. The protrusion 111 contacts with the tape "S" and causes a reduced contact area between the tape "S" and the first surface 111. Likewise, the protrusion 121 contacts with the tape "S" and causes a reduced contact area between the tape "S" and the second surface 12. Therefore, the tape "S" is prevented from sticking to the first and second surfaces 11 and 12 and its delivery is not impeded.

[0015] The first end 101 of the frame 10 includes a first lateral wall 13 and a second lateral wall 14 opposite to each other. The first and second lateral walls 13 and 14 extend transversely to the first and second surfaces 11 and 12. The first and second lateral walls 13 and 14 are retained in the case 1 in order to prevent displacement of the device 3.

[0016] The device 3 defines an imaginary axis "H" which extends in an axial direction of the frame 10. The frame 10 has a shape that is almost symmetrical about the axis "H".

[0017] The first guiding member 20 is formed on the first surface 11 and is in proximity to the first lateral wall 13. Additionally, the first guiding member 20 extends opposite to the second surface 12 and is disposed on an extremity of the first end 101 of the frame 10. The first guiding member 20 directs and causes the change in orientation of the tape "S" from the supply spool to the first surface 11 of the frame 10. Likewise, the first guiding member 20 includes a first guiding section 21 contacting with the tape "S", and the first guiding section 21 includes a guiding edge 213 facilitating the tape "S" to move over the first guiding section 21 smoothly. The first guiding section 21 also includes a first terminal edge 211 connected with the first surface 11 of the frame 10 and a second terminal edge 212 disposed in proximity to the first lateral wall 13, and the lateral wall 13 prevents the tape "S" coming off the first guiding section 21 from the second terminal edge 212. The first guiding section 21 is offset from the first surface 11 at an angle "α", and the angle "α" has a range from 90° to 150° in order to facilitate the first guiding section 21 to twist the tape "S" and enable the tape "S" to move smoothly. In this embodiment, the first guiding section is offset from the first surface 11 at 140°.

[0018] The second guiding member 30 is formed on the second surface 12 and is in proximity to the first lateral wall 13. Additionally, the second guiding member 30 extends opposite to the first surface 11 and is disposed on the extremity of the first end 101 of the frame 10. The second guiding member 30 directs and causes the tape "S" to return to its original orientation so as to go back to the reel device 2. The second guiding member 30 includes a second guiding section 31 contacting with the tape "S", and the second guiding section 31 includes a guiding edge 313 facilitating the tape "S" to move over the second guiding section 31 smoothly. The second guiding section 31 is offset from the second surface 12 at an angle "β", and the angle "β" is near or equal to 90°. Thus, the second guiding section 31 is substantially perpendicular to the second surface 12. The second guiding member 30 directs and causes the tape "S" to return to the orientation of the reel device 2 so as to collect the used tape "S" conveniently. Furthermore, the second guiding member 30 extends from a side of the first lateral wall 13 toward the second lateral wall 14 and terminates before the axis "H", and the second guiding section 31 is away from the axis "H" at a distance "C". The distance "C" has a range from 0 to 1 cm. In a preferred embodiment, the distance of "C" is 0 cm. It is understood that if the distance of "C" is greater than 1 cm, the tape "S" would deviate away from a predetermined path defined on where the tape "S" is twisted, and impedes the application head 40 to transfer the masking material of the correction tape and/or the adhesive film on the surface. Further, it is understood that the range of "C" varies with a size of the tape transfer device correspondingly. Therefore, the present invention is not limited to the said range of "C".

[0019] Figs. 6 through 9 are schematic diagrams of the reel device 2 and the device 3 for changing the orientation of the tape "S". The tape "S" is directed from the reel device 2 to the first surface 11 by the first guiding member 20. The angle "α" enables the first guiding section 21 of the first guiding member 20 to change the orientation of the tape "S" and prevents the tape "S" from deviating away from a predetermined path defined on the application head 40 and interfering with the frame 10 in order to move the tape "S" smoothly. The tape "S" is then directed from the first surface 11 to the application head 40 and to the second surface 12. The tape "S" is directed from the second surface 12 to the reel device 2 by the second

guiding member 30 thereafter. As mentioned, the second guiding member 30 extends from the side of the first lateral wall 13 toward the second lateral wall 14 and terminates before the axis "H" in order to maintain the tape "S" in a central path defined on the application head 40 and prevent the tape "S" from deviating away from the path. The first and second guiding members 20 and 30 are spaced from the application head 40 at a distance "D1". The tape "S" has a width of "D2". The ratio of "D1" to "D2" is not less than 3 so that the tape "S" is twisted to a substantially flat surface at the application head 40.

[0020] The tape "S" has a transfer film i.e. the masking material or the adhesive film, and the application head 40 is adapted to transfer the transfer film to a surface. Before the tape "S" is directed from the reel device 2 to the application head 40, the tape "S" includes the transfer film formed thereon. The transfer film is transferred to the surface by the application head 40, so after the tape "S" passes the application head 40, the tape "S" is left, but without transfer film retained thereon and the tape "S" is directed to the reel device 2.

[0021] In view of the present invention, the device 3 for changing the orientation of the tape "S" of the present invention includes the frame 10, the first guiding member 20, and the second guiding member 30. The frame 10 includes the first end 101 retained in the case 1 of the tape transfer device and the second end 102 exposed outside the case 1 and connected with the application head 40. The frame 10 includes the first and second surfaces 11 and 12, and the tape "S" is wound on the first and second surfaces 11 and 12. The first and second guiding members 20 and 30 are disposed on the first end 101 of the frame 10, and the first guiding member 20 is disposed on the first surface 11 and the second guiding member 30 is disposed on the second surface 12, respectively. The first guiding member 20 directs and causes the change in orientation of the tape "S", and the second guiding member 30 directs and causes the tape "S" to return to its original orientation. Furthermore, the first and second guiding members 20 and 30 prevent the tape "S" from deviating away from the predetermined path defined on the application head 40.

[0022] In view of forgoing, the first and second guiding members 20 and 30 control the moving direction of the tape "S" on the application head 40 of the tape transfer device and prevent the tape "S" from deviating away from the predetermined path defined on the application head 40 in order not to impede the application head 40 to transfer the transfer film on the surface.

[0023] Furthermore, the first guiding section 21 of the first guiding member 20 is offset from the first surface 11 at an angle "α", and the angle "α" has a range from 90° to 150° in order to facilitate the first guiding section 21 to twist the tape "S" and enable the tape "S" to move smoothly to the application head 40.

[0024] Furthermore, the second guiding member 30 is away from the axis "H" at a distance "C", and the distance "C" has a range from 0 to 1 cm in order to prevent the tape "S" from deviating away from the predetermined path defined on the application head 40.

[0025] Moreover, the first and second guiding members 20 and 30 are spaced from the application head 40 at the distance "D1". The tape "S" has the width of "D2". The ratio of "D1" to "D2" is not less than 3 so that the tape "S" adheres better to the shape of application head 40.

[0026] While the specific embodiments have been illustrated and described, numerous modifications come to mind without significantly departing from the spirit of invention, and the scope of invention is only limited by the scope of the accompanying claims.

Claims

1. A device (3) for changing the orientation of a tape (S) of a tape transfer device comprising:

   a frame (10) including a first end (101) and a second end (102), with the first end (101) retained in a case (1) of the tape transfer device, with the second end exposed outside the case, a first surface (11) and a second surface (12), and with the tape wound on the first and second surfaces of the frame;
   a first guiding member (20) disposed on the first end of the frame and on the first surface and including a first guiding section (21) contacting with the tape, with the first guiding section causing changes in orientation of the tape; and
   a second guiding member (30) disposed on the first end of the frame and on the second surface and including a second guiding section (31) contacting with the tape, with the second guiding section causing the tape to return to its original orientation.

2. The device as claimed in claim 1 wherein the first guiding section (21) is offset from the first surface (11) of the frame (10) at an angle (α).

3. The device as claimed in claim 2 wherein the first guiding section (21) includes a first terminal edge (211) and a second terminal edge (212), with the first terminal edge connected with the first surface (11) of the frame (10), and with the second terminal edge disposed in proximity to a lateral side of the frame.

4. The device as claimed in claim 2 wherein the angle (α) has a range from 90° to 150°.

5. The device as claimed in claim 1 wherein the second guiding section (31) is offset from the second surface (12) at an angle (β), and wherein the angle is substantially 90°.

6. The device as claimed in claim 2 wherein the second guiding section (31) is offset from the second surface (12) at an angle (β), and wherein the angle is substantially 90°.

7. The device as claimed in claim 1 wherein the frame (10) defines an imaginary axis (H) which extends in an axial direction of the frame, and wherein the second guiding member (30) extends from a lateral side of the frame, with the second guiding section (31) not extending past the axis, and with the second guiding section being away from the axis at a distance (C).

8. The device as claimed in claim 7 wherein the distance has a range from 0 to 1 cm.

9. The device as claimed in any one of claims 1 through 6 wherein the second end of the frame is connected with an application head, wherein the first and second guiding members prevent the tape from deviating away from a predetermined path defined on the application head, wherein the first and second guiding members (20, 30) are spaced from the application head (40) at a distance (D1), and wherein the tape (S) has a width (D2), and with the ratio of the distance to the width being not less than 3.

10. The device as claimed in claim 1 wherein the first end (101) of the frame (10) includes a first lateral wall (13) and a second lateral wall (14) opposite to each other, with the first and second lateral walls extending transversely to the first and second surfaces (11, 12) respectively, and wherein the first and second guiding members (20, 30) are disposed in proximity to the first lateral wall.

11. The device as claimed in claim 1 wherein the first surface (11) includes a protrusion (111) extending in an axial direction of the first surface, and the second surface (12) includes a protrusion (121) extending in an axial direction of the second surface, respectively.

12. The device as claimed in claim 1 wherein the first guiding section (21) includes a first guiding edge (213) facilitating the tape (S) to move over the first guiding section (21) smoothly, and the second guiding section (31) includes a second guiding edge (313) facilitating the tape to move over the second guiding section smoothly, respectively.

13. The device as claimed in claim 1 wherein the tape (S) has a transfer film which is a masking material of a correction tape.

14. The device as claimed in claim 1 wherein the tape (S) has a transfer film which is a film with an adhesive effect.

15. The device as claimed in claim 1 wherein the tape (S) has a transfer film, and wherein the application head (40) is adapted to transfer the transfer film to a surface.

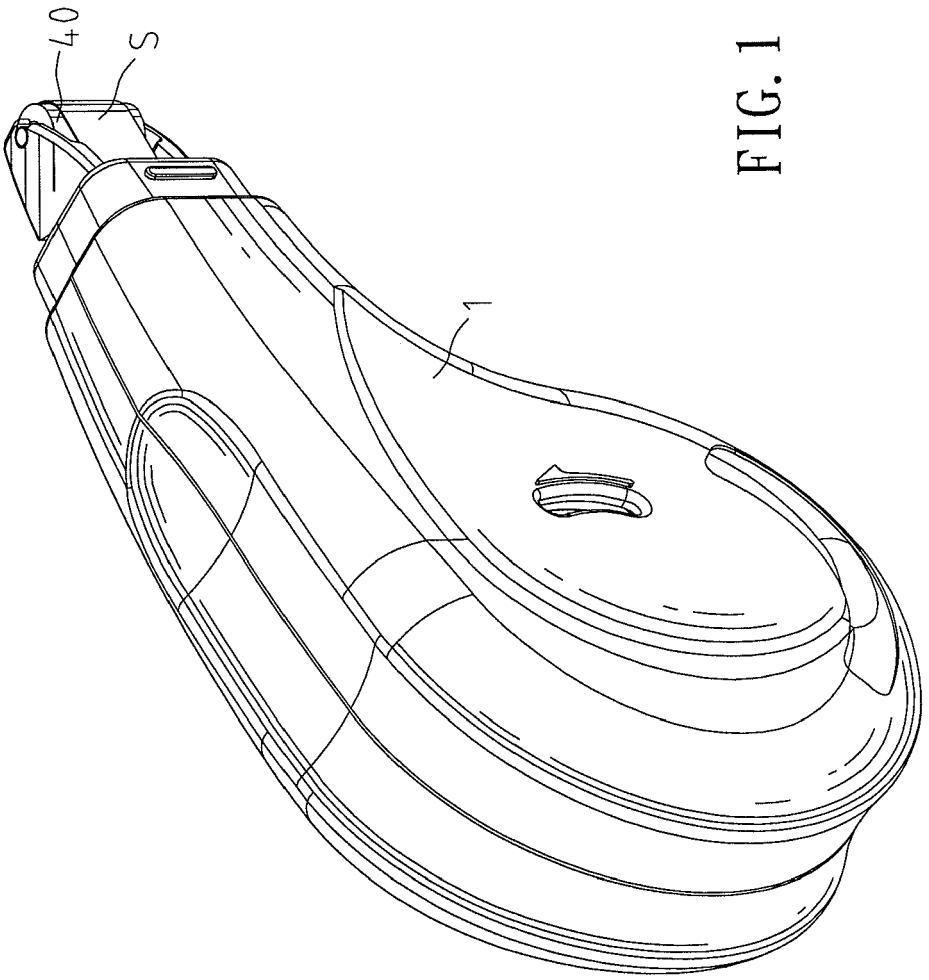

FIG. 1

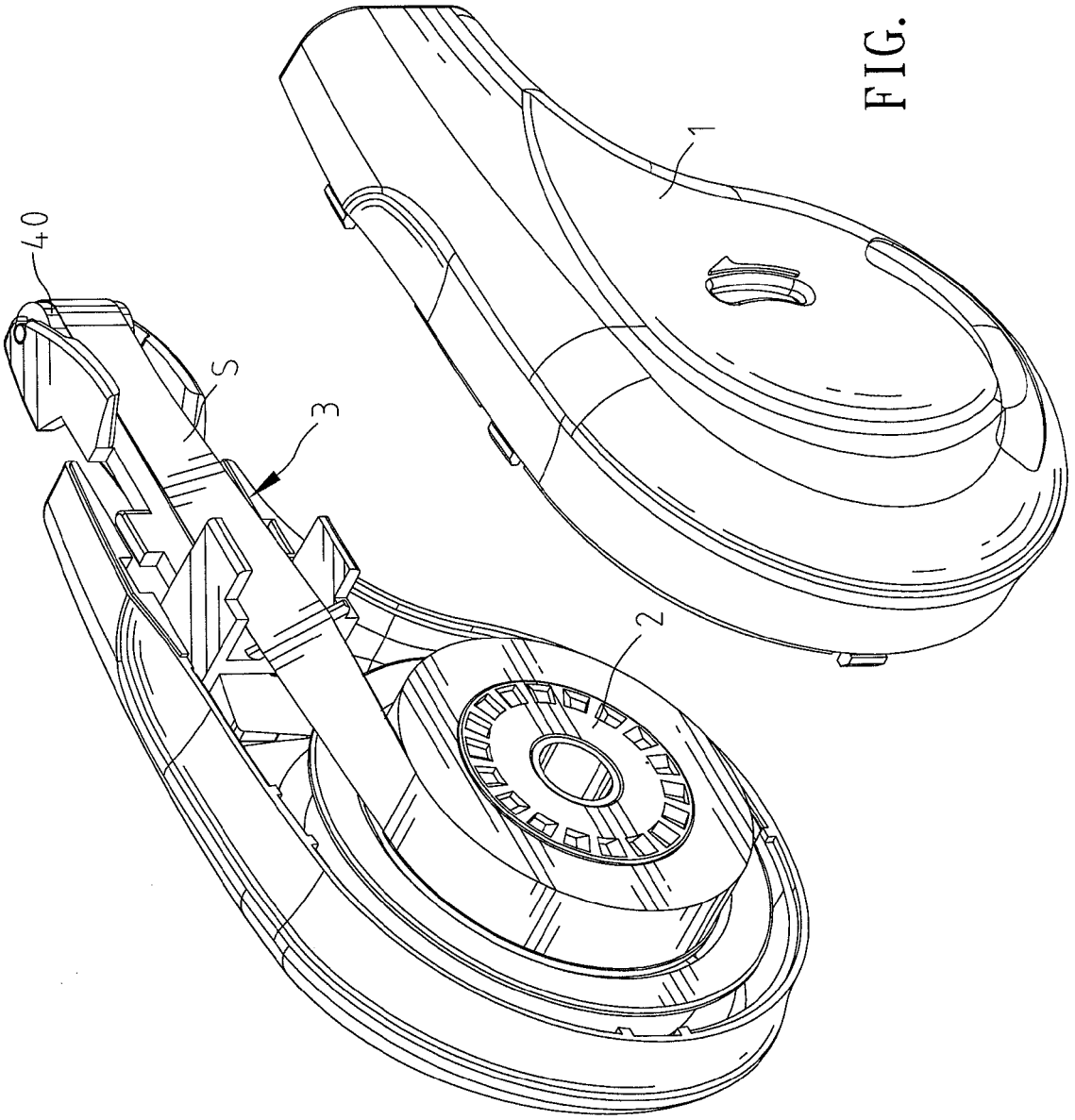

FIG. 2

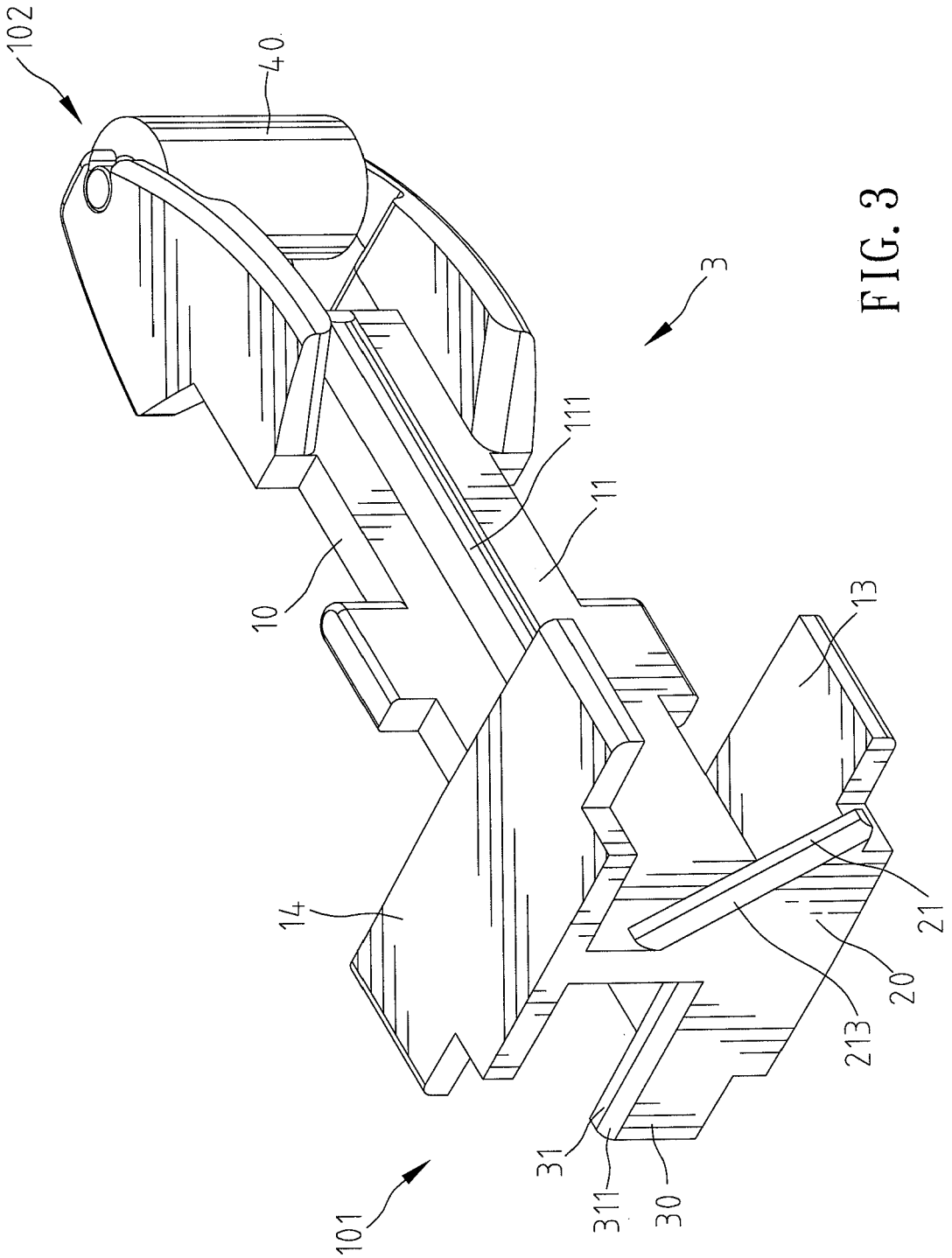

FIG. 3

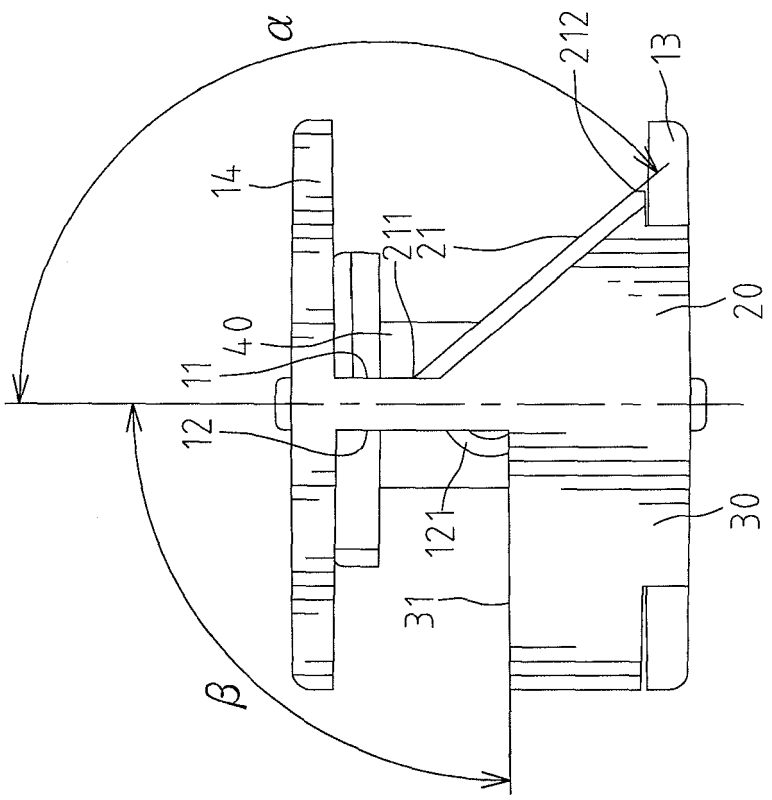

FIG. 4

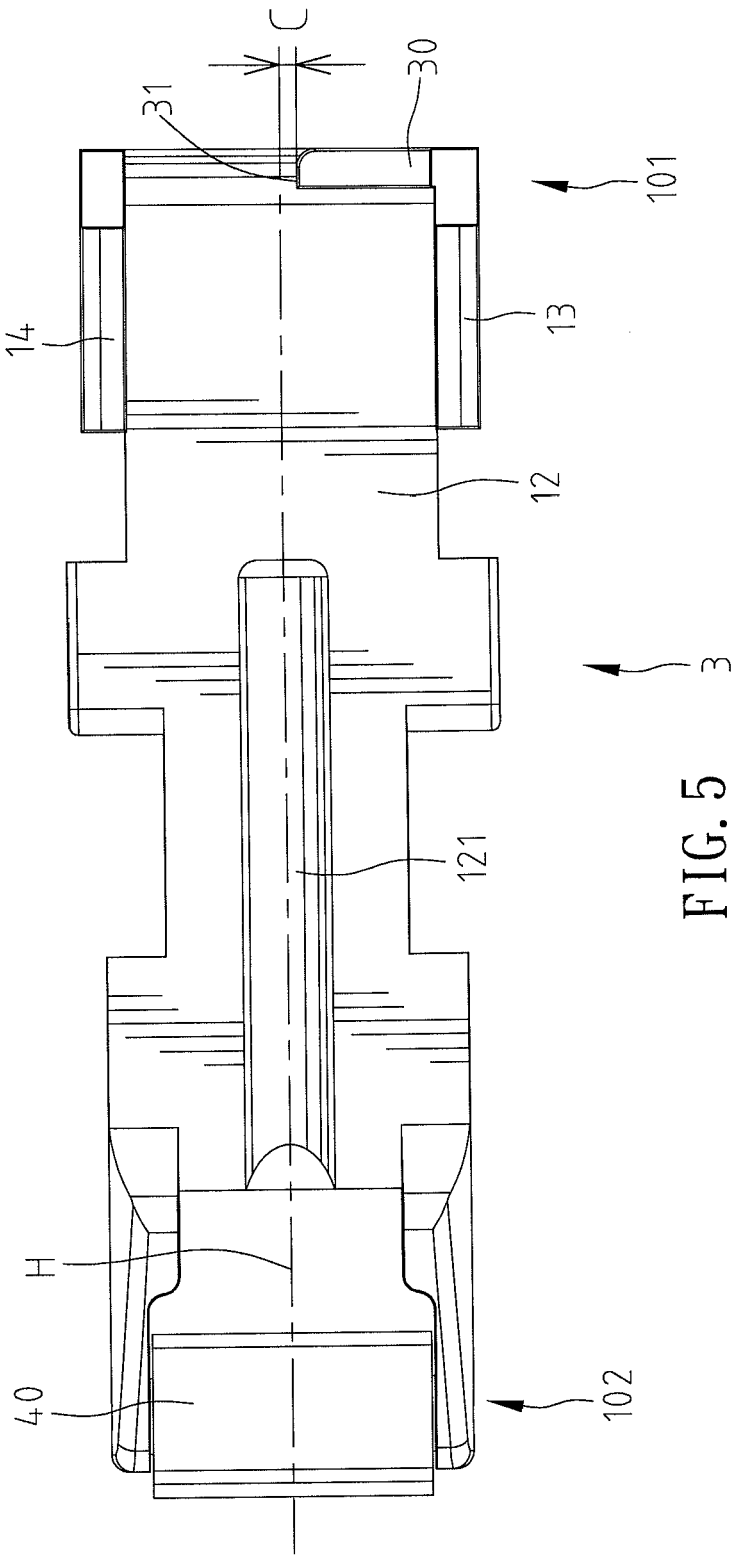

FIG. 5

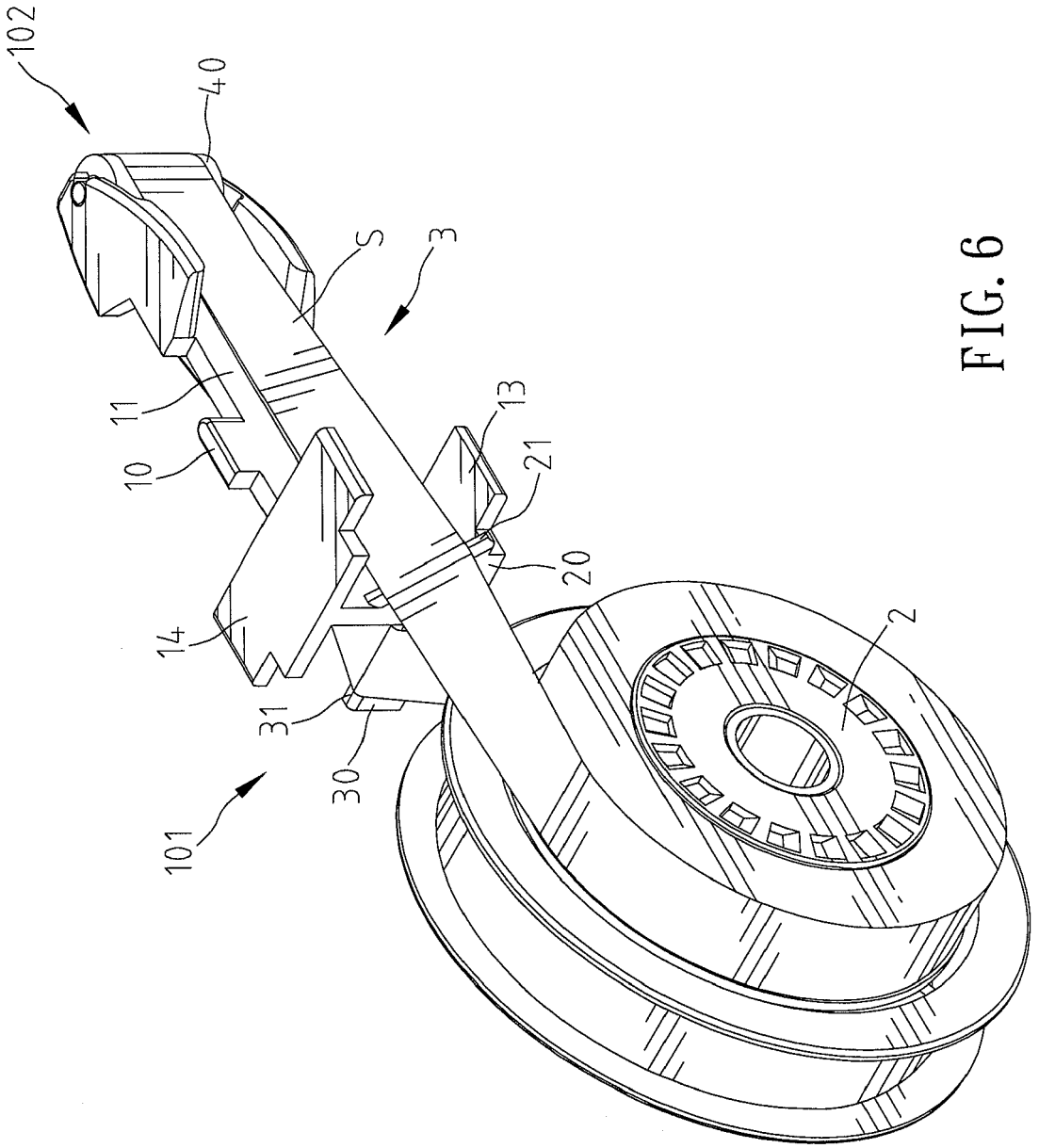

FIG. 6

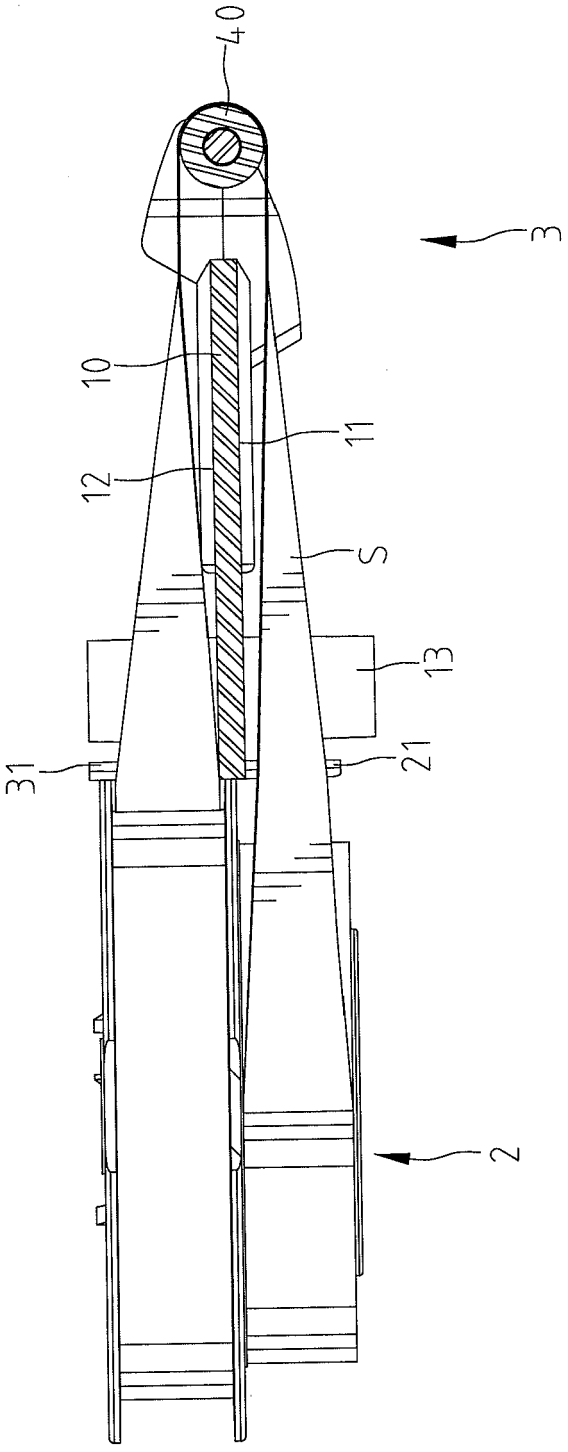

FIG. 7

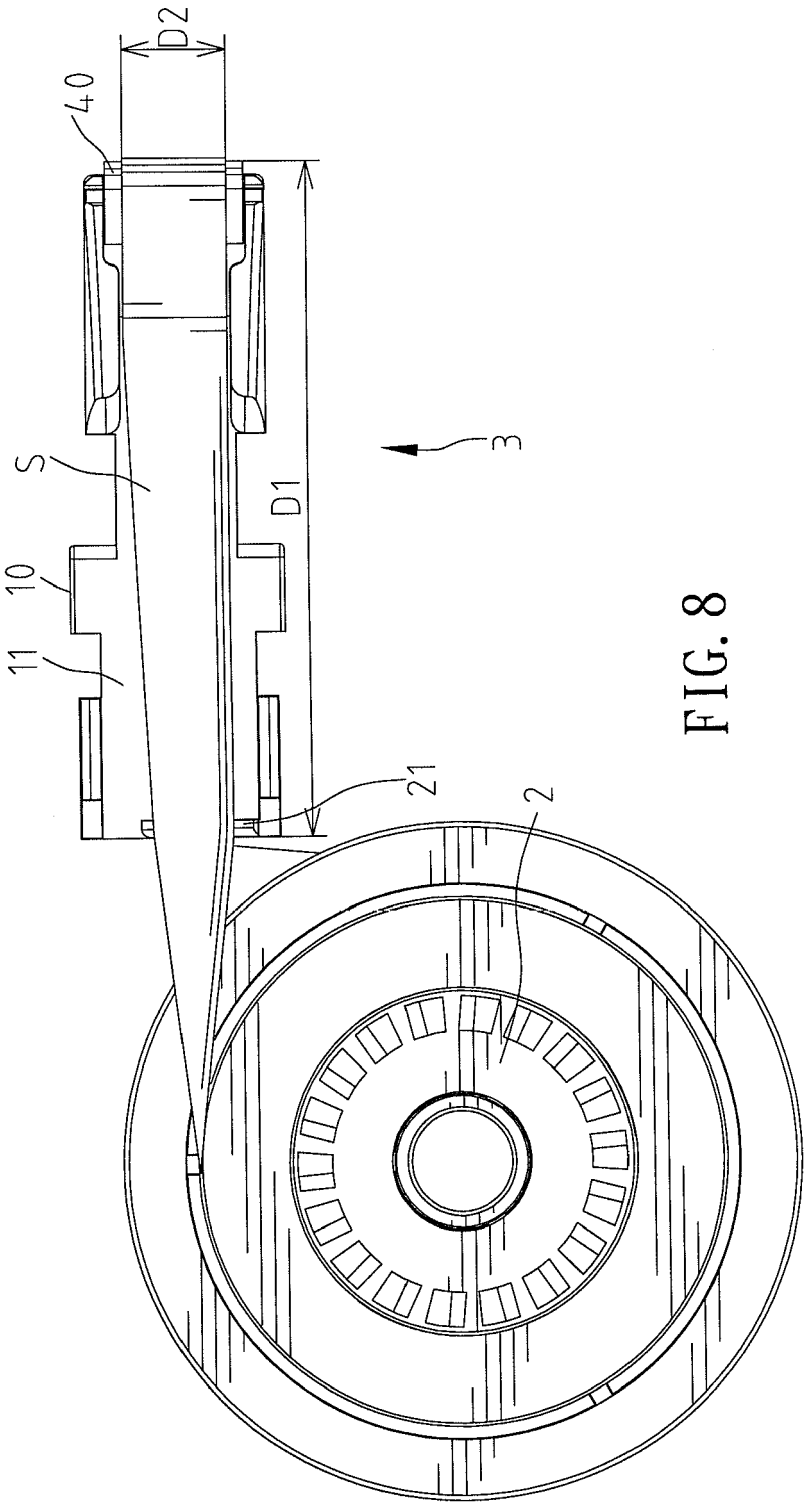

FIG. 8

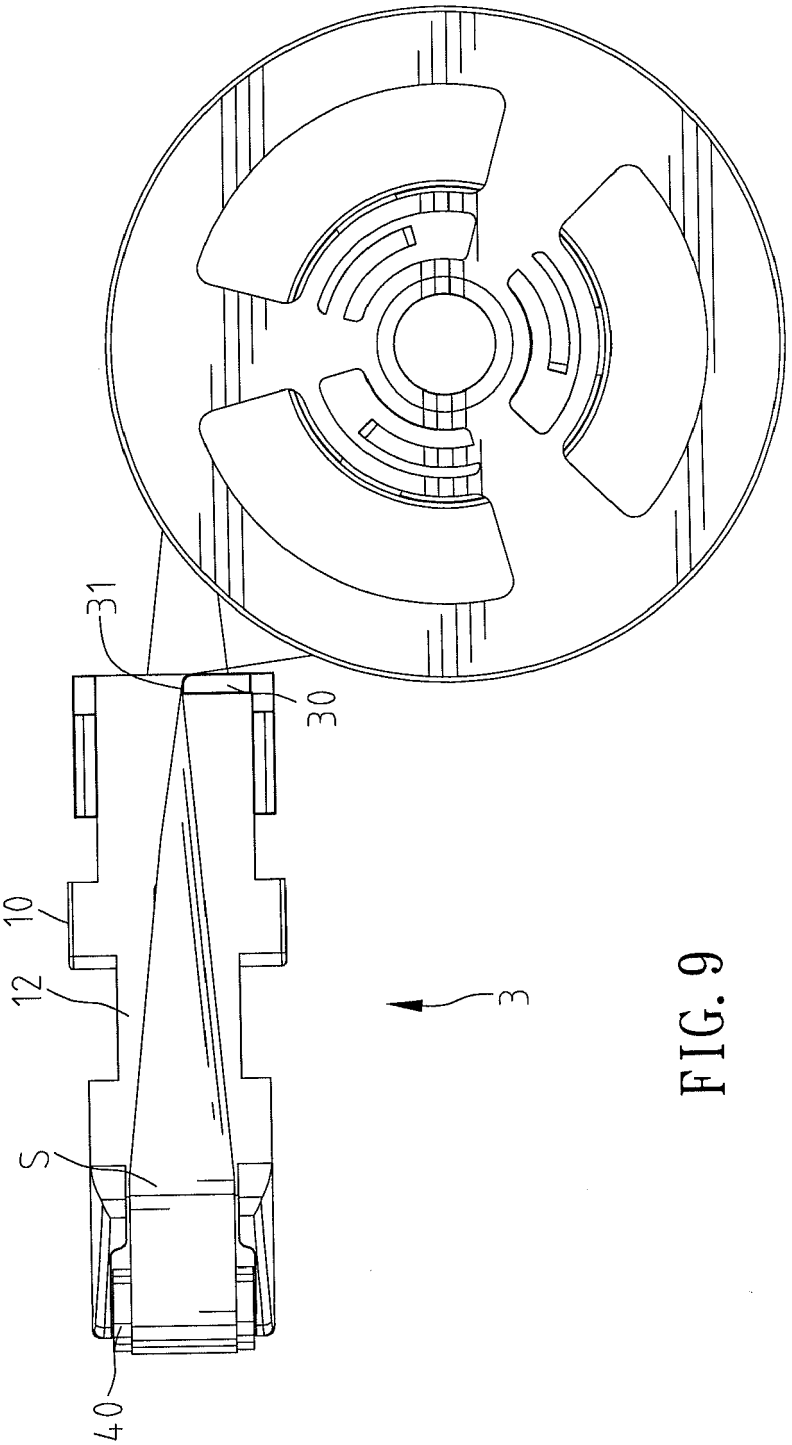

FIG. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 09 16 8690

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 332 998 A (CAMPINS MASRIERA JUAN ANTONIO [ES]) 6 August 2003 (2003-08-06) * paragraph [0025] - paragraph [0028] * * paragraph [0058] - paragraph [0065] * -----	1-4,7-9, 12-15	INV. B65H37/00
X	US 5 795 085 A (YOO KWANG-HO [KR]) 18 August 1998 (1998-08-18) * the whole document * -----	1-6,9, 10,12-15	
A	DE 10 2006 031173 A1 (HENKEL KGAA [DE]) 10 January 2008 (2008-01-10) * the whole document * -----	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14 January 2010	Jezierski, Krzysztof

CATEGORY OF CITED DOCUMENTS

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14-01-2010

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