



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
27.02.2008 Bulletin 2008/09

(51) Int Cl.:
A47L 13/38^(2006.01) A47L 13/46^(2006.01)

(21) Application number: **07109650.7**

(22) Date of filing: **05.06.2007**

(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 YU

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(30) Priority: **22.08.2006 CN 200610121441**

(54) **Twisting mechanism forduster**

(57) The present invention relates to a twisting mechanism for a duster for setting one end of a dusting cloth of the duster as a fixed end while setting the opposite end as a rotatable end. The twisting mechanism primarily comprises: a brace, inserted from the rear end through

the front end of the dusting cloth and coupled with the front end of the dusting cloth to set it as a fixed end; and a rotating mechanism, pivotally connected to the rear end of the brace and hooking the rear end of the dusting cloth for driving the dusting cloth to twist into a spiral dusting cloth having a 360-degree dusting surface on the brace.

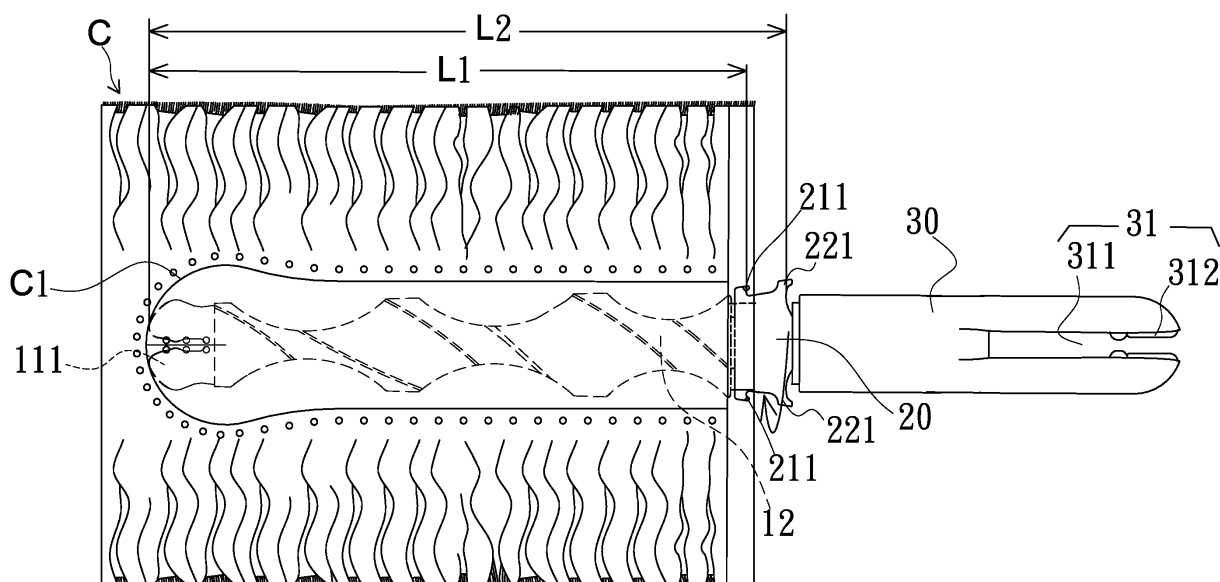


FIG 4

Description

BACKGROUND OF THE INVENTION

1. Technical Field

[0001] The present invention relates to a twisting mechanism for a duster and, more particularly, to a mechanism for twisting a dusting cloth of the duster and retaining the dusting cloth at a twisted position.

2. Description of Related Art

[0002] A conventional duster is typically composed of a distinctive dusting cloth capable of attracting dust and a fixture for bracing and holding the dusting cloth. To prepare the duster for dusting operation, the front end of the fixture is inserted into the dusting cloth in the manner that the rear end of the dusting cloth can be coupled with hooks provided at the middle portion of the fixture. Thereby, the dusting cloth can be spread and stretched, so that a user can hold the fixture at its rear end and wield the duster for implementing the dusting cloth to attract dust.

[0003] Such conventional duster functions for attracting dust in virtue of the positive-charged fluff layer at the surface of the dusting cloth attracting negative-charged dust. However, since the fluff layer can only be presented at the surface (the upper and lower surfaces) of the dusting cloth, dead spots of the duster tend to occur when the duster contacts diversified surface angles of objects to be cleaned. To ensure complete dusting, a user has to continually maintain a particular relative angle between the fluff level and the surfaces of objects to be cleaned. This may not only unnecessarily consume dusting time, but also render a user's wrist discomfort after his/her long-term dusting operation.

[0004] To remedy the foresaid problem, a rotary duster has been disclosed by Taiwan Patent Application 093132036, which belongs to the same assignee as that of the present invention. The mentioned Taiwan Patent Application, in view of the disadvantage that the conventional duster can only be implemented with its either side for collecting dust, has taught an assembly of a dusting cloth and a fixture that is capable of providing a 360-degree dusting surface, as shown in Figures 1 and 2. The dusting cloth 50 comprises two layers of smooth non-woven fabrics as a lining. An electrostatic non-woven sheet is stacked to the inner side and the outer side of the lining, respectively. Then hot-pressing process and cutting machine are implemented to integrate the stacked lining and electrostatic non-woven sheets as an integrated meshed non-woven sheet that having four layers. Further, a layer of heat-fusible intermingled yarn and another electrostatic non-woven sheet are stacked to both sides of the meshed non-woven sheet. Then hot-pressing process can be again employed to integrate the stacked sheets as the dusting cloth 50 that have eight layers of non-woven fabrics or yarn. An accommodating recess

51 may be defined at the middle portion of the dusting cloth 50 by means of hot-pressing process for allowing the fixture to be settled therein so that the dusting cloth can be fully braced. The prior-art fixture 60 is primarily composed of a handle 61, a curved rod 62 settled at one end of the handle 61, an adaptive coupler pivotally connected with the curved rod 62 and a twisting shaft 63 attached to the other end of the adaptive coupler. Therein, spiral spines 631 are provided at the surface of the twisting shaft 63, as shown in Figure 1, and a fork portion is formed at the tip of the twisting shaft 63 for inserting into the accommodating recess 51 and being coupled with the end of the accommodating recess 51 so that the front end of the front end of the dusting cloth 50 adjacent to the end of the accommodating recess 51 can be fastened to the twisting shaft 63. Subsequently, a user can use his/her hand to wring the middle portion of the dusting cloth 50 along the spiral spines 631 of the twisting shaft 63 to endow the dusting cloth 50 with a spiral shape having a 360-degree dusting surface, as shown in Figure 2. Hence, the user can easily grasp the handle 61 and wield the duster along a single direction to have the twisted dusting cloth 50 dust objects with various-angled surfaces so that the dusting efficiency is consequently enhanced.

[0005] Though the prior-art rotary duster might satisfy the need of effective dusting, some problems may need to be solved for the optimum practical use thereof. One disadvantage of the prior-art rotary duster is that to endow the dusting cloth with the 360-degree dusting surface, the user's hand has to directly touch and wring the surface of the dusting cloth along the spiral spine of the twisting shaft and this may cause the user's hand stained. Further, during dusting, the dusting cloth is liable to reversely rotate to its initial flat position due to its own tension. At this time, the user's re-rotating the dusting cloth can undesirably render the dust collected at the dusting cloth scattered to the ground again.

SUMMARY OF THE INVENTION

[0006] The present invention has been accomplished under these circumstances in view. It is one objective of the present invention to provide a twisting mechanism for a duster, wherein one end of a dusting cloth of the duster is set as a fixed end while the opposite end is set as a rotatable end whereby the dusting cloth can be rotated and twisted into a spiral dusting cloth having a 360-degree dusting surface.

[0007] It is also an objective of the present invention to provide a twisting mechanism for a duster, wherein the rotatable end of the dusting cloth is restricted to unidirectional rotation so that the dusting cloth can be maintained with the spiral shape having a 360-degree dusting surface.

[0008] To achieve these and other objectives of the present invention, the twisting mechanism for a duster primarily comprises:

a brace, inserted from the rear end through the front end of the dusting cloth and coupled with the front end of the dusting cloth so as to set the front end as a fixed end;

a rotating mechanism, pivotally connected to the rear end of the brace and hooking the rear end of the dusting cloth so as to set the rear end of the dusting cloth as a rotatable end for driving the dusting cloth to twist into a spiral dusting cloth having a 360-degree dusting surface on the brace.; and
a handle, provided at the rear end of the twisting mechanism for being held and wielded by a user's hand for dusting operation.

[0009] According to the disclosed twisting mechanism for a duster, a fork portion is formed at the tip of the brace for being coupled with the dusting cloth. Further, at least one hook assembly is provided at the surface of the rotating mechanism for hooking the rear end of the dusting cloth so that the dusting cloth can be rotated by the rotating mechanism and twisted into a spiral shape having a 360-degree dusting surface.

[0010] The twisting mechanism is further directed to an assembly of a unidirectional rotating mechanism and a column for fixing the dusting cloth as a spiral shape having a 360-degree dusting surface. More specifically, the unidirectional rotating mechanism is settled at the rear end of the brace and can be rotated in either a clockwise or anticlockwise direction to drive the rotatable end of the dusting cloth.

[0011] The rear end of the handle can be further attached by an extension rod for enhancing the reachable dusting altitude or distance, wherein the extension rod may be a telescopic extension rod.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The invention as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

Figure 1 is an assembly drawing of a conventional duster;

Figure 2 is a schematic drawing showing a dusting cloth twisted into a spiral shape;

Figure 3 is a perspective view of the twisting mechanism for a duster of the present invention;

Figure 4 is an assembly drawing of the disclosed twisting mechanism for a duster showing the brace sheathed by the accommodating recess;

Figure 5 is an assembly drawing of the disclosed twisting mechanism for a duster showing the dusting cloth twisted into a spiral shape;

Figure 6 is an exploded view of the twisting mechanism for a duster of the present invention; and

Figure 7 is an applied drawing of the twisting mechanism for a duster of the present invention illustrating the handle attached by an extension structure.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0013] The disclosed twisting mechanism for a duster is adapted for twisting a dusting cloth C into a spiral shape having a 360-degree dusting surface for the purpose of eliminating dead spots of the duster. In the preferred embodiment, the dusting cloth C is a stack of layers of non-woven fabrics and heat-fusible intermingled yarn which is integrated as a single unit by means of hot-pressing process, wherein an accommodating recess C1 is defined at the middle portion of the dusting cloth C by means of hot-pressing process. However, it will be understood that various dusting cloths having other structures or materials may be also applied to the present invention.

[0014] Please refer to Figures 3 through 7 for a twisting mechanism for a duster according to the present invention, which primarily comprises a brace 10, a rotating mechanism 20 and a handle 30.

[0015] The brace 10 is substantially a column 11, wherein a plurality of spiral spines 12 are provided at the surface of the column 11 for guiding the twisting direction of the dusting cloth C and a fork portion 111 is formed at the tip of the column 11 for coupling with the end of the accommodating recess C1, as shown in Figure 4, so that the front end of the dusting cloth C adjacent to the fork portion 111 is set as a fixed end.

[0016] The rotating mechanism 20 is pivotally connected to the rear end of the brace 10 and a first hook assembly 21 as well as a second hook assembly 22 are provided at the surface thereof, wherein the distance L1 between the first hook assembly 21 and the tip of the brace 10 is smaller than the distance L2 between the second hook assembly 22 and the tip of the brace 10 whereby the rear end of the dusting cloth C can be hooked and set as a rotatable end. Thus, the rear end of the dusting cloth C, which possesses a relatively smaller length, can be hooked at the first hook assembly 21, as shown in Figure 4. Alternatively, the rear end of the dusting cloth C, which possesses a relatively greater length, can be hooked at the second hook assembly 22 (not shown). According to the present embodiment, each of the first hook assembly 21 and the second hook assembly 22 is composed of at least two hooks (211, 221) wherein each said hook is arranged at one of the opposite sides of the rotating mechanism 20, respectively. When the rotating mechanism 20 is rotated clockwise or anticlockwise with respect to the brace 10, the hooks can pull the rotatable end of the dusting cloth C to rotate with respect to the surface of the brace 10 so that the middle portion between the fixed end and the rotatable end of the dusting cloth C can be shaped corresponding to the spiral spines 12 at the surface of the brace 10 into a spiral shape having a 360-degree dusting surface, as shown in Figure 5. Thus, the rotational direction of the rotating mechanism

20 has to be set corresponding to the extending direction of the spiral spines 12. That is to say, when the spiral spines 12 are laid out as an S shape extending from the lower-right to the upper-left, the rotating mechanism 20 shall be correspondingly set as clockwise rotatable. Alternatively, when the spiral spines 12 are laid out as a Z shape extending from the lower-left to the upper-right, as shown in Figure 4, the rotating mechanism 20 shall be correspondingly set as anticlockwise rotatable.

[0017] The handle 30 is provided at the rear end of the rotating mechanism 20 and has a diameter greater than or equal to that of the rotating mechanism 20 for being held and wielded by a user. Further, a coupling structure 31 may be provided at the rear end of the handle 30 for connecting with an extension structure, such as an extension rod 40, as shown in Figure 7. An alternative embodiment of the coupling structure 31, as shown in Figure 6, may comprise a recess 311 passing through the upper and lower surfaces of the rear end of the handle 30 for pivotally receiving the extension rod 40. Each of the left and right walls of the recess 311 has plural positioning protrusions 312 facing those of the other, respectively, and meantime, the front end of the extension rod 40 has plural positioned dents 401 corresponding to the positioning protrusions 312 for controlling the angle between the immovable handle 30 and the extension rod 40. Thereby, the angle θ between the handle 30 and the extension rod 40 can be adjusted steppedly to facilitating reaching an enhanced dusting altitude or distance. The extension rod 40 in the present embodiment is a telescopic extension rod, which is composed of a plurality of telescoped sleeves.

[0018] Please refer back to Figures 4 through 6 again. To install the dusting cloth C on the twisting mechanism, the brace 10 is firstly inserted into the accommodating recess C1 of the dusting cloth C, and the fork portion 111 at the tip of the brace 10 is coupled with the accommodating recess C1. Then the side of the dusting cloth C adjacent to the end of the accommodating recess C1 is therefore set as a fixed end. Subsequently, the opposite end of the dusting cloth C is hooked by either the first hook assembly 21 or the second hook assembly 22 of the rotating mechanism 20, depending on the length of the dusting cloth C, so that the dusting cloth C can be spread and attached to the brace 10. At this time, a user can easily rotate the rotating mechanism 20 adjacent to the brace 10 to make the hook assembly drive the rotatable end to rotate. As a result, the middle portion of the dusting cloth C can be twisted along the extending direction of the spiral spines 12 of the brace 10 into a spiral shape having a 360-degree dusting surface. Thereupon, the assembly and configuration of the disclosed subject and the dusting cloth C can be accomplished. As the user is free from touching the surface of the dusting cloth for twisting the dusting cloth directly, his/her hand can be kept clean.

[0019] Besides, the twisting mechanism of the present invention is a unidirectional rotating mechanism 20 and

the rotating direction of the rotating mechanism 20 is set corresponding to the extending direction of the spiral spines 12. Therefore, when the brace 10 rotates the rotatable end of the dusting cloth C clockwise or anticlockwise, the dusting cloth can be twisted along the extending direction of the spiral spines 12 into a spiral shape have a 360-degree dusting surface, which allows a user to dust with improved efficiency. As the dusting cloth C is twisted into the spiral shape, the unidirectional rotating mechanism 20 facilitates retaining the rotatable end of the dusting cloth C at the rotated position and counteracting the tension of the dusting cloth C so as to maintain the spiral shape of the dusting cloth C.

[0020] Although a particular embodiment of the invention has been described in detail for purposes of illustration, it will be understood by one of ordinary skill in the art that numerous variations will be possible to the disclosed embodiments without going outside the scope of the invention as disclosed in the claims.

Claims

1. A twisting mechanism for a duster, comprising:

a brace, inserted from the rear end through the front end of the dusting cloth and coupled with the front end of the dusting cloth; and
a rotating mechanism, which is pivotally connected to the rear end of the brace and hooking the rear end of the dusting cloth to set the rear end of the dusting cloth as the rotatable end, for pulling the dusting cloth to rotate and twist into a spiral shape having a 360-degree dusting surface on the brace.

2. The twisting mechanism of Claim 1, wherein a handle is settled at the front end of the rotating mechanism.
3. The twisting mechanism of Claim 1, wherein a fork portion is formed at the tip of the brace for being coupled with the front end of the dusting cloth.
4. The twisting mechanism of Claim 1, wherein at least one first hook assembly having a pair of hooks is provided at the rotating mechanism for hooking the rear end of the dusting cloth.
5. The twisting mechanism of Claim 1, wherein the rotating mechanism is a rotator or a torque mechanism that can be rotated clockwise or anticlockwise.
6. The twisting mechanism of Claim 4, wherein the first hook assembly are arranged at two sides of the surface of the rotating mechanism.
7. The twisting mechanism of Claim 1 or 5, wherein a

first hook assembly having a pair of hooks and a second hook assembly having a pair of hooks are provided at the rotating mechanism.

8. The twisting mechanism of Claim 7, wherein the hooks of the first hook assembly are arranged at two sides of the surface of the rotating mechanism and the angle therebetween is 180-degree. 5
9. The twisting mechanism of Claim 7, wherein the hooks of the second hook assembly are arranged at two sides of the surface of the rotating mechanism and the angle therebetween is 180-degree. 10
10. The twisting mechanism of Claim 2, wherein a coupling structure is provided at the end of the handle for being further coupled with an extension structure. 15
11. The twisting mechanism of Claim 10, wherein the coupling structure comprises a recess passing through the upper and lower surfaces of the handle for pivotally receiving the extension structure and a plurality of positioning protrusions provided on two walls of the recess. 20

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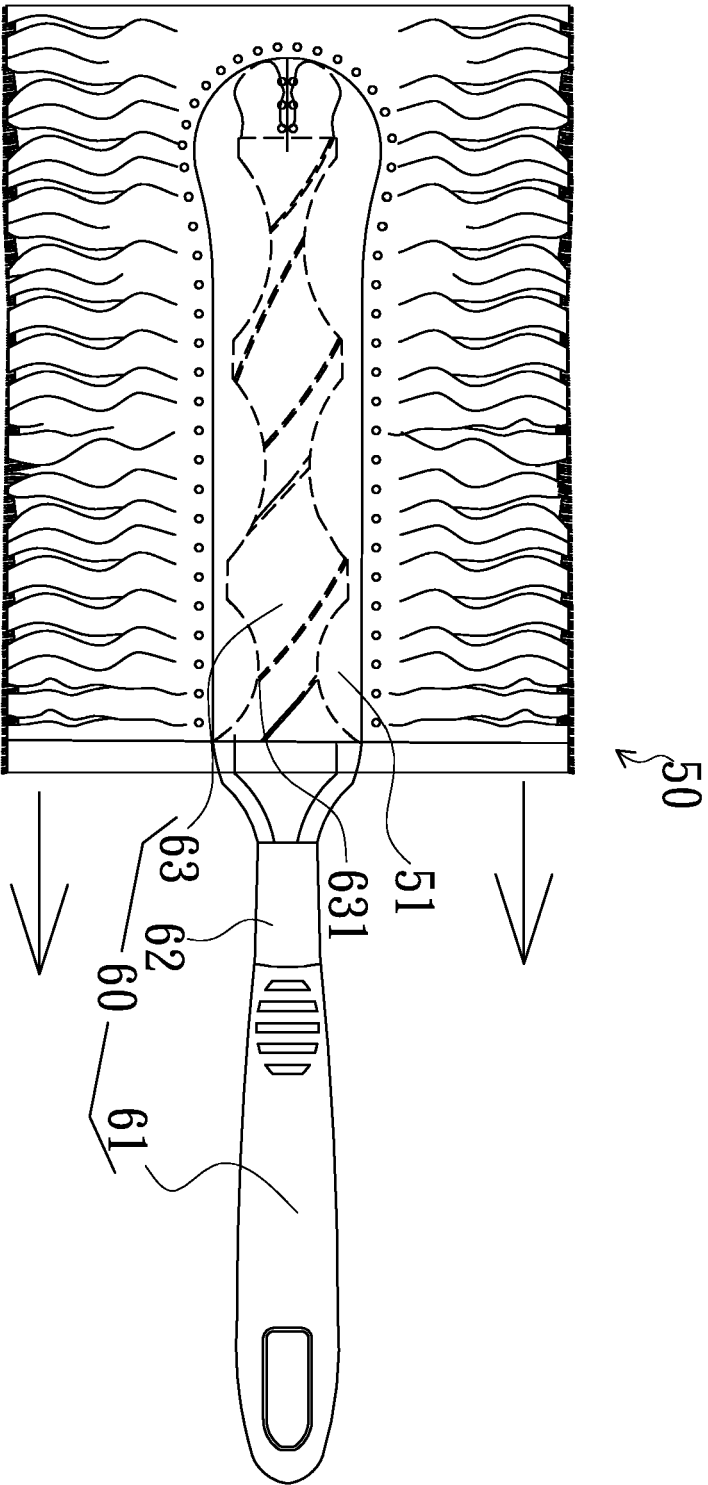


FIG 1
PRIOR ART

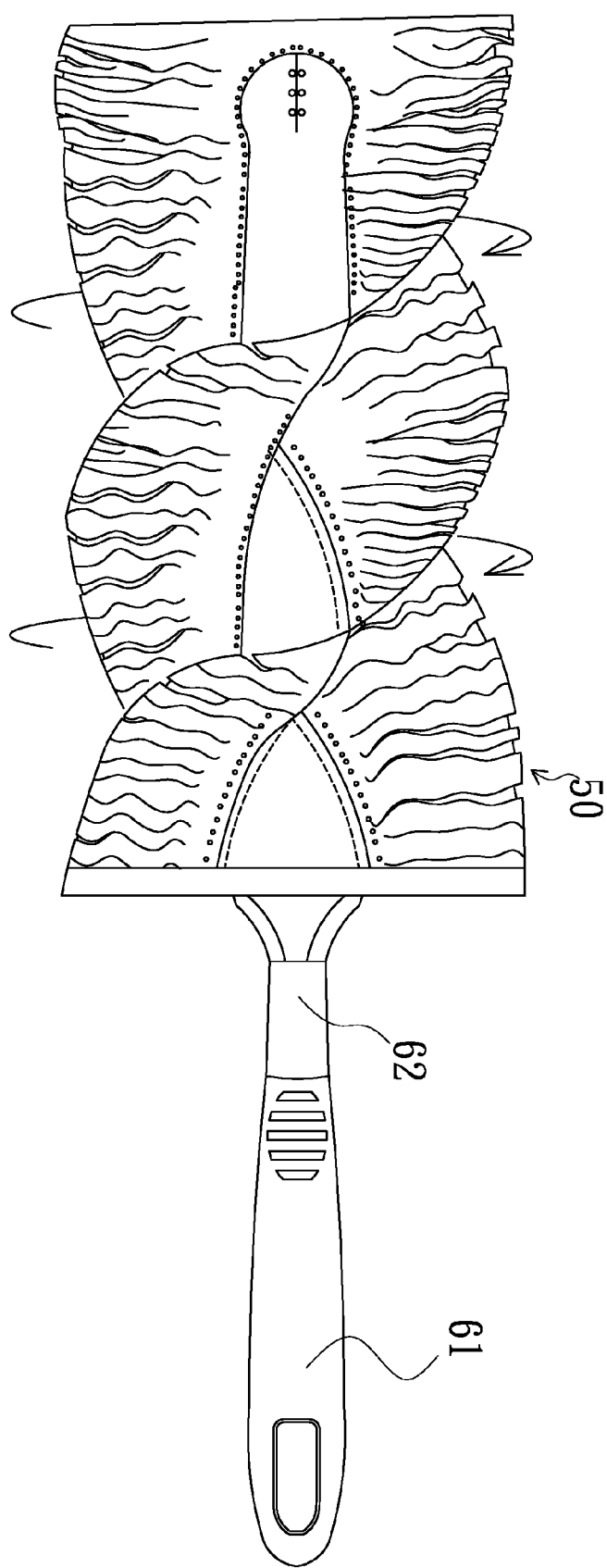
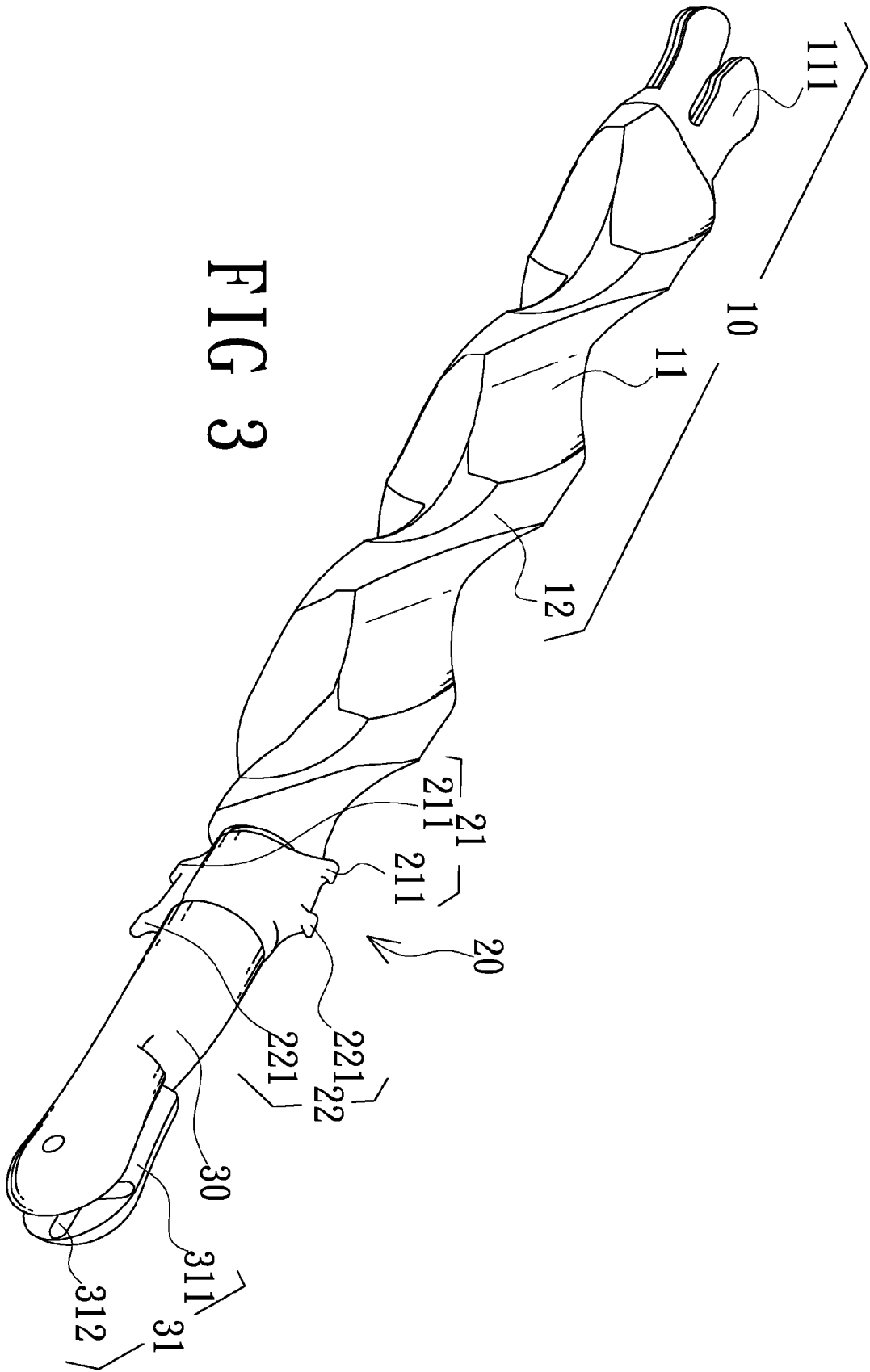


FIG 2
PRIOR ART



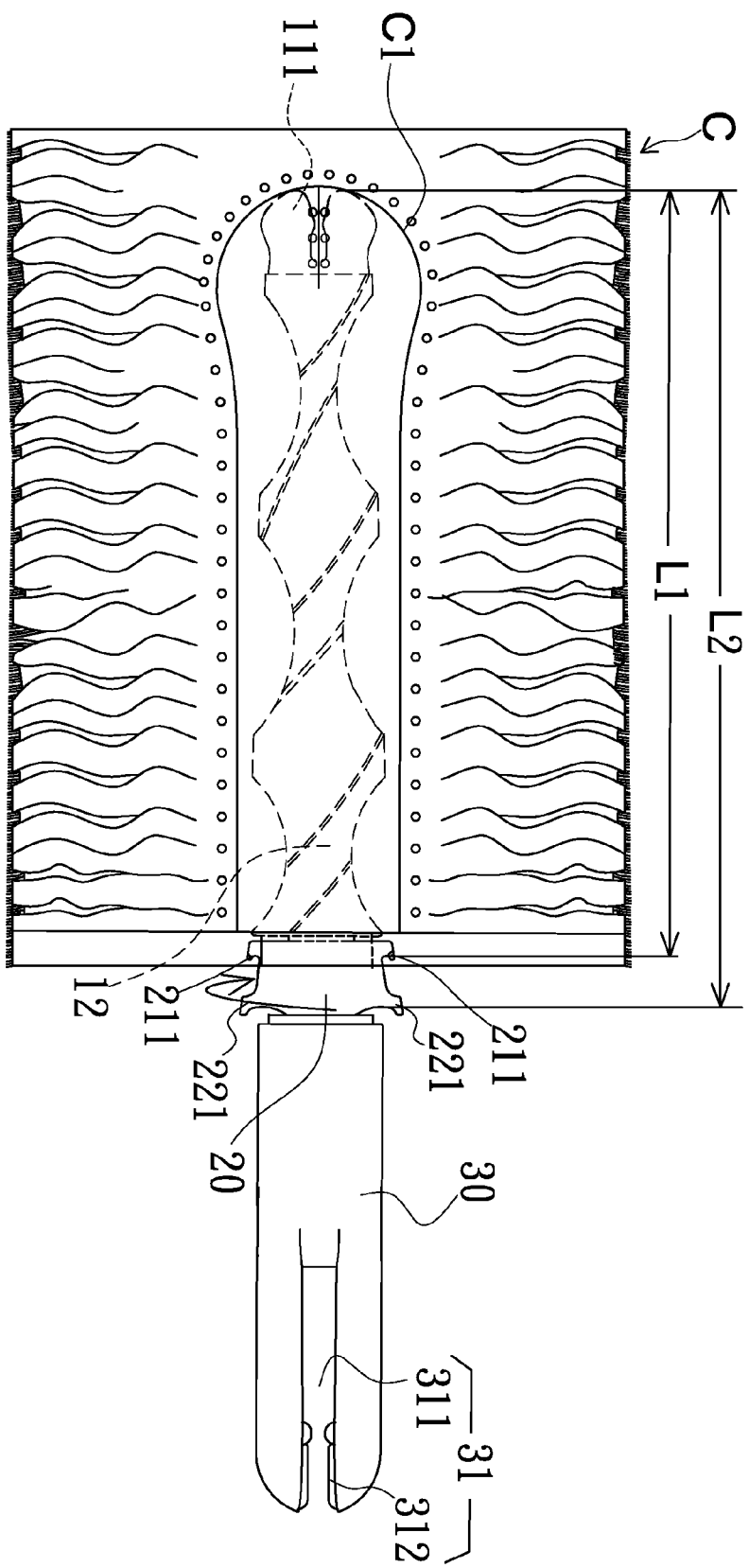


FIG 4

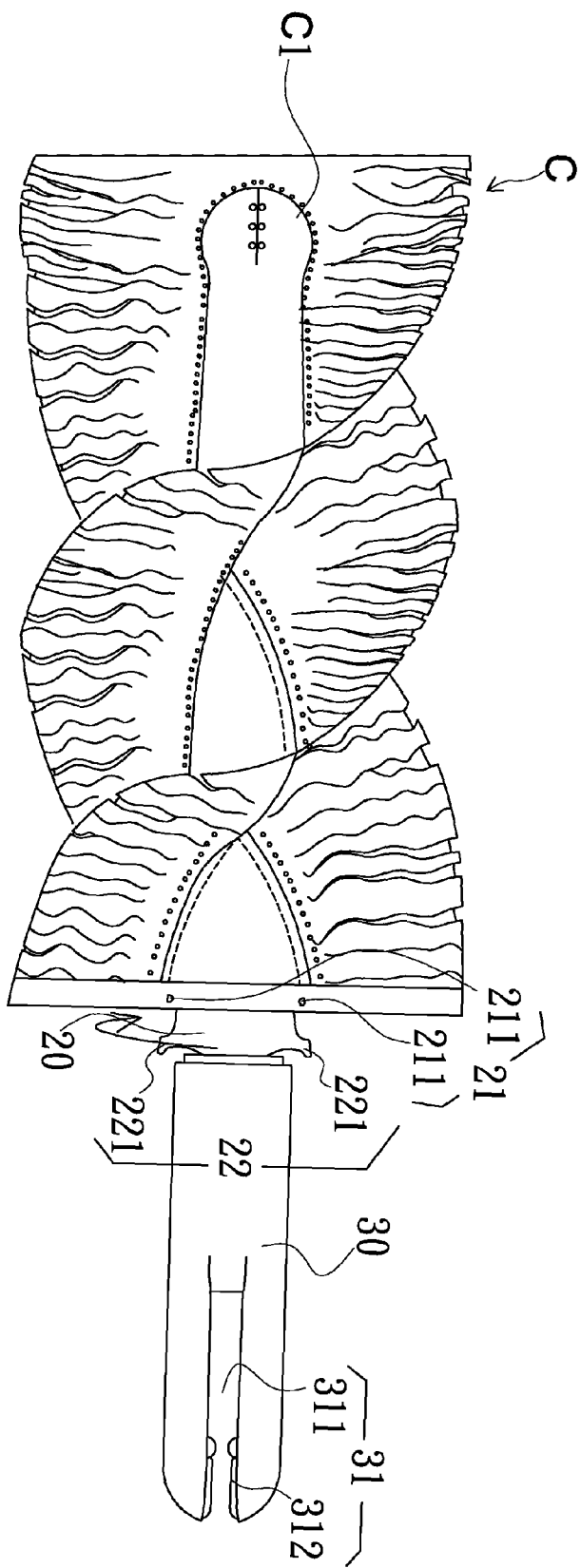


FIG 5

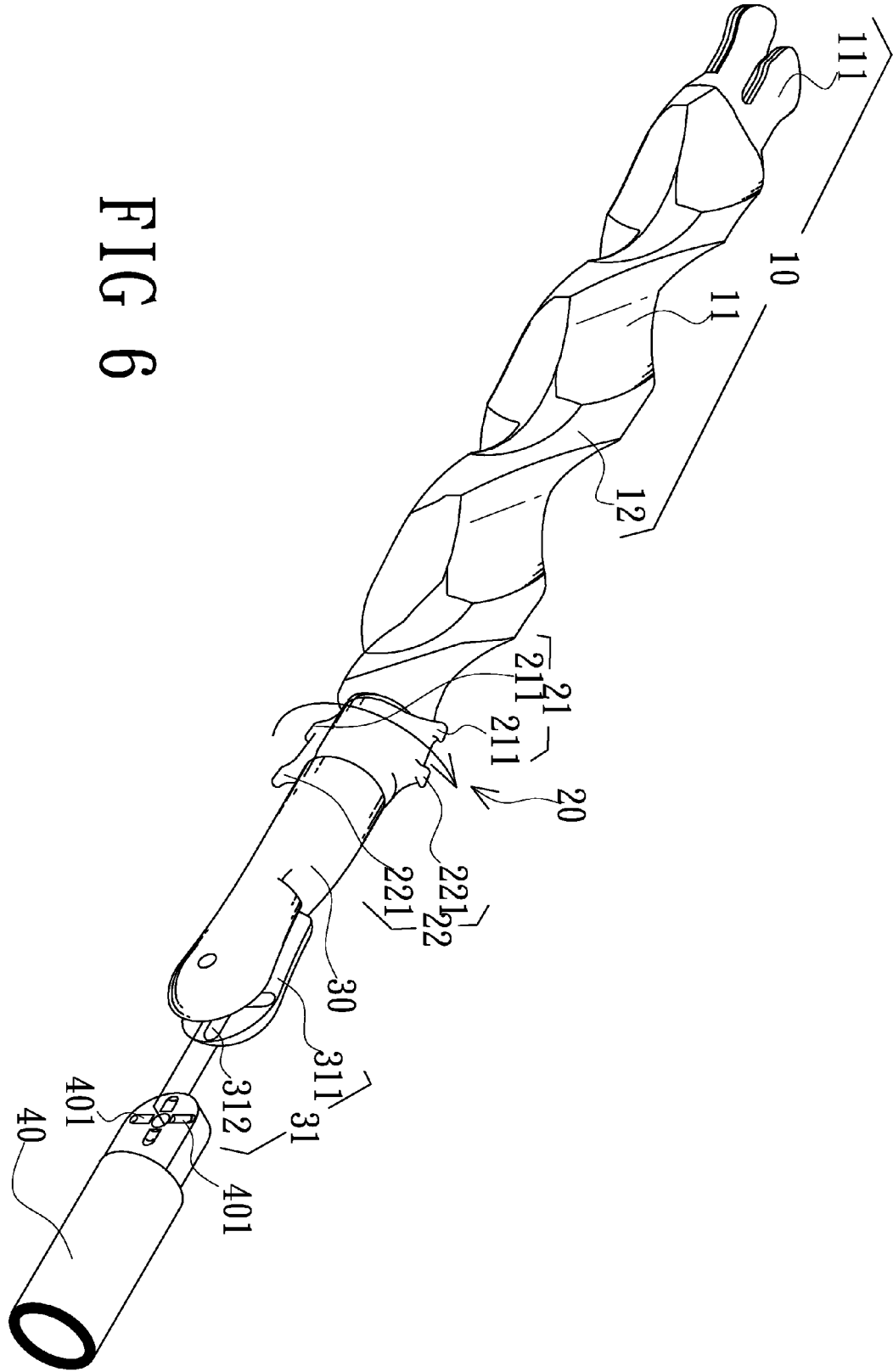
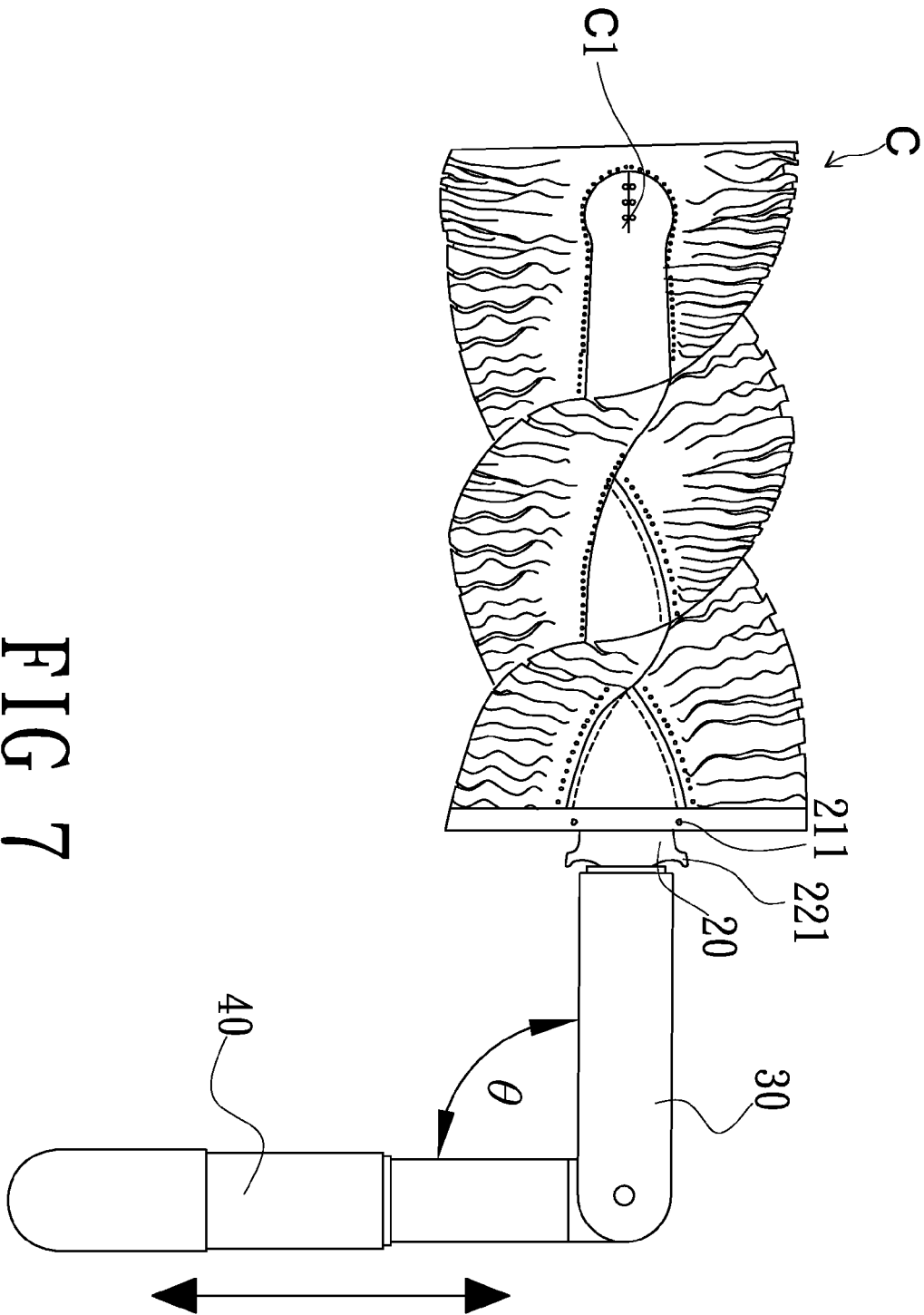


FIG 6



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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