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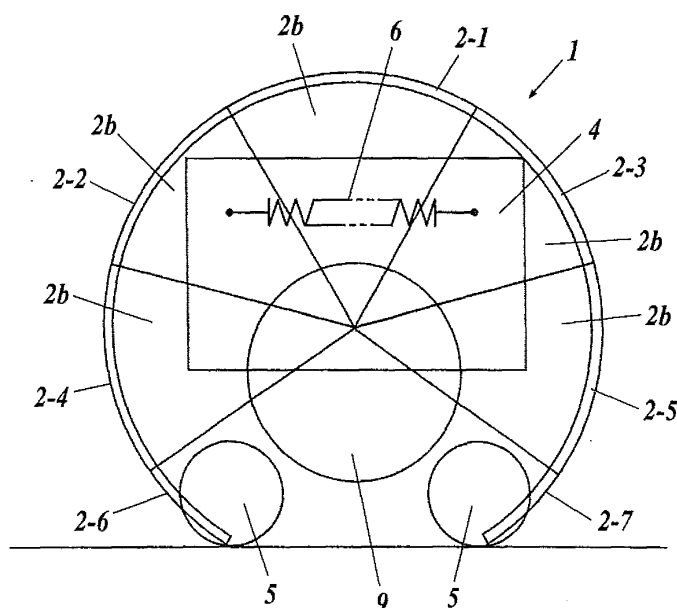
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(54) **A moving toy**

(57) Disclosed is a moving toy including: a shell body including a plurality of shell pieces placed side by side adjacent shell pieces of which are connected with each other to be capable of bending and stretching, the shell body being configured so as to capable of being both in a shrinking state in which the shell body curls up and in a unfolding state in which the shell body is released by

bending and stretching; and a forcing member to allow the shell body to be in the shrinking state by an urging force, wherein the shell body includes an unfolding member on one surface side of the shell body, and the unfolding member is configured to push the shell body from the one surface side against the urging force by the forcing member to allow the shell body to be temporary and intermittently in the unfolding state.

FIG 1



Description

[0001] The present invention relates to a moving toy.

[0002] Conventionally, as a moving toy which is capable of changing a figure thereof, a robot toy and other toys have been known.

[0003] However, a movement of a conventional robot toy or the like is predictable and lacks an element of surprise, because only a part of the toy such as arms and legs moves with respect to a main body.

[0004] The present invention has been achieved in view of the above point, and an aim of the present invention is to provide a moving toy which is unpredictable and extremely humorous.

[0005] In order to achieve the above object, a moving toy according to a first aspect of the invention includes: a shell body including a plurality of shell pieces placed side by side adjacent shell pieces of which are connected with each other to be capable of bending and stretching, the shell body being configured so as to be capable of being both in a shrinking state in which the shell body curls up and in a unfolding state in which the shell body is released by bending and stretching; and a forcing member to allow the shell body to be in the shrinking state by an urging force, wherein the shell body includes an unfolding member on one surface side of the shell body, and the unfolding member is configured to push the shell body from the one surface side against the urging force by the forcing member to allow the shell body to be temporary and intermittently in the unfolding state.

[0006] The above and other objects, advantages and features of the present invention will become more fully understood from the detailed description given hereinbelow and the appended drawings which are given by way of illustration only, and thus are not intended as a definition of the limits of the present invention, and wherein:

FIG. 1 is a schematic view showing a moving toy in which a shell body is in a shrinking state;

FIG. 2 is a schematic view showing the moving toy in which the shell body is in an unfolding state;

FIG. 3 is a perspective view showing a main part of a power transmission mechanism;

FIG. 4 is a view showing a main part of an unfolding member;

FIG. 5A is a view showing an intermittent mechanism in the unfolding member in Fig. 4;

FIG. 5B is a view showing an intermittent mechanism in the unfolding member in Fig. 4;

FIG. 5C is a view showing an intermittent mechanism in the unfolding member in Fig. 4;

FIG. 6 is a view showing a movement of the shell body; and

FIG. 7 is a schematic view showing a main part of a rolling member.

[0007] In the following, a moving toy according to the

embodiment of the present invention will be described with respect to the drawings.

[0008] FIG. 1 is a schematic view showing the moving toy in which a shell body is in a shrinking state, FIG. 2 is a schematic view showing the moving toy in which the shell body is in an unfolding state, FIG. 3 is a perspective view showing a main part of a power transmission mechanism, FIG. 4 is a view showing a main part of an unfolding member, FIG. 5A-5C are views showing intermittent mechanisms in the unfolding member in Fig. 4, FIG. 6 is a view showing a movement of the shell body, and FIG. 7 is a schematic view showing a main part of a rolling member.

[0009] A moving toy 1 according to the embodiment is a toy which has a movement imitating a pill bug, an armadillo, and the like.

[0010] A shell body 2 of the moving toy 1 is composed of seven shell pieces 2-1 to 2-7, though not limited to this configuration.

[0011] Each of the shell pieces composing the shell body 2 is constructed of a warping plate. The adjacent shell pieces are connected to each other with rubber and the like so as to be capable of bending and stretching. In this regard, the shell piece 2-4 and the shell piece 2-6 are integrated together to substantively compose one shell piece. The shell piece 2-5 and the shell piece 2-7 are integrated together to substantively compose one shell piece. Moreover, side plates 2b of fan-like form are attached to both sides of each of the shell pieces 2-1 to 2-5.

[0012] Thus, the shell body 2 of the moving toy 1 may be brought alternately to an arched shape shown in Fig. 1 and an unfolding state shown in Fig. 2. Incidentally, when the shell body 2 is in a shrinking state, adjacent side plates 2b among the above side plates 2b are abut to each other.

[0013] Next, the way of playing with the moving toy 1 and the movement of the moving toy 1 will be described.

[0014] The moving toy 1 is a wind-up toy, though not limited to this configuration. When allowing the moving toy 1 to move, a knob 7 (see Fig. 3) is turned to wind up a power spring. When winding the power spring has been ended, the moving toy 1 is placed on a floor surface. Then, the moving toy 1 travels on the floor surface in a predetermined direction, being in the unfolding state shown in Fig. 2. This travelling is performed by wheels 9 rolling on the floor surface. When the wheels 9 roll, idle rollers 5, 5 provided at both end portions of the shell body 2 touch the ground so as to roll. The shell body 2 of the moving toy 1 instantly turns into the shrinking state shown in Fig. 1 after travelling in the unfolding state for a brief while. In the shrinking state, the both end portions of the shell body 2 abut to the floor surface so that the wheels 9 float above the floor surface. Then, a leg piece 26 (see Fig. 7) kicks the floor surface so that the moving toy 1 rolls to go into a 360-degree roll. After that, the shell body 2 of the moving toy 1 gradually shifts to the unfolding state. When the shell body 2 of the moving toy 1 becomes

the unfolding state, the wheels 9 touch the ground and the moving toy 1 travels on the floor surface in the pre-determined direction. Above movement is repeated until power generated by the power spring is consumed.

[0015] Next, details of an inner configuration of the moving toy 1 will be explained.

[0016] Although not limited to this configuration, a spring 6 for allowing the shell body 2 to be the arched shape is hung between the shell piece 2-2 and the shell piece 2-3. The spring 6 may be hung between the shell piece 2-4 and the shell piece 2-5, or hung between each neighboring shell pieces. Moreover, the spring 6 may be hung between a component of an after-mentioned unfolding member A and the shell piece so that a tension of the spring 6 is reduced when the component of the folding member A moves.

[0017] A machine casing 4 is attached on a lower surface side of the shell piece 2-1 centrally located among the five shell pieces.

[0018] The machine casing 4 is provided with: the unfolding member A to allow the shell body 2 to temporary and intermittently unfold in cooperation with the spring 6; a travelling member B including the wheels 9 to allow the moving toy 1 to travel; and the rolling member C including the leg piece 26 to allow the moving toy 1 to roll.

[0019] The unfolding member A, the travelling member B and the rolling member C are, though not particularly limited to this configuration, sharing many parts such as the power spring as a power source and the power transmission mechanism for transmitting the power generated by the power spring.

[0020] Hereinafter configurations of the unfolding member A, the travelling member B and the rolling member C will be described in this order.

1. Unfolding Member A

[0021] The unfolding member A includes an intermittent mechanism 15. The intermittent mechanism 15 includes: a partial gear 16 fixed at an output shaft 10 of a power spring unit; a rack member 17 capable of engaging with the partial gear 16; and a spring 18 to force the rack member 17 upward, as shown in Fig. 3.

[0022] Here, the partial gear 16 includes a tooth section and a tooth-lacking section 16a as shown in Figs 4-6. On the other hand, the rack member 17 includes rack teeth (tooth section) 17a and a tooth-lacking section 17b. A pin 17c is attached to an upper end portion of the rack member 17, and inserted into an oblong hole 20a of a swing member 20 composing a swing mechanism 19 described below.

[0023] By the intermittent mechanism 15, as shown in Fig 5A, the rack member 17 moves downward by rotative force of the partial gear 16 while the partial gear 16 engages with the rack teeth 17a of the rack member 17 (a first moving period). Then, as shown in Fig. 5B, when the tooth-lacking section 17b at the upper end portion of the rack member 17 reaches an engaging position by the

movement of the rack member 17, since teeth of the rotating partial gear 16 continuously hit the rack tooth 17a at the highest rung of the rack member 17, the rack member 17 keeps its position despite the rotation of the partial gear 16 (a stopping period). This state is maintained until the tooth-lacking section 16a of the rotating partial gear 16 reaches the engaging position. Then, as shown in Fig. 5C, when the tooth-lacking section 16a of the partial gear 16 reaches the engaging position by the rotation of the partial gear 16, since the rack member 17 becomes entirely free from the partial gear 16, the rack member 17 moves upward by an urging force of the spring 18 (a second moving period). After that, the rack member 17 returns to an initial position shown in Fig. 5A.

[0024] Moreover, the unfolding member A includes the swing mechanism 19 which operates by the intermittent mechanism 15. The swing mechanism 19 pushes lower surfaces of the shell pieces 2-2, 2-3, 2-4, 2-5. Fig. 6 shows the swing mechanism 19 which pushes the lower surfaces of the shell pieces 2-3, 2-5. Although the swing mechanism 19 pushing the lower surface of the pieces 2-2, 2-4 is not shown, both of the swing mechanisms 19 are configured symmetrically.

[0025] The swing mechanism 19 includes the above-described swing member 20 as shown in Fig. 6. The swing member 20 swings around a shaft 2c provided in the shell piece 2-1. The swing member 20 includes a pushing portion 20b for pushing the shell piece 2-3 and a pushing portion 20c for pushing the shell piece 2-5.

[0026] The swing member 20 includes a curving arm 20d. The oblong hole 20a is formed in the arm 20d so as to curve along in a longitudinal direction of the arm. Into the oblong hole 20a of the arm 20d, as described above, the pin 17c of the rack member 17 is inserted.

[0027] According to the swing mechanism 19, as shown in Fig. 6, the swing member 20 rotates counter-clockwise when the rack member 17 comes down so that the pushing portion 20b pushes the shell piece 2-3 and the pushing portion 20c pushes the shell piece 2-5. By this, the shell body 2 is brought into the unfolding state.

[0028] Incidentally, the unfolding member A is not limited to the above configuration. What is needed is to be able to push the shell body 2 so as to bring it into the unfolding state.

2. Travelling Member B

[0029] The travelling member B allows the wheels 9 to roll on the floor surface with the power created by the power spring to allow the shell body 2 to travel. Thus, the moving toy 1 is allowed to travel. The travelling member B includes: a gear 11 fixed in the output shaft 10 of the power spring unit; a gear 13 attached to a shaft 12 parallel to the output shaft 10 and engages with the gear 11; a gear 14 fixed in an axle 8 parallel to the shaft 12 and engages the gear 13; and the wheels 9, as shown in Fig. 3.

[0030] According to the travelling member B, the power

created by the power spring is transmitted to the wheels 9 through the output shaft 10, the gear 11, the gear 13 and the gear 14 so that the wheels 9 roll. Incidentally, right and left wheels 9 are connected to each other with the axle 8 to roll together.

[0031] Incidentally, the travelling member B is not limited to the above configuration. The travelling member B may be a member which allows the moving toy 1 to walk.

3. Rolling member C

[0032] The rolling member C allows the shell body 2 to roll on the floor surface by the power created by the power spring so as to go into a 360-degree roll. The rolling member C includes: the gear 11 fixed in the output shaft 10 of the power spring unit; the gear 23 attached to a shaft 22 parallel to the output shaft 10 and engages with the gear 11; an eccentric pin 23a attached to an end surface of the gear 23; a piece-like plate 25 of fan-like form attached to a shaft 24 parallel to the shaft 22 and capable of rotating around the shaft 24; the leg piece 26 which rotates together with the piece-like plate 25; and a spring 27 to force the leg piece 26 in a direction allowing the leg piece 26 to move away from the floor surface, as shown in Figs. 3 and 7.

[0033] According to the rolling member C, the power created by the power spring is transmitted to the gear 23 through the output shaft 10 and the gear 11 so that the gear 23 rotates. When the gear 23 rotates, in the middle of the rotation, the eccentric pin 23a kicks the piece-like plate 25 against urging force of the spring 27. By this, the leg piece 26 hits the floor surface so that the shell body 2 rolls (goes into a 360-degree roll) as a reaction of the hitting.

[0034] As described above, according to the embodiment of the present invention, a moving toy includes: a shell body including a plurality of shell pieces placed side by side adjacent shell pieces of which are connected with each other to be capable of bending and stretching, the shell body being configured so as to capable of being both in a shrinking state in which the shell body curls up and in a unfolding state in which the shell body is released by bending and stretching; and a forcing member to allow the shell body to be in the shrinking state by an urging force, wherein the shell body includes an unfolding member on one surface side of the shell body, and the unfolding member is configured to push the shell body from the one surface side against the urging force by the forcing member to allow the shell body to be temporary and intermittently in the unfolding state.

[0035] Preferably, the moving toy further includes a travelling member to allow the moving toy to travel on a floor surface.

[0036] Preferably, the travelling member includes a wheel for allowing the moving toy to travel by a rolling motion on the floor surface.

[0037] Preferably, the shell body is configured so that both end portions of the shell body abut to the floor sur-

face to allow the wheel to float above the floor surface when the shell body is in the shrinking state.

[0038] Preferably, the moving toy is configured so that the shell body covers the travelling member when the shell body is in the shrinking state.

[0039] Preferably, the moving toy further includes on the one surface side a rolling member to hit the floor surface so that the moving toy rolls on the floor surface as a reaction of the hitting when the shell body is in the shrinking state.

[0040] According to the present invention, since the shell body becomes the unfolding state and the shrinking state alternately, it is possible to achieve highly attractive moving toy which imitates an unfolding and curling movement of a pill bug, an armadillo, and the like.

[0041] Moreover, since the shell body travels in the unfolding state, it is possible to achieve a moving toy which imitates a walking movement of a pill bug, an armadillo, and the like.

[0042] Moreover, since travelling is performed by a rolling motion of the wheel, a configuration of the moving toy may be mechanistically simple.

[0043] Moreover, since the travelling member floats to stop travelling when the shell body is in the shrinking state, a configuration of the moving toy may be mechanistically simple.

[0044] Moreover, since the travelling member is covered by the shell body when the shell body is in the shrinking state, it is possible to project an image as if a pill bug, an armadillo, and the like curl up to hide their feet, and thereby the amusing moving toy can be realized.

[0045] Furthermore, since the moving toy rolls when the shell body is in the shrinking state, the more amusing moving toy can be realized.

[0046] Although various exemplary embodiments have been shown and described, the invention is not limited to the embodiments shown. Therefore, the scope of the invention is intended to be limited solely by the scope of the claims that follow.

Claims

1. A moving toy including:

a shell body including a plurality of shell pieces placed side by side adjacent shell pieces of which are connected with each other to be capable of bending and stretching, the shell body being configured so as to capable of being both in a shrinking state in which the shell body curls up and in a unfolding state in which the shell body is released by bending and stretching; and a forcing member to allow the shell body to be in the shrinking state by an urging force, wherein the shell body includes an unfolding member on one surface side of the shell body, and the unfolding member is configured to push the

shell body from the one surface side against the urging force by the forcing member to allow the shell body to be temporary and intermittently in the unfolding state.

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2. The moving toy according to claim 1 further comprising a travelling member to allow the moving toy to travel on a floor surface.

3. The moving toy according to claim 2, wherein the travelling member includes a wheel for allowing the moving toy to travel by a rolling motion on the floor surface.

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4. The moving toy according to claim 3, wherein the shell body is configured so that both end portions of the shell body abut to the floor surface to allow the wheel to float above the floor surface when the shell body is in the shrinking state.

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5. The moving toy according to claim 2,3 or 4, wherein the moving toy is configured so that the shell body covers the travelling member when the shell body is in the shrinking state.

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6. The moving toy according to any one of claims 1 to 5 further comprising on the one surface side a rolling member to hit the floor surface so that the moving toy rolls on the floor surface as a reaction of the hitting when the shell body is in the shrinking state.

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FIG 1

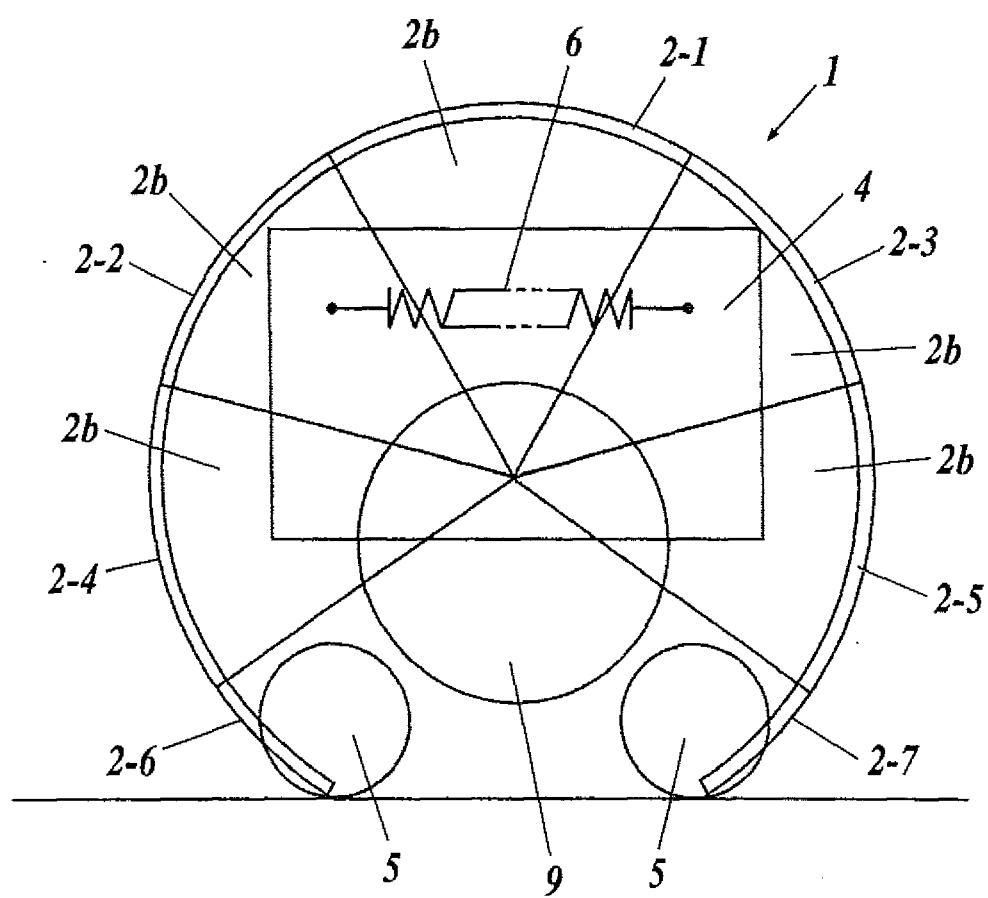


FIG. 2

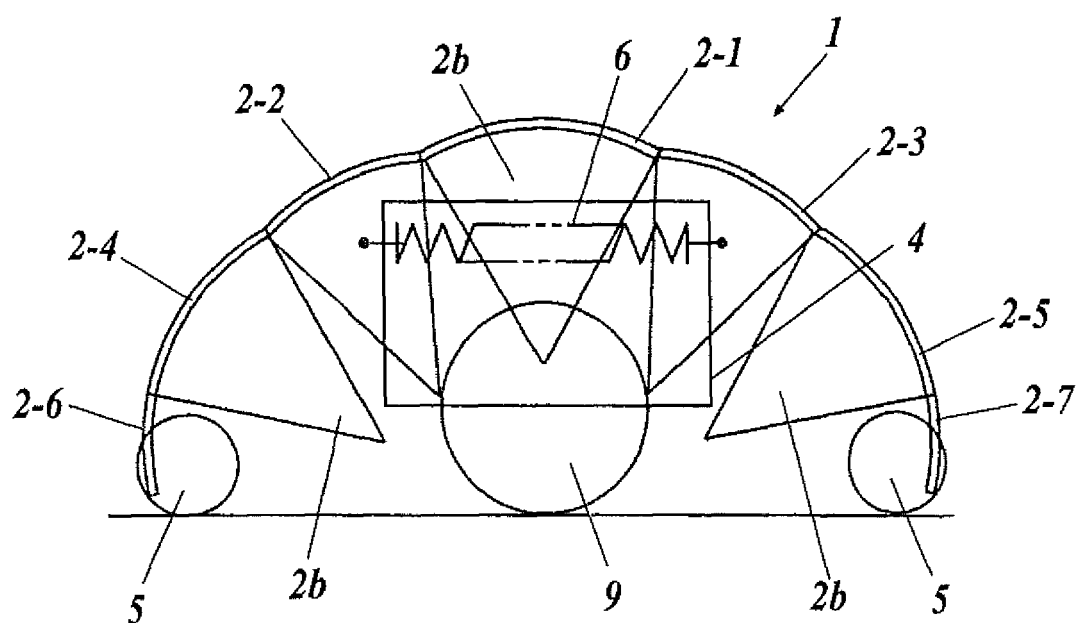


FIG.3

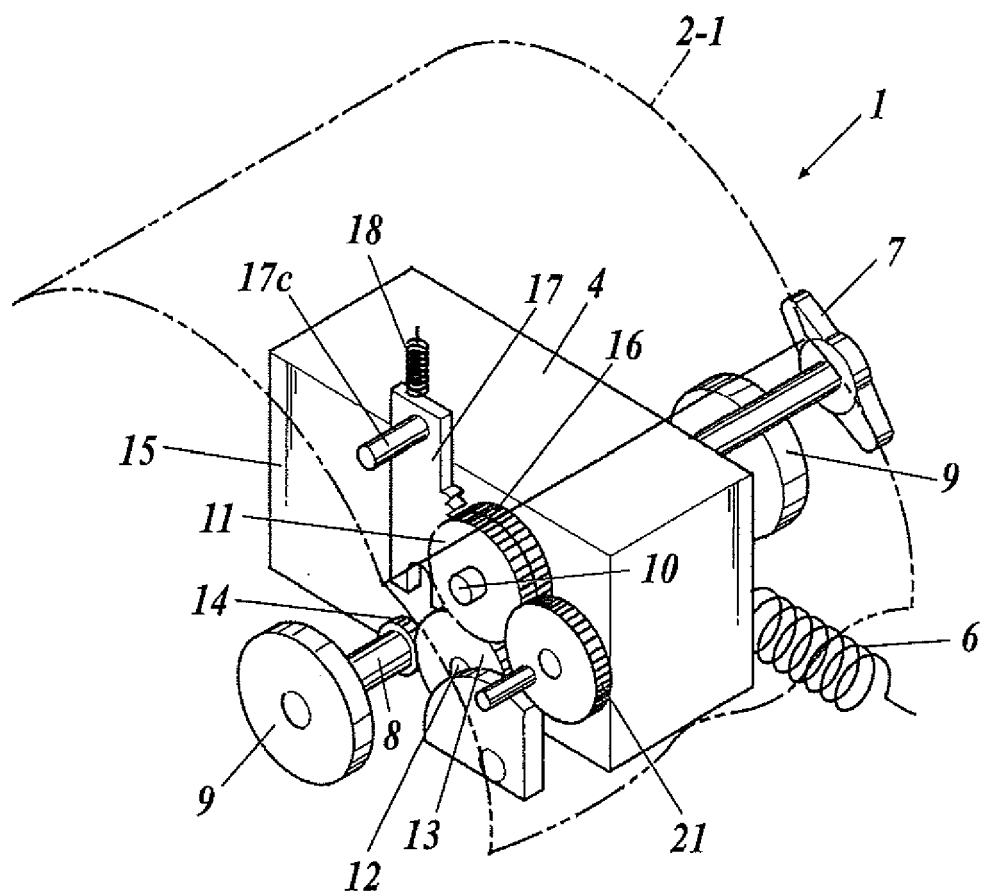


FIG. 4

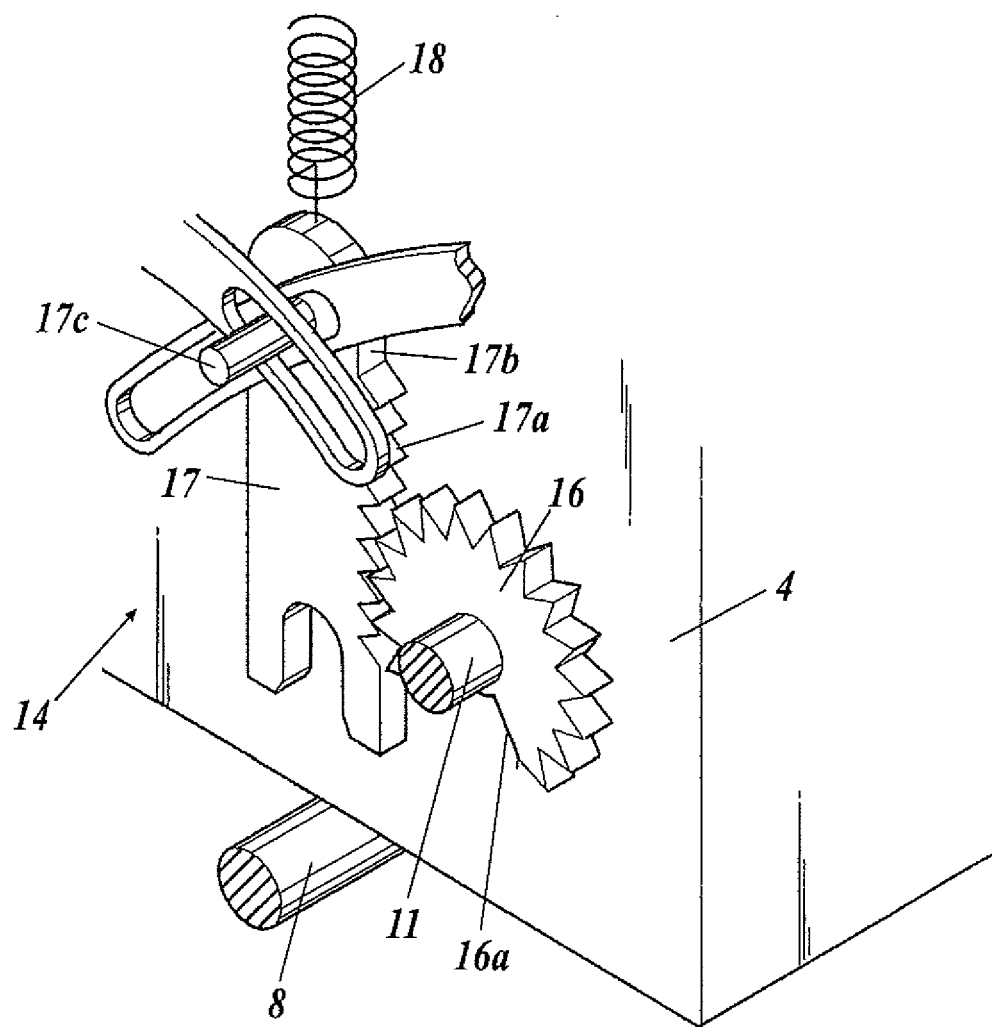


FIG. 5A

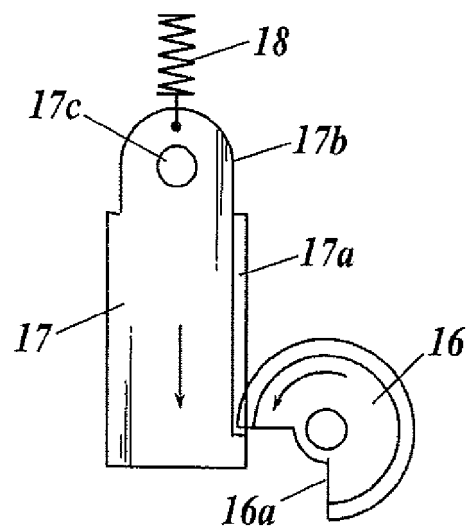


FIG. 5B

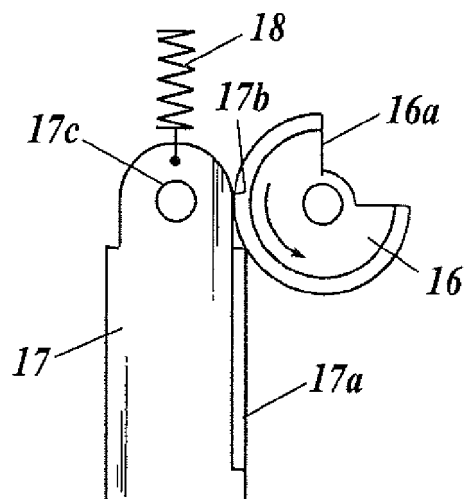


FIG. 5C

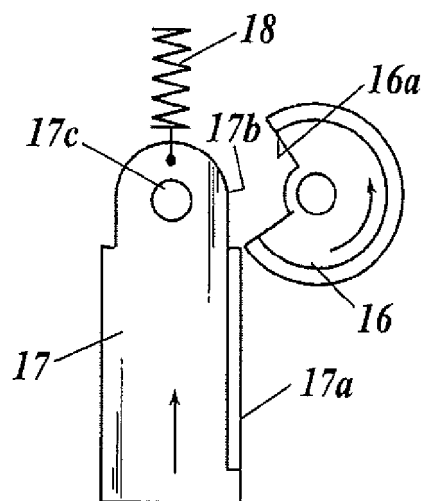


FIG. 6

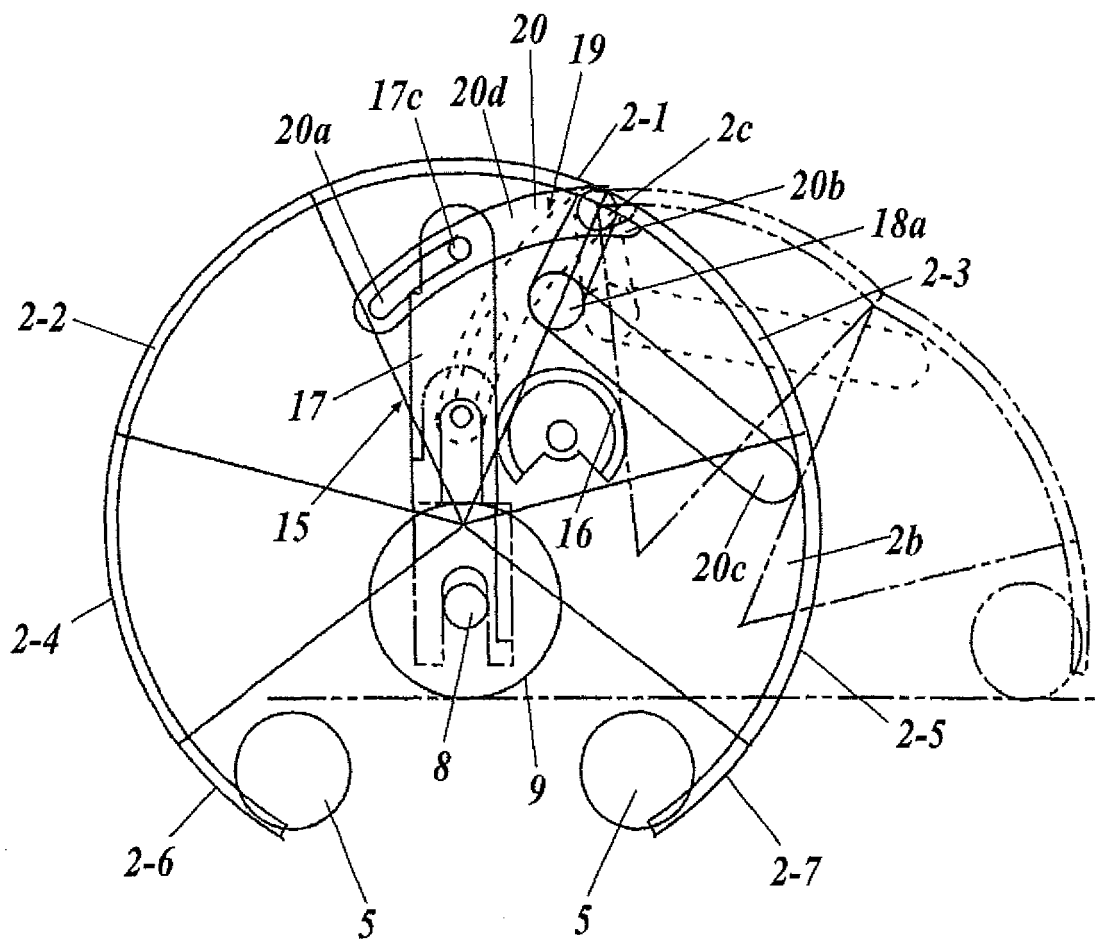
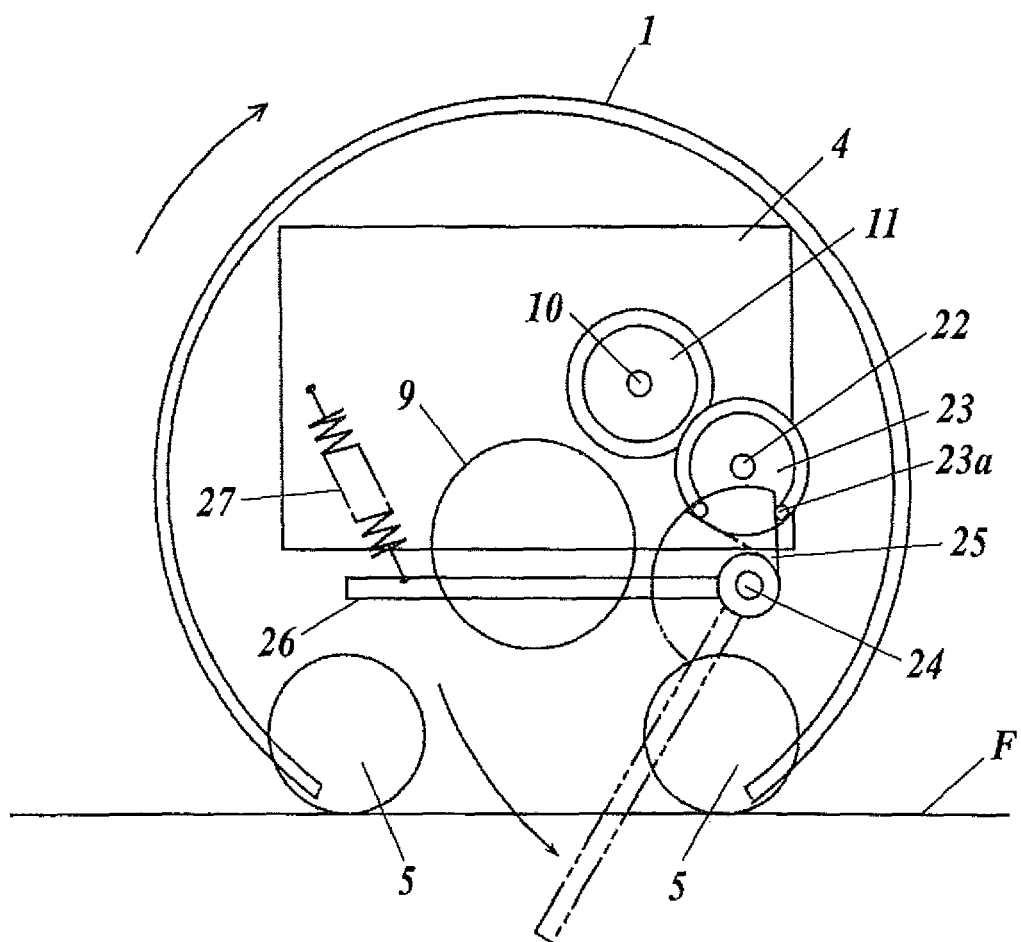


FIG. 7





EUROPEAN SEARCH REPORT

Application Number
EP 09 15 6599

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 20 August 2009	Examiner Shmonin, Vladimir
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EP 09 15 6599

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20-08-2009

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