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(54) **A ROTATION BLOCKING AND UN-BLOCKING MECHANISM FOR ROLLER BLINDS**  
**EIN ABROLL-BLOCKIER- UND ENTBLOCKUNGSMECHANISMUS FÜR ROLLÄDEN**  
**MECANISME DE BLOCAGE ET DECLenchement DE ROTATION POUR STORES ROULANTS**

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## Description

**[0001]** The invention relates to a blocking and unblocking mechanism for a roller blind according to the preamble of claim 1.

**[0002]** Roller blinds are of two main types. The first type, as shown in US-A-4 345 636 or GB-A-2 199 065 has a manual pull in the lower edge part so that a spring inside the roller blind roller is tightened when the blind is pulled down. This is a self-raising roller blind. When the roller blind is at rest raising is blocked by an element which locks the rotating outer part to the fixed inner part of the roller. Such elements are presently frequently balls which are carried in pockets in the rotating outer part. When the roller blind is to be raised again the lower edge part has to be pulled, and it must be quickly released, in order that the wedged-in ball is released, and the roller blind must under the influence of the spring obtain such a great rotational speed that all balls remain in the pockets in the outer part. The other type, as shown in EP-A-0 627 542, is activated by pulling an endless ball chain at one end of the roller blind. A pull in one direction causes raising against gravity, and the ball chain must be blocked when the roller blind has the correct position. Lowering is performed by releasing the blocking and braking against gravity. It may be desirable to combine the two constructions, so that the spring force only compensates for the weight of the more or less lowered roller blind, in order that lowering as well as raising is performed by a pull in the ball chain. However it may also be desirable to retain the self-raising feature with lowering by means of the ball chain. In this case, however, it is a problem that release by pulling the ball chain in similarity to pulling the lower edge part does not function reliably. This gives the user an insecure feeling compared to the traditional solution using a pull in the lower edge part. This means that an important possibility for building-in the roller blind is made more difficult.

**[0003]** DE-A-23 39 170 describes a blocking member which is positively controlled by guide surfaces, the position of which is established by a resilient member. The problem solved by these constructions is that of obtaining instant stopping at the moment the ball chain is released during the winding or unwinding operation.

**[0004]** It is the purpose of the invention to improve a mechanism of the kind mentioned that overcomes the mentioned disadvantages. This is obtained in a construction with the features of claim 1.

**[0005]** In order to obtain operation by means of an endless ball chain and lowering by pulling in one direction the ball chain and releasing in the other direction an advantageous embodiment has been provided, wherein the flexible element is an endless ball chain and in that the pulley is a chain wheel carrying a number of axially protruding arms in a number which corresponds to the number of balls, wherein by pulling the ball chain in one direction it establishes a link between the chain wheel and the roller blind tube and wherein by pulling the ball

chain in the other direction it releases the ball (10) which is presently wedged-in.

**[0006]** In order to enable the construction of a roller blind, the axially protruding arms are provided with symmetrically placed release surfaces.

**[0007]** The invention will be described in greater detail in the following with reference to the drawings, in which

Fig. 1 shows the end of a roller for a roller blind with a chain wheel and chain guide,

Fig. 2 in perspective shows a chain wheel and surrounding elements according to the invention,

Fig. 3a shows an axial section in the locking mechanism in the released state, and

Fig. 3b shows an axial section in the locking mechanism in the blocked state.

**[0008]** Fig. 1 shows the internal mechanism in a roller for a roller blind with operation control to be located on the left side. It consists of an inner part having the form of a rod 1, around which a raising helical spring which is not shown may be placed, so that one end of the spring is connected to an outer part having the form of a bushing 2, and the other end of the spring is connected to the end of the rod 1. The rod 1 is non-rotating, in that it is provided with an insert 3 which is secured against rotation by insertion into a bracket. The insert 3 furthermore ensures that a shield 4 for a pull cord also remains non-rotating. The roller blind which is not shown will rotate around the stationary rod 1, wherein the bushing 2 constitutes a bearing. By operating the roller blind by means of a pull cord or a ball chain, the movement is transferred to the bushing. This occurs when the cord is placed around a cord pulley or chain wheel 5 which in a suitable manner establishes a connection to the bushing 2. At S it is indicated how a pull cord or ball chain operates with the chain wheel 5.

**[0009]** In Fig. 2 some of the elements of Fig. 1 are shown in larger scale. The shield 4 is provided with two large openings 8 and 9 which permit a large deviation angle for the operating cord. The chain wheel 5 is placed rotatably on the part 6 and has three arms A which engage into the bushing 2. The directions S show how the cord or the ball chain mesh with the chain wheel 5. The arms A have a particular cross section which make the invention operational.

**[0010]** In Fig. 3a a cross section of the bushing 2 which rotates around the part 6 on the rod 1 is shown. Only one ball is shown, in the pocket 11, but in practical use there are also balls in the pockets 12 and 13. The ball is flung against that part of the pocket which is most remote from the axis of rotation, and for this reason it does not create any blocking. Driving from the chain wheel 5 occurs by engagement of the arms A in corresponding hollows B in the bushing 2.

**[0011]** In Fig. 3b a corresponding cross section as in Fig. 3a is seen, wherein only the ball performs its blocking function. The ball 10 is wedged between the left edge of the pocket 11 and the right edge of the depression 7. The invention is brought into action by pulling in the ball chain, so that the flange A' on the arm A pushes the ball 10 out of engagement between the edge 11 of the pocket and the depression 7. In the figure this corresponds to a clockwise rotation of the cord pulley 5 with the arms A mentioned.

**[0012]** It will be noted that the arms A have a symmetrical cross section with two similarly made flanges A' which means that the chain wheel 5 may be made in one piece and still be used for operation from the left side or from the right side, wherein there will be a flange A' available in both situations for acting on a blocking ball.

## Claims

1. A blocking and un-blocking mechanism for a roller blind comprising

a) a non-rotating inner part (1)  
 b) a rotatable outer part (2)  
 c) a pulley (5) provided at one end of the inner part (1)  
 d) wherein the pulley (5) is rotatably placed on a part (6) of the inner part (1)  
 e) a number of balls (10) wedgeable between the inner part (1, 6) and the outer part (2), said mechanism being of the type in which, under certain conditions of rotational speed, one out of a number of the balls (10) is wedged between the inner part (1, 6) and the outer part (2),  
**characterized in that** the mechanism further comprises  
 f) a flexible pulling element (S) for operating the roller blind, placed around the pulley (5) at one end of the inner part (1),  
 g) wherein the pulley (5) has an element (A) which engages into the rotatable outer part (2) so that when pulling the flexible pulling element (S), it is capable of pushing out a wedged-in ball (10) so that the outer part (2) may rotate relative to the inner part (1, 6).

2. A mechanism according to claim 1, **characterized in that** the flexible element is an endless ball chain (S) and that the pulley is a chain wheel (5) carrying axially protruding arms (A) in a number which corresponds to the number of balls (10), wherein by pulling the ball chain (S) in one direction it establishes a link between the chain wheel (5) and the inner part and by pulling the ball chain (S) in the other direction it releases the ball (10) which is wedged-in.

3. A mechanism according to claim 2, **characterized**

**in that** the axially protruding arms (A) are provided with symmetrically placed release surfaces (A').

## Patentansprüche

1. Ein Blokier- und Entblockungsmechanismus für einen Rolladen umfassend

a) einen nicht-rotierenden Innenteil (1)  
 b) einen rotierbaren Aussenteil (2)  
 c) eine Schnurscheibe (5) bei der einen Ende des Innenteils (1) vorgesehen  
 d) worin die Schnurscheibe (5) drehbar auf einem Teil (6) des Innenteils (1) angebracht ist  
 e) eine Anzahl von Kugeln (10) die einkeilbar zwischen dem Innenteil (1, 6) und Aussenteil (2) sind; der Mechanismus von der Typ ist bei welchem, unter gewissen Umdrehungszahlbedingungen, eine von der Anzahl der Kugeln (10) zwischen dem Innenteil (1, 6) und Aussenteil (2) eingekeilt ist,  
**dadurch gekennzeichnet, dass** die Einrichtung weiter umfasst  
 f) ein flexibles Zugelement (S) für die Handhabung des Rolladen, um der Schnurscheibe (5) an einer Ende des inneren Teils (1) angebracht ist,  
 g) wobei die Schnurscheibe (5) ein Element (A) hat, welches in den rotierbaren Aussenteil (2) eingreift, so dass wenn das flexible Zugelement (S) gezogen wird, es im Stande ist, eine eingekeilte Kugel (10) auszuschieben, womit der Aussenteil (2) in Verhältnis zu dem Innenteil (1, 6) drehen kann.

2. Ein Mechanismus gemäss Anspruch 1, **dadurch gekennzeichnet, dass** das flexible Element eine endlose Kugelschleife (S) ist und dass die Schnurscheibe ein Kettenrad (5) ist, das axial ausragende Stäbchen (A) trägt, in einer Anzahl, die die Anzahl von Kugeln (10) entspricht, wobei Ziehen an der Kugelschleife (S) in einer Richtung eine Verknüpfung zwischen dem Kettenrad (5) und dem Innenteil hervorbringt, und wobei Ziehen in der anderen Richtung die Kugel (10), die eingekeilt ist, freigibt.

3. Ein Mechanismus gemäss Anspruch 2, **dadurch gekennzeichnet, dass** die axial ausragende Stäbchen (A) mit symmetrisch angebrachte Freigabeoberflächen (A') versehen sind.

## Revendications

1. Mécanisme de blocage et déclenchement pour un store roulant comprenant

- a) une partie intérieure non-rotatif (1)  
 b) une partie extérieure tournable (2)  
 c) une poulie (5) pourvue a une coté de la partie intérieure (1)  
 d) et et dans lequel la poulie (5) et situé tournable sur une partie (6) de la partie intérieure (1)  
 e) un nombre de billes (10) qui sont capables d'être coincé entre la partie intérieure (1, 6) et la partie extérieure (2), ledit mécanisme étant du type permettant, sous certain conditions de vitesse de rotation, le coincement d'une des billes (10) entre la partie intérieure (1, 6) et la partie extérieure (2)  
**caracterisé en ce que** le mécanisme comprends en outre  
 f) un élément de tirage flexible (S) pour faire fonctionner le store, mis autour de la poulie (5) pres d'une coté de la partie intérieure (1),  
 g) dans lequel la polie (5) porte un élément (A) qu'engrène la partie extérieure tournable (2), ainsi que quand l'élément de tirage flexible (S) est tiré, il est capable de pousser une bille coincé (10) pour permettre le rotation de la partie extérieure (2) relative à la partie intérieure (1, 6).
2. Mécanisme selon revendication 1, l'élément flexible est une chaîne a billes infini (S) et en ce que la poulie est à chaîne (5) qui porte des bras saillant axialement (A) au nombre correspondent au nombre de billes (10), le tirage de la chaîne a billes (S) dans une direction établissant une connexion entre la poulie a chaîne (5) et la partie intérieure, et le tirage dans la direction opposée dégage la bille (10) que est coincé.
3. Mécanisme selon revendication 2, **caracterisé en ce que** les bras saillant axialement (A) sont pourvue des surfaces de dégagement (A') placé symmetriquement.

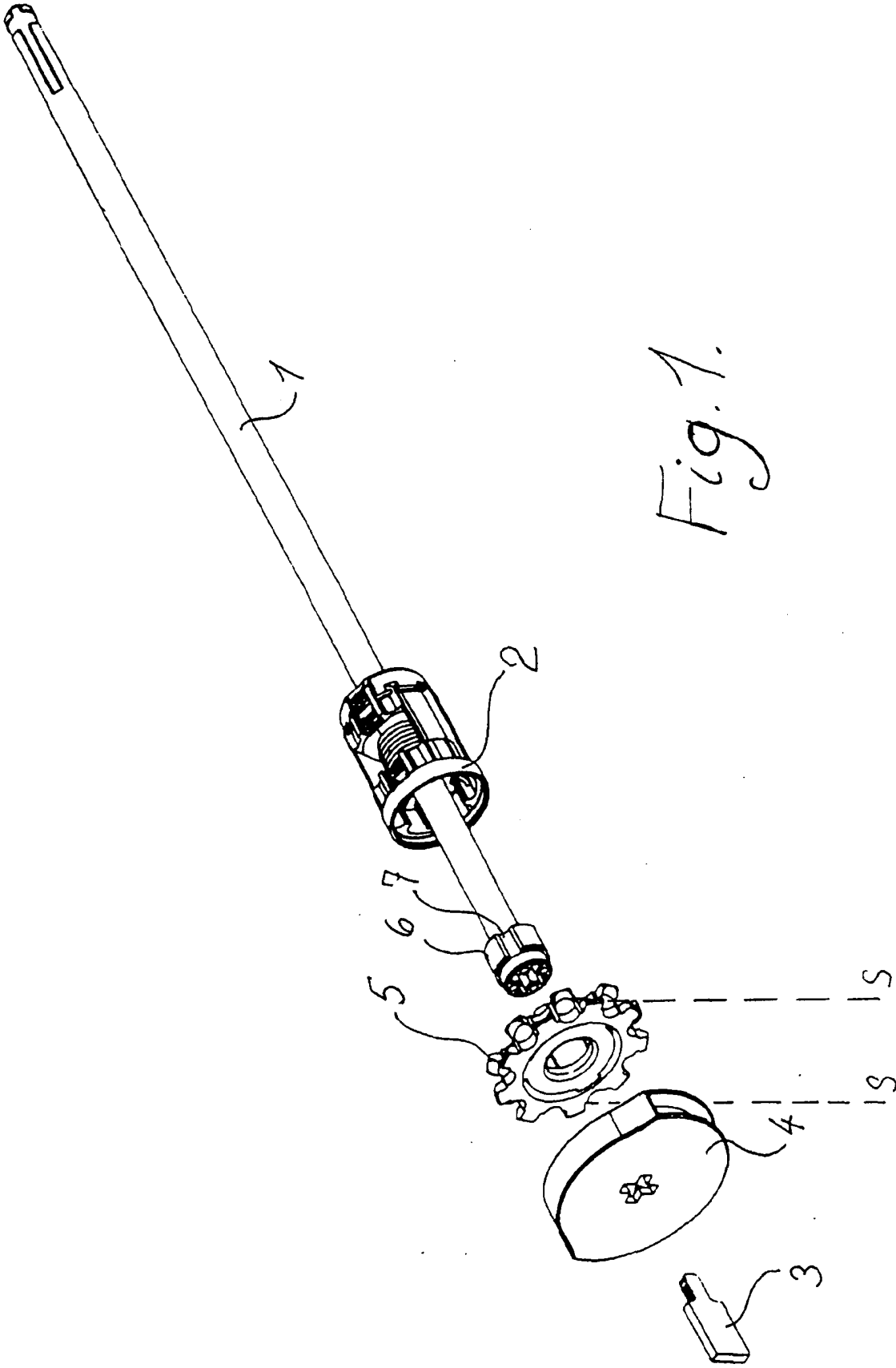
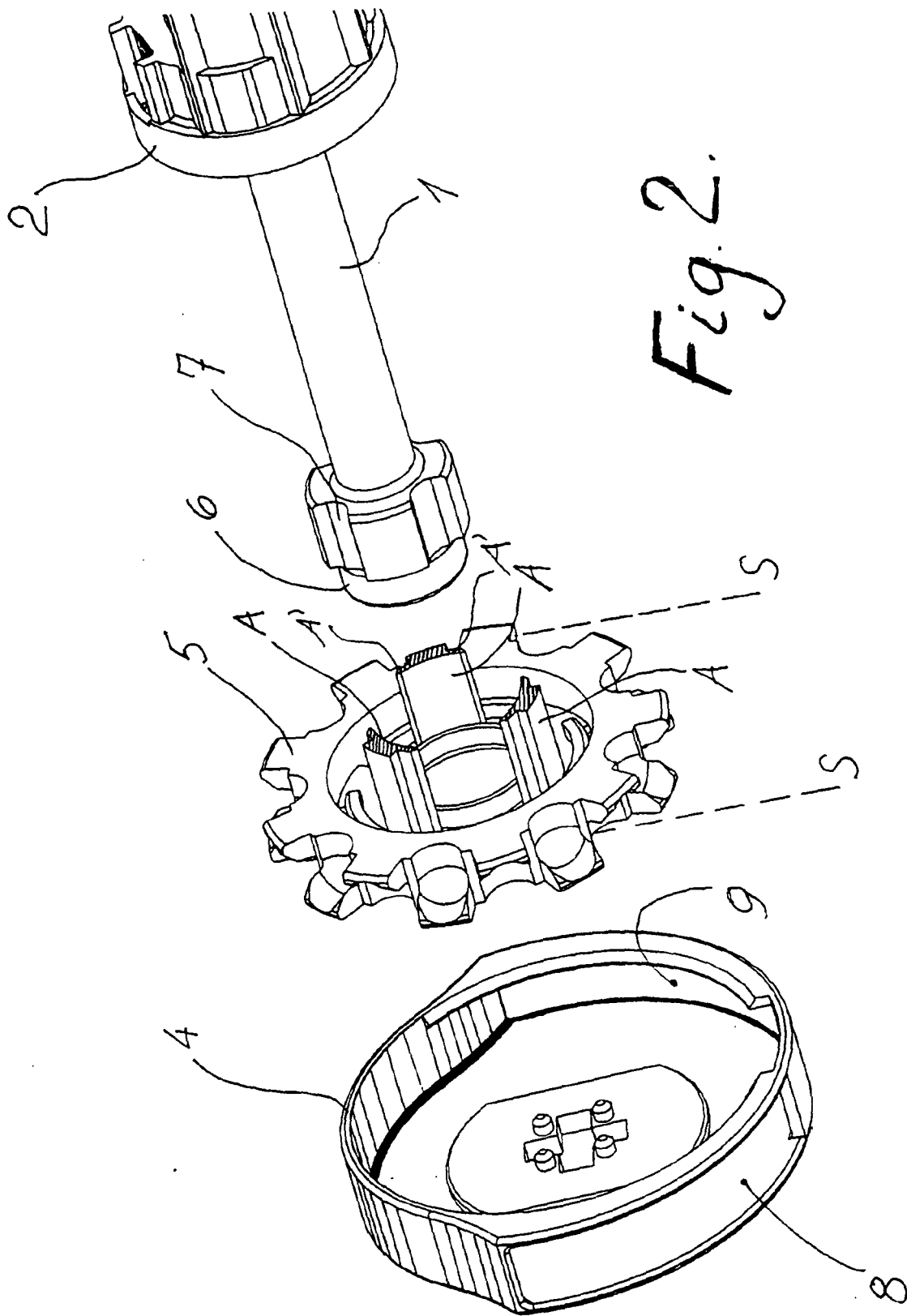
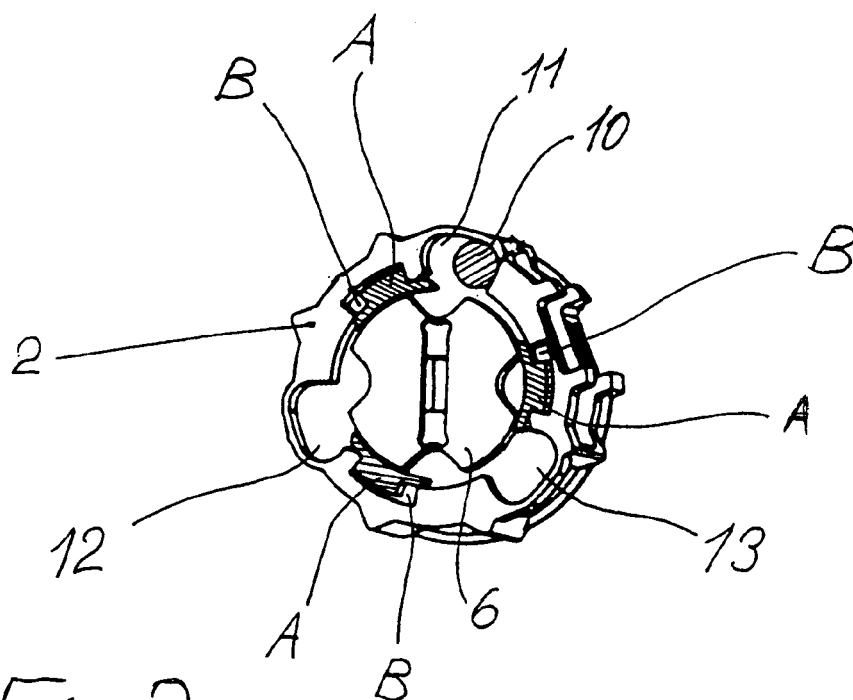


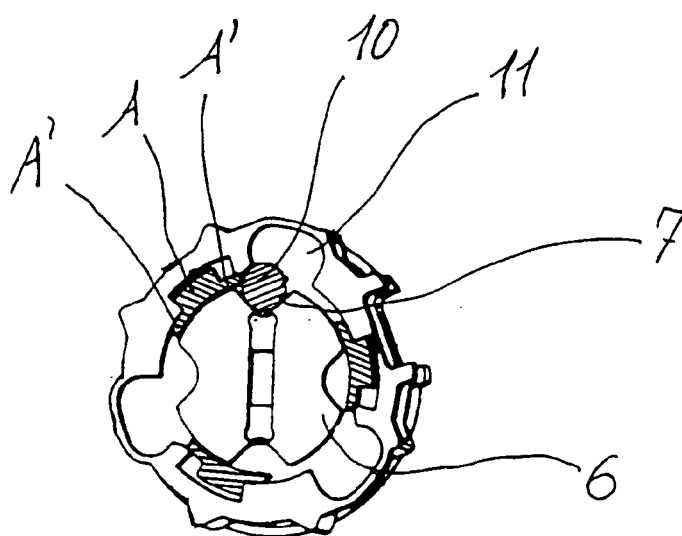
Fig. 1.





*Fig. 3a.*

*Fig. 3b.*



**REFERENCES CITED IN THE DESCRIPTION**

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