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(71) Applicant: **Kia Motors Corporation**
Seocho-gu, Seoul (KR)

(72) Inventor: **Lee, Choong-kyung**
Gwangmyoung-shi, Kyunggi-do (KR)

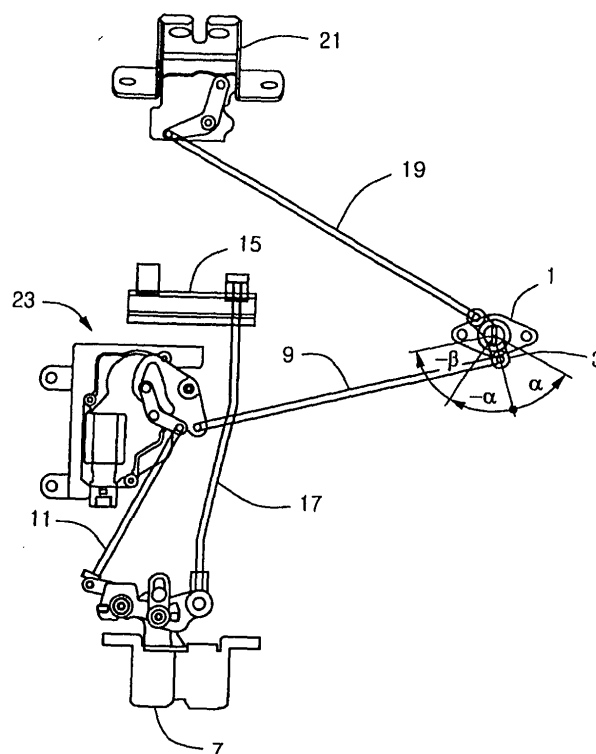
(74) Representative: **Viering, Jentschura & Partner**
Steinsdorfstrasse 6
80538 München (DE)

(54) **Lock and latch coupling structure having control mechanism in vehicular tail gate locking system**

(57) The invention relates to a coupling structure between a lock (3) and a latch (7) in a vehicular tail gate locking system. The coupling structure of the invention comprises a key lever (29) for being rotated axially depending on displacement of a first rod (9) coupled to the lock and a remote lever (31) for being axially rotated de-

pending on axial rotation of the key lever to shift the position of a second rod (11). A control latch (23) is further provided which allows the second rod to maintain its position as the lock is further rotated by any angle while the lock is in a locked position so that the further rotational force of the lock lever caused by a user is not transmitted to the latch.

FIG. 3



Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates generally to a tail gate locking system, and more particularly, to a rotation-absorbing device capable of absorbing rotational force of a lock lever to prevent the rotational force of the lock lever from being transmitted to a tail gate latch in a locking system.

Description of the Prior Art

[0002] In a coupling structure between a tail gate lock and a tail gate latch which are components of a tail gate locking system, the tail gate lock and latch are directly connected via a single rod, or via two rods and an intermediate crank lever for connection of the rods.

[0003] As a lock lever is rotated right or left for a proper angle, the tail gate lock is locked to or unlocked from the tail gate latch via the rod(s) connected therebetween.

[0004] Fig. 1 shows conventional coupling structures, i.e. a conventional coupling structure in which a lock lever and a latch section are connected via a single rod and another conventional coupling structure in which a lock lever and a latch section are connected via two rods and a crank lever.

[0005] As shown in Fig. 1, the first coupling structure of the prior art has a lock lever 3 and a latch section 7 connected via a single rod 5. The second coupling structure of the prior art has the lock lever 3 and the latch section 7 which are connected with assistance of first and second rods 9 and 11 via a crank lever 13 serving as an intermediate connecting lever.

[0006] In the operation of the conventional coupling structures having the above constructions, as the lock lever 3 is rotated right or left by a proper angle α , the latch is actuated by the rod connected thereto or by the rods and the crank lever.

[0007] However, as shown in Fig. 2, where each of the conventional coupling structures has any further function in addition to the above function of controlling the locking/unlocking between the lock and latch, e.g., where it is necessary to increase the rotation angle of the lock lever by an angle β in addition to the previously rotated angle α in order to control a window latch, the coupling structures each may have a potential problem in operation.

[0008] In other words, as the lock lever is rotated further, i.e., rotated further by the angle β which is unnecessary to the operation of the latch, the rod(s) and the crank lever, if any, transmit the further rotational force to the latch without absorbing the further unnecessary rotational force.

SUMMARY OF THE INVENTION

[0009] The present invention has been made to solve the foregoing problems and it is therefore an object of the present invention to liberate a latch from any effect of further rotational force of a lock lever even though a separate function such as window latch is also provided.

[0010] In order to obtain the above object, the present invention, in place of a crank lever mounted in the prior art, includes the mounting of a control latch capable of absorbing the further rotational force of the lock lever caused by a user so that both a tail gate latch and a window latch can be controlled in common with one lock without further mounting any additional device for controlling the window latch and the like.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The above and other objects, features and other advantages of the present invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

Fig. 1 illustrates conventional coupling structures between a lock and a latch;

Fig. 2 illustrates change of rotation angle in the lock lever in which an additional function is further provided;

Fig. 3 illustrates a general coupling structure between a lock lever and a latch section in which a control latch is further provided according to the present invention;

Fig. 4 is a detailed view illustrating the control latch according to the invention;

Fig. 5A illustrates the entire configuration of a key lever;

Fig. 5B illustrates the detailed configuration of an opening in the key lever;

Fig. 6 illustrates a remote lever; and

Figs. 7A to 7E severally illustrate aspects of the operational position of the control latch depending on locking, unlocking and further rotational force of a lock.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0012] The following detailed description will present a preferred embodiment of the invention in reference to the accompanying drawings.

[0013] Fig. 3 generally shows a coupling structure between a lock lever and a latch section of a tail gate in which a control latch is also provided.

[0014] As shown in Fig. 3, the coupling structure further comprises a window latch 21 connected to the lock section 1 via a window rod 19 in addition to conventional components including a lock lever 3 and the first and

second rods 9 and 11, in which the lock lever 3 is connected to one end of the first rod 9 and the latch section 7 is connected to one end of the second rod 11.

[0015] In the above construction, a control latch 23 is provided which is so connected to the other ends of the first rod 9 and the second rod 11 that rotational force of the lock lever 3 caused by the window latch 19 may not be transmitted to the latch section 7.

[0016] Fig. 4 is a detailed view illustrating a construction of the control latch.

[0017] As shown in Fig. 4, the control latch 23 includes a base 25, an actuator 27, a key lever 29 and a remote lever 31. The base 25 is mounted on the tail gate, and serves to fix other components.

[0018] The key lever 29 rotatable about an axis P1 is axially rotated and restricted in position by the first rod 9 connected thereto, and controls axial rotation of the remote lever 31 coupled at a portion to the key lever 29 so as to restrain the position of the remote lever 31.

[0019] Fig. 5A is a plan view of the key lever 29 separated from the control latch 23 for the purpose of illustrating the configuration of an upper portion of the key lever 29.

[0020] Fig. 5B illustrates the configuration of an opening in the key lever 29.

[0021] As shown in Fig. 5B, the periphery of the opening partially corresponds to arcs of concentric circles which are described, respectively, from the axis P1 as their common center or origin.

[0022] Fig. 6 illustrates the remote lever 31 separated from the control latch 23.

[0023] The remote lever 31 rotatable about an axis P2 is axially rotated and restricted in position owing to axial rotation of the key lever 29 so as to restrain the position of the second rod 11 coupled thereto.

[0024] With the above construction, the control latch 23 shifts the second rod 11 for a given distance when the lock lever 3 is rotated right or left by an angle α , and however, has no effect on the position of the second rod 11 when the lock lever 3 is further rotated by any angle β .

[0025] Figs. 7A and 7E illustrate several aspects of the operation of the above control lever 23.

[0026] Fig. 7A shows the relative position between the key lever and the remote lever in when the lock is locked from an unlocked position.

[0027] Displacing the lock lever to the left by an angle α from the unlocked position shifts the position of the second rod 11 with a distance X.

[0028] Fig. 7B shows the relative position between the key lever and the remote lever when a key is removed in the locked position.

[0029] In this case, even though the lock lever is displaced to the right by the angle α toward its original position, the second rod 11 maintains its position, shifted with the distance X, without any change in position.

[0030] Fig. 7C shows the relative position between the key lever and the remote lever when the tail gate is unlocked from the locked position.

[0031] Displacing the lock lever to the right by the angle α from the locked position shifts the position of the second rod 11 by the distance X so as to return the second rod 11 into its original position.

[0032] Fig. 7D shows the relative position between the key lever and the remote lever if the key is removed in an opened position.

[0033] In this case, even though the lock lever is displaced to the left by the angle α , the second rod 11 maintains its position.

[0034] Fig. 7E shows the relative position between the key lever and the remote lever when a window is opened in the locked position.

[0035] In this case, the lock lever is displaced to the left by the angle β , whereas the second rod 11 maintains its position.

[0036] As a result, further rotational force by the angle β does not even have any effect on the position of the second rod 11.

[0037] According to the coupling structure having the above construction and operation, both the tail gate latch and the window latch can be controlled in common with one lock for the convenience's sake. Further, since it is unnecessary to mount any additional device for controlling the window latch, components can be reduced in number so as to save cost as well as simplify assembly process.

[0038] While the present invention has been shown and described in connection with the preferred embodiment, it is intended that the present invention is not limited to the foregoing embodiment but those skilled in the art can make various modifications and variations without departing from the principle of the invention as defined in the appended claims.

Claims

1. A coupling structure between a tail gate lock and a tail gate latch in a vehicular tail gate locking system, comprising:

a first rod connected by one end to the tail gate lock;
a second rod connected by one end to the tail gate latch; and
a control latch for allowing the second rod to maintain its position as the lock is further rotated by a proper angle in a locked position.

2. A coupling structure in accordance with claim 1, wherein the control latch includes:

a base mounted on the tail gate;
a key lever supported on the base and coupled to the first rod for being axially rotated depending on displacement of the first rod; and
a remote lever supported on the base and for

being axially rotated depending on axial rotation of the key lever to shift the position of the second rod connected to the remote lever,

whereby the second rod is displaced by a proper distance as the lock is locked from an unlocked position, the second rod maintains its position as a key is removed in the locked position of the lock, the second rod is reversely displaced by the proper distance to its original position as the lock is unlocked from the locked position, the second rod maintains its position as the key is removed in the unlocked position of the lock, and the second rod maintains its position when the lock is further rotated in the locked position.

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FIG. 1

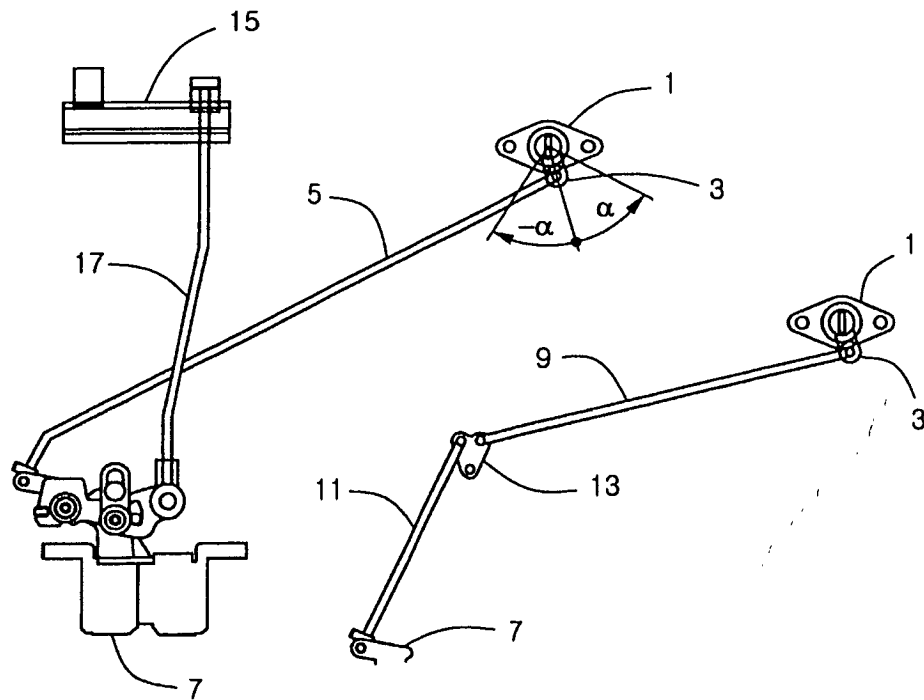


FIG. 2

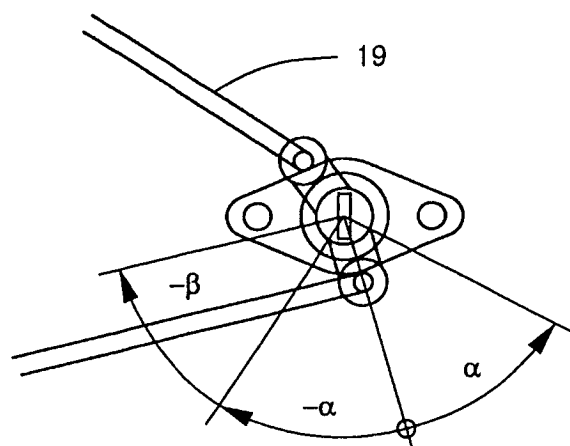


FIG. 3

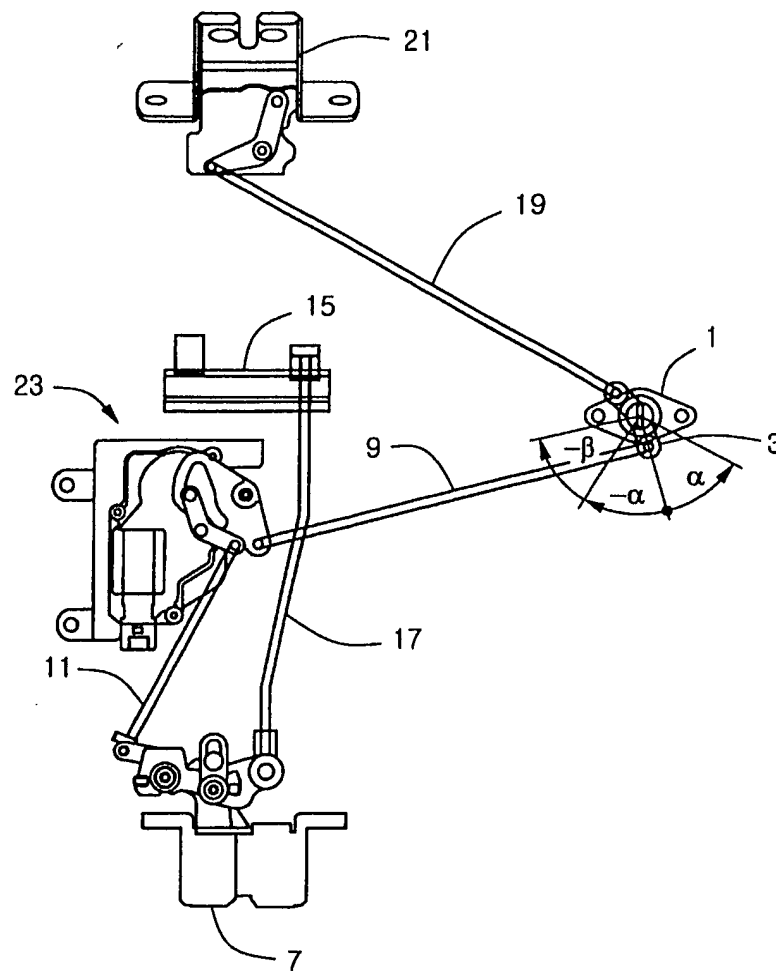


FIG. 4

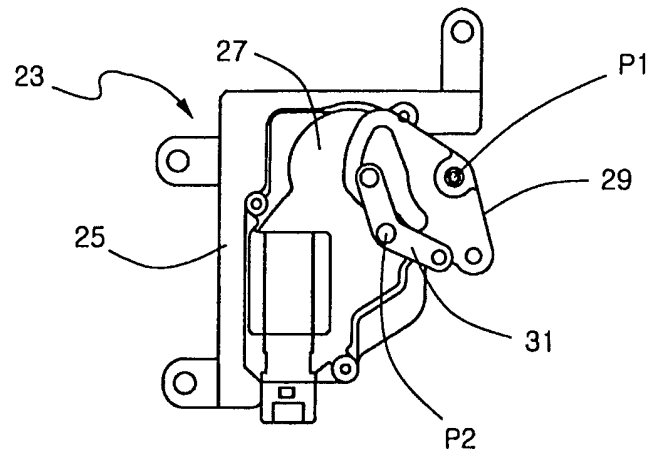


FIG. 5A

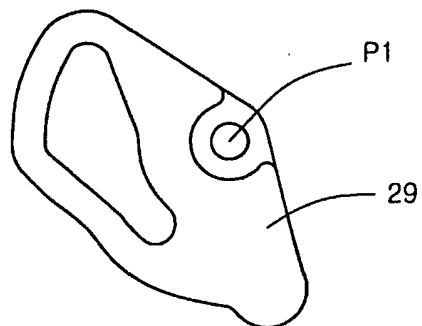


FIG. 5B

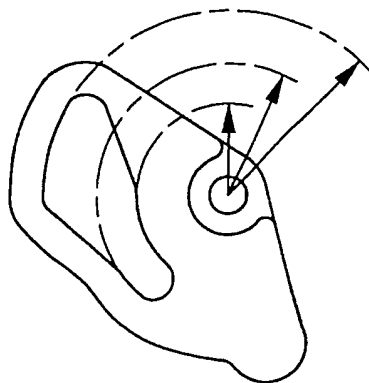


FIG. 6

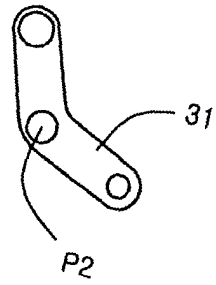


FIG. 7A

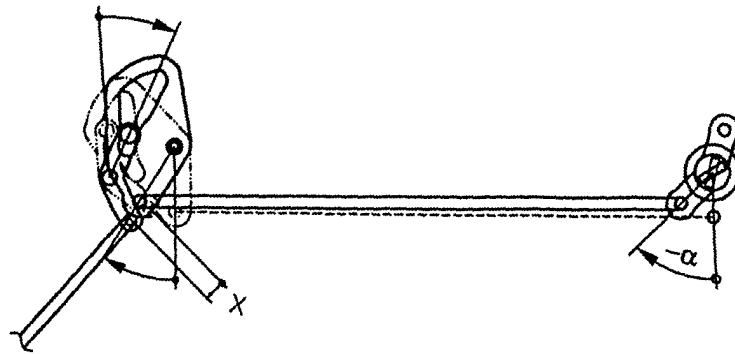


FIG. 7B

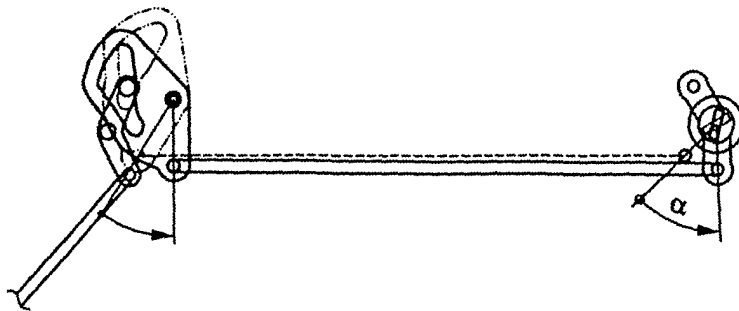


FIG. 7C

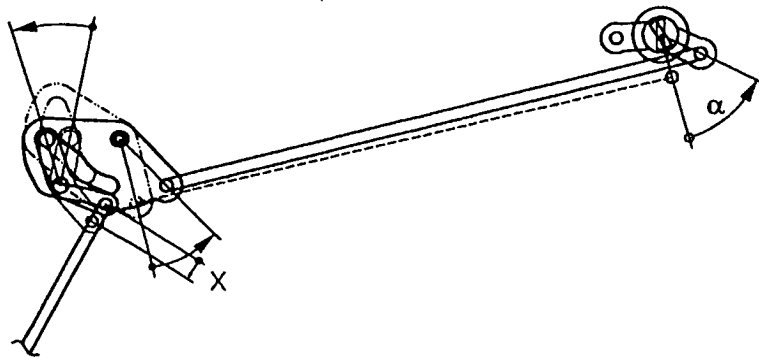


FIG. 7D

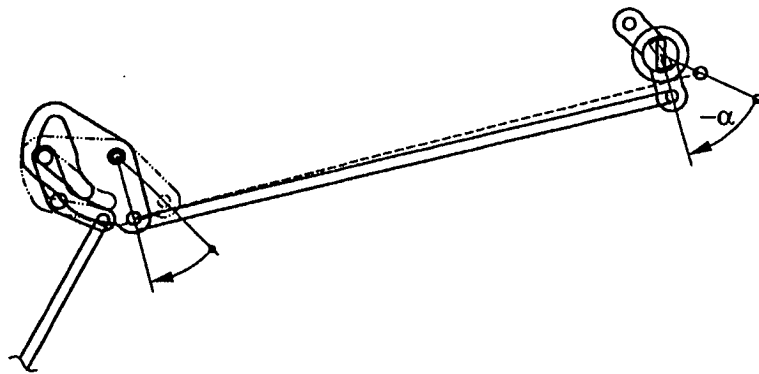
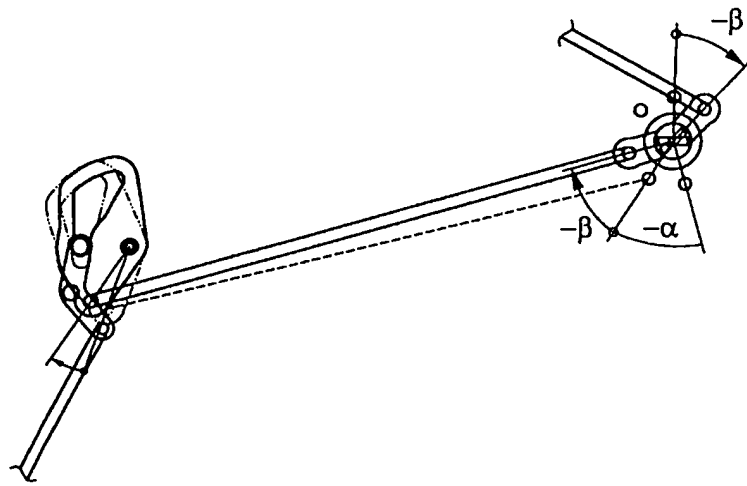


FIG. 7E





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 02 5117

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 4 773 683 A (NAKAMURA HITOSHI) 27 September 1988 (1988-09-27) * column 6, line 27 - line 61; figures *	1,2	E05B65/19
X	US 4 157 844 A (KWASIBORSKI STANLEY JR ET AL) 12 June 1979 (1979-06-12) * column 1, line 62 - column 3, line 60; figures *	1,2	
A	US 6 431 618 B1 (CHOO JIN SU) 13 August 2002 (2002-08-13) * column 1, line 37 - column 3, line 6; figures *	1,2	
A	US 6 131 989 A (MILLER JOHN F ET AL) 17 October 2000 (2000-10-17) * the whole document *	1,2	
A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 10, 31 August 1999 (1999-08-31) & JP 11 131885 A (MAZDA MOTOR CORP), 18 May 1999 (1999-05-18) * abstract *	1,2	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E05B B60J
Place of search	Date of completion of the search	Examiner	
MUNICH	27 May 2003	Henkes, R	
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03 82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 02 5117

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27-05-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4773683 A	27-09-1988	JP 1731714 C	17-02-1993
		JP 4020807 B	07-04-1992
		JP 62037486 A	18-02-1987
		DE 3626798 A1	19-02-1987
		FR 2586056 A1	13-02-1987
US 4157844 A	12-06-1979	CA 1105961 A1	28-07-1981
US 6431618 B1	13-08-2002	KR 2001055507 A	04-07-2001
		AU 732940 B1	03-05-2001
		DE 10028648 A1	21-06-2001
		JP 2001164811 A	19-06-2001
US 6131989 A	17-10-2000	US 6123386 A	26-09-2000
JP 11131885 A	18-05-1999	NONE	