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AS: 100.780

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO  
Rad: 06-034463- -00002-0000  
Fec: 2006-07-28 16:07:44 Dep. 2020 NUECREACIONES )  
Tra. 11 PATENTEIYII  
Cve: 379 FASINACIONALI  
Act 444 RESPUESTAREQUE Fotos: 47

Señores

**SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO**

**DIVISION DE NUEVAS CREACIONES**

E. S. D.

RESPUESTA A OFICIO 6312 DE JUNIO 09, 2006

REF: Expediente No. 06 034.463 - Solicitud de Patente Entrada en Fase Nacional

Corresp. a la Solicitud Internacional PCT/JP2004/015195

a favor de HONDA MOTOR CO., LTD.

Titulada: MOTOCICLETA Y UNIDAD DE POTENCIA

JUAN PABLO CADENA SARMIENTO, vecino de Bogotá, portador de la tarjeta profesional No. 57492, obrando como apoderado de la sociedad HONDA MOTOR CO., LTD., según lo acredita el documento de poder presentado en esa División, para dar cumplimiento al requerimiento notificado por fijación en lista el 09 de Junio de 2006, y de acuerdo con los Artículos 38 y 39 de la Decisión 486 de la Comisión de la Comunidad Andina, Artículo 27 del Tratado de Cooperación en Materia de Patentes (PCT), regla 51 bis del Reglamento y Circular Única de la SIC, me permito:

1. ACLARAR que la presente solicitud fue presentada ante la Oficina Internacional bajo el capítulo I del PCT, para lo cual estamos presentando en esta misma fecha Memorial Único de Correcciones y Modificaciones donde se hace la correspondiente modificación.
2. Allegar Reporte de Examen Preliminar Internacional sobre Patentabilidad (Formas PCT/IB/373 y PCT/IB/237), junto con su correspondiente traducción al castellano.
3. Allegar la traducción al inglés del documento de prioridad.

De la señora jefe atentamente,

  
**JUAN PABLO CADENA SARMIENTO**  
C.C. No. 80.410.337 de Usaquén  
Cra 7 No. 16-56 Piso 9

Bogotá, 28 de Julio de 2006  
CHP/MEV/her.

## PATENT COOPERATION TREATY

## PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

|                                                                                                                                  |                                                                            |                                                                |
|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------|
| Applicant's or agent's file reference<br>PO6033200                                                                               | FOR FURTHER ACTION<br>See item 4 below                                     |                                                                |
| International application No.<br>PCT/JP2004/015195                                                                               | International filing date (day/month/year)<br>07 October 2004 (07.10.2004) | Priority date (day/month/year)<br>08 October 2003 (08.10.2003) |
| International Patent Classification (8th edition unless older edition indicated)<br>See relevant information in Form PCT/ISA/237 |                                                                            |                                                                |
| Applicant<br>HONDA MOTOR CO., LTD.                                                                                               |                                                                            |                                                                |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                 |                     |                                     |          |                                      |                                                                                                  |                                     |                            |                                               |                                                                                                                                                                 |                                     |                         |                                      |                                                  |                                       |                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------------------------------|----------|--------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------|--------------------------------------|--------------------------------------------------|---------------------------------------|-------------------------------------------------------|
| 1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                 |                     |                                     |          |                                      |                                                                                                  |                                     |                            |                                               |                                                                                                                                                                 |                                     |                         |                                      |                                                  |                                       |                                                       |
| 2. This REPORT consists of a total of 4 sheets, including this cover sheet.<br><br>In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                 |                     |                                     |          |                                      |                                                                                                  |                                     |                            |                                               |                                                                                                                                                                 |                                     |                         |                                      |                                                  |                                       |                                                       |
| 3. This report contains indications relating to the following items:<br><br><table border="0"><tr><td><input checked="" type="checkbox"/> Box No. I</td><td>Basis of the report</td></tr><tr><td><input type="checkbox"/> Box No. II</td><td>Priority</td></tr><tr><td><input type="checkbox"/> Box No. III</td><td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td></tr><tr><td><input type="checkbox"/> Box No. IV</td><td>Lack of unity of invention</td></tr><tr><td><input checked="" type="checkbox"/> Box No. V</td><td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td></tr><tr><td><input type="checkbox"/> Box No. VI</td><td>Certain documents cited</td></tr><tr><td><input type="checkbox"/> Box No. VII</td><td>Certain defects in the international application</td></tr><tr><td><input type="checkbox"/> Box No. VIII</td><td>Certain observations on the international application</td></tr></table> | <input checked="" type="checkbox"/> Box No. I                                                                                                                   | Basis of the report | <input type="checkbox"/> Box No. II | Priority | <input type="checkbox"/> Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability | <input type="checkbox"/> Box No. IV | Lack of unity of invention | <input checked="" type="checkbox"/> Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement | <input type="checkbox"/> Box No. VI | Certain documents cited | <input type="checkbox"/> Box No. VII | Certain defects in the international application | <input type="checkbox"/> Box No. VIII | Certain observations on the international application |
| <input checked="" type="checkbox"/> Box No. I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Basis of the report                                                                                                                                             |                     |                                     |          |                                      |                                                                                                  |                                     |                            |                                               |                                                                                                                                                                 |                                     |                         |                                      |                                                  |                                       |                                                       |
| <input type="checkbox"/> Box No. II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Priority                                                                                                                                                        |                     |                                     |          |                                      |                                                                                                  |                                     |                            |                                               |                                                                                                                                                                 |                                     |                         |                                      |                                                  |                                       |                                                       |
| <input type="checkbox"/> Box No. III                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability                                                                |                     |                                     |          |                                      |                                                                                                  |                                     |                            |                                               |                                                                                                                                                                 |                                     |                         |                                      |                                                  |                                       |                                                       |
| <input type="checkbox"/> Box No. IV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Lack of unity of invention                                                                                                                                      |                     |                                     |          |                                      |                                                                                                  |                                     |                            |                                               |                                                                                                                                                                 |                                     |                         |                                      |                                                  |                                       |                                                       |
| <input checked="" type="checkbox"/> Box No. V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |                     |                                     |          |                                      |                                                                                                  |                                     |                            |                                               |                                                                                                                                                                 |                                     |                         |                                      |                                                  |                                       |                                                       |
| <input type="checkbox"/> Box No. VI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Certain documents cited                                                                                                                                         |                     |                                     |          |                                      |                                                                                                  |                                     |                            |                                               |                                                                                                                                                                 |                                     |                         |                                      |                                                  |                                       |                                                       |
| <input type="checkbox"/> Box No. VII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Certain defects in the international application                                                                                                                |                     |                                     |          |                                      |                                                                                                  |                                     |                            |                                               |                                                                                                                                                                 |                                     |                         |                                      |                                                  |                                       |                                                       |
| <input type="checkbox"/> Box No. VIII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Certain observations on the international application                                                                                                           |                     |                                     |          |                                      |                                                                                                  |                                     |                            |                                               |                                                                                                                                                                 |                                     |                         |                                      |                                                  |                                       |                                                       |
| 4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis.2).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                 |                     |                                     |          |                                      |                                                                                                  |                                     |                            |                                               |                                                                                                                                                                 |                                     |                         |                                      |                                                  |                                       |                                                       |

|                                                                                                                                     |                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| The International Bureau of WIPO<br>34, chemin des Colombettes<br>1211 Geneva 20, Switzerland<br><br>Facsimile No. +41 22 740 14 35 | Date of issuance of this report<br>20 June 2006 (20.06.2006)                  |
|                                                                                                                                     | Authorized officer<br><br>Masashi Honda<br><br>Telephone No. +41 22 338 70 10 |

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特許協力条約

発行人 日本国特許庁 (国際調査機関)

REC'D 27 JAN 2005

WIPO PCT

出願人代理人  
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あて名

〒 107-6013

東京都港区赤坂一丁目12番32号アーク森ビル1  
3階 泉光特許事務所PCT  
国際調査機関の見解書  
(特許庁規則第40条の2)  
[PCT規則43の2.1]発せ日  
(日.月.年) 25.1.2005出願人又は代理人  
の登録番号 P 05089200

今後の手続書については、下記2を参照すること。

国際出願番号  
PCT/JP2004/018195国際出願日  
(日.月.年) 07.10.2004優先日  
(日.月.年) 08.10.2003国際特許分類 (IPC) Int. Cl. B60K17/02, B62M9/00, F16D41/08,  
F16D43/16, F16D47/04出願人 (氏名又は名称)  
本田技研工業株式会社

1. この見解書は次の内容を含む。

- ☒ 第I項 見解の基礎  
☐ 第II項 優先権  
☐ 第III項 新規性、進歩性又は産業上の利用可能性についての見解の不作成  
☐ 第IV項 発明の単一性の欠如  
☒ 第V項 PCT規則43の2.1(a)(i)に規定する新規性、進歩性又は産業上の利用可能性についての見解、それを裏付けるための文獻及び説明  
☐ 第VI項 ある項の引用文獻  
☐ 第VII項 国際出願の不備  
☐ 第VIII項 国際出願に対する意見

2. 今後の手続書

国際予備審査の請求がされた場合は、出願人がこの国際調査機関とは異なる国際予備審査機関を選択し、かつ、その国際予備審査機関がPCT規則56.1の2(b)の規定に基づいて国際調査機関の見解書を国際予備審査機関の見解書とみなさない旨を国際事務局に通知していた場合を除いて、この見解書は国際予備審査機関の最初の見解書とみなされる。

この見解書が上記のように国際予備審査機関の見解書とみなされる場合、様式PCT/ISA/220を添付した日から3月又は優先日から22月のうちいずれか遅く満了する期限が経過するまでに、出願人は国際予備審査機関に、適當な場合は修正書とともに、答弁書提出することができる。

さらなる選択は、様式PCT/ISA/220を参照すること。

3. さらなる詳細は、様式PCT/ISA/220の備考を参照すること。

見解書を作成した日

04.01.2005

名称及びあて先

日本国特許庁 (ISA/JP)

郵便番号100-8815

東京都千代田区霞が関三丁目4番5号

特許庁審査官 (権限のある職員)

関口 勇

BJ 9338

電話番号 03-3581-1101 内線 3328

様式PCT/ISA/237 (表紙) (2004年1月)

国際調査機関 見解書

国際出願番号 PCT/JP2004/016196

## 第I欄 見解の基礎

1. この見解書は、下記に示す場合を除くほか、国際出願の言語を基礎として作成された。

- ☐ この見解書は、                                 語による翻訳文を基礎として作成した。  
それは国際調査のために提出されたPCT規則12.3及び22.1(b)にいう翻訳文の言語である。

2. この国際出願で提示されかつ請求の範囲に係る発明に不可欠なスクリーンショット又はアミノ酸配列に関して、以下に基づき見解書を作成した。

- a. タイプ ☐ 配列図  
☐ 配列表に関連するテーブル
- b. フォーマット ☐ 書体  
☐ コンピュータ読み取り可能な形式
- c. 提出時期 ☐ 出願時の国際出願に含まれる  
☐ この国際出願と共にコンピュータ読み取り可能な形式により提出された  
☐ 出願後に、調査のために、この国際調査機関に提出された

3. ☐ さらに、配列表又は配列表に関連するテーブルを提出した場合に、出願後に提出した配列若しくは追加して提出した配列が出願時に提出した配列と同一である旨、又は、出願時の開示を超える事項を含まない旨の補正書の提出があった。

4. 補足意見:

## 国際調査機関の見解書

国際出願番号 PCT/JP2004/015196

第V編 新規性、進歩性又は産業上の利用可能性についてのPCT規則43の2.1(a) (i)に定める見解、  
それを含む文献及び説明

## 1. 見解

|                |                |     |        |
|----------------|----------------|-----|--------|
| 新規性 (N)        | 請求の範囲<br>請求の範囲 | 1-6 | 有<br>無 |
| 進歩性 (IS)       | 請求の範囲<br>請求の範囲 | 1-6 | 有<br>無 |
| 産業上の利用可能性 (IA) | 請求の範囲<br>請求の範囲 | 1-6 | 有<br>無 |

## 2. 文献及び説明

- 文献1: JP 62-75141 A (ヤマハ発動機株式会社) 1987. 04. 07, 全文, 全図
- 文献2: 日本国実用新案登録出願52-116770号 (日本国実用新案登録出願公開54-42242号) の願書に添付した明細書及び図面の内容を撮影したマイクロフィルム (本田技研工業株式会社), 1979. 03. 22, 第10頁第12行-第12頁第7行, 第1-3図
- 文献3: 日本国実用新案登録出願59-180618号 (日本国実用新案登録出願公開61-94425号) の願書に添付した明細書及び図面の内容を撮影したマイクロフィルム (鈴木自動車工業株式会社), 1986. 06. 18, 第6頁第17行-第8頁第8行
- 文献4: JP 2001-295867 A (本田技研工業株式会社) 2001. 10. 26, 全文, 全図 & ID 29762 A
- 文献5: JP 2000-190746 A (株式会社フジテック) 2000. 07. 11, 全文, 全図
- 文献6: 日本国実用新案登録出願58-10621号 (日本国実用新案登録出願公開59-116639号) の願書に添付した明細書及び図面の内容を撮影したマイクロフィルム (本田技研工業株式会社), 1984. 08. 07, 全文, 全図
- 文献7: JP 60-263734 A (ヤマハ発動機株式会社) 1985. 12. 27, 全文, 全図

## 請求の範囲1-6

内燃機関の駆動力よりも車輪から変速機構側に伝達される駆動力が大きく、かつクランク軸の回転速度が所定値以上である時に変速機構からクランク軸へ動力を伝達する一方向クラッチの構成は、国際調査報告に引用されたいずれの文献にも記載されておらず、当業者にとって自明なものでもない。

## PATENT COOPERATION TREATY

TRANSLATION

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43W.1)

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

Date of mailing  
(day/month/year)

Applicant's or agent's file reference

P05033200

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/JP2004/015195

International filing date (day/month/year)

07.10.2004

Priority date (day/month/year)

08.10.2003

International Patent Classification (IPC) or both national classification and IPC

Applicant

HONDA MOTOR CO., LTD.

## 1. This opinion contains indications relating to the following items

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

## 3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/015195

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐

This opinion has been established on the basis of a translation from the original language into the following language

\_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐

a sequence listing

☐

table(s) related to the sequence listing

b. format of material

☐

in written format

☐

in computer readable form

c. time of filing/furnishing

☐

contained in the international application as filed.

☐

filed together with the international application in computer readable form.

☐

furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/015195

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

## 1. Statement

|                               |            |     |
|-------------------------------|------------|-----|
| Novelty (N)                   | Claims 1-6 | YES |
|                               | Claims     | NO  |
| Inventive step (IS)           | Claims 1-6 | YES |
|                               | Claims     | NO  |
| Industrial applicability (IA) | Claims 1-6 | YES |
|                               | Claims     | NO  |

## 2. Citations and explanations

Document 1: JP, 62-75141, A (Yamaha Motor Co., Ltd.), 7 April, 1987 (07.04.87), full text, all drawings

Document 2: Microfilm of the specification and drawings annexed to the written application of Japanese Utility Model Application No. 116770/1977 (Laid-open No. 42242/1979) (Honda Motor Co., Ltd.), 22 March, 1979 (22.03.79), page 10, line 12 to page 12, line 7, Figs. 1-3

Document 3: Microfilm of the specification and drawings annexed to the written application of Japanese Utility Model Application No. 180618/1984 (Laid-open No. 94425/1986) (Suzuki Jidosha Kogyo K.K., presently named Suzuki Motor Corp.), 18 June, 1986 (18.06.86), page 6, line 17 to page 8, line 8

Document 4: JP, 2001-295867, A (Honda Motor Co., Ltd.), 26 October, 2001 (26.10.01), full text, all drawings, & ID, 29762, A

Document 5: JP, 2000-190746, A (K.K. Fujitec), 11 July, 2000 (11.07.00), full text, all drawings

Document 6: Microfilm of the specification and drawings annexed to the written application of Japanese Utility Model Application No. 10621/1983 (Laid-open No. 116639/1984) (Honda Motor Co., Ltd.), 7 August, 1984 (07.08.84), full text, all drawings

Document 7: JP, 60-263734, A (Yamaha Motor Co., Ltd.), 27 December, 1985 (27.12.85), full text, all drawings

## Claims 1-6

None of the documents cited in the ISR describes the constitution of a one-way clutch in which (1) the drive force transmitted from wheels to a speed change mechanism is larger than the drive force of an internal combustion engine, and (2) power is transmitted from the speed change mechanism to a crankshaft when the rotating speed of the crankshaft is more than a predetermined value. This constitution is not considered to be obvious to a person skilled in the art either.

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TRATADO DE COOPERACION DE PATENTES

PCT

INFORME PRELIMINAR INTERNACIONAL SOBRE PATENTABILIDAD  
(Capítulo 1 del Tratado de Cooperación de Patentes)

(PCT Regla 44 bis)

|                                                                                                                                         |                                                                                             |                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Referencia del solicitante o el agente:<br>P05033200                                                                                    | PARA ACCION POSTERIOR Ver ítem 4 debajo                                                     |                                                                            |
| Solicitud Internacional No:<br>PCT/JP2004/015195                                                                                        | Fecha de presentación internacional<br>(día/mes/año):<br>07 de octubre de 2004 (07.10.2004) | Fecha de prioridad (día/mes/año):<br>08 de octubre de 2003<br>(08.10.2003) |
| Clasificación internacional de patentes (IPC) o clasificación nacional e IPC:<br>Ver información relevante en el Formulario PCT/ISA/237 |                                                                                             |                                                                            |
| Solicitante<br>HONDA MOTOR CO., LTD.                                                                                                    |                                                                                             |                                                                            |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Este informe preliminar internacional sobre patentabilidad (Capítulo I) lo emite la Oficina Internacional a nombre de la Autoridad de Búsqueda Internacional bajo la Regla 44 bis. 1(a).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 2. | Este INFORME consiste de un total de 4 hojas, incluyendo esta portada.<br><br>En las hojas anexas, cualquier referencia a la opinión escrita de la Autoridad de Búsqueda Internacional debe en su lugar leerse como referencia al informe preliminar internacional sobre patentabilidad (Capítulo I).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 3. | Este Informe contiene indicaciones relacionadas con los siguientes ítems:<br><br><input checked="" type="checkbox"/> Casilla No. I Base de este Informe.<br><br><input type="checkbox"/> Casilla No. II Prioridad.<br><br><input type="checkbox"/> Casilla No. III Sin establecer opinión respecto a novedad, nivel inventivo y aplicabilidad industrial.<br><br>/ <input type="checkbox"/> Casilla No. IV Falta de unidad de invención.<br><br><input checked="" type="checkbox"/> Casilla No. V Declaración justificada bajo el Artículo 35(2) respecto a novedad, nivel inventivo o aplicabilidad industrial; citas y explicaciones que sustentan tal declaración.<br><br><input type="checkbox"/> Casilla No. VI Ciertos documentos citados<br><br><input type="checkbox"/> Casilla No. VII Ciertos defectos en la solicitud internacional<br><br><input type="checkbox"/> Casilla No. VIII Ciertas observaciones sobre la solicitud internacional. |
| 4. | La Oficina Internacional comunicará este informe a las oficinas designadas de acuerdo con las Reglas 44 bis.3(c) y 93 bis.1 pero no, excepto donde el solicitante hace una solicitud expresa bajo el Artículo 23(2), antes del vencimiento de los 30 meses desde la fecha de prioridad (Regla 44 bis.2).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

|                                                                                                                            |                                                                              |
|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
|                                                                                                                            | Fecha de emisión de este informe<br>20 de junio de 2006 (20.06.2006)         |
| La Oficina Internacional de la OMPI<br>A chemin des ColombettesP<br>1211 Genva 20, Suiza<br>Facsimile No. +41 22 740 14 35 | Funcionario autorizado :<br>Masashi Honda<br>Teléfono No. : +41 22 338 70 10 |

Formulario PCT/IB/37 (Enero 2004)

De  
AUTORIDAD DE BUSQUEDA INTERNACIONAL

105  
**PCT**

**OPINION ESCRITA DE LA  
AUTORIDAD DE BUSQUEDA  
INTERNACIONAL  
(Regla 43bis.1 del PCT)**

|                                                                                                  |                                                              |                                                |  |
|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------|--|
|                                                                                                  |                                                              | Fecha de envío<br>(día/mes/año)                |  |
|                                                                                                  |                                                              | PARA ACCIÓN POSTERIOR<br>ver párrafo 2 debajo  |  |
| Referencia del solicitante o el agente:<br>P05033200                                             |                                                              |                                                |  |
| Solicitud Internacional No.<br>PCT/JP2004/015195                                                 | Fecha presentación internacional (día/mes/año)<br>07.10.2004 | Fecha de prioridad (día/mes/año)<br>08.10.2003 |  |
| Clasificación internacional de patentes (IPC) o tanto la clasificación internacional como la IPC |                                                              |                                                |  |
| Solicitante<br>HONDA MOTOR CO., LTD.                                                             |                                                              |                                                |  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Esta opinión contiene indicaciones relacionadas con los siguientes ítems:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                     |
| <input checked="" type="checkbox"/> Casilla No. I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Base de esta Informe.                                                                                                                                               |
| <input type="checkbox"/> Casilla No. II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Prioridad.                                                                                                                                                          |
| <input type="checkbox"/> Casilla No. III                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Sin establecer opinión respecto a novedad, nivel inventivo y aplicabilidad industrial.                                                                              |
| <input type="checkbox"/> Casilla No. IV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Falta de unidad de invención.                                                                                                                                       |
| <input checked="" type="checkbox"/> Casilla No. V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Declaración justificada bajo el Artículo 35(2) respecto a novedad, nivel inventivo o aplicabilidad industrial; citas y explicaciones que sustentan tal declaración. |
| <input type="checkbox"/> Casilla No. VI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Ciertos documentos citados                                                                                                                                          |
| <input type="checkbox"/> Casilla No. VII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Ciertos defectos en la solicitud Internacional                                                                                                                      |
| <input type="checkbox"/> Casilla No. VIII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Ciertas observaciones sobre la solicitud Internacional.                                                                                                             |
| 2. ACCION ADICIONAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                     |
| <p>Si se hace una solicitud de un examen preliminar Internacional, esta opinión usualmente se considerará una opinión escrita de la Autoridad del Examen Preliminar Internacional ("IPEA"). Sin embargo, esto no aplica cuando el solicitante escoge una Autoridad diferente a esta para que sea la IPEA y la IPEA seleccionada ha notificado a la Oficina Internacional bajo la Regla 68.1bis(b) que las opiniones escritas de la Autoridad de Búsqueda Internacional no se considerarán como tales.</p> <p>Si esta opinión es, como se proporciona arriba, considerada una opinión escrita de la IPEA, el solicitante está invitado a presentar a la IPEA una respuesta escrita junto con, según sea apropiado, correcciones, antes del vencimiento de tres meses desde la fecha de envío del Formulario PCT/ISA/220 o antes del vencimiento de 22 meses desde la fecha de prioridad, cualquiera que venga primero.</p> <p>Para opciones adicionales, ver Formulario PCT/ISA/220</p> |                                                                                                                                                                     |
| 3. Para detalles adicionales, ver notas al Formulario PCT/ISA/220.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                     |

|                                         |                         |
|-----------------------------------------|-------------------------|
| Nombre y dirección de correo de ISA/JP: | Funcionario Autorizado: |
|                                         | Teléfono No.            |

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**OPINION ESCRITA DE LA  
AUTORIDAD DE BUSQUEDA INTERNACIONAL**

Solicitud internacional No.  
PCT/JP2004/015195

**Casilla No. I Base de esta opinión**

1. Respecto al idioma, esta opinión ha sido establecida en base a la solicitud internacional en el idioma en el que se presentó, a menos que se indique lo contrario bajo este ítem.  
☐ Esta opinión se ha establecido en base a una traducción del idioma original al siguiente idioma , el cual es el idioma de la traducción presentada para propósitos de la búsqueda internacional (bajo las Reglas 12.3 y 23.1(b)).
2. Respecto a cualquier secuencia de nucleótidos y/o aminoácidos divulgada en la solicitud internacional y necesaria para la invención reivindicada, esta opinión se ha establecido en base a:
  - a. tipo de material:  
☐ un listado de la secuencia  
☐ tabla(s) relacionada(s) con el listado de la secuencia
  - b. formato del material:  
☐ en formato escrito  
☐ en formato legible por computador
  - c. tiempo de presentación/entrega:  
☐ contenido en la solicitud internacional como se presentó  
☐ presentado junto con la solicitud internacional en forma legible por computador  
☐ presentado subsiguientemente a esta Autoridad para propósito de la búsqueda.
3. ☐ Además, en caso que se halla presentado o entregado más de una versión o copia de un listado de la secuencia y/o tabla relacionada con ello, se han presentado las declaraciones requeridas de que la información en las copias subsiguientes o adicionales es idéntica a las de la solicitud como se presentó o no van más allá de la solicitud como se presentó, según sea apropiado.
4. Comentarios adicionales:

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OPINION ESCRITA DE LA  
AUTORIDAD DE BUSQUEDA INTERNACIONAL

Solicitud internacional No.  
PCT/JP2004/015195

**Casilla No. V Declaración Justificada bajo la Regla 43 bis.1(a)(i) respecto a la novedad, nivel inventivo, o aplicabilidad industrial; citas y explicaciones que sustentan dicha declaración**

**1. Declaración**

|                               |                         |    |
|-------------------------------|-------------------------|----|
| Novedad (N)                   | Reivindicaciones: 1 – 6 | Si |
|                               | Reivindicaciones:       | No |
| Nivel Inventivo (IS)          | Reivindicaciones: 1 – 6 | Si |
|                               | Reivindicaciones:       | No |
| Aplicabilidad Industrial (IA) | Reivindicaciones: 1 – 6 | Si |
|                               | Reivindicaciones:       | No |

**2. Citas y explicaciones**

Documento 1: JP, 62-75141, A (Yamaha Motor Co., Ltd.) 7 de abril de 1987 (07.04.87), texto completo, todos los dibujos.

Documento 2: Microficha de la descripción y los dibujos anexos a la solicitud escrita de la solicitud japonesa de modelo de utilidad No. 116770/1977 (No. de exposición 42242/1979) (Honda Motor Co. Ltd.), 22 de marzo de 1979 (22.03.79) página 10, línea 12 a página 12, línea 7, figuras 1 – 3.

Documento 3: Microficha de la descripción y los dibujos anexos a la solicitud escrita de la solicitud japonesa de modelo de utilidad No. 180818/1984 (No. de exposición 94425/1986) (Suzuki Jidosha Kogyo K.K., actualmente denominada Suzuki Motor Corp.), 18 de junio de 1986 (18.06.86), página 8, línea 17 a página 8, línea 8.

Documento 4: JP, 2001-295867, A (Honda Motor Co. Ltd.), 26 de octubre de 2001 (26.10.01), texto completo, todos los dibujos & ID, 29762, A.

Documento 5: JP, 2000-190746, A (K. K. Fujitec), 11 de julio de 2000 (11.07.00), texto completo, todos los dibujos.

Documento 6: Microficha de la descripción y los dibujos anexa a la solicitud escrita de la solicitud de modelo de utilidad japonesa No. 10621/1983 (No. de exposición 11663/1984) (Honda Motor Co., Ltd.), 7 de agosto de 1984 (07.08.84), texto completo y todos los dibujos.

Documento 7: JP, 60-263734, A (Yamaha Motor Co., Ltd.), 27 de diciembre de 1985 (27.12.85), texto completo y todos los dibujos.

**Reivindicaciones 1 - 16:**

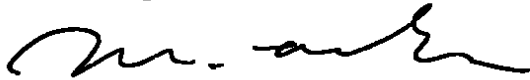
Ninguno de los documentos citados en el XBI describe la constitución de una embrague unidireccional en el cual (1) la fuerza impulsora transmitida desde las ruedas a un mecanismo de cambio de velocidad es mayor que la fuerza impulsora de un motor de combustión interna, y (2) la potencia es transmitida desde el mecanismo de cambio de velocidad a un cigüeñal cuando la velocidad de rotación del cigüeñal es superior a un valor predeterminado. Esta constitución tampoco se considera obvia para una persona con habilidad en el arte.

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**DECLARATION**

I, Mitsuru Nakano,  
hereby certify that to the best of my knowledge and belief  
the following is a true translation into English made by  
me of Japanese Patent Application No. 2003-349059 filed  
October 8, 2003.

Signed on June 22, 2006



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Mitsuru Nakano

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[Document] Patent Application

[Reference No.] PH3997A

[Addressed To] Commissioner, Patent Office

[International Patent Classification] F16D 43/12

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[Identification No.] 100112298

[Patent Attorney]

[Name] Mitsuharu ODA

[Indication of Fee]

[Deposit Account No.] 044624

[Amount] ¥21,000

[List of Attached Documents]

|           |                             |        |
|-----------|-----------------------------|--------|
| [Article] | Claims                      | 1 copy |
| [Article] | Specification               | 1 copy |
| [Article] | Drawings                    | 1 copy |
| [Article] | Abstract of the Description | 1 copy |

~~16~~ III

[Designation of Document] Claims

[Claim 1]

A motorcycle wherein a centrifugal start-up clutch and a torque converter are provided between a crankshaft of an internal combustion engine and a transmission mechanism;

wherein said motorcycle further comprises a one-way clutch provided between said crankshaft and said torque converter so that said one-way clutch transmits power from said transmission mechanism to said crankshaft only when a driving force transmitted from a wheel toward said transmission mechanism is larger than a driving force of said internal combustion engine and a rotational speed of said crank shaft is not lower than a predetermined value.

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[Designation of Document] Specification

[Title of the Invention] Motorcycle

[Technical Field]

[0001]

The present invention relates to a motorcycle in which a centrifugal start-up clutch and a torque converter are provided between a crankshaft of an internal combustion engine and a transmission mechanism.

[Background Art]

[0002]

In some internal combustion engines used in such motorcycles, a one-way clutch allowing only power transmission from a wheel to a crankshaft is provided as an engine brake on the crankshaft (e.g. see Patent Document 1 or Patent Document 2).

[0003]

[Patent Document 1] Japanese Utility Model Laid-Open No. 116639/1984

[Patent Document 2] Japanese Patent Laid-Open No. 75141/1987

[Disclosure of the Invention]

[Problem that the Invention is to Solve]

[0004]

The aforementioned one-way clutch in the background art always operates as a one-way clutch. Therefore, when the

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one-way clutch is used as an engine brake so as to allow only power transmission from the wheel to the crankshaft, rotations of the wheel will be transmitted to the crankshaft if the wheel rotates even when the internal combustion engine is stopping. For this reason, in order to take (shove) the motorcycle around when the internal combustion engine is stopping, it is necessary to change a gear to a neutral position so as to release the driving force. When there is no neutral structure, a new neutral structure has to be built in a gear transmission.

[Means for Solving the Problem]

[0005]

In order to solve the foregoing problem in the background art, according to the invention, there is provided a motorcycle including: an internal combustion engine having a crankshaft; a transmission mechanism; a centrifugal start-up clutch; and a torque converter, the centrifugal start-up clutch and the torque converter being provided between the crankshaft and the transmission mechanism; wherein the motorcycle further includes a one-way clutch provided between the crankshaft and the torque converter so that the one-way clutch transmits power from the transmission mechanism to the crankshaft only when a driving force transmitted from a wheel toward the transmission mechanism is larger than a driving force of the internal combustion engine and a rotational speed of the crank shaft is not lower than a predetermined value.

[Effect of the Invention]

[0006]

According to the invention configured thus, the power is not transmitted from the transmission mechanism side (wheel side) to the crankshaft side when the rotation number of the crankshaft is lower than the predetermined value. Thus, even when the wheel is rotated at a low speed, for example, in order to take the motorcycle around, the rotation of the wheel is not transmitted to the crankshaft. Accordingly, it is not necessary to operate the gear or the like when the motorcycle is taken around. In addition, even when the gear transmission has no neutral mechanism, the motorcycle can be taken around. Thus, it is unnecessary to provide a neutral mechanism, so that the number of parts can be reduced on a large scale. On the other hand, when the accelerator is released during the running of the motorcycle, the rotations of the wheel are transmitted to the crankshaft so that the engine brake can be applied.

[Best Mode for Carrying Out the Invention]

[0007]

An embodiment according to the invention will be described below with reference to Figs. 1-4. First, Fig. 1 is a general side view of a motorcycle according to this embodiment.

[0008]

In the motorcycle 1, a power unit 10 is suspended at the center of a body frame 2. A shaft of a front wheel 4 is supported

on a front fork 3 rotatably pivoted on a front portion of the body frame 2. Further, a shaft of a rear wheel 6 is supported on the rear end of a rear fork 5 pivoted at its front end on the power unit 10 and extending backward.

[0009]

The power unit 10 is constituted by an internal combustion mechanism 11 and a load-side transmission mechanism 12 integrated with each other. Fig. 2 is a longitudinal sectional view of a main portion of the power unit 10.

[0010]

A left unit casing 13L and a right unit casing 13R which are left and right half splits are combined to incorporate a crank casing of the internal combustion engine 11 and a gear casing of the transmission mechanism 12. Thus, a crank chamber and a gear chamber are formed internally.

[0011]

A crankshaft 15 is supported on the left and right unit casings 13L and 13R through bearings 16L and 16R respectively, so as to be disposed to point in the left/right direction of the vehicle. In the internal combustion engine 11, a piston 18 slidably fitted into a cylinder bore of a cylinder block 17 is connected to the crank shaft 15 through a connecting rod 19.

[0012]

A cylinder head 20 joined to the cylinder block 17 forms

a combustion chamber 21 between the cylinder head 20 and the top face of the piston 18. The cylinder head 20 is provided with an air intake and exhaust valve (not shown) for opening and closing an air intake and exhaust port communicating with the combustion chamber 21. A cam shaft 22 for driving the air intake and exhaust valve is rotatably supported on the cylinder head 20 and in parallel to the crankshaft 15.

[0013]

In the transmission mechanism 12, an input shaft 25 and an output shaft 26 disposed in parallel with the crankshaft 15 are rotatably laid between the left and right unit casings 13L and 13R. A primary reduction driven gear 25a is fitted to an end portion of the input shaft 25 projecting rightward from the right unit casing 13R, and a driving gear 25b is formed on the left inside. A driving sprocket 26a is fitted to an end portion of the output shaft 26 projecting on the left outside of the left unit casing 13L, and a driven gear 26b is fitted on the right inside of the left unit casing 13L. The driven gear 26b and the driving gear 25b gear with each other.

[0014]

A chain 27 is laid between the driving sprocket 26a projecting outside the output shaft 26 and a driven sprocket 6a (see Fig. 1) provided integrally with the rear wheel 6, so as to form a final reduction mechanism.

[0015]

In a right side portion of the crankshaft 15 projecting rightward from the right unit casing 13R, a centrifugal start-up clutch 30, a torque converter 40 and a primary reduction driving gear 48a are disposed in turn from the right end toward the inside. The primary reduction driving gear 48a gears with the primary reduction driven gear 25a of the transmission mechanism 12.

[0016]

The primary reduction mechanism based on the gearing between the primary reduction driving gear 48a and the primary reduction driven gear 25a, the centrifugal start-up clutch 30 and the torque converter 40 are covered, from the right side, with a right side cover 28 which is joined to the right end face of the right unit casing 13R. The right side cover 28 rotatably supports an end portion of the crankshaft 15 through a bearing 29.

[0017]

The centrifugal start-up clutch 30 has a clutch inner 31 and a clutch outer 35. The clutch inner 31 is comprised of a disk-like inner plate 31a and an inner boss portion 31b for retaining the base end of the inner plate 31a. The inner boss portion 31b is spline-coupled with a right end portion of the crankshaft 15 and fixed by a clutch lock bolt 32 so as to rotate integrally with the crankshaft. In addition, on a plurality of spindles 33 provided on the outer circumferential

end side of the inner plate 31a so as to project in parallel with the crankshaft 15, clutch weights 34 are pivoted to tilt desirably, respectively.

[0018]

The outer plate 35a of the clutch outer 35 covers the plurality of clutch weights 34 so that the inner circumferential surface of the cylindrical portion of the outer plate 35a is opposed to the clutch weights 34. On the other hand, the outer boss portion 35b retaining the base end of the outer plate 35a is rotatably pivoted on the crankshaft 15 through a bearing 37 while being supported on the inner boss portion 31b through a one-way clutch 60.

[0019]

With the rotation of the crankshaft 15, the clutch inner 31 rotates together. However, the rotational torque is not transmitted to the clutch outer 35 through the one-way clutch 60. When the rotational speed of the crankshaft 15 exceeds a predetermined value, the tilting of the clutch weights 34 increases and acts on the outer plate 35a. Thus, the clutch outer 35 is rotated due to the engagement of the centrifugal clutch 30.

[0020]

The one-way clutch 60 can transmit the rotation power from the transmission mechanism 12 side (the clutch outer 35 side) to the crankshaft 15 (the clutch inner 31 side) only when

the driving force transmitted from the wheel to the transmission mechanism 12 side (the clutch outer 35 side) is larger than the driving force on the inner combustion engine 11 side (the clutch inner side) and the rotational speed of the inner combustion engine 11 (the crankshaft 15) is not lower than a predetermined value. The detailed structure of the one-way clutch 60 and the like will be described later.

[0021]

The torque converter 40 disposed on the centrifugal start-up clutch 30 adjacently to the right unit casing 13R is constituted by a pump impeller 41 coupled integrally with the outer boss portion 35b retaining the base end of the outer plate 35a, a turbine impeller 42 opposed to the pump impeller 41, and a stator impeller 43 disposed between the impellers 41 and 42.

[0022]

A stator boss portion 44 retaining the base end of the stator impeller 43 is spline-fitted to a cylindrical stator shaft 45. The stator shaft 45 is rotatably supported on the crankshaft 15 through a bearing 46, and supported on the right unit casing 13R through a free wheel clutch 47 so that the stator impeller 43 can rotate in one direction together with the stator shaft 45.

[0023]

A cylindrical turbine shaft 48 retaining the base end

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of the turbine impeller 42 is rotatably supported on the stator shaft 45 through a bearing 49, and the primary reduction driving gear 48a is formed in a left end portion of the turbine shaft 48.

[0024]

A side cover 50 covering the back surface of the turbine impeller 42 is coupled integrally with the pump impeller 41. A free wheel clutch 51 for transmitting a back-load is inserted between the side cover 50 and the turbine shaft 48.

[0025]

When the rotational speed of the crankshaft 15 exceeds a predetermined speed so that the pump impeller 41 rotates together with the clutch outer 35 due to the engagement of the centrifugal start-up clutch 30, hydraulic oil in the torque converter 40 circulates to flow in turn from the outer circumferential side of the pump impeller 41 back to the inner circumferential side of the pump impeller 41 through the turbine impeller 42 and the stator impeller 43 whose rotation is regulated by the free wheel clutch 47. Thus, the rotational torque of the pump impeller 41 is transmitted to the turbine impeller 42. In such a manner, the turbine shaft 48 integrated with the turbine impeller 42, that is, the primary reduction driving gear 48a is driven to rotate.

[0026]

When the rotational speed of the turbine impeller 42

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increases to approach the speed of the pump impeller 41, the stator impeller 43 runs idle due to the free wheel clutch 47. Thus, the impellers 41, 42 and 43 enhance the efficiency as a fluid coupling together. In such a manner, the torque converter 40 performs an automatic transmission function.

[0027]

When the back-load at the time of speed reduction is input from the transmission mechanism 12 to the turbine shaft 48 through the primary reduction mechanism, the rotational torque of the turbine shaft 48 is transmitted directly to the pump impeller 41 through the side cover 50 due to the engagement of the free wheel clutch 51. As a result, the rotation of the clutch outer boss portion 35b integrated with the pump impeller 41 is transmitted to the crankshaft 15 through the one-way clutch 60. Thus, the engine brake is applied.

[0028]

Next, the detailed structure of the one-way clutch 60 will be described with reference to Figs. 3-10.

[0029]

First, Fig. 3 is a development of a first plate 70 of a cage 63 constituting the one-way clutch 60, and Fig. 4 is a view showing the shape of the first plate 70 which has been formed. In Fig. 4, (a) is a front view, (b) is a view on arrow B of (a), (c) is a view on arrow C of (a), and (d) is a view on arrow D of (a). In addition, Fig. 5 is a development of

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a second plate 80 of the cage 63, and Fig. 6 is a view showing the shape of the second plate 80 which has been formed. In Fig. 6, (a) is a front view, (b) is a view on arrow B of (a), (c) is a view on arrow C of (a), and (d) is a view on arrow D of (a).

[0030]

In this embodiment, a plate-like steel sheet is punched to form the first plate 70 and the second plate 80.

[0031]

The first plate 70 developed as shown in Fig. 3 is constituted by a substantially annular body 71, a plurality of (6 in the illustrated example) protrusion portions 72 extending from the body 71 in the outer diameter direction, and two engagement tongue portions 76 extending from the body 71 in the inner diameter direction. Each protrusion portion 72 is comprised of a first columnar portion 73 and a spring seat portion 74. A hole 75 to which an accordion spring 66 will be attached as described later is provided in the spring seat portion 74. The engagement tongue portions 76 serve to fix the cage 63 to a one-way clutch inner race 62 which will be described later. Further, the body 71 is provided with caulking holes 77 for coupling the body 71 with the second plate 80 as will be described later.

[0032]

When the body 71 of the first plate 70 developed as shown

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in Fig. 3 is bent twice in each protrusion portion 72 and once in each engagement tongue portion 76, the three-dimensional first plate 70 as shown in Fig. 4 is formed.

[0033]

Next, the second plate 80 developed as shown in Fig. 5 is constituted by a substantially annular body 81, a plurality of (6 in the illustrated example) protrusion portions 82 extending from the body 81 in the outer diameter direction, and two engagement tongue portions 86 extending from the body 81 in the inner diameter direction. Each protrusion portion 82 has a second columnar portion 83 and a caulking protrusion 85. A spindle operating surface 84 which will be described later is formed between the second columnar portion 83 and the caulking protrusion 85. The engagement tongue portions 86 serve to fix the cage 63 to the one-way clutch inner race 62 which will be described later.

[0034]

When the body 81 of the second plate 80 developed as shown in Fig. 5 is bent three times in each protrusion portion 82 and once in each engagement tongue portion 86, the three-dimensional second plate 80 as shown in Fig. 6 is formed.

[0035]

Next, Fig. 7 is a front view of the one-way clutch 60 according to the embodiment, and Fig. 8 is a sectional view taken on a plane including the axis thereof. In the one-way

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clutch 60 according to the embodiment, the one-way clutch inner race 62 is inserted and mated between the first and second plates 70 and 80 formed into predetermined shapes by punching a plate-like steel sheet and bending it respectively as shown in Fig. 4 and 6. The caulking protrusions 85 of the second plate 80 are inserted and caulked into the caulking holes 77 of the first plate 70, while the engagement tongue portions 76 and 86 are fitted and fixed into concave grooves 62a of the one-way clutch inner race 62.

[0036]

In addition to the concave grooves 62a to which the engagement tongue portions 76 and 86 of the first and second plates 70 and 80 will be fitted, the inner circumference of the one-way clutch inner race 62 has a spline 62b for coupling the one-way clutch 62 itself with the outer circumference of the inner boss portion 31b of the centrifugal start-up clutch 30. In addition, cam surfaces 62c and recess portions 62d are formed in a plurality of (6 in the illustrated example) places of the outer circumference. Each cam surface 62c is inclined with respect to the circumference so that a clutch roller 64 can be caught or released between the cam surface 62c and a one-way clutch outer race 61 which will be described later. Each recess portion 62d can receive a spindle 65 which will be described later likewise.

[0037]

~~27~~ 125

In Figs. 7 and 8, the reference numeral 61 represents a one-way clutch outer race (also see Fig. 2) formed integrally with the clutch outer boss portion 35b of the centrifugal start-up clutch 30. The inner circumference of the one-way clutch inner race 62 is spline-coupled with the outer circumference of the clutch inner boss portion 31b of the centrifugal start-up clutch 30. The outer circumference of the one-way clutch inner race 62 is disposed to secure a gap between the outer circumference of the one-way clutch inner race 62 and the inner circumference of the one-way clutch outer race 61 so that the one-way clutch inner race 62 can rotate relatively to the one-way clutch outer race 61.

[0038]

Acylindrical spindle 65 is received in each recess portion 62d of the one-way clutch inner race 62d, and a clutch roller 64 is disposed outside the spindle 65. In addition, an accordion spring 66 is provided in each spring seat portion 74 so as to urge the clutch roller 64 in a non-engagement direction (counterclockwise in Fig. 7).

[0039]

Next, Figs. 9 and 10 are views showing the operating states of the one-way clutch 60 according to the embodiment. Fig. 9 shows the state where the one-way clutch 60 is running idle in opposite directions, while Fig. 10 shows the state where the one-way clutch 60 is operating as a one-way clutch.

~~34~~ 126

[0040]

When the internal combustion engine 11 is stopping or rotating at a low speed, as shown in Fig. 9, each spindle 65 is located on the inner diameter side of the corresponding recess portion 62d of the one-way clutch inner race 62 so that the corresponding clutch roller 64 is pressed in the non-engagement direction by the corresponding accordion spring 66. That is, the clutch roller 64 can run idle between the one-way clutch outer race 61 and the cam surface 62c of the one-way clutch inner race 62. Thus, in the state shown in Fig. 9, even when either the one-way clutch outer race 61 or the one-way clutch inner race 62 rotates in any direction, the rotation thereof is not transmitted to the other.

[0041]

Next, when the crankshaft 15 rotates in the illustrated clockwise direction, the clutch inner boss portion 31b and the one-way clutch inner race 62 rotate together. When the rotational speed reaches a predetermined value or higher, as shown in Fig. 10, the spindle 65 moves outward along the spindle operating surface 84 due to centrifugal force so as to push the clutch roller 64 against the force of the accordion spring 66 and in the engagement direction (clockwise in the Figure) along the cam surface 62c. Thus, the clutch roller 64 is tightly pressed and nipped between the inner circumferential surface of the one-way clutch outer race 61 and the cam surface 62c

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of the one-way clutch inner race 62.

[0042]

When the driving force transmitted from the rear wheel 6 to the transmission mechanism 12 is larger than the driving force of the internal combustion engine 11 in this state, the clockwise rotation of the transmission mechanism 12, that is, the one-way clutch outer race 61 is transmitted directly to the one-way clutch inner race 62, that is, the crankshaft 15. On the contrary, when the driving force of the internal combustion engine 11 is larger than the driving force transmitted from the rear wheel 6 to the transmission mechanism 12, clockwise rotation of the one-way clutch inner race 62 leads the clutch roller 64 to move in the non-engagement direction between the one-way clutch outer race 61 and the cam surface 62c. Thus, the clutch roller 64 can run idle so that the rotation is not transmitted.

[0043]

Description will be made along an actual drive of the motorcycle. Usually during running, the driving force of the internal combustion engine 11 is larger than the driving force transmitted from the wheel to the transmission mechanism 12. Accordingly, due to the clockwise rotation of the one-way clutch inner race 62, the clutch roller 64 moves counterclockwise, that is, in the non-engagement direction and runs idle as shown in Fig. 9. Thus, the rotation is not transmitted by the one-way

37 128

clutch 60.

[0044]

Next, by the operation of reduction in engine speed during running, the rotation of the wheel is transmitted to the one-way clutch outer race 61 formed in the clutch outer boss portion 35b of the centrifugal start-up clutch 30 (to rotate the one-way clutch outer race 61 in the illustrated clockwise direction). When the crankshaft 15 and the outer boss portion 35b are rotating at a predetermined rotation number or more, the spindle 65 moves outward due to centrifugal force so as to push the clutch roller 64 in the counterclockwise direction (engagement direction) along the cam surface 62c as shown in Fig. 10. Thus, the clutch roller 64 is nipped between the inner circumferential surface of the one-way clutch outer race 61 and the cam surface 62c of the one-way clutch inner race 62. As a result, the clockwise rotation of the one-way clutch outer race 61 is transmitted to the one-way clutch inner race 62, that is, the crankshaft 15 so that the engine brake is applied.

[0045]

For example, when the motorcycle is taken (shoved) around with the internal combustion engine being stopped and with the wheels being rotated at a low speed, no centrifugal force acts on the spindle 65 of the one-way clutch 60. Accordingly, as shown in Fig. 9, the clutch roller 64 is pushed in the counterclockwise direction (non-engagement direction) due to

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the force of the accordion spring 66 so as to sink the spindle 65 into the recess portion 62d of the one-way clutch inner race 62. Thus, the clutch roller 64 runs idle so that the one-way clutch 60 can run idle in the opposite directions. In such a manner, the motorcycle can be shoved around without changing the gear into a neutral position.

[0046]

In the embodiment, as described above, the rotation of the wheel is not transmitted to the crankshaft 15 even when the wheel is rotated at a low speed. It is therefore unnecessary to operate the gear when the motorcycle is taken around. On the other hand, when the accelerator is released during running, the rotation of the wheel is transmitted to the crankshaft so that the engine brake can be applied.

[0047]

In the embodiment, the centrifugal force of each spindle 65 is used so that a predetermined rotation number with which the lock state of the one-way clutch can be released can be selected desirably in accordance with the weight of the spindle 65. Thus, the general-purpose properties are improved. In addition, due to operation using the centrifugal force, there occurs no loss by friction.

[0048]

It can be considered that the spindle 65 is formed out of a material such as a steel product, copper, a steel alloy,

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aluminum, or synthetic resin. When a material having a high specific gravity, such as steel, is used, the centrifugal force applied per unit volume is increased. Thus, an interlocking state can be obtained even in a small apparatus size and at a low rotational speed, and the diameter of each spindle can be reduced.

[0049]

Although the cylindrical clutch rollers 64 are shown as rolling elements in the embodiment, the rolling elements may be spherical. In addition, the spindles 65 may be not cylindrical rollers but spherical pieces. Further, as for the combination of each rolling element and each spindle, the both may be rollers, or the both may be spherical pieces. Alternatively, one of them may be a roller while the other is a spherical piece.

[0050]

Although the cam surfaces 62c of the one-way clutch inner race 62 are provided circumferentially at 6 places, the number can be changed desirably in accordance with a required torque capacity or the like. However, it is preferable that the cam surfaces 62c are provided circumferentially at an equal interval regardless of the number.

[0051]

Although the diameter of each clutch roller 64 is substantially equal to the diameter of each spindle 65 in Figs.

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7, 9 and 10, it is not always necessary to make them equal to each other. The diameters may be set desirably in accordance with the use conditions (for example, a range of the rotation number during operation).

[0052]

The embodiment has been described on the case where the cam surfaces 62c are formed in the outer circumference of the one-way clutch inner race 62, and the clutch rollers 64 are retained between the cam surfaces 62c and the one-way clutch outer race 61 disposed outside of the cam surfaces 62c. However, the cam surfaces may be formed in the inner circumference of the one-way clutch outer race 61 so that the clutch rollers can be retained between the cam surfaces and the one-way clutch inner race 62 disposed inside of the cam surfaces.

[Brief Description of Drawings]

[0053]

[Fig. 1] Fig. 1 is a general side view of a motorcycle 1 according to an embodiment.

[Fig. 2] Fig. 2 is a main portion longitudinal sectional view of a power unit 10 depicted in Fig. 1.

[Fig. 3] Fig. 3 is a development of a first plate 70 of a cage 63 constituting a one-way clutch 60 depicted in Fig. 2.

[Fig. 4] Fig. 4 are views showing the shape of the first plate 70 which has been formed.

[Fig. 5] Fig. 5 is a development of a second plate 80 of the cage 63.

[Fig. 6] Figs. 6A-6D are views showing the shape of the second plate 80 which has been formed.

[Fig. 7] Fig. 7 is a front view of the one-way clutch 60.

[Fig. 8] Fig. 8 is a sectional view taken on a plane of the one-way clutch 60 including the axis thereof.

[Fig. 9] Fig. 9 is a view showing the operating state of the one-way clutch 60, which is running idle in opposite directions.

[Fig. 10] Fig. 10 is a view showing the operating state of the one-way clutch 60, which is operating as a one-way clutch.

[Description of Reference Numerals and Signs]

[0054]

1...motorcycle, 2...body frame, 3...front fork, 5...rear fork, 6...rear wheel, 6a...driven sprocket;

10...power unit, 11...internal combustion engine, 12...transmission mechanism, 13L...left unit casing, 13R...right unit casing, 15...crankshaft, 16L, 16R...bearing, 17...cylinder block, 18...piston, 19...connecting rod, 20...cylinder head, 21...combustion chamber, 22...cam shaft, 25...input shaft, 25a...primary reduction driven gear, 25b...driving gear, 26...output shaft, 26a...driving sprocket, 26b...driven gear, 27...chain, 28...right side cover,

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29...bearing;

30...centrifugal start-up clutch, 31...clutch inner,  
31a...inner plate, 31b...inner boss portion, 32...clutch lock  
bolt, 33...spindle, 34...clutch weight, 35...clutch outer,  
35a...outer plate, 35b...outer boss portion, 37...bearing,

40...torque converter, 41...pump impeller, 42...turbine  
impeller, 43...stator impeller, 44...stator boss portion,  
45...stator shaft, 46...bearing, 47...free wheel clutch,  
48...turbine shaft, 48a...primary reduction driving gear,  
49...bearing, 50...side cover, 51...free wheel clutch;

60...one-way clutch, 61...one-way clutch outer race,  
62...one-way clutch inner race, 62a...concave groove,  
62b...spline, 62c...cam surface, 62d...recess portion,  
63...cage, 64...clutch roller, 65...spindle, 66...accordion  
spring, 70...first plate, 71...body, 72...protrusion portion,  
73...first columnar portion, 74...spring seat portion,  
75...hole, 76...engagement tongue portion, 77...caulking hole,  
80...second plate, 81...body, 82...protrusion portion,  
83...second columnar portion, 84...spindle operating surface,  
85...caulking protrusion, and 86...engagement tongue portion.

~~39~~  
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[Designation of Document] ABSTRACT

[Abstract]

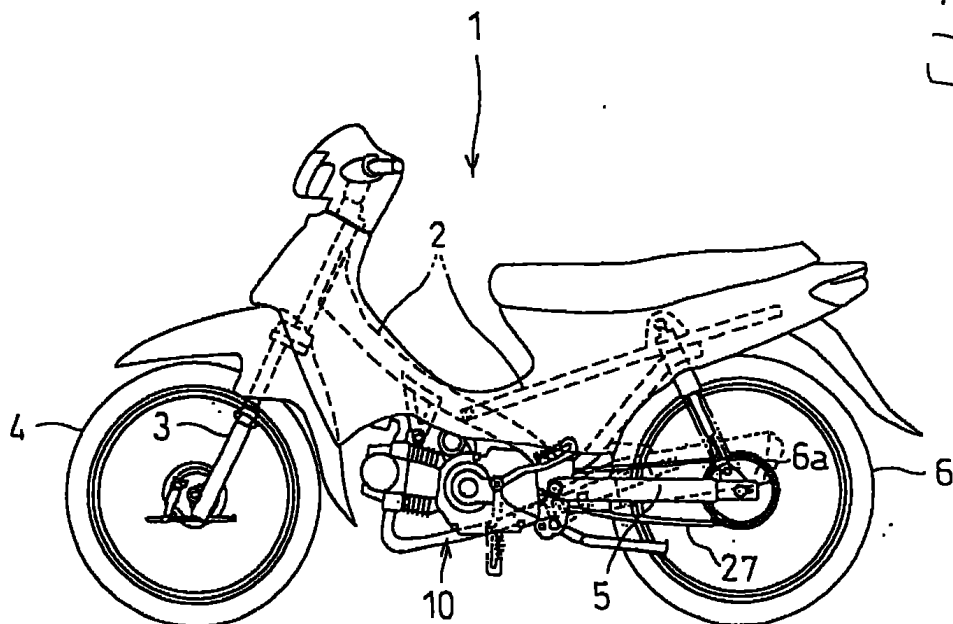
[Problem]

To prevent an engine brake from being applied when a motorcycle is shoved around.

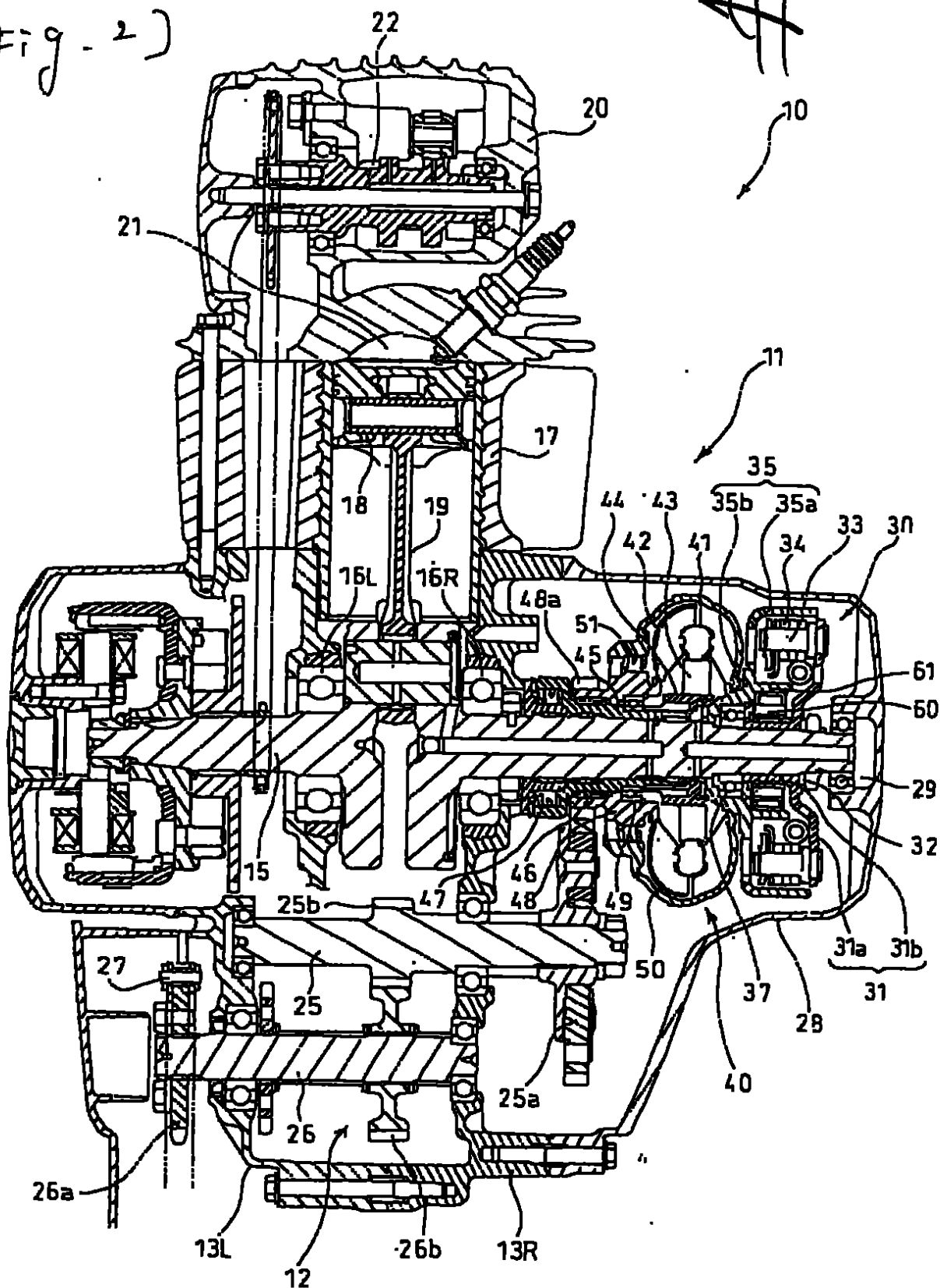
[Means for Resolution]

A motorcycle including: an internal combustion engine having a crankshaft 15; a transmission mechanism; a centrifugal start-up clutch; and a torque converter, the centrifugal start-up clutch and the torque converter being provided between the crankshaft 15 and the transmission mechanism; wherein the motorcycle further includes a one-way clutch 60 provided between the crankshaft 15 and the torque converter so that the one-way clutch 60 transmits power from the transmission mechanism to the crankshaft 15 only when a driving force transmitted from a wheel toward the transmission mechanism is larger than a driving force of the internal combustion engine and a rotational speed of the crank shaft 15 is not lower than a predetermined value.

[Selected Drawing] Fig. 9

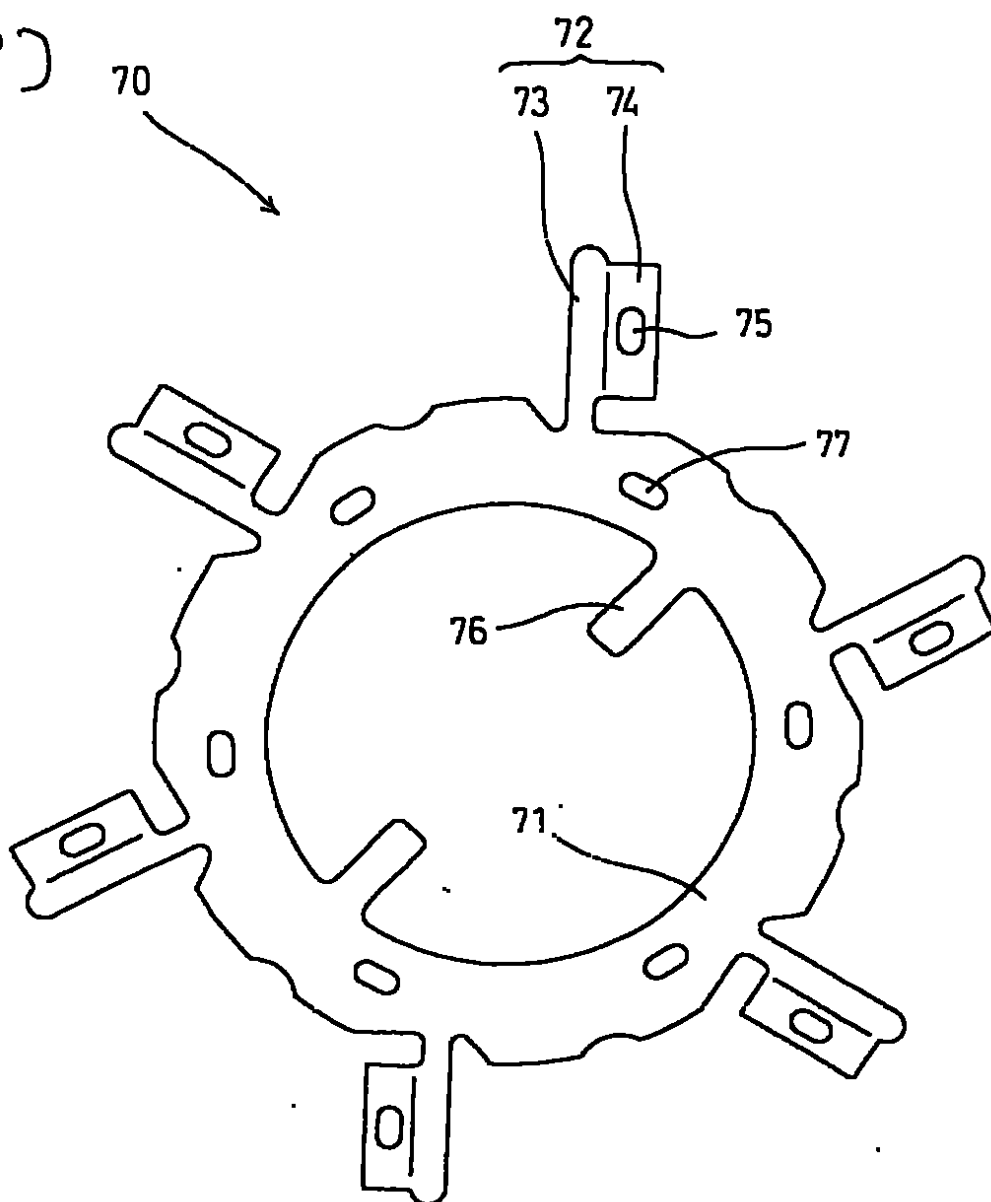


[Fig. 2]



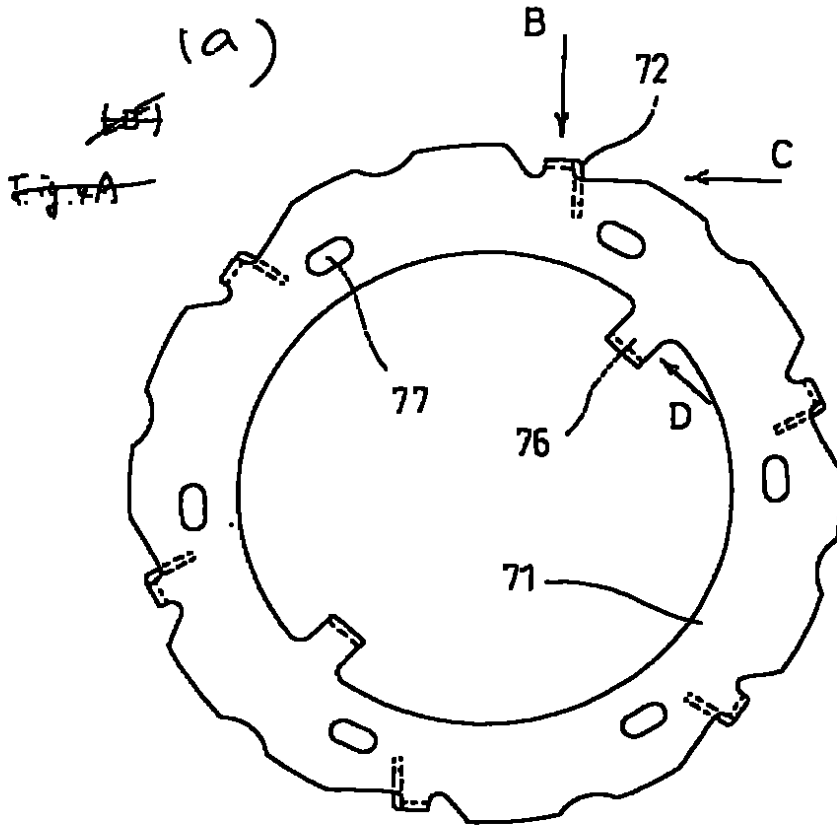
[図3]

(Fig. 3)

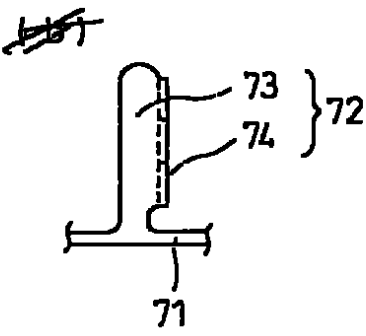


~~図4~~

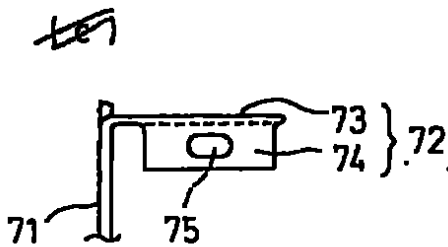
[Fig. 4] 70  
(a)



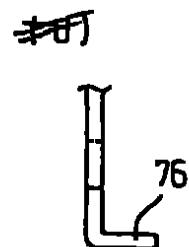
(b)  
~~Fig. 4B~~



(c) ~~Fig. 4C~~

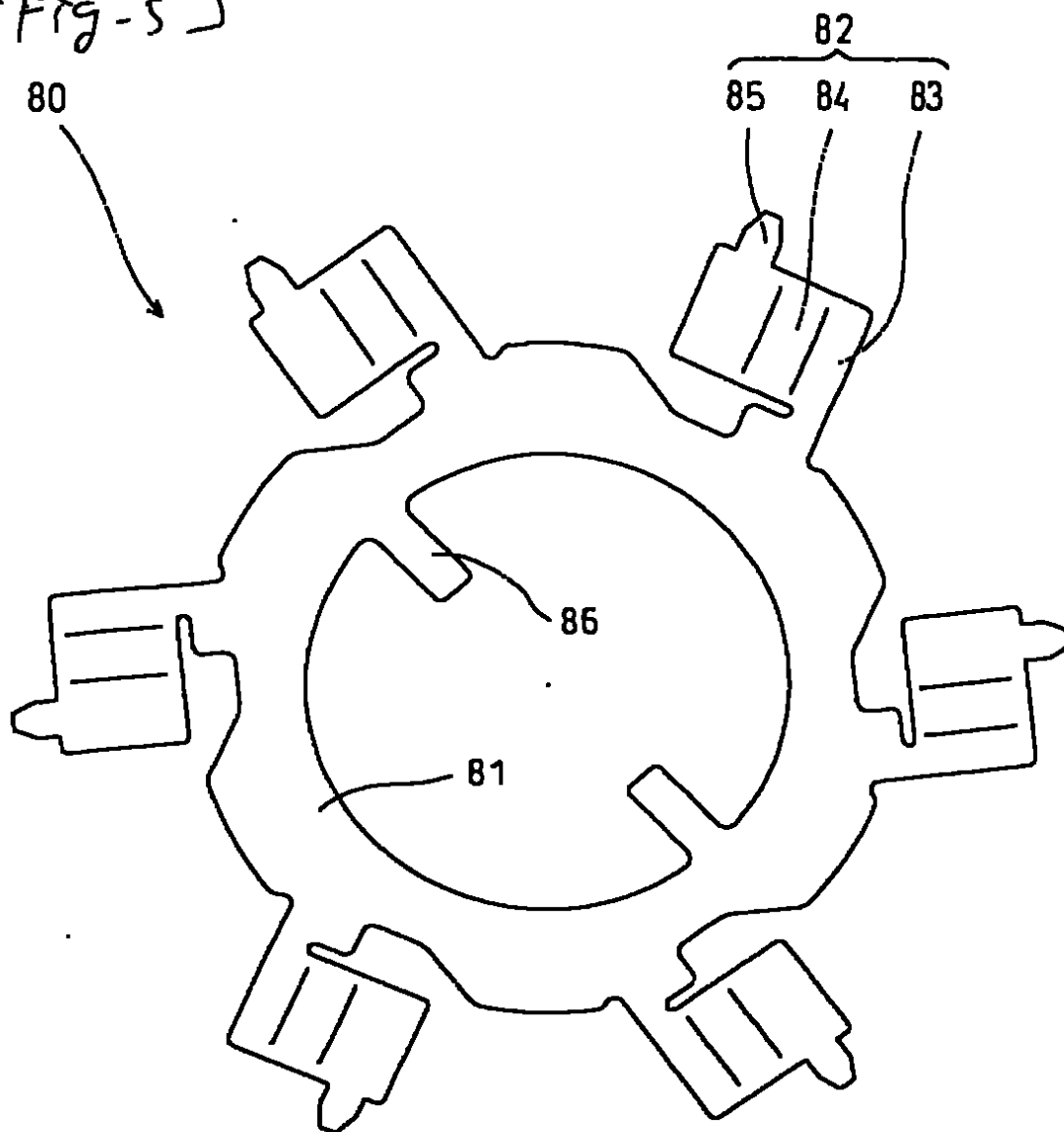


(d) ~~Fig. 4D~~



[図5]

[Fig-5]



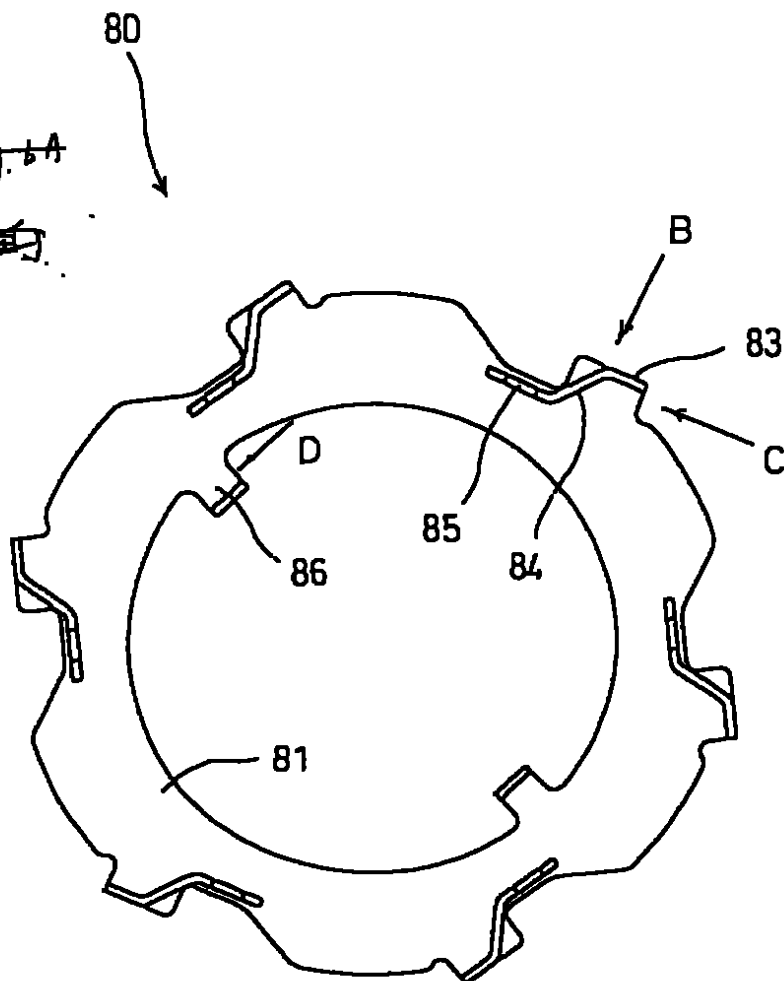
(図6)

[Fig. 6]

Fig. 6A

~~Fig. 6A~~

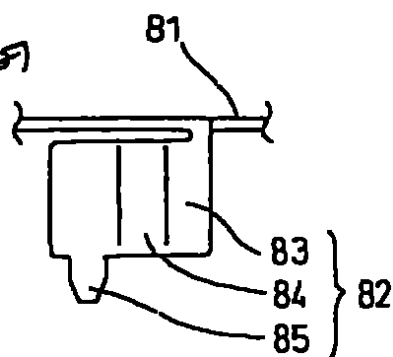
(a)



(b)

Fig. 6B

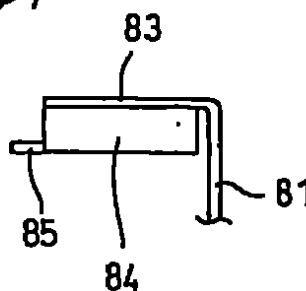
~~Fig. 6B~~



(c)

Fig. 6C

~~Fig. 6C~~



(d)

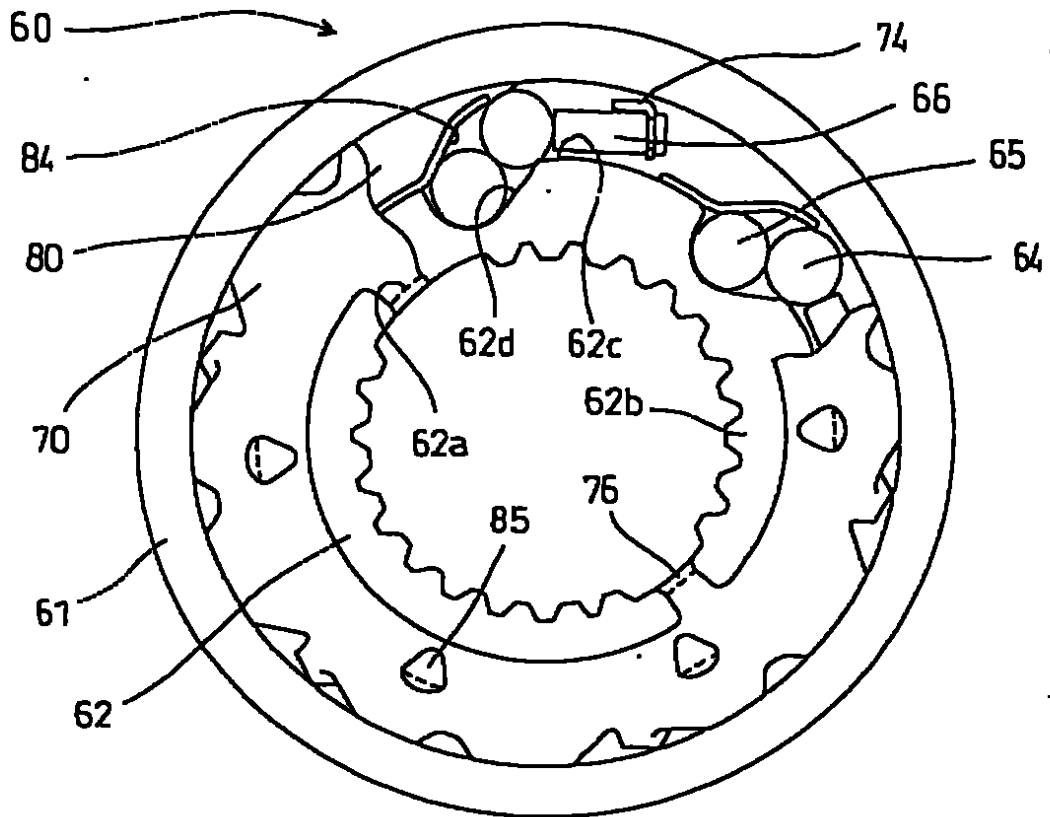
Fig. 6D

~~Fig. 6D~~



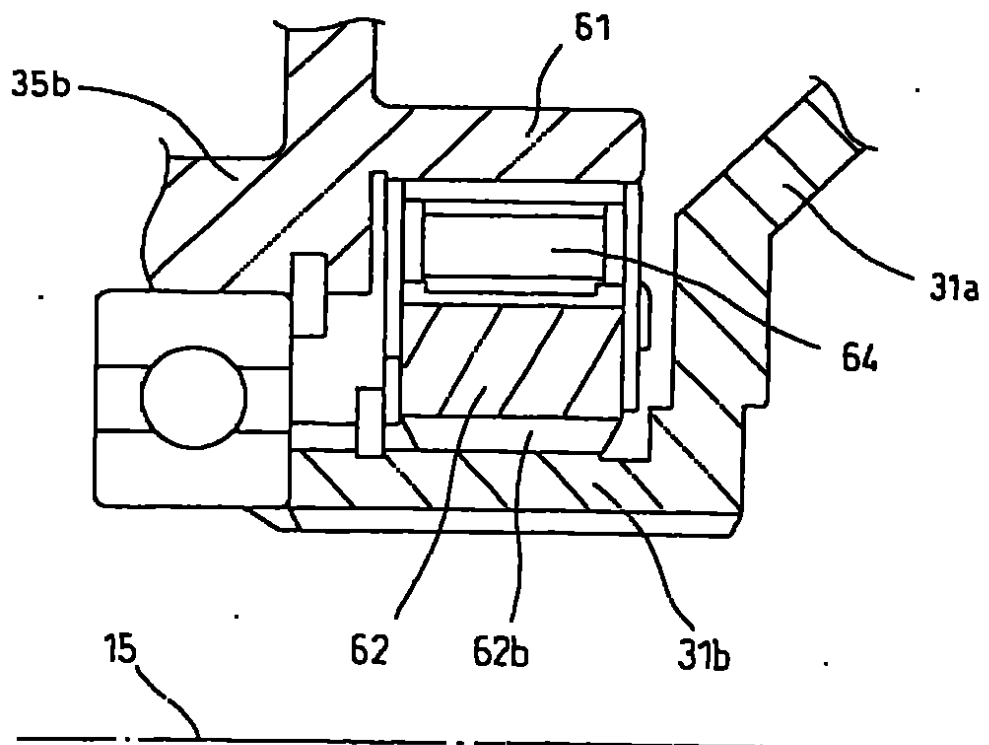
〔図7〕

〔Fig. 7〕

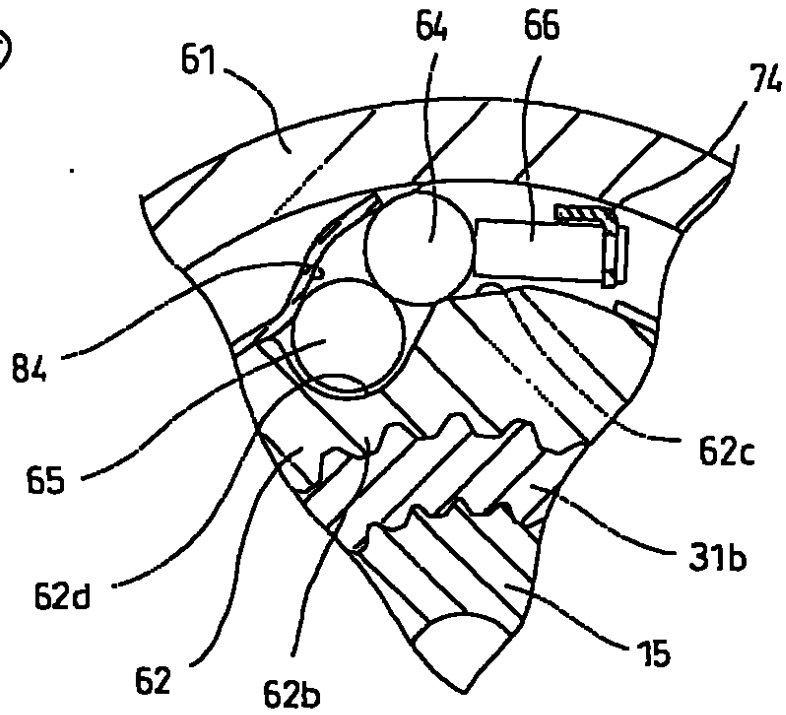


〔図8〕

〔Fig. 8〕



[Fig. 9]



~~[Fig. 10]~~

[Fig. 10]

