



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
16.07.2003 Bulletin 2003/29

(51) Int Cl.7: **F04B 27/10, F04B 27/08**

(43) Date of publication A2:
02.01.2002 Bulletin 2002/01

(21) Application number: **01114766.7**

(22) Date of filing: **25.06.2001**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventors:
• **Sugiura, Manabu**
2 chome, Kariya-shi, Aichi-ken 448-8671 (JP)
• **Kato, Takayuki**
2 chome, Kariya-shi, Aichi-ken 448-8671 (JP)
• **Sugioka, Takahiro**
2 chome, Kariya-shi, Aichi-ken 448-8671 (JP)

(30) Priority: **27.06.2000 JP 2000193456**

(71) Applicant: **Kabushiki Kaisha Toyota Jidoshokki**
Kariya-shi, Aichi-ken (JP)

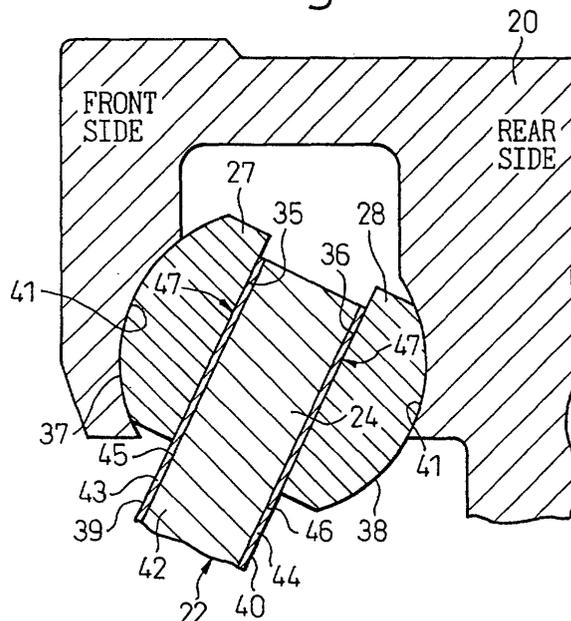
(74) Representative: **HOFFMANN - EITLÉ**
Patent- und Rechtsanwälte
Arabellastrasse 4
81925 München (DE)

(54) **Swash plate type compressor**

(57) The sliding characteristics of the sliding portions, where components slide on each other, are improved and the work of coating forming thereof is simplified. DLC coatings (43) and (44) are formed on a front surface (39) and a rear surface (40) of a swash plate

(22) by a CVD method or a PVD method. Therefore, the sliding characteristics of the sliding portion (47) between the swash plate (22) and shoes (27) and (28) are improved and abrasion or seizure occurs less frequently on the surface of the swash plate (22) and flat surfaces (35) and (36) of the shoes (27) and (28).

Fig.2





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 11 4766

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 1 010 771 A (TOYODA AUTOMATIC LOOM WORKS ; TAIHO KOGYO CO LTD (JP)) 21 June 2000 (2000-06-21) * the whole document *	1-8	F04B27/10 F04B27/08
A	EP 0 776 986 A (TOYODA AUTOMATIC LOOM WORKS ; TAIHO KOGYO CO LTD (JP)) 4 June 1997 (1997-06-04) * abstract *	1	
A	EP 0 890 743 A (TOYODA AUTOMATIC LOOM WORKS ; TAIHO KOGYO CO LTD (JP)) 13 January 1999 (1999-01-13) * page 2, line 38 - page 3, line 12 *	1	
A	US 5 943 941 A (KATO MASAFUMI ET AL) 31 August 1999 (1999-08-31) * column 2, line 38 - line 60 *	1	
A,D	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 12, 29 October 1999 (1999-10-29) & JP 11 193780 A (TOYOTA AUTOM LOOM WORKS LTD), 21 July 1999 (1999-07-21) * abstract *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			F04B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
MUNICH		22 May 2003	Fistas, N
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503.03.82 (P04G01)

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

EP 01 11 4766

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-05-2003

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1010771	A	21-06-2000	JP 2000179453 A	27-06-2000
			BR 9905905 A	07-11-2000
			CN 1263995 A	23-08-2000
			EP 1010771 A1	21-06-2000
			KR 2000048230 A	25-07-2000
			US 6337141 B1	08-01-2002

EP 0776986	A	04-06-1997	JP 8311634 A	26-11-1996
			DE 69614644 D1	27-09-2001
			DE 69614644 T2	27-06-2002
			EP 0776986 A1	04-06-1997
			KR 255279 B1	01-05-2000
			US 5875702 A	02-03-1999
			WO 9636745 A1	21-11-1996

EP 0890743	A	13-01-1999	JP 11013638 A	19-01-1999
			BR 9802293 A	03-11-1999
			CN 1215141 A	28-04-1999
			DE 69803903 D1	28-03-2002
			DE 69803903 T2	01-08-2002
			EP 0890743 A2	13-01-1999
			KR 272615 B1	15-11-2000
			US 6123009 A	26-09-2000

US 5943941	A	31-08-1999	JP 3039762 B2	08-05-2000
			JP 8247026 A	24-09-1996
			WO 9742411 A1	13-11-1997
			EP 0838590 A1	29-04-1998

JP 11193780	A	21-07-1999	EP 0926340 A2	30-06-1999
			US 6189434 B1	20-02-2001
