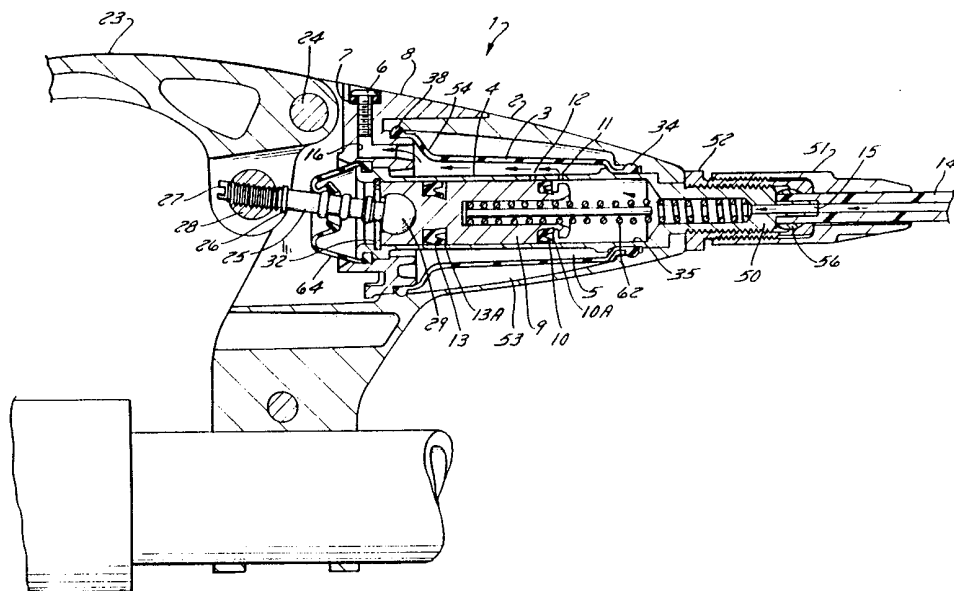




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : B62L 3/02, B60T 11/16, B62L 1/00, F16D 55/224, 65/12	A3	(11) International Publication Number: WO 99/10225 (43) International Publication Date: 4 March 1999 (04.03.99)
(21) International Application Number: PCT/US98/17487 (22) International Filing Date: 24 August 1998 (24.08.98) (30) Priority Data: 08/920,495 29 August 1997 (29.08.97) US (71) Applicant: HAYES BRAKE, INC. [US/US]; 5800 West Donges Bay Road, Mequon, WI 53092-4429 (US). (72) Inventors: BUCKLEY, James, A.; 5111 North Idlewild Avenue, Whitefish Bay, WI 53217 (US). HINKENS, George, H.; 10312 North Stanford Drive, Mequon, WI 53097 (US). JOHNSON, Korey; 1711 South 81st Street, West Allis, WI 53214 (US). (74) Agents: VOGEL, Peter, J. et al.; Foley & Lardner, 777 East Wisconsin Avenue, Milwaukee, WI 53202-5367 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims</i> <i>and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 20 May 1999 (20.05.99)

(54) Title: BICYCLE BRAKE SYSTEM**(57) Abstract**

A hydraulic brake system for a two wheel bike having handlebars, a master cylinder assembly (1) mounted on the handlebar, the assembly including a housing (2), a tubular body (4) mounted in the housing (2), a piston (9) mounted in the tubular body (4), an operating lever (23) pivotally mounted on the housing (2), a push rod (25) operatively connecting the operating lever (23) to the piston (9) to an inoperative position in the cartridge body (4), a resilient bladder (3) filled with a hydraulic fluid enclosing the cartridge body (4), a port timing hole (11) in the cartridge body (4) connecting the cartridge body (4) to the bladder (3) to maintain fluid pressure in the cartridge body (4), a brake assembly mounted on the housing, and a brake line (14) operatively connecting the cartridge body to the brake assembly.

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/17487

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 B62L3/02 B60T11/16 B62L1/00 F16D55/224 F16D65/12

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 B62L B60T F16D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 297 07 918 U (GUSTAV MAGENWIRTH GMBH & CO) 3 July 1997 see claims; figures ---	1,10
A	US 1 717 520 A (REILLY) 18 June 1929 see column 1, line 51 - column 2, line 86; figure 1 ---	1,10
A	US 2 310 976 A (MASTELLER) 16 February 1943 see column 1, line 23 - column 2, line 54; figure 1 ---	1,10
A	WO 89 07540 A (AUTOMOTIVE PRODUCTS PLC) 24 August 1989 see claim 1; figures 10,19,21 --- -/--	1,10

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- "&" document member of the same patent family

Date of the actual completion of the international search

24 March 1999

Date of mailing of the international search report

29.03.99

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/17487

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3 216 198 A (BROOKS) 9 November 1965 see claims; figures ---	1,10
A	PATENT ABSTRACTS OF JAPAN vol. 008, no. 197 (M-324), 11 September 1984 & JP 59 086724 A (YOSHIKAWA SEISAKUSHO:KK), 19 May 1984 see abstract ---	14,15
A	FR 2 032 528 A (LE BOUR) 27 November 1970 see the whole document ---	14,15
A	US 4 705 145 A (GOULART) 10 November 1987 see column 4, line 57 - column 5, line 10; figures 4,5 -----	14,15

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 98/ 17487

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

claims 1 : 1-13, 16, 17
claims 2 : 14, 15

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 98/17487

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 29707918 U	03-07-1997	NONE	
US 1717520 A	18-06-1929	NONE	
US 2310976 A	16-02-1943	NONE	
WO 8907540 A	24-08-1989	US 4924673 A	15-05-1990
		AU 3343589 A	06-09-1989
		AU 4031889 A	06-09-1989
		EP 0406262 A	09-01-1991
		WO 8907541 A	24-08-1989
		GB 2231930 A,B	28-11-1990
		GB 2232734 A,B	19-12-1990
		JP 3502790 T	27-06-1991
		KR 136380 B	01-05-1998
		US 4949590 A	21-08-1990
US 3216198 A	09-11-1965	NONE	
FR 2032528 A	27-11-1970	NONE	
US 4705145 A	10-11-1987	CA 1273301 A	28-08-1990