



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
01.08.2001 Bulletin 2001/31

(51) Int Cl.7: **E06C 1/32**, E06C 7/08,
E06C 7/50

(43) Date of publication A2:
27.12.2000 Bulletin 2000/52

(21) Application number: **99310087.4**

(22) Date of filing: **15.12.1999**

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

(71) Applicant: **Lee, Ik Woo**
Youngdeungpo-gu (KR)

(72) Inventor: **Lee, Ik Woo**
Youngdeungpo-gu (KR)

(30) Priority: **22.06.1999 KR 9923544**
03.11.1999 KR 9948423

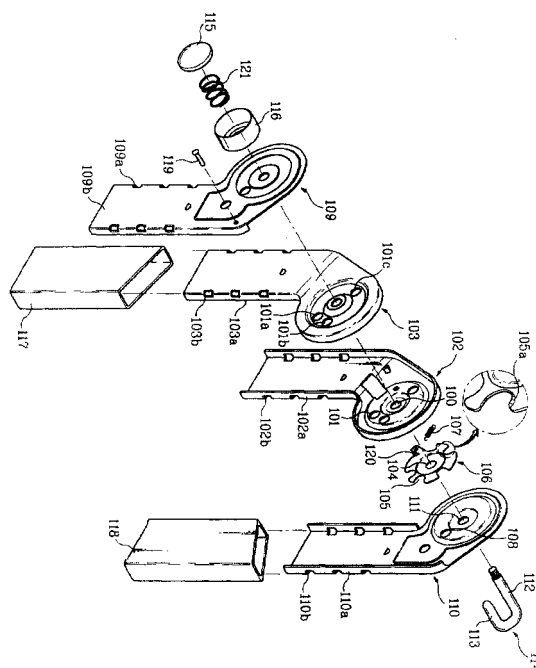
(74) Representative: **Mouteney, Simon James**
MARKS & CLERK,
57-60 Lincoln's Inn Fields
London WC2A 3LS (GB)

(54) **Ladder having locking device and method for manufacturing the same**

(57) A ladder with a locking device comprises a pair of inner rotating plates (102, 103) provided with a plurality of hinge holes spaced apart at predetermined angles; a rotating plate (106) with notch portions (105) corresponding to the hinge holes, said rotating plate rotating on an outer surface of the inner rotating plates (102, 103) to selectively open the hinge holes; a resilient member (107) biasing the rotating plate (106) to an initial state of closing the hinge holes, one end of said resilient member (107) being secured to the rotating plate (106) and the other end secured to one of the inner rotating plates (102); a pair of outer rotating plates (109, 110) with fixing holes formed on one side and supporting said inner rotating plates (102, 103) rotatably; and a locking key (114) including a guide pin (112) for securing the rotating plate (106), inner rotating plates (102, 103) and outer rotating plates (109, 110), and a fixing pin (113) for selective insertion into the hinge holes, said locking key (114) being adapted to lock after the ladder has been spread by rotating the inner rotating plates (102, 103) with respect to the outer rotating plates (109, 110), this being possible when the fixing pin (113) has been released from the hinge holes by the pressing of a push cover (115). The releasing of the hinge assembly due to an external force is prevented, thereby preventing accidents whilst facilitating the use of the ladder by enabling easy control of the locking and releasing of the assembly. Furthermore, the number of operations for assembling the ladder is reduced, thereby increasing the workability. Also, clearance between hollow beams of the ladder and the hinge assembly is obviated, thereby in-

creasing the durability of the ladder. Furthermore, the number of parts for assembling the ladder is reduced, which in turn reduces the cost for manufacturing the ladder considerably.

FIG. 4





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 31 0087

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)
Y	US 4 666 327 A (SU GEORGE) 19 May 1987 (1987-05-19) * abstract; figure 1 * * column 2, line 3 - line 14 * * column 2, line 36 - line 54 * ---	1,4	E06C1/32 E06C7/08 E06C7/50
Y	US 4 770 559 A (YOO HOE G) 13 September 1988 (1988-09-13) * abstract; figure 2 * * column 3, line 36 - line 63 * ---	1,4	
A	DE 40 32 283 A (RAUSCHENBERGER METALLWAREN GMB) 16 April 1992 (1992-04-16) * column 6, line 31 - column 7, line 44; figures 1,2,3,7,6 * -----	1-3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E06C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		20 March 2001	Demeester, J
CATEGORY OF CITED DOCUMENTS		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 8 : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background C : non-written disclosure P : intermediate document			

EPO FORM 1503 03/82 (P/AC01)



European Patent
Office

Application Number
EP 99 31 0087

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-4



European Patent
Office

LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 99 31 0087

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-4

A ladder hinge comprising a rotating plate with notch portions and a resilient member.

2. Claims: 5-6

A method of manufacturing a ladder with a step of forming securing grooves at the corners of the elongated portion of the rotating plates and a step of engrossing the corners of the beams to the securing groove by press working.

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

EP 99 31 0087

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.

20-03-2001

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4666327	A	19-05-1987	NONE	
US 4770559	A	13-09-1988	NONE	
DE 4032283	A	16-04-1992	NONE	

EPO FORM PD459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82