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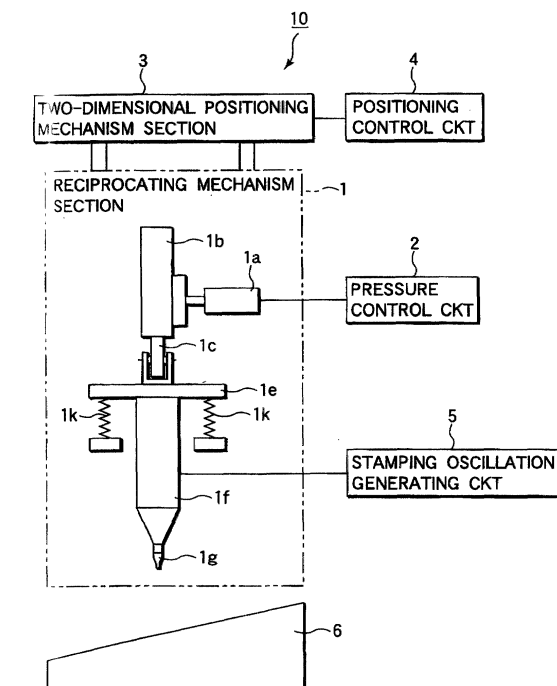
(71) Applicant: **Ando Electric Co., Ltd.
Kawasaki-shi, Kanagawa (JP)**

(72) Inventors:
• **Yano, Tetsuo, Ando Electric Co., Ltd.
Kawasaki-shi, Kanagawa (JP)**
• **Kudoh, Tetsuya, Ando Electric Co., Ltd.
Kawasaki-shi, Kanagawa (JP)**
• **Ohta, Yasunori, Ando Electric Co., Ltd.
Kawasaki-shi, Kanagawa (JP)**
(74) Representative: **Grünecker, Kinkeldey,
Stockmair & Schwanhäusser Anwaltssozietät
Maximilianstrasse 58
80538 München (DE)**

(54) **Punching apparatus and punching method**

(57) In a stamping apparatus, a subtracter 22b and an adder 23b compare an output value of an amplifier 29 which is a signal proportional to [T] expressing the torque generated at a fulcrum 101 by the reaction force [F] from the material to be stamped 6, to a pulse · duty setting value stored in a pulse · duty setting section 21b, and a signal in which the difference is added to the pulse · duty setting value, is generated, and a switch 25 inputs the signal into a comparator 24b in order to make the signal the comparison signal to the chopping wave outputted from a chopping wave generation circuit 26' in the PWM pulse generation circuit 26.

FIG.1





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EUROPEAN SEARCH REPORT

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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)
A	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 12, 31 October 1998 (1998-10-31) & JP 10 181292 A (ANDO ELECTRIC CO LTD), 7 July 1998 (1998-07-07) * abstract *	1	B26F1/02 B26F1/24 B26D5/00 B26D5/16 B44B5/00 B44B3/00 B26D5/12
A	DE 39 32 549 A (ANDO ELECTRIC) 5 April 1990 (1990-04-05) * abstract *	1	
P,A	EP 0 982 152 A (ANDO ELECTRIC) 1 March 2000 (2000-03-01) * abstract *	1	
A	US 5 628 673 A (MOROOKA MASAYA) 13 May 1997 (1997-05-13) * abstract *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B44B B26F B26D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 15 October 2002	Examiner Pineau, A
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			

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

EP 00 12 5144

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
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15-10-2002

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 10181292	A	07-07-1998	NONE	
DE 3932549	A	05-04-1990	JP 1762592 C	28-05-1993
			JP 2092417 A	03-04-1990
			JP 4051248 B	18-08-1992
			DE 3932549 A1	05-04-1990
			GB 2225290 A	30-05-1990
			IT 1233896 B	21-04-1992
			KR 9306461 B1	16-07-1993
EP 0982152	A	01-03-2000	JP 2000062395 A	29-02-2000
			EP 0982152 A2	01-03-2000
			US 6099177 A	08-08-2000
US 5628673	A	13-05-1997	JP 3049464 B2	05-06-2000
			JP 7153722 A	16-06-1995
			JP 3049465 B2	05-06-2000
			JP 7153723 A	16-06-1995
			GB 2284280 A , B	31-05-1995