



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/US91/05085 (22) International Filing Date: 18 July 1991 (18.07.91) (30) Priority data: 556,164 20 July 1990 (20.07.90) US (71)(72) Applicant and Inventor: McGREW, Stephen, P. [US/ US]; 149-B Josephine Street, Santa Cruz, CA 95060 (US). (74) Agents: BULCHIS, Edward, W. et al.; Seed and Berry, 6300 Columbia Center, Seattle, WA 98104-7092 (US).	(81) Designated States: AT (European patent), AU, BE (Euro- pean patent), BR, CA, CH (European patent), CS, DE (European patent), DK (European patent), ES (Euro- pean patent), FR (European patent), GB (European pa- tent), GR (European patent), HU, IT (European patent), JP, KR, LU (European patent), NL (European patent), + PL, SE (European patent), SU. Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the</i> <i>claims and to be republished in the event of the receipt of</i> <i>amendments.</i> (88) Date of publication of the international search report: 19 March 1992 (19.03.92)	
(54) Title: EMBOSsing TOOL		
(57) Abstract <p>A method and apparatus for producing durable embossing tools is disclosed. An anisotropic etching process, such as ion etching, is used to etch a relief pattern into a hard substrate. A transfer layer is formed overlaying a generally smooth, seamless surface region of a substrate. A desired relief pattern is formed in the transfer layer, by exposing a photoresist, embossing, or the like. The substrate having the photoresist thereon is subjected to an anisotropic etch. The anisotropic etch continues until the transfer layer is completely removed and the relief pattern is formed in the upper surface of the embossing tool. The relative etch rates between the transfer layer and the surface region of the embossing tool are selected to provide the desired depth modulation in the surface of the embossing tool. An embossing tool produced according to the invention has a relatively hard surface and may thus be used for the mass production of holographic images without significant degradation of the pattern. Because the embossing tool can be made from an extremely hard material such as chromium or hardened steel, materials which previously could not be economically embossed with holograms, such as aluminum or steel, may now be embossed by an embossing tool made according to this invention.</p>		

+ DESIGNATIONS OF "SU"

Any designation of "SU" has effect in the Russian Federation. It is not yet known whether any such designation has effect in other States of the former Soviet Union.

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INTERNATIONAL SEARCH REPORT

International Application No. PCT/US 91/05085

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁹		
According to International Patent Classification (IPC) or to both National Classification and IPC Int. Cl. 5 G 03 F 7/00 G 02 B 5/32 G 03 H 1/18		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int. Cl. 5	G 02 B G 03 F G 03 H	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category ⁹	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	US,A,3944420 (M.T. GALE et al.) 16 March 1976, see the whole document	1-2,4,6 ,7,9,12 ,17
Y	---	10,11, 13,14
Y	US,A,4514479 (R.A. FERRANTE) 30 April 1985, see column 3, lines 35-43	14
Y	US,A,4629282 (S.P. MCGREW) 16 December 1986, see figures 1,2	9,10,11 ,13
X	WO,A,8912261 (M. TEITEL) 14 December 1989, see the whole document	1,2,4,6 ,12,17
X	GB,A,1508660 (RCA CORP.) 26 April 1978, see the whole document	1,2,4, 12,17
	---	-/-
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>⁹ Special categories of cited documents : ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p> </div> </div>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
12-09-1991	13. 01. 92	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">M. PERIZ</div> <div style="font-family: cursive; font-size: 1.2em;">M. Periz</div> </div>	

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category ²	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	EP, A, 0365031 (TOPPAN PRINTING CO., LTD) 25 April 1990, see the whole document -----	1-17

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

V. OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. Claim numbers....., because they relate to subject matter not required to be searched by this Authority, namely:

2. Claim numbers....., 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. Claim numbers....., because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING ²

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

1. Claims 1 - 17, 30
2. Claims 18 - 29, 31 - 33

For further information pls. see Form PCT/ISA/206 mailed on 09/10/91

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.
2. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. 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 the claims. It is covered by claim numbers:
Claims 1 - 17, 30
4. As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

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

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

US 9105085
SA 49780

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office FDP file on 11/02/92. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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		SE-A- 7505781	24-11-75

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