

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

**EP 0 899 094 A3**

(12)

**EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
**06.05.1999 Bulletin 1999/18**

(51) Int. Cl.<sup>6</sup>: **B41C 1/10**

(43) Date of publication A2:  
**03.03.1999 Bulletin 1999/09**

(21) Application number: **98116247.2**

(22) Date of filing: **27.08.1998**

(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**

(30) Priority: **29.08.1997 CA 2214300**

(71) Applicant:  
**TOYO INK MANUFACTURING CO., LTD.  
Tokyo (JP)**

(72) Inventor: **Castegnier, Adrien  
Qutrement, Quebec, H2V 2Z2 (CA)**

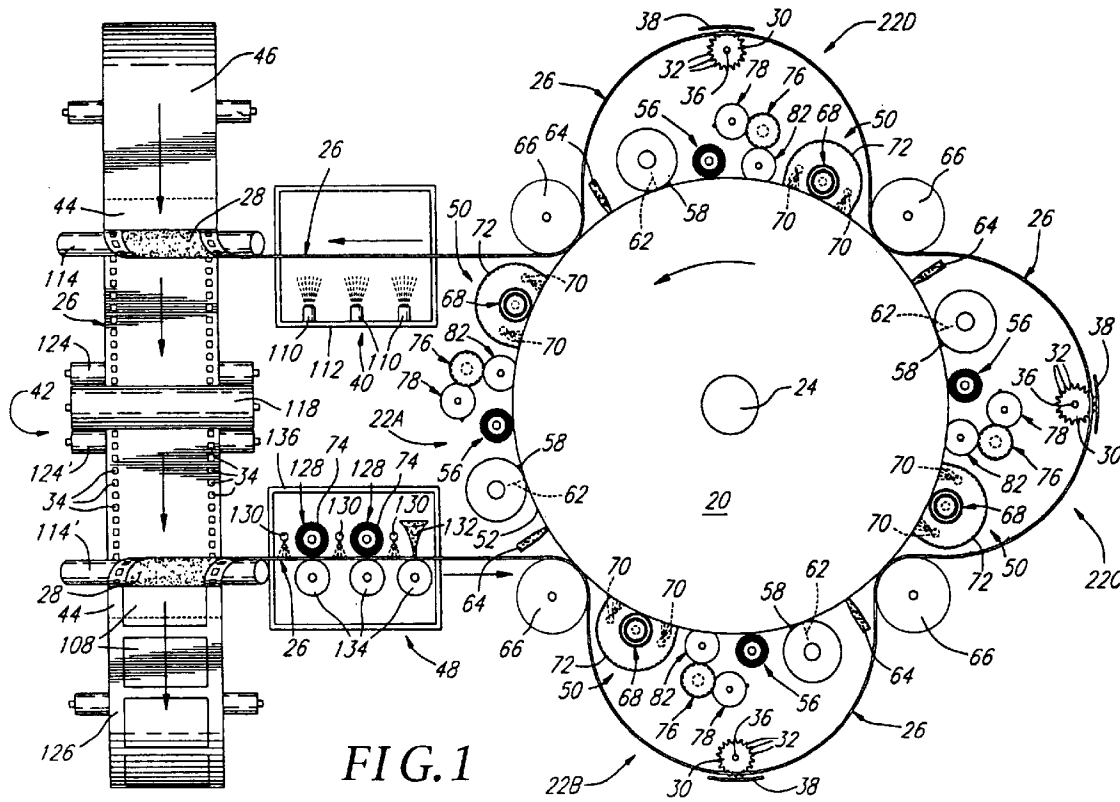
(74) Representative:  
**Blumbach, Kramer & Partner GbR  
Radeckestrasse 43  
81245 München (DE)**

**(54) Multicolor electrocoagulation printing method and apparatus**

(57) A polychromic image is reproduced and transferred onto a substrate by (a) providing a single positive electrolytically inert electrode having a continuous passivated surface moving at substantially constant speed along a predetermined path, the passivated surface defining a positive electrode active surface; (b) forming on the positive electrode active surface a plurality of dots of colored, coagulated colloid representative of a desired image, by electrocoagulation of an electrolytically coagulable colloid present in an electrocoagulation printing ink comprising a liquid colloidal dispersion containing said electrolytically coagulable colloid, a dispersing medium, a soluble electrolyte and a coloring agent; and (c) bringing an endless non-extendable belt moving at substantially the same speed as the positive electrode and having on one side thereof a colloid retaining surface adapted to releasably retain dots of electrocoagulated colloid, into contact with the positive electrode active surface to cause transfer of the dots of colored, coagulated colloid from the positive electrode active surface onto the colloid retaining surface of the belt and to thereby imprint the colloid retaining surface with the image. Steps (b) and (c) are repeated several times to define a corresponding number of printing stages arranged at predetermined locations along the path and each using a coloring agent of different color, and to thereby produce several differently colored images of coagulated colloid which are transferred at respective transfer positions onto the colloid retaining surface of the belt in superimposed relation to provide the desired

polychromic image. A substrate is then brought into contact with the porous surface of the belt to cause transfer of the polychromic image from the colloid retaining surface onto the substrate and to thereby imprint the substrate with the polychromic image.

**EP 0 899 094 A3**





European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 98 11 6247

| 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.6) |
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | US 4 661 222 A (CASTEGNIER ADRIEN)<br>28 April 1987                                 | 1                                | B41C1/10                                     |
| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | * the whole document *<br>---                                                       | 1-11                             |                                              |
| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | US 5 538 601 A (CASTEGNIER ADRIEN)<br>23 July 1996<br>* the whole document *<br>--- | 1-11                             |                                              |
| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | FR 424 094 A (J.A. JEFFERSON HAYES )<br>* the whole document *<br>-----             | 1                                |                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                     |                                  | TECHNICAL FIELDS SEARCHED (Int.Cl.6)         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                     |                                  | B41C<br>B41F                                 |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                     |                                  |                                              |
| Place of search                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                     | Date of completion of the search | Examiner                                     |
| THE HAGUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                     | 10 March 1999                    | Rasschaert, A                                |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone<br/> Y : particularly relevant if combined with another document of the same category<br/> A : technological background<br/> O : non-written disclosure<br/> P : intermediate document</p> <p>T : theory or principle underlying the invention<br/> E : earlier patent document, but published on, or after the filing date<br/> D : document cited in the application<br/> L : document cited for other reasons<br/> &amp; : member of the same patent family, corresponding document</p> |                                                                                     |                                  |                                              |

EPO FORM 1503 03/82 (P04C01)

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

EP 98 11 6247

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.

10-03-1999

| Patent document<br>cited in search report |   | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|-------------------------------------------|---|---------------------|----------------------------|---------------------|
| US 4661222                                | A | 28-04-1987          | NONE                       |                     |
| US 5538601                                | A | 23-07-1996          | US 5727462 A               | 17-03-1998          |
| FR 424094                                 | A |                     | NONE                       |                     |