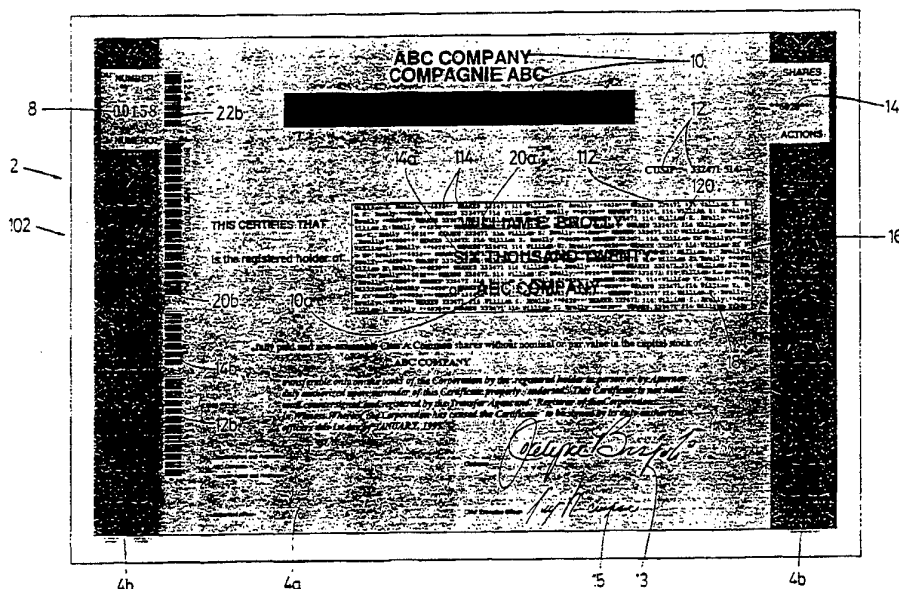


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>5</sup> : <b>B42D 15/00</b>	<b>A1</b>	(11) International Publication Number: <b>WO 94/22675</b> (43) International Publication Date: 13 October 1994 (13.10.94)
<p>(21) International Application Number: PCT/CA94/00193</p> <p>(22) International Filing Date: 5 April 1994 (05.04.94)</p> <p>(30) Priority Data: 042,531 5 April 1993 (05.04.93) US</p> <p>(71) Applicant (for all designated States except US): MONTREAL TRUST CO. [CA/CA]; 510 Burrard Street, Vancouver, British Columbia V6C 3B9 (CA).</p> <p>(72) Inventor; and (75) Inventor/Applicant (for US only): BROLLY, William, E. [CA/CA]; 3132 Northcrest Drive, White Rock, British Columbia V4P 1R3 (CA).</p> <p>(74) Agent: WALL, Deeth, Williams; National Bank Building, 150 York Street, Suite 400, Toronto, Ontario M5H 3S5 (CA).</p>	<p>(81) Designated States: AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, GE, HU, JP, KG, KP, KR, KZ, LK, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b> With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</p>	

(54) Title: TAMPER EVIDENT DOCUMENT AND METHOD FOR CREATING SAME



## (57) Abstract

A tamper resistant document (2) such as a stock (102) or marriage (202) certificate, having at least two indicia of information printed in a defined repetitive off-set pattern (18) across a substantial portion (16) of the instrument. Repeated indicia for a tamper resistant stock certificate include the number of shares, the C.U.S.I.P. number (12) and the shareholder's name (120). Repeated indicia for a tamper resistant marriage certificate (202) include the names of the individuals (124, 126), the marriage date (128) and the certificate registration number (130). In addition, this and/or other information is overlaid on the pattern in larger print. The document may have information encoded in bar codes (12b) of the type used with computerized optical scanning. The tamper resistant document is produced by laser printing on a generic engraved document (2).

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## TAMPER EVIDENT DOCUMENT AND METHOD FOR CREATING SAME

## FIELD OF THE INVENTION

This invention relates to the protection of documents, such as financial instruments, against tampering.

## BACKGROUND OF THE INVENTION

Tampering with checks, stock certificates and other documents is a potentially costly problem of long standing. For example, the face value of an instrument may be changed in a variety of ways. Alternatively, the name of the payee, shareholder or company issuing stocks may be altered, and the document used for fraudulent purposes.

The problem of tampering with documents has been addressed in a variety of ways. To ward against the simple insertion of additional numerals before a figure, the amount of the figure is also generally written out in words. Safety paper bearing a background pattern or image is commonly used for checks. Impact printing, in which ink penetrates the surface of the paper, is used. Erasure of information written or printed on such a check usually disrupts the background, thus giving evidence of tampering.

Laser printing, in which the toner sits on the surface of the paper, has been considered unsuitable for protecting documents against tampering. This is because it is relatively easy to scrape toner from a document's surface.

Stock certificates, in particular, are individually engraved with such information as the name and the logo of the issuing company and the class of shares. This means that each share certificate must be separately designed and engraved, each at a significant cost, no matter how small the company. A stock of blank certificates bearing the company name must be maintained for each company. On such controlled paper, information such as the name of the shareholder and the number

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of shares must be printed by relatively slow impact printing so that the ink penetrates the paper surface. This method of doing business is costly and cumbersome. A similar situation prevails with other certificates, such as birth and marriage certificates.

U.S. Patent No. 1,564,724 describes protective marking of a commercial paper instrument with a background legend. Specifically, the legend is present on that portion of the instrument on which the amount payable is inscribed as a number consisting of figures. Behind each individual figure, the legend consists of the repetition in columns of the group of letters spelling the corresponding figure word, wherein the letters are of a much smaller size than the figure and the words are in register. At the ends of the number, terminal limits are set by background legends, again in small print columns, consisting of other groups of words, such as "pay", "dollars", "cents", etc. Thus, if a tamperer were to attempt to change the amount of a cheque protected in this way, he would need to alter a relatively large figure and the repeated figure words behind it. According to this invention, a check for a particular amount would always have the same background legend, regardless of the identity of the payee or of any other information specific to a given transaction.

U.S. Patent No. 2,804,821 describes a method of making check protecting hand stamps. Such a stamp has on one side a resilient printing face that is used to impose a design over the space on a check containing the name of the payee and the amount, so that any attempt to change either will be evident. The stamps are produced from master design elements, each of which has on its printing face gridwork comprising rhomboidal areas, each rhombus containing a letter or a dot positioned at a specific location in the rhombus. Portions of the master design elements are combined in such a way that each stamp is uniquely different from all others. However, each stamp may be

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used many times, and all checks printed from a single stamp will be identical.

Canadian Patent No. 680,924 describes fraud preventing safety paper having a regular background pattern that is printed with two different types of ink. A portion of the background pattern is printed with a bleachable, water soluble ink that is insoluble in organic solvents. A complementary portion of the background is printed with an ink that is soluble in organic solvents, but water-insoluble and not bleachable. Thus, tampering with the safety paper using either one of these two general ink-eradicating methods removes only a portion of the background pattern, offering immediate evidence of tampering. Such safety paper may be used as a generic alternative to engraved paper.

U.S. Patent No. 4,681,348 describes financial documents protected against alteration having two areas on which indicia are printed. The first area, which extends substantially the length of the document, has at least one line of indicia indicating a maximum amount. The second area has, in addition to indicia indicating a maximum amount, a plurality of diagonal variably spaced lines that indicate currency. In the preferred embodiment of this invention, the printing in both areas consists of a word or a line of words repeated in register. A user would write the particular amount of a cheque over the background indicia. According to this invention, all financial documents within a specific amount range, e.g., "not valid over five hundred U.S. dollars", would have identical background indicia.

In addition, this patent describes, but does not claim, two layers on the check, each layer containing a different chemical, one of which chemicals is contained in pressure-sensitive frangible capsules. The pressure of writing

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or printing in an area having the two layers causes the chemicals to combine, producing a type of ink.

#### **SUMMARY OF THE INVENTION**

The present invention provides, in one aspect, a tamper resistant document, including printing in a defined, repetitive pattern over a substantial portion of the document, the printing including at least three indicia of information desired to be secured from tampering, to enable identification of the document and to reduce the ability to alter or obliterate such information, wherein the at least three indicia are interspersed with each other. In a second aspect, the present invention provides a method of printing a document as described above.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

For a better understanding of the present invention and to show more clearly how it may be carried into effect, reference will now be made by way of example to the accompanying drawings, which show the preferred embodiments of the present invention and in which:

Figure 1 is a front plan view of a generic engraved document suitable as a substrate for tamper evident laser printing according to a preferred embodiment of the present invention.

Figure 2 is a front plan view of a generic engraved document as in Figure 1 having tamper evident laser printing according to a preferred embodiment of the present invention.

Figure 3 is a front plan view of a marriage certificate according to a preferred embodiment of this invention.

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Figure 4 is a front plan view of a marriage certificate according to another preferred embodiment of this invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figure 1, a generic document 2 suitable for use as a stock or other security certificate has background engraving 4a and engraved decorative borders 4b. Here, the background engraving 4a shown is the word "SECURITY/SECURITE" in negative, but other suitable words or patterns may be used. Each individual document 2 has an unique number 8 identifying it within the batch.

Referring to Figure 2, a stock certificate 102 printed according to the present invention may use generic document 2 as a substrate. Line 10 is provided for the name of a company issuing shares. Each individual certificate 102 bears a C.U.S.I.P. (Committee on Uniform Securities Identification Procedures) number 12 printed separately from any other text. A number 14 corresponding to the number of shares of the certificate 102 is also printed separately from any other text.

A substantial portion 16 of the certificate 102 bears a defined repetitive off-set pattern 18 consisting of indicia of information and/or identification to be secured against tampering. The indicia are in small print relative to similar information elsewhere on the certificate 102. The individual indicia repeated are the C.U.S.I.P. number 112 (also printed separately as number 12), the number of shares 114 (also printed separately as number 14) and the shareholder's name 120. The different indicia 112, 114 and 120 are interspersed with each other in the off-set pattern.

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The portion 16 also bears the number of shares 14a, the shareholder's name 20a, and the name of the company issuing shares 10a each printed a single time over the background pattern 18 in print substantially larger than the indicia 112, 114 and 120.

The certificate 102 is also provided with computer bar codes 12b, 14b and 20b of the type commonly used with store cash registers. Bar code 12b encodes in a form suitable for optical scanning the C.U.S.I.P. number that is printed separately as number 12 and in the pattern 18 as indicia 112. Bar code 14b encodes the number of shares that is printed separately as number 14 and in the pattern 18 as indicia 114. Bar code 20b encodes the shareholder's name that is printed separately as line 20a and in the pattern 18 as indicia 120. Bar code 22b is provided for the encoding of any additional information, for example, for internal use.

The certificate also bears digitized signatures, 13 and 15.

In operation, the stock certificate 102 is resistant to tampering such as, for example, changing the number of shares or the shareholder's name. First, this information is repeated a plurality of times on the stock certificate 102 -- in the former case as 14, 14a, 114 and 14b, and in the latter case as 20a, 120 and 20b. All of these instances would have to be changed for the tampering to be successful.

Second, the defined repetitive pattern 18 formed by the indicia 112, 114 and 120 presents a visual image that resists tampering. Changing or deleting indicia 112, 114 or 120 in only a portion of the pattern 18 would be immediately evident. Similarly, a change to the indicia 112, 114 or 120 that was sloppy or not faithful to the overall print style would be evident, even if the change were made for every repeated instance throughout the pattern 18. Additional protection is



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provided by the fact that the repetition of a particular item of information in the pattern 18 is not aligned or in register, but is off-set and interspersed with other information. Thus the tamperer cannot simply eradicate a row or a column containing the particular item of information, and effective tampering becomes more difficult.

A third way in which the stock certificate 102 is resistant to tampering is through the encoding of key information in computer bar codes 12b, 14b, and 20b. Whereas a tamperer may be able to change print without leaving evidence of such a change, alteration of such encoded information would be almost certainly recognized during computerized optical scanning of the certificate 102.

Figures 3 and 4 show two different forms of marriage certificate 202. These show features similar to those shown in the stock certificate 102. A generic document 2 has background engraving 4a and engraved decorative borders 4b. Here, the background engraving 4a shown is the word "CANADA", but other suitable words or patterns might be used. Lines 7a, 7b are provided for the jurisdiction in which the certificate is granted. Indicia to be secured against tampering are printed in a defined repetitive off-set pattern 18 in a substantial defined portion 16 of the marriage certificate 202. In the case of Figure 3, the portion 16 covers most of the certificate 202. In the case of Figure 4, the portion 16 covers a security area on the bottom left side of the certificate 202. The indicia include the names 124, 126 of the individuals being married, the marriage date 128 and the registration number 130 of the marriage certificate 202. At least some of this information is also printed a single time in larger print as an overlay across the pattern, respectively as 24a, 26a, 28a, and, in Figure 4, 30a. In Figure 3, the registration number 30 is only printed in larger print separately from any other text. Other information, such as, for example, the place of marriage

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32a or place of birth 34a may also, if desired, be printed in larger print across the pattern 18 of indicia, as shown in Figure 3.

The certificates 102 and 202 shown in Figures 2, 3 and 4 are preferably prepared by laser printing on controlled paper such as generic engraved documents 2. This printing method is rapid, reliable and quiet, and the high-resolution product it produces is attractive. The economy, ease and rapidity of laser-printing make the production of individually unique documents according to the present invention cost-effective.

In addition to monetary savings, the present invention could lead to the reduction of a company's inventory of blank certificates and of their handling.

The present invention is not limited to stock and marriage certificates, but may be used for other documents, for example, bonds, checks, birth certificates and other documents requiring protection against tampering.

It will be understood that this description is made with reference to the preferred embodiments of the invention. However, it is possible to make other embodiments that employ the principles of the invention and that fall within its spirit and scope as defined by the following claims.

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## WHAT IS CLAIMED IS:

1. A tamper resistant document, including:  
printing in a defined, repetitive pattern over a substantial portion of the document, the printing including at least three indicia of information desired to be secured from tampering, to enable identification of the document and to reduce the ability to alter or obliterate such information,  
wherein the at least three indicia are interspersed with each other.
2. The document of claim 1, further including printing of a larger size than the at least three indicia, the larger size printing including at least a portion of the same information contained in the at least three indicia, wherein the larger size printing is overlaid on the pattern.
3. The document of claim 2, wherein the repeated printing of each of the at least three indicia is off-set rather than aligned in register.
4. The document of claim 3, wherein the document is of controlled paper.
5. The document of claim 2, wherein at least one of the at least three indicia is unique to the document.
6. The document of claim 5, further including information encoded in bar codes suitable for computerized optical scanning.
7. The document of claim 6, further including at least one digitized signature.
8. The document of claim 1, wherein the printing is accomplished by laser printing.

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9. The document of claim 8, wherein the repeated printing of each of the at least three indicia is off-set rather than aligned in register.

10. The document of claim 9, wherein the document is of controlled paper.

11. The document of claim 3 or claim 9, wherein the document is one of the group consisting of a stock certificate, a bond, a marriage certificate and a birth certificate.

12. A method of producing a tamper evident document, including the step of printing in a defined, repetitive pattern over a substantial portion of the document at least three indicia of information desired to be secured from tampering, to enable identification of the document and to reduce the ability to alter or obliterate such information,

wherein the step of printing a pattern includes interspersing the at least three indicia in the pattern.

13. The method of claim 12, further including the step of printing information of a larger size than the at least three indicia in an overlay on the pattern, wherein the larger size printing so printed includes at least a portion of the same information contained in the at least three indicia.

14. The method of claim 13, wherein the step of printing a pattern further includes printing each of the at least three indicia in an off-set pattern rather than aligned in register.

15. The method of claim 14, wherein the step of printing a pattern and the step of printing larger size information are on controlled paper.

16. The method of claim 13, wherein at least one of the at least three indicia printed is unique to the document.

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17. The method of claim 16, further including the step of printing information encoded in bar codes suitable for computerized optical scanning.

18. The method of claim 17, further including the step of printing at least one digitized signature.

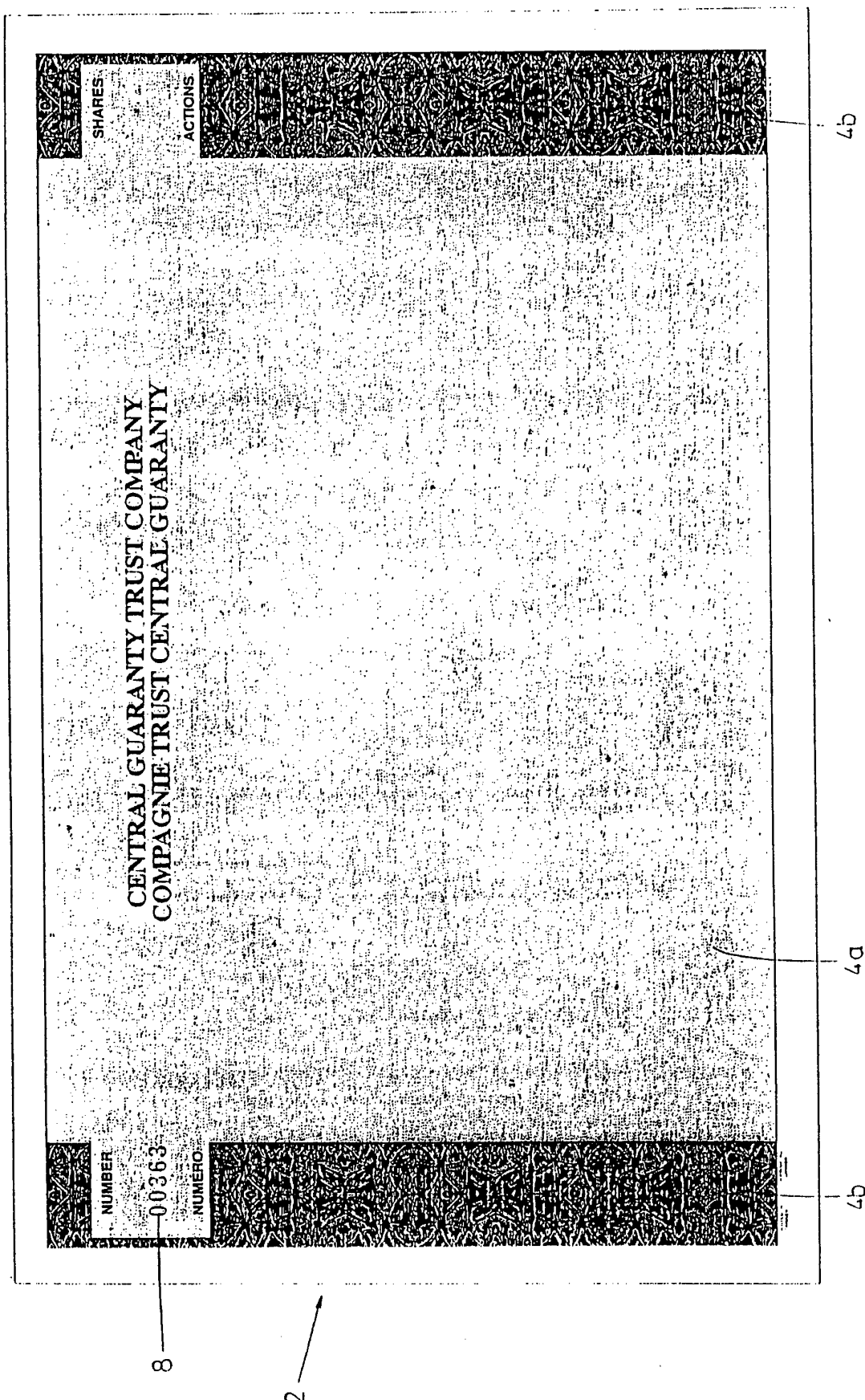
19. The method of claim 12, wherein the step of printing a pattern is laser printing.

20. The method of claim 19, wherein the step of printing a pattern further includes printing each of the at least three indicia in an off-set pattern rather than aligned in register.

21. The method of claim 20, wherein the step of printing a pattern and the step of printing larger size information are on controlled paper.

22. The method of claim 14 or 20, wherein the document so printed is one of the group consisting of a stock certificate, a bond, a marriage certificate and a birth certificate.

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8

2

102

14

16

1234

00158

22b

12

10

14a

114

20a

112

120

14b

20b

10a

12b

4b

4b

15

13

4a

1234

00158

22b

12

10

14a

114

20a

112

120

14b

20b

10a

12b

4b

4b

15

13

4a

3/4

7a  
7b

24a  
34a  
26a  
34a  
28a  
32a

126  
128  
130

2  
202

CANADA  
BRITISH COLUMBIA

MINISTRY OF HEALTH -- Division of Vital Statistics

This is to certify that the following is an extract from the registration of the marriage record in the Division of Vital Statistics, Victoria, British Columbia:

Name of Bridegroom: **WILLIAM E. BROOKLY**

Place of Birth: **VANCOUVER, B.C.**

Name of Bride: **JENNIFER J. GABBOTT**

Place of Birth: **MONTEHEART, P.Q.**

Date of Marriage: **8 AUGUST, 1970**

Place of Marriage: **CHILTSWICK, B.C.**

Registration Date: **20 AUGUST, 1970**

Registration No: **70-08-044620**

Given under my hand at Victoria, British Columbia  
this 20 day of August, 1970

Director of Vital Statistics

HLTH 406 (REV. 8/3/72)

M0181535

124  
128  
130



4/4

2

7a

7b

202

24

34

26

34

28

32

124

24a

26a

28a

**CANADA**  
**BRITISH COLUMBIA**

**MINISTRY OF HEALTH - Division of Vital Statistics**  
M0181533

This is to certify that the following is an extract from the registration of the marriage record in the Division of Vital Statistics, Victoria, British Columbia:

Name of Bridegroom WILLIAM E. BROLLY  
Place of Birth VANCOUVER, B.C.  
Name of Bride JENNIFER J. GABBOTT  
Place of Birth MONTREAL, P.Q.  
Date of Marriage 8 AUGUST, 1970  
Place of Marriage CHILLWACK, B.C.  
Registration Date 20 AUGUST, 1970  
Registration No. 70-08-044620

Given under my hand at Victoria, British Columbia  
this 20 day of August, 19 70  
*[Signature]*  
Director of Vital Statistics

WILLIAM E. BROLLY  
JENNIFER J. GABBOTT  
8 AUGUST 1970  
70-08-044620  
Vital Statistics  
HJTH 436 (REV. 83/12)

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 94/00193

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 5 B42D15/00

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 5 B42D

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.
X	US,A,1 564 724 (TODD AND TIEFEL) 8 December 1925 cited in the application	1-5, 12-16
Y	see the whole document ---	6,17
Y	WO,A,92 05521 (DE NEDERLANDSCHE BANK) 2 April 1992 see the whole document -----	6,17



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents :

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"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.

"&" document member of the same patent family

Date of the actual completion of the international search

19 July 1994

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Evans, A

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA 94/00193

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-1564724		NONE	
WO-A-9205521	02-04-92	NL-A- 9002071	01-02-91