

Methods of Forgery in Counterfeit Travel Documents

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With rapid developments in international travel, fraudulent travel documents used by illegal immigrants and criminals are frequently encountered by document examiners in Hong Kong. As the methods of forgery display certain consistent trends for a particular type of forged travel documents, the discovery of evidence of tampering or alteration on these documents is not a random process but is often targeted towards specific aspects of forgery. This article describes some of the target examination of some types of passports encountered in the authors' laboratory, namely, the People's Republic of China (PRC), Hong Kong Special Administrative Region, People's Republic of China (HKSAR PRC), Canadian, Korean, and the Philippines.

Introduction

As border traffic grows with increasing numbers of international travel, travel documents such as passports are frequently submitted for examination. Fraudulent travel documents are used by persons (criminals, terrorists, and illegal immigrants) attempting to travel under guise or assume totally new identities to gain entry into various countries.

The most common type of fraudulent passport is one that has been legally issued, lost or stolen, and then fraudulently used by another person different in appearance. It is usually necessary to substitute the holder's photograph by removing the original and replacing it with another. Another type of falsification is the production of a counterfeit passport. The role of the document examiner is to determine the authenticity and integrity of the questioned document by comparing it with a genuine sample for differences and detecting any sign of alterations and erasures (Levinson, 1984; Munden, Peszat, and Moyes, 1995).

To cope with the augmented workload and maintain a high efficiency, a computer-assisted instrument, such as the Video Spectral Comparator (VSC), is used in most cases. In addition, as the methods of forgery carry certain consistent trends for a particular type of questioned official travel documents, the search for evidence of tampering or alteration would not be a random process; instead, the document examiners would target specific aspects of forgery commonly encountered in that particular type of passport.

BN(O)	7%
Canadian	2%
HKSAR	8%
Korean	5%
Philippines	3%
PRC	28%
ROC	4%
USA	3%
TWP	18%
Pakistani	2%
Indonesian	2%
Japanese	2%
Singaporean	2%
Others	14%

Table 1. Distribution by country of the various travel documents examined.

The most common method of altering travel documents is tampering with the bio-data page by photo substitution or page substitution. Forensic examination of these questioned documents would initially be concentrated on the bearer's photograph and the printing of the bio-data page, followed by the examination of inner folios, inner front and back covers, and the binding thread.



Figure 1. Presence of a repeated array of dotted patterns over the entire page in a genuine PRC passport.

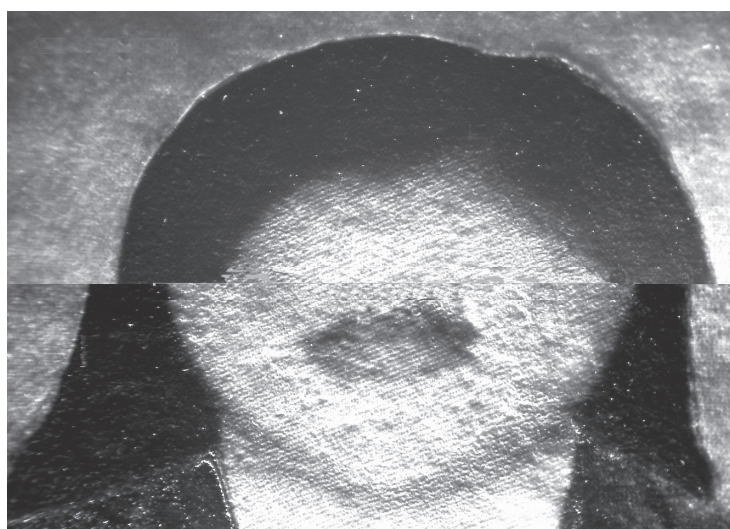


Figure 2. Presence noted of a cut mark along the outer rim of the head and neck region indicating a substitution by cut-and-paste in a passport.

Methods and Materials

In 2003, there were 1,457 questioned travel documents submitted to the Government Laboratory in Hong Kong for urgent forensic examination. Distribution of the various travel documents was summarized in Table 1. Among these, passports from various countries such as the People's Republic of China, Hong Kong Special Administrative Region of the Peoples Republic of China, Canada, Korea, and the Philippines contributed the majority of submissions and were of particular

interest. This paper presents some of the most common forgery methods encountered, namely photo substitution and page substitution, employed in these passports.

The People's Republic of China (PRC) Passports

Among the various methods of tampering or alteration carried out on the PRC passport, the most common kind of fraud is photo substitution. The bio-data page of a PRC passport is



Figure 3. Discrepancies found in the alignment of printing dots resulting from a cut-and-paste in an altered passport.

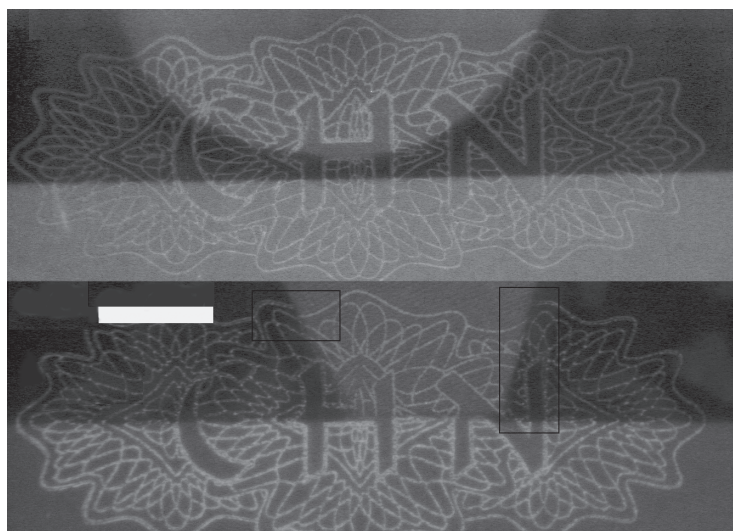


Figure 4. Nonalignment of the guilloché found in a questioned passport indicating a cut-and-paste.

located at the inner front cover and is protected by a piece of laminate bearing a guilloché. The bearer's photograph is digitized and forms an integral part of the bio-data page.

In a genuine PRC passport, the bio-data page is printed with a color laser printer. Examination would normally reveal the presence of a repeated array of yellow dotted patterns over the entire page, which is characteristic of the individual color laser printer (Figure 1). Since these dots are yellow in color, they are too pale to be clearly

seen with the naked eye. The Video Spectral Comparator is useful for the examination of these patterns. Illuminating the bio-data page with infrared light and using the band-pass filter at around 434 nm, these distinctive patterns could be explicitly visualized over the entire page. Thus, examination of the dotted patterns would throw light as to whether the photograph has been substituted (Li and Leung, 1998; Tweedy, 2001).

About 27% of the forged PRC passports submitted to our laboratory were photo substituted



Figure 5. Using the VSC, it was apparent the dotted patterns were disturbed around the area of the portrait. passport.

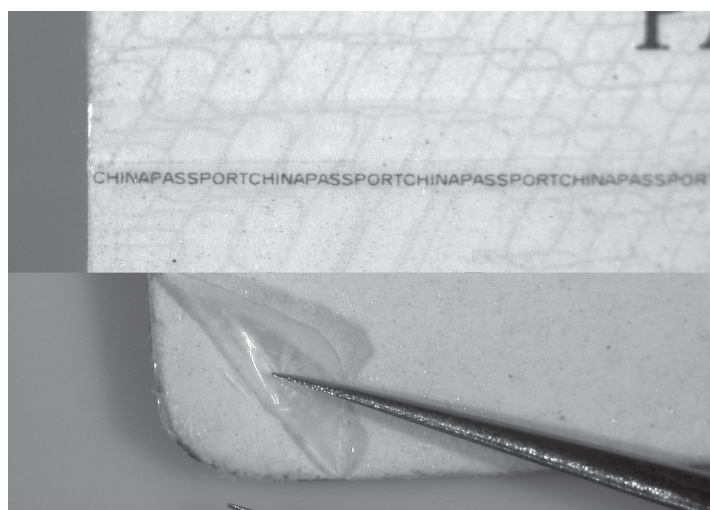


Figure 6. Presence of extra laminates observed on an altered passport.

by the “cut-and-paste” method. Examination under the microscope revealed the presence of noncontinuous edge around the head and neck regions of the existing portrait and fiber disturbance around the face, indicating that the original portrait had been substituted by means of cut-and-paste (Figure 2). Furthermore, the substituted portrait was found not to be an integral part of the bio-data page, but an extraneous sheet of substituted portrait pasted on top of the partially erased original portrait. This cut-and-paste method could result in the nonalignment

of printing dots of the existing portrait between the facial region and the background printing (Figure 3) and the portion of guilloche on the existing portrait with its counterpart on the lower rim (Figure 4). Moreover, the filtered image from the Video Spectral Comparator revealed that the yellow dot pattern was disturbed around the area of the portrait (Figure 5).

Apart from the cut-and-paste method, about 42% of the forged PRC passports were photo-substituted with the application of an extraneous piece of laminate bearing the substituted



Figure 7. As a result of discrepancies in the printing quality and the printing method, nondecipherable microprinting on the questioned passport can be observed.

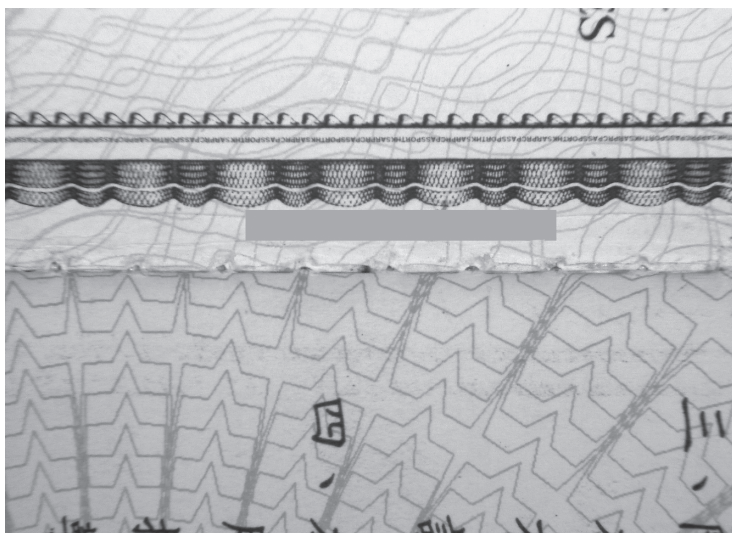


Figure 8. With the inner back cover substituted, a cut mark can be observed along the stitched edge of an altered passport.

portrait. Microscopic examination reveals the presence of the extra laminate, which is usually detected along the line of the microprinting (Figure 6). In addition, nonalignment of the printing dots between the face, shoulders, and/or background printing of the portrait can be observed (Figure 3). The “extra laminate” could also display discrepancies in the smoothness of curvature around the edges and in ultraviolet fluorescence when compared with the corresponding laminate of a genuine passport.

Peoples Republic of China, Hong Kong Special Administrative Region, (HKSAR) Passports

In an HKSAR passport, the bio-data page bearing the digitized portrait and personal particulars are located on the inner back cover. Within all the fraudulent HKSAR passports submitted to our laboratory, about 44% and 47% of them were prepared by page substitution and photo substitution respectively.

Page substitution of the HKSAR passport can be carried out on the inner back cover alone



Figure 9. Detection of “window-hole” cut marks can be observed using transmitted light.

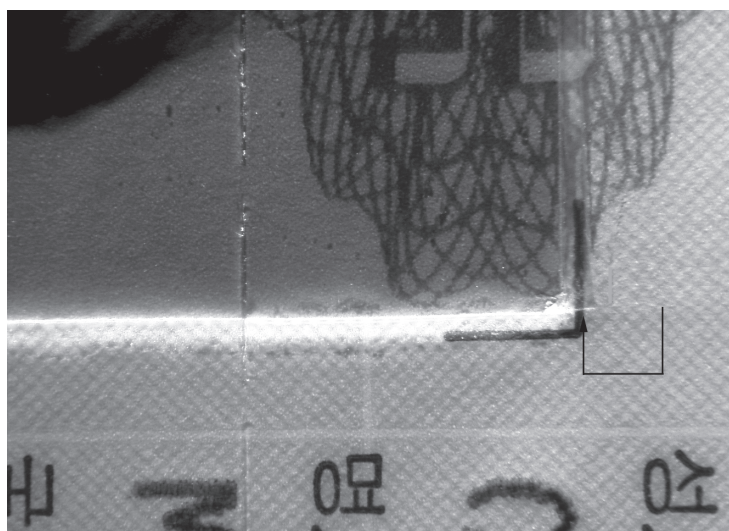


Figure 10. Substituting the original photograph with a new photograph can be determined from extra rim marks, which are inconsistent with the contour of the existing photograph in a passport.

(bio-data page) or the entire inner folio. For a document examiner, a comparison of the printing method and the printing quality between the questioned and genuine passports using the microscope would throw light on the method of page substitution (Figure 7). If the inner back cover was substituted, a cut mark could be observed along the binding edge (Figure 8). Sometimes, the laminate on the inner back cover has also been substituted. The substituted laminate would display discrepancies in the texture and appearance of ultraviolet fluorescent printing when compared with the corresponding laminate in a genuine passport.

In some other cases, photo substitution of the HKSAR passports was prepared with the "window hole" substitution method. This was done by cutting off the entire portrait and covering the "window hole" area with a substituted photograph. After that, an additional laminate was placed on top of the page to retain a smooth and flat surface. Examination using a microscope would normally reveal the presence of cut marks along the four rims of the portrait. The extraneous laminate would also display discrepancies in the texture and appearance of ultraviolet fluorescence when compared with the corresponding page in a genuine passport.

Canadian Passports

In a Canadian passport, the personal particulars and bearer's photograph are located on a sticker on the bio-data page on page 2 and covered with a piece of translucent laminate. Among the forged Canadian passports submitted to our laboratory, about 76% of them were prepared by splitting the bio-data page into two halves and subsequently making two diagonal slits in the area immediately below the bearer's photograph. This procedure would allow the original photograph to be removed from the bio-data page with minimal disturbance to the laminate. By inserting the "substituted" photograph into the vacant quadrant of the bio-data page, and subsequently gluing the two halves of the bio-data page together, photo substitution of the Canadian passport was completed.

The only area that can be detected for signs of forgery is the bio-data page, adhered on which is the original photograph. However, the translucent covering laminate renders detection of fiber disturbance around the bearer's photograph on the bio-data page more difficult. With the application of a Polilight, or strong transmitted light, through

the bio-data page, different opacity (due to the diagonal slit marks) could be observed in the vicinity of the four corners or under the substituted photograph (Figure 9). In addition, fiber disturbance and nonalignment along the bottom edge and crease marks could be observed due to the gluing of the two halves of the spliced bio-data page. In addition, bubbles of air under the laminate or wrinkles on the surface are also signs that the plastic sheet was lifted up and reapplied.

Korean Passports

In a genuine Korean passport, the holder's photograph is present on the bio-data page on page 2, covered with a plastic laminate bearing green and red Hangul scripts (Korean texts) near the left and right edges. Among the questioned Korean passports submitted to our laboratory, the most common method of photo substitution involves the lifting of the plastic laminate from the bio-data page to facilitate substitution of the original photograph.

When a photograph is placed between the laminate and the bio-data page for a period of time, rim marks consistent with the contour of the outer rims of the photograph will be formed. However, when the original photograph is removed by lifting up the laminate on the bio-data page and then substituting a new photograph, extra rim marks, which are inconsistent with the contour of the existing photograph, will be observed (Figure 10).

About 54% of the forged Korean passports displayed extra rim marks, which can be observed under the microscope with the help of oblique light. Furthermore, the removal of the laminate from the bio-data page can result in the loss of printing ink in the vicinities of the red guilloche, blue floral motif, and the green and red wavy Korean texts (Figure 11).

Philippines Passports

About 27% of the forged passports from the Philippines were tampered with by photo substitution. The method employed involves splitting the inner front cover (bio-data page) and the front cover into two halves and subsequently making two diagonal slits in the area immediately below the bearer's photograph (Figure 12), similar to the photo-substitution method employed in Canadian passports mentioned above. Examination revealed abnormal cleavage of the laminate in the vicinity of the edges of the photograph, which would indicate that photo substitution had been carried out.

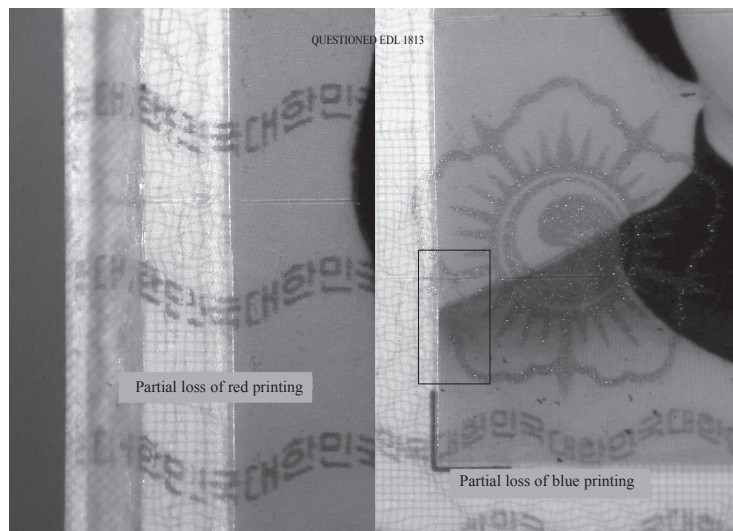


Figure 11. The removal of laminate can result in the loss of printing ink in the vicinities of the red guilloche, blue floral motif, and the green and red wavy Korean texts.

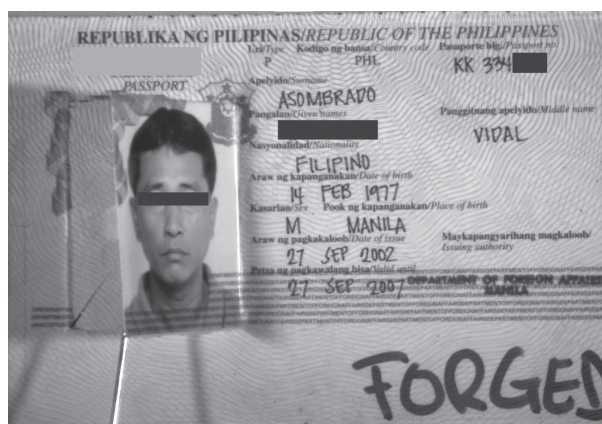


Figure 12. A passport from the Philippines displaying the presence of a cut mark.

Conclusion

When a document examiner inspects travel documents, the application of general techniques is always valuable. As more and more fraudulent travel documents are submitted for examination, specific methods of examination targeted towards the different types of passports will be necessary to maintain a high efficiency.

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