

Using Innovative Decorative Designs for securing The Egyptian Universities Temporary Graduation Certificate Stamps

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Abstract

A postage stamp is a piece of artwork which proficiently designed and printed and issued by a post office, postal administration, or other authorized vendors to customers who pay postage. (Glossary of Terms, 2017). Stamp design is perhaps the most interesting part of the stamp. It is one of the main reasons why stamps have been collected through the ages. Stamps have a monetary value and are produced only by security printers under very strict control. So the production methods include prepress stage, must be difficult to duplicate in order to prevent counterfeiting. Counterfeiting of security documents such as postage stamps is becoming now more than ever a serious problem, due to the availability of high-quality and low-priced color photocopiers and desktop publishing systems, (Isaac Amidror, 2002). This study aims to use new decorative designs supported with an overt security feature called "Guilloche", and another semi covert one called "Micro printing". In order to add aesthetic appeal to the Egyptian universities temporary graduation certificate stamps, and in the same time, to contribute in securing those stamps against counterfeiting. This will contribute automatically in reducing the risks of the negative impact of the use of counterfeit stamps on the Egyptian economy. After experimental work study, the results have shown that using these innovative designs is a very important issue, especially when we talk about protecting the Egyptian universities and the nation rights from scammers and therefore the national income, so it was very important to make these innovative designs to be hard to reproduce to achieve the research goals.

Keywords

Counterfeiting, Postage stamps, Postage stamps design, Security features, Guilloche, Intaglio printing, Gravure printing.

المخلص:

طابع البريد هو قطعة فنية يتم تصميمها وطباعتها باحترافية شديدة ثم يتم اصدارها بواسطة مكاتب البريد أو الإدارات البريدية أو أية جهة رسمية معتمدة للمستهلك الذي يقوم بشراءه.

ويعتبر تصميم الطابع هو أكثر عنصر شيق في الطابع، وهو أحد الأسباب الرئيسية التي تدعو مجععي الطوابع الى تجميعها على مر العصور. والطوابع تعتبر من المطبوعات ذات القيمة التي تتطلب تأمينها ضد عمليات التزييف والتزوير، لذا يتم طباعتها بواسطة المطابع المتخصصة تحت رقابة صارمة للغاية، كما أن طرق انتاجها بما تشمل مرحلة

ما قبل الطبع (التجهيزات الطباعية) لابد أن تكون من البداية صعبة للغاية بحيث يسهم ذلك في الحد من عمليات تزيفها، فتزيف المطبوعات أو الوثائق ذات القيمة كطوابع البريد أصبح من المشاكل الواجب وضعها في الإعتبار في تلك الفترة، خاصة مع توافر أنظمة النشر المكتبي، والناسخات، والطابعات الملونة عالية الجودة ومنخفضة السعر.

هذه الدراسة تهدف إلى استخدام تصميمات زخرفية مبتكرة مدعمة بوسيلة تأمين مرئية يطلق عليها "زخارف الجلوش"، وأيضاً وسيلة تأمين أخرى ولكن غير مرئية يطلق عليها الحروف المجهرية أو الميكرونية، والتي ستسهم بدورها في إعطاء شكل جمالي للطوابع التي ترفق بشهادات التخرج المؤقتة بالجامعات المصرية، وفي نفس الوقت ستسهم في تأمينها كمطبوع ذات قيمة ضد عمليات التزيف. وهذا سيسهم بدوره وبشكل آلي وغير مباشر في تقليل مخاطر الآثار السلبية الناتجة من استخدام الطوابع المزيفة على الإقتصاد المصري.

بعد إجراء التجارب العملية، أظهرت النتائج أن استخدام تلك التصميمات الزخرفية المبتكرة لهو أمر هام للغاية، خاصة عندما تتحدث عن حماية حقوق الجامعات المصرية وأيضاً حماية حقوق الدولة نفسها من المحتالين، وبالتالي حماية الدخل القومي المصري، لذا وجب استخدام تلك التصميمات المبتكرة بشكل يصعب من عملية إعادة انتاجها أو طباعتها مرة أخرى بسهولة من قبل المزيفين، مما يحقق أهداف البحث.

الكلمات المفتاحية:

تزوير ، طوابع بريدية ، تصميم طوابع بريدية ، ميزات أمنية ، طباعة نقش ، طباعة حفر.

Introduction

A postage stamp is a small piece of paper issued by a post office, postal administration, or other authorized vendors to customers who pay postage. (Glossary of Terms, 2017), they attached to various mail, packages, envelopes, cards and aerogrammes, (Alex Barinoff, 2020). They are legitimate if they are recognized internationally in practice, (Matthew Karanian, 2000), and they have a monetary value and are produced only by security printers under very strict control. The production methods must be difficult to duplicate in order to prevent forgery, (K. Rowe, et al, 2015).

Expertizing is the science of ascertaining whether a stamp is genuine or not genuine. It is necessary to know papers, colors, designs, printing processes, ...etc. (Hans Stolz, 2019)

Problem:

The authors found that their University "*Helwan and Assiut*" temporary graduation certificate stamps are very valuable authentic documents that are produced essentially to be attached to the temporary graduation certificates. However, they are not secured with any security feature to be protected from counterfeiting, as shown in (*figure 1 {A, B, C and D} and 2 {A, B, C and D}*), and they can be counterfeited easily by using any ordinary flatbed scanner, professional image processor application like Photoshop and then printing with any desktop color printer. In response to this need, authors created some innovative designs for each "*Helwan and Assiut University temporary graduation certificate stamp*" that achieve two goals, first of all is securing the stamps from counterfeiting, secondly, creating an aesthetic appeal to them.

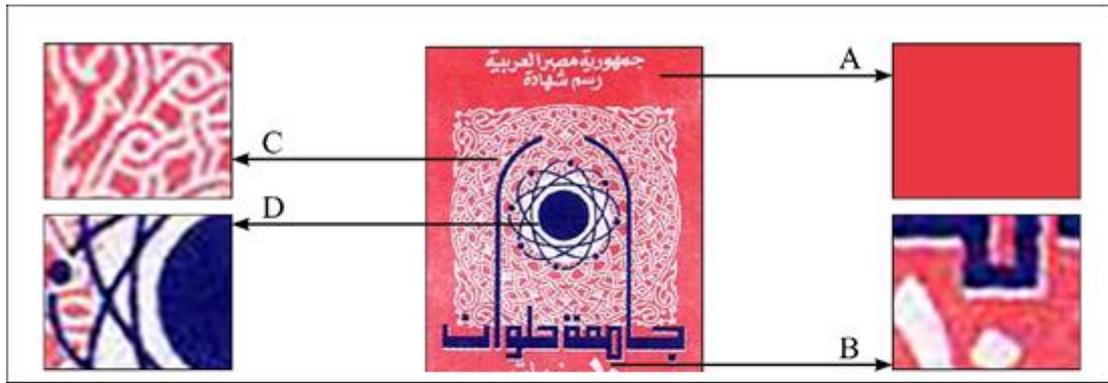


Figure 1: Illustrates The Original Non-secured Helwan University Stamp



Figure 2: Illustrates The Original Non-secured Assiut University Stamp

Methodology:

Descriptive, analytical and experimental study are conducted.

Originality/ value:

This paper serves for securing temporary graduation certificates stamps in Egyptian universities against counterfeiting, which reduces the risks of the negative impact of the use of counterfeit stamps on the Egyptian economy.

Objectives:

This study aims to create new decorative designs supported with an overt security feature called "*Guilloche*", and another semi covert one called "*Micro printing*", in order to add aesthetic appeal to the temporary graduate certificate stamps, and in the same time, will contribute in securing those stamps against counterfeiting and forgery.

Literature Review:

Paper: Usually most stamps are printed on high quality paper, designed specifically for them, and are printed in sheets, rolls, or small booklets, (Bhutan, 2013). But there are a few exceptions, like some modern stamps are made using silk, gold and aluminum foil, even plastic.

Colors: The colors of stamps are always seen by reflected light. The light source is of importance. A stamp will appear to have different tones of color under different light sources. This is of importance in expertizing.

Design: The printed design, is of decisive importance, in expertizing you have to know the differences in design between the genuine stamps and the forged ones. This is of great importance because it will instantly get rid of scammers.

Printing techniques: can be used to tell the genuine from a forgery, to distinguish high-quality initial printings from subsequent inferior ones, and to determine which look-alike stamps were printed at different times, using similar but distinct technologies. (Fred Baumann, 2015)

At the printing plant, the process begins with the delivery of paper for stamps, with the glue already applied to the back. Two printing processes are most often used in making stamps, the intaglio process, and the offset process.

(Lawrence H. Berlow, 2020). When applying the concept of Intaglio, the image is scratched, cut or etched into a printing surface or plate to reduce instances of duplication because of the presence of the metallic plate. (Mostafa M. Khalil, 2019). The preferred surfaces for plates are usually steel copper. The main characteristics of the intaglio stamp printing process are printing with cells, which engraved with the help of chemical tools on the surface. Then it is filled with ink as far as it passes through. You need to scrape the excess ink on the surface off by the doctor blade. The rest of the ink is finally left at the cells to be transferred to the stamp paper with necessary high temperature and pressure.

Nowadays electronic engraving is really popular. Which you can get high quality printed stamps with high resolutions. Lines and dots on them are hardly seen, that can't be said about photogravure and lithography methods. In photogravure, the design of the stamp is attached to the cylinder with the help of photographic process by screening the image of a stamp. Photogravure printing method boasts a wide number of colors and tones and makes up the perfect print. It happens because one can vary the depth of etch. In a stamp plate you can vary the quantity and depth of ink, (Alex Barinoff, 2020).

The postage stamp design:

Postage stamp design is an art form that blossoms on a tiny area of space. (Ruohan Zhao, 2020) It is perhaps the most interesting part of a stamp. It is one of the main reasons why stamps have been collected through the ages.

<https://www.2-clicks-stamps.com/article/different-parts-of-postage-stamps.html>

Stamp characteristics, like color, size, design, and even the printing process are then agreed upon with the competent designer. A postage stamp design is composed of 6 elements as following:

1) Denomination: The main role of a stamp is to show the amount or denomination of the pre-payment of it. The postage stamps are required to have a specific value or denomination.

2) Country Name: This part of the postage stamp design is usually for stamps that are intended for international use.

3) Textual Elements: After the placement of denomination and country's name, the textual elements may contain a simple yet functional purpose like "official mail", "university graduation certificate", "supporting and financing educational projects", the year when the stamp was issued, etc.

4) Graphic Design

Ranged from the early portrayals of kings, queens and presidents to later depictions of ships, birds and satellites, (Kenmore, 2010) [famous people](#), (Thomas Mallon, 2006), historical

events, comics, dinosaurs, hobbies (knitting, stamp collecting), sports, holiday themes, and a wealth of other subjects too numerous to list. (United, 2010). But in general, the graphic element of a postage stamp design can be one of four major categories:

A-Portrait bust: can be the full face or a profile.

B-Emblem: flag, coat of arms, post horn, national symbol, etc.

C-Numeric: a postage stamp design that is created around the numeral of denomination.

D-Pictorial: any image that ranges from animals and plants, to landscapes, to historical figures, to original artwork. Images may also be abstract designs, allegories or represent real-world objects.

5) Shape and Size

The most common postage stamp's shape is a rectangle, because this is the most practical way to put stamps in a stamp sheet.

<https://www.stampworld.com/en/articles/postage-stamp-design/>

In addition to the most common rectangular shape, stamps have been issued in geometric (circular, triangular and pentagonal) and irregular shapes. (Associated Press, 2011) The size of a postage stamp ranged from 10 mm to 30 mm to 52 mm x 95 mm. As these dimensions have proven to be the best and easiest size to handle.

6) The Process of Making the Postage Stamp Design

After choosing a subject, the postal administration, (here is Universities), usually contracts a designer or an artist to create the stamp design, the stamp designer must follow all rules and limitations and also be required to have previous experiences in designing stamps. Also, the designer has to consider the scenario of working with small stamps. I.e. details should be clear in all sizes, whether small or large.

Postage stamps Counterfeiting:

Counterfeiting of security documents such as postage stamps is becoming now more than ever a serious problem, due to the availability of high-quality and low-priced color photocopiers and desk-top publishing systems. Many security features have already been introduced in the past for authentication of documents. Some of these features are clearly visible to the naked eye and are produced for public (overt), while other features are hidden and only detectable by special devices (covert).

This paper serves to create new decorative designs supported with an overt security feature called "*Guilloche*", and another semi covert one called "*Micro printing*", this innovative design items will add aesthetic appeal to the temporary graduate certificate stamps, and in the same time, will contribute in securing those stamps against counterfeiting and forgery.

Guilloche is a unique standard feature to protect documents. It is used as background patterns on virtually all currency notes, passports or any authentication documents. (Zhigang Fan, et al 2008), Using a guilloche pattern as a background can be very effective to protect a document from counterfeiters. (T. Bozhkova, 2017)

"*Micro printing*", it is a *covert* security feature that makes it harder to fake official documents and print it. When used as an anti-fraud tool, small letters are often printed so small that the human eye cannot read them; they can become visible as lines with the unaided eyes. Under the magnification it can be clearly read. More importantly, *micro printing* helps you verify when a document is legitimate. (Justin Pritchard, 2019) Micro printed features are hard to

scan. (Anju Annie Thomas, et al, 2018) even with a powerful scanner, you'd need a very fancy printer to clearly print tiny letters. Micro printing like guilloche patterns, they are designed to be hard to reproduce. They may provide a variable data version of them, where, for example, the postage stamp denomination is embedded in the guilloche, also you can build stamp denomination or fill it with micro printing, and thus every postage stamp has a different pattern (to a decoder) while having the identical human visual impression.

Practicality:

Materials and procedures:

New innovative designs for the "*Helwan and Assiut University temporary graduation certificate stamps*" structured with some security features like "*Guilloche*" patterns, "*Micro printing*" patterns, were generated by Adobe Illustrator CC 2020 software, as following:

1st: For each university stamp, the authors created (**5**) new innovative designs (**two** of them were designed with the same colors of the original stamp colors, as shown in figures (3,4,8 and 9), **another two** designs were designed with different colors from the original stamp colors, as shown in figures (5,6,10 and 11), and **the fifth** one was designed with the same colors of the original stamp colors but after adding a main object to it, this object demonstrates deeply the main purpose of using the "Certificate", as shown in figures (7 and 12)

2nd: For both universities, all new stamp innovative designs, were supported with *Guilloche* and *Micro printing* patterns as security features in order to make the counterfeiting process difficult.

- For **Helwan University stamps**, Guilloche patterns are located all over the backgrounds and most of items on each stamp as shown in (*figures from 3 to 7*) but micro printing patterns can become visible as lines with the unaided eyes. But under the magnification they can be clearly seen as "Helwan University" and located in some specified places, as shown in (*figures 3 {B}, figures 4 {C}, figures 5 {A&C}, figures 6 {C}, and finally figures 7 {C}*),):

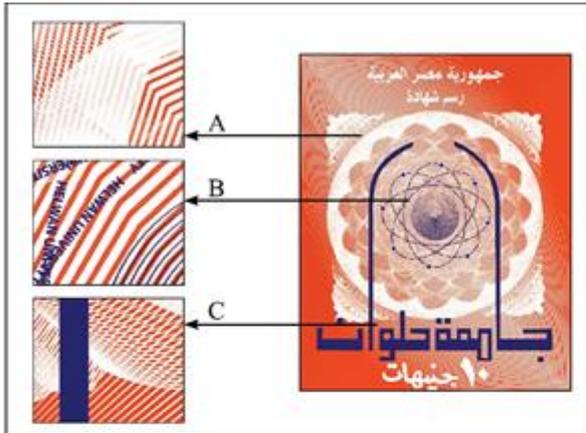


Figure 3: Illustrates 1st stamp that designed with the same colors of the original stamp colors

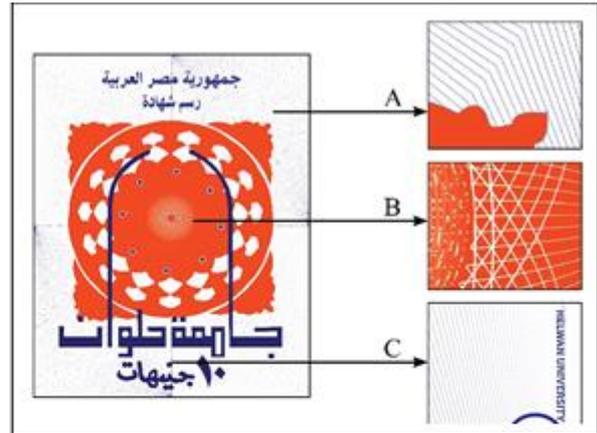


Figure 4: Illustrates 2nd stamp that designed with the same colors of the original stamp colors

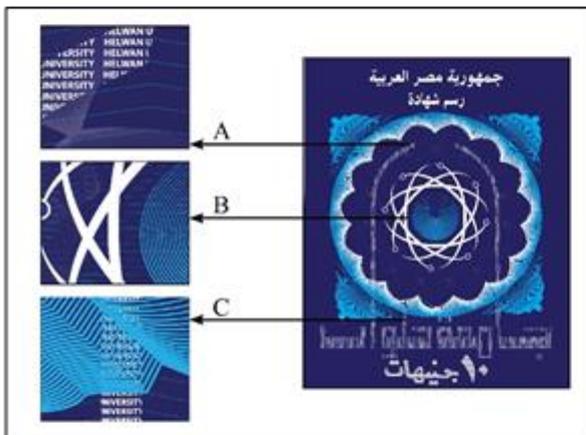


Figure 5: Illustrates 1st stamp that designed different colors from the original stamp colors

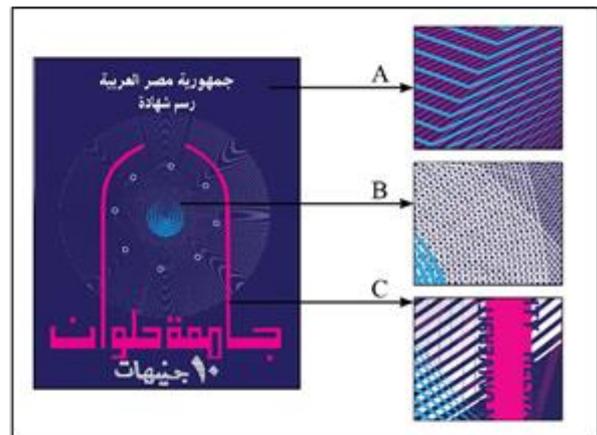


Figure 6: Illustrates 2nd stamp that designed different colors from the original stamp colors



Figure 7: Illustrates the stamp which designed with the same colors of the original stamp colors but after adding a main object to it to demonstrates deeply the main purpose of using the "Certificate"

- For **Assiut University stamps**, Guilloche patterns are located all over the backgrounds and most of items on each stamp as shown in (figures from 8 to 12) but micro printing patterns can become visible as lines with the unaided eyes. But under the magnification they can be clearly seen as "Assiut University" and located in some specified places, as shown in (figures 8 {C}, figures 9 {B}, figures 10 {C}, figures 11 {B}, and finally figures 12 {C},):

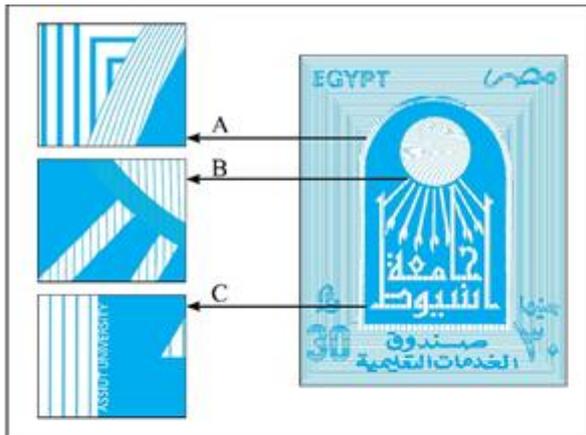


Figure 8: Illustrates 1st stamp that designed with the same colors of the original stamp colors

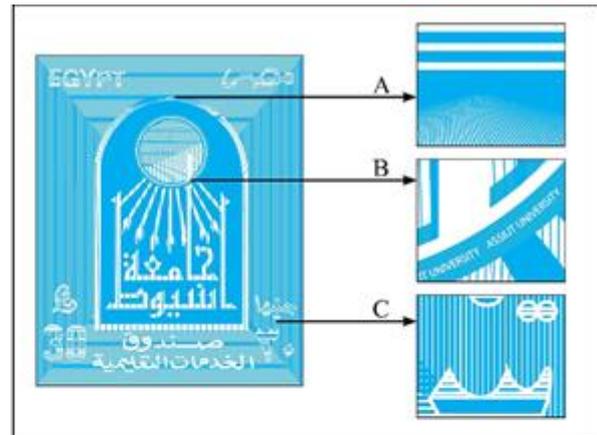


Figure 9: Illustrates 2nd stamp that designed with the same colors of the original stamp colors



Figure 10: Illustrates 1st stamp that designed different colors from the original stamp colors

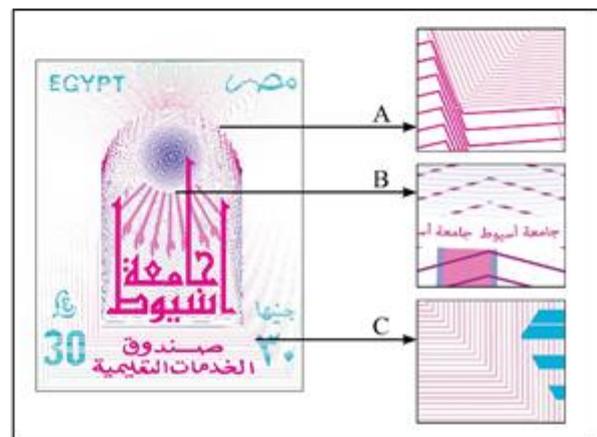


Figure 11 Illustrates 2nd stamp that designed different colors from the original stamp colors

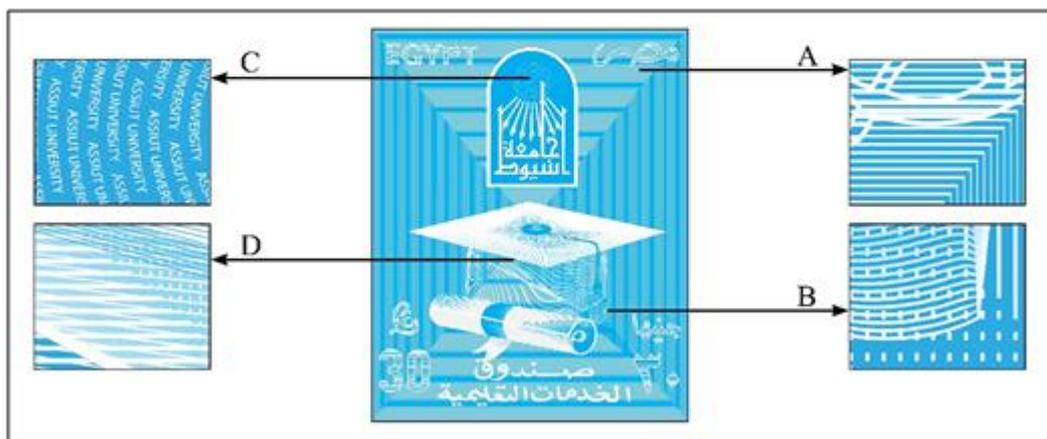


Figure 12: Illustrates the stamp which designed with the same colors of the original stamp colors but after adding a main object to it to demonstrates deeply the main purpose of using the "Certificate"

Results:

There are three different results for the research experimental procedures:

- **1st:** As shown in figure 1 and 2, the current designs of the stamps are very poor aesthetically and can be counterfeited easily, so it was necessary to change the whole design.
- **2nd:** Using innovative designs, which includes many items and security features like Guilloche and Micro printing, add an aesthetic appeal to the stamps, and help in preventing counterfeiting them by imitators, but make them impossible, as shown in figures from 3 to 12.
- **3rd:** Guilloche and Micro printing patterns can be very effective to protect stamps from counterfeiters, because they are hard to scan even with a powerful scanner, you'd need a very fancy printer to clearly print them, they are designed to be hard to reproduce

Recommendations:

The authors recommend some recommendations for both of postage stamp producer and end-user as following:

1st: For postage stamp producer (Egypt Post Printing House):

- It is very important to contract a designer or an artist to create new innovative stamp designs, and must follow all rules and limitations and also be required to have previous experiences in designing stamps, to create anti-counterfeiting postage stamps that are impossible to be counterfeited.
- Print the new innovative stamp designs with multi-levels security (Overt, semi Covert, Covert and forensic) features with sophisticated printing techniques to prevent stamp reproduction with any ordinary flatbed scanner and with any desktop color printer, like using Guilloche and Micro printing that add an aesthetic appeal to the stamps, and help in preventing counterfeiting them by imitators, but make them impossible, as shown in figures from 3 to 12.

2nd: For postage stamp end-user (Student or Graduate):

- It is very important to have the awareness of postage stamp security features, and check them up carefully before buying the stamps, to determine whether they are genuine or not.

Conclusion

Using Innovative Decorative Designs for securing The Egyptian Universities Temporary Graduation Certificate Stamps is a very important issue, especially when we talk about protecting the university and the nation rights from scammers and therefore the national income, so it was very important to make these innovative designs to be hard to reproduce to achieve two goals, one of them is to secure the stamps from counterfeiting, and the other, to create an aesthetic appeal to them. The designs structured with some security features like "*Guilloche*" patterns and "*Micro printing*" patterns, were generated by Adobe Illustrator CC 2020 software, in order to achieve the research goals.

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