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Design Patents for Animated Images: Development Trends

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Mobile devices have replaced computers and become the major tool to browse web pages. Such a result has enhanced the demand for animated image design and patent applications. Animated images, including graphical user interface (GUI) and computer-generated icons (CGI), are set to become mainstream applications in design patents. Taking the official database of animated images in the USA as the research sample, this study aims to analyse the animated image patents and their anticipated development trends. A total of 201 samples were screened for this study. The research concluded as follows: (1) The frequency of applications related to GUI and CGI increased annually and the number of GUI applications far exceeded that of CGI after 2010, showing that GUI is gradually replacing CGI and becoming the mainstream application in animated image patents. (2) The GUI applications focus on computers and mobile phones, indicating that the applications of computers and mobile phones are the major developments of GUI for the time being. It is worth noting that the number of applications of GUI patents with unspecified object is also increasing in the past years, revealing the diversified development trend of GUI, beyond the applications of computers and mobile phones. (3) An assignee analysis revealed Microsoft as the first enterprise to attain patent portfolios of animated images and has, to some extent, presented barriers to the entry of other enterprises. (4) As far as number of patent icons is concerned, seven dynamic icons have appeared in the US Animated Image Patent Gazette.

Keywords: Animated image, design patent, graphical user interface (GUI), computer-generated icon (CGI)

The rapid development and the maturity of industrial technologies have changed consumer demand for popular products, particularly, their design. Mobile manufacturers, like Apple/ Samsung/ HTC, have thus turned design patents into competitive fields, in which product design is considered as the major protected object. A lot of important research on design patents has been proposed in the past years, such as the similarity scope of design patents[1] and patent portfolios with design patent map.[2-3] Design patents have gradually become a competitive tactic among mature products.

The popularity of smart phones and tablet personal computers confirms that the growth trends in this area cannot be underestimated. According to 2013 Top Ten Strategic Technology Prediction reported by Gartner, mobile devices would prevail in 2013, as they would replace computers and become the major tool to browse web pages. It further predicted more than 70 billion mobile app (application) downloads in 2014 and the market share of smart phones at about 80 per cent of the entire mobile market in 2015. Such a strong trend spells a significant boom in the software applications market.[4]

The compelling functions of application software, presenting the diverse utilities of games, social community networking, online shopping, and information enquiry, have translated into convenient lives for human beings. Both Graphical User Interfaces (GUIs) and Computer-Generated Icons (CGI) are accessed by users when using the software. The design of GUI and CGI stresses on friendly user interface and effective icon recognition, which are directly related to the operation of GUI and CGI.

Design patents for GUI and CGI have become increasingly popular in the US and abroad. It becomes more evident from the trends in large technology companies enhancing their design patent portfolios

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for strategic value. One high-profile, high-stake case illustrating this point is the ongoing patent infringement saga between Apple and Samsung, which involves several design patents directed to GUI and CGI. Other large technology companies, such as Microsoft and Sony, are also active in the area of design patent protection for GUI and CGI.[5]

The United States Patent and Trademark Office (USPTO) issued Examination Guidelines for computer-generated icons in 1996, when a CGI was granted design patent. In 2005, GUI with dynamic changes was further granted design patent[6] and the examination guidelines related to changeable computer generated icon (CCGI) were included by USPTO in August 2006 (ref. 7). The Japan Patent Office (JPO) issued Registration and Application Guide for Design Patents in 2004, which not only widened the definition of design patent, but covered LCDs in design patent morphology. Japan Design Patent Regulations was further revised in 2006 to include icon design.

The European Union (EU) passed the European Union Community Design Regulation in 2001, providing regulations to protect GUI and regarding graphic symbols officially as products. Korean Intellectual Property Office (KIPO) revised the Examination Guidelines for Design Patents in 2003, when products with icon design were covered in design patent. What is more, Canada, Brazil, and Australia also included GUI and CGI on displays in design patents in 2004, 2005, and 2010, respectively.[8]

As per the Manual of Patent Examining Procedure of USPTO, computer-generated icons are 2D images. Since a patentable design is inseparable from the object to which it is applied and cannot exist alone merely as a scheme of surface ornamentation, a computer-generated icon must be shown in a computer screen, monitor, and other display, etc., thereof, to satisfy 35 USC 171 (ref. 9).

Taiwan Intellectual Property Office (TIPO) announced a new-version of the Substantive Examination Guidelines for Invention Patent in 2013, in which GUI and CGI were defined as interface displaying virtual graphs through electronics, computers, or other information products.[10] GUI is an entire frame composed of several icons and the background[11], as shown in Fig. 1; CGI, on the other hand, refers to a single icon[12-13], as shown in Fig. 2.

The emphasis on design patents for GUI and CGI has caused researchers to discuss the fields in depth, such as the discrimination of GUI and CGI through the classification numbers and application cases of patents in USA.[14] According to the analysis [15], design patents for GUI and CGI have been rapidly growing in the USA. For this reason, the study analysed the CGI Patent Gazette by USPTO to understand the development trend in design patents for GUI and CGI in the USA.

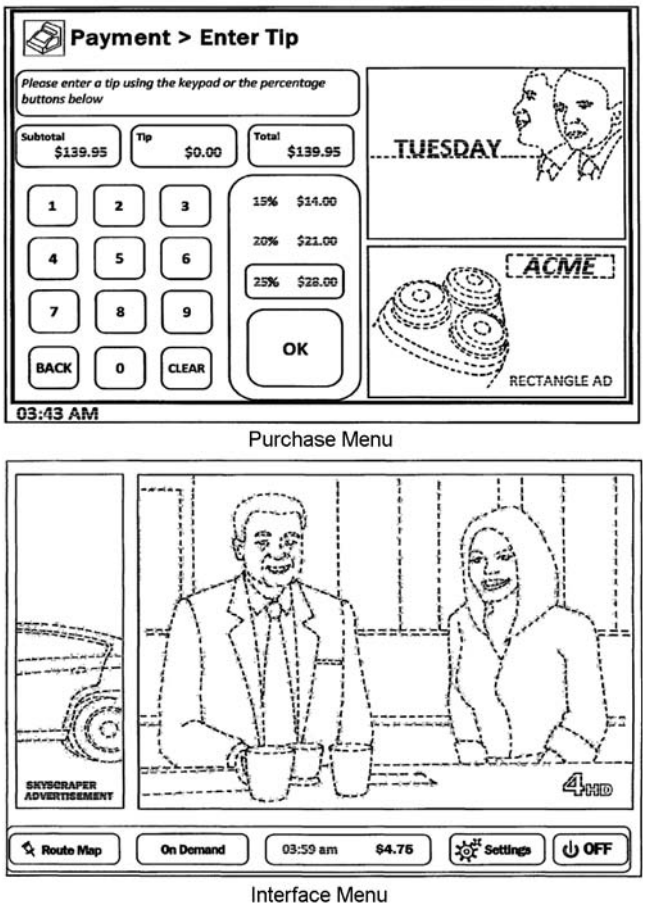

Fig. 1—Example of Graphical User Interface

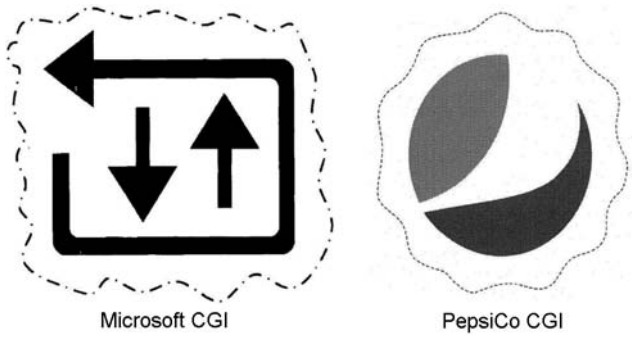

Fig. 2—Examples of CGI

Method Used in the Study

The Locarno Agreement is currently applied to the international classification for industrial designs (in short, LOC); such a classification was included in the revision of Patent Act in Taiwan in 2001. Display and icon are included in the sub-type 04 of type 14 in LOC which is further divided into GUI and CGI, according to the serial numbers. Nevertheless, two problems are encountered when screening and analysing patents among the US patent data with LOC: (1) design patents for GUI and CGI are not necessarily classified into Type 14-04, and (2) the LOC classification serial numbers are not recorded in the US patent data, as a result of which GUI and CGI applications can hardly be distinguished.[15]

The research samples acquired from the patent database of USPTO using the US Patent Classification (USPC) were screened and analysed. The relevant class was the USPC's D14 class, No 485-495 for the GUI and CGI category (as shown in Table 1).

The existing patent cases filed between 1976-2012 and relating to the D14/485-D14/495 in the USPC were artificially retrieved and duplicates removed. A total 3356 instances of patent data were eventually acquired. Since this study explored patents for animated image, including GUI and CGI, the patent retrieval scope was focused on patent title keyword of 'animated'. The cases undecided as in 2012 are excluded from this study as the data are not complete. Finally, a total 201 items of design patent for GUI and CGI between 2004 and 2011 were screened as the research samples.

Results

The 201 research samples for US design patents related to animated image were analysed for the following parameters: (1) the annual growth trends in GUI and CGI, (2) the type of applications in GUI and CGI, (3) assignee, and (4) number of drawings in the design patent.

Analysis of Annual Growth Trend of GUI and CGI

Based on the year of application, the application frequency of patents for animated images in 2004-2011 was analysed; where the highest application frequency for animated images, namely, 70, was in 2011, and the lowest, 0, in 2005. The application frequency in design patents for animated images has shown an annual growing trend between 2004 and 2011 (Fig. 3).

The results showed an annually increasing patent application trend for GUI, while the first application for CGI appeared in 2008, and the number of patent applications for CGI reached a peak in 2009, when the number of applications even exceeded that of GUI. However, the number of patent applications for GUI far exceeded that for CGI after 2010 showing the importance of GUI patents as compared to CGI patents.

Analysis of Application Types of GUI and CGI

As can be seen from Table 1, the USPC Class D14 No 485-495 was analysed for GUI and CGI applications. According to the application type, GUI was classified into (1) Type I: computers, (2) Type II: mobile phones, (3) Type III: tablet PCs, (4) Type IV:

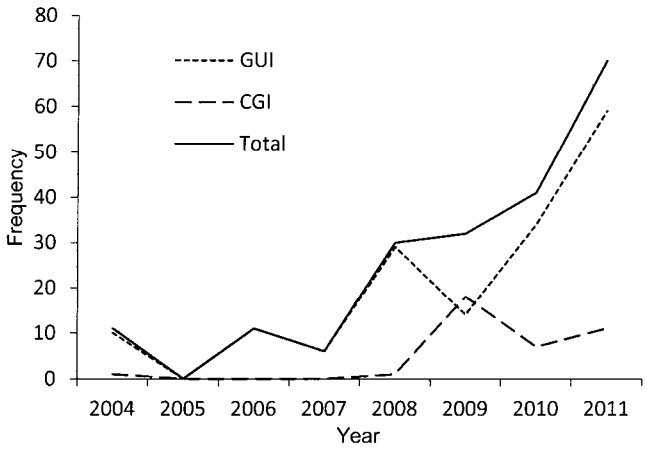

Fig. 3—Application frequency of design patents for animated images

Table 1—Classification of GUI and CGI in USPC

USPC	GUI		CGI	
D14	485	Generated image	489	Icon
	486	Drop down menu or full screen menu type	490	And letter, number, or word
	487	Button bar or scroll type	491	And arrow
	488	Plural image or array	492	Simulative
			493	Document
			494	Animate
			495	Humanoid

unspecified objects, and (5) Type V: other objects (such as cameras, teaching equipment, dual displays, media players, 3D interactive displays, temperature controllers, and XBOX360). CGI, on the other hand, was not further restricted by the type of object, but only statistically analysed on the basis of classification. The classification statistics of GUI and CGI are showed in Table 2 and Table 3, respectively.

In case of GUI, the classification no 488 had the highest number of applications (frequency) followed by 485, 487 and 486; while in case of CGI it was 495 with the highest number of applications followed by 489,492 and 494. There were no applications for the classification nos 490, 491, and 493 of CGI.

The classification types in Table 2 and Table 3 were further organized as shown in Fig. 4. B1 and D1 were the most frequent application types in 2004, which were applied to computers (Type I) for GUI. A4 was the most frequent application type in 2006, and was mostly applied to unspecified objects (Type IV). D2 was the most frequent application type in 2007, mainly applied to plural image or array for mobile phones (Type II). D4 was the most frequent application type in 2008, which was mainly applied to plural image or array for unspecified objects (Type IV). Similarly, in 2009, K1 was the most frequent application type in 2009 (applied to humanoid CGI design), in 2010 it was C2 applied to button bar or scroll type design for mobile phones (Type II) and lastly in 2011 it was D1 applied to plural image or array for computers (Type I).

The application types for GUI and CGI focused on D1 (30), A4 (25), D4 (23), and C2 (21) during 2004-2011, which represented 49.25 per cent of the total research samples.

Analysis of Assignees

Among assignees, Microsoft was one of the earliest to apply for a design patent in an animated image in 2004, followed by Apple. Microsoft leads the all other assignees in the field of animated image design patents by a huge amount as can be seen from Fig. 5.

Analysis of the Number of Drawings in the Design Patent

In case of design patents, the scope depends on the quantity of drawings or images disclosed. Similar is the situation for animated images which is seen as an impediment by applicants. In future, the number of images that appears in a design application is expected to be at the core of design patent litigations. Nevertheless, the number of drawings in design patents for animated images is not regulated in the USA and other countries, only in the European Union. It has been considered as an important parameter in this study since it could act as an indicator for countries which wish to implement such regulations in future. It was found that in the design patents for animated images examined, a great number of them contained 4 to 10 images that fell close to the regulated number of figures in the European Union. Here 11 per cent cases had 7 images. Focussing on 4 to 10 images (i.e. 7+/-3 images - 7 is stipulated in Europe), as the statistical datum of images in the design patents, 3 per cent of the samples studied contained 4 images, 5 per cent contained 5 images,

Table 2—GUI classification number and classification frequency

USPC	485		486		487		488	
SC/ Fq	SC	Fq	SC	Fq	SC	Fq	SC	Fq
Type I	A1	6	B1	16	C1	2	D1	30
Type II	A2	1	B2	5	C2	21	D2	11
Type III	A3	0	B3	0	C3	1	D3	4
Type IV	A4	25	B4	5	C4	5	D4	23
Type V	A5	4	B5	2	C5	2	D5	0
Total	--	36	--	28	--	31	--	68

Note: SC= Sample code, Fq= Frequency

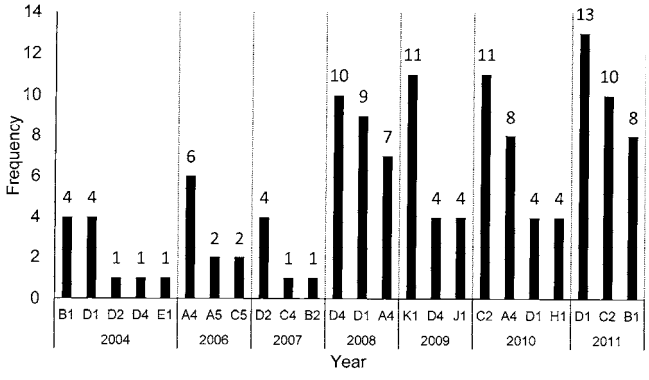

Fig. 4—Frequency analysis of application types for GUI and CGI

Table 3—CGI classification code and classification frequency

USPC	489		490		491		492		493		494		495	
	SC	Fq	SC	Fq	SC	Fq	SC	Fq	SC	Fq	SC	Fq	SC	Fq
Total	E1	9	F1	0	G1	0	H1	8	I1	0	J1	5	K1	16

Note: SC = Sample code; Fq=Frequency

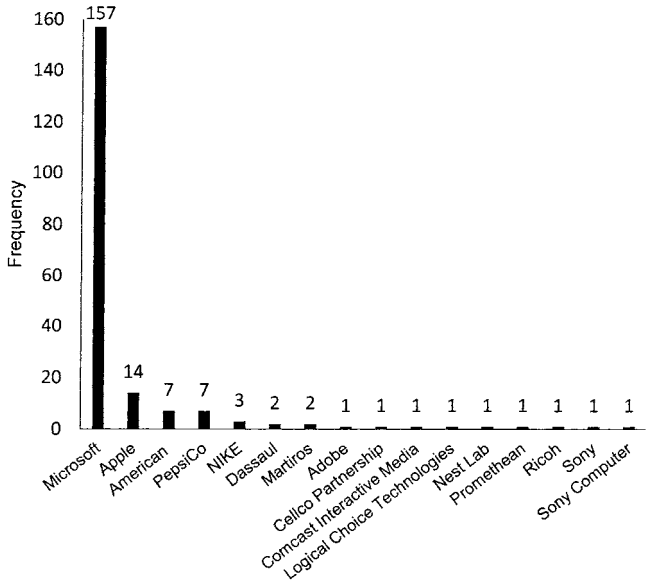

Fig. 5—Number of applications filed by different assignees for design patents in animated images

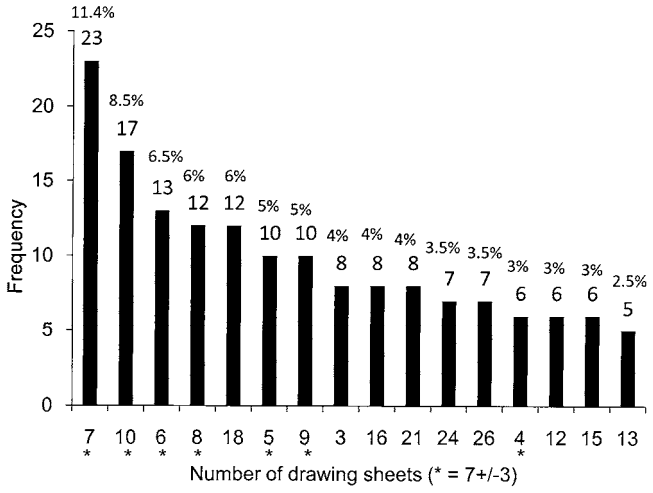

Fig. 6—Number of drawings in the design patents

6 per cent contained 6 images and 8 images respectively and there were 5 per cent samples with 9 images. Thus a total of 44 per cent cases had 4 to 10 images as shown in Fig. 6.

Discussion and Conclusion

Of the 201 design patent samples examined at the USPTO in 2004-2011, a total 58 cases were for GUI with unspecified objects (Type IV) in the classification no 485-496 (ref. 16).

Considering all the above categories where design patents have been filed, the unspecified objects provide optimal protection for design patents, as all possible objects for animated images are protected, expanding the scope for protection of design patents. It is therefore considered the future development trend of animated image design patents.

An analysis of the application frequency during 2004-2011, revealed that the number of patents for animated images increased annually. According to the analysis of annual applications for GUI and CGI, the application number for GUI increased annually. Nevertheless, the first application for CGI appeared only in 2008; the application quantity for CGI reached a peak in 2009, when it even exceeded the application quantity for GUI. However, since then the number of applications for GUI has remained higher than that for CGI. According to the statistical data, enterprises had more patents for GUI than for CGI.

Between 2004 and 2011 (excluding 2005), most application types were classification nos 485-495 in USPC, with these applications accounting for about 81.09 per cent of the total samples, with the focus on GUI for various products. Apparently, GUI would be the mainstream trend in future patent applications.

An analysis of assignees showed that Microsoft has the maximum number of GUI and CGI design patents, followed by Apple. While Microsoft started applying for GUI and CGI as early as 2004, Apple only applied for design patents of GUI and CGI in 2007.

Design applications as analysed in the study, with 7 images occurred the maximum number of times (11 per cent). This result conforms to the regulations regarding the number of animated images in a design patent in European Union. Based on the research results, the countries tending to implement patent systems for GUI and CGI could set the number of images at 4-10 (i.e. 7+/ -3 images), which was found appropriate in about half (44 per cent) of the patent applications examined.

Besides European Union restricting the number of images in animated image patents and Japan regulating the appearance of the objects (six-sided figure and reference diagram), there are no other relevant image restrictions in the USA, Taiwan, and South Korea. These research results could be an important reference for cross-border applications of patents for GUI and CGI.

The applications of design patents for animated images in the USA focus on GUI, and computers and mobile phones dominate as the application type. GUI is expected to be the mainstream trend of global applications of design patent for animated image in the future. When the competitors utilize design patents for GUI and CGI as competitive strategies, the design

patent portfolios would become more important. In addition to technological patent landmines, design patents for GUI and CGI would most likely become very competitive products in the future.

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