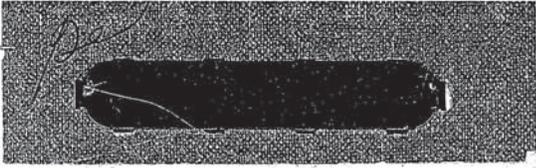


441	Subclass
345	Class



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UTILITY SERIAL NUMBER 08 726091	PATENT DATE SEP 28 1999	PATENT NUMBER
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SERIAL NUMBER 08/726,091	FILING DATE 10/04/96	CLASS 365 244	SUBCLASS 411	GROUP ART UNIT 2414 342	EXAMINER Nguyen, Phu
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APPLICANTS KEVIN E. MCFARLAND, COPPELL, TX; RODNEY T. WHISNANT, PLANO, TX.

CONTINUING DATA
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P04/08/98

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Foreign priority claimed 35 USC 119 conditions met	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	AS FILED	STATE OR COUNTRY TX	SHEETS DRWGS. 5	TOTAL CLAIMS 28	INDEP. CLAIMS 4	FILING FEE RECEIVED \$1,026.00	ATTORNEY'S DOCKET NO. 018682.0120
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DALLAS TX 75201-2980

TITLE METHOD AND SYSTEM FOR PRODUCING GRAPHICAL IMAGES
U.S. DEPT. OF COMM./PAT. & TM—PTO-436L (Rev.12-94)

PARTS OF APPLICATION FILED SEPARATELY 7-28-99		Formal Drawings (5 sheets) set 1		10-4-96		M. Cole Applications Examiner	
NOTICE OF ALLOWANCE MAILED		Assistant Examiner		CLAIMS-ALLOWED			
4/12/99				Total Claims 28		Print Claim 21	
ISSUE FEE		PHU K. NGUYEN PRIMARY EXAMINER GROUP 2400		DRAWING			
Amount Due \$10500	Date Paid 6-10-99			Sheets-Drwg. 15	Figs. Drwg. 8	Print Fig. 3A	
Label Area		PREPARED FOR ISSUE		ISSUE BATCH NUMBER R63			
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Form PTO-436A (Rev. 8/92)

ISSUE FEE IN FILE

Formal Drawings (5 sheets) set 1

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PATENT APPLICATION



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Date Entered or Counted

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Date Entered or Counted	Description	Date Received or Mailed
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	2. <u>IDS</u>	<u>1/16/97</u>
	3. <u>Verified Statement - Small Entity</u>	<u>3-17-97</u> <u>clm 5-6</u>
<u>2-17-98</u>	4. <u>Req (3)</u>	<u>3-2-98</u> <u>(A)</u>
	5. <u>Amdt A</u>	<u>6-9-98</u> <u>clm 6-2</u>
<u>10-13-98</u>	6. <u>Req 3mas</u>	<u>NOV 12 1998</u> <u>TH-6</u>
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PATENT NUMBER		ORIGINAL CLASSIFICATION	
		CLASS	SUBCLASS
		345	441
APPLICATION SERIAL NUMBER		CROSS REFERENCE(S)	
08/726,091		CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)
APPLICANT'S NAME (PLEASE PRINT)			
McFARLAND et al			
IF REISSUE, ORIGINAL PATENT NUMBER			
INTERNATIONAL CLASSIFICATION			
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GROUP ART UNIT		ASSISTANT EXAMINER (PLEASE STAMP OR PRINT FULL NAME)	
272		PHU K. NGUYEN	
		PRIMARY EXAMINER (PLEASE STAMP OR PRINT FULL NAME)	

PTO 270
(REV. 5-91)

ISSUE CLASSIFICATION SLIP

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

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POSITION	ID NO.	DATE
CLASSIFIER	#14	11-6-96
EXAMINER	JM	12-5-96
TYPIST		
VERIFIER	277	12-9-
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SPEC. HAND		
FILE MAINT.		
DRAFTING		

INDEX OF CLAIMS

Claim	Date	
	Final	Original
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SYMBOLS
 ✓ Rejected
 = Allowed
 - (Through numeral) Canceled
 + Restricted
 N Non-elected
 I Interference
 A Appeal
 O Objected

(1 FET INSIDE)



SEARCHED			
Class	Sub.	Date	Exmr.
345	440	02.08.98	PN
	441		
	442		
	443		
	113		
114			
UPDATE	SEARCH	4/3/99	PN

SEARCH NOTES	
Date	Exmr.

INTERFERENCE SEARCHED			
Class	Sub.	Date	Exmr.
345	441	4/3/99	PN
	440		
	442		

(RIGHT OUTSIDE)



US005959633A

United States Patent [19]
McFarland et al.

[11] **Patent Number:** **5,959,633**
[45] **Date of Patent:** **Sep. 28, 1999**

[54] **METHOD AND SYSTEM FOR PRODUCING GRAPHICAL IMAGES** 5,805,160 9/1998 Yoshida et al. 345/339
5,812,131 9/1998 Bertram 345/339

[75] **Inventors:** Kevin E. McFarland, Coppell; Rodney T. Whisnant, Plano, both of Tex.

OTHER PUBLICATIONS

Developing Visio Solutions, Version 4, 1995, pp. 1-163.

[73] **Assignee:** Micrografx, Inc., Richardson, Tex.

Primary Examiner—Phu K. Nguyen
Attorney, Agent, or Firm—Baker & Botts, L.L.P.

[21] **Appl. No.:** 08/726,091

[57] **ABSTRACT**

[22] **Filed:** Oct. 4, 1996

[51] **Int. Cl.⁶** G06F 15/00

[52] **U.S. Cl.** 345/441

[58] **Field of Search** 345/440, 441, 345/442, 443, 113, 114

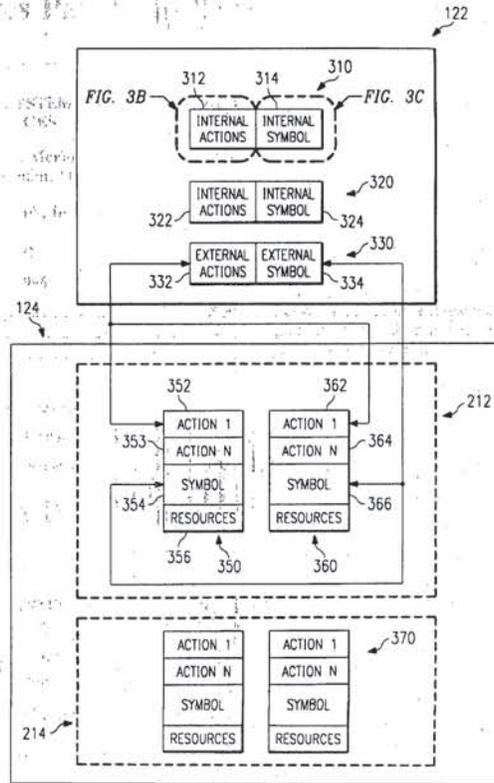
A method and system for producing graphical images includes a computer-readable medium and a computer program encoded on the computer-readable medium. The computer program is operable to access an external shape stored outside the computer program. The external shape comprises external capabilities. The computer program is further operable to delegate the production of a graphical image of the external shape to the external capabilities.

[56] **References Cited**

U.S. PATENT DOCUMENTS

5,790,117 8/1998 Haviatti et al. 345/333

28 Claims, 5 Drawing Sheets



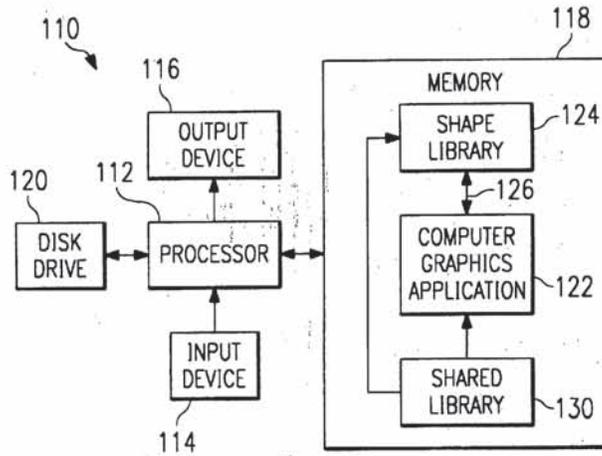


FIG. 1

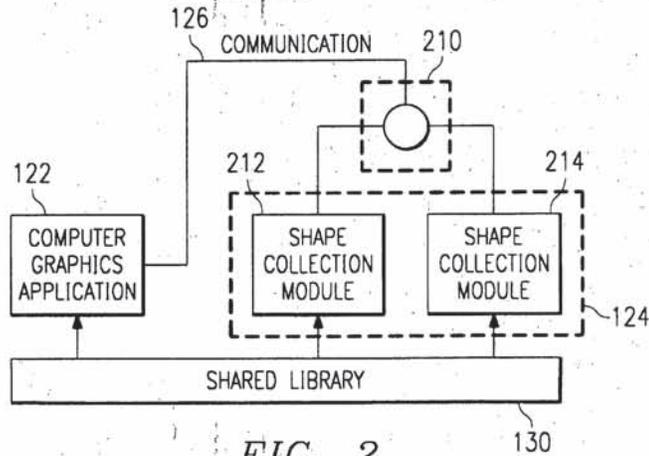


FIG. 2

FIG. 3A

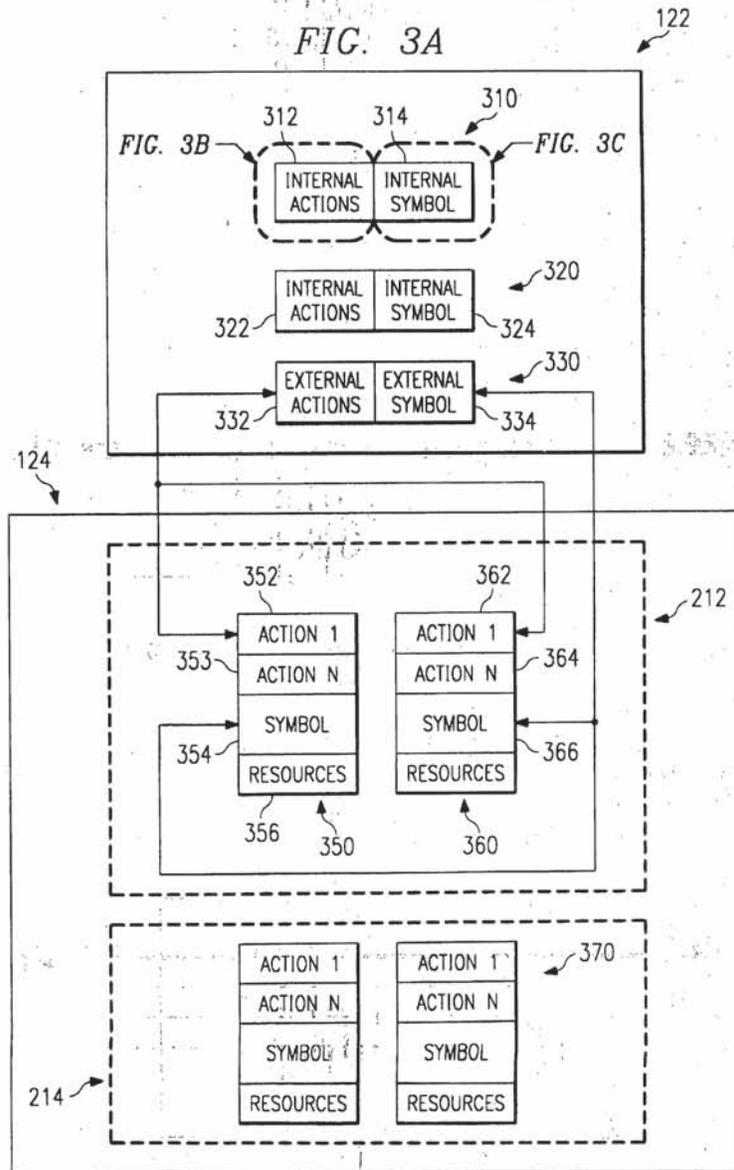


FIG. 3B

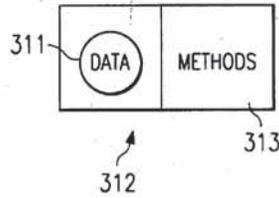


FIG. 3C

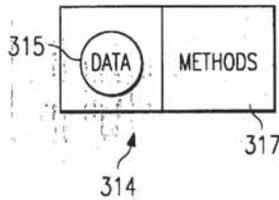
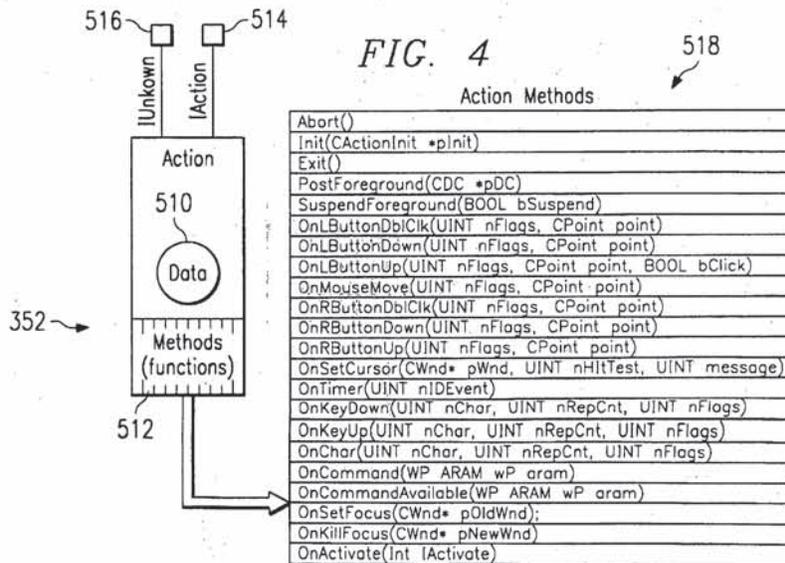
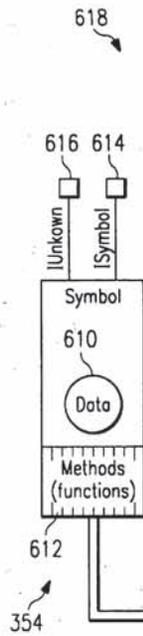


FIG. 4



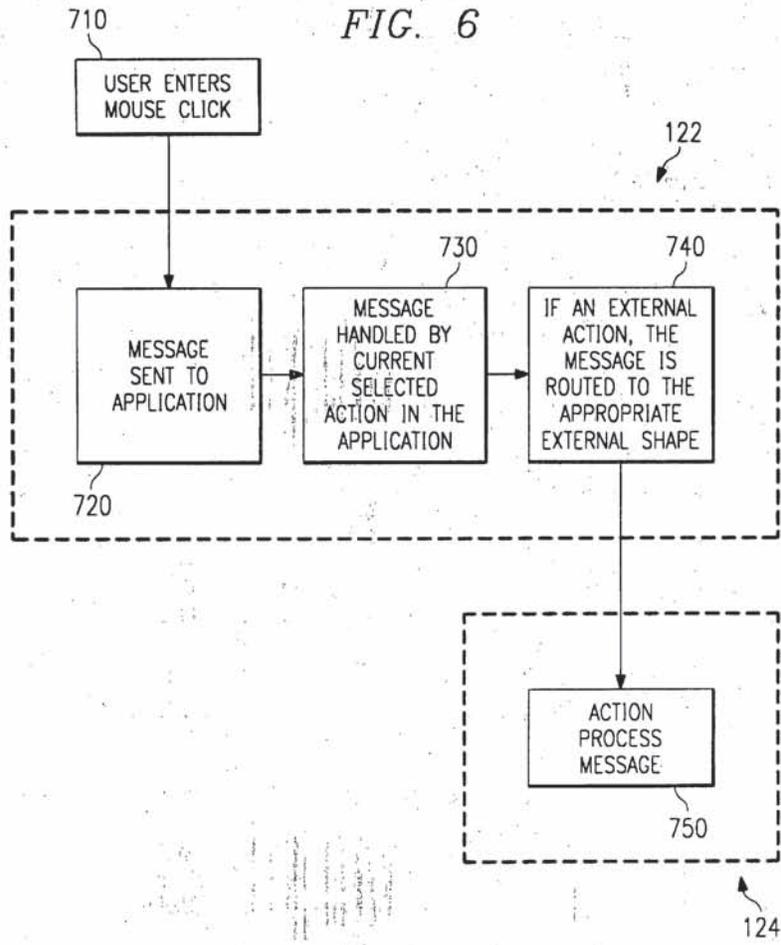


Symbol Methods

Duplicate ()
GetCaps ()
SetCaps(unsigned long ulCaps)
GetLineStyle ()
GetPenWidth ()
GetPenHeight ()
GetPenAngle ()
GetPenStyle ()
GetEndStyle ()
GetEndRadius ()
GetFill ()
GetFillType ()
GetTransparency ()
GetLineColor ()
GetFillColor ()
GetBkColor ()
SetLineColor (COLORREF rgbNew)
SetLineStyle (BYTE)
SetPen (UINT Style,Int Width,Int Height,Int Angle)
SetPenWidth (Int Width)
SetPenHeight (Int Height)
SetPenAngle (Int Angle)
SetPenStyle (Int Style)
SetEndStyles (BYTE EndStyles,BYTE EndRadius)
SetEndStyle (BYTE Style)
SetEndRadius (BYTE Radius)
SetFillColor (COLORREF rgbNew)
SetFill (const CSymFill &NewFill,BOOL bCopy=TRUE,BOOL bDelete=TRUE)
SetFillType (EFillType NewType)
SetBkColor (COLORREF rgbNew)
SetTransparency (BOOL bTrans)
SetBackground (BOOL bOpaque,COLORREF rgbBackground)
CalculateBounds ()
GetVisibleBounds (RECT *pRect)
GetGeometricBounds (RECT *pRect)
GetTextDisplayBounds (LPRECT lpRect)
GetEndPoints (LPPPOINT lpPoints)
GetCurves (LPPPOINT *pPoints,Int *piNumPoints,Int CurveNum=0)
GetNumCurves()
Draw (CDrawInfo &DrawInfo) const=0:
Draw (CDrawInfo &DrawInfo, CXForm2D &xform)
GetTransform()
SetTransform(CXForm2D &xform)
GetPosition(LPPPOINT lpPos)
Translate(const CPoint &ptOffset)
Shear(const CPoint &ptOrigin, double tShearFactor, BOOL bAboutX)
Rotate (const CPoint &Origin, double fAngle)
Scale (const CPoint &Origin, double xScale, double yScale)
MultiplyTransform (const CXForm2D &xform)
Serialize(CArchive &archive)
GetContextMenu(Cmenu *pMenu, BOOL bEditOnly)
GetNumEditActions()
GetEditAction(int iIdx)
GetHint(int iIdx, char *p, Int iLen)
GetNumConnectPts()
GetConnectPts(LPPPOINT lpPoints)
GetConnectPt(int iIndex, LPPPOINT lpPoint, LPPoint lpPointReference=NULL)
GetData(int iType)
SetData(int iType, void * pData)
SwapUndo(Int iUndo, void *pData)
FreeUndo(Int iUndoID, void *pData)
GetShapeName(LPSTR str, Int iMax)

FIG. 5

FIG. 6



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METHOD AND SYSTEM FOR PRODUCING GRAPHICAL IMAGES

TECHNICAL FIELD OF THE INVENTION

This invention relates generally to the field of computer graphics and more particularly to a method and system for producing graphical images.

BACKGROUND OF THE INVENTION

Systems for creating computer graphics are well known. Many computer graphics systems provide tools within a computer program that allow a user to draw and edit a variety of shapes. However, conventional systems only enable a user to draw and edit a limited number of shapes. If additional shapes are desired, the computer program in the system must be modified to include the additional tools needed to draw and edit the desired shape. Adding new tools to the computer program each time a new shape is desired is a lengthy and costly process. Furthermore, once a computer program is released, it becomes difficult to update the program with additional shapes.

In an effort to overcome these disadvantages, one computer graphics system incorporates a limited component plug-in capability utilizing tables. When a particular shape is desired, the system accesses a table of data files. The data files contain information describing a shape. The shape is then created and edited with tools within the computer program. Such a system is limited to editing and creating shapes in ways permitted by the tools within the computer program. Thus, although shapes may be added after release of the computer program, the shapes that may be added are limited to shapes that the internal tools in the computer program know how to create and edit.

SUMMARY OF THE INVENTION

Therefore, a need has arisen for a new method and system that overcomes the disadvantages and deficiencies of the prior art.

The invention includes a method and system for generating graphical images. According to one embodiment of the invention, a method for producing graphical images includes executing a computer program and providing a shape library external to the computer program. The shape library defines a shape having associated capabilities. The method further comprises providing the capabilities associated with the shape to the computer program while the application is executing and generating a graphical image based on the capabilities.

According to another embodiment of the invention a system for producing graphical images includes a computer-readable medium and a computer program encoded on the computer-readable medium. The computer program is operable to access an external shape stored outside the computer program. The external shape has external capabilities. The computer program is further operable to delegate the production of a graphical image of the external shape to the external capabilities.

The invention provides several technical advantages. New shapes may be added easily without rewriting the underlying computer program. Additionally, shapes may be developed by third parties, addressing particular markets. Furthermore, because shapes may be developed external to the computer program, they may be developed outside the application project schedule. Moreover, because shapes may be added easily, upgrades to the computer graphics package may be

provided more frequently at lower cost. In addition, the invention provides for the modular production of additional shapes. Shapes may be grouped in different modules based on similarity of appearance or other characteristics, such as intended use. For example, shapes commonly used in a particular technical field may be grouped in one module. The invention also provides an architecture that allows for the integration of additional shapes with an existing computer program without modifying that existing program.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention and the advantages thereof, reference is now made to the following descriptions taken in connection with the accompanying drawings in which:

FIG. 1 illustrates a computer graphics system;

FIG. 2 illustrates in more detail the software architecture of the computer graphics system;

FIG. 3A illustrates the interaction between a graphics application and shape library;

FIG. 3B illustrates details of an internal action shown in FIG. 3A;

FIG. 3C illustrates details of an internal symbol shown in FIG. 3A;

FIG. 4 shows a schematic of the external action associated with the external shape shown in FIG. 3A;

FIG. 5 shows a schematic of the external symbol associated with the external shape shown in FIG. 3A; and

FIG. 6 is an example flow chart of an example external action.

DETAILED DESCRIPTION OF THE INVENTION

An embodiment of the present invention and its advantages are best understood by referring to FIGS. 1 through 6 of the drawings, like numerals being used for like and corresponding parts of the various drawings.

FIG. 1 shows a schematic diagram of a computer graphics system 110 according to one embodiment of the invention. Computer graphics system 110 comprises computer software running on a general purpose computer. Computer graphics system 110 comprises a processor 112, input device 114, output device 116, memory 118, and disk drive 120. The present invention comprises computer software that may be stored in memory 118 or on disk drive 120 and is executed by processor 112. Disk drive 120 may comprise a variety of types of storage media such as, for example, floppy disk drives, hard disk drives, CD ROM disk drives, or magnetic tape drives. Data may be received from the user of computer graphics system 110 using a keyboard or any other type of input device 114. Data may be output to a user of computer graphics system 110 through output device 116. Output device 116 may comprise a variety of types of output devices such as, for example, a computer display or a printer.

Computer graphics system 110 comprises computer graphics application 122, which is a computer software program for producing graphical images on output device 116. In FIG. 1, computer graphics application 122 is illustrated as being stored in memory 118 for execution by processor 112. Computer graphics application 122 may also be stored in disk drive 120. Computer graphics application 122 receives information from input device 114 and produces graphical images on output device 116. Computer graphics system 110 further comprises an external shape

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library 124. In FIG. 1, shape library 124 is illustrated as being stored in memory 118. Shape library 124 may also be stored in disk drive 120. Shape library 124 contains information used by computer graphics application 122 to produce graphical images on output device 116. Information in shape library 124 is communicated to computer graphics application 122 through communication link 126. The computer graphics system 110 further comprises a shared library 130. In FIG. 1, shared library 130 is illustrated as being stored in memory 118. However, as discussed in greater detail below, shared library 130 may also be stored in disk drive 120. Shared library 130 provides a group of utility functions that may be used by either computer graphics system 110 or shape library 124.

FIG. 2 shows a schematic of memory 118 in block diagram form, further illustrating computer graphics application 122, shape library 124, communication link 126, and shared library 130 shown in FIG. 1. The computer graphics application 122 is a shape manipulator that, as discussed in greater detail below, is operable to access generic capabilities associated with an external shape and delegate the production of a graphical image of the external shape to the capabilities associated with the shape. The production of a graphical image may comprise, for example, generating data that may be used by the computer graphics application 122 to place a graphical image on an output device, generating data and placing a graphical image on an output device, writing a representation of a graphical image to memory, or the generation of other forms of representations of graphical images. Capabilities are action methods, symbol methods, or any other functions that allow the generation of information required to produce a graphical image. Exemplary action methods and symbol methods are discussed below. The ability to place the capabilities of a shape outside computer graphics application 122 provides several technical advantages. For example, shapes not contemplated at the time of creation of computer graphics application 122 may be subsequently added to computer graphics system 120 without modifying computer graphics application 122. Additionally, shapes may be developed by third parties, addressing particular markets. Furthermore, because shapes may be developed external to the computer graphics application 122, they may be developed outside the application project schedule. In addition, the invention provides for the modular production of additional shapes. Shapes may be grouped in different modules based on similarity of appearance or other characteristics, such as intended use. For example, shapes commonly used in a particular technical field may be grouped in one module. The invention also provides an architecture that allows for the integration of additional shapes with an existing computer program without modifying that existing program.

The shape library 124 comprises a plurality of shape collection modules 212 and 214. In a particular embodiment, shape collection modules 212 and 214 comprise a dynamic link library (DLL) that allows executable routines to be stored separately as files with DLL extensions and to be loaded only when needed by the program that calls them. In that embodiment, shape collection DLLs 212 and 214 are self-registering DLLs, which means they comprise two functions to register and unregister themselves through a system registry database for recognition by the computer graphics application 122. However, the present invention contemplates any suitable software architecture using dynamic link libraries, plug-ins, extensions, initialization files, or other modular arrangement that allows shape collection modules 212 and 214 to be stored external to computer graphics application 122.

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Shape collection modules 212 and 214 may be loaded into memory 118 from disk drives 120 when needed by computer graphics application 122. In one embodiment, shape collection modules 212 and 214 are loaded into memory 118 when computer graphics application 122 is executed. Because shape collection modules 212 and 214 are separate from computer graphics application 122, additions or improvements may be made to shape collection modules 212 and 214 without affecting the operation of computer graphics application 122. Although two shape collection modules 212 and 214 are explicitly shown, the computer graphics application 122 supports any number of shape collection modules. Shape collection library 124 may comprise, for example, shape collection modules delivered with computer graphics application 122, shape collection modules subsequently provided, and shape collection modules developed by third parties. Shape collection modules in shape library 124 may be organized in a variety of formats, including a flat structure or a hierarchical arrangement. In a hierarchical arrangement, related shape collection modules may contain sub-modules. The criteria for grouping shape collection modules and sub-modules may comprise appearance, field of application, or other suitable criteria for arranging collections of shapes. For example, shape collection module 212 may contain various forms of arrow shapes, and shape collection module 214 may contain various shapes related to digital electronic circuits.

The shared library 130 may also be a DLL. However, the present invention contemplates any suitable software architecture using dynamic link libraries, plug-ins, extensions, initialization files, or other modular arrangement that allows utility functions to be stored externally to computer graphics application 122 and shape library 124. Shared library 130 may be loaded into memory 118 from disk drives 120 when needed by computer graphics application 122. Shared library 130 provides a group of utility functions that may be used by either computer graphics system 110 or shape library 124. Examples of these utility functions include, for example, drawing small markers on a computer screen, such as on output device 116, or drawing a gradient blend.

The communication link 126 allows communication between computer graphics application 122 and shape library 124. Communication link 126 may comprise, for example, the component object model 210 used by the Object Linking and Embedding (OLE) technology developed by Microsoft. Communication link 126 may also comprise a simple dynamic link library application program interface, pipes, shared memories, or sockets as used in a UNIX operating environment as well as other emerging object-oriented technologies, such as OpenDoc, Nextstep, and CORBA. Communication link 126 allows communication of complex objects between external modules 212 and 214 and computer graphics application 122 without requiring knowledge of the contents of the external modules 212 and 214.

FIG. 3A shows a schematic of computer graphics application 122 and its interaction with shape library 124 in block diagram form, further illustrating details of computer graphics application 122. The computer graphics application 122 comprises a plurality of internal shapes 310 and 320 and one external shape 330. Internal shapes 310 and 320 each comprise information used by computer graphics application 122 to produce a different graphical image on output device 116. These images may comprise, for example, a circle or a rectangle. External shape template 330 comprises pointers to shapes contained within shape library 124, which are used by computer graphics application 122 to produce graphical images that are not supported by internal shapes 310 or 320.

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Each internal shape 310, 320 comprises a set of internal actions 312 and an internal symbol 314. Internal actions 312 comprise a set of internal action methods 313 and a set of internal action data 311, shown in FIG. 3B. Internal action methods 313 are functions that operate on internal action data 311 to generate an internal action 312. An internal action 312 allows computer graphics application 122 to pass user interaction from input device 114, such as mouse and keyboard inputs, to internal symbol methods 317, which in turn generate information used by computer graphics application 122 to create, edit, render, modify, read, or write a graphical object. Examples of internal actions 312 comprise the create action and edit actions. The create action creates a representation of graphical image, for example a rectangle, that the computer graphics application 122 places on an output device. An edit action allows editing a graphical image. Both the create action and the edit action may comprise clicking on an external shape button or a menu item on a graphical user interface.

Internal symbol 314 comprises a set of internal symbol methods 317 and a set of internal symbol data 315, as shown in FIG. 3C. The internal symbol methods 317 are functions that operate on internal symbol data 315 to generate information used by computer graphics application 122 to create, edit, render, modify, read, or write a graphical object on output device 116. For example, internal symbol methods 317 may rotate a representation of a rectangle and the computer graphics application 122 may place a rotated rectangle on a computer screen based on the representation of the rotated rectangle produced by the internal symbol methods 317.

FIG. 3A also illustrates shape library 124. The shape library 124 comprises a plurality of shape collection modules 212 and 214. Each shape collection module 212, 214 comprises a plurality of external shapes, such as external shapes 350, 360, and 370. Shape collection modules 212 and 214 may be organized such that similar shapes are contained within the same shape collection module. External shape 350 comprises a plurality of external actions 352, 353, an external symbol 354, and external resources 356. External resources 356 provide additional information used by computer graphics application 122 to generate graphical images, for example, information related to bit mapped images.

The external shape template 330 does not comprise a predetermined set of actions, and a symbol. Rather, in response to information from device 114, external shape template 330 accesses an external shape contained within shape library 124, such as external shape 350 or 360, to utilize the capabilities of the external shape. The external shape template 330 comprises an external action template 332 and an external symbol template 334. The external action template 332 accesses an external action, such as external actions 352 and 362; and the external symbol template 334 accesses an external symbol, such as external symbols 354 and 366.

In FIG. 3A, external shape template 330 is associated with two shapes 350 and 360 in shape library 124. For shape 350, external action template 332 points to external action 352 and external symbol template 334 points to external symbol 354. For shape 360, external action template 332 points to external action 362 and external symbol template 334 points to external symbol 366. In FIG. 3A, shape template 330 does not point to shape 370. Pointing to shapes 350 and 360 and not pointing to shape 370 by external shape template 330 corresponds to the condition of displaying two external shapes 350 and 360 contained within shape library 124 on output device 116 and not displaying a third external shape 370.

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FIG. 4 shows a schematic of an external action 352 associated with external shape 350. External action 352 comprises external action data 510 and external action methods 512. External action methods 512 are functions that work together to operate on external action data 510 to create an external action. An external action, such as external action 352, allows computer graphics application 122 to pass user interaction from input device 114, such as mouse and keyboard inputs, to external symbol methods 612, which as discussed below are functions that operate to create, edit, render, modify, read, or write a graphical object on output device 116. Examples of external action 352 comprise the create action and edit actions. The create action creates a graphical image, for example a star. An edit action allows editing a graphical image, for example editing a star. A user may invoke the create star external action, for example, by clicking on a star button in a graphical user interface. The star button may provide a menu with a variety of types of stars.

External action methods 512 comprise generic action methods 518. Generic action methods 518 comprise generic functions that are operable in combination to receive user interaction received by the computer graphics application 122 from input device 114 for manipulation of shapes that are not contained within computer graphics application 122 and that comprise a configuration unknown to computer graphics application 122. The generic action methods 518 are defined generically in such a way that they may be applied to any type of shape. Unlike conventional systems, they are not specific to any one shape. The computer graphics application 122 is written to be operable to access the generic access methods 518 and the generic action methods 518 are exhaustive such that any action that may be associated with any shape can be represented by the generic access methods 518. Thus, the generic action methods 518 are generic enough to allow for the subsequent creation of new actions through the use of generic action methods 518. The use of generic action methods 518 and, as discussed below, generic symbol methods 618 allows external shapes to be used by computer graphics application 122.

One of the generic action methods 518 comprises an initialization method, CActionInit method. The CActionInit method allows an external shape to communicate with the computer graphics application 122. After execution of an external action, data or events are communicated by the external action through a callback function provided in the initialization of the action. The callback function is provided in the initialization of an action by a pointer within the CActionInit method. Data transfers that may be communicated by an external shape to the computer graphics application 122 through the use of a callback function provided in the initialization of an action comprise the transfer of an external symbol to the computer graphics application for insertion into a current drawing, querying a disk path to a CD-ROM for retrieving a file from the CD-ROM, passing data for "undoing" an operation, retrieving the area of a current page selection, or other types of data transfers. Events that may be communicated by an external shape to the computer graphics application 122 through the use of a callback function provided in the initialization of an action comprise notifying the application to display or not to display selection markers, notifying the computer graphics application 122 that the external symbol has been changed, invalidating the area of the external symbol for reprinting, or other events that may need to be communicated to the computer graphics application by an external action.

External action 352 is a queryable interface. A queryable interface may receive requests for communication in differ-

ent formats. External action 352 supports an IAction interface format 514 and an IUnknown interface format 516. The IAction interface format 514 is defined by generic action methods 518 and provides a format for communication with computer graphics application 122. The IUnknown interface format 516 is a default interface format used in many applications and allows the computer graphics application 122 to access the IAction interface format 514. External actions associated with other external shapes are substantially similar to external action 352 associated with external shape 350.

FIG. 5 shows a schematic of an external symbol 354 associated with external shape 350. External symbol 354 comprises external symbol data 610 and external symbol methods 612. External symbol methods 612 are functions that operate on external symbol data 610 to create, edit, render, modify, read, or write a graphical object.

External symbol methods 612 comprise generic symbol methods 618. Generic symbol methods 618 are generic functions that allow manipulation of a graphical image of unknown configuration. The generic symbol methods are defined generically in such a way that they may be applied to any type of shape. Unlike conventional systems, they are not specific to any one shape. The generic symbol methods 618 are generic enough to allow for the subsequent creation of new symbols through use of generic symbol methods 618. The generic symbol methods 618 are also exhaustive such that any symbol or manipulation of any symbol can be represented by generic symbol methods 618. Because, computer graphics application 122 is operable to receive and utilize generic symbol methods 618, use of generic symbol methods 618 allows external shapes to be used by computer graphics application 122. Thus, the use of generic external symbol methods, such as generic external symbol methods 618, allows manipulation of graphical images that are not contained within computer graphics application 122 and that comprise a configuration unknown to computer graphics application 122.

External symbol 354 is also a queryable interface. External symbol 354 supports an ISymbol interface format 614 and an IUnknown interface format 616. The ISymbol interface format 614 is defined by symbol methods 618 and provides a format for communication with computer graphics application 122. The IUnknown interface format 616 is a default interface format used in many applications and allows the computer graphics application 122 to access the ISymbol interface format 614.

FIG. 6 is an example flow chart of an example external action, such as external action 352. At step 710 a user may enter a mouse click to provide a message that a desired action take place. For example, the user may click on a button in a graphical user interface to provide a message to computer graphics application 122 to create a star. At step 720 computer graphics application 122 receives the mouse click. Because the message requests an external action, at step 730 the external action template 332 is selected to handle the request. At step 740, external action template 332 routes the message to the appropriate external action associated with the desired star shape, such as action 352, in shape library 124. Steps 720, 730, and 740 are performed by computer graphics application 122 within computer graphics application 122. At step 750, the message for the requested action is received within shape library 124 and the external action is executed by the methods associated with the requested action in order to produce a star. External symbols, such as external symbol 354, are accessed by computer graphics application 122 in substantially the same way as external actions are accessed.

Referring now to FIGS. 1 through 6 of the drawings, the operation of one embodiment of the invention will be described. If a user desires to create an arrow on a computer screen, he makes an appropriate demand through input device 114. Such a demand may comprise, for example, clicking on a button in a graphical user interface with a mouse on a particular area of a computer screen to select a menu item. In response to a request from input device 114, computer graphics application 122 determines whether the desired graphical image is an external shape or an internal shape. If it is an external shape, external shape template 330 accesses external actions and an external symbol from a shape in shape library 124 that is associated with the desired external shape. The execution of the external actions and the external symbol may draw an arrow on output device 116. Because the external actions comprise generic action methods 518 and the external symbol comprises generic symbol methods 618, the computer graphics application 122, which is operable to access and use generic action methods 518 and generic symbol methods 618, is able to produce a graphic image based on an external shape, even if the external shape was produced subsequent to the generation of computer graphics application 122.

Therefore, the invention provides a system for the production of graphical images that allows shapes to be stored outside the computer program using the shapes. New shapes may be added to the system without incurring the disadvantages associated with revising the computer program. Furthermore, because the invention provides a program operable to receive a robust set of generic action methods 518 and a robust set of generic symbol methods 618 from external shapes in shape library 124, the invention allows for the addition of shapes with capabilities not contemplated at the time the computer program was written. Thus, unlike conventional systems, the invention is not limited to utilizing external shapes that have predetermined capabilities.

Although the invention has been particularly shown and described by the foregoing detailed description, it will be understood by those skilled in the art that various other changes in form and detail may be made without departing from the spirit and scope of the invention.

What is claimed is:

1. A computerized system comprising:
 - a storage medium;
 - a processor coupled to the storage medium;
 - a computer program stored in the storage medium, the computer program operable to run on the processor, the computer program further operable to:
 - access an external shape stored outside the computer program, the external shape comprising external capabilities; and
 - delegate the production of a graphical image of the external shape to the external capabilities.
2. The computerized system of claim 1, wherein the computer program is further operable to:
 - access an external shape stored outside the computer program, the external shape comprising an external action and an external symbol; and
 - delegate the production of graphical image of the external shape to the external action and the external symbol.
3. The computerized system of claim 2, wherein the computer program is further operable to:
 - receive user input in a manner defined by the external action; and
 - manipulate the graphical image in response to the user input in a manner defined by the external symbol.

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4. The computerized system of claim 2 wherein the external action comprises a plurality of external methods and external data.

5. The computerized system of claim 4 wherein the plurality of external methods comprises:

- a first method responsive to a mouse button activation;
- a second method responsive to a mouse movement;
- a third method responsive to input from a keyboard; and
- a fourth method responsive to a command received from the computer program based on input received from a user.

6. The computerized system of claim 2 wherein the external symbol comprises a plurality of external methods and external data.

7. The computerized system of claim 6 wherein the plurality of external methods comprises:

- a first external method operable to set the attributes of the external symbol;
- a second external method operable to calculate the bounds of the external symbol;
- a third external method operable to get the attributes of the external symbol;
- a fourth external method operable to render the external symbol; and
- a fifth external method operable to archive the external symbol.

8. A computer program encoded on a computer-readable medium, the computer program operable to:

- access an external shape stored outside the computer program, the external shape comprising external capabilities; and
- delegate the production of a graphical image of the external shape to the external capabilities.

9. The computer program of claim 8, wherein the computer program is further operable to:

- access an external shape stored outside the computer program, the external shape comprising an external action and an external symbol; and
- delegate the production of a graphical image of the external shape to the external action and the external symbol.

10. The computer program of claim 9, wherein the computer program is further operable to:

- receive user input in a manner defined by the external action; and
- manipulate the graphical image in response to the user input in a manner defined by the external symbol.

11. The computer program of claim 9, wherein the external action comprises a plurality of external methods and external data.

12. The computerized system of claim 11 wherein the plurality of external methods comprises:

- a first method responsive to a mouse button activation;
- a second method responsive to a mouse movement; and
- a third method operable to allow the external shape to communicate data and events to the computer program.

13. The computer program of claim 9 wherein the external symbol comprises a plurality of external methods and external data.

14. The computerized system of claim 13 wherein the plurality of external methods comprises:

- a first external method operable to get the attributes of the external symbol;

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a second external method operable to calculate the bounds of the external symbol;

a third external method operable to transform the external symbol;

a fourth external method operable to render the external symbol; and

a fifth external method operable to archive the external symbol.

15. The computer program of claim 8 wherein the external capabilities comprise a plurality of external methods and external data.

16. A method for producing graphical images comprising: executing a computer program;

providing a shape library external to the computer program, the shape library having at least one shape, the at least one shape having capabilities;

providing the capabilities associated with the at least one shape to the computer program while the application is executing; and

generating a graphical image based on the capabilities.

17. The method of claim 16 wherein the step of providing a shape library comprises providing a dynamic link library.

18. The method of claim 16 wherein the step of providing the capabilities associated with the shape comprises providing a plurality of actions comprising a plurality of action methods and providing a symbol comprising a plurality of symbol methods.

19. The method of claim 18 wherein the plurality of action methods comprises:

- a first method responsive to a mouse button activation;
- a second method responsive to a mouse movement;
- a third method responsive to input from a keyboard; and
- a fourth method responsive to a command received from the computer program based on input received from a user.

20. The computerized system of claim 18 wherein the plurality of symbol methods comprises:

- a first external method operable to get the attributes of the symbol;
- a second external method operable to calculate the bounds of the symbol;
- a third external method operable to transform the symbol;
- a fourth external method operable to render the symbol; and
- a fifth external method operable to archive the symbol.

21. A computer graphics program encoded on a computer readable medium for generating a graphical image, comprising:

an external shape module having an external shape that defines an external action and an external symbol, the external action operable to perform a generic action method and the external symbol operable to perform a generic symbol method;

a communication link coupled to the external shape module; and

a computer graphics application coupled to the communication link and operable to communicate with the external shape module using the communication link, the computer graphics application comprising an external action template operable to access the external action and an external symbol template operable to access the external symbol, the computer graphics application further operable to delegate the production of a graphical image to the generic action method and the generic symbol method.

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22. The computer graphics program of claim 21, further comprising an internal shape defining an internal action and an internal symbol.

23. The computer graphics program of claim 21, wherein the external symbol is operable to perform a plurality of generic symbol methods.

24. The computer graphics program of claim 21, wherein the external shape module comprises a dynamic link library.

25. The computer graphics program of claim 21, further comprising a shared library and wherein the computer graphics application is further operable to access the shared library and the external shape library is operable to access the shared library.

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26. The computer graphics program of claim 21, wherein the communication link is operable to allow communication between the external shape library and the computer graphics application without the computer graphics application requiring knowledge of the contents of the external shape library.

27. The computer graphics program of claim 21, wherein the communication link comprises the Object Linking and Embedding technology developed by Microsoft.

28. The computer graphics program of claim 21, wherein the communication link comprises a dynamic link library application program interface.

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PATENT



APPLICATION FOR U.S. PATENT
TRANSMITTAL FORM

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Sir:

Transmitted herewith for filing is the patent application
of:

Inventor(s): Kevin E. McFarland et al.

For: METHOD AND SYSTEM FOR PRODUCING GRAPHICAL IMAGES

Enclosed are: 5 Sheets of Formal Drawings

FEE CALCULATION					FEE
	Number		Number Extra	Rate	Basic Fee
					\$ 770.00
Total Claims:	28	- 20 =	8	X \$22 =	\$ 176.00
Independent Claims	4	- 3 =	1	X \$80 =	\$ 80.00
TOTAL FILING FEE =					\$ 1,026.00

Enclosed is a check in the amount of \$1,026.00. Please charge any additional fees or credit any overpayment to Deposit Account No. 02-0384 of BAKER & BOTTS, L.L.P. A duplicate copy of this sheet is enclosed.

October 4, 1996
Date

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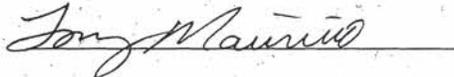
In re Application of: Kevin E. McFarland et al
Date Filed: October 4, 1996
Title: METHOD AND SYSTEM FOR PRODUCING
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PATENT APPLICATION **726091**

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METHOD AND SYSTEM FOR PRODUCING GRAPHICAL IMAGES

TECHNICAL FIELD OF THE INVENTION

This invention relates generally to the field of computer graphics and more particularly to a method and system for producing graphical images.



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PATENT APPLICATION

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BACKGROUND OF THE INVENTION

Systems for creating computer graphics are well known. Many computer graphics systems provide tools within a computer program that allow a user to draw and edit a variety of shapes. However, conventional systems only enable a user to draw and edit a limited number of shapes. If additional shapes are desired, the computer program in the system must be modified to include the additional tools needed to draw and edit the desired shape. Adding new tools to the computer program each time a new shape is desired is a lengthy and costly process.

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Furthermore, once a computer program is released, it becomes difficult to update the program with additional shapes.

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In an effort to overcome these disadvantages, one computer graphics system incorporates a limited component plug-in capability utilizing tables. When a particular shape is desired, the system accesses a table of data files. The data files contain information describing a shape. The shape is then created and edited with tools within the computer program. Such a system is limited to editing and creating shapes in ways permitted by the tools within the computer program. Thus, although shapes may be added after release of the computer program, the shapes that may be added are limited to shapes that the internal tools in the computer program know how to create and edit.

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SUMMARY OF THE INVENTION

Therefore, a need has arisen for a new method and system that overcomes the disadvantages and deficiencies of the prior art.

5 The invention includes a method and system for generating graphical images. According to one embodiment of the invention, a method for producing graphical images includes executing a computer program and providing a shape library external to the computer program. The shape library defines a shape having associated capabilities. The method further comprises providing the capabilities associated with the shape to the computer program while the application is executing and generating a graphical image based on the capabilities.

10 According to another embodiment of the invention a system for producing graphical images includes a computer-readable medium and a computer program encoded on the computer-readable medium. The computer program is operable to access an external shape stored outside the computer program. The external shape has external capabilities. The computer program is further operable to delegate the production of a graphical image of the external shape to the external capabilities.

15 The invention provides several technical advantages. New shapes may be added easily without rewriting the underlying computer program. Additionally, shapes may be developed by third parties, addressing particular markets. Furthermore, because shapes may be developed external to the computer program, they may be developed outside the application project schedule. Moreover, because shapes may be added easily, upgrades to the computer graphics package may be provided more frequently at lower cost. In addition, the invention provides for the modular production of additional shapes. Shapes may be grouped in different modules based on similarity of appearance or other characteristics, such as intended use. For example, shapes commonly used in a particular technical field may be grouped in one module. The invention also provides an architecture that allows for the integration of additional shapes with an existing computer program without modifying that existing program.

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BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention and the advantages thereof, reference is now made to the following descriptions taken in connection with the accompanying drawings in which:

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FIGURE 1 illustrates a computer graphics system;

FIGURE 2 illustrates in more detail the software architecture of the computer graphics system;

FIGURE 3A illustrates the interaction between a graphics application and shape library;

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FIGURE 3B illustrates details of an internal action shown in FIGURE 3A;

FIGURE 3C illustrates details of an internal symbol shown in FIGURE 3A;

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FIGURE 4 shows a schematic of the external action associated with the external shape shown in FIGURE 3A;

FIGURE 5 shows a schematic of the external symbol associated with the external shape shown in FIGURE 3A; and

FIGURE 6 is an example flow chart of an example external action.

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DETAILED DESCRIPTION OF THE INVENTION

An embodiment of the present invention and its advantages are best understood by referring to FIGURES 1 through 6 of the drawings, like numerals being used for like and corresponding parts of the various drawings.

5 FIGURE 1 shows a schematic diagram of a computer graphics system 110 according to one embodiment of the invention. Computer graphics system 110 comprises computer software running on a general purpose computer. Computer graphics system 110 comprises a processor 112, input device 114, output device 116, memory 118, and disk drive 120. The present invention comprises computer software
10 that may be stored in memory 118 or on disk drive 120 and is executed by processor 112. Disk drive 120 may comprise a variety of types of storage media such as, for example, floppy disk drives, hard disk drives, CD ROM disk drives, or magnetic tape drives. Data may be received from the user of computer graphics system 110 using a keyboard or any other type of input device 114. Data may be output to a user of
15 computer graphics system 110 through output device 116. Output device 116 may comprise a variety of types of output devices such as, for example, a computer display or a printer.

 Computer graphics system 110 comprises computer graphics application 122, which is a computer software program for producing graphical images on output
20 device 116. In FIGURE 1, computer graphics application 122 is illustrated as being stored in memory 118 for execution by processor 112. Computer graphics application 122 may also be stored in disk drive 120. Computer graphics application 122 receives information from input device 114 and produces graphical images on output device 116. Computer graphics system 110 further comprises an external shape library 124.
25 In FIGURE 1, shape library 124 is illustrated as being stored in memory 118. Shape library 124 may also be stored in disk drive 120. Shape library 124 contains information used by computer graphics application 122 to produce graphical images on output device 116. Information in shape library 124 is communicated to computer graphics application 122 through communication link 126. The computer graphics
30 system 110 further comprises a shared library 130. In FIGURE 1, shared library 130

is illustrated as being stored in memory 118. However, as discussed in greater detail below, shared library 130 may also be stored in disk drive 120. Shared library 130 provides a group of utility functions that may be used by either computer graphics system 110 or shape library 124.

5 FIGURE 2 shows a schematic of memory 118 in block diagram form, further illustrating computer graphics application 122, shape library 124, communication link 126, and shared library 130 shown in FIGURE 1. The computer graphics application 122 is a shape manipulator that, as discussed in greater detail below, is operable to access generic capabilities associated with an external shape and delegate the
10 production of a graphical image of the external shape to the capabilities associated with the shape. The production of a graphical image may comprise, for example, generating data that may be used by the computer graphics application 122 to place a graphical image on an output device, generating data and placing a graphical image on an output device, writing a representation of a graphical image to memory, or the
15 generation of other forms of representations of graphical images. Capabilities are action methods, symbol methods, or any other functions that allow the generation of information required to produce a graphical image. Exemplary action methods and symbol methods are discussed below. The ability to place the capabilities of a shape outside computer graphics application 122 provides several technical advantages. For
20 example, shapes not contemplated at the time of creation of computer graphics application 122 may be subsequently added to computer graphics system 120 without modifying computer graphics application 122. Additionally, shapes may be developed by third parties, addressing particular markets. Furthermore, because shapes may be developed external to the computer graphics application 122, they may be developed
25 outside the application project schedule. In addition, the invention provides for the modular production of additional shapes. Shapes may be grouped in different modules based on similarity of appearance or other characteristics, such as intended use. For example, shapes commonly used in a particular technical field may be grouped in one module. The invention also provides an architecture that allows for the integration of



additional shapes with an existing computer program without modifying that existing program.

The shape library 124 comprises a plurality of shape collection modules 212 and 214. In a particular embodiment, shape collection modules 212 and 214 comprise a dynamic link library (DLL) that allows executable routines to be stored separately as files with DLL extensions and to be loaded only when needed by the program that calls them. In that embodiment, shape collection DLLs 212 and 214 are self-registering DLLs, which means they comprise two functions to register and unregister themselves through a system registry database for recognition by the computer graphics application 122. However, the present invention contemplates any suitable software architecture using dynamic link libraries, plug-ins, extensions, initialization files, or other modular arrangement that allows shape collection modules 212 and 214 to be stored external to computer graphics application 122.

Shape collection modules 212 and 214 may be loaded into memory 118 from disk drives 120 when needed by computer graphics application 122. In one embodiment, shape collection modules 212 and 214 are loaded into memory 118 when computer graphics application 122 is executed. Because shape collection modules 212 and 214 are separate from computer graphics application 122, additions or improvements may be made to shape collection modules 212 and 214 without affecting the operation of computer graphics application 122. Although two shape collection modules 212 and 214 are explicitly shown, the computer graphics application 122 supports any number of shape collection modules. Shape collection library 124 may comprise, for example, shape collection modules delivered with computer graphics application 122, shape collection modules subsequently provided, and shape collection modules developed by third parties. Shape collection modules in shape library 124 may be organized in a variety of formats, including a flat structure or a hierarchical arrangement. In a hierarchical arrangement, related shape collection modules may contain sub-modules. The criteria for grouping shape collection modules and sub-modules may comprise appearance, field of application, or other suitable criteria for arranging collections of shapes. For example, shape collection module 212 may

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contain various forms of arrow shapes, and shape collection module 214 may contain various shapes related to digital electronic circuits.

The shared library 130 may also be a DLL. However, the present invention contemplates any suitable software architecture using dynamic link libraries, plug-ins, extensions, initialization files, or other modular arrangement that allows utility functions to be stored externally to computer graphics application 122 and shape library 124. Shared library 130 may be loaded into memory 118 from disk drives 120 when needed by computer graphics application 122. Shared library 130 provides a group of utility functions that may be used by either computer graphics system 110 or shape library 124. Examples of these utility functions include, for example, drawing small markers on a computer screen, such as on output device 116, or drawing a gradient blend.

The communication link 126 allows communication between computer graphics application 122 and shape library 124. Communication link 126 may comprise, for example, the component object model 210 used by the Object Linking and Embedding (OLE) technology developed by Microsoft. Communication link 126 may also comprise a simple dynamic link library application program interface, pipes, shared memories, or sockets as used in a UNIX operating environment as well as other emerging object-oriented technologies, such as OpenDoc, Nextstep, and CORBA. Communication link 126 allows communication of complex objects between external modules 212 and 214 and computer graphics application 122 without requiring knowledge of the contents of the external modules 212 and 214.

FIGURE 3A shows a schematic of computer graphics application 122 and its interaction with shape library 124 in block diagram form, further illustrating details of computer graphics application 122. The computer graphics application 122 comprises a plurality of internal shapes 310 and 320 and one external shape 330. Internal shapes 310 and 320 each comprise information used by computer graphics application 122 to produce a different graphical image on output device 116. These images may comprise, for example, a circle or a rectangle. External shape template 330 comprises pointers to shapes contained within shape library 124, which are used by computer

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graphics application 122 to produce graphical images that are not supported by internal shapes 310 or 320.

Each internal shape 310, 320 comprises a set of internal actions 312 and an internal symbol 314. Internal actions 312 comprise a set of internal action methods 313 and a set of internal action data 311, shown in FIGURE 3B. Internal action methods 313 are functions that operate on internal action data 311 to generate an internal action 312. An internal action 312 allows computer graphics application 122 to pass user interaction from input device 114, such as mouse and keyboard inputs, to internal symbol methods 317, which in turn generate information used by computer graphics application 122 to create, edit, render, modify, read, or write a graphical object. Examples of internal actions 312 comprise the create action and edit actions. The create action creates a representation of graphical image, for example a rectangle, that the computer graphics application 122 places on an output device. An edit action allows editing a graphical image. Both the create action and the edit action may comprise clicking on an external shape button or a menu item on a graphical user interface.

Internal symbol 314 comprises a set of internal symbol methods 317 and a set of internal symbol data 315, as shown in FIGURE 3C. The internal symbol methods 317 are functions that operate on internal symbol data 315 to generate information used by computer graphics application 122 to create, edit, render, modify, read, or write a graphical object on output device 116. For example, internal symbol methods 317 may rotate a representation of a rectangle and the computer graphics application 122 may place a rotated rectangle on a computer screen based on the representation of the rotated rectangle produced by the internal symbol methods 317.

FIGURE 3A also illustrates shape library 124. The shape library 124 comprises a plurality of shape collection modules 212 and 214. Each shape collection module 212, 214 comprises a plurality of external shapes, such as external shapes 350, 360, and 370. Shape collection modules 212 and 214 may be organized such that similar shapes are contained within the same shape collection module. External shape 350 comprises a plurality of external actions 352, 353, an external symbol 354, and



external resources 356. External resources 356 provide additional information used by computer graphics application 122 to generate graphical images, for example, information related to bit mapped images.

5 The external shape template 330 does not comprise a predetermined set of actions and a symbol. Rather, in response to information from device 114, external shape template 330 accesses an external shape contained within shape library 124, such as external shape 350 or 360, to utilize the capabilities of the external shape. The external shape template 330 comprises an external action template 332 and an external symbol template 334. The external action template 332 accesses an external action, 10 such as external actions 352 and 362, and the external symbol template 334 accesses an external symbol, such as external symbols 354 and 366.

15 In FIGURE 3A, external shape template 330 is associated with two shapes 350 and 360 in shape library 124. For shape 350, external action template 332 points to external action 352 and external symbol template 334 points to external symbol 354. For shape 360, external action template 332 points to external action 362 and external symbol template 334 points to external symbol 366. In FIGURE 3A, shape template 330 does not point to shape 370. Pointing to shapes 350 and 360 and not pointing to shape 370 by external shape template 330 corresponds to the condition of displaying two external shapes 350 and 360 contained within shape library 124 on output device 20 116 and not displaying a third external shape 370.

25 FIGURE 4 shows a schematic of an external action 352 associated with external shape 350. External action 352 comprises external action data 510 and external action methods 512. External action methods 512 are functions that work together to operate on external action data 510 to create an external action. An external action, such as external action 352, allows computer graphics application 122 to pass user interaction from input device 114, such as mouse and keyboard inputs, to external symbol methods 612, which as discussed below are functions that operate to create, edit, render, modify, read, or write a graphical object on output device 116. Examples of external action 364 comprise the create action and edit actions. The 30 create action creates a graphical image, for example a star. An edit action allows

editing a graphical image, for example editing a star. A user may invoke the create star external action, for example, by clicking on a star button in a graphical user interface. The star button may provide a menu with a variety of types of stars.

5 External action methods 512 comprise generic action methods 518. Generic action methods 518 comprise generic functions that are operable in combination to receive user interaction received by the computer graphics application 122 from input device 114 for manipulation of shapes that are not contained within computer graphics application 122 and that comprise a configuration unknown to computer graphics application 122. The generic action methods 518 are defined generically in such a way that they may be applied to any type of shape. Unlike conventional systems, they are not specific to any one shape. The computer graphics application 122 is written to be operable to access the generic access methods 518 and the generic action methods 518 are exhaustive such that any action that may be associated with any shape can be represented by the generic access methods 518. Thus, the generic action methods 518 are generic enough to allow for the subsequent creation of new actions through the use of generic action methods 518. The use of generic action methods 518 and, as discussed below, generic symbol methods 618 allows external shapes to be used by computer graphics application 122.

10 One of the generic action methods 518 comprises an initialization method, CActionInit method. The CActionInit method allows an external shape to communicate with the computer graphics application 122. After execution of an external action, data or events are communicated by the external action through a callback function provided in the initialization of the action. The callback function is provided in the initialization of an action by a pointer within the CActionInit method. Data transfers that may be communicated by an external shape to the computer graphics application 122 through the use of a callback function provided in the initialization of an action comprise the transfer of an external symbol to the computer graphics application for insertion into a current drawing, querying a disk path to a CD-ROM for retrieving a file from the CD-ROM, passing data for "undoing" an operation, retrieving the area of a current page selection, or other types of data transfers. Events



that may be communicated by an external shape to the computer graphics application 122 through the use of a callback function provided in the initialization of an action comprise notifying the application to display or not to display selection markers, notifying the computer graphics application 122 that the external symbol has been changed, invalidating the area of the external symbol for reprinting, or other events that may need to be communicated to the computer graphics application by an external action.

External action 352 is a queryable interface. A queryable interface may receive requests for communication in different formats. External action 352 supports an IAction interface format 514 and an IUknown interface format 516. The IAction interface format 514 is defined by generic action methods 518 and provides a format for communication with computer graphics application 122. The IUknown interface format 516 is a default interface format used in many applications and allows the computer graphics application 122 to access the IAction interface format 514. External actions associated with other external shapes are substantially similar to external action 352 associated with external shape 350.

FIGURE 5 shows a schematic of an external symbol 354 associated with external shape 350. External symbol 354 comprises external symbol data 610 and external symbol methods 612. External symbol methods 612 are functions that operate on external symbol data 610 to create, edit, render, modify, read, or write a graphical object.

External symbol methods 612 comprise generic symbol methods 618. Generic symbol methods 618 are generic functions that allow manipulation of a graphical image of unknown configuration. The generic symbol methods are defined generically in such a way that they may be applied to any type of shape. Unlike conventional systems, they are not specific to any one shape. The generic symbol methods 618 are generic enough to allow for the subsequent creation of new symbols through use of generic symbol methods 618. The generic symbol methods 618 are also exhaustive such that any symbol or manipulation of any symbol can be represented by generic symbol methods 618. Because, computer graphics application 122 is operable to

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receive and utilize generic symbol methods 618, use of generic symbol methods 618 allows external shapes to be used by computer graphics application 122. Thus, the use of generic external symbol methods, such as generic external symbol methods 618, allows manipulation of graphical images that are not contained within computer graphics application 122 and that comprise a configuration unknown to computer graphics application 122.

External symbol 354 is also a queryable interface. External symbol 354 supports an ISymbol interface format 614 and an IUnknown interface format 616. The ISymbol interface format 614 is defined by symbol methods 618 and provides a format for communication with computer graphics application 122. The IUnknown interface format 616 is a default interface format used in many applications and allows the computer graphics application 122 to access the ISymbol interface format 614.

FIGURE 6 is an example flow chart of an example external action, such as external action 352. At step 710 a user may enter a mouse click to provide a message that a desired action take place. For example, the user may click on a button in a graphical user interface to provide a message to computer graphics application 122 to create a star. At step 720 computer graphics application 122 receives the mouse click. Because the message requests an external action, at step 730 the external action template 332 is selected to handle the request. At step 740, external action template 332 routes the message to the appropriate external action associated with the desired star shape, such as action 352, in shape library 124. Steps 720, 730, and 740 are performed by computer graphics application 122 within computer graphics application 122. At step 750, the message for the requested action is received within shape library 124 and the external action is executed by the methods associated with the requested action in order to produce a star. External symbols, such as external symbol 354, are accessed by computer graphics application 122 in substantially the same way as external actions are accessed.

Referring now to FIGURES 1 through 6 of the drawings, the operation of one embodiment of the invention will be described. If a user desires to create an arrow on a computer screen, he makes an appropriate demand through input device 114. Such a

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demand may comprise, for example, clicking on a button in a graphical user interface with a mouse on a particular area of a computer screen to select a menu item. In response to a request from input device 114, computer graphics application 122 determines whether the desired graphical image is an external shape or an internal shape. If it is an external shape, external shape template 330 accesses external actions and an external symbol from a shape in shape library 124 that is associated with the desired external shape. The execution of the external actions and the external symbol may draw an arrow on output device 116. Because the external actions comprise generic action methods 518 and the external symbol comprises generic symbol methods 618, the computer graphics application 122, which is operable to access and use generic action methods 518 and generic symbol methods 618, is able to produce a graphic image based on an external shape, even if the external shape was produced subsequent to the generation of computer graphics application 122.

Therefore, the invention provides a system for the production of graphical images that allows shapes to be stored outside the computer program using the shapes. New shapes may be added to the system without incurring the disadvantages associated with revising the computer program. Furthermore, because the invention provides a program operable to receive a robust set of generic action methods 518 and a robust set of generic symbol methods 618 from external shapes in shape library 124, the invention allows for the addition of shapes with capabilities not contemplated at the time the computer program was written. Thus, unlike conventional systems, the invention is not limited to utilizing external shapes that have predetermined capabilities.

Although the invention has been particularly shown and described by the foregoing detailed description, it will be understood by those skilled in the art that various other changes in form and detail may be made without departing from the spirit and scope of the invention.

WHAT IS CLAIMED IS:

1. A computerized system comprising:
a storage medium;
a processor coupled to the storage medium;
a computer program stored in the storage medium, the computer program operable to run on the processor, the computer program further operable to:
access an external shape stored outside the computer program, the external shape comprising external capabilities; and
delegate the production of a graphical image of the external shape to the external capabilities.
2. The computerized system of Claim 1, wherein the computer program is further operable to:
access an external shape stored outside the computer program, the external shape comprising an external action and an external symbol; and
delegate the production of graphical image of the external shape to the external action and the external symbol.
3. The computerized system of Claim 2, wherein the computer program is further operable to:
receive user input in a manner defined by the external action; and
manipulate the graphical image in response to the user input in a manner defined by the external symbol.
4. The computerized system of Claim 2 wherein the external action comprises a plurality of external methods and external data.
5. The computerized system of Claim 2 wherein the external symbol comprises a plurality of external methods and external data.

5. ~~6.~~ The computerized system of Claim 4 wherein the plurality of external methods comprises:
a first method responsive to a mouse button activation;
a second method responsive to a mouse movement;
5 a third method responsive to input from a keyboard; and
a fourth method responsive to a command received from the computer program based on input received from a user.

7. The computerized system of Claim ⁶~~5~~ wherein the plurality of external methods comprises:
10 a first external method operable to set the attributes of the external symbol;
a second external method operable to calculate the bounds of the external symbol;
a third external method operable to get the attributes of the external symbol;
15 a fourth external method operable to render the external symbol; and
a fifth external method operable to archive the external symbol.

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8. A computer program encoded on a computer-readable medium, the computer program operable to:

access an external shape stored outside the computer program, the external shape comprising external capabilities; and

5 delegate the production of a graphical image of the external shape to the external capabilities.

9. The computer program of Claim 8, wherein the computer program is further operable to:

10 access an external shape stored outside the computer program, the external shape comprising an external action and an external symbol; and

delegate the production of a graphical image of the external shape to the external action and the external symbol.

15 10. The computer program of Claim 9, wherein the computer program is further operable to:

receive user input in a manner defined by the external action; and

manipulate the graphical image in response to the user input in a manner defined by the external symbol.

20 ~~11.~~ The computer program of Claim 8 wherein the external capabilities comprise a plurality of external methods and external data.

25 ~~12.~~ The computer program of Claim 9, wherein the external action comprises a plurality of external methods and external data.

13. The computer program of Claim 9 wherein the external symbol comprises a plurality of external methods and external data.

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12. 18
~~14.~~ The computerized system of Claim ~~12~~¹¹ wherein the plurality of external methods
comprises:

- a first method responsive to a mouse button activation;
- a second method responsive to a mouse button activation; and
- a third method operable to allow the external shape to communicate data and
events to the computer program.

14.
~~15.~~ The computerized system of Claim 13 wherein the plurality of external methods
comprises:

- a first external method operable get the attributes of the external symbol;
- a second external method operable to calculate the bounds of the external
symbol;
- a third external method operable to transform the external symbol;
- a fourth external method operable to render the external symbol; and
- a fifth external method operable to archive the external symbol.

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- 5 16. A method for producing graphical images comprising:
executing a computer program;
providing a shape library external to the computer program, the shape library
having at least one shape, the at least one shape having capabilities;
providing the capabilities associated with the at least one shape to the computer
program while the application is executing; and
generating a graphical image based on the capabilities.
- 10 17. The method of Claim 16 wherein the step of providing a shape library
comprises providing a dynamic link library.
- 15 18. The method of Claim 16 wherein the step of providing the capabilities
associated with the shape comprises providing a plurality of actions comprising a
plurality of action methods and providing a symbol comprising a plurality of symbol
methods.
- 20 19. The method of Claim 18 wherein the plurality of action methods comprises:
a first method responsive to a mouse button activation;
a second method responsive to a mouse movement;
a third method responsive to input from a keyboard; and
a fourth method responsive to a command received from the computer
program based on input received from a user.
- 25 20. The computerized system of Claim 18 wherein the plurality of symbol methods
comprises:
a first external method operable get the attributes of the symbol;
a second external method operable to calculate the bounds of the symbol;
30 a third external method operable to transform the symbol;

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PATENT APPLICATION

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a fourth external method operable to render the symbol; and
a fifth external method operable to archive the symbol.

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21. A computer graphics program encoded on a computer readable medium for generating a graphical image, comprising:

5 an external shape module having an external shape that defines an external action and an external symbol, the external action operable to perform a generic action method and the external symbol operable to perform a generic symbol method;
a communication link coupled to the external shape module; and
a computer graphics application coupled to the communication link and
10 operable to communicate with the external shape module using the communication link, the computer graphics application comprising an external action template operable to access the external action and an external symbol template operable to access the external symbol, the computer graphics application further operable to delegate the production of a graphical image to the generic action method and the generic symbol method.

15 22. The computer graphics program of Claim 21, further comprising an internal shape defining an internal action and an internal symbol.

20 23. The computer graphics program of Claim 21, wherein the external symbol is operable to perform a plurality of generic symbol methods.

24. The computer graphics program of Claim 21, wherein the external shape module comprises a dynamic link library.

25 25. The computer graphics program of Claim 21, further comprising a shared library and wherein the computer graphics application is further operable to access the shared library and the external shape library is operable to access the shared library.

30 26. The computer graphics program of Claim 21, wherein the communication link is operable to allow communication between the external shape library and the

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computer graphics application without the computer graphics application requiring knowledge of the contents of the external shape library.

5 27. The computer graphics program of Claim 21, wherein the communication link comprises the Object Linking and Embedding technology developed by Microsoft.

28. The computer graphics program of Claim 21, wherein the communication link comprises a dynamic link library application program interface.

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5

METHOD AND SYSTEM FOR PRODUCING GRAPHICAL IMAGES

Sub A

ABSTRACT OF THE DISCLOSURE

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The invention discloses a method and system for producing graphical images. The system includes a computer-readable medium and a computer program encoded on the computer-readable medium. The computer program is operable to access an external shape stored outside the computer program. The external shape comprises external capabilities. The computer program is further operable to delegate the production of a graphical image of the external shape to the external capabilities.

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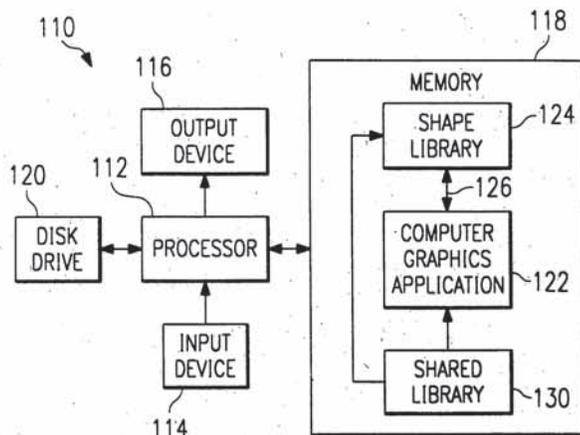


FIG. 1

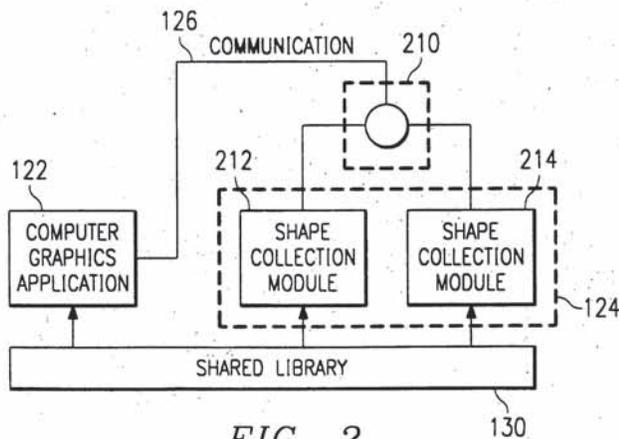


FIG. 2

FIG. 3A

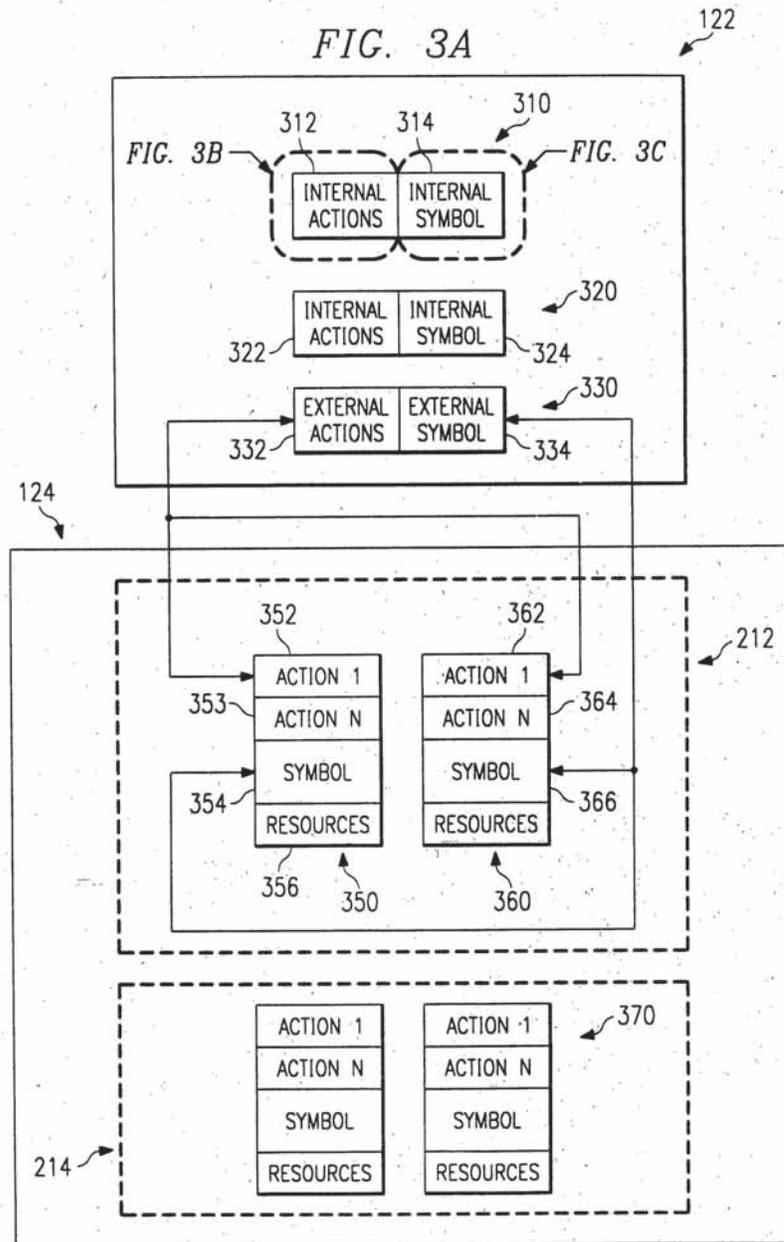


FIG. 3B

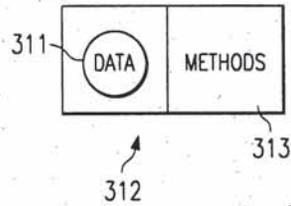
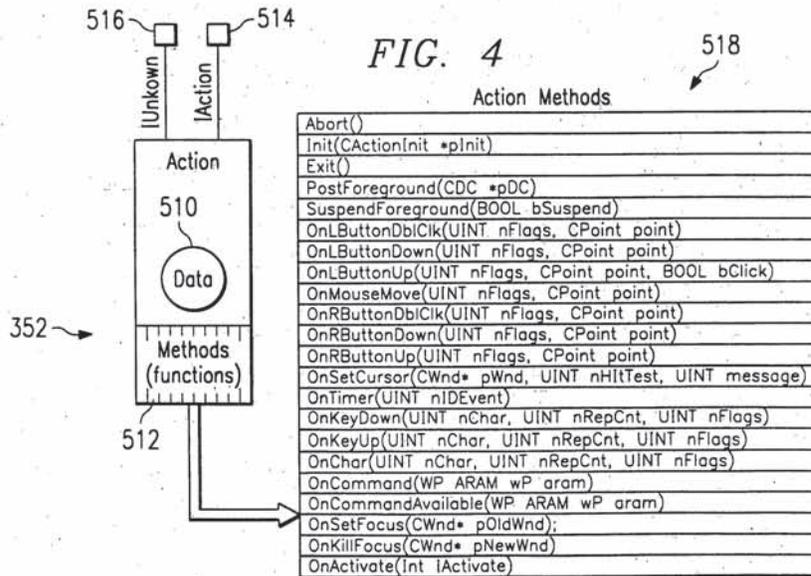
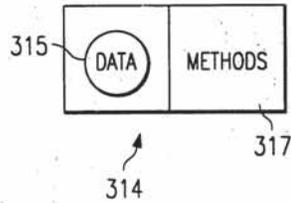


FIG. 3C



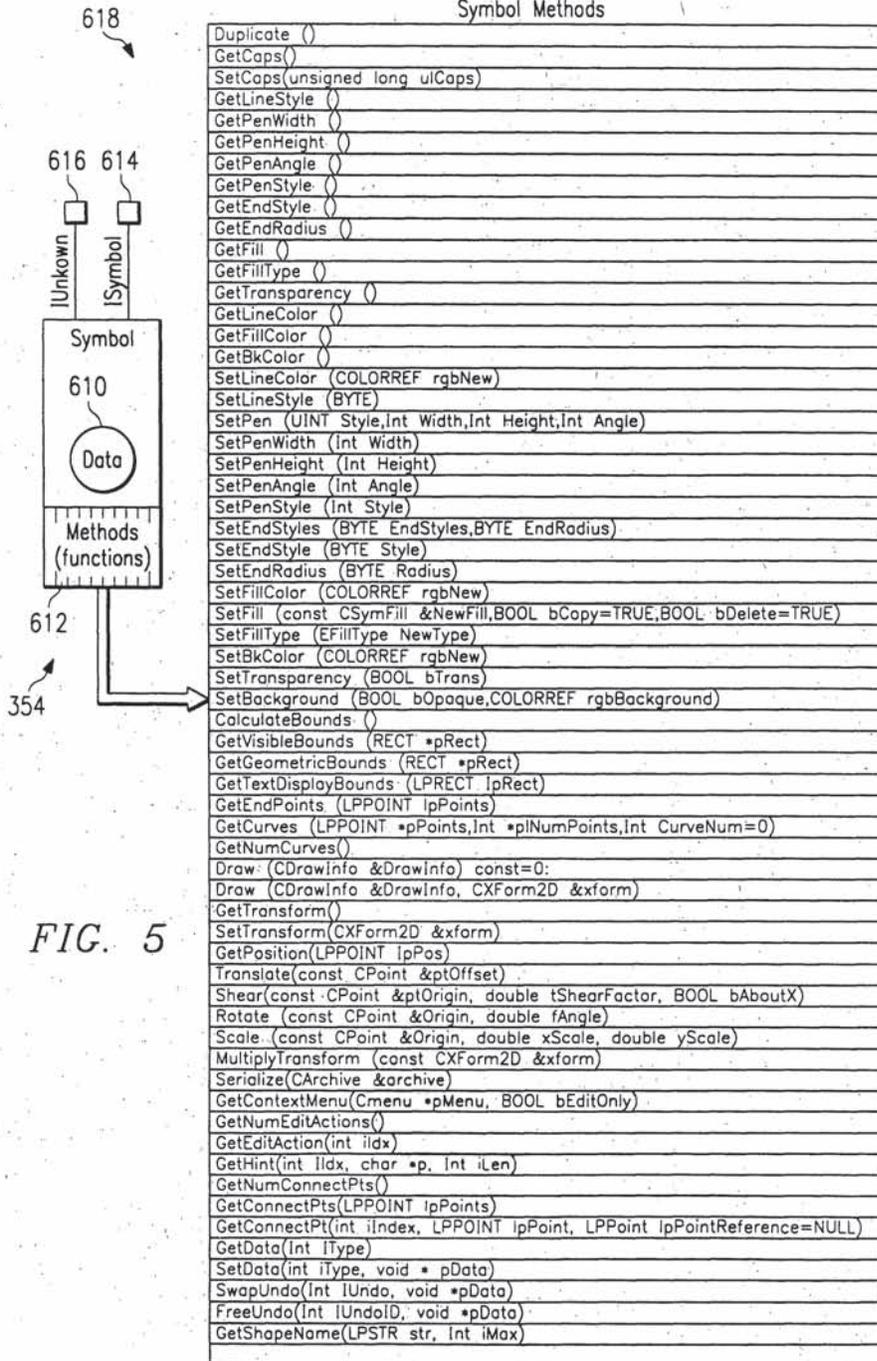
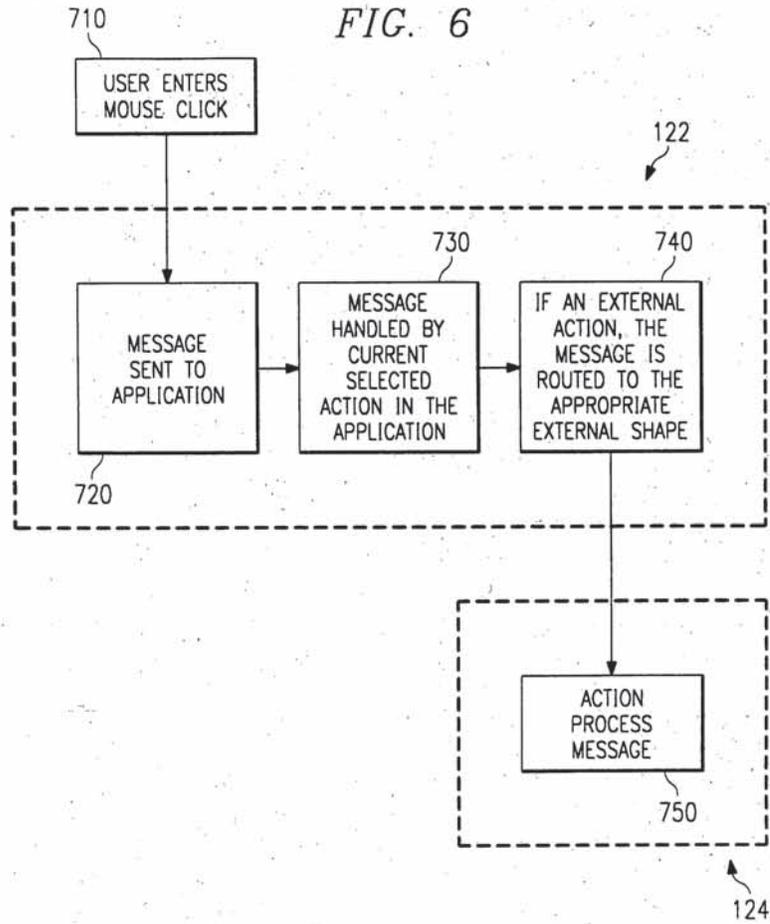


FIG. 5

FIG. 6



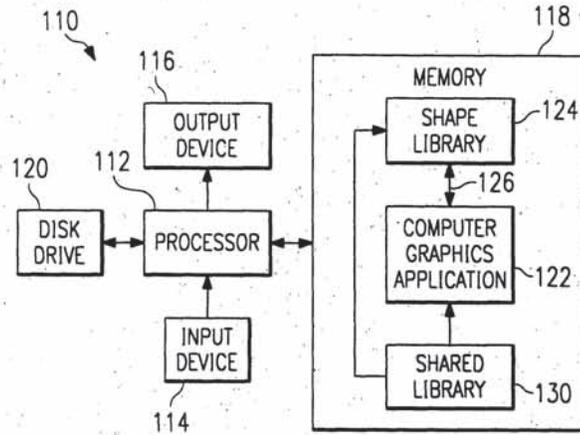


FIG. 1

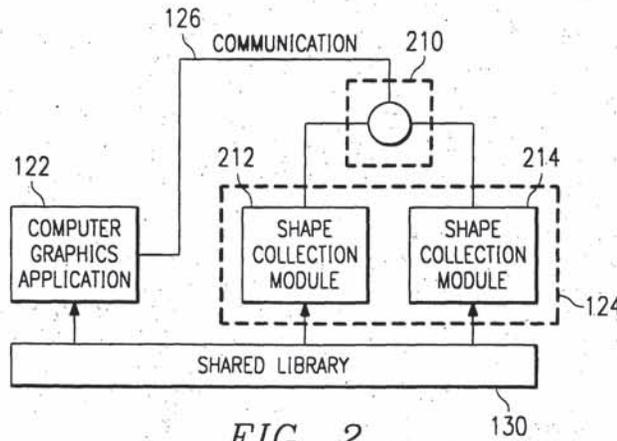


FIG. 2

FIG. 3A

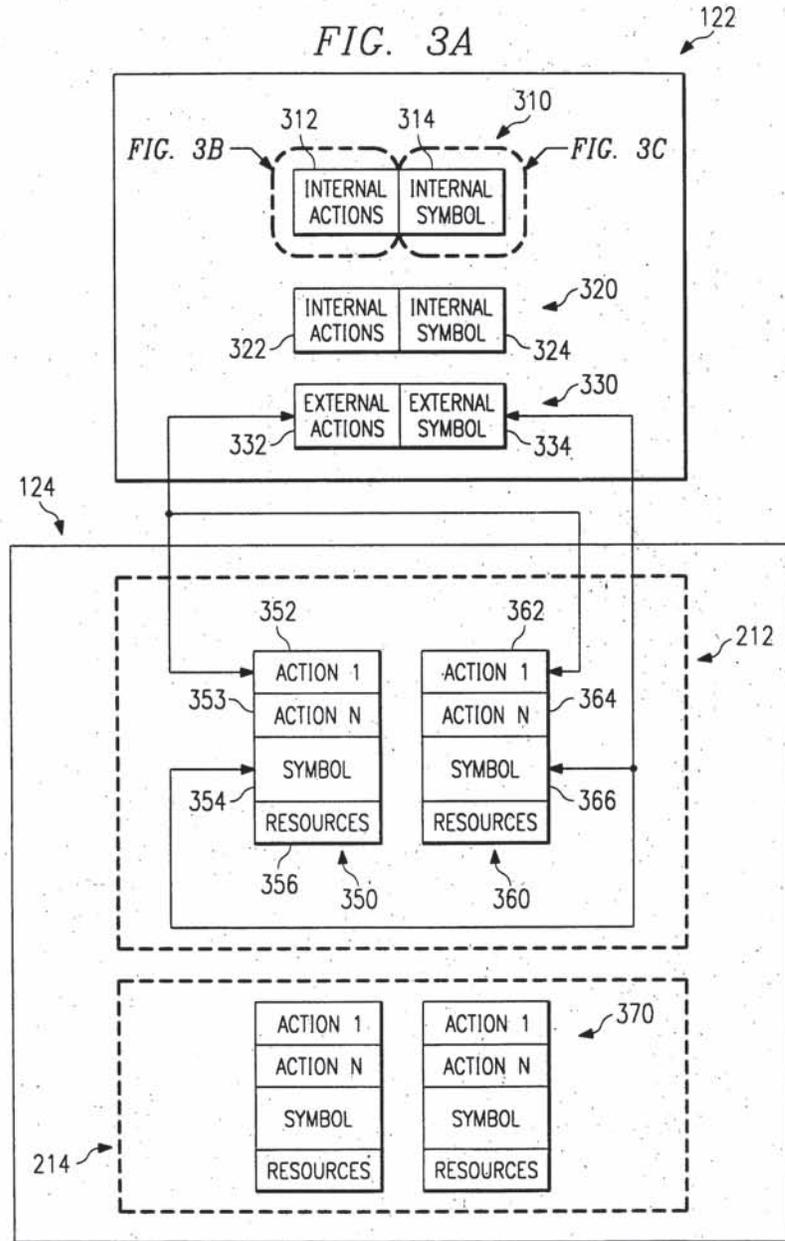


FIG. 3B

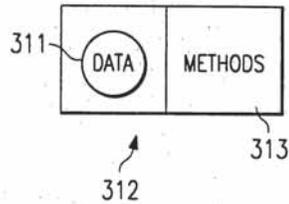


FIG. 3C

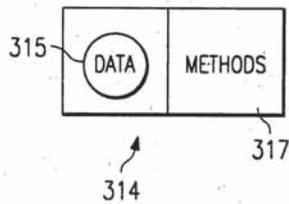
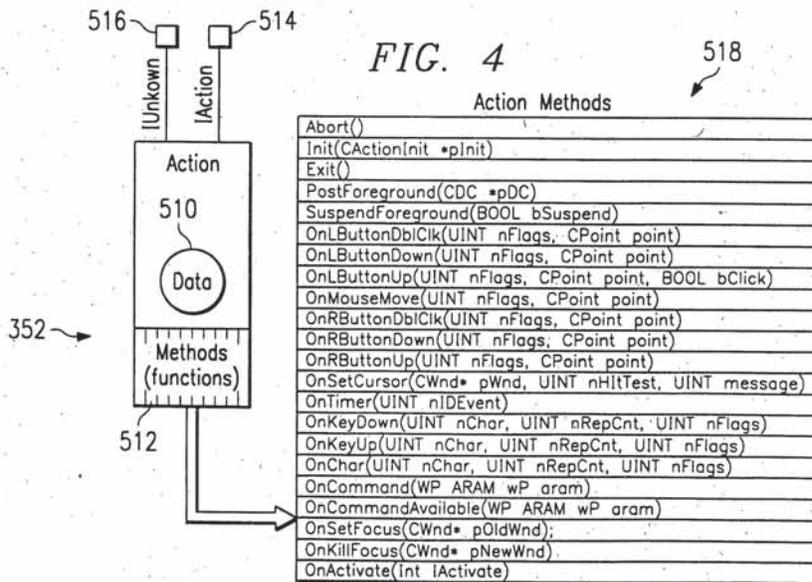


FIG. 4



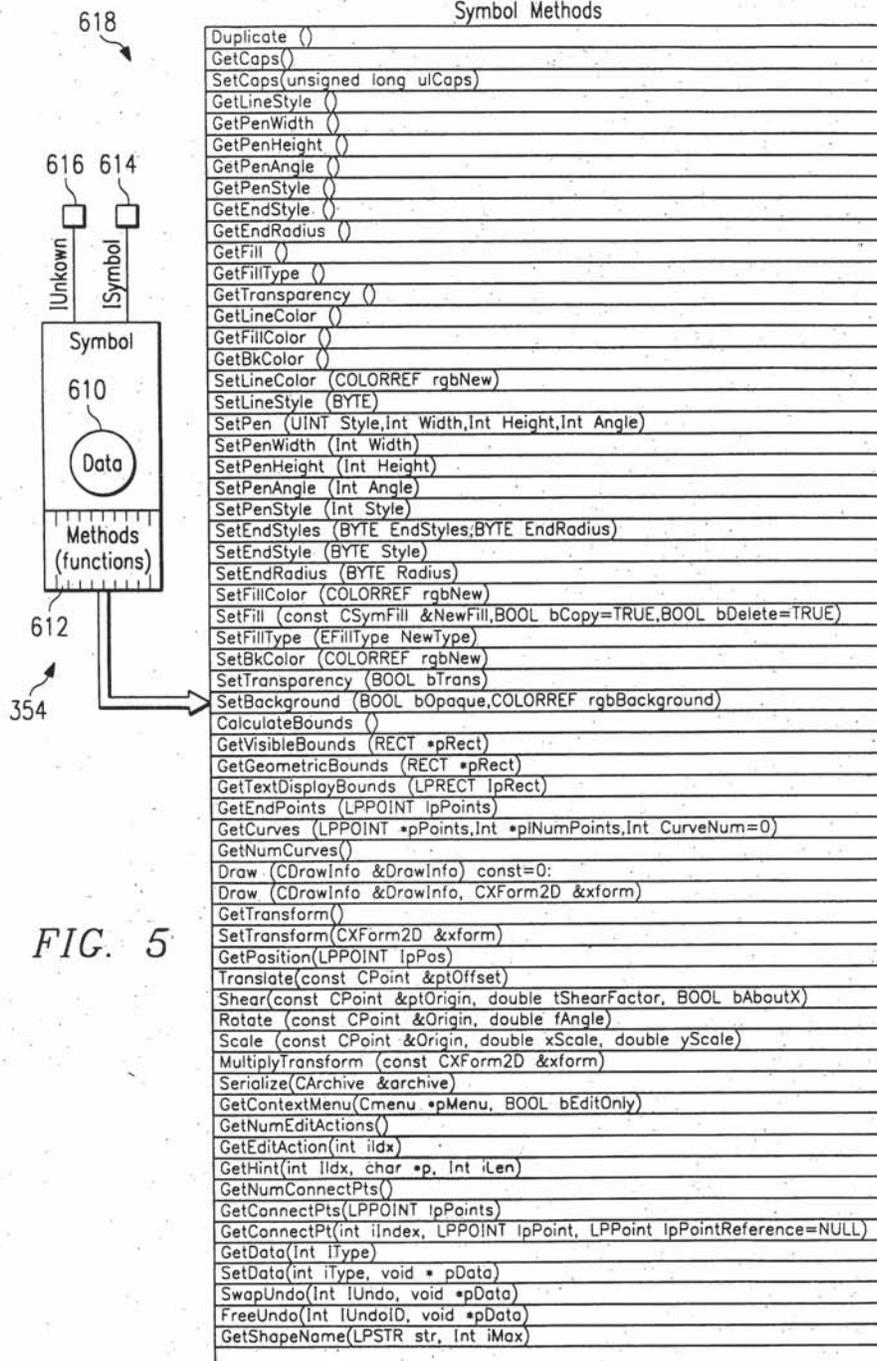
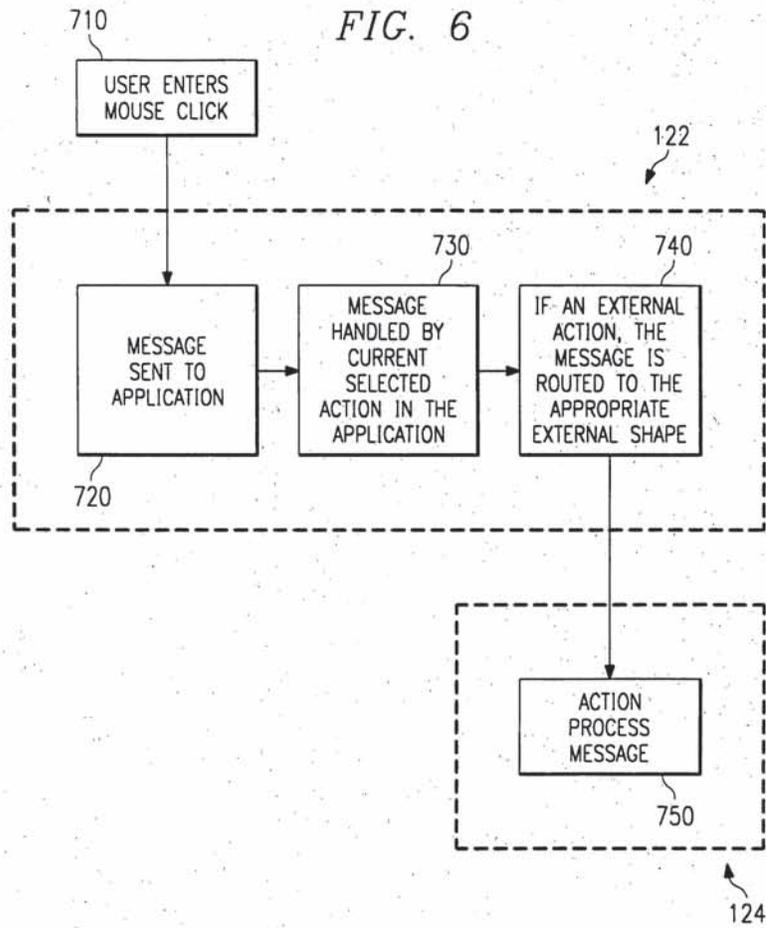


FIG. 5

FIG. 6





Attorney's Docket: 018682.0120

Title: METHOD AND SYSTEM FOR
PRODUCING GRAPHICAL IMAGES

Inventors: Kevin E. McFarland, et al.

Filed: October 4, 1996

Sheet 1 of 5

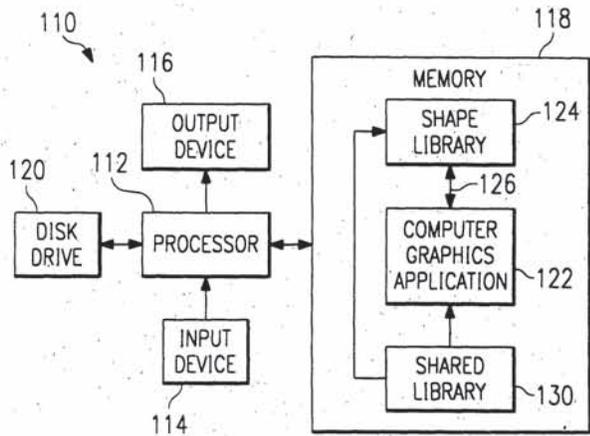


FIG. 1

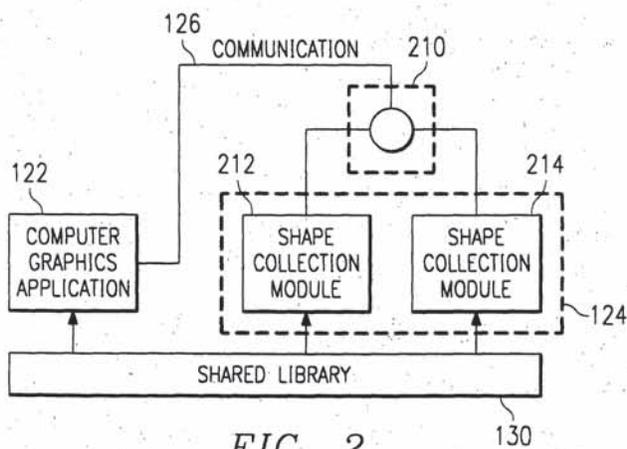


FIG. 2

FIG. 3A

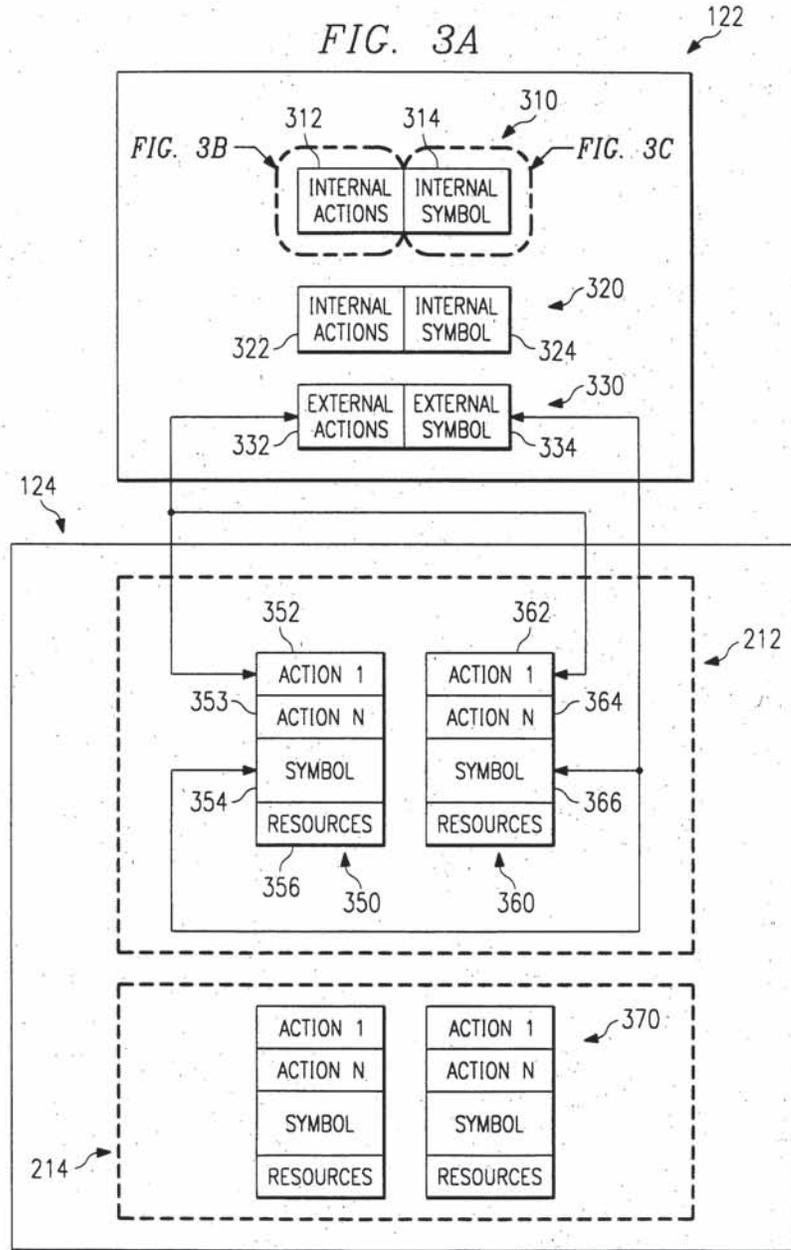


FIG. 3B

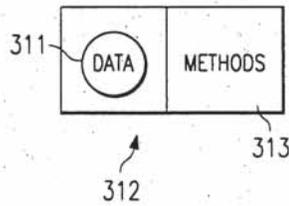


FIG. 3C

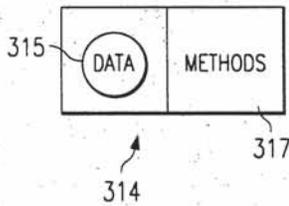
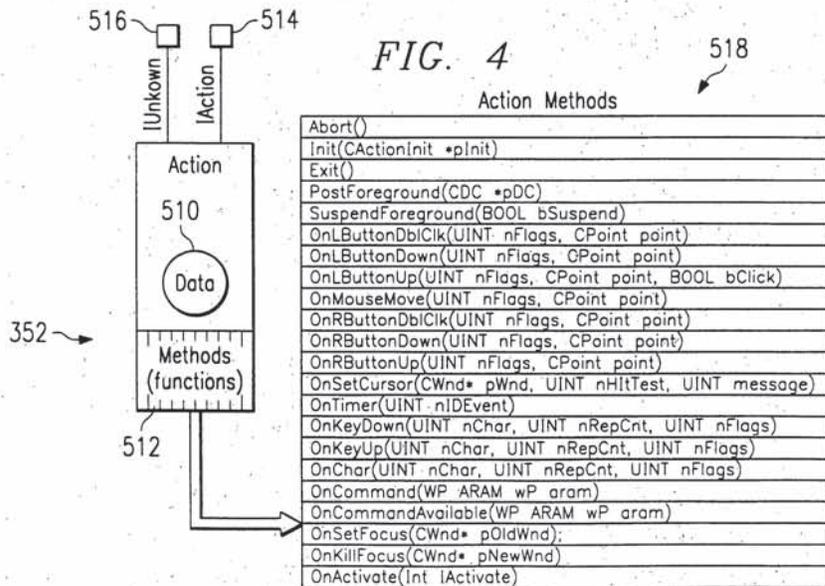


FIG. 4



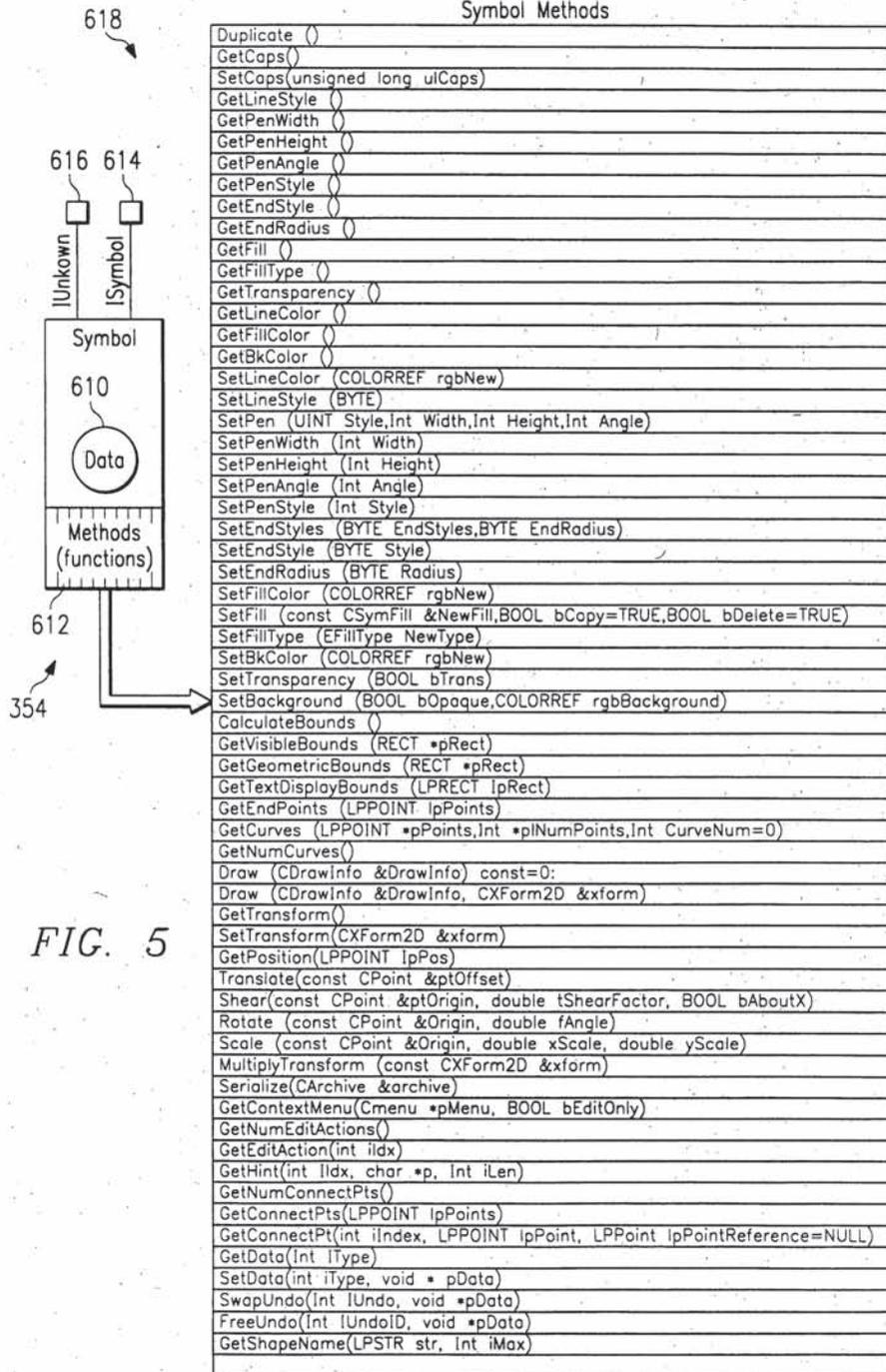
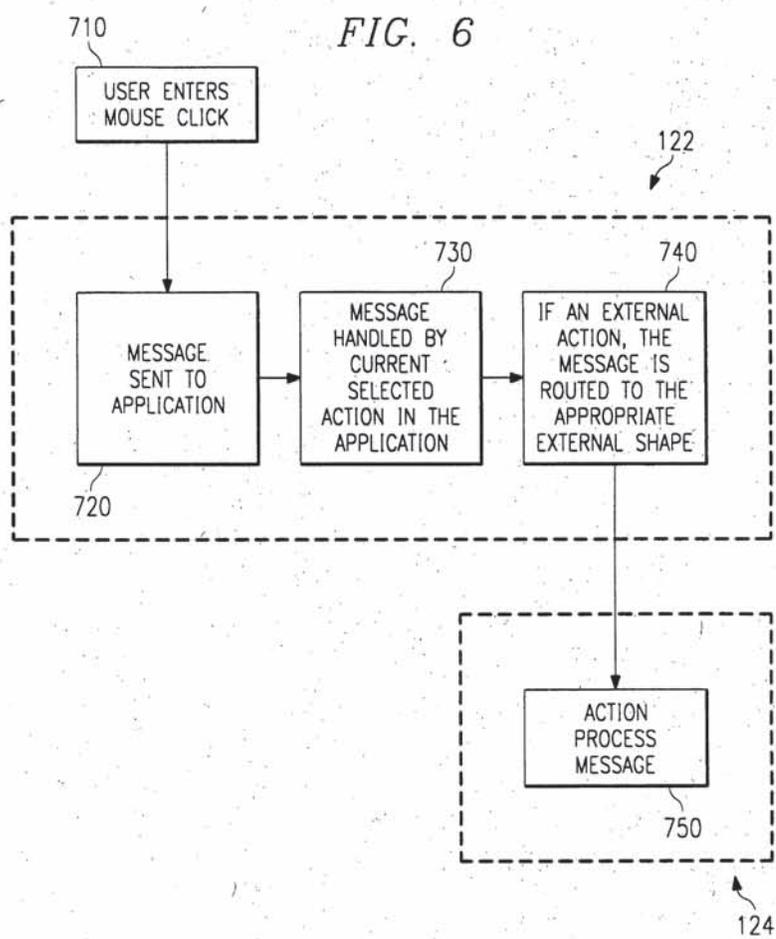


FIG. 5

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FIG. 6



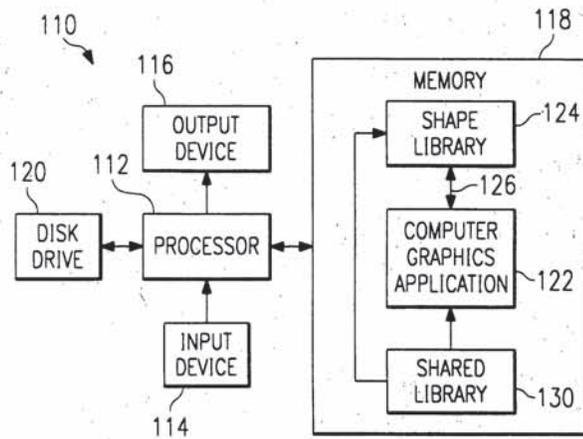


FIG. 1

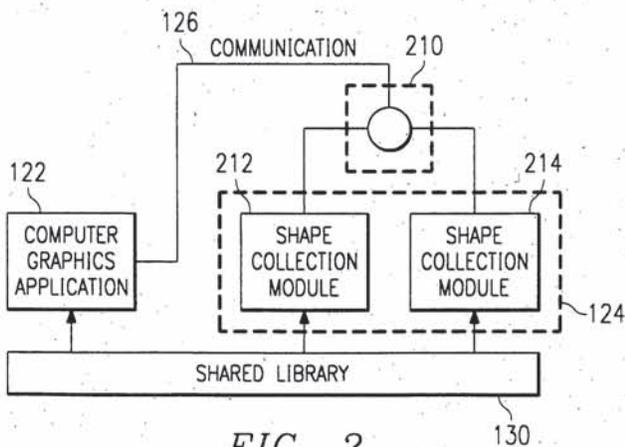


FIG. 2

FIG. 3A

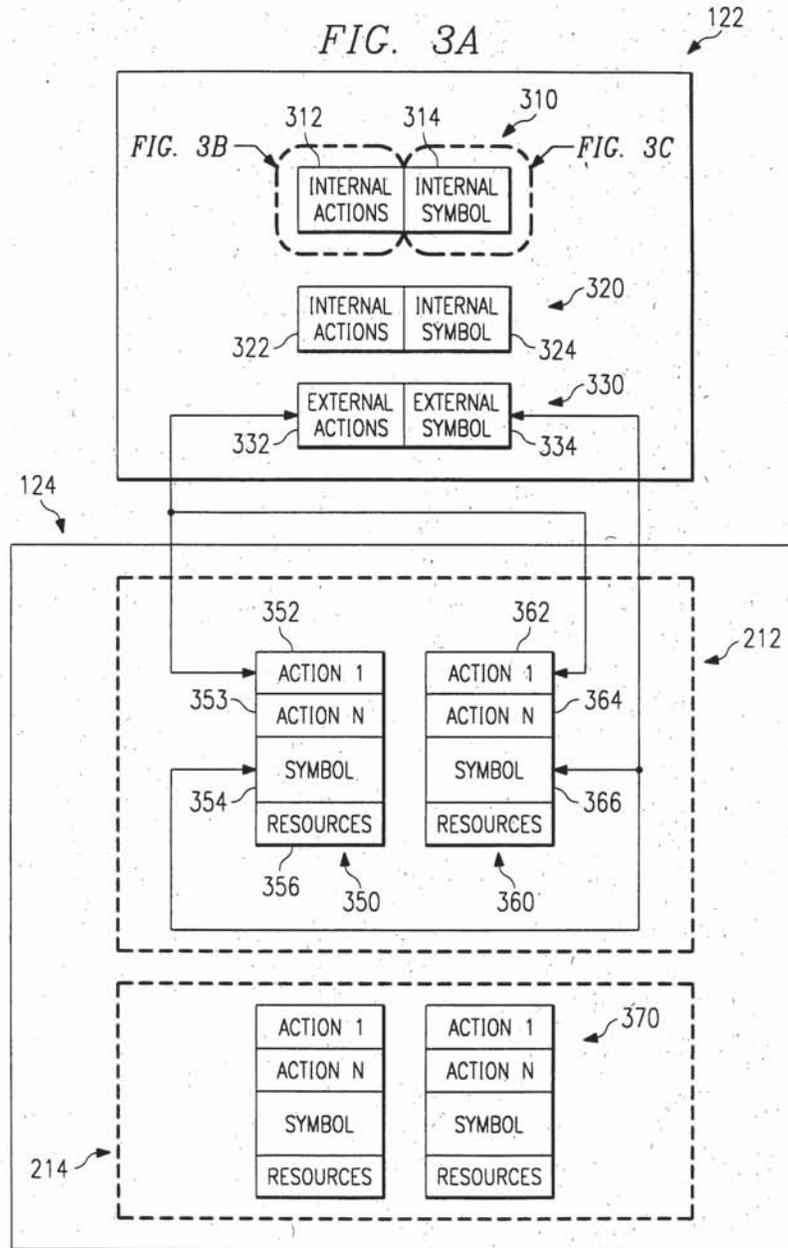


FIG. 3B

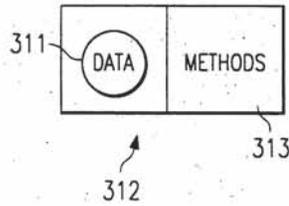


FIG. 3C

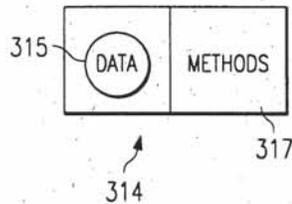
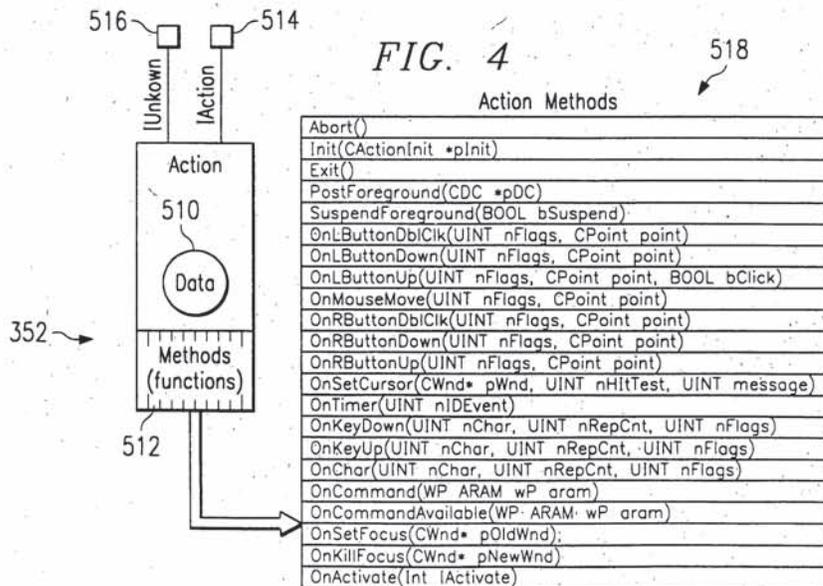
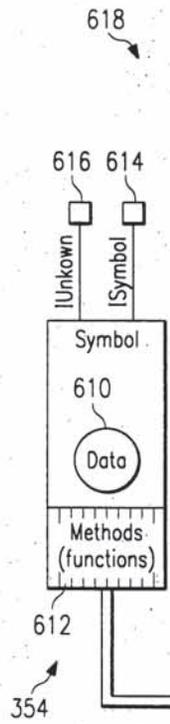


FIG. 4



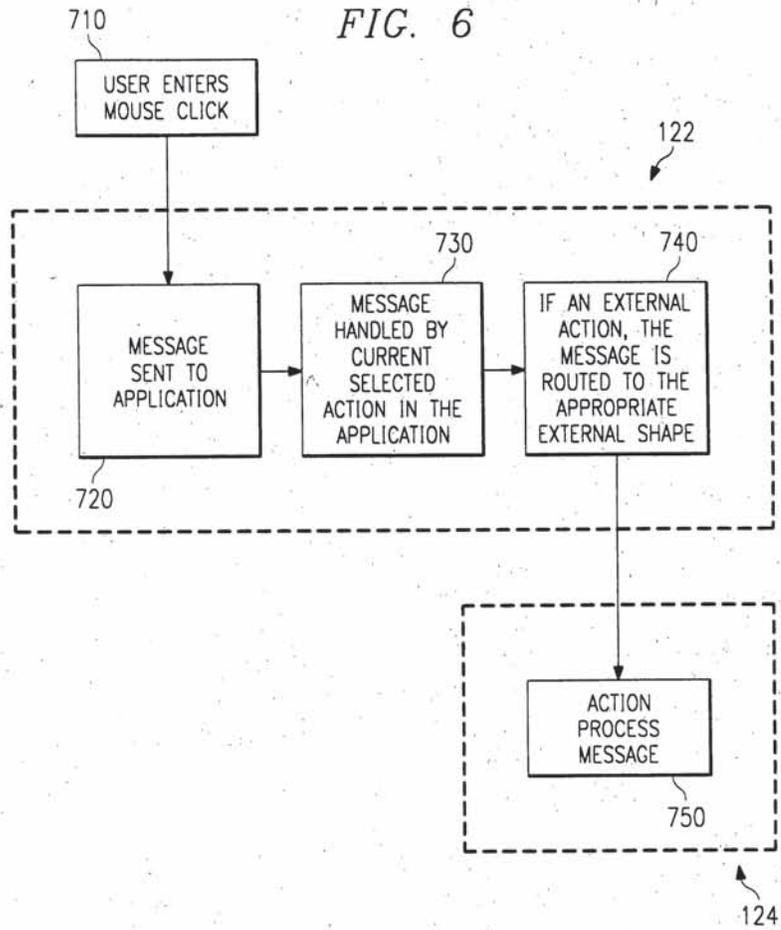


Symbol Methods

Duplicate ()
GetCaps()
SetCaps(unsigned long ulCaps)
GetLineStyle ()
GetPenWidth ()
GetPenHeight ()
GetPenAngle ()
GetPenStyle ()
GetEndStyle ()
GetEndRadius ()
GetFill ()
GetFillType ()
GetTransparency ()
GetLineColor ()
GetFillColor ()
GetBkColor ()
SetLineColor (COLORREF rgbNew)
SetLineStyle (BYTE)
SetPen (UINT Style,Int Width,Int Height,Int Angle)
SetPenWidth (Int Width)
SetPenHeight (Int Height)
SetPenAngle (Int Angle)
SetPenStyle (Int Style)
SetEndStyles (BYTE EndStyles,BYTE EndRadius)
SetEndStyle (BYTE Style)
SetEndRadius (BYTE Radius)
SetFillColor (COLORREF rgbNew)
SetFill (const CSymFill &NewFill,BOOL bCopy=TRUE,BOOL bDelete=TRUE)
SetFillType (EFillType NewType)
SetBkColor (COLORREF rgbNew)
SetTransparency (BOOL bTrans)
SetBackground (BOOL bOpaque,COLORREF rgbBackground)
CalculateBounds ()
GetVisibleBounds (RECT *pRect)
GetGeometricBounds (RECT *pRect)
GetTextDisplayBounds (LPRECT lpRect)
GetEndPoints (LPPPOINT lpPoints)
GetCurves (LPPPOINT *pPoints,Int *piNumPoints,Int CurveNum=0)
GetNumCurves()
Draw (CDrawInfo &DrawInfo) const=0:
Draw (CDrawInfo &DrawInfo, CXForm2D &xform)
GetTransform()
SetTransform(CXForm2D &xform)
GetPosition(LPPPOINT lpPos)
Translate(const CPoint &ptOffset)
Shear(const CPoint &ptOrigin, double tShearFactor, BOOL bAboutX)
Rotate (const CPoint &Origin, double fAngle)
Scale (const CPoint &Origin, double xScale, double yScale)
MultiplyTransform (const CXForm2D &xform)
Serialize(CArchive &archive)
GetContextMenu(Cmenu *pMenu, BOOL bEditOnly)
GetNumEditActions()
GetEditAction(int idx)
GetHint(int lIdx, char *p, Int iLen)
GetNumConnectPts()
GetConnectPts(LPPPOINT lpPoints)
GetConnectPt(int iIndex, LPPPOINT lpPoint, LPPoint lpPointReference=NULL)
GetData(Int iType)
SetData(int iType, void * pData)
SwapUndo(int IUndo, void *pData)
FreeUndo(int IUndoID, void *pData)
GetShopeName(LPSTR str, Int iMax)

FIG. 5

FIG. 6





Attorney's Docket: 018682.0120
Title: METHOD AND SYSTEM FOR
PRODUCING GRAPHICAL IMAGES
Inventors: Kevin E. McFarland, et al.
Filed: October 4, 1996
Sheet 1 of 5

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3A
345
441
34
345
441

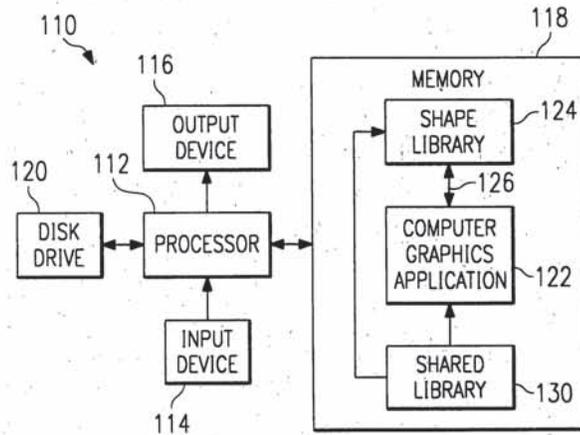


FIG. 1

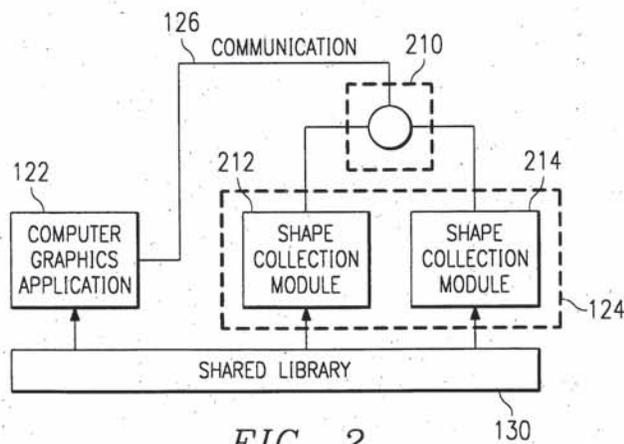
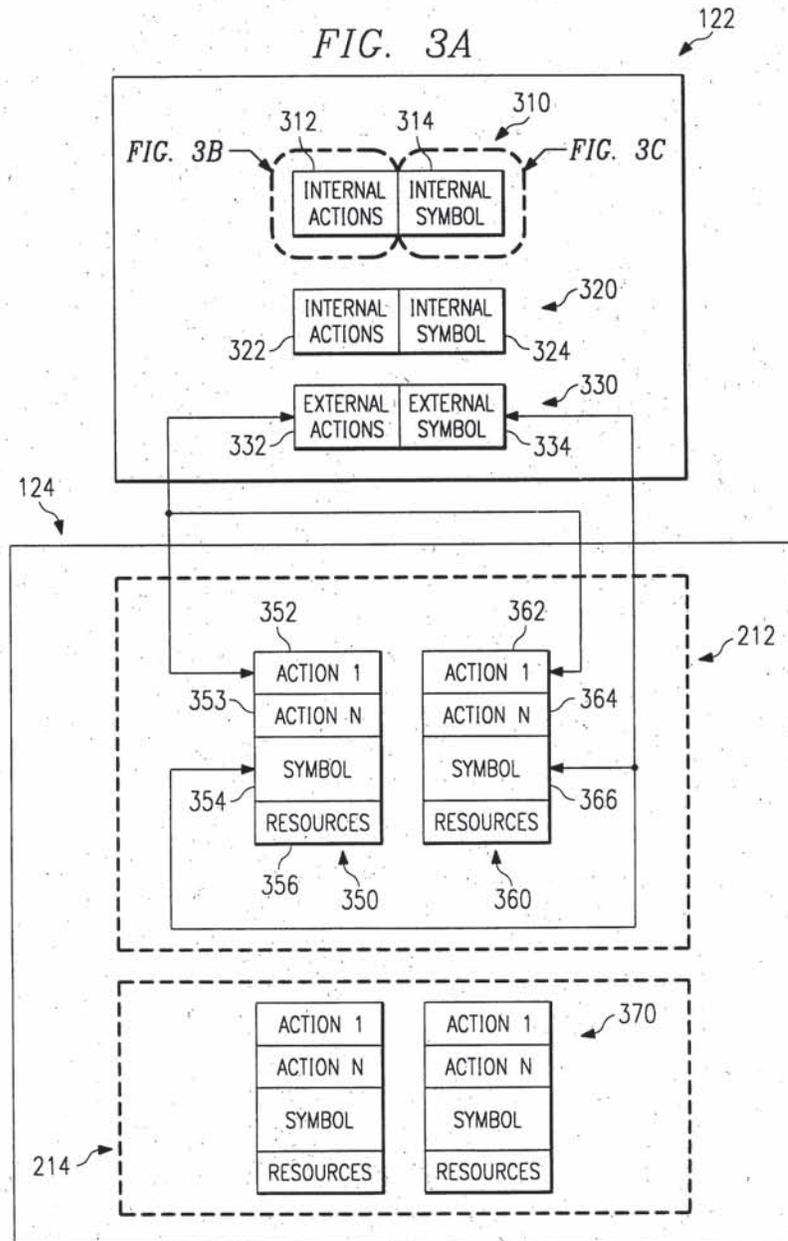


FIG. 2

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FIG. 3A



3A
34/5
441

FIG. 3B

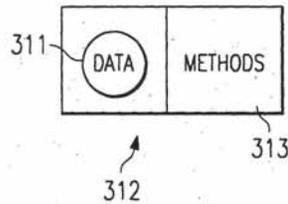


FIG. 3C

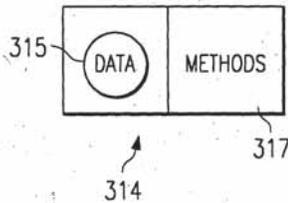
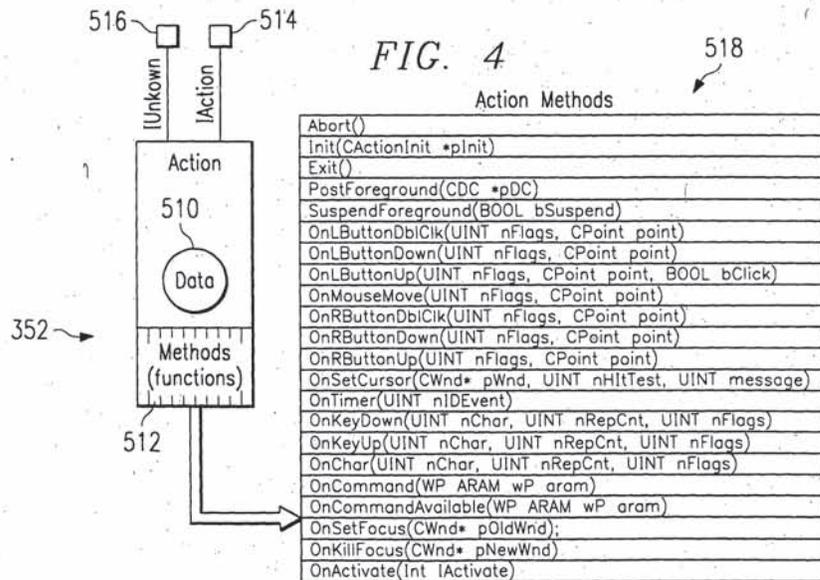


FIG. 4



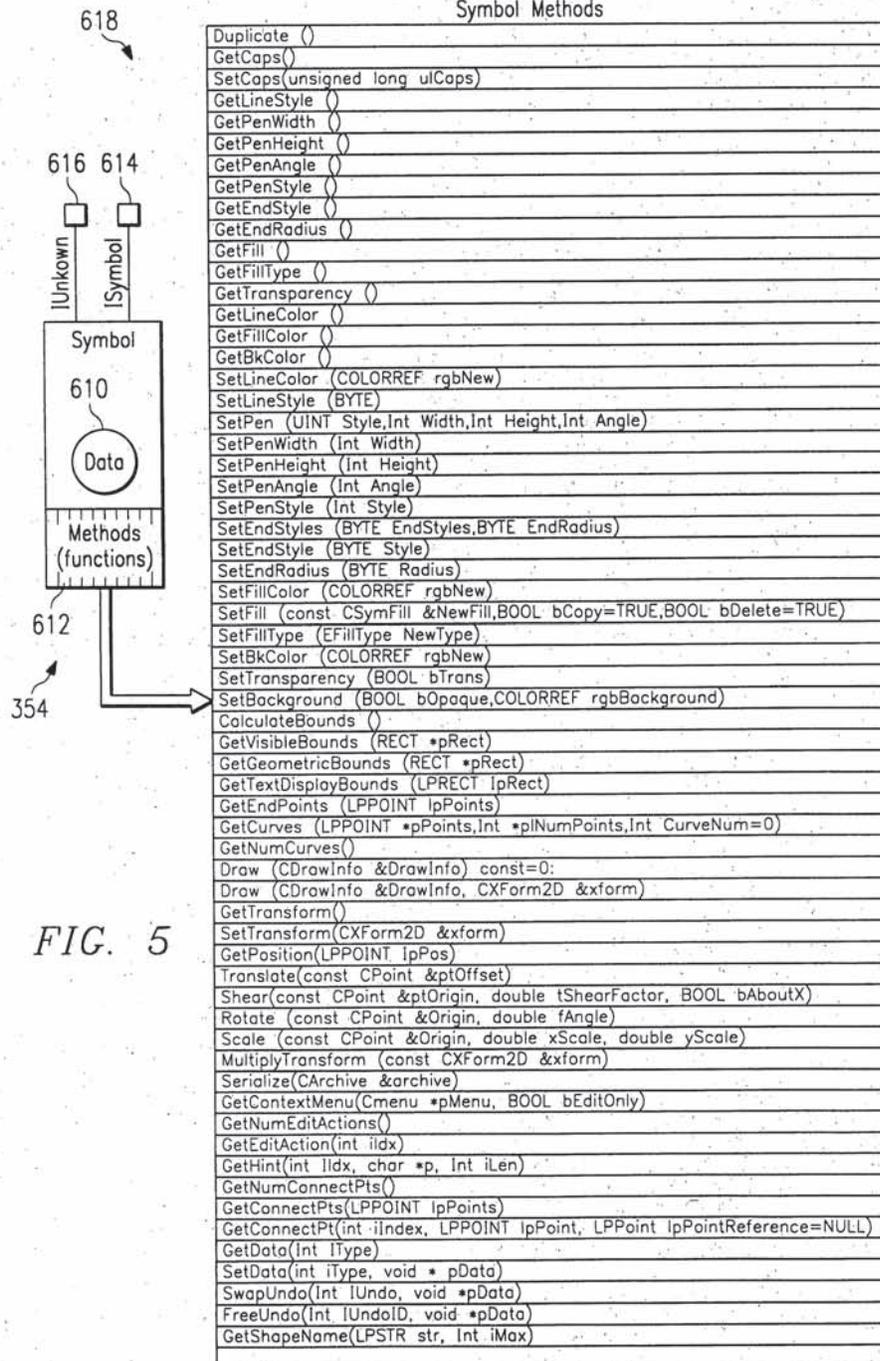
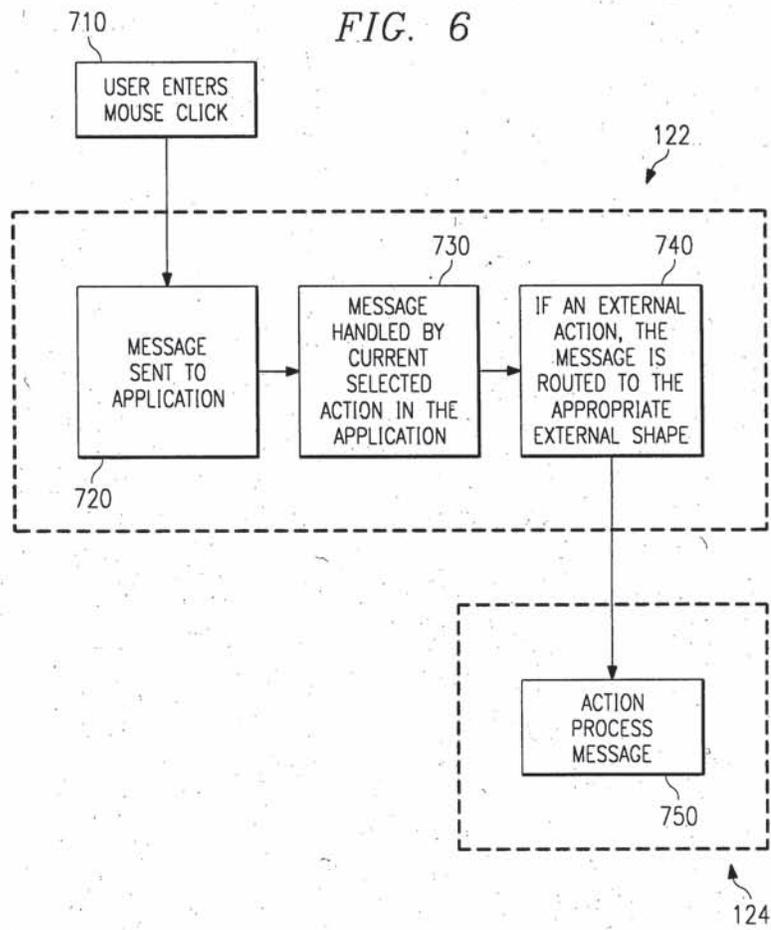


FIG. 5

FIG. 6



ATTORNEY DOCKE)
018682.0120

PATENT

I

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I declare that:

My residence, post office address and citizenship are as stated below next to my name, that I believe I am the original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention or design entitled METHOD AND SYSTEM FOR PRODUCING GRAPHICAL IMAGES the specification of which (check one):

is attached hereto; or

was filed on as Application Serial No. _____ and
was amended on _____ (if applicable);

that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above; and that I acknowledge the duty to disclose to the U.S. Patent and Trademark Office all information known to me to be material to patentability as defined in 37 C.F.R. § 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application(s) for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

<u>Number</u>	<u>Country</u>	<u>Date Filed</u>	<u>Priority Claimed (Yes) (No)</u>
---------------	----------------	-----------------------	--

-----NONE-----

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application(s) in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose to the U.S. Patent and Trademark Office all

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018682.0120

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2

information known to me to be material to patentability as defined in 37 C.F.R. § 1.56 which became available between the filing date of the prior application(s) and the national or PCT international filing date of this application:

<u>Application</u> <u>Serial Number</u>	<u>Date Filed</u>	<u>Status</u>
--	-------------------	---------------

-----NONE-----

I hereby appoint:

Jerry W. Mills	Reg. No. <u>23,005</u>
Robert M. Chiaviello, Jr.	Reg. No. <u>32,461</u>
Ann C. Livingston	Reg. No. <u>32,479</u>
William N. Hulseley III	Reg. No. <u>33,402</u>
Thomas R. Felger	Reg. No. <u>28,842</u>
Charles S. Fish	Reg. No. <u>35,870</u>
Robert H. Johnston III	Reg. No. <u>37,364</u>
Wei Wei Jeang	Reg. No. <u>33,305</u>
Kevin J. Meek	Reg. No. <u>33,738</u>
Anthony E. Peterman	Reg. No. <u>38,270</u>
Barton E. Showalter	Reg. No. <u>38,302</u>
David G. Wille	Reg. No. <u>38,363</u>
Robert J. Ward	Reg. No. <u>38,652</u>
Christopher J. Rourke	Reg. No. <u>39,348</u>
Philip W. Woo	Reg. No. <u>39,880</u>
Bradley P. Williams	Reg. No. <u>40,227</u>
Terry J. Stalford	Reg. No. <u>39,522</u>
Roger J. Fulghum	Reg. No. <u>39,678</u>
Rodger L. Tate	Reg. No. <u>27,399</u>
Scott F. Partridge	Reg. No. <u>28,142</u>
James G. Gatto	Reg. No. <u>32,694</u>
James B. Arpin	Reg. No. <u>33,470</u>
James Remenick	Reg. No. <u>36,902</u>
Jay B. Johnson	Reg. No. <u>38,193</u>
Christopher C. Campbell	Reg. No. <u>37,291</u>
Jerome T. Tao	Reg. No. <u>37,247</u>
Stacy B. Margolies	Reg. No. <u>39,760</u>

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ATTORNEY DOCKET NO.
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3

all of the firm of Baker & Botts, L.L.P., my attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith, and to file and prosecute any international patent applications filed thereon before any international authorities.

Send Correspondence To:

Baker & Botts, L.L.P.
2001 Ross Avenue
Dallas, Texas 75201-2980

Direct Telephone Calls To:

Jerry W. Mills
at (214) 953-6665
Atty. Docket No. 018682.0120

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Full name of first joint inventor, if any

Kevin E. McFarland

1-00

Inventor's signature

Kevin E. McFarland

Date

10/4/96

Residence (City, County, State)

Coppell, Dallas County, Texas TX

Citizenship

United States Citizenship

Post Office Address

146 Pecan Hollow

City and State

Coppell, Dallas County, Texas 75019

Over
✓

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018682.0120

ATTORNEY DOCKET NO.
018682.0120

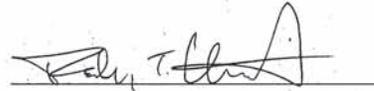
PATENT

4

Full name of the second joint inventor

Rodney T. Whisnant 2-00

Inventor's signature



Date
Residence (City, County, State)

10/4/96
Plano, Collin County, Texas TX

Citizenship
Post Office Address
City and State

United States Citizenship
817 Bellflower Drive
Plano, Collin County, Texas 75075

DAL01:172618.1
018682.0120

Transaction History Date 1997-1-16
Date information retrieved from USPTO Patent
Application Information Retrieval (PAIR)
system records at www.uspto.gov

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PATENT APPLICATION
08/726,091

2414 #2

1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Kevin E. McFarland, et al.
Serial No.: 08/726,091
Filing Date: JAN 13 1997 October 4, 1996
Title: METHOD AND SYSTEM FOR PRODUCING
GRAPHICAL IMAGES

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GROUP 240

Assistant Commissioner of
Patents
Washington, D.C. 20231

I hereby certify that this
correspondence is being deposited
with the United States Postal
Service as first class mail in an
envelope addressed to: Assistant
Commissioner of Patents,
Washington, D.C. 20231 on this
3rd day of January, 1997.
Darlene Owens
Darlene Owens
1.3.97
Date

Dear Sir:

INFORMATION DISCLOSURE STATEMENT

Applicant respectfully requests, pursuant to 37 C.F.R. §§ 1.56, 1.97 and 1.98, that the art listed on the attached PTO-1449 form be considered and cited in the examination of the above-identified application. A copy of this art is enclosed for the convenience of the Examiner. Furthermore, pursuant to 37 C.F.R. §§ 1.97(h), no representation is made that this art is material to patentability of the present application.

This Information Disclosure Statement is being submitted before an Office Action on the merits, and therefore, pursuant to 37 C.F.R. § 1.97(b), no fee is believed to be due. If, however, a fee is due, the Commissioner is hereby authorized to charge such fee to Deposit Account No. 02-0384 of Baker & Botts, L.L.P.

DAL01:188488
018682.0120

Attorney's Docket:
18682.0120

PATENT APPLICATION
08/726,091

2

Applicant respectfully submits that the claims of Applicants' above-referenced patent application are patentably distinguishable from these references.

Respectfully submitted,

BAKER & BOTTS, L.L.P.
Attorney for Applicant



Bradley P. Williams
Reg. No. 40,227

2001 Ross Avenue
Dallas, Texas 75201-2980
(214) 953-6447
Date: January 3, 1997

DAL01:188488
018682.0120

Attorney's Docket 018682.0120



1

PATENT
62412
#3
4-9-97
NYC

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: McFarland, et al.
Serial No.: 08/726,091
Filing Date: October 4, 1996
Title: METHOD AND SYSTEM FOR PRODUCING
GRAPHICAL IMAGES

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97 APR - 7 PM 7:27
GROUP 240

Honorable Assistant Commissioner
for Patents
Washington, D.C. 20231

I hereby certify that this
correspondence is being deposited
with the United States Postal Service
as first class mail in an envelope
addressed to: Assistant Commissioner
for Patents, Washington, D.C. 20231,
on March 6, 1997
Dona Webb
Name
March 6, 1997
Date of Signature

Dear Sir:

LETTER

Assignee of the above-identified U.S. Patent Application hereby notifies the U.S. Patent and Trademark Office that Assignee qualifies as a small entity pursuant to 37 C.F.R. § 1.9(d). Enclosed for filing in this application is a Verified Statement (Declaration) Claiming Small Entity Status (37 C.F.R. §§ 1.9(f) & 1.27(c)) -- Small Business Concern.

The Commissioner is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 02-0384 of Baker & Botts, L.L.P.

Respectfully submitted,
BAKER & BOTTS, L.L.P.
Attorneys for Applicants
Barton E. Showalter
Reg. No. 38,302

2001 Ross Avenue
Dallas, Texas 75201-2980
(214) 953-6509
Date: March 6, 1997

DAL01:200708.1



Attorney's Docket: 018682.0120

Filed: 1996
Serial No. 08/726,091
Title: METHOD AND SYSTEM FOR PRODUCING GRAPHICAL IMAGES

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS
(37 CFR 1.9(f) & 1.27(c)) -- SMALL BUSINESS CONCERN**

I hereby declare that I am an official of the small business concern empowered to act on behalf of the concern identified below:

Name of Small Business Concern: Micrografx, Inc.
Address of Small Business Concern: 1303 E. Arapaho Road
Richardson, Texas 75081

I hereby declare that the above-identified small business concern qualifies as a small business concern as defined in 13 CFR 121.12, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees to the United States Patent and Trademark Office, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled METHOD AND SYSTEM FOR PRODUCING GRAPHICAL IMAGES by inventor Kevin E. McFarland, described in the specification filed October 4, 1996.

If the rights held by the above-identified small business concern are not exclusive, each individual, concern or organization having rights in the invention is listed below, and no rights to the invention are held by any person, other than the inventor, who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person made the invention, or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d), or a nonprofit organization under 37 CFR 1.9(e):

NONE

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or my maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Name of Person Signing: R. Edwin Pearce
Title of Person if other than owner: Secretary and General Counsel
Address of Person Signing: 1303 E. Arapaho Road
Richardson, Texas 75081

Signature: R. Edwin Pearce

Date: 3-3-97

DAL01:197820.1

Transaction History Date 1998-03-02
Date information retrieved from USPTO Patent
Application Information Retrieval (PAIR)
system records at www.uspto.gov

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**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/726,091	10/04/96	McFARLAND	K 018682.0120

BAKER AND BOTTS
2001 ROSS AVENUE
DALLAS TX 75201-2980

LM41/0302

EXAMINER

NGUYEN, P

ART UNIT

PAPER NUMBER

2772

4

DATE MAILED: 03/02/98

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No. <i>08/746,091</i>	Applicant(s) <i>McFauland</i>
Examiner <i>Nguyen</i>	Group Art Unit <i>2772</i>

---The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address---

Period for Response

A SHORTENED STATUTORY PERIOD FOR RESPONSE IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a response be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for response is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to respond within the set or extended period for response will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- Responsive to communication(s) filed on _____
- This action is FINAL.
- Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

- Claim(s) 1-28 is/are pending in the application.
- Of the above claim(s) None is/are withdrawn from consideration.
- Claim(s) _____ is/are allowed.
- Claim(s) 1-28 is/are rejected.
- Claim(s) _____ is/are objected to.
- Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- The proposed drawing correction, filed on _____ is approved disapproved.
- The drawing(s) filed on _____ is/are objected to by the Examiner.
- The specification is objected to by the Examiner.
- The oath or declaration is objected to by the Examiner.

Phu K. Nguyen

PHU K. NGUYEN
PRIMARY EXAMINER
GROUP 2400

Priority under 35 U.S.C. § 119 (a)-(d)

- Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
 - All Some* None of the CERTIFIED copies of the priority documents have been received.
 - received in Application No. (Series Code/Serial Number) _____
 - received in this national stage application from the International Bureau (PCT Rule 1.7.2(a)).

*Certified copies not received: _____

Attachment(s)

- Information Disclosure Statement(s), PTO-1449, Paper No(s) 2 Interview Summary, PTO-413
- Notice of References Cited, PTO-892 Notice of Informal Patent Application, PTO-152
- Notice of Draftsperson's Patent Drawing Review, PTO-948 Other _____

Office Action Summary

Art Unit: 2772

1. The abstract of the disclosure is objected to because it contains the language that can be implied (e.g., "The invention discloses"). Correction is required. See MPEP § 608.01(b).

Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 250 words. It is important that the

Art Unit: 2772

abstract not exceed 250 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 2772

3. Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over VISIO (Developing Visio Solutions).

As per claim 1, Visio teaches the claimed "computerized system" comprising:

"a storage medium" (Visio, disk, page 4);

"a processor" (Visio, page 4);

"a computer program" (Visio, Developing Visio Solutions);

"access an external shape" (Visio, create a master, pages 141-143); and

"delegate the production to the external capabilities" (Visio, pages 142-144).

It is noted that Visio does not explicitly teach "an external shape stored outside the computer program" as claimed. However, Visio, new masters which are newly created suggests the external shape outside the computer program as claimed. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to configure Visio's system as claimed.

Claim 2 adds into claim 1 "an external action and an external symbol" which Visio teaches in the create of new master's name and icon (pages 141-145).

Claims 3-7 add into claim 2 the manipulation and attribution of the external shape which Visio teaches in pages 60-71.

Due to the similarity of claims 8-15, 16-20, and 21-28 to claims 1-7, they are rejected under a similar rationale.

Serial Number: 08/726,091

Page 5

Art Unit: 2772

Accordingly, the claimed invention as represented in the claims does not represent a patentable distinction over the art of record.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to P. Nguyen whose telephone number is (703) 305-9796. The examiner can normally be reached on Monday to Friday from 0800 a.m. to 0430 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather Herndon, can be reached on (703) 305-9701. The fax phone number for this Group is (703) 305-9724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.

P.Nguyen/vgj
February 18, 1998


PHU K. NGUYEN
PRIMARY EXAMINER
GROUP 2400

NOTICE OF DRAFTSPERSON'S PATENT DRAWING REVIEW

PTO Draftpersons review all originally filed drawings regardless of whether they are designated as formal or informal. Additionally, patent Examiners will review the drawings for compliance with the regulations. Direct telephone inquiries concerning this review to the Drawing Review Branch, 703-305-8404.

The drawings filed (insert date) 10/4/96, are
 A. not objected to by the Draftsperson under 37 CFR 1.84 or 1.152.
 B. objected to by the Draftsperson under 37 CFR 1.84 or 1.152 as indicated below. The Examiner will require submission of new, corrected drawings when necessary. Corrected drawings must be submitted according to the instructions on the back of this Notice.

- DRAWINGS.** 37 CFR 1.84(a): Acceptable categories of drawings:
 Black ink. Color.
 Not black solid lines. Fig(s) _____
 Color drawings are not acceptable until petition is granted. Fig(s) _____
- PHOTOGRAPHS.** 37 CFR 1.84(b)
 Photographs are not acceptable until petition is granted. Fig(s) _____
 Photographs not properly mounted (must use bristol board or photographic double-weight paper). Fig(s) _____
 Poor quality (half-tone). Fig(s) _____
- GRAPHIC FORMS.** 37 CFR 1.84 (d)
 Chemical or mathematical formula not labeled as separate figure. Fig(s) _____
 Group of waveforms not presented as a single figure, using common vertical axis with time extending along horizontal axis. Fig(s) _____
 Individual waveform not identified with a separate letter designation adjacent to the vertical axis. Fig(s) _____
- TYPE OF PAPER.** 37 CFR 1.84(c)
 Paper not flexible, strong, white, smooth, nonshiny, and durable. Sheet(s) _____
 Erasures, alterations, overwritings, interlineations, cracks, creases, and folds copy machine marks not accepted. Fig(s) _____
 Mylar, velum paper is not acceptable (too thin). Fig(s) _____
- SIZE OF PAPER.** 37 CFR 1.84(f): Acceptable sizes:
 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches)
 21.6 cm. by 33.1 cm. (8 1/2 by 13 inches)
 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches)
 21.0 cm. by 29.7 cm. (DIN size A4)
 All drawing sheets not the same size. Sheet(s) _____
 Drawing sheet not an acceptable size. Sheet(s) _____
- MARGINS.** 37 CFR 1.84(g): Acceptable margins:

Paper size			
21.6 cm. X 35.6 cm. (8 1/2 X 14 inches)	21.6 cm. X 33.1 cm. (8 1/2 X 13 inches)	21.6 cm. X 27.9 cm. (8 1/2 X 11 inches)	21.0 cm. X 29.7 cm. (DIN Size A4)
T .51 cm. (2")	2.5 cm. (1")	2.5 cm. (1")	2.5cm.
L .64 cm. (1/4")	.64 cm. (1/4")	.64 cm. (1/4")	2.5 cm.
R .64 cm. (1/4")	.64 cm. (1/4")	.64 cm. (1/4")	1.5 cm.
B .64 cm. (1/4")	.64 cm. (1/4")	.64 cm. (1/4")	1.0 cm.

Margins do not conform to chart above.
 Sheet(s) _____
 Top (T) Left (L) Right (R) Bottom (B)
- VIEWS.** 37 CFR 1.84(h)
 REMINDER: Specification may require revision to correspond to drawing changes.
 All views not grouped together. Fig(s) _____
 Views connected by projection lines or lead lines. Fig(s) _____
 Partial views. 37 CFR 1.84(h) 2
- View and enlarged view not labeled separately or properly. Fig(s) _____
 Sectional views. 37 CFR 1.84 (h) 3
 Hatching not indicated for sectional portions of an object. Fig(s) _____
 Cross section not drawn same as view with parts in cross section with regularly spaced parallel oblique strokes. Fig(s) _____
- ARRANGEMENT OF VIEWS.** 37 CFR 1.84(i)
 Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned so that the top becomes the right side, except for graphs. Fig(s) _____
- SCALE.** 37 CFR 1.84(k)
 Scale not large enough to show mechanism with crowding when drawing is reduced in size to two-thirds in reproduction. Fig(s) _____
 Indication such as "actual size" or scale 1/2" not permitted. Fig(s) _____
- CHARACTER OF LINES, NUMBERS, & LETTERS.** 37 CFR 1.84(l)
 Lines, numbers & letters not uniformly thick and well defined, clean, durable, and black (except for color drawings). Fig(s) _____
- SHADING.** 37 CFR 1.84(m)
 Solid black shading areas not permitted. Fig(s) _____
 Shade lines, pale, rough and blurred. Fig(s) _____
- NUMBERS, LETTERS, & REFERENCE CHARACTERS.** 37 CFR 1.84(p)
 Numbers and reference characters not plain and legible. 37 CFR 1.84(p)(l) Fig(s) _____
 Numbers and reference characters not oriented in same direction as the view. 37 CFR 1.84(p)(l) Fig(s) _____
 English alphabet not used. 37 CFR 1.84(p)(2). Fig(s) _____
 Numbers, letters, and reference characters do not measure at least .32 cm. (1/8 inch) in height. 37 CFR(p)(3) Fig(s) _____
- LEAD LINES.** 37 CFR 1.84(q)
 Lead lines cross each other. Fig(s) _____
 Lead lines missing. Fig(s) _____
- NUMBERING OF SHEETS OF DRAWINGS.** 37 CFR 1.84(t)
 Sheets not numbered consecutively, and in Arabic numerals, beginning with number 1. Sheet(s) _____
- NUMBER OF VIEWS.** 37 CFR 1.84(u)
 Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig(s) _____
 View numbers not preceded by the abbreviation Fig. Fig(s) _____
- CORRECTIONS.** 37 CFR 1.84(w)
 Corrections not made from prior PTO-948. Fig(s) _____
- DESIGN DRAWING.** 37 CFR 1.152
 Surface shading shown not appropriate. Fig(s) _____
 Solid black shading not used for color contrast. Fig(s) _____

COMMENTS:

ATTACHMENT TO PAPER NO. _____ REVIEWER [Signature] DATE 12/12/96
 PTO Copy

Attorney's Docket 018682.0120

PATENT

#5/A

6-17-98

GP 2772 MJC



1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: McFarland, et al.
 Serial No.: 08/726,091
 Filing Date: October 4, 1996
 Group Art Unit: 2772
 Examiner: P. Nguyen
 Title: METHOD AND SYSTEM FOR PRODUCING
 GRAPHICAL IMAGES

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 98 JUN 15 AM 10:11
 GROUP 2700

Honorable Assistant Commissioner
 for Patents
 Washington, D.C. 20231

I hereby certify that
 this correspondence is
 being deposited with the
 United States Postal
 Service as first class
 mail in an envelope
 addressed to: Assistant
 Commissioner for
 Patents, Washington,
 D.C., 20231, on

June 2, 1998.

D'Anna S. Friedrich
Name

June 2, 1998
Date of Signature

Dear Sir:

AMENDMENT

In response to the Official Action mailed March 2, 1998,
 Applicants respectfully request the Examiner to reconsider the
 rejection of the claims in view of the comments as set forth
 below. Please amend the Application as follows.

IN THE ABSTRACT

Please amend the Abstract to read as follows:

A

ABSTRACT OF THE DISCLOSURE

A
A method and system for producing graphical images includes a computer-readable medium and a computer program encoded on the computer-readable medium. The computer program is operable to access an external shape stored outside the computer program. The external shape comprises external capabilities. The computer program is further operable to delegate the production of a graphical image of the external shape to the external capabilities.

IN THE CLAIMS

For the convenience of the Examiner all of the pending claims are reproduced below regardless of whether amended or not. No amendments to the claims have been made.

1. A computerized system comprising:
 - a storage medium;
 - a processor coupled to the storage medium;
 - a computer program stored in the storage medium, the computer program operable to run on the processor, the computer program further operable to:
 - access an external shape stored outside the computer program, the external shape comprising external capabilities;
 - and
 - delegate the production of a graphical image of the external shape to the external capabilities.
 2. The computerized system of Claim 1, wherein the computer program is further operable to:
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access an external shape stored outside the computer program, the external shape comprising an external action and an external symbol; and

delegate the production of graphical image of the external shape to the external action and the external symbol.

3. The computerized system of Claim 2, wherein the computer program is further operable to:

receive user input in a manner defined by the external action; and

manipulate the graphical image in response to the user input in a manner defined by the external symbol.

4. The computerized system of Claim 2 wherein the external action comprises a plurality of external methods and external data.

5. The computerized system of Claim 2 wherein the external symbol comprises a plurality of external methods and external data.

6. The computerized system of Claim 4 wherein the plurality of external methods comprises:

a first method responsive to a mouse button activation;

a second method responsive to a mouse movement;

a third method responsive to input from a keyboard; and

a fourth method responsive to a command received from the computer program based on input received from a user.

7. The computerized system of Claim 5 wherein the plurality of external methods comprises:

a first external method operable to set the attributes of the external symbol;

a second external method operable to calculate the bounds of the external symbol;

a third external method operable to get the attributes of the external symbol;

a fourth external method operable to render the external symbol; and

a fifth external method operable to archive the external symbol.

8. A computer program encoded on a computer-readable medium, the computer program operable to:

access an external shape stored outside the computer program, the external shape comprising external capabilities; and

delegate the production of a graphical image of the external shape to the external capabilities.

9. The computer program of Claim 8, wherein the computer program is further operable to:

access an external shape stored outside the computer program, the external shape comprising an external action and an external symbol; and

delegate the production of a graphical image of the external shape to the external action and the external symbol.

10. The computer program of Claim 9, wherein the computer program is further operable to:

receive user input in a manner defined by the external action; and

manipulate the graphical image in response to the user input in a manner defined by the external symbol.

11. The computer program of Claim 8 wherein the external capabilities comprise a plurality of external methods and external data.

12. The computer program of Claim 9, wherein the external action comprises a plurality of external methods and external data.

13. The computer program of Claim 9 wherein the external symbol comprises a plurality of external methods and external data.

14. The computerized system of Claim 12 wherein the plurality of external methods comprises:

a first method responsive to a mouse button activation;

a second method responsive to a mouse button activation;

and

a third method operable to allow the external shape to communicate data and events to the computer program.

15. The computerized system of Claim 13 wherein the plurality of external methods comprises:

a first external method operable get the attributes of the external symbol;

a second external method operable to calculate the bounds of the external symbol;

a third external method operable to transform the external symbol;

a fourth external method operable to render the external symbol; and

a fifth external method operable to archive the external symbol.

16. A method for producing graphical images comprising:
executing a computer program;
providing a shape library external to the computer program, the shape library having at least one shape, the at least one shape having capabilities;
providing the capabilities associated with the at least one shape to the computer program while the application is executing;
and
generating a graphical image based on the capabilities.

17. The method of Claim 16 wherein the step of providing a shape library comprises providing a dynamic link library.

18. The method of Claim 16 wherein the step of providing the capabilities associated with the shape comprises providing a plurality of actions comprising a plurality of action methods and providing a symbol comprising a plurality of symbol methods.

19. The method of Claim 18 wherein the plurality of action methods comprises:

- a first method responsive to a mouse button activation;
- a second method responsive to a mouse movement;
- a third method responsive to input from a keyboard; and
- a fourth method responsive to a command received from the computer program based on input received from a user.

20. The computerized system of Claim 18 wherein the plurality of symbol methods comprises:

- a first external method operable to get the attributes of the symbol;
- a second external method operable to calculate the bounds of the symbol;
- a third external method operable to transform the symbol;
- a fourth external method operable to render the symbol; and
- a fifth external method operable to archive the symbol.

21. A computer graphics program encoded on a computer readable medium for generating a graphical image, comprising:

- an external shape module having an external shape that defines an external action and an external symbol, the external action operable to perform a generic action method and the external symbol operable to perform a generic symbol method;
- a communication link coupled to the external shape module; and
- a computer graphics application coupled to the communication link and operable to communicate with the external shape module using the communication link, the computer graphics application comprising an external action template operable to access the

external action and an external symbol template operable to access the external symbol, the computer graphics application further operable to delegate the production of a graphical image to the generic action method and the generic symbol method.

22. The computer graphics program of Claim 21, further comprising an internal shape defining an internal action and an internal symbol.

23. The computer graphics program of Claim 21, wherein the external symbol is operable to perform a plurality of generic symbol methods.

24. The computer graphics program of Claim 21, wherein the external shape module comprises a dynamic link library.

25. The computer graphics program of Claim 21, further comprising a shared library and wherein the computer graphics application is further operable to access the shared library and the external shape library is operable to access the shared library.

26. The computer graphics program of Claim 21, wherein the communication link is operable to allow communication between the external shape library and the computer graphics application without the computer graphics application requiring knowledge of the contents of the external shape library.

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27. The computer graphics program of Claim 21, wherein the communication link comprises the Object Linking and Embedding technology developed by Microsoft.

28. The computer graphics program of Claim 21, wherein the communication link comprises a dynamic link library application program interface.

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REMARKS

This Application has been carefully reviewed in light of the Official Action mailed March 2, 1998. Applicants respectfully request reconsideration and favorable action in this case.

Objection to the Abstract

The Examiner objects to the Abstract because of improper language pursuant to M.P.E.P. § 608.01(b). Applicants have amended the Abstract accordingly.

Section 103 Rejections

The Examiner rejects Claims 1-28 under 35 U.S.C. § 103(a) as being unpatentable over a book entitled "Developing Visio Solutions" ("Visio"). In this regard it was stated as follows:

As per claim 1, Visio teaches the claimed "computerized system" comprising:

"a storage medium" (Visio, disk, page 4);

"a processor" (Visio, page 4);

"a computer program" (Visio, Developing Visio Solutions);

"access an external shape" (Visio, create a master, pages 141-143); and

"delegate the production to the external capabilities" (Visio, pages 142-144).

It is noted that Visio does not explicitly teach "an external shape stored outside the computer program" as claimed. However, Visio, new masters which are newly created suggests the external shape outside the computer program as claimed. Thus, it

would have been obvious to a person of ordinary skill in the art at the time the invention was made to configure Visio's system as claimed.

Claim 2 adds into claim 1 "an external action and an external symbol" which Visio teaches in the create of new master's name and icon (pages 141-145).

Claims 3-7 add into claim 2 the manipulation and attribution of the external shape which Visio teaches in pages 60-71.

Due to the similarity of claims 8-15, 16-20, and 21-28 to claims 1-7, they are rejected under a similar rationale.

Applicants respectfully traverse this rejection of Claims 1-28 for the reasons described below. Claims 21-28 are addressed first, and Claims 1-20 are addressed next.

Claims 21-28

Applicants respectfully traverse the rejection of Claims 21-28. According to the Manual of Patent Examining procedure:

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art

reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Manual of Patent Examining Procedure, § 2143. The above rejection is improper for at least the reason that the proposed modification of Visio does not teach or suggest every limitation of the claimed invention. Claim 21 recites:

an external shape module having an external shape that defines an external action and an external symbol, the external action operable to perform a generic action method and the external symbol operable to perform a generic symbol method;

a communication link coupled to the external shape module; and

a computer graphics application coupled to the communication link and operable to communicate with the external shape module using the communication link, the computer graphics application comprising an external action template operable to access the external action and an external symbol template operable to

access the external symbol, the computer graphics application further operable to delegate the production of a graphical image to the generic action method and the generic symbol method.

Visio does not teach or suggest this combination. Visio utilizes a table of data files that are accessed when a particular shape is desired. The data files contain information describing a shape. The shape is then created and edited with tools within the computer program. Such a system is limited to editing and creating shapes in ways permitted by the tools within the computer program. Thus, although shapes may be added after the release of the computer program used in Visio, the shapes that may be added are limited to shapes that the internal tools in the computer program knows how to create and edit.

The proposed modification of Visio does not teach or suggest all of the limitations claimed in Claim 21. For example, the cited portions of Visio do not teach "an external shape module having an external shape that defines an external action and an external symbol, the external action operable to perform a generic action method and the external symbol operable to perform a generic symbol method," nor is such a limitation identified by the Examiner as being taught by the cited reference. Nowhere in the cited portions of Visio is there any suggestion of external actions or symbols that are operable to perform a generic action method or a generic symbol method. Rather, in the cited portions of Visio, Visio describes the creation of a master, which is defined at page 16 of Visio as a shape saved on a stencil so that it can be reused in other drawings. The performance of a generic

action method or generic symbol methods is not addressed by the cited portions of the reference. Failure to utilize external actions operable to perform generic action methods and external symbols operable to perform generic symbols methods limits Visio to the production of shapes the may be produced utilizing only the internal tools of the computer program. Thus, the proposed modification does not teach the above-cited claim limitation. For this reason alone, the rejection is improper.

In addition to not teaching the claimed external shape module, the cited portions of Visio do not teach "a communications link coupled to the external shape module," nor does the Examiner assert that such a limitations is taught. Furthermore, the cited portions of Visio do not teach "a computer graphics application comprising an external action template operable to access the external action and an external symbol template operable to access the external symbol, the computer graphics application further operable to delegate the production of a graphical image to the generic action method and the generic symbol method," nor does the Examiner assert that such limitations are taught. Nowhere in the cited portions of Visio is there a teaching of the delegation of the production of a graphical image to a generic action method and a generic symbol method of an external shape. In fact, Visio suggests the opposite. In the last paragraph of page 142, Visio states with reference to the creation of a master:

With either of the procedures described in this section, you can create a master from an object that you have pasted or imported into Visio from another

program. However, when users create an instance of such a master, they won't be able to edit the shape's vertices, rotate it, or add text to it.

Thus, the capabilities of a shape utilized by Visio are limited *a priori* by the capabilities of Visio, which is inconsistent with the delegation of the production of a graphical image to a generic action method and a generic symbol method contained in a shape external to the computer program. Thus, not only do the cited portions of Visio not teach this delegation, but it teaches away from such delegation. For each of the above reasons, the rejection is improper. Reconsideration and favorable action are requested.

As depending from allowable independent Claim 21, dependent Claims 22-28 are also allowable. Reconsideration and favorable action are requested.

Claims 1-15

Applicants respectfully traverse the above rejection of Claims 1-15. This rejection is improper for at least two reasons. First, the proposed modification of Visio does not teach or suggest every limitation of the claimed invention. Second, the proposed modification is improper because there is no suggestion or motivation in the art to modify the reference as suggested by the Examiner.

With respect to the first reason, Claims 1 and 8 each recite, for example, "a computer program further operable to: access an external shape stored outside the computer program, the

external shape comprising external capabilities; . . . and delegate the production of a graphical image of the external shape to the external capabilities." Applicants respectfully submit the cited reference does not teach or suggest this limitation. For example, the rejection itself admits that Visio does not explicitly teach "an external shape stored outside the computer program as claimed." Therefore, Applicants respectfully submit that Visio also does not teach a computer program operable to access an external shape having external capabilities and operable to delegate the production of a graphical image of the external shape to the external capabilities. Contrary to the assertion made in the rejection, Applicants find no mention on pages 142-144 in Visio of the delegation of the production of a graphical image of the external shape to the external capabilities, and as described above in conjunction with Claims 21-28, Visio actually teaches away from providing external shapes with external capabilities. For at least this reason, the rejection is improper.

In addition to not teaching the claimed limitations, the rejection is also improper because there is no suggestion or motivation in the art to modify the reference as suggested by the Examiner. In this regard, the Examiner stated:

It is noted that Visio does not explicitly teach "an external shape stored outside the computer program" as claimed. However, Visio, new masters which are newly created suggests the external shape outside the computer program as claimed. Thus, it would have been obvious to a person of ordinary skill in the art at

the time the invention was made to configure Visio's system as claimed.

This recitation clearly does not constitute a suggestion or motivation in the art to modify the reference as proposed by the Examiner. The Examiner admits that Visio does not explicitly teach "an external shape stored outside the computer program." Thus, it is clear that the Examiner has concluded that Visio new masters, which are described in Visio, do not constitute an external shape stored outside the computer program. As not constituting an external shape stored outside the computer program, Applicants respectfully submit that the use of Visio new masters does not suggest the claimed combinations.

The Examiner is reminded that it is the Examiner's responsibility to provide a convincing line of argument as to why one of ordinary skill in the art would be motivated to modify a reference. M.P.E.P. § 706.02(j) ("The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. To support the conclusion that the claimed invention is directed to obvious subject matter, either the reference must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat App. & Inter. 1985)"). Such a convincing line of argument has not been provided, nor is one available in the prior art.

Rather, only the teachings of the specification provide such reasoning. According to one non-limiting embodiment of the invention, the utilization of an external shape having external capabilities allows the production of shapes that the underlying computer program would not otherwise know how to create or edit. Therefore, according to the specification, it is desirable to utilize external shapes having external capabilities. However, the Examiner cannot rely on the teachings of the invention to provide the rationale for the proposed modification. Such reliance is clearly improper. M.P.E.P. § 2143 ("The teaching or suggestion to make the claimed combination and the reasonable expectation of success must be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)"). For this additional reason, the proposed modification is improper, and therefore the rejection is improper. Reconsideration and favorable action are requested.

In addition to depending from allowable independent Claim 1, Claim 2 is allowable for that additional reason that *Visio* does not teach "an external shape comprising an external action and an external symbol." As described above, the Examiner admits that *Visio* does not teach an external shape stored outside the computer program. Clearly, *Visio* does not teach an external shape comprising an external action and an external symbol. Reconsideration and favorable action are requested. As depending from Claims 1 and 2, dependent Claims 3 through 6 are also allowable.

In addition to depending from allowable independent Claims 1 and 2, Claim 7 recites additional limitations that are not taught by the cited reference. By way of example, Claim 7 recites "a third external method operable to get the attributes of the external symbol." Visio does not teach this limitation, nor has the Examiner asserted that such a limitation is taught by Visio. Reconsideration and favorable action are requested.

For analogous reasons, the rejection of dependent Claims 9 through 15 is also improper. Reconsideration and favorable action are requested.

Claims 16-20

Applicants respectfully traverse the rejection of independent Claim 16 and the claims that depend from it under similar rationale as described above in conjunction with Claims 1 and 8. For example, Claim 16 recites "providing a shape library external to the computer program, the shape library having at least one shape, the at least one shape having capabilities;" and "providing the capabilities associated with the at least one shape to the computer program while the application is executing." These limitations are clearly not taught by Visio. For at least this reason, Claim 16, and the claims that depend from Claim 16, are allowable. Reconsideration and favorable action are requested.

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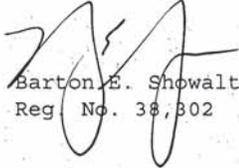
Conclusions

Applicants have now made an earnest attempt to place this case in condition for allowance. For the foregoing reasons, and for other reasons clearly apparent, Applicants respectfully request full allowance of all pending Claims. If the Examiner feels that a telephone conference or an interview would advance prosecution of this Application in any manner, the undersigned attorney for Applicants stands ready to conduct such a conference at the convenience of the Examiner.

The Commissioner is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 02-0384 of Baker & Botts, L.L.P.

Respectfully submitted,

BAKER & BOTTS, L.L.P.
Attorneys for Applicants


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Date: June 2, 1998

DAL01:362861.1

Transaction History Date 1998-11-12
Date information retrieved from USPTO Patent
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Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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DAKER AND BOITZ
2161 ROSS AVENUE
MILWAUKEE WI 53221-2966

LM41/1112

EXAMINER

ART UNIT

PAPER NUMBER

DATE MAILED:

11/12/98

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No. 08/726,091	Applicant(s) McFarland et al.
Examiner P. Nguyen	Group Art Unit 2772

---The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address---

Period for Response

A SHORTENED STATUTORY PERIOD FOR RESPONSE IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a response be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for response is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to respond within the set or extended period for response will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- Responsive to communication(s) filed on 6-9-98
- This action is **FINAL**.
- Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- Claim(s) 1-28 is/are pending in the application.
- Of the above claim(s) None is/are withdrawn from consideration.
- Claim(s) _____ is/are allowed.
- Claim(s) 1-28 is/are rejected.
- Claim(s) _____ is/are objected to.
- Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- The proposed drawing correction, filed on _____ is approved disapproved.
- The drawing(s) filed on _____ is/are objected to by the Examiner.
- The specification is objected to by the Examiner.
- The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
 - All Some* None of the CERTIFIED copies of the priority documents have been received.
 - received in Application No. (Series Code/Serial Number) _____
 - received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

Phu K. Nguyen
PHU K. NGUYEN
PRIMARY EXAMINER
GROUP 2400

Attachment(s)

- Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- Notice of References Cited, PTO-892
- Notice of Draftsperson's Patent Drawing Review, PTO-948
- Interview Summary, PTO-413
- Notice of Informal Patent Application, PTO-152
- Other _____

Office Action Summary

Art Unit: 2772

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Visio (Developing Visio Solutions) in view of Halviatti et al. (5,790,117).

As per claim 1, Visio teaches the claimed "computerized system" comprising:

"a storage medium" (Visio, disk, page 4);

"a processor" (Visio, page 4);

"a computer program" (Visio, Developing Visio Solutions);

"access an external shape" (Visio, create a master, pages 141-143); and

"delegate the production ...to the external capabilities" (Visio, pages 142-144).

Art Unit: 2772

It is noted that Visio does not explicitly teach "an external shape stored outside the computer program" as claimed. However, Visio, new masters which are newly created suggests the external shape outside the computer program as claimed. Furthermore, Halviatti teaches that such "external shape" is well known in the art (Halviatti, ATUs 340, Fig. 3).

Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made, in view of the teaching of Halviatti, to configure Visio's system as claimed.

Claim 2 adds into claim 1 "an external action and an external symbol" which Visio teaches in the create of new master's name and icon (pages 141-145).

Claims 3-7 add into claim 2 the manipulation and attribution of the external shape which Visio teaches in pages 60-71.

Due to the similarity of claims 8-15, 16-20 and 21-28 to claims 1-7, they are rejected under a similar rationale.

Accordingly, the claimed invention as represented in the claims does not represent a patentable distinction over the art of record.

3. Due to new ground of the rejection cited above, this action has been made NON-FINAL.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phu Nguyen whose telephone number is (703) 305-9796. The examiner can normally be reached on Monday-Friday from 8:00am to 4:30pm.

Application/Control Number: 08/726,091

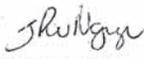
Page 4

Art Unit: 2772

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Powell, can be reached on (703) 305-9703. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-9724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

PN/ayc
October 20, 1998


PHU K. NGUYEN
PRIMARY EXAMINER
GROUP 2400

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Notice of References Cited		Application No. 08/726 091	Applicant(s) McFarland et al			
		Examiner P. Nguyen	Group Art Unit 2772	Page 1 of 1		
U.S. PATENT DOCUMENTS						
*	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	
A	5,790,117	8/98	Halviatti et al	345	333	
B	5,805,160	9/98	Yoshida et al	345	339	
C	5,812,131	9/98	Bertram	345	339	
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NON-PATENT DOCUMENTS						
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* A copy of this reference is not being furnished with this Office action.
(See Manual of Patent Examining Procedure, Section 707.05(a).)

Attorney's Docket:
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MJC



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: McFarland, et al.
Serial No.: 08/726,091
Filing Date: October 4, 1996
Group Art Unit: 2772
Examiner: Phu Nguyen
Title: METHOD AND SYSTEM FOR PRODUCING
GRAPHICAL IMAGES

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Group 2700

Honorable Assistant Commissioner
for Patents
Washington, D.C. 20231

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on the date shown below.
D'Anna S. Love
D'Anna S. Love
January 22, 1999
Date

Dear Sir:

RESPONSE PURSUANT TO 37 CFR § 1.111

In response to the Official Action mailed November 12, 1998, Applicants respectfully request the Examiner to reconsider the rejection of the claims in view of the comments as set forth below.

IN THE CLAIMS

For the convenience of the Examiner all of the pending claims are reproduced below regardless of whether amended or not. No amendments to the claims have been made.

1. A computerized system comprising:
a storage medium;
a processor coupled to the storage medium;
a computer program stored in the storage medium, the computer program operable to run on the processor, the computer program further operable to:
access an external shape stored outside the computer program, the external shape comprising external capabilities; and
delegate the production of a graphical image of the external shape to the external capabilities.
2. The computerized system of Claim 1, wherein the computer program is further operable to:
access an external shape stored outside the computer program, the external shape comprising an external action and an external symbol; and
delegate the production of graphical image of the external shape to the external action and the external symbol.
3. The computerized system of Claim 2, wherein the computer program is further operable to:
receive user input in a manner defined by the external action; and
manipulate the graphical image in response to the user input in a manner defined by the external symbol.
4. The computerized system of Claim 2 wherein the external action comprises a plurality of external methods and external data.

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5. The computerized system of Claim 2 wherein the external symbol comprises a plurality of external methods and external data.

6. The computerized system of Claim 4 wherein the plurality of external methods comprises:

a first method responsive to a mouse button activation;

a second method responsive to a mouse movement;

a third method responsive to input from a keyboard; and

a fourth method responsive to a command received from the computer program based on input received from a user.

7. The computerized system of Claim 5 wherein the plurality of external methods comprises:

a first external method operable to set the attributes of the external symbol;

a second external method operable to calculate the bounds of the external symbol;

a third external method operable to get the attributes of the external symbol;

a fourth external method operable to render the external symbol; and

a fifth external method operable to archive the external symbol.

8. A computer program encoded on a computer-readable medium, the computer program operable to:

access an external shape stored outside the computer program, the external shape comprising external capabilities; and

delegate the production of a graphical image of the external shape to the external capabilities.

9. The computer program of Claim 8, wherein the computer program is further operable to:
access an external shape stored outside the computer program, the external shape comprising an external action and an external symbol; and
delegate the production of a graphical image of the external shape to the external action and the external symbol.

10. The computer program of Claim 9, wherein the computer program is further operable to:
receive user input in a manner defined by the external action; and
manipulate the graphical image in response to the user input in a manner defined by the external symbol.

11. The computer program of Claim 8 wherein the external capabilities comprise a plurality of external methods and external data.

12. The computer program of Claim 9, wherein the external action comprises a plurality of external methods and external data.

13. The computer program of Claim 9 wherein the external symbol comprises a plurality of external methods and external data.

14. The computerized system of Claim 12 wherein the plurality of external methods comprises:
a first method responsive to a mouse button activation;
a second method responsive to a mouse button activation; and
a third method operable to allow the external shape to communicate data and events to the computer program.

15. The computerized system of Claim 13 wherein the plurality of external methods comprises:

- a first external method operable get the attributes of the external symbol;
- a second external method operable to calculate the bounds of the external symbol;
- a third external method operable to transform the external symbol;
- a fourth external method operable to render the external symbol; and
- a fifth external method operable to archive the external symbol.

16. A method for producing graphical images comprising:
executing a computer program;
providing a shape library external to the computer program, the shape library having at least one shape, the at least one shape having capabilities;
providing the capabilities associated with the at least one shape to the computer program while the application is executing; and
generating a graphical image based on the capabilities.

17. The method of Claim 16 wherein the step of providing a shape library comprises providing a dynamic link library.

18. The method of Claim 16 wherein the step of providing the capabilities associated with the shape comprises providing a plurality of actions comprising a plurality of action methods and providing a symbol comprising a plurality of symbol methods.

19. The method of Claim 18 wherein the plurality of action methods comprises:
a first method responsive to a mouse button activation;
a second method responsive to a mouse movement;
a third method responsive to input from a keyboard; and
a fourth method responsive to a command received from the computer program based on input received from a user.

20. The computerized system of Claim 18 wherein the plurality of symbol methods comprises:

- a first external method operable get the attributes of the symbol;
- a second external method operable to calculate the bounds of the symbol;
- a third external method operable to transform the symbol;
- a fourth external method operable to render the symbol; and
- a fifth external method operable to archive the symbol.

21. A computer graphics program encoded on a computer readable medium for generating a graphical image, comprising:

- an external shape module having an external shape that defines an external action and an external symbol, the external action operable to perform a generic action method and the external symbol operable to perform a generic symbol method;
- a communication link coupled to the external shape module; and
- a computer graphics application coupled to the communication link and operable to communicate with the external shape module using the communication link, the computer graphics application comprising an external action template operable to access the external action and an external symbol template operable to access the external symbol, the computer graphics application further operable to delegate the production of a graphical image to the generic action method and the generic symbol method.

22. The computer graphics program of Claim 21, further comprising an internal shape defining an internal action and an internal symbol.

23. The computer graphics program of Claim 21, wherein the external symbol is operable to perform a plurality of generic symbol methods.

24. The computer graphics program of Claim 21, wherein the external shape module comprises a dynamic link library.

25. The computer graphics program of Claim 21, further comprising a shared library and wherein the computer graphics application is further operable to access the shared library and the external shape library is operable to access the shared library.

26. The computer graphics program of Claim 21, wherein the communication link is operable to allow communication between the external shape library and the computer graphics application without the computer graphics application requiring knowledge of the contents of the external shape library.

27. The computer graphics program of Claim 21, wherein the communication link comprises the Object Linking and Embedding technology developed by Microsoft.

28. The computer graphics program of Claim 21, wherein the communication link comprises a dynamic link library application program interface.

REMARKS

This Application has been carefully reviewed in light of the Official Action mailed November 12, 1998. Applicants respectfully request reconsideration and favorable action in this case.

Section 103 Rejections

The Examiner rejects Claims 1-28 under 35 U.S.C. § 103(a) as being unpatentable over a book entitled "Developing Visio Solutions" ("*Visio*"), both alone and in combination with U.S. Patent No. 5,790,117 to Halviatti ("*Halviatti*"). In this regard it was stated as follows:

As per claim 1, Visio teaches the claimed "computerized system" comprising:

"a storage medium" (Visio, disk, page 4);

"a processor" (Visio, page 4);

"a computer program" (Visio, Developing Visio Solutions);

"access an external shape" (Visio, create a master, pages 141-143); and "delegate the production ... to the external capabilities" (Visio, pages 142-144).

It is noted that Visio does not explicitly teach "an external shape stored outside the computer program" as claimed. However, Visio, new masters which are newly created suggests the external shape outside the computer program as claimed. Furthermore, *Halviatti* teaches that such "external shape" is well known in the art (*Halviatti*, ATUs 240, Fig. 3).

Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made, in view of the teaching of *Halviatti*, to configure Visio's system as claimed.

Claim 2 adds into claim 1 "an external action and an external symbol" which Visio teaches in the create of new master's name and icon (pages 141-145).

Claims 3-7 add into claim 2 the manipulation and attribution of the external shape which Visio teaches in pages 60-71.

Due to the similarity of claims 8-15, 16-20, and 21-28 to claims 1-7, they are rejected under a similar rationale.

Applicants respectfully traverse this rejection of Claims 1-28 for the reasons described below. Claims 21-28 are addressed first, and Claims 1-20 are addressed next.

Claims 21-28

Applicants respectfully traverse the rejection of Claims 21-28. According to the Manual of Patent Examining procedure:

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art

reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Manual of Patent Examining Procedure, § 2143. The above rejection is improper for at least the reason that neither the proposed modification of Visio nor the combination of Visio and *Halviatti* teaches or suggests every limitation of the claimed invention. Claim 21 recites:

an external shape module having an external shape that defines an external action and an external symbol, the external action operable to perform a generic action method and the external symbol operable to perform a generic symbol method;

a communication link coupled to the external shape module; and
a computer graphics application coupled to the communication link and operable to communicate with the external shape module using the communication link, the computer graphics application comprising an external action template operable to access the external action and an external symbol template operable to access the external symbol, the computer graphics application further operable to delegate the production of a graphical image to the generic action method and the generic symbol method.

Visio does not teach or suggest this combination. Visio utilizes a table of data files that are accessed when a particular shape is desired. The data files contain information describing a shape. The shape is then created and edited with tools within the computer program. Such a system is limited to editing and creating shapes in ways permitted by the tools within the

computer program. Thus, although shapes may be added after the release of the computer program used in Visio, the shapes that may be added are limited to shapes that the internal tools in the computer program know how to create and edit.

Furthermore, the combination of Visio and *Halviatti* does not teach all of the limitations of Claim 21. The invention claimed in *Halviatti* is a "computer-aided software testing system and methods which assist a Quality-Assurance engineer and software developers with the testing of Graphical User Interface (GUI) software programs." *Halviatti* at col. 1, lines 21-26. Specifically, a computer-based training system is provided that "monitors various events of the Windows system and desired target applications." Messages from these "events" are "trapped by the ATUs and reported to the Message Engine as CBT messages." Messages of interest are processed by a script engine. *Halviatti* at col. 8, lines 42-61. *Halviatti* does not teach or suggest a computer graphics program that comprises an external shape module, as claimed in the present application.

Neither the proposed modification of Visio nor the combination of Visio and *Halviatti* teaches or suggests all of the limitations claimed in Claim 21. For example, the cited portions of Visio do not teach **"an external shape module having an external shape that defines an external action and an external symbol, the external action operable to perform a generic action method and the external symbol operable to perform a generic symbol method,"** nor is such a limitation identified by the Examiner as being taught by Visio. Nowhere in the cited portions of Visio is there any suggestion of external actions or symbols that are operable to perform a generic action method or a generic symbol method. Rather, in the cited portions of Visio, Visio describes the creation of a master, which is defined at page 16 of Visio as a shape saved on a stencil so that it can be reused in other drawings. The performance of a generic action method or generic symbol methods is not addressed by the cited portions of the reference. Failure to utilize external actions operable to perform generic action methods and external symbols operable to perform generic symbols methods limits Visio to the production of shapes the may be produced utilizing only the internal tools of the computer program. Thus, the proposed modification does not teach the above-cited claim limitation.

Furthermore, the combination of Visio and *Halviatti* also does not teach the claimed external shape module. The Examiner states that *Halviatti* teaches that external shapes are well known in the art. The Examiner cites to *Halviatti's* disclosure of "ATUs". *However, the ATUs are not related to, and do not suggest, external shapes. The function of the ATUs is to process messages from specific target applications and from an operating system, such as Microsoft Windows. Halviatti at col. 8, line 64 to col. 9, line 13. The ATUs function "to trap events and convert them into CBT messages," which are "high-level message[s] describing one or more events which have occurred." Halviatti at col. 9, lines 14-20. For example, instead of having to monitor low-level system messages that announce when either the left or right mouse button is in either an up or down position, the user is only informed that a mouse button has been clicked. Halviatti at col. 9, lines 20-25. In no way does Halviatti teach or suggest an "external shape" in an "external shape module" that is operable to produce "a graphical image." For these reasons alone, the rejection is improper.*

In addition to not teaching the claimed external shape module, the cited portions of Visio and *Halviatti* do not teach **"a communications link coupled to the external shape module,"** nor does the Examiner assert that such a limitation is taught. Furthermore, the cited portions of Visio and *Halviatti* do not teach **"a computer graphics application comprising an external action template operable to access the external action and an external symbol template operable to access the external symbol, the computer graphics application further operable to delegate the production of a graphical image to the generic action method and the generic symbol method,"** nor does the Examiner assert that such limitations are taught. Nowhere in the cited portions of Visio and *Halviatti* is there a teaching of the delegation of the production of a graphical image to a generic action method and a generic symbol method of an external shape. In fact, Visio suggests the opposite. In the last paragraph of page 142, Visio states with reference to the creation of a master:

With either of the procedures described in this section, you can create a master from an object that you have pasted or imported into Visio from another program.

However, when users create an instance of such a master, they won't be able to edit the shape's vertices, rotate it, or add text to it.

Thus, the capabilities of a shape utilized by Visio are limited *a priori* by the capabilities of Visio, which is inconsistent with the delegation of the production of a graphical image to a generic action method and a generic symbol method contained in a shape external to the computer program. Thus, not only does Visio not teach this delegation, it teaches away from such delegation. In addition, as stated above, *Halviatti* also does not teach this limitation. For each of the above reasons, the rejection is improper. Reconsideration and favorable action are requested.

As depending from allowable independent Claim 21, dependent Claims 22-28 are also allowable. Reconsideration and favorable action are requested.

Claims 1-15

Applicants respectfully traverse the above rejection of Claims 1-15. This rejection is improper for at least two reasons. First, neither the proposed modification of Visio nor the combination of Visio and *Halviatti* teaches or suggests every limitation of the claimed invention. Second, the proposed modification of Visio is improper because there is no suggestion or motivation in the art to modify the reference as suggested by the Examiner.

With respect to the first reason, Claims 1 and 8 each recite, for example, "**a computer program further operable to: access an external shape stored outside the computer program, the external shape comprising external capabilities; . . . and delegate the production of a graphical image of the external shape to the external capabilities.**" Applicants respectfully submit Visio, either alone or in combination with *Halviatti*, does not teach or suggest this limitation. For example, the rejection itself admits that Visio does not explicitly teach "**an external shape stored outside the computer program as claimed.**" Therefore, Applicants respectfully submit that Visio also does not teach a computer program operable to access an external shape having external capabilities and operable to delegate the

production of a graphical image of the external shape to the external capabilities. Contrary to the assertion made in the rejection, Applicants find no mention on pages 142-144 in *Visio* of the delegation of the production of a graphical image of the external shape to the external capabilities, and as described above in conjunction with Claims 21-28, *Visio* actually teaches away from providing external shapes with external capabilities. For at least this reason, the rejection is improper.

Furthermore, *Halviatti* does not teach or suggest the use of an external shape. The Examiner states that *Halviatti* teaches that an "external shape" is well known in the art. However, Applicants find no reference to an external shape, or anything related to an external shape, in that reference. As described above, contrary to the Examiner's assertion, the ATUs disclosed in *Halviatti* in no way teach or suggest the use of external shapes. For at least this reason, the rejection is improper.

In addition to not teaching the claimed limitations, the rejection is also improper because there is no suggestion or motivation in the art to modify *Visio* as suggested by the Examiner. In this regard, the Examiner stated:

It is noted that *Visio* does not explicitly teach "an external shape stored outside the computer program" as claimed. However, *Visio*, new masters which are newly created suggests the external shape outside the computer program as claimed.

This recitation clearly does not constitute a suggestion or motivation in the art to modify the reference as proposed by the Examiner. The Examiner admits that *Visio* does not explicitly teach "an external shape stored outside the computer program." Thus, it is clear that the Examiner has concluded that *Visio* new masters, which are described in *Visio*, do not constitute an external shape stored outside the computer program. As not constituting an external shape stored outside the computer program, Applicants respectfully submit that the use of *Visio* new masters does not suggest the claimed combinations.

The Examiner is reminded that it is the Examiner's responsibility to provide a convincing line of argument as to why one of ordinary skill in the art would be motivated to modify a reference. M.P.E.P. § 706.02(j) ("The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. To support the conclusion that the claimed invention is directed to obvious subject matter, either the reference must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat App. & Inter. 1985)"). Such a convincing line of argument has not been provided, nor is one available in the prior art.

Rather, only the teachings of the specification provide such reasoning. According to one non-limiting embodiment of the invention, the utilization of an external shape having external capabilities allows the production of shapes that the underlying computer program would not otherwise know how to create or edit. Therefore, according to the specification, it is desirable to utilize external shapes having external capabilities. However, the Examiner cannot rely on the teachings of the invention to provide the rationale for the proposed modification. Such reliance is clearly improper. M.P.E.P. § 2143 ("The teaching or suggestion to make the claimed combination and the reasonable expectation of success must be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)"). For this additional reason, the proposed modification is improper, and therefore the rejection is improper. Reconsideration and favorable action are requested.

In addition to depending from allowable independent Claim 1, Claim 2 is allowable for that additional reason that neither *Visio* nor *Halviatti* teaches **"an external shape comprising an external action and an external symbol."** As described above, the Examiner admits that *Visio* does not teach an external shape stored outside the computer program. Clearly, *Visio* does not teach an external shape comprising an external action and an external symbol. In addition, as described above, *Halviatti* does not teach an external shape, and therefore also does not teach an external shape comprising an external action and an external symbol. Reconsideration and

favorable action are requested. As depending from Claims 1 and 2, dependent Claims 3 through 6 are also allowable.

In addition to depending from allowable independent Claims 1 and 2, Claim 7 recites additional limitations that are not taught by the cited references. By way of example, Claim 7 recites "**a third external method operable to get the attributes of the external symbol.**" Neither *Visio* nor *Halviatti* teach this limitation, nor has the Examiner asserted that such a limitation is taught by these references. Reconsideration and favorable action are requested.

For analogous reasons, the rejection of dependent Claims 9 through 15 is also improper. Reconsideration and favorable action are requested.

Claims 16-20

Applicants respectfully traverse the rejection of independent Claim 16 and the claims that depend from it under similar rationale as described above in conjunction with Claims 1 and 8. For example, Claim 16 recites "**providing a shape library external to the computer program, the shape library having at least one shape, the at least one shape having capabilities;**" and "**providing the capabilities associated with the at least one shape to the computer program while the application is executing.**" These limitations are clearly not taught by *Visio* or *Halviatti*. For at least this reason, Claim 16, and the claims that depend from Claim 16, are allowable. Reconsideration and favorable action are requested.

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PATENT
08/726,091

16

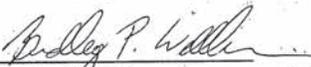
Conclusions

Applicants have now made an earnest attempt to place this case in condition for allowance. For the foregoing reasons, and for other reasons clearly apparent, Applicants respectfully request full allowance of all pending Claims. If the Examiner feels that a telephone conference or an interview would advance prosecution of this Application in any manner, the undersigned attorney for Applicants stands ready to conduct such a conference at the convenience of the Examiner.

The Commissioner is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 02-0384 of Baker & Botts, L.L.P.

Respectfully submitted,

BAKER & BOTTS, L.L.P.
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Date: January 22, 1999

DAL01:422029.1

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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
08/726,091	10/04/96	MCFARLAND	K 018682.0120

BAKER AND BOTTS
 2001 ROSS AVENUE
 DALLAS TX 75201-2980

LM61/0412

EXAMINER

NGUYEN, P

ART UNIT PAPER NUMBER

2772

8

DATE MAILED: 04/12/99

This is a communication from the examiner in charge of your application.
 COMMISSIONER OF PATENTS AND TRADEMARKS

NOTICE OF ALLOWABILITY

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course.

This communication is responsive to the correspondence filed 1-26-99
 The allowed claim(s) is/are 1-28

- The drawings filed on _____ are acceptable.
- Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
 - All Some* None of the CERTIFIED copies of the priority documents have been received.
 - received in Application No. (Series Code/Serial Number) _____
 - received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

- Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

A SHORTENED STATUTORY PERIOD FOR RESPONSE to comply with the requirements noted below is set to EXPIRE **THREE MONTHS** FROM THE "DATE MAILED" of this Office action. Failure to timely comply will result in ABANDONMENT of this application. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

- Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION, PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.
- Applicant MUST submit NEW FORMAL DRAWINGS
 - because the originally filed drawings were declared by applicant to be informal.
 - including changes required by the Notice of Draftsperson's Patent Drawing Review, PTO-948, attached hereto or to Paper No. _____
 - including changes required by the proposed drawing correction filed on _____, which has been approved by the examiner.
 - including changes required by the attached Examiner's Amendment/Comment.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the reverse side of the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

- Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any response to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

Attachment(s)

- Notice of References Cited, PTO-892
- Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- Notice of Draftsperson's Patent Drawing Review, PTO-948
- Notice of Informal Patent Application, PTO-152
- Interview Summary, PTO-413
- Examiner's Amendment/Comment
- Examiner's Comment Regarding Requirement for Deposit of Biological Material
- Examiner's Statement of Reasons for Allowance

Phu K. Nguyen
 PHU K. NGUYEN
 PRIMARY EXAMINER
 GROUP 2400



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

NOTICE OF ALLOWANCE AND ISSUE FEE DUE

LMS1/0412

BAKER AND BOTTS
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APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
08/726,091	10/04/96	028	NGUYEN, P	2772 04/12/99
First Named Applicant	MCFARLAND,		35 USC 154(b) term ext. =	0 Days.

TITLE OF INVENTION: METHOD AND SYSTEM FOR PRODUCING GRAPHICAL IMAGES

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
2 018582.0120	345-441.000	R63	UTILITY	YES	\$605.00	07/12/99

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.

THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.

HOW TO RESPOND TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.
If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

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If the SMALL ENTITY is shown as NO:

- A. Pay FEE DUE shown above, or
- B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give application number and batch number.
Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

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PTOL-85 (REV. 10-96) Approved for use through 06/30/99. (0651-0033)

PART B—ISSUE FEE TRANSMITTAL

Complete and mail this form, together with applicable fees, to: **Box ISSUE FEE
Assistant Commissioner for Patents
Washington, D.C. 20231**

MAILING INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE. Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Issue Fee Receipt, the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

Note: The certificate of mailing below can only be used for domestic mailings of the Issue Fee Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing.

Certificate of Mailing

I hereby certify that this Issue Fee Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Box Issue Fee address above on the date indicated below.

Karen Langford (Depositor's name)

Karen Langford (Signature)

June 7, 1999 (Date)

CURRENT CORRESPONDENCE ADDRESS (Note: Legibly mark-up with any corrections or use Block 1)

BAKER AND BOTTS
2001 ROSS AVENUE
DALLAS TX 75201-2980



APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
08/726,091	10/04/96	028	NGUYEN, P 2772	04/12/99
First Named Applicant: MCFARLAND, 35 USC 154(b) term ext. = 0 Days.				

TITLE OF INVENTION: METHOD AND SYSTEM FOR PRODUCING GRAPHICAL IMAGES

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
2 018682.0120	345-441.000	R53	UTILITY	YES	\$605.00	07/12/99

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). Use of PTO form(s) and Customer Number are recommended, but not required.

Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

"Fee Address" indication (or "Fee Address" Indication form PTO/SB/47) attached.

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Baker & Botts, L.L.P.

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type) PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the PTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Micrografx, Inc.

(B) RESIDENCE: (CITY & STATE OR COUNTRY) Richardson, Texas

Please check the appropriate assignee category indicated below (will not be printed on the patent)

Individual corporation or other private group entity government

4a. The following fees are enclosed (make check payable to Commissioner of Patents and Trademarks):

Issue Fee
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4b. The following fees or deficiency in these fees should be charged to:

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The COMMISSIONER OF PATENTS AND TRADEMARKS IS requested to apply the Issue Fee to the application identified above.

(Authorized Signature)

(Date)

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Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent No.: 5,959,633
Issue Date: 9/28/1999
Serial No.: 08/726,091
Filing Date: 10/4/1996
Title: METHOD AND SYSTEM FOR PRODUCING GRAPHICAL IMAGES

Box M Fee
Honorable Assistant Commissioner of Patents
Washington, DC 20231

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Box M Fee, Commissioner of Patents and Trademarks, Washington, D.C. 20231, on the date shown below.

Chun-wei Fleming
Name

5-16-02
Date

Dear Sir:

COMPLETED

NOTIFICATION OF CHANGE IN SMALL ENTITY STATUS

The assignee of the above-identified U.S. Patent Application wishes to notify the U.S. Patent and Trademark Office that status as a Small Entity is no longer appropriate pursuant to 37 C.F.R. §1.9.

Respectfully submitted,

BAKER BOTTS L.L.P.
Attorneys for Assignee

[Signature]
Barton E. Showalter
Registration No. 38,302

Date: *May 16, 2002*
2001 Ross Avenue, Suite 600
Dallas, TX 75201-2980
(214) 953-6509
Attorney Docket No.: 073030.0106

STATUS AND ENTITY
BRANCH
2002 JUN -3 PM 4:26

DAL01:673305.1

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 1996

Application or Docket Number:

08/726091

CLAIMS AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA
BASIC FEE		
TOTAL CLAIMS	<i>08</i> minus 20 =	<i>8</i>
INDEPENDENT CLAIMS	<i>4</i> minus 3 =	<i>1</i>
MULTIPLE DEPENDENT CLAIM PRESENT		

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
	385.00	OR		770.00
x\$11=		OR	x\$22=	<i>176</i>
x40=		OR	x80=	<i>80</i>
+130=		OR	+260=	
TOTAL		OR	TOTAL	<i>1026</i>

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

AMENDMENT A	(Column 1)	(Column 2)	(Column 3)	PRESENT EXTRA
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR		
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
x\$11=		OR	x\$22=	
x40=		OR	x80=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B	(Column 1)	(Column 2)	(Column 3)	PRESENT EXTRA
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR		
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
x\$11=		OR	x\$22=	
x40=		OR	x80=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C	(Column 1)	(Column 2)	(Column 3)	PRESENT EXTRA
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR		
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
x\$11=		OR	x\$22=	
x40=		OR	x80=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
 *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
 The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

