

CLASS 345, COMPUTER GRAPHICS PROCESSING AND SELECTIVE VISUAL DISPLAY SYSTEMS

SECTION I - CLASS DEFINITION

This class provides for processes and apparatus for selective electrical control of two or more light-generating or light-controlling display elements* in accordance with a received or stored image data signal. The image data includes character, graphical information or display attribute data. The image data may include, for example, information data from a peripheral input device, from the reception of a television signal, from the recognition of image data, or from the generation or creation of image data by a computer.

This class also provides for digital data processing systems or methods for data processing for visual presentation, wherein the processing of data includes the creation or manipulation of graphic objects (e.g., artificial images), or text.

SCOPE OF THE CLASS

- (1) Note. This class includes a display controller* for accessing image data. The display control includes, for example, control between a display memory and the display elements*. The display control may be performed by a processor, wherein enhancements for a previously created and stored image are provided. Examples of such display control include display memory addressing, display screen energizing, and received image data control in response to input signals applied to the display control to provide an enhanced image for display. A specific display system* in combination with a data processor or computer is classified herein.
- (2) Note. The display elements* of this class include, for example, (1) a CRT display wherein visual elements* of the image or message originate at the light-emitting screen of a cathode-ray tube, (2) a flat panel display (non-CRT display system*) wherein visual elements* of image or message are the result of light producers or light controllers arranged in a tangible mechanical grouping or array, (3) any matrix arrangement of light-generating or light-controlling display elements* with selective electrical display control, or (4) any plural arrangement of segmented light-generating or light-controlling display elements* with selective electrical display control.
- (3) Note. Claimed subject matter directed to a display function (waveform) generator combined with a display is classified herein unless there is claimed structure relating to the manner in which the waveform is detected or measured.
- (4) Note. Generally, significantly claimed structure external to this class, claimed in combination with subject matter under the class definition above, which displays or produces an image or message related to such external structure or its function, is classified in the class appropriate to the external structure; however, a significantly claimed operator interface claimed in combination with computer graphics processing such as attribute processing or graphic manipulation, which displays or produces an image or message related to such operator interface is classified herein. Further, nominally claimed structure external to this class, claimed in combination with subject matter under this class definition, is classified in this class unless provided for in the appropriate external class.
- (5) Note. This class provides for peripheral input devices which include a manually actuatable selective means (e.g., keyboards, light pens, joysticks, mice, and touch tablets etc.) to selectively input the information data to the selective display control which translates the selective input into a message symbol or image, (e.g., a character or graphic object) on the display to an observer.
- (6) Note. This class also provides for display storage devices such as display memory with more than nominal recitation of their organization and structure claimed for storing the previously created or generated data to be displayed on the display.
- (7) Note. Graphic objects of this class are defined by their coordinates, shape, size, and attributes. Such graphic objects define

- a portion of a displayed image and may be a combination of computer generated objects and real life images.
- (8) Note. Information processing for creating a visual image which includes more than a nominal recitation of information processing is classified herein.
- (9) Note. The use of a memory system for processing in conjunction with a data presentation/computer graphics system (e.g., for manipulating the addressing or contents of image or text data stored in a memory) is classified herein.
- (10) Note. Font generation for display and font processing to form the character patterns is classified herein.
- (11) Note. Color information processing wherein the color in the image is calculated, is classified herein (e.g., shading, interpolating color values in a polygon).
- (12) Note. Generation or manipulation of three dimensional or perspective display information or objects, generation or control of a mapping pattern, or animation are classified in this class.
- (13) Note. Systems which display a change of appearance, where the change is computer generated (e.g., creation or modification of hairstyles or clothing to be overlaid with a video image or a model), are classified in this class.
- 200, Electricity: Circuit Makers and Breakers, particularly subclass 5 for multiple switch control.
- 235, Registers, particularly subclasses 375 through 386 for systems controlled by data bearing records which may include selective display; various subclasses for basic machines and associated indicating mechanisms for ascertaining the number of movements of various devices and machines, plus machines made from these basic machines alone (e.g., cash registers, voting machines), and in combination with various perfecting features, such as printers and recording means.
- 250, Radiant Energy, subclasses 200 through 239 for light detection using photocell circuitry and subclass 553 for light source array or matrix.
- 257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), appropriate subclasses for single, plural, and integrated element solid-state light source.
- 273, Amusement Devices: Games, appropriate subclasses for TV games using display device.
- 313, Electric Lamp and Discharge Devices, appropriate subclasses for some light sources, per se, particularly subclasses 484 through 493 for gaseous discharge display panel and subclasses 498-512 for solid-state type device.
- 315, Electric Lamp and Discharge Devices: Systems, appropriate subclasses for structure of cathode-ray tube energizing circuits and subclass 169.1 – 169.4 for structure of panel display devices (e.g., electroluminescent and gas display).
- 324, Electricity: Measuring and Testing, subclass 121 for measuring and testing electricity using a CRT.
- 326, Electronic Digital Logic Circuitry, appropriate subclasses for electronic digital logic circuits; and appropriate subclasses for generic digital logic devices, circuitry, and subcombinations thereof, wherein nonarithmetical operations are performed upon discrete electrical signals representing a value normally described by numerical digits.
- 327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, subclasses 108 through 112 for miscellaneous current driving circuits.
- 340, Communications: Electrical, subclasses 1.1 through 16.1 for controlling one or more devices to obtain a plurality of results by transmission of a designated one of plural distinctive control signals over a smaller number of communication lines or channels, particularly

SECTION II - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

- 40, Card, Picture, or Sign Exhibiting, particularly subclass 406 for display device with gas or liquid movement.
- 74, Machine Element or Mechanism, particularly subclass 471 for control elements which move in two planes.
- 116, Signals and Indicators, particularly subclasses 200 through 337 for various indicators.
- 178, Telegraphy, particularly subclasses 18.01 through 20.04 for digitizing writing tablets, stylus, and circuits.

- subclasses 2.1-2.8 for path selection, subclass 2.81 for tree or cascade selective communication, subclasses 3.1-3.9 for communication systems where status of a controlled device is communicated, subclasses 4.2 and 4.21 for synchronizing selective communication systems, subclasses 9.1-9.17 for addressing, and subclasses 12.1-12.55 for pulse responsive actuation.
- 341, Coded Data Generation or Conversion, subclasses 22 through 34 for bodily actuated code generation relating to a keyboard; and various subclasses for electrical pulse and digit code converters (e.g., systems for originating or emitting a coded set of discrete signals or translating one code into another code wherein the meaning of the data remains the same but the formats may differ).
- 342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclass 142 for radar display systems using a CRT display.
- 348, Television, appropriate subclasses for systems and subsystems for display of television (real time scanned produced) signals.
- 349, Liquid Crystal Cells, Elements and Systems, appropriate subclasses for the details of a liquid crystal cell structure.
- 352, Optics: Motion Pictures, subclass 87 where motion picture animation will be found.
- 353, Optics: Image Projectors, appropriate subclasses for specifics of optics involved with an image projector.
- 358, Facsimile and Static Presentation Processing, subclasses 1.1 through 1.18 for static presentation processing.
- 359, Optical: Systems and Elements, subclasses 237 through 324 for structure relating to an optical modulator and subclasses 443-461 for projection screens.
- 360, Dynamic Magnetic Information Storage or Retrieval, (which is an integral part of Class 369 following subclass 18), appropriate subclasses for record carriers and systems wherein information is stored and retrieved by interaction with a medium and there is relative motion between a medium and a transducer, for example, magnetic disk drive devices and control thereof, per se.
- 362, Illumination, appropriate subclasses for a specific illumination device and particularly subclasses 227 through 252 for plural light sources for general lighting uses.
- 365, Static Information Storage and Retrieval, subclasses 106 through 119 and 120-128 for storage systems using visible light for the retrieval of stored information instead of for the display of a selected image (message or data); and various subclasses for addressable static singular storage elements or plural singular storage elements of the same type (i.e., the internal elements of memory, per se).
- 368, Horology: Time Measuring Systems or Devices, subclasses 223 through 242 for displays of time (i.e., watches).
- 369, Dynamic Information Storage or Retrieval, particularly subclasses 99 through 175 for information handling in conjunction with a dynamic store; and various subclasses for record carriers and systems wherein information is stored and retrieved by interaction with a medium and there is relative motion between a medium and a transducer.
- 377, Electrical Pulse Counters, Pulse Dividers, or Shift Registers: Circuits and Systems, subclasses 112 through 113 for display control with registers; and various subclasses for generic circuits for pulse counting.
- 379, Telephonic Communications, subclass 96 for displaying digital information on a terminal.
- 380, Cryptography, appropriate subclasses for cryptographic electric signal modification in general.
- 382, Image Analysis, appropriate subclasses, for previously scanned image data and for image recognition, processing and nominal display relating to such recognition; and various subclasses for operations performed on image data with the aim of measuring a characteristic of an image, detecting variations, detecting structures, or transforming the image data, and for procedures for analyzing and categorizing patterns present in image data.
- 400, Typewriting Machines, particularly subclasses 83 through 85 for typewriting machines including a display.
- 434, Education and Demonstration, subclasses 1 through 10 for system performing distant object energy sensing wherein said systems include a display, subclasses 307 and 323 for educational system including a CRT.
- 463, Amusement Devices: Games, subclasses 1 through 47, where there is recited a method or apparatus for moving or processing information specified as game or contest information (e.g., a video game, etc.), especially subclasses 31-34 for specifics of processing visual infor-

- mation data in a game or contest appropriate for Class 463.
- 705, Data Processing: Financial, Business Practice, Management, or Cost/Price Determination, appropriate subclasses for user interface specific to business practice.
- 707, Data Processing: Database, Data Mining, and File Management or Data Structures, subclasses 634 and 805 for database specific user interface.
- 708, Electrical Computers: Arithmetic Processing and Calculating, subclasses 270 through 277 for mathematical function generation and subclass 849 for specialized analog function generation including a CRT display.
- 713, Electrical Computers and Digital Processing Systems: Support, subclass 187 and 188 for software program protection or computer virus detection in combination with data encryption.
- 714, Error Detection/Correction and Fault Detection/Recovery, appropriate subclasses for generic electrical pulse or pulse coded data error detection and correction.
- 715, Data Processing: Presentation Processing of Document, Operator Interface Processing, and Screen Saver Display Processing, appropriate subclasses for document processing specific user interface, for an operator interface generally, or for screen saver display processing.

SECTION III - GLOSSARY

The following terms have been defined for purposes of classification in this class. In the class and subclass definition of this class, terms used in a sense defined below are indicated by an asterisk (*). When these terms are not indicated by an asterisk(*) in the definitions, the meaning is not restricted to the glossary definitions below.

ADDRESS DATA

Data that represent or identify a source or destination. (also see: Data)

ALPHANUMERIC

Any symbol found in the ASCII character set.

BUS

A conductor used for transferring data, signals, or power.

COMPUTER

A machine that inputs data, processes data, stores data, and outputs data.

DATA

Representation of information in a coded manner suitable for communication, interpretation, or processing. Also see: Address Data; Instruction Data; Status Data; User Data.

DATA PROCESSING

See PROCESSING, below.

DISPLAY CONTROLLER

An electrical circuit which actuates a display device* in accordance with received image data*.

DIGITAL DATA PROCESSING SYSTEM

An arrangement of processor(s) in combination with either memory or peripherals, or both, performing data processing.

DISPLAY DEVICE

A communication device which converts image data* into a visual image*.

DISPLAY ELEMENT

Means for producing a visual effect in a display device* comprised of a plurality (e.g., matrix) of such means.

DISPLAY SYSTEM

A system which comprises one or more display terminals* or one or more display devices*.

DISPLAY TERMINAL

A unit which comprises at least one display device* and user interface control means (e.g., mouse).

IMAGE DATA

The information provided to form the visual image*.

INFORMATION

Meaning that a human being assigns to data by means of the conventions applied to that data.

INSTRUCTION DATA

Data that represent an operation and identify its operands, if any. (also see: Data)

MEMORY

A functional unit to which data can be stored and from which data can be retrieved.

PERIPHERAL

A functional unit that transmits data to or receives data from a computer to which it is coupled.

PROCESSING

Methods or apparatus performing systematic operations upon data or information exemplified by functions such as data or information transferring, merging, sorting, and computing (i.e., arithmetic operations or logical operations).

- (1) Note. In this class, the glossary term data is used to modify processing in the term data processing; whereas the term digital data processing system refers to a machine performing data processing.
- (2) Note. In an effort to avoid redundant constructions, in this class, where appropriate, the term address data processing is used in place of address data data processing.

PROCESSOR

A functional unit that interprets and executes instruction data.

STATUS DATA

Data that represent conditions of data, digital data processing systems, computers, peripherals, memory, etc. (also see: Data)

USER DATA

Data other than address data, instruction data, or status data. (also see: Data)

VISUAL ELEMENT

The smallest constituent part of a composite visual image*. A visual element* may be the visual effect produced by a display element*.

VISUAL IMAGE

The resultant image shown by the display device*.

SUBCLASSES

1.1 PLURAL DISPLAY SYSTEMS:

This subclass is indented under the class definition. Subject matter including more than one visual display system.

- (1) Note. The use of adjacent Arts to display a large image is typical of this type of plural display system.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 4, for a single display system having plural display devices.

SEE OR SEARCH CLASS:

- 709, Electrical Computers and Digital Processing Systems: Multicomputer Data Transferring, appropriate subclasses for transmission of information among multiple computer systems.
- 710, Electrical Computers and Digital Data Processing Systems: Input/Output, subclasses 1 through 74 for input/output data processing, and subclasses 100-132 for intrasystem connection in a digital data processing system.

1.2 Data transmitted or received at surface of display:

This subclass is indented under subclass 1.1. Subject matter wherein the more than one visual display system includes plural display terminals in which a user uses an electronic device to transmit and or receive data at the display surface by electromagnetic means.

1.3 Tiling or modular adjacent displays:

This subclass is indented under subclass 1.1. Subject matter wherein the more than one visual display system includes plural displays adjacent to be viewed by the same user.

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